

# Installation and Maintenance Manual

Model: GTPW

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a TOYOTA ADVANCED LOGISTICS company

**Contributions**

ROLE	NAME	TITLE
Author	Ben Baker	Senior Design Engineer
Checker	Josh Foiles	Design Engineer
Approver	Chris Perry	Engineering Manager

**Revisions**

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## Term and Acronym Definitions

<b>TERM/ACRONYM</b>	<b>DEFINITION</b>
<b>2 Groove</b>	Roller format which uses O-Rings to transfer rotational motion from one roller to another in DC conveyor.
<b>Accumulation</b>	The collection or staging of multiple cartons, cases, or totes of product on conveyor.
<b>ATO</b>	Assembled to Order; Orders consisting of standard products
<b>Back pressure</b>	Pressure against carton(s) in the direction of carton flow resulting from weight of densely accumulated cartons.
<b>BF</b>	Between frame; this refers to the distance between conveyor bed side frames.
<b>BHCS</b>	Button head cap screw
<b>BOM</b>	Bill of Materials
<b>BZPDC</b>	Belted Zero Pressure Direct Current; DC belted conveyor format powered by MDRs with the intent to maintain zero pressure conditions
<b>Carton or Case</b>	Term for conveyable items generally contained in cardboard boxes.
<b>CB</b>	Carriage bolt
<b>CCW</b>	Counter-clockwise
<b>CW</b>	Clockwise
<b>DC</b>	Direct current
<b>DC Card</b>	A control card used to power and control the logic used when operating a MDR in DC conveyor applications.
<b>Diffuse</b>	A photoeye format that houses both the emitter and receiver and senses an object when the light beam is reflected back to the sensor. This type of photoeye is a standalone unit and does not use reflectors.
<b>Discharge</b>	The point where cartons, cases, or totes exit a conveyor or similar unit used in a material handling system.
<b>Divert</b>	(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.
<b>Double-dispense</b>	Event in which two or more cartons are dispensed by a shotgun zone when a single carton, case, or tote is requested. This is generally a result of two cartons, cases, or totes being in full contact just prior to reaching the shotgun zone.
<b>End-stop</b>	A plate mounted to conveyor with the intent of stopping and holding a carton, case, or tote in position until removed by a user or diverted by a conveyor unit.
<b>E-stop</b>	A highly visible button or pull cable designed to shut down equipment in the case of an emergency.

TERM/ACRONYM	DEFINITION
<b>ETO</b>	Engineered to Order; Orders requiring custom Engineering
<b>FAT</b>	Factory Acceptance Testing
<b>Flange</b>	A feature in sheet metal consisting of a face and bend connected to an existing face along a straight edge.
<b>Gapping</b>	The separation of cartons, cases, or totes which are initially in contact with one another. Generally done by progressively increasing the speed of consecutive zones, forcing cartons, cases, or totes to "pull a gap."
<b>Guide Rail</b>	Mechanism used to maintain the desired position of conveyable cartons, cases, or totes on their respective conveying surface.
<b>GTPW</b>	Goods-To-Person Workstation
<b>HHCS</b>	Hex head cap screw
<b>ID</b>	Inner diameter of a circular, cylindrical or arced body.
<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>MDR</b>	Motorized drive roller; DC powered conveyor roller with an internally mounted motor which may be controlled via internal or external commutation.
<b>MSD</b>	Master specification document; a document used to describe a product's intended capabilities, appearance, and interaction with users.
<b>OAW</b>	Overall width of any given conveyor bed.
<b>OD</b>	Outer diameter of a circular, cylindrical, or arced body.
<b>O-Ring</b>	A plastic ring with a circular cross section used for power transmission in DC conveyor applications.
<b>OSHA</b>	Occupational Safety and Health Administration
<b>Photoeye</b>	Device used to detect the presence of an object-such as a carton, case, or tote-by use of an emitter and receiver (not necessarily in the same unit as one another).

TERM/ACRONYM	DEFINITION
<b>Plow</b>	To gradually force a carton, case, or tote to move perpendicular to the initial direction of travel by means of physical contact with adjustable guide rail if and when the carton, case, or tote is outside the desirable bounds on the conveying surface.
<b>PM</b>	Project Management (or Project Manager)
<b>PO</b>	Purchase Order
<b>Poly-V</b>	A band or roller hub format with longitudinal ribs used for power transmission in DC conveyor applications.
<b>PPE</b>	Personal protective equipment
<b>Prox Sensor</b>	A sensor able to detect the presence of nearby objects without any physical contact.
<b>PTL</b>	Pick-To-Light
<b>Pulley</b>	Mechanical device used to change the direction of the belt in a conveyor system, to drive and/or tension the belt.
<b>Reflector</b>	A reflective component needed for retroreflective photoeyes to receive transmitted light or radiation when no object is in front of the photoeye.
<b>Retroreflective</b>	Of or relating to a surface or device that reflects light or other radiation back to its source.
<b>RLVDC</b>	Roller Live Direct Current; DC roller conveyor powered by live MDRs.
<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>RZPDC</b>	Roller Zero Pressure Direct Current; DC roller conveyor powered by MDRs with the intent to maintain zero pressure conditions.
<b>RZPDCS</b>	Roller Zero Pressure Direct Current Skew; RZPDC format conveyor configured as a skew.
<b>Shingling</b>	Event in which surfaces of adjacent cartons, cases, or totes are forced to lift off the conveyor due to elevated uneven carton, case, or tote back pressure.
<b>Shotgun</b>	Zone of conveyor (typically BZPDC) located at the discharge end of a conveyor mark. Used to accelerate a carton, case, or tote enough to get it well within the conveying path of another mark (typically RZPDC or RLVDC) mounted perpendicular to the initial mark.
<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>Singulation</b>	The active separation of cartons, cases, or totes.

<b>TERM/ACRONYM</b>	<b>DEFINITION</b>
<b>Skew</b>	A format of DC conveyor where one end of all rollers are shifted one roller position to provide an angled conveying surface for left or right justification of cartons, cases, or totes.
<b>SKU</b>	Stock Keeping Unit; Product and service identification code for a product (i.e. bar code).
<b>Slug</b>	The release or activation of all zones in a line of accumulating conveyor at the same time while still maintaining zero back pressure between products.
<b>Splice Assembly</b>	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.
<b>Takeup Pulley</b>	Pulley with an adjustable position used to eliminate unnecessary slack in a belt.
<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>Waterfall</b>	Method of overlapping guide rail such that cartons, cases, or totes cannot catch on downstream guide rail.
<b>Wire Ferrule</b>	Metal tube crimped over stranded wire to make a uniformly shaped terminal for increased connection quality and consistency.
<b>Wiz Nut</b>	A serrated flange nut used to cut into the surface of the component it is tightened against.
<b>Zero Pressure</b>	Condition where adjacent cartons, cases, or totes are not in contact with one another.
<b>Zone</b>	Any section of DC conveyor driven by a single MDR.

Table of Contents

<b>1</b>	<b>Introduction.....</b>	<b>11</b>
<b>2</b>	<b>OSHA and Safety .....</b>	<b>11</b>
<b>3</b>	<b>Model: GTPW .....</b>	<b>11</b>
<b>4</b>	<b>Receiving.....</b>	<b>15</b>
	4.1 Mark Numbers .....	15
	4.2 Skid Contents.....	15
	4.3 Skid Documentation.....	16
<b>5</b>	<b>Installation.....</b>	<b>17</b>
<b>6</b>	<b>Maintenance and Operation.....</b>	<b>20</b>
	6.1 Safety During Operation .....	20
	6.2 Maintenance Schedule.....	20
	6.2.1 Mechanical Service .....	20
	6.2.2 Electrical Service.....	21
	6.3 Replacement Procedures for DC Conveyor .....	22
	6.3.1 Replacing Rollers .....	22
	6.3.2 Replacing Bands .....	25
	6.3.3 Tracking Poly-V Bands .....	26
	6.4 Replacement Procedures for Pop-Up Transfers.....	26
	6.4.1 Removal of Pop-Up Transfer from GTPW .....	26
	6.4.2 Pop-Up Transfer Centering and Leveling .....	27
	6.4.3 Blade Motor Replacement .....	29
	6.4.4 Drive Sprocket Replacement .....	30
	6.4.5 Drive Spline Replacement .....	31
	6.4.6 Drive Belt and Blade Belt Replacement .....	33
	6.4.7 Idler Pulley Replacement.....	33
	6.4.8 Air Cylinder Replacement .....	34
	6.4.9 Pivot Bearing Replacement .....	36
	6.5 Replacement Procedures for IO-Link and Pneumatic Control Items .....	37
	6.5.1 Regulator Replacement .....	37
	6.5.2 Control Valve Bank Replacement .....	38
	6.5.3 IO-Link Block Replacement .....	38
<b>7</b>	<b>Troubleshooting and Repair.....</b>	<b>40</b>
	<b>Appendix 1: General Arrangement Drawings .....</b>	<b>42</b>
	<b>Appendix 2: Typical GTPW Electrical Layout Drawings.....</b>	<b>50</b>

## List of Figures

Figure 1-GTPW Typical Installation.....	12
Figure 2-GTPW General Arrangement.....	13
Figure 3: Mark Number Stickers.....	15
Figure 4: Skid Sticker.....	16
Figure 5-GTPW With Power Supply Sled in Shipping Position.....	18
Figure 6: MDR Removal-1 .....	23
Figure 7: MDR Removal-2 .....	24
Figure 8: MDR Removal-3 .....	24
Figure 9: Band Replacement .....	25
Figure 10-Removal of Pop-Up Transfer from GTPW Frame .....	27
Figure 11-Leveling an Installed Pop-Up Transfer .....	28
Figure 12-Centering an Installed Pop-Up Transfer .....	28
Figure 13-Exploded View of Pop-Up Transfer .....	30
Figure 14-Side View of Pop-Up Transfer Blades (Routing A).....	31
Figure 15-Side View of Pop-Up Transfer Blades (Routing B).....	32
Figure 16-Exploded View of Idler Pulley Assembly.....	34
Figure 17-Air Cylinder Detail.....	35
Figure 18-GTPW Power Supply Sled .....	37
Figure 19-General Arrangement, GTP Workstation Pop-Up Module, Sheet 1 of 3 .....	42
Figure 20-General Arrangement, GTP Workstation Pop-Up Module, Sheet 2 of 3 .....	43
Figure 21-General Arrangement, GTP Workstation Pop-Up Module, Sheet 3 of 3 .....	44
Figure 22-General Arrangement, GTP Workstation, Sheet 1 of 2 .....	45
Figure 23-General Arrangement, GTP Workstation, Sheet 2 of 2 .....	46
Figure 24-GTP Workstation Power Supply Sled, Sheet 1 of 1 .....	48
Figure 25-Typical GTPW Electrical Layout, Sheet 1 of 9 .....	50
Figure 26-Typical GTPW Electrical Layout, Sheet 2 of 9 .....	51
Figure 27-Typical GTPW Electrical Layout, Sheet 3 of 9 .....	52
Figure 28-Typical GTPW Electrical Layout, Sheet 4 of 9 .....	53
Figure 29-Typical GTPW Electrical Layout, Sheet 5 of 9 .....	54
Figure 30-Typical GTPW Electrical Layout, Sheet 6 of 9 .....	55
Figure 31-Typical GTPW Electrical Layout, Sheet 7 of 9 .....	56
Figure 32-Typical GTPW Electrical Layout, Sheet 8 of 9 .....	57
Figure 33-Typical GTPW Electrical Layout, Sheet 9 of 9 .....	58

## List of Tables

Table 1: MDR Nut Torque Specifications .....	21
Table 2: Troubleshooting Guide .....	40
Table 3-BOM for GA-GTPW-54-ML-0002 .....	47
Table 4-BOM for GA-GTPW-54-ML-0003 .....	49

## Reference Documents

MANUFACTURER	DOCUMENT TITLE	URL
<b>Balluff</b>	BNI EIP-507-005-Z040 BNI EIP-527-005-Z040 IP67 Module 4 IO-Link Class A and 8 in- and outputs 4 IO-Link Class B and 4 inputs Users Guide	<a href="https://assets.balluff.com/WebBinary1/MAN_BNI_EIP_5x7_005_Z040_EN_J19_DOK_930726_07_000.pdf">https://assets.balluff.com/WebBinary1/MAN_BNI_EIP_5x7_005_Z040_EN_J19_DOK_930726_07_000.pdf</a>
<b>Balluff</b>	BNI IOL-302-002-K006 IO-Link 1.1 sensor/actuator hub with extension port Users Guide	<a href="https://assets.balluff.com/WebBinary1/MAN_BNI_IOL_302_002_K006_EN_I16_DOK_919408_03_000.pdf">https://assets.balluff.com/WebBinary1/MAN_BNI_IOL_302_002_K006_EN_I16_DOK_919408_03_000.pdf</a>
<b>Balluff</b>	BNI IOL-75x-(V08-V13)-K007 IO-Link Version 1.1 Valve Plug User's Guide	<a href="https://assets.balluff.com/WebBinary1/MAN_BNI_IOL_75X_VXX_V08_13_K007_EN_I16_DOK_899072_06_000.pdf">https://assets.balluff.com/WebBinary1/MAN_BNI_IOL_75X_VXX_V08_13_K007_EN_I16_DOK_899072_06_000.pdf</a>
<b>Interroll</b>	User Manual Interroll 9006 Hybrid Control for RollerDrive	<a href="https://www.interroll.us/fileadmin/user_upload/AMERICAS/User_Manuals/9006_Manual_20120402.pdf">https://www.interroll.us/fileadmin/user_upload/AMERICAS/User_Manuals/9006_Manual_20120402.pdf</a>
<b>Interroll</b>	User Manual Interroll ZoneControl	<a href="https://www.interroll.us/fileadmin/user_upload/AMERICAS/User_Manuals/en_ZoneControl_V1_en_11-01-12.pdf">https://www.interroll.us/fileadmin/user_upload/AMERICAS/User_Manuals/en_ZoneControl_V1_en_11-01-12.pdf</a>
<b>Interroll</b>	Instruction Manual Interroll DriveControl	<a href="https://www.interroll.us/fileadmin/user_upload/AMERICAS/User_Manuals/en_DriveControl_20-54_V21_EN.pdf">https://www.interroll.us/fileadmin/user_upload/AMERICAS/User_Manuals/en_DriveControl_20-54_V21_EN.pdf</a>
<b>Interroll</b>	User Manual Interroll RollerDrive EC100 EC110	<a href="https://www.interroll.us/fileadmin/user_upload/AMERICAS/User_Manuals/en_RollerDrive_EC100_EC110_V3_en.pdf">https://www.interroll.us/fileadmin/user_upload/AMERICAS/User_Manuals/en_RollerDrive_EC100_EC110_V3_en.pdf</a>
<b>Interroll</b>	User Manual Interroll RollerDrive EC310	<a href="https://www.interroll.us/fileadmin/user_upload/AMERICAS/User_Manuals/en_RollerDrive_EC310_V2-1_en.pdf">https://www.interroll.us/fileadmin/user_upload/AMERICAS/User_Manuals/en_RollerDrive_EC310_V2-1_en.pdf</a>
<b>Itoh Denki</b>	HBM604 User Manual	<a href="http://itohdenki.com/wp-content/uploads/HBM604-Manual.pdf">http://itohdenki.com/wp-content/uploads/HBM604-Manual.pdf</a>

MANUFACTURER	DOCUMENT TITLE	URL
<b>Itoh Denki</b>	User Manual IB-E01, IB-E03B, and IB-E04F Dual 24V Brushless DC Motor Driver Module and Itoh Configurator E/IP Software	<a href="http://itohdenki.com/wp-content/uploads/IB-E-and-ICE-Manual-REV201408-001.pdf">http://itohdenki.com/wp-content/uploads/IB-E-and-ICE-Manual-REV201408-001.pdf</a>
<b>Itoh Denki</b>	HB-510N/P Technical Document	<a href="http://itohdenki.com/wp-content/uploads/HB-510-rev13-0514.pdf">http://itohdenki.com/wp-content/uploads/HB-510-rev13-0514.pdf</a>
<b>Itoh Denki</b>	CBM-105FN/FP Circuit Board	<a href="http://itohdenki.com/wp-content/uploads/CBM-105F-rev13-0514.pdf">http://itohdenki.com/wp-content/uploads/CBM-105F-rev13-0514.pdf</a>
<b>Teknic, Inc.</b>	ClearPath MC/SD User Manual Rev.3.05	<a href="https://www.teknic.com/files/downloads/clearpath_user_manual.pdf">https://www.teknic.com/files/downloads/clearpath_user_manual.pdf</a>
<b>Wilkerson</b>	Installation & Service Instructions 84-014-000: Filter / Regulator Models B18, B28 and B28A (#84014000)	<a href="http://www.wilkersoncorp.com/installation/84-014-000_R4_0906.pdf">http://www.wilkersoncorp.com/installation/84-014-000_R4_0906.pdf</a>
<b>Bastian Solutions</b>	BZPDC Installation and Maintenance Manual	Contact Bastian Solutions representative
<b>Bastian Solutions</b>	RZPDC Installation and Maintenance Manual	Contact Bastian Solutions representative
<b>Bastian Solutions</b>	Side Cover and Guiderail Installation Manual	Contact Bastian Solutions representative
<b>Bastian Solutions</b>	Support Installation Manual	Contact Bastian Solutions representative

## **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: GTPW**

The Goods-to-Person Workstation (GTPW) conveyor consists of a series of air-actuated right-angle transfers mounted between the rollers of a 24V DC roller zero pressure conveyor. GTPWs are used to present cartons to operators for filling or emptying at multiple “pick zones” along one side of the conveyor. Once the carton is filled, it will transfer over to the parallel takeaway conveyor and additional cartons will index forward. Figure 1 shows a typical installation of a GTPW and the surrounding conveyor with flow arrows indicating the possible flow paths through the GTPW.

The GTPW is packaged with its power supplies, I/O, and pneumatic controls mounted to a “sled” that is fully assembled to the GTPW in the factory in order to reduce the amount of onsite labor and installation time required. This power supply sled is field-mounted underneath the conveyor feeding into the GTPW. Figure 1 shows a typical installation where the power supply sled includes angle brackets and an additional floor support so that it can also be used to support one end of the infeed conveyor. Installations may vary; see the site-specific system layout and installation drawings for details.

All I/O is consolidated into an IO-Link interface which allows the GTPW to be controlled by hooking up a single Ethernet connection. A 4-port network switch is provided with the GTPW for field installation convenience (mounted inside the 24V power supply enclosure), so up to (2) additional scanners or other Ethernet devices may share the Ethernet connection with the GTPW. Surplus I/O connections may also be provided for some surrounding conveyor; see the system electrical layout drawings for details. System electrical layouts are the responsibility of the system integrator to provide unless otherwise specified.

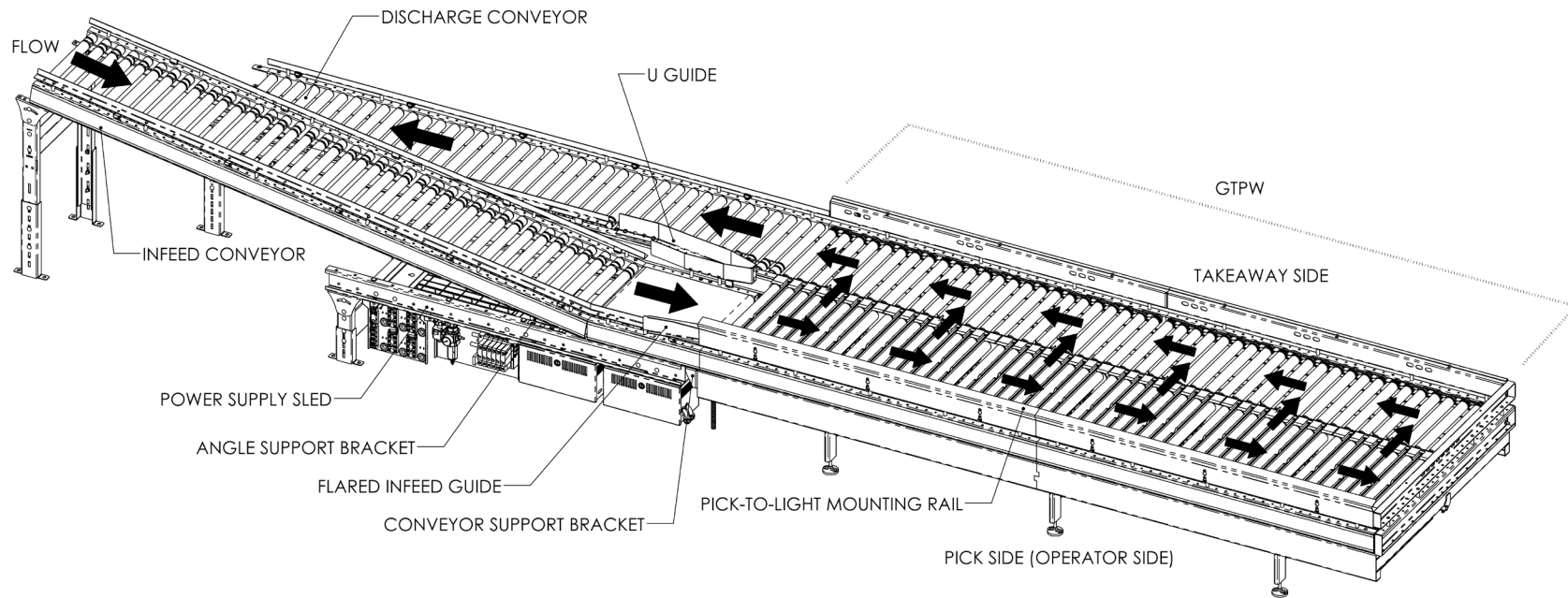


Figure 1-GTPW Typical Installation

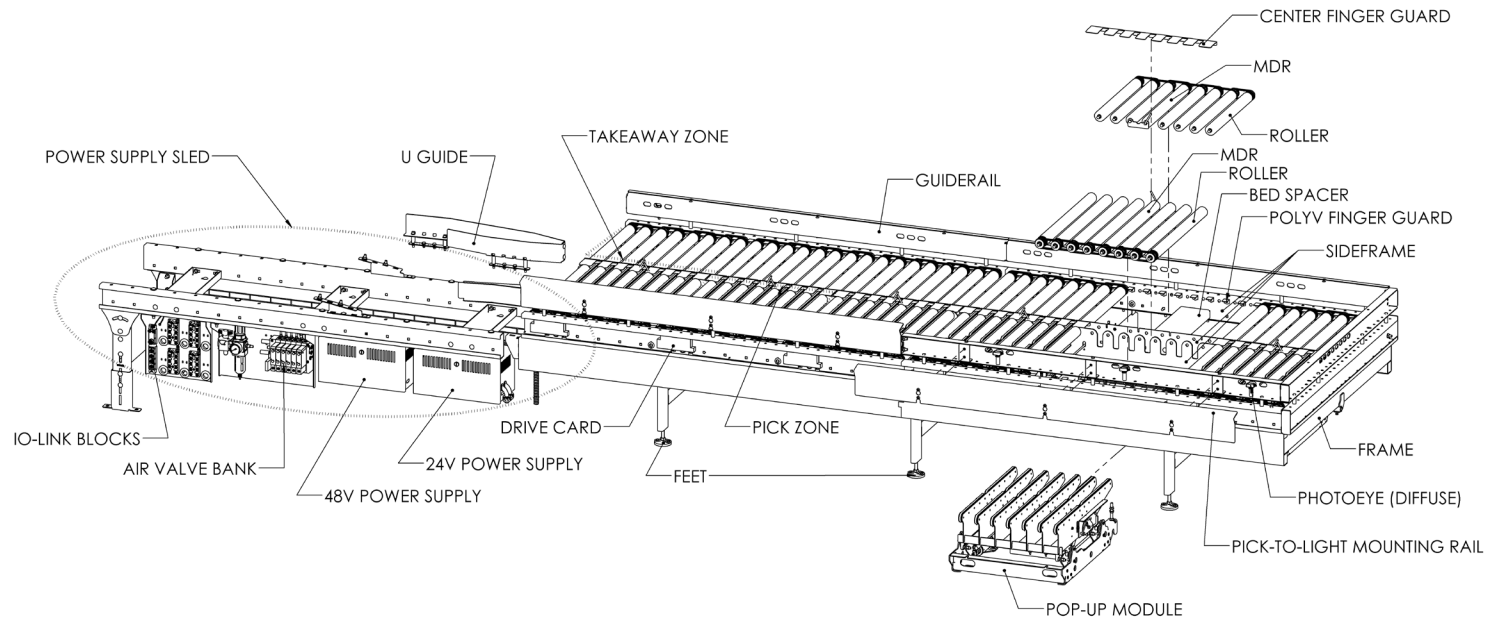


Figure 2-GTPW General Arrangement

The model shown in Figure 1 and Figure 2 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.

The model shown in Figure 1 and Figure 2 shows a 6-position "right hand" GTPW with 24" zone length. This means the GTPW has (6) pick zones, each containing an air-actuated pop-up transfer module mounted between the rollers of a 3" roller center DC zone. Each pick zone contains (1) diffuse photoeye. The workstation is a "right hand" model because when viewed standing at the infeed conveyor and looking in the direction of flow, the pick side or operator's side is on the right. Most systems contain both "right hand" and "left hand" GTPW models so a pair of GTPWs can be installed with the pick sides facing a shared operator area.

Each pop-up transfer consists of a pneumatic cylinder that lifts a row of "blades" into the product from below. The blades each contain a single timing belt and fit between rollers of the pick zone. The blade belts are driven by a 48V DC servo motor. The transfer operation accelerates the product such that it will slide onto the adjacent rollers of the takeaway zone. Figure 2 shows an exploded view with a pop up module removed from the GTPW.

Opposite the (6) pick zones, there are (6) takeaway zones. In typical applications, the takeaway zones are all controlled together as (1) long zone, and all share a single diffuse photoeye mounted near the discharge of the GTPW.

In normal operation, cartons enter the pick zones along an infeed conveyor downlane (shown in Figure 1) that would be installed directly above the power supply sled. They are then indexed along to one of the pick zones, where an operator interacts with the carton (either adding or removing products). The provided pick-to-light (PTL) mounting rail is used to mount indicator lights for each pick zone that would tell the operator which carton to pick from or put to, as well as a pushbutton for each pick zone that the operator can use to trigger a transfer when the picking operation is completed. Once the operator completes the picking operation, the pop-up transfer actuates and transfers the carton onto the takeaway zone, which then runs to discharge the carton onto takeaway conveyor running parallel to the infeed conveyor. Once a product is transferred off of a pick zone, the upstream products will index down to the next pick zone, allowing additional cartons to enter the GTPW regardless of which pick zone the carton was in when it was transferred. In most picking operations multiple cartons will be picked to simultaneously, increasing throughput and operator efficiency.

## 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@bastiansolutions.com](mailto: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.

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



Figure 3: 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 3, 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 4 shows a sample of a skid label. These stickers are placed on the surface of each skid.



Figure 4: 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.
  - a. Lay out the locations of the downlanes before setting the GTPW in position. In many installations, the downlanes are connected to sortation equipment that determines their location, so the easiest installation order is to set the final position of the GTPW after the downlanes are fully laid out and located.
3. Use elevation layouts to determine the conveyor's top of conveying surface. Adjust the feet of the GTPW to the correct height (the GTPW will ship with the feet adjusted to their lowest setting for stability during transport).



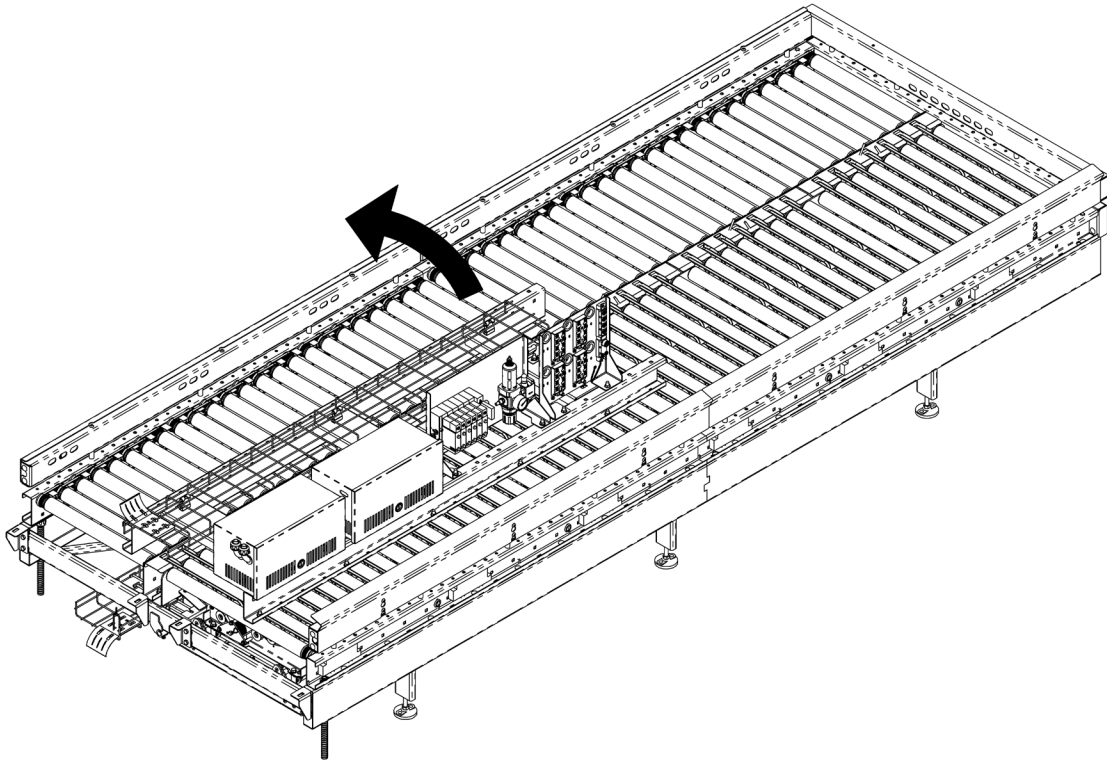
Maximum foot height is when 5" of thread is exposed on the adjustment bolt. Do not unscrew the feet past their maximum height, as the GTPW could fall if the adjustment bolt becomes completely unthreaded from the leg.

4. Set the GTPW in position. Fine tune the foot height to ensure the conveying surface is level and that all feet are contacting the floor. Once the feet are in their final positions, lock the height adjustment by tightening the jam nuts against the lower surface of the legs, to a torque of 45 ft-lb.



When lifting the GTPW, do not lift from the bottoms of the pop-up assemblies or the cable tray. Ensure that forks or other lifting equipment are only lifting from the welded frame. Cribbing will be needed to ensure that forks do not contact the pop-up assemblies. Use caution to ensure no cables or air lines are pinched between the cribbing and the forks or dislodged during lifting operations.

5. Carefully lift the power supply sled off the top of the GTPW conveying surface and unfold it so it can be placed underneath the install location of the infeed conveyor.
  - a. Use temporary supports or cribbing to ensure the sled does not rest on the power supply enclosures or any cabling.
  - b. Figure 5 shows how the power supply sled is positioned in its shipping position, upside down on the GTPW conveying surface. Cable bundles (not pictured) connect the sled with the GTPW. The unconnected end of the sled (indicated by the curved arrow) is lifted and rotated to turn the sled upright and position it to the location it is shown in Figure 2 (in section 3).



*Figure 5-GTPW With Power Supply Sled in Shipping Position*



The power supply sled is heavy (approximately 150 lbs) and awkward to maneuver. Use safe team lift practices to prevent injury and ensure the sled is not damaged during lifting.



Protect the conveying surface of the GTPW, particularly the belts of the pop-up transfers, from damage when lifting the power supply sled. Do not rest the corner of the sled on a pop-up transfer belt during the lifting process.

6. Complete installation of the infeed and discharge downlane conveyor.
  - a. Refer to the “Bastian Solutions Conveyor Support Installation Manual” and the manuals for the downlane conveyor types (typically Bastian Solutions RZPDC or Bastian Solutions BZPDC conveyors) for more information on installing conveyor.
  - b. The GTPW has brackets to support the infeed and discharge conveyors, so in most installations there are no separate floor supports immediately adjacent to the GTPW. Reference the system layout drawings for specific information regarding placement of supports.

7. Lift the power supply sled from its temporary supports or cribbing and fasten it underneath the infeed conveyor using the 3/8"-16 carriage bolts and w/z nuts provided. The recommended torque specification is 26 ft-lb.
  - a. Depending on the system layout, the power supply sled may have its own floor support on the infeed end (farthest from the GTPW) or it may be entirely supported below the infeed conveyor. If the infeed conveyor is declining, it is typical for the power supply sled to support the declined conveyor with an angle bracket. Reference the system layout drawings for more information.
  - b. See Figure 1 (in section 3) for a view of a typical installation including infeed and discharge conveyor sections mated to the GTPW.
8. Check that the height of the infeed and discharge ends are correct per the system layout.
9. Fasten the supports and GTPW feet to the floor (or other permanent fixture). The GTPW feet have holes with pop-out plugs to accommodate fastening.



Ensure the securing method is appropriate for the application. Installations in seismic zones will generally require an independent seismic review. Bastian Solutions does not provide general-purpose recommendations for concrete anchors or other fastening methods, since fastening requirements depend on the site-specific details of the mounting surface.

10. Attach any guiderail transition pieces or miscellaneous accessories. The GTPW itself ships with guiderail already installed. For information on guiderail installation, please reference the "Bastian Solutions Conveyor Side Cover and Guiderail Installation Manual".
  - a. Typical GTPW installations use a special U-shaped guiderail that mounts between the infeed and discharge conveyors. The long side of the U-shaped guiderail mounts on the discharge side.

## 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.

### 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.

1. Only fully trained employees should operate or perform maintenance on the conveyors. Proper training should include the detailed description of fail-safes, stopping devices, or other emergency regulations put in place.
2. WARNING stickers should be replaced if worn or damaged.
3. 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.
4. Operators should inspect the conveyor for damage, foreign objects, and verify all personnel is clear of the equipment prior to engaging drive.
5. Ensure that all areas are clear of objects prior to loading and unloading.
6. 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.
7. 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

1. A visual and auditory inspection of the equipment should be performed to identify any unusual noise that may indicate that there is a problem with the equipment.
2. Check all nuts and bolts to ensure bolts remain tight. MDR nuts should be torqued using a torque wrench to each MDR's torque specs. Please reference Table 1 for a list of common MDRs and their torque requirements.
3. PolyV bands should be inspected for excessive wear, stretching or slip and replaced as necessary.
4. Check bushings at pivot locations for excess wear or slop and replace as needed.
5. Belts should be inspected for excessive wear or improper tracking if applicable.
6. Inspect, clean, re-grease, or replace bearings as necessary.
7. The recommended interval for maintenance is at least once every 6 months.



Many maintenance procedures on the pop-up transfers are easier to perform by removing the entire pop-up from the GTPW frame. It is recommended to purchase one or more pre-built spare pop-up units so the units can be swapped to perform offline maintenance while allowing the system to continue operating.

Table 1: MDR Nut Torque Specifications

MDR	MDR NUT TORQUE SPECS
Interroll EC100/110	30 ft-lb
Interroll EC310	50 ft-lb
Itoh PM486FE/FP	23 ft-lb

### 6.2.2 Electrical Service

1. 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.

2. If adjustment of control card settings is required, refer to the respective technical manual listed in Reference Documents, or contact Bastian Solutions Customer Service at [ConveyorSupport@bastiansolutions.com](mailto:ConveyorSupport@bastiansolutions.com).
3. If there is a need to replace a DC control card, perform the following:
  - a. De-energize associated power supply and remove respective side cover (if applicable)
  - b. Adjust settings of replacement control card to match those of the existing control card.
  - c. Remove the existing control card from the side frame for ease of cable disconnection:
    - i. If the existing control card has a mounting plate, remove wiz nut securing control card mounting plate to side frame.
    - ii. If the existing control card is secured to the conveyor side frame with anything other than a mounting plate, install new securing material on the new control card and re-use the securing material on the side frame.
  - d. One at a time, remove all cables and connectors and plug them into the same respective connection port on the new control card.
  - e. If the control card in question has a mounting plate, remove the mounting plate secured to the existing control card, and install it on the new control card (if the new control card does not already have a mounting plate installed on it).
  - f. Install the new control card on the conveyor side frame
  - g. Re-energize associated power supply, check the lane for proper system functionality, and reinstall respective side cover (if applicable).



Never "hot swap" control cards (i.e. disconnect and reconnect power connector on control cards without de-energizing respective power supply). When doing this, there is an increased risk of damaging the new control card.



There is always a possibility that control card errors are being caused by faulty communication cables (RJ45, CAT5, or CAT6), or problems with adjacent cards connected via the communication cables.

4. If cards or card fuses are blowing:
  - a. Ensure there are no shorts in system power wiring

- b. Ensure all conveyor side frames are electrically bonded and provided a direct connection to earth ground
  - c. Ensure control card DIP switch settings match those needed for zone MDR (if applicable)
  - d. If associated conveyor zone has powered brake roller, ensure it is electrically connected
  - e. If problems persist, refer to the respective technical manual listed in the Reference Documents section of this document.
5. If experiencing any other electrical problems with Bastian Solutions DC conveyor, contact Bastian Solutions Customer Service at [ConveyorSupport@bastiansolutions.com](mailto:ConveyorSupport@bastiansolutions.com).

## 6.3 Replacement Procedures for DC Conveyor

### 6.3.1 Replacing Rollers

Poly-V bands are not easily stretched by hand. Therefore, when replacing rollers, it is advised to start at one end of the zone and remove each roller one by one until the roller needing replacement has been reached.

#### For standard rollers:

1. Follow the lockout/tagout procedure in place to ensure safety.
2. Remove the side cover from the intended work area.
3. Apply pressure on the end of the hex shaft on the band side 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 7)
4. Provide upward force on the roller body until the hex is sitting above the side frame. Refer to Figure 8. (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.)
5. Remove the hex shaft from the opposite hex hole.
6. Pull the roller away from the bands until the roller is completely free of the side frames and bands.



Keep Poly-V bands to use for re-installation of rollers.

7. Repeat steps 3 through 6 for each subsequent roller until the roller needing replacement has been removed.
8. Slide the new roller through the band of the adjacent roller that has not been removed.

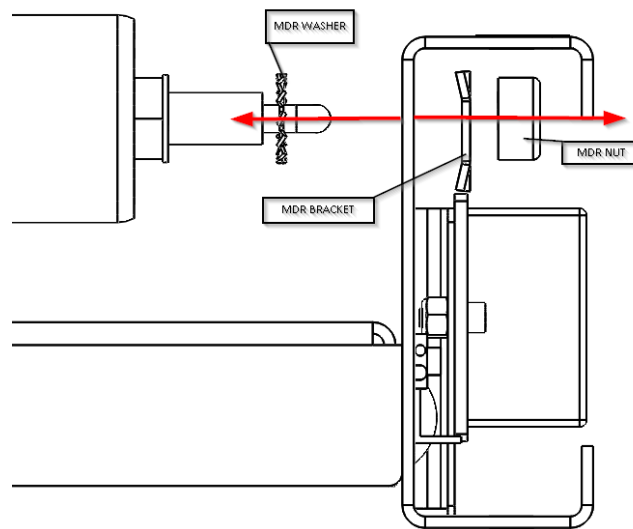


Ensure that Poly-V bands alternate positions on the inside and outside of the hub as shown in Figure 9.

9. Once the new roller is through both bands, guide the hex shaft into the hex hole.
10. After the hex shaft is in the hex hole, the opposite side shaft can be inserted into the appropriate hex hole. Use the roller's length as leverage to aid in this step. Use a putty knife or other flat surface tool to guide the hex shaft into the opposite hex hole.
11. Repeat steps 8 through 10 for each roller until all rollers have been re-installed.
12. Track the Poly-V bands as described in section 6.3.3.
13. Replace the side cover.

**For motor driven rollers (MDRs):**

1. Follow the lockout/tagout procedure in place to ensure safety.
2. Remove the side cover from the intended work area.
3. Loosen the MDR nut located on the cable side of the roller.
4. Pull the MDR bracket away from the frame. (Refer to Figure 6)
5. Remove rollers starting at one end until the MDR is reached. Refer to steps 3 through 6 of section 6.3.1 for standard rollers.
6. Once the MDR has been reached, apply pressure on the end of the hex shaft opposite the MDR cable using 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 7)



*Figure 6: MDR Removal-1*

7. Provide upward force on the roller body until the hex is sitting above the side frame. Refer to Figure 8. (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.)

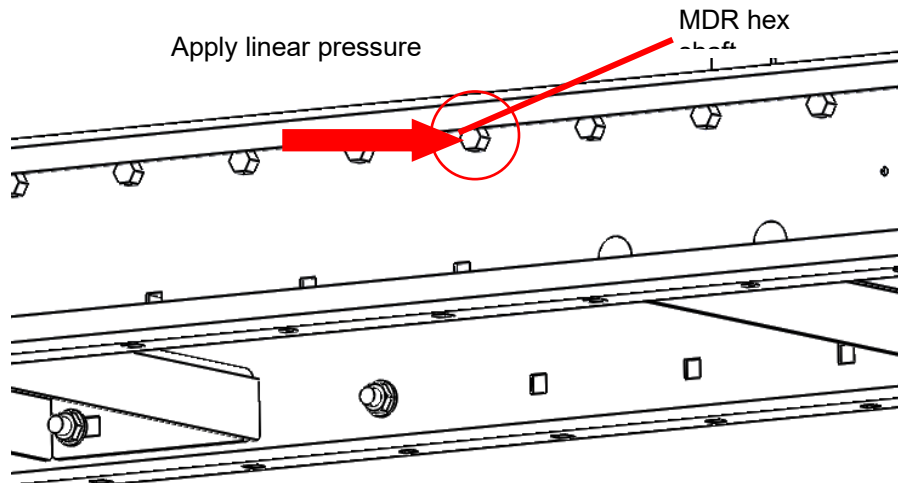


Figure 7: MDR Removal-2

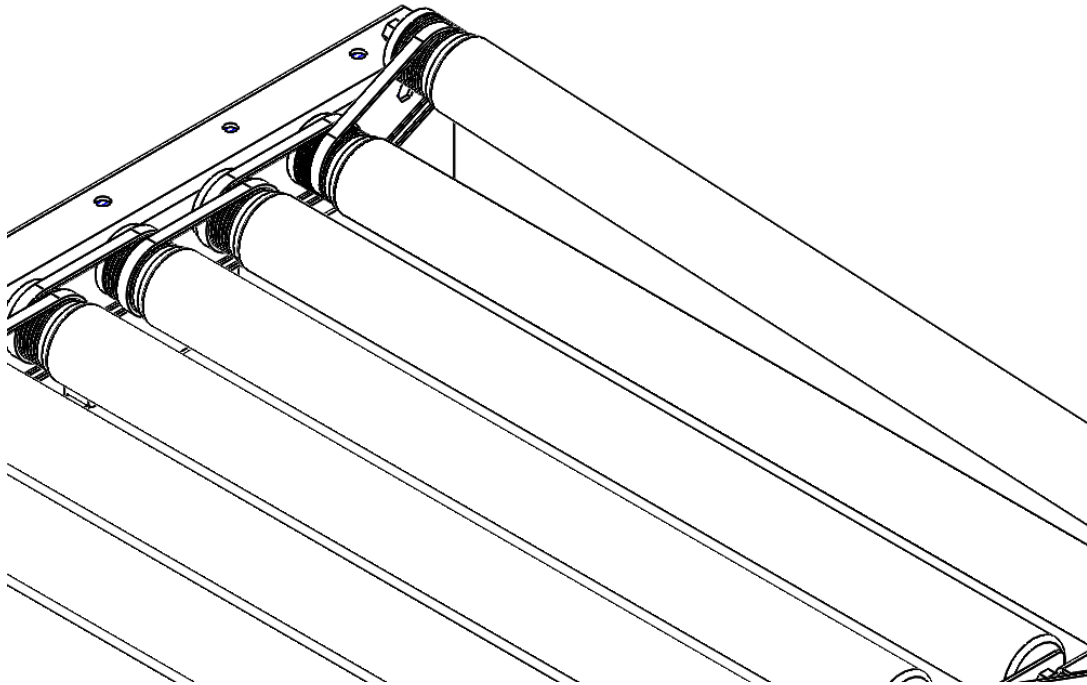


Figure 8: MDR Removal-3

8. Pull the threaded shaft out of the side frame.
9. Pull the MDR away from the bands until the MDR is completely free of the side frames and bands.
10. Slide the new MDR cable through the MDR washer and guide it through the hex hole.
11. Guide the MDR back through the existing bands to attach to an adjacent roller that has not been removed.



Ensure that Poly-V bands alternate positions on the inside and outside of the hub as shown in Figure 9.

12. Use a putty knife or other flat surface tool to guide the hex shaft into the hex hole.
13. Place the MDR bracket back onto the threaded shaft.
14. Fasten the MDR nut using a torque wrench to the appropriate value given in Table 1.
15. Plug the MDR into the card.
16. Repeat steps 8 through 10 of section 6.3.1 for standard rollers until all rollers have been re-installed.
17. Track the Poly-V bands as described in section 6.3.3.
18. Replace the side cover.

### 6.3.2 Replacing Bands

Poly-V bands are not easily stretched by hand. Therefore, when replacing bands, it is advised to start at one end of the zone and remove each roller one by one until the band needing replacement has been reached.

1. Follow the lockout/tagout procedure in place to ensure safety
2. Remove the side cover from the intended work area.
3. Repeat steps 3 through 6 of section 6.3.1 for standards rollers until the band needing replacement has been removed.
4. Install the replacement band onto the hub of the Poly-V roller.



Ensure that Poly-V bands alternate positions on the inside and outside of the hub as shown in Figure 9.

5. Repeat steps 8 through 10 of section 6.3.1 for standard rollers until all rollers have been re-installed.
6. Track the Poly-V bands as described in 6.3.3.
7. Replace the side cover.

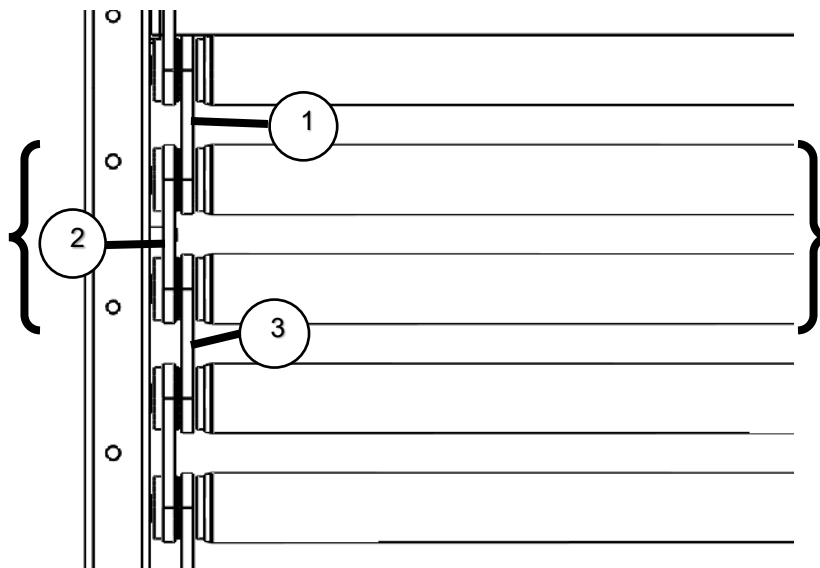


Figure 9: Band Replacement

### 6.3.3 Tracking Poly-V Bands





Poly-V bands should be tracked to prevent excessive wear and extend the life of the bands.

1. Follow the lockout/tagout procedure in place to ensure safety.
2. Turn the roller that is attached to the band needing tracking.
3. Apply a linear force to the side of the band near the hub of the roller while simultaneously turning the roller.
4. Repeat until all bands are free from contacting each other, are within the grooves of the hub and are parallel with the side frame.

## 6.4 Replacement Procedures for Pop-Up Transfers

### 6.4.1 Removal of Pop-Up Transfer from GTPW

The pop-up transfer units are designed to be individually removed from underneath the conveying surface. Most maintenance procedures on the transfers themselves will be easier if the transfer is removed from the GTPW frame.

1. Follow LOTO procedures to remove all electrical power and air pressure from the equipment before starting work.
2. Disconnect cables and air lines from the pop-up transfer. There are (4) connections per pop-up: a 48V power cable (2x2 Molex Mini-Fit), an I/O cable (2x4 Molex Mini-Fit), a prox sensor cable (M12), and an air line (1/4" push fitting). All (4) connections are made in the cable tray directly opposite the pop up.
3. The pop-up transfer is designed to pivot on two pins near the centerline of the GTPW in order to make the removal process easier. Ensure the pins are present and secure before loosening any bolts.
  - a. The pins are indicated by flag note  in Figure 10.
4. Loosen the screws holding the yellow center finger guard in place, then lift the finger guard out.
5. Remove the (2) long carriage bolts holding the inboard side of the pop-up transfer in place. Access to these bolts is from the top of the conveying surface, underneath the center finger guard. As the bolts are loosened, the pop-up will drop onto the pivot pins.
  - a. These carriage bolts are indicated by flag note  in Figure 10.
  - b. Access to these bolts is also indicated by flag note  in Figure 12. Figure 10 is a top-down detail view; see Figure 23 in Appendix 1 for the full context of the detail view.
  - c. The bolts must be completely removed to allow the pop up to swing down.
6. Support the underside of the pop-up to prevent it from dropping when the remaining bolts are removed. A hydraulic pump cart or similar device is recommended.
7. Remove the underside nuts on the (2) long square head bolts holding the outboard side of the pop-up in place. They are accessed from underneath the GTPW.
  - a. These square head bolts are indicated by flag note  in Figure 10.
  - b. These bolts do not need to be completely removed. The pop-up will swing down if only the underside nut is removed.
8. Slowly lower the outboard side of the pop-up to pivot it downward on the pivot pins, until the outboard top surface of the pop-up is lower than the bottom of the GTPW frame.
9. Lift the inboard side of the pop-up off the pivot pins, slowly lower it to horizontal, and slide the pop-up out from underneath the GTPW frame.



The pop-up transfer unit is heavy (approximately 105 lbs. for a 7-blade configuration). Follow safe team lift practices to avoid injury, and always ensure the unit is safely supported before loosening its mounting bolts.

10. Installation of the pop-up unit is the reverse of removal. After the pop up has been installed, it must be centered and leveled. See section 6.4.2 for details of the centering and leveling process.

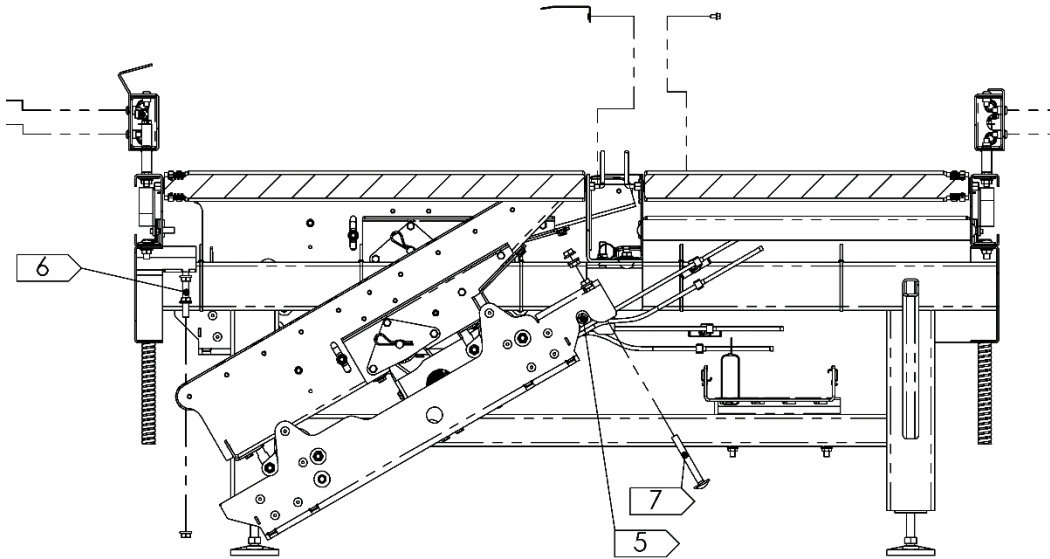


Figure 10-Removal of Pop-Up Transfer from GTPW Frame

#### 6.4.2 Pop-Up Transfer Centering and Leveling

1. Follow LOTO procedures to remove all electrical power and air pressure from the equipment before starting work.
2. For correct operation, the transfer must be leveled at all (4) corners, set to the appropriate distance below the conveying surface, and the transfer blades must be centered in between the pick zone rollers.
3. Adjust the horizontal position of the transfer by sliding the (4) mounting bolts in their slots, until each blade of the transfer is approximately centered between the adjacent rollers. There should be slightly less than 1/4" clearance on each side of the blade.



Due to normal manufacturing variations in the blade parallelism, it may not be possible to exactly center all blades in a pop-up. The equipment will work as designed as long as there is no interference between the pop-up blades and the pick zone rollers with the pop-up in its actuated (up) position. 1/8" clearance is the minimum recommended to ensure long-term reliability.

4. Once the horizontal position on the outboard side (close to the operator) is correctly adjusted, tighten the jam nuts against the slots in the frame to lock the adjustment in place.
  - a. Torque 3/8"-16 hardware to 31 ft-lb.

5. Vertical height adjustment of the pop-up transfer is provided by the (4) bolts that the transfer hangs from. On the outboard side, this adjustment is separate from the horizontal position adjustment.
6. Measure the height of the blade belt surface with respect to a straightedge laid on the top roller surface of the pick zone. Take measurements at all (4) corners and adjust the height until all (4) measurements are  $3/8'' \pm 1/16''$ .
  - a. See Figure 11 for an example measurement location.
  - b. Height measurements are done with the equipment locked out, so the blades will be in their lowered position. The pop-up module has  $3/4''$  of lift stroke, so the blades will protrude  $3/8''$  above the top surface of the roller plane in their raised position.
7. Once both the height adjustment and horizontal position is correct, tighten the underside wiz nuts on the two inboard bolts and the top side wiz nuts on the two outboard bolts to lock the adjustment into position.
  - a. Torque  $3/8''$ -16 hardware to 31 ft-lb.

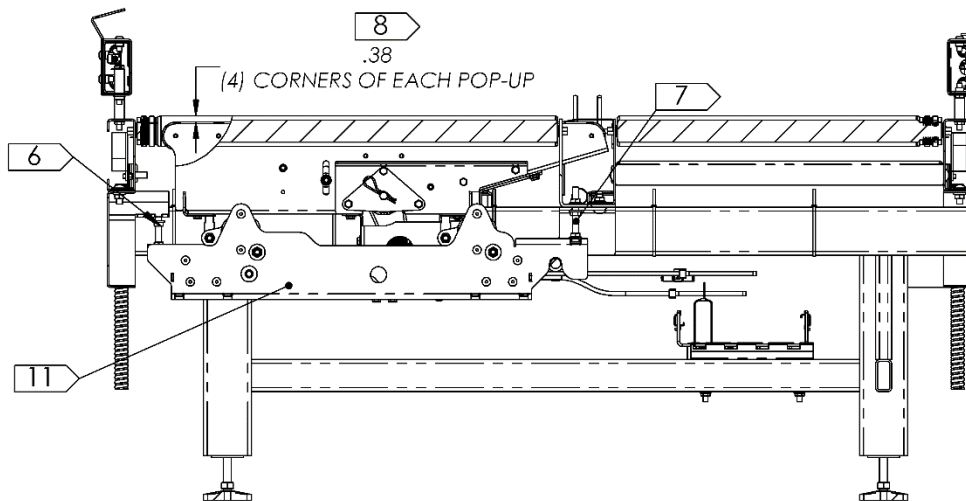


Figure 11-Leveling an Installed Pop-Up Transfer

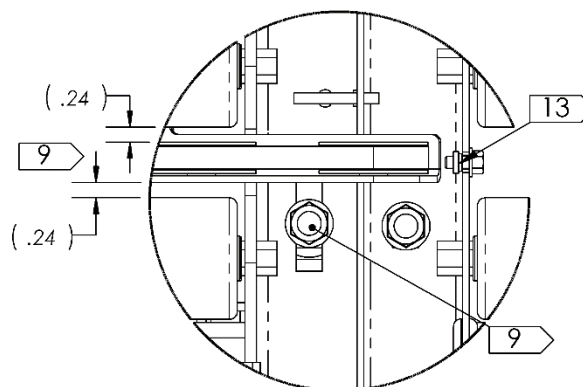


Figure 12-Centering an Installed Pop-Up Transfer  
(Top Detail View; see Figure 23 in Appendix 1 for context)

## 6.4.3 Blade Motor Replacement

1. Follow LOTO procedures to remove all electrical power and air pressure from the equipment before starting work.



Blade motor replacement can be done without removing the pop-up from the GTPW, if desired.

2. See Figure 13 for an exploded view of the pop-up unit. The motor is indicated by balloon (7). Also see Figure 19 through Figure 21 in Appendix 1 for general arrangement drawings.
3. Cut the zip tie around the body of the motor. Unplug the power and I/O cables connected to the motor.
4. Loosen the (4) 1/4"-20 bolts holding the motor mount to the transfer frame, and slide the motor up to relax the drive belt tension. The drive belt is indicated by balloon (9) in Figure 13.
5. Remove the (4) #10-32 SHCS holding the motor to the motor mount. Slide the motor out of the pop-up transfer.
6. Undo the (2) set screws holding the drive sprocket (balloon (8) in Figure 13) on the motor shaft.
7. Remove the drive sprocket, step key, and set screws, and install them on the replacement motor.
  - a. Ensure that the drive sprocket does not rub against the face of the replacement motor when the motor spins (at least 1/32" clearance is recommended).
  - b. Torque the #10-24 set screws to 32 in-lb.
  - c. A gear puller tool may be required to remove the drive sprocket. Use care to ensure the sprocket is not damaged during removal.
8. Install the replacement motor onto the motor mount using the (4) #10-32 SHCS and wiz nuts.
  - a. Torque the #10-32 SHCS to 68 in-lb.
9. Seat the drive belt into the grooves of the drive sprocket, then evenly pull the motor and motor mount down to tension the belt. Tighten the (4) 1/4"-20 bolts once correct tension is achieved.
  - a. Torque the 1/4"-20 HHCS to 101 in-lb.
  - b. Recommended belt tension is approximately 30 lbs. To achieve this tension, pull the motor downward with a force of approximately 60 lbs.
  - c. Ensure that the motor is square with the frame. If the drive sprocket is tilted, the drive belt will "walk" and can wear quickly on the edges.
10. Plug in the power and I/O cables to the new motor, and secure them with a zip tie around the motor body.
11. If the motor does not have the correct configuration file loaded onto it (for example, if it was ordered directly from the OEM or if it was intended for another piece of equipment), it will be necessary to connect to the motor via USB and load the configuration file onto it. The motor must be powered for this step.



Service while the equipment is powered should only be performed by trained personnel who understand the hazards of the conveyor in operation.

12. Refer to the Teknic ClearPath User Manual for detailed instructions on loading and saving configuration files, and information on obtaining the required software.
  - a. Contact Bastian Solutions Customer Service if assistance is needed, or to obtain configuration files.
  - b. Configuration files may also be obtained by plugging into a motor on an adjacent pop-up and saving the file to the computer.

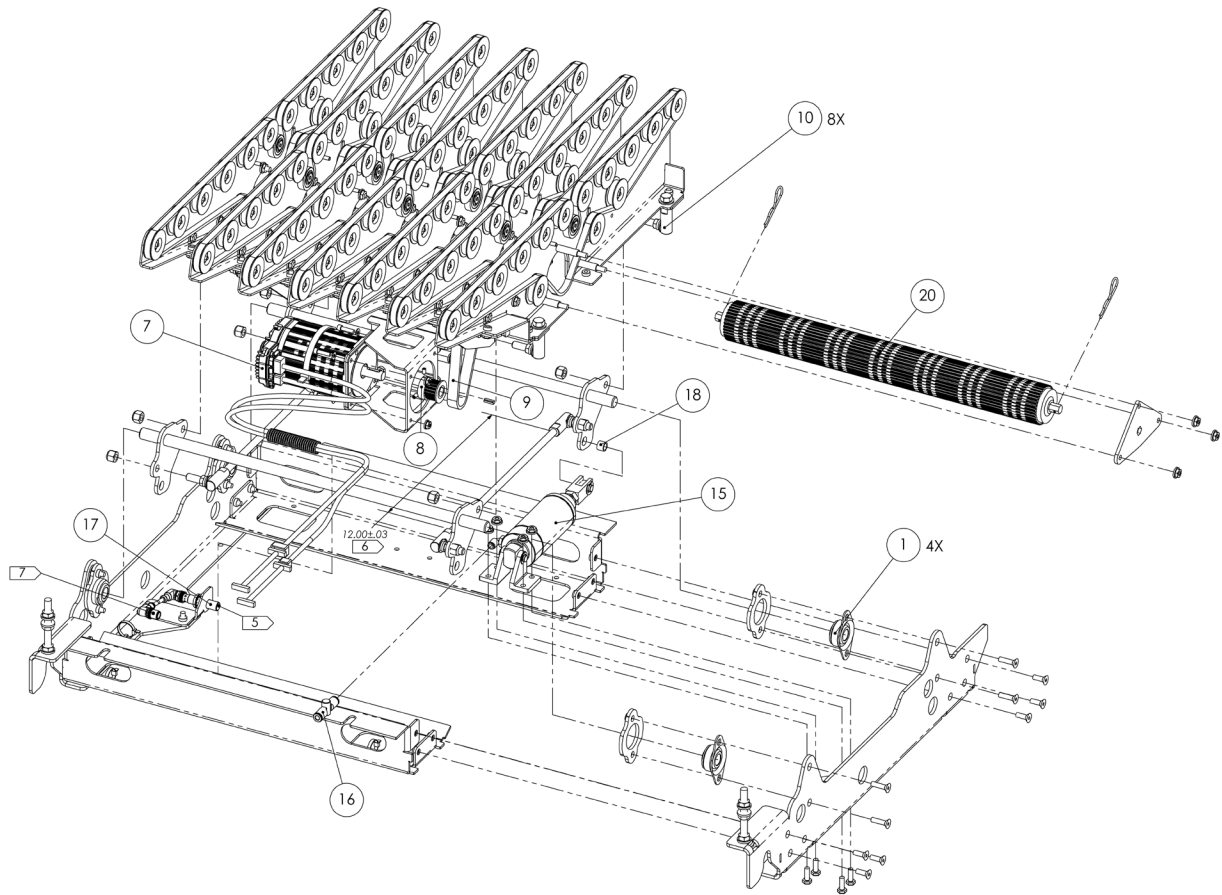


Figure 13-Exploded View of Pop-Up Transfer

#### 6.4.4 Drive Sprocket Replacement

1. Follow LOTO procedures to remove all electrical power and air pressure from the equipment before starting work.



NOTE Drive sprocket replacement can be done without removing the pop-up from the GTPW, if desired.

2. See Figure 13 for an exploded view of the pop-up unit. The motor is indicated by balloon (7). Also see Figure 19 through Figure 21 in Appendix 1 for general arrangement drawings.
3. Loosen the (4) 1/4"-20 bolts holding the motor mount to the transfer frame, and slide the motor up to relax the drive belt tension. The drive belt is indicated by balloon (9) in Figure 13.
4. Undo the (2) set screws holding the drive sprocket (balloon (8) in Figure 13) on the motor shaft.
5. Remove the drive sprocket, step key, and set screws. A gear puller tool may be required to remove the drive sprocket.



Do not pound on the motor shaft or pry on the motor face. Damage to the motor bearings may result from excessive shaft loads during the removal process.

6. File down any burrs on the motor shaft caused by the set screws, to ensure the new drive sprocket is installed easily.
7. Install the replacement drive sprocket onto the motor shaft, re-using the step key from the original drive sprocket.
  - a. Ensure that the replacement drive sprocket does not rub against the face of the motor when the motor spins (at least 1/32" clearance is recommended).
  - b. Torque the #10-24 set screws to 32 in-lb.
8. Seat the drive belt into the grooves of the drive sprocket, then evenly pull the motor and motor mount down to tension the belt. Tighten the (4) 1/4"-20 bolts once correct tension is achieved.
  - a. Torque the 1/4"-20 HHCS to 101 in-lb.
  - b. Recommended belt tension is approximately 30 lbs. To achieve this tension, pull the motor downward with a force of approximately 60 lbs.
  - c. Ensure that the motor is square with the frame. If the drive sprocket is tilted, the drive belt will "walk" and can wear quickly on the edges.

#### 6.4.5 Drive Spline Replacement

1. Follow LOTO procedures to remove all electrical power and air pressure from the equipment before starting work.
2. Follow the procedure in section 6.4.1 to remove the pop-up from the GTPW.

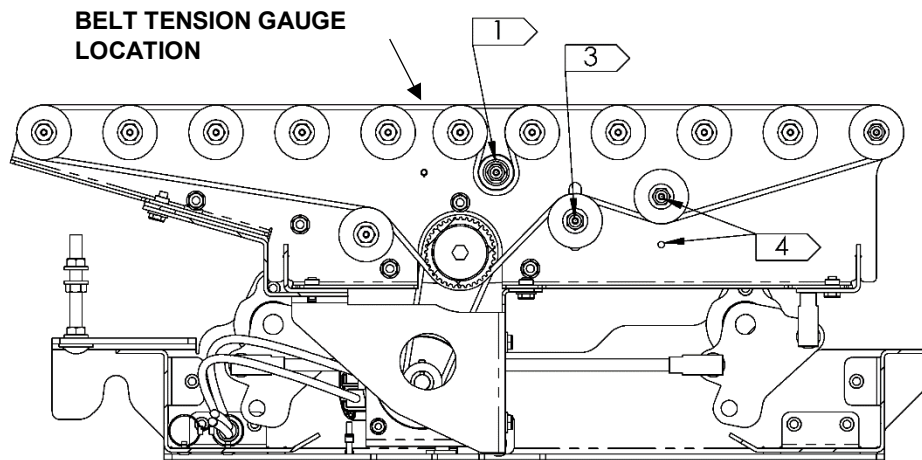


Figure 14-Side View of Pop-Up Transfer Blades (Routing A)

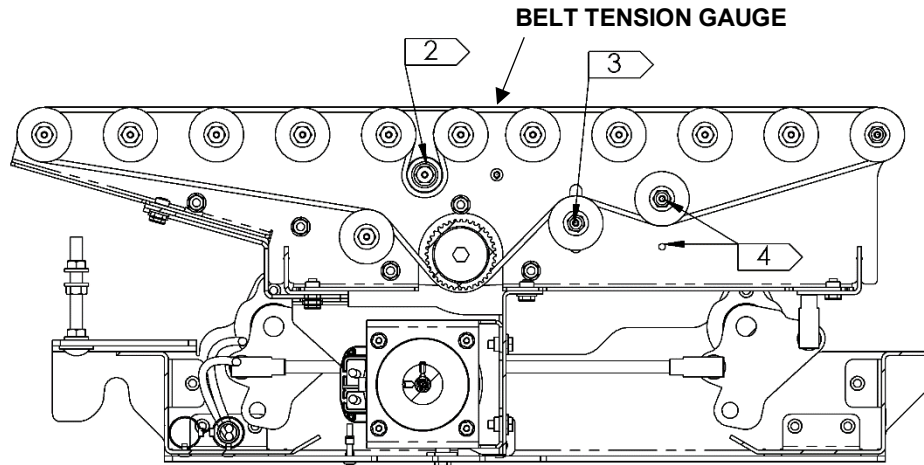



Figure 15-Side View of Pop-Up Transfer Blades (Routing B)

3. See Figure 13 for an exploded view of the pop-up unit. The drive spline is indicated by balloon (20). Also see Figure 19 through Figure 21 in Appendix 1 for general arrangement drawings.
4. Release blade belt tension on each blade by loosening the tensioner pulley and sliding it down. The tensioner pulley is indicated by flag note 3 in Figure 14 and Figure 15.
5. Loosen the (4) 1/4"-20 bolts holding the motor mount to the transfer frame, and slide the motor up to relax the drive belt tension. The drive belt is indicated by balloon (9) in Figure 13, and the motor is indicated by balloon (7) in Figure 13.
6. Remove the triangular end plate and spacers on one end of the spline hex shaft.
  - a. See the exploded view in Figure 13 which shows how the triangular end plate should disassemble.
7. Remove the cotter pin on the other end of the spline hex shaft and slide the spline out of the pop-up module.
8. Remove the cotter pin on one end of the replacement spline hex shaft, and slide the replacement spline back into the pop-up module. Replace the cotter pin once the spline hex shaft is inserted into the triangular end plate.
  - a. Ensure each blade belt and the drive belt are routed around the spline correctly, and ensure the drive belt is in the correct location (between the correct two blade belts) before proceeding.



Do not allow the hex shaft to slip out of the spline bearing with the cotter pin removed. The inside of the spline contains a piece of bronze wool for ESD dissipation, and this can make it difficult to get the hex shaft back into place if it is removed from the spline bearings.

9. Install the other triangular end plate onto the free end of the spline, and re-install the end plate and spacers onto the pop-up module.
  - a. Torque the 1/4"-20 HHCS to 101 in-lb.
10. Ensure the spline has a small amount of lateral play (is not binding between the end plates) and spins freely.
11. Using a belt tensioner gauge, re-tension each blade belt by moving the tensioner pulley upwards until the belt tensioner gauge shows a displacement between 0.850-0.950 inches.
  - a. Tighten the tensioner pulley bolt to 80 in-lb.

- b. Tensioner gauge should be placed as shown in Figure 14 or Figure 15 depending on routing.
  - c. If additional tensioner travel is needed, move the idler pulley indicated by flag note  in Figure 14 and Figure 15, to the lower of the (2) indicated holes.
12. Seat the drive belt into the grooves of the drive pulley, then evenly pull the motor and motor mount down to tension the belt. Tighten the (4) 1/4"-20 bolts once correct tension is achieved.
  - a. Torque 1/4"-20 HHCS to 101 in-lb.
  - b. Recommended belt tension is approximately 30 lbs. To achieve this tension, pull the motor downward with a force of approximately 60 lbs.
  - c. Ensure that the motor is square with the frame. If the drive pulley is tilted, the drive belt will "walk" and can wear quickly on the edges.
13. Follow the procedure in section 6.4.2 to re-install the pop-up into the GTPW.

#### 6.4.6 Drive Belt and Blade Belt Replacement


1. Follow LOTO procedures to remove all electrical power and air pressure from the equipment before starting work.
2. Follow the procedure in section 6.4.1 to remove the pop-up from the GTPW.
3. Follow the procedure in section 6.4.5, steps 4 through 7, to remove the drive spline from the pop-up.
4. At this point, the drive belt is completely removed from the pop-up and the blade belts can be easily lifted off the blade idlers.
5. If replacing a drive belt, swap the existing drive belt for a replacement before reassembling.
  - a. When replacing the spline, ensure the replacement drive belt is between the correct two blade belts.
  - b. The drive belt is indicated by balloon (9) in Figure 13.
6. To replace a blade belt, take note of the belt routing, then remove the belt needing replacement from the blade.
7. Re-route the replacement blade belt following the routing in Figure 14 for "A" routings, or the routing in Figure 15 for "B" routings.
  - a. "A" and "B" routings alternate on adjacent blades.
8. Follow the procedure in section 6.4.5, steps 8 through 12, for re-assembly of the pop-up.
9. Follow the procedure in section 6.4.2 to re-install the pop-up into the GTPW.

#### 6.4.7 Idler Pulley Replacement

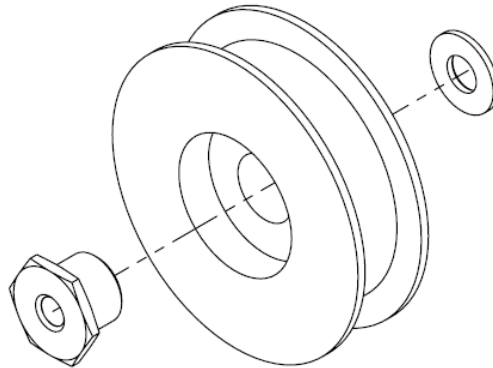
1. Follow LOTO procedures to remove all electrical power and air pressure from the equipment before starting work.
2. Follow the procedure in section 6.4.1 to remove the pop-up from the GTPW.



Depending on the location of the pulley needing replacement, it may also be accessible by removing rollers from the pick zone conveyor, instead of removing the pop-up from the GTPW. See section 6.3.1 for details on roller removal and replacement.

3. Release blade belt tension on the blade needing pulley replacement by loosening the tensioner pulley and sliding it down. The tensioner pulley is indicated by flag note  in Figure 14 and Figure 15.
4. Remove the idler pulley and replace it using the same hardware. See Figure 16.
  - a. Apply Loctite 243 or equivalent removable primerless threadlocker to the PEM stud before replacing the pulley. Ensure no threadlocker is allowed to drip into the pulley bearing.
  - b. Tighten #10-32 hardware to 80 in-lb.

5. Verify the belt routing following the routing in Figure 14 for “A” routings, or the routing in Figure 15 for “B” routings.
  - a. “A” and “B” routings alternate on adjacent blades.
6. Using a belt tensioner gauge, re-tension each blade belt by moving the tensioner pulley upwards until the belt tensioner gauge shows a displacement between 0.850-0.950 inches.
7. Tighten the tensioner pulley bolt to 80 in-lb.
8. Tensioner gauge should be placed as shown in Figure 12 or Figure 13 depending on routing.
9. If additional tensioner travel is needed, move the idler pulley indicated by flag note in Figure 12 and Figure 13, to the lower of the (2) indicated holes.
10. Follow the procedure in section 6.4.2 to re-install the pop-up into the GTPW.



*Figure 16-Exploded View of Idler Pulley Assembly*

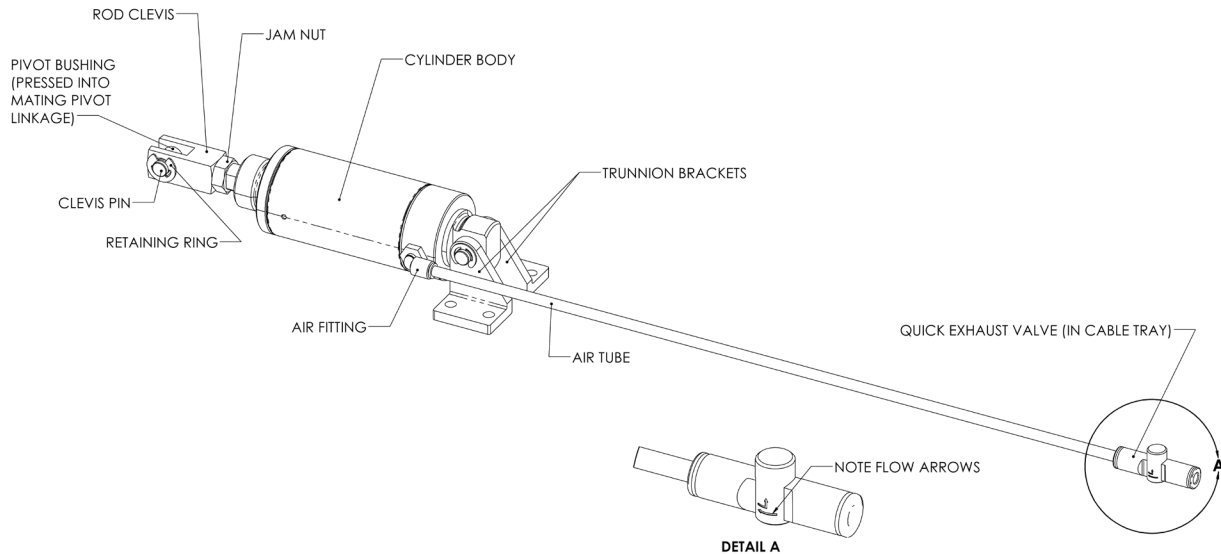
#### 6.4.8 Air Cylinder Replacement

1. Follow LOTO procedures to remove all electrical power and air pressure from the equipment before starting work.



Air cylinder replacement can be done without removing the pop-up from the GTPW, if desired. Removal from the GTPW will make the procedure easier, but the total amount of labor will generally be less if the pop-up is not removed.

2. See Figure 13 for an exploded view of the pop-up unit. The air cylinder is indicated by balloon (15). Also see Figure 19 through Figure 21 in Appendix 1 for general arrangement drawings.
3. See Figure 17 for a detail of the different parts of the air cylinder, as reference for the terms used in this section.
4. Remove the air tube from the push-connect air fitting connected to the cylinder.
5. Remove the retaining ring securing the cylinder clevis to the pivot linkage, and slide the linkage pin out.
6. Remove the (4) 1/4”-20 bolts holding the cylinder trunnion brackets onto the frame of the pop-up.
7. Slide the cylinder out of the pop-up assembly.
8. Inspect the pivot bushing indicated by balloon (18) in Figure 13. If the bushing is worn, press it out of the pivot link plate and press in a new one.



*Figure 17-Air Cylinder Detail*

9. Remove the rod clevis, cylinder trunnion brackets, and air fitting from the old cylinder, and install them onto the replacement cylinder. Replace any items that are excessively worn or damaged.
  - a. Bastian Solutions recommends using a PTFE pipe thread sealant (pipe tape or a liquid-applied pipe dope compound) when removing and reinstalling air fittings, to ensure the fittings do not leak. The factory-applied thread sealant is not intended to be reusable. Ensure no thread sealant materials or debris get into the cylinder body when installing the air fitting.
10. Slide the replacement cylinder into the pop-up assembly.
11. Insert the linkage pin to secure the cylinder clevis to the pivot linkage, and replace the retaining ring securing the linkage pin in place.
  - a. Ensure the holes for the cylinder trunnion brackets line up with the holes in the frame with the linkage pin installed. If not, the position of the cylinder clevis will need to be adjusted on its screw thread by turning the cylinder rod.
  - b. Once all adjustment to the cylinder clevis is complete, tighten the 1/2"-20 jam nut against the face of the clevis. Torque to approximately 50 ft-lb.
12. Bolt the trunnion brackets to the frame with (4) 1/4"-20 bolts.
  - a. Torque the 1/4"-20 HHCS to 101 in-lb.
13. Insert the air line into the push fitting on the replacement cylinder.
14. Turn on the air supply to the GTPW and use the manual operator on the valve to test the motion. Ensure the cylinder extends and retracts smoothly and there are no air leaks.



Service while the equipment is powered should only be performed by trained personnel who understand the hazards of the conveyor in operation.

## 6.4.9 Pivot Bearing Replacement

1. Follow LOTO procedures to remove all electrical power and air pressure from the equipment before starting work.
2. Follow the procedure in section 6.4.1 to remove the pop-up from the GTPW.
3. See Figure 13 for an exploded view of the pop-up unit. The pivot bearing is indicated by balloon (1). Also see Figure 19 through Figure 21 in Appendix 1 for general arrangement drawings.
4. Place the pop up assembly upside down (resting on its blades). Use caution not to damage the idler pulleys.
5. Remove the flat head cap screws holding the side plate onto the frame. If the pivot bearing to be replaced is on the cylinder side, also remove the air cylinder by following the procedure in section 6.4.8, steps 4 to 7.
6. Slide the side plate off the pivot shafts.
7. Remove the pivot bearing from the side plate. Install the new pivot bearing to the side plate, re-using the same hardware and the pivot bearing retainer plate.
  - a. Torque the 1/4"-20 FHCS to 125 in-lb.
  - b. The supplied 1/4"-20 FHCS have nylon threadlocking patches which are reusable for several uses. If the patch is worn out, apply Loctite 243 or an equivalent primerless removable threadlocking compound.
8. The ends of the pivot shafts are coated in anti-seize compound for corrosion prevention. Add additional compound before reassembly if the steel shaft ends are exposed.
9. Replace the side plate onto the pop-up transfer.
  - a. Torque the 1/4"-20 FHCS to 125 in-lb.
  - b. The supplied 1/4"-20 FHCS have nylon threadlocking patches which are reusable for several uses. If the patch is worn out, apply Loctite 243 or an equivalent primerless removable threadlocking compound.
10. If the cylinder was removed, replace it by following the procedure in section 6.4.8, steps 10 to 13.
11. Follow the procedure in section 6.4.2 to re-install the pop-up into the GTPW.

## 6.5 Replacement Procedures for IO-Link and Pneumatic Control Items

The electrical and pneumatic control equipment for the GTPW is mounted on the attached power supply sled which is installed underneath the infeed conveyor. See Figure 18 for a detailed view.

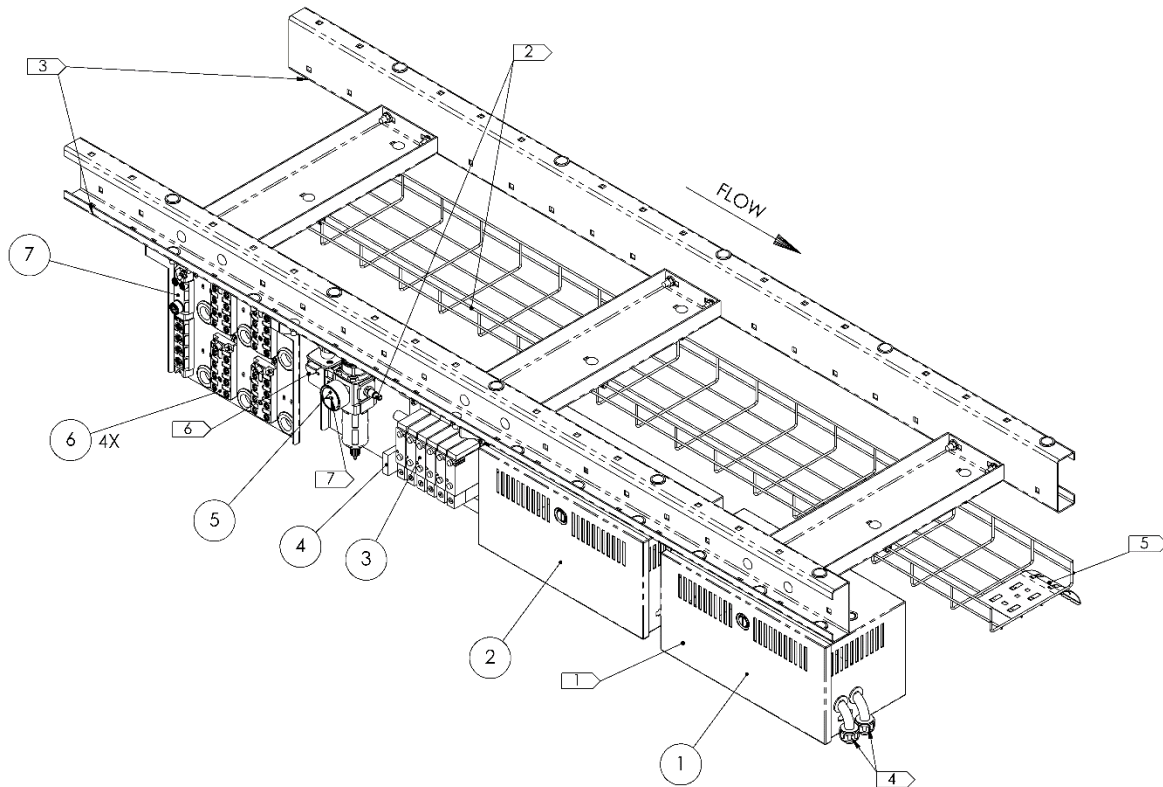


Figure 18-GTPW Power Supply Sled

### 6.5.1 Regulator Replacement

1. Follow LOTO procedures to remove all electrical power and air pressure from the equipment before starting work.



The air supply must be depressurized at a lockout location upstream of the GTPW before disconnecting any air supply lines leading into the regulator and dump valve assembly. The lockable dump valve supplied with the GTPW is intended to safely depressurize downstream air lines inside the GTPW itself but does not have the capability to depressurize lines upstream of the valve.

2. Refer to the Wilkerson Installation & Service Instructions for details on maintenance and service of the regulator assembly. Many common service items (filter element changes, bowl emptying and cleaning) do not require removal and replacement of the entire regulator assembly.
3. Disconnect the 3/8" air tube from the push fitting on the regulator.
4. Disconnect the system air supply line from the dump valve. **Ensure the system air supply line is depressurized before disconnecting!**
5. Remove the (2) socket head screws attaching the regulator and dump valve assembly from its mounting bracket.

6. Remove any supply-side fittings from the regulator assembly and install them on the replacement regulator assembly.
  - a. Bastian Solutions recommends using a PTFE pipe thread sealant (pipe tape or a liquid-applied pipe dope compound) when removing and reinstalling air fittings, to ensure the fittings do not leak. The factory-applied thread sealant is not intended to be reusable. Ensure no thread sealant materials or debris get into the air lines or the regulator body when installing the air fitting.
7. Install the replacement regulator assembly. (Installation is the reverse of removal.)
8. Turn the air supply on once all fittings are secured.
9. Set the new regulator to 60 PSI. Check for leaks at all connection points.

### 6.5.2 Control Valve Bank Replacement

1. Follow LOTO procedures to remove all electrical power and air pressure from the equipment before starting work.
2. Check to make sure each air line going into the valve manifold is correctly labeled. Replace any missing or unreadable labels before disconnecting any air lines.
3. Disconnect the 3/8" supply air line and the 1/4" air lines running to each pop up transfer.
4. Disconnect the DB25 connector from the valve bank.
5. Remove the (4) socket head cap screws holding the valve bank onto its mounting bracket.
6. Install the replacement valve bank. Installation is the reverse of removal.
7. Turn the air supply on once all fittings are secured.
8. Check for leaks at all connection points.
9. One at a time, use the manual operator button on each valve to actuate each pop-up. Verify that all air lines are connected in the right order. Check for leaks around each 1/4" air line connection with the pop-up actuated.

### 6.5.3 IO-Link Block Replacement

1. Follow LOTO procedures to remove all electrical power and air pressure from the equipment before starting work.
2. Check to make sure each cable going into the block is correctly labeled. Replace any missing or unreadable labels before disconnecting any cables. Verify that the labeled cable locations match the system electrical drawings before continuing.
3. Disconnect all cables plugged into the block.
4. Unbolt the block from its mounting bracket.
5. Bolt the replacement block onto the mounting bracket. Ensure that the grounding screw is securely attached and is making good electrical contact with the grounding tab or grounding strap on the block.
6. Plug in all cables to the replacement block, in the same locations they were in on the old block. Refer to the system electrical drawings as needed.
  - a. See the typical electrical layout drawings in Appendix 2 for typical wiring details for a 6-position GTPW (some systems may be wired differently; always reference the system-specific electrical drawings where available).
7. Power up the GTPW.



The system PLC sends a configuration command to each IO-Link block to map the I/O connected to that block. This command is typically sent during system power-up, so depending on the Controls architecture, the system or area of the system in which the GTPW is installed may need to be power cycled for the replacement block to begin communicating.

8. If the replaced block is the networking module (4 output ports, plus power and Ethernet connections), then the IP address will need to be set on the front of the block. Refer to the Balluff BNI EIP-507-005-Z040 user's guide for details. If the replaced block is a valve plug or a sensor/actuator module, this step is not necessary.
9. Observe the GTPW during operation to determine if everything is operating correctly. If the operation is problematic, check for cables that are in the incorrect locations or not plugged in fully.



If the input cable to a block is connected to the wrong IO-Link port on the networking module or the wrong expander port on a sensor/actuator module, the block may be loaded with an incorrect configuration that will not allow it to communicate correctly when the wiring error is fixed. It is possible to manually correct this configuration issue through the web interface to the blocks. Refer to the Balluff user's guides for details, and contact Bastian Solutions Customer Service if additional assistance is needed.

## 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 representative. The troubleshooting techniques provided are the same operations followed by our field service engineers. To swiftly address any issues on site, Bastian Solutions 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.

For troubleshooting any servo motor (including LED blink code definitions), please refer to the Teknic motor service bulletin and/or each motor's respective manuals.

*Table 2: Troubleshooting Guide*

<b>ERROR</b>	<b>CAUSE</b>	<b>ACTION</b>
<b>Pop-up lifts but does not divert product</b>	Blade drive motor is not powered and/or receiving signal.	Ensure that power and communication cables are plugged in.
	Blade drive motor is faulted with a yellow blink code	Reference the Teknic ClearPath MC/SD User Manual for blink codes. Contact Bastian Solutions Customer Service for troubleshooting assistance.
	Blade drive motor has a red error light	Replace the faulty motor.
<b>Lift cylinder is not actuating</b>	Valve block is not receiving commands	Ensure that the valve block connector is plugged in and the green operation light is illuminated. Confirm operation with the manual operator on the valve.
	Low air pressure	Set the regulator to 60 PSI. Ensure that the air supply is adequate for continuous operation.
	Stuck valve	Clean or replace the valve. Follow manufacturer's instructions for acceptable lubricants. Ensure the filter element in the regulator is present and in good condition. Check for excessive water in the air supply.
	Mechanical interference	Check adjustment of pop-up module in the pick zone to ensure the blades are not touching the pick zone rollers during the lift cycle.
	Quick exhaust valve problem	Verify the flow direction of the quick exhaust valve is towards the pop up module. Replace the valve if it is not operating. (The valve is plumbed inline near the pop-up

ERROR	CAUSE	ACTION
		module, indicated by balloon (16) in Figure 13.)
	Pop-up is overloaded	Reduce product weight below the maximum of 75 lbs/zone.
<b>Pop-up attempts to divert but product does not divert fully</b>	Pop-up blade module is set too low	Adjust vertical and horizontal position of the pop-up module per the instructions in section 6.4.2.
	Pop-up is overloaded	Reduce product weight below the maximum of 75 lbs/zone.
	Specific product requires nonstandard speed or acceleration settings	The blade motor configuration can be modified for higher or lower speed and acceleration to handle specific product conditions. Contact Bastian Solutions Customer Service for details.
<b>Flow direction is incorrect</b>	Incorrect card settings	Verify direction settings against the user's manual for the card model.
<b>Unexpected operation, or incorrect zone actuates when a command is sent</b>	Cables swapped on IO-Link blocks	Verify wiring against system electrical drawings.

**8 Appendix 1: General Arrangement Drawings**

ITEM NO.	PART NUMBER (7 BLADES)	PART NUMBER (5 BLADES)	QTY (7 BLADES)	QTY (5 BLADES)	UNITS	DESCRIPTION	REVISION DESCRIPTION
1	A003BR-10008		4		EA	MOUNTED BEARING, 0.625in BORE, 2 BOLT FLANGE, HEAVY DUTY, SELF-ALIGNING	ORIGINAL DOCUMENT
2	A001CP-10067		98	70	EA	PULLEY, 1.39in OD, 0.362in W, FLANGED	
3	A003BR-10004		7	5	EA	BALL BEARING, 1614ZZ	
4	A003HN-10004		105	75	EA	STUB SHAFT, #10-32 UNF NUT	
5	Z077TC-10058		7	5	EA	SLEEVE, HRT FLANGE IDLER PULLEY, MACHINED	
6	A001TB-10005		7	5	EA	TIMING BELT, 1635mm L x 9MM W, 5M HTD, ENDLESS, NEOPRENE	
7	A013TM-10006		1		EA	DC SERVO MOTOR, TEKNIC MCVC-3441P	
8	A001CP-10002		1		EA	SPROCKET, HTD, 15mm W, 18 TOOTH	
9	A001TB-10004		1		EA	TIMING BELT, 350mm L X 15mm W, 5M HTD	
10	A003BA-10001		8		EA	BALL JOINT, 3/8"-24 X 0.75in THD LENGTH FOR HOUSING, 3/8"-24 X 0.875in THD LENGTH FOR STUD, ZINC PLATED	
11	A003MW-10002		7	5	EA	MIL SPEC WASHER, #10 ID, 0.562in OD, 0.06in THK, BLACK OXIDE STAINLESS	
12	A003FH-10003		7	5	EA	HHCS, SERRATED FLANGE, #10-32 UNF, 5/8"L, GR5, FULL THD	
13	A003FH-10004		7	5	EA	HHCS, SERRATED FLANGE, #10-32 UNF, 3/4"L, GR5, FULL THD	
14	A003MW-10003		7	5	EA	MIL SPEC WASHER, #10 ID, 0.625in OD, 0.04in THK, BLACK OXIDE STAINLESS	
15	A015PA-10001		1		EA	2" BORE SINGLE ACTING AIR CYLINDER	
16	A016VA-10024		1		EA	QUICK EXHAUST VALVE, 0.25in TUBE	
17	A002SE-10024		1		EA	PROX, M12X1 FLUSH MNT, PNP NO, M12 CONNECTOR	
18	A003BR-10035		1		EA	SLEEVE BEARING, 0.375in ID, 0.500in OD, 0.375in L, SAE 863 HIGH LOAD	
19	A003MW-10001		91	65	EA	MIL SPEC WASHER, #10 ID, 0.438in OD, 0.03in THK, CADMIUM PLATED	
20	xxx	xxx	1		EA	ASM, GTPW DRIVE SPLINE	

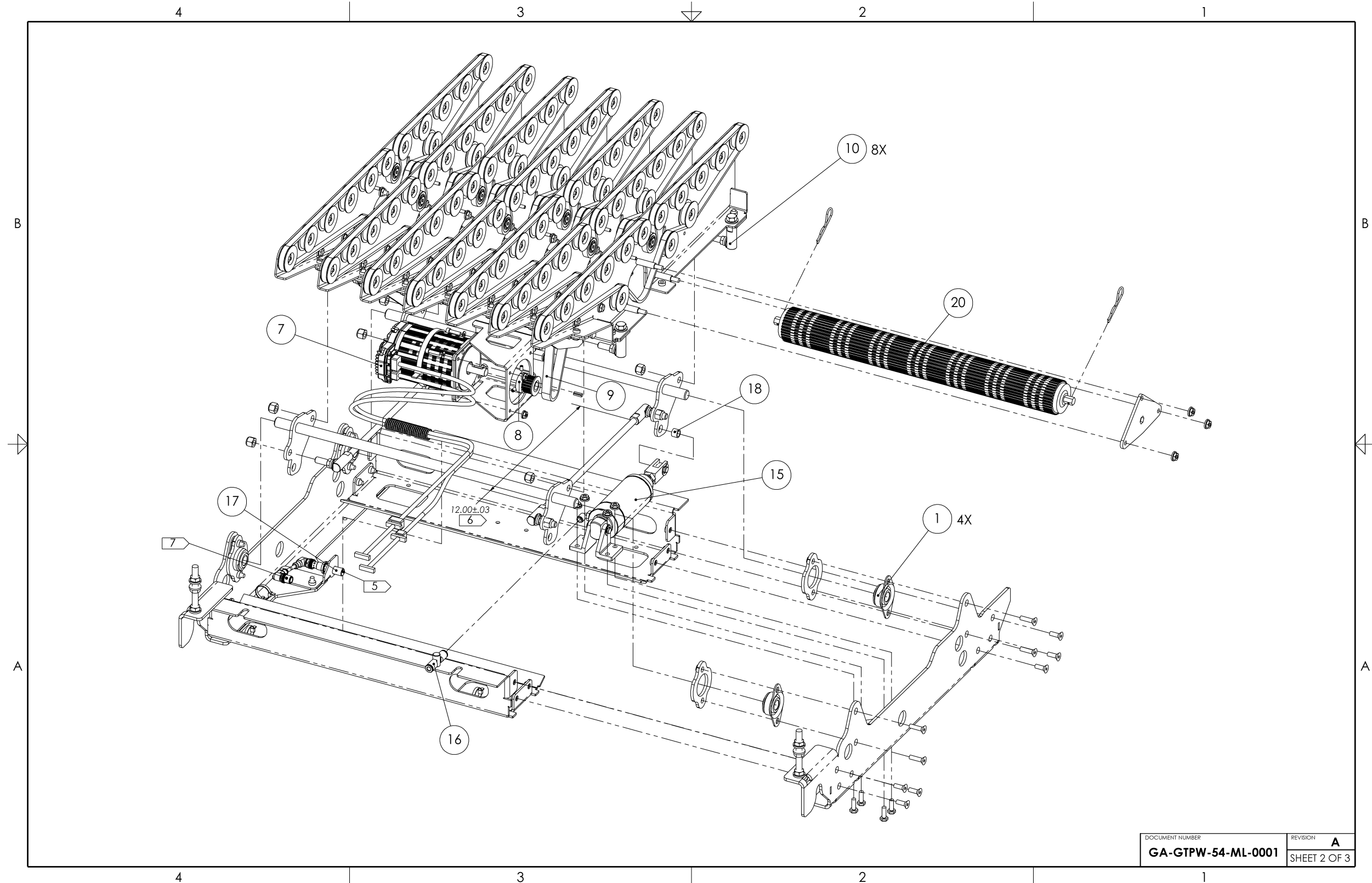
**NOTES:**

- 1 BLADE BELT "A" ROUTING. "A" AND "B" ROUTINGS ALTERNATE.
- 2 BLADE BELT "B" ROUTING. "A" AND "B" ROUTINGS ALTERNATE.
- 3 BLADE BELT TENSIONER ADJUSTMENT
- 4 MOVABLE TENSION PULLEY. PULLEY MAY BE MOVED TO ALTERNATE HOLE TO GAIN ADDITIONAL TRAVEL ON BLADE BELT TENSIONER IF NEEDED.
- 5 ADJUST DOWN PROX TO 0.08" AWAY FROM BLADE MOTOR MOUNTING BRACKET
- 6 LINKAGE DIMENSION IS FACTORY SET AND NOT INTENDED TO BE USED FOR ADJUSTMENT. BOTH LINKS ADJUSTED TO THE SAME DISTANCE.
- 7 DISCONNECT POINTS FROM GTPW HARNESS: POWER CABLE, I/O CABLE, DOWN PROX CABLE, AND AIR LINE AT QUICK DISCONNECT FITTING. ALL DISCONNECT POINTS ARE IN CABLE TRAY NEAR POP-UP.

FASTENER	TORQUE (IN-LB)	THREADLOCKER
#10-32 PEM STUD	32	LOCTITE 243
#10-32 HHCS GR5	32	N/A
1/4"-20 HHCS GR5	101	N/A
1/4"-20 FHCS	125	NYLON PATCH
3/8"-24 HHCS GR5	420	N/A
3/8"-16 CB GR5	372	N/A

<p style="font-size: 8px;">1821 BASTIAN COURT WESTFIELD, IN 46074 www.BastianSolutions.com</p> <p style="font-size: 8px;">This drawing is the property of Bastian Solutions. It is confidential and contains proprietary information of Bastian Solutions. It is loaned on the condition that it is not to be reproduced in whole or in part without the express written consent of Bastian Solutions. Unauthorized copying of this drawing is in violation of U.S. copyright laws. Acceptance of this drawing shall be construed as an acceptance of these terms.</p>	<p>ORIGINATOR <b>B. BAKER</b></p> <p>CHECKER <b>R. CHOUDHURI</b></p> <p>APPROVER <b>C. PERRY</b></p> <p>APPROVAL DATE <b>10/29/2019</b></p>	<p>TITLE <b>GENERAL ARRANGEMENT, GTP WORKSTATION POP-UP MODULE, 54" OAW, MULTIPLE OAL</b></p> <p>DOCUMENT NUMBER <b>GA-GTPW-54-ML-0001</b></p> <p>REVISION <b>A</b></p> <p>SHEET 1 OF 3</p>
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Figure 19-General Arrangement, GTP Workstation Pop-Up Module, Sheet 1 of 3



DOCUMENT NUMBER	REVISION
<b>GA-GTPW-54-ML-0001</b>	<b>A</b>
SHEET 2 OF 3	

Figure 20-General Arrangement, GTP Workstation Pop-Up Module, Sheet 2 of 3

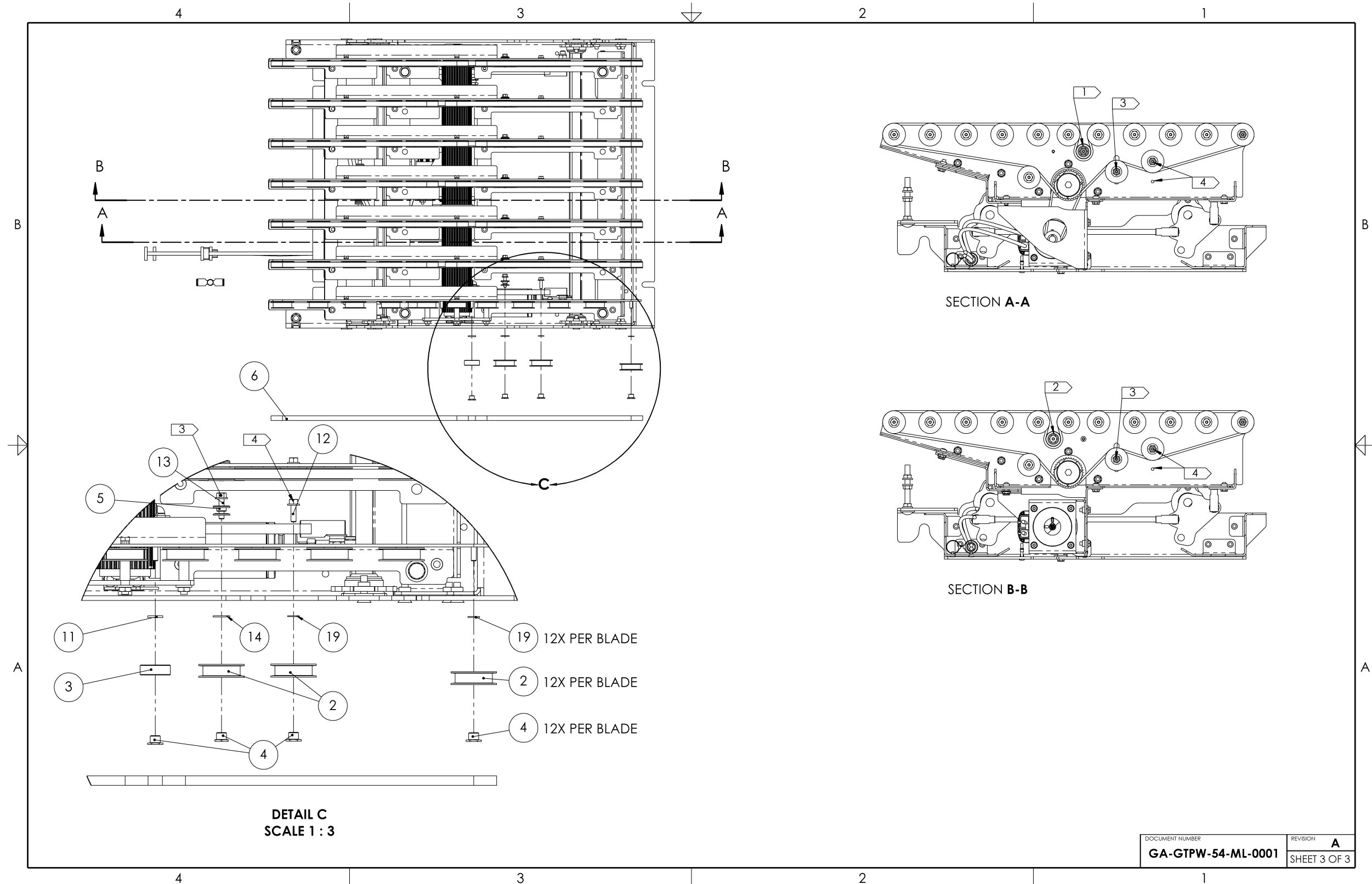


Figure 21-General Arrangement, GTP Workstation Pop-Up Module, Sheet 3 of 3

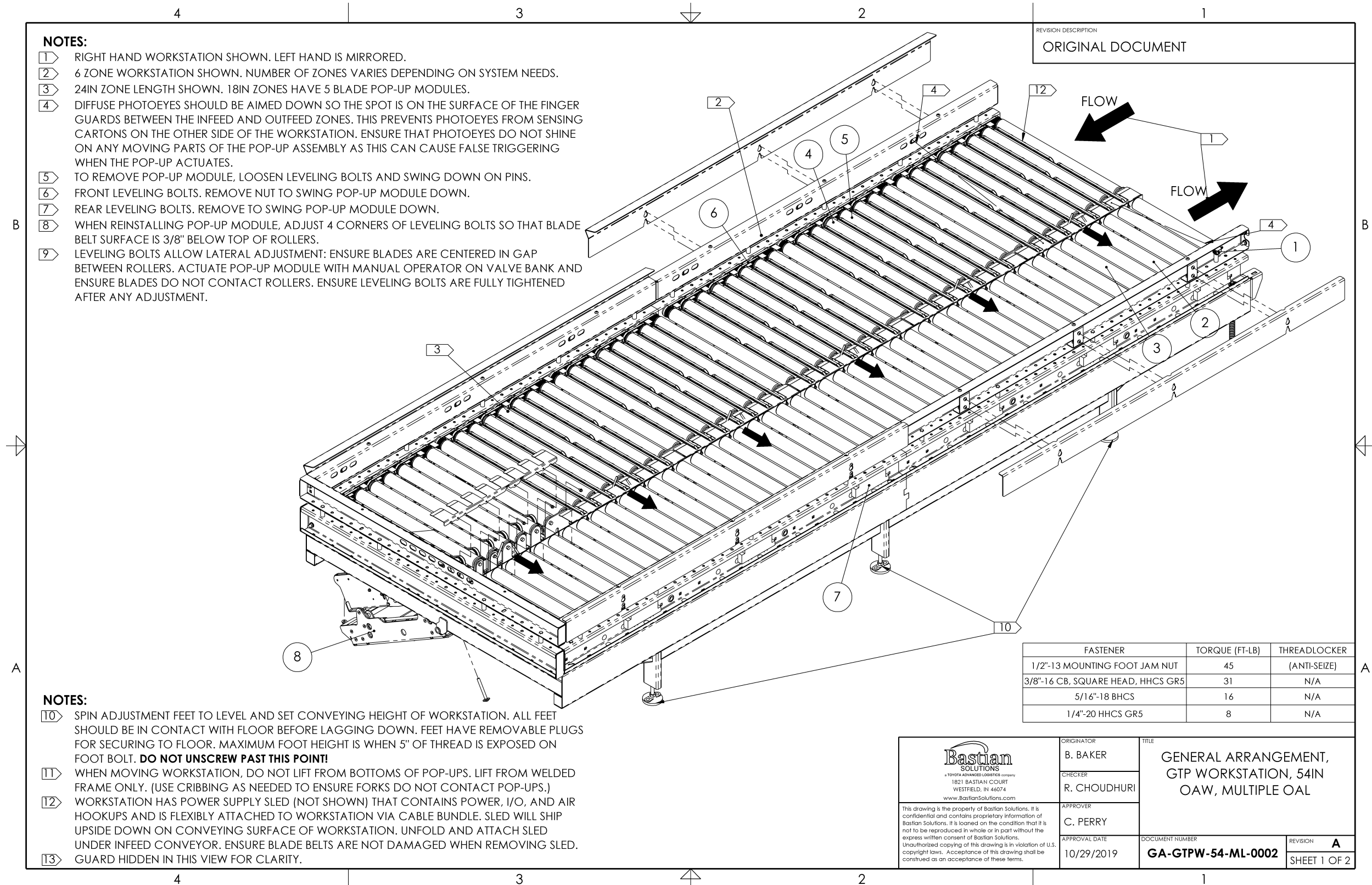
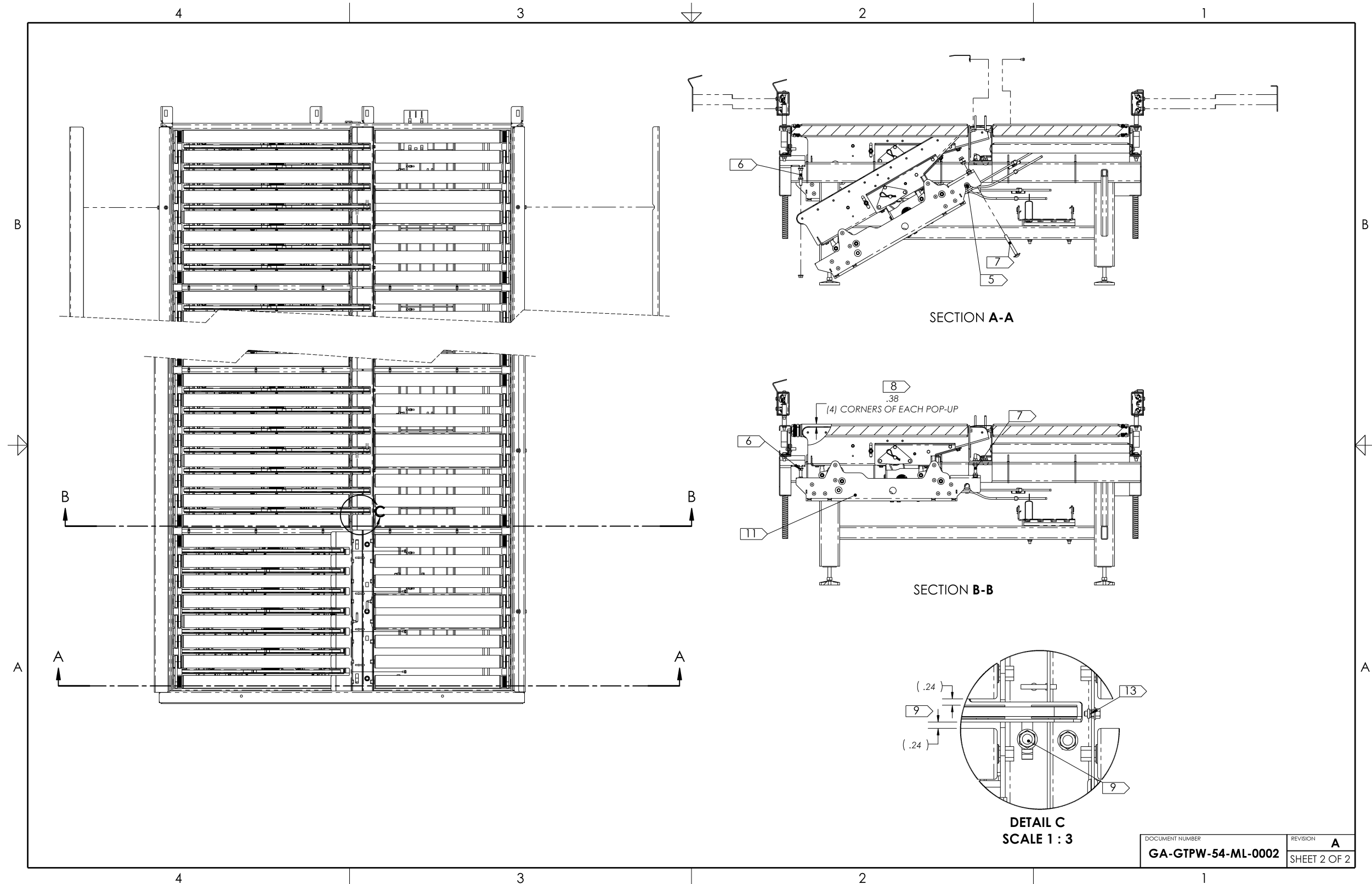


Figure 22-General Arrangement, GTP Workstation, Sheet 1 of 2



DOCUMENT NUMBER	REVISION
GA-GTPW-54-ML-0002	A
SHEET 2 OF 2	

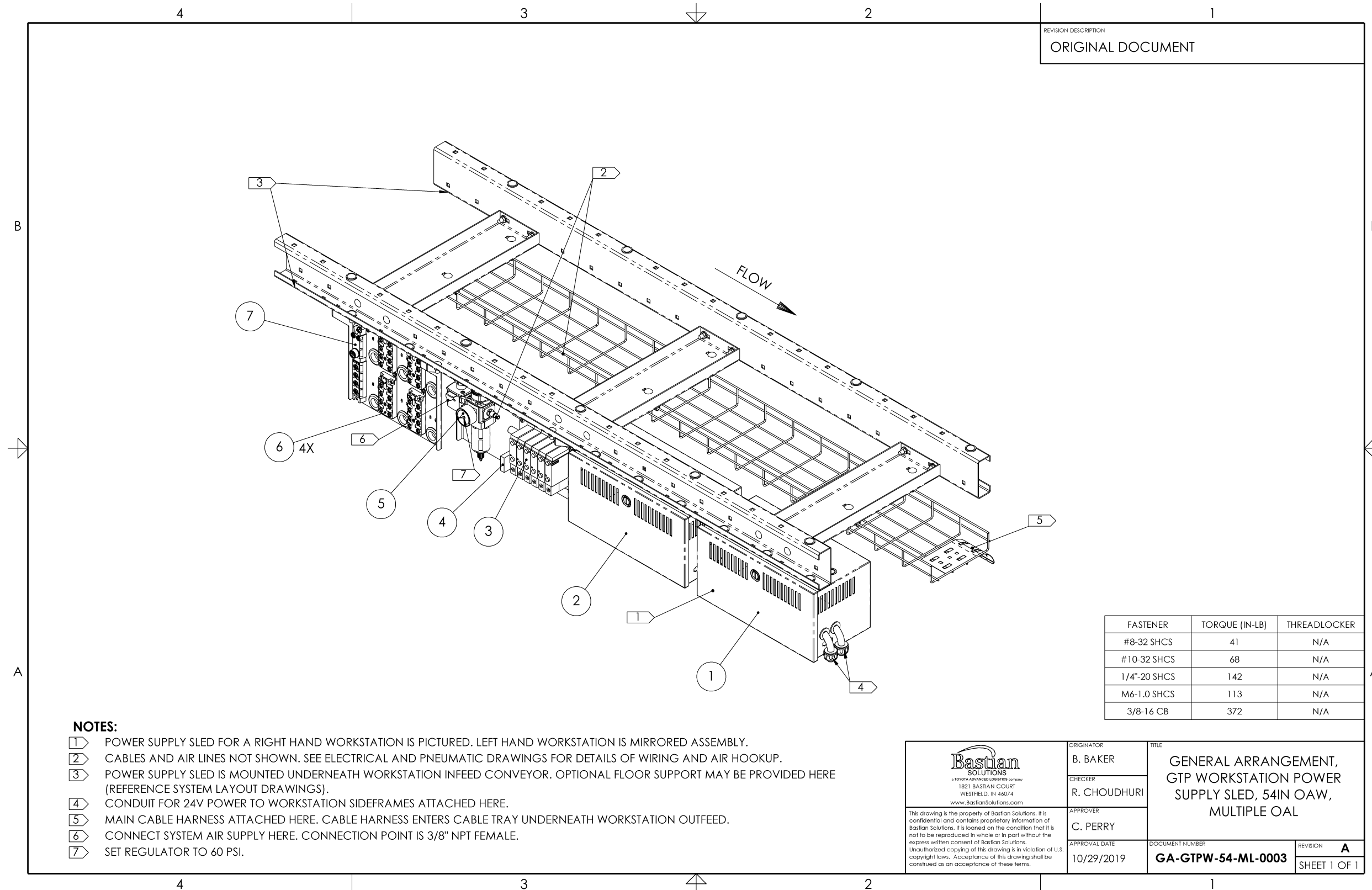
Figure 23-General Arrangement, GTP Workstation, Sheet 2 of 2

Table 3-BOM for GA-GTPW-54-ML-0002

ITEM NO.	PART NUMBER		QTY		UNITS	DESCRIPTION
	24" ZONE LENGTH	18" ZONE LENGTH	24" ZONE LENGTH	18" ZONE LENGTH		
1	A002SE-10034		QTY OF PICK ZONES + 1		EA	PHOTOEYE, DIFFUSE, 5mm TO 500mm SENSING RANGE, 4 PIN M8 CONNECTOR
2	VARIES*		QTY OF PICK ZONES		EA	MDR, 1.9in OD, POLYV, 7/16in TAPERHEX, 20.5in BF
3	A001RL-10047		QTY OF PICK ZONES x 7	QTY OF PICK ZONES x 5	EA	ROLLER, 1.9in OD, POLYV, 7/16" HEX, 20.5in BF, ABEC-1
4	VARIES*		QTY OF PICK ZONES		EA	MDR, 1.9in OD, POLYV, 7/16in TAPERHEX, 26.5in BF
5	A001RL-10048		QTY OF PICK ZONES x 7	QTY OF PICK ZONES x 5	EA	ROLLER, 1.9in OD, POLYV, 7/16" HEX, 26.5in BF, ABEC-1
6	A001BA-10005		QTY OF PICK ZONES x 14	QTY OF PICK ZONES x 10	EA	POLYV, 3 RIBS, 286mm L, 3in RS
7	VARIES*		QTY OF PICK ZONES x 2		EA	MDR CARD
8	xxx**	xxx**	QTY OF PICK ZONES		EA	ASM, WORKSTATION POP UP TRANSFER

\*Reference Bastian Solutions RZPDC manual for part numbers and detailed replacement instructions.

\*\*See GA-GTPW-54-ML-0001 for detailed view of spare parts inside pop up transfer assemblies. It is also possible to purchase spare complete pop up assemblies which can be swapped out for maintenance purposes.



REVISION DESCRIPTION
ORIGINAL DOCUMENT

FASTENER	TORQUE (IN-LB)	THREADLOCKER
#8-32 SHCS	41	N/A
#10-32 SHCS	68	N/A
1/4"-20 SHCS	142	N/A
M6-1.0 SHCS	113	N/A
3/8-16 CB	372	N/A

**NOTES:**

- 1 POWER SUPPLY SLED FOR A RIGHT HAND WORKSTATION IS PICTURED. LEFT HAND WORKSTATION IS MIRRORED ASSEMBLY.
- 2 CABLES AND AIR LINES NOT SHOWN. SEE ELECTRICAL AND PNEUMATIC DRAWINGS FOR DETAILS OF WIRING AND AIR HOOKUP.
- 3 POWER SUPPLY SLED IS MOUNTED UNDERNEATH WORKSTATION INFEEED CONVEYOR. OPTIONAL FLOOR SUPPORT MAY BE PROVIDED HERE (REFERENCE SYSTEM LAYOUT DRAWINGS).
- 4 CONDUIT FOR 24V POWER TO WORKSTATION SIDEFAMES ATTACHED HERE.
- 5 MAIN CABLE HARNESS ATTACHED HERE. CABLE HARNESS ENTERS CABLE TRAY UNDERNEATH WORKSTATION OUTFEED.
- 6 CONNECT SYSTEM AIR SUPPLY HERE. CONNECTION POINT IS 3/8" NPT FEMALE.
- 7 SET REGULATOR TO 60 PSI.

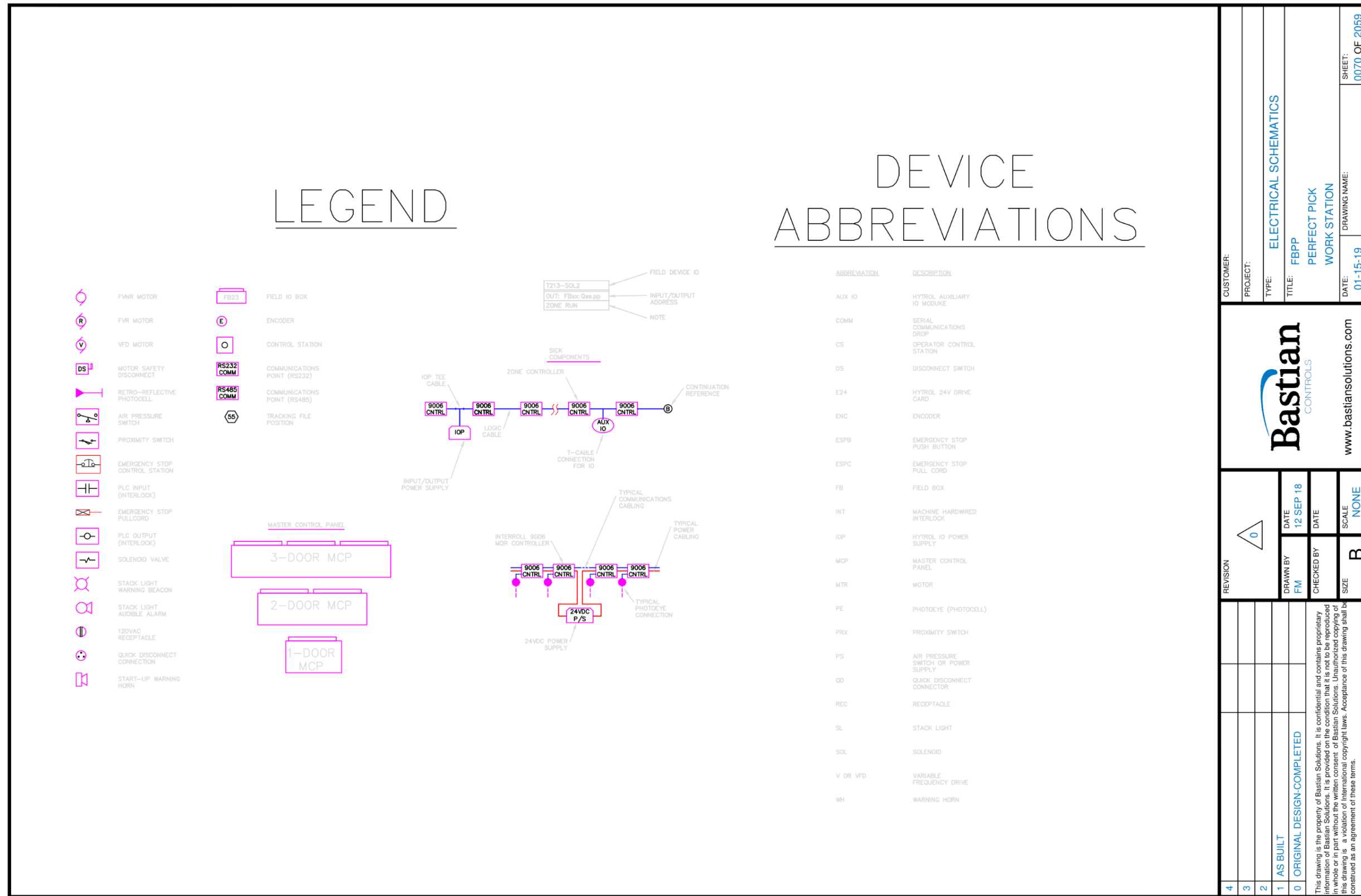
 <small>a TOYOTA ADVANCED LOGISTICS company</small> 1821 BASTIAN COURT WESTFIELD, IN 46074 www.BastianSolutions.com	ORIGINATOR B. BAKER	TITLE GENERAL ARRANGEMENT, GTP WORKSTATION POWER SUPPLY SLED, 54IN OAW, MULTIPLE OAL
	CHECKER R. CHOUDHURI	
	APPROVER C. PERRY	
APPROVAL DATE 10/29/2019	DOCUMENT NUMBER <b>GA-GTPW-54-ML-0003</b>	REVISION <b>A</b> SHEET 1 OF 1

Figure 24-GTP Workstation Power Supply Sled, Sheet 1 of 1

Table 4-BOM for GA-GTPW-54-ML-0003

ITEM NO.	PART NUMBER					QTY	UNITS	DESCRIPTION
	4 ZONE	5 ZONE	6 ZONE	7 ZONE	8 ZONE			
1	A002PS-10055					1	EA	POWER SUPPLY, 400-500 VAC, 3 PHASE INPUT, 20A, 24VDC OUTPUT, WITH 4 PORT UNMANAGED NETWORK SWITCH AND QTY (6) 1/2" TRADE SIZE CONDUIT HOLES
2	A002PS-10056					1	EA	POWER SUPPLY, 400-500 VAC, 3 PHASE INPUT, 40A, 48VDC OUTPUT, WITH QTY (2) 1/2" TRADE SIZE CONDUIT HOLES
3	A016VA-10036	A016VA-10033	A016VA-10037	A016VA-10038	A016VA-10039	1	EA	VALVE BANK, DB25 CONNECTOR, 5/2 PILOTED, A SIDE TO 1/4in PUSH, B SIDE PLUGGED, 3/8in PUSH INLET, MUFFLED EXHAUST
4	A002CC-10004					1	EA	CABLE, BALLUFF MAC-CONNECT ADAPTER FOR MAC VALVE BANK, BNI006M
5	A016RE-10006					1	EA	3/8" FILTER REGULATOR WITH LOCKOUT
6	A002CC-10003					4	EA	BLOCK, IO LINK SLAVE
7	A002CC-10010					1	EA	BLOCK, IO-LINK MASTER, (4) TYPE A PORTS

**9 Appendix 2: Typical GTPW Electrical Layout Drawings**



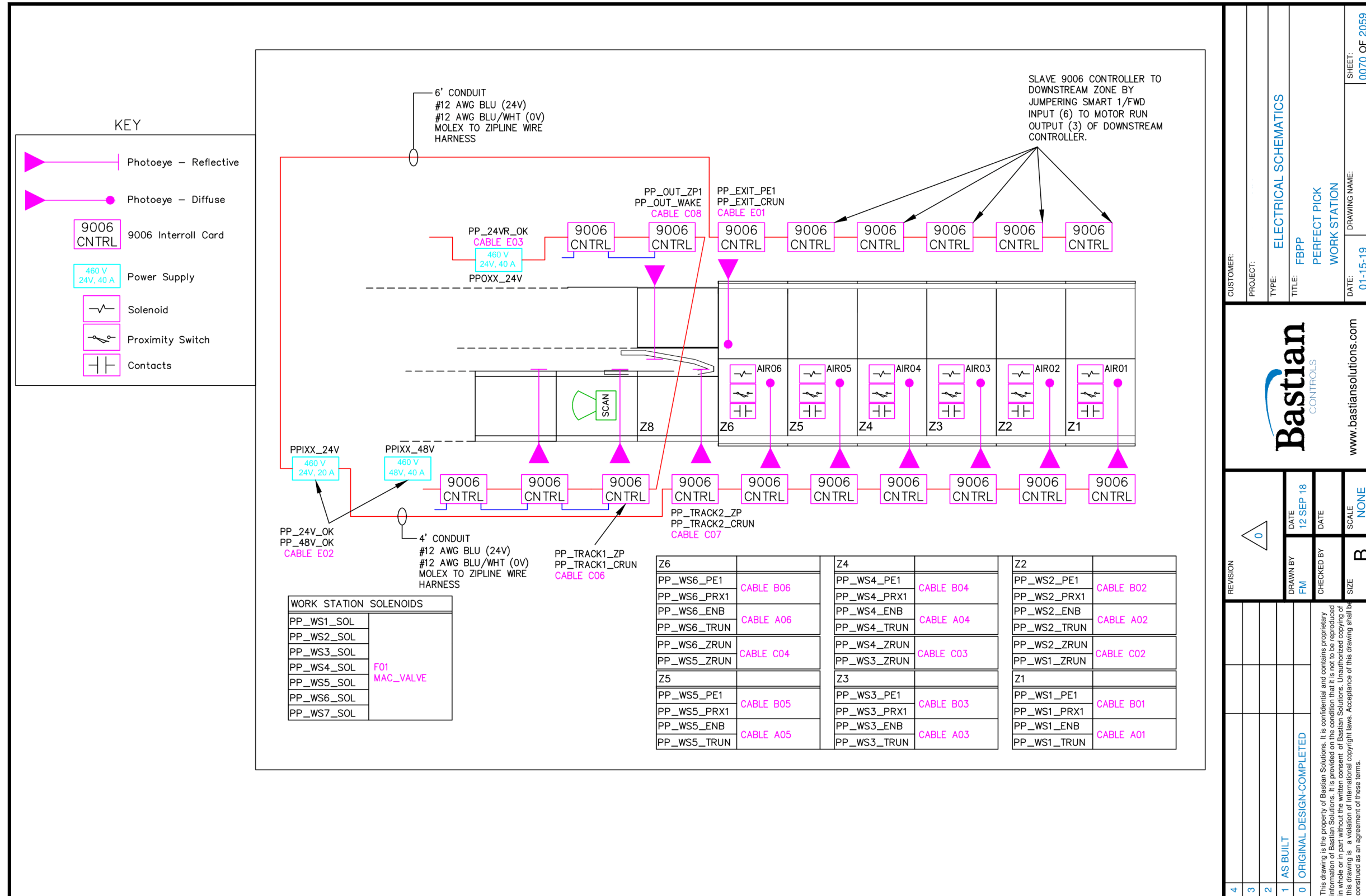
CUSTOMER:	
PROJECT:	ELECTRICAL SCHEMATICS
TYPE:	FBPP PERFECT PICK WORK STATION
DATE:	01-15-19
SHEET:	0070 OF 2059

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REVISION	0						
		DATE	12 SEP 18	DATE		SCALE	NONE
		DRAWN BY	FM	CHECKED BY		SIZE	B

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Figure 25-Typical GTPW Electrical Layout, Sheet 1 of 9



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**REVISION**

4				
3				
2				
1	AS BUILT			
0	ORIGINAL DESIGN-COMPLETED			

**DATE** 12 SEP 18

**SCALE** NONE

**SIZE** B

**PROJECT INFORMATION:**

- CUSTOMER:
- PROJECT:
- TYPE: ELECTRICAL SCHEMATICS
- TITLE: FBPP PERFECT PICK WORK STATION
- DATE: 01-15-19
- DRAWING NAME:
- SHEET: 0070 OF 2059

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Figure 26-Typical GTPW Electrical Layout, Sheet 2 of 9

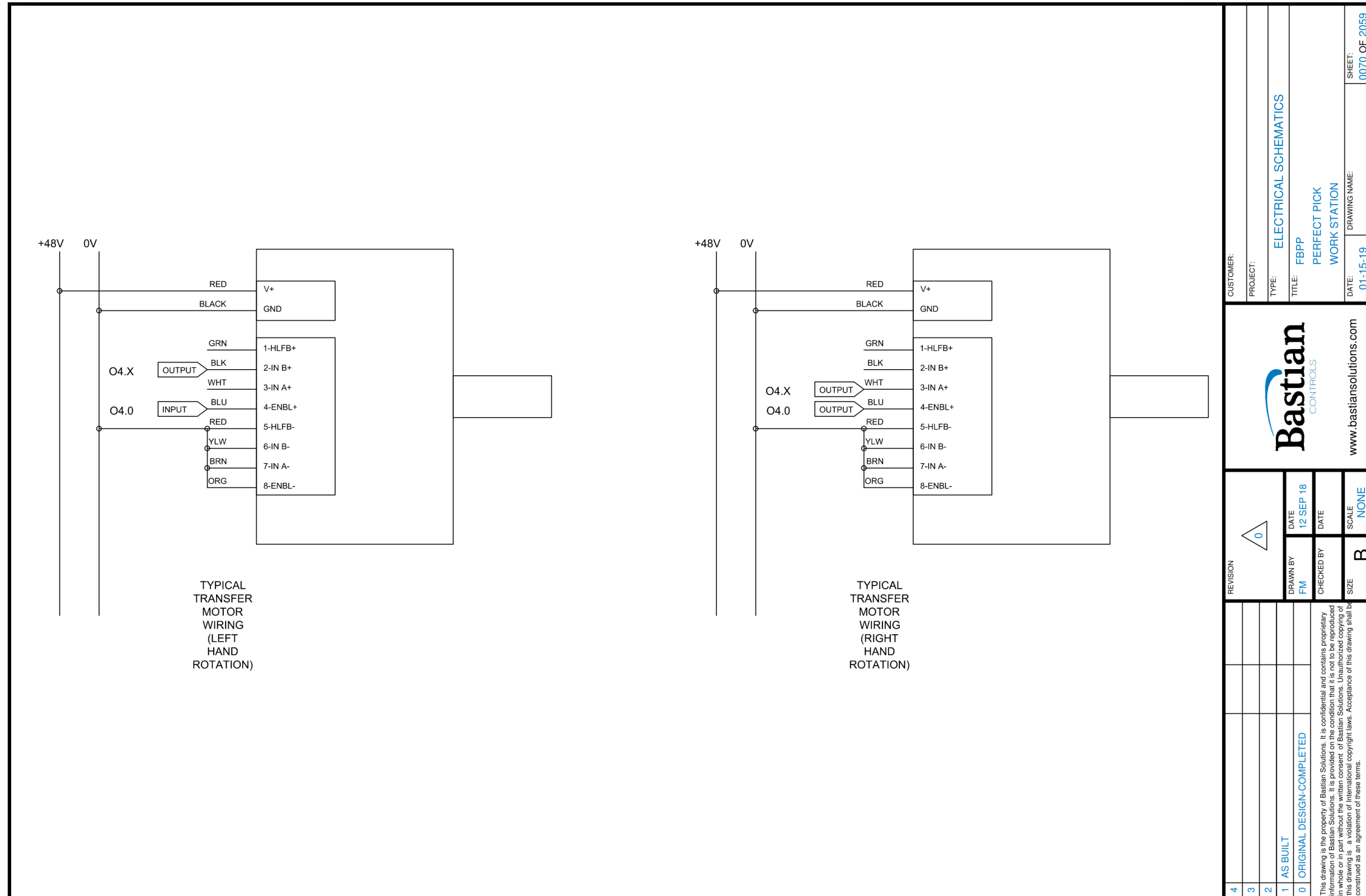


Figure 27-Typical GTPW Electrical Layout, Sheet 3 of 9

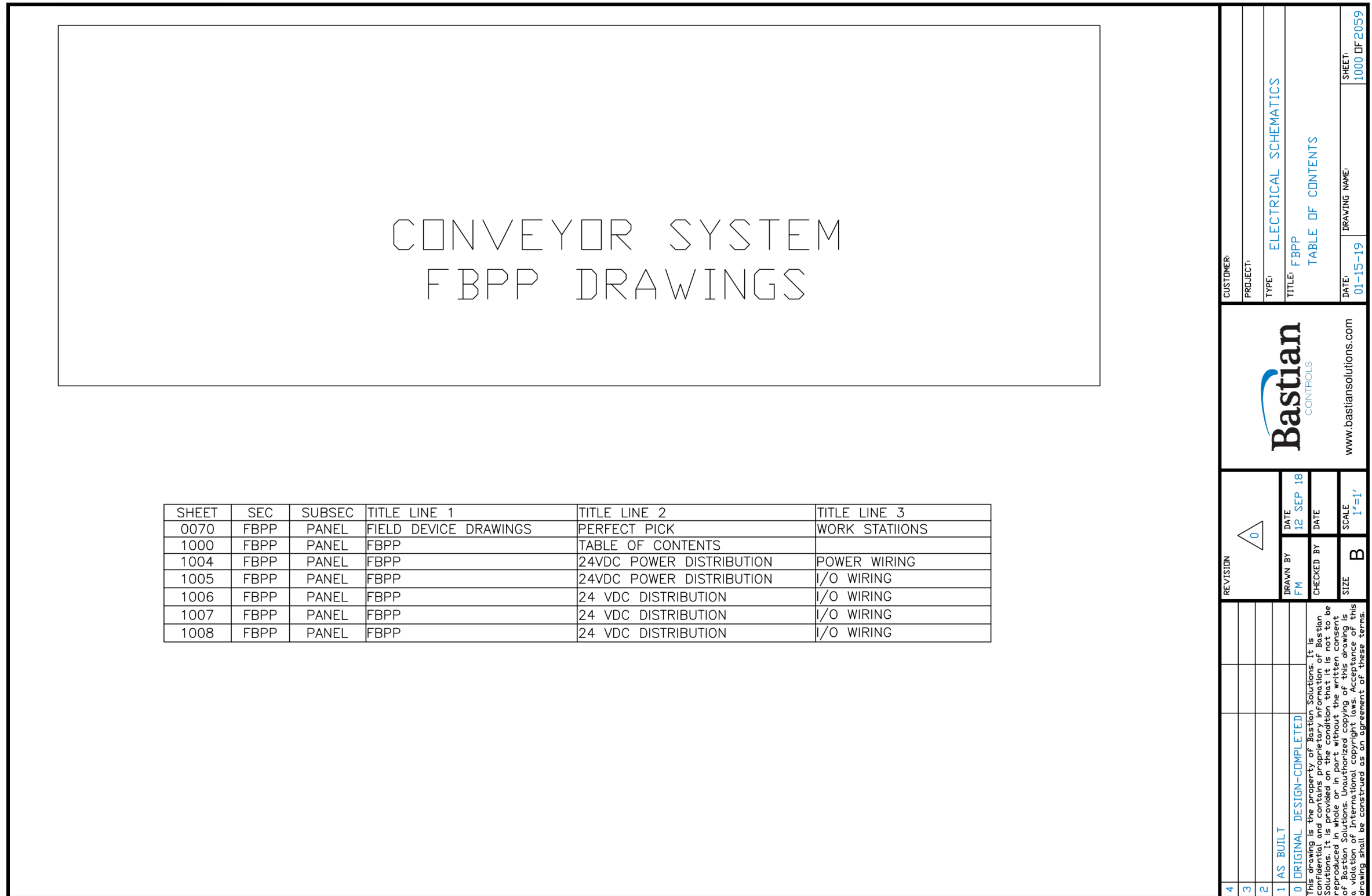


Figure 28-Typical GTPW Electrical Layout, Sheet 4 of 9

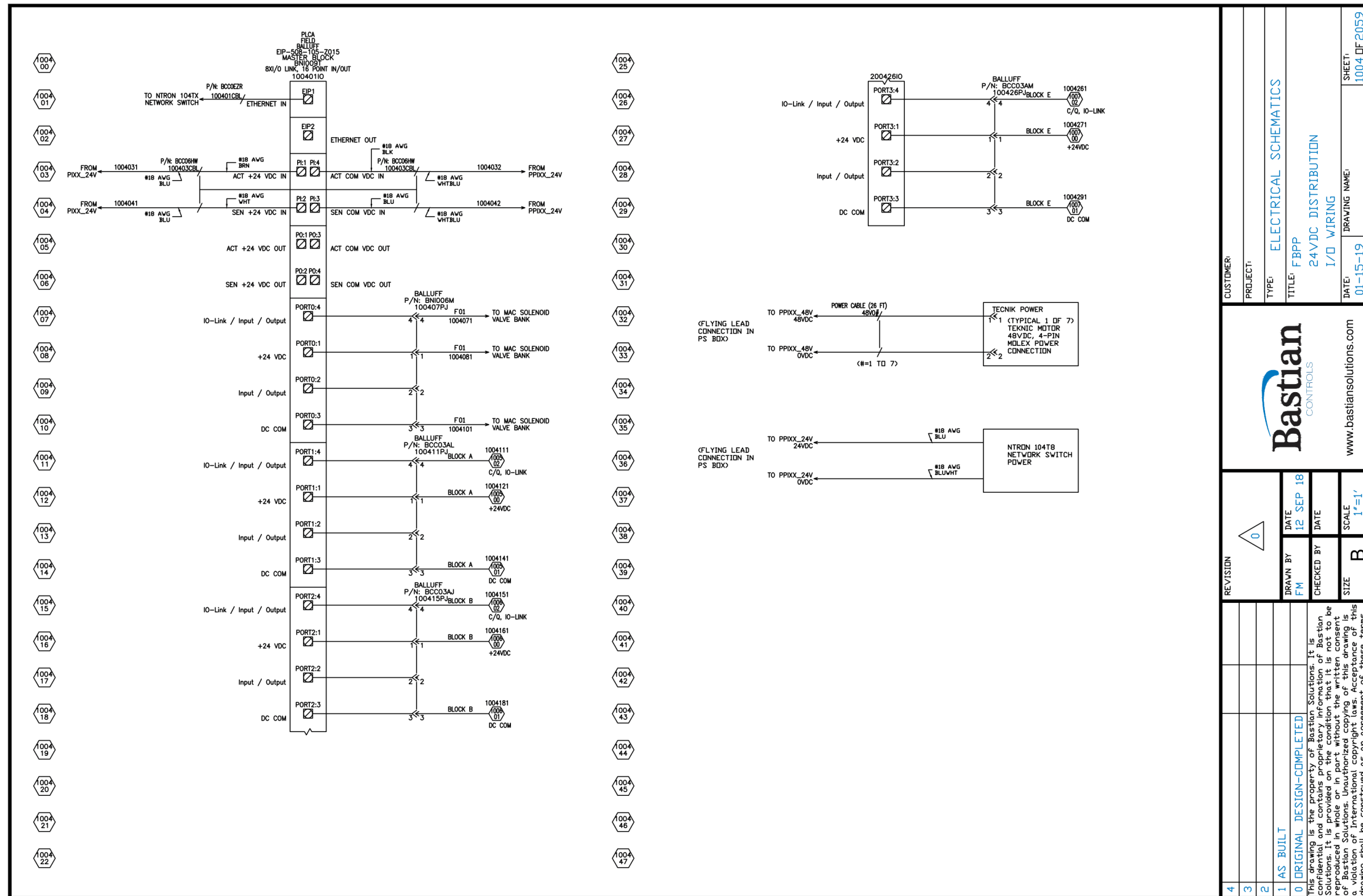


Figure 29-Typical GTPW Electrical Layout, Sheet 5 of 9

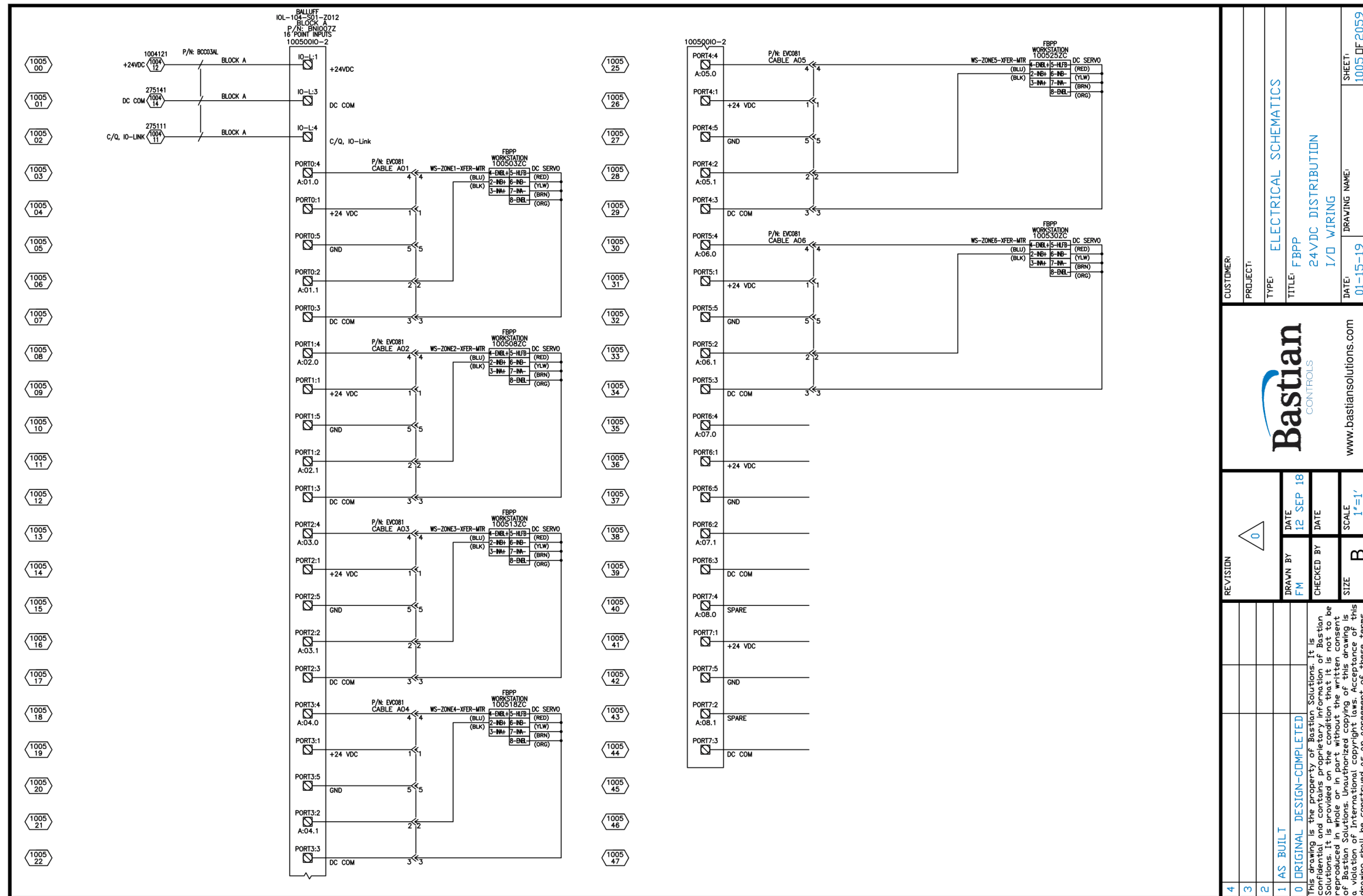


Figure 30-Typical GTPW Electrical Layout, Sheet 6 of 9

4					
3					
2					
1	AS BUILT				
0	ORIGINAL DESIGN-COMPLETED				
<p>This drawing is the property of Bastian Solutions. It is confidential and contains proprietary information of Bastian Solutions. It is provided on the condition that it is not to be reproduced or in any way disseminated without the prior written consent of Bastian Solutions. The use of this drawing for any purpose other than that intended by Bastian Solutions is a violation of international copyright laws. Acceptance of this drawing shall be construed as an agreement of these terms.</p>					
REVISION		DATE	DATE	SCALE	
0		12 SEP 18		1"=1'	
DRAWN BY		CHECKED BY	SIZE	B	
FM					
<p>CUSTOMER: PROJECT: TYPE: <b>ELECTRICAL SCHEMATICS</b> TITLE: <b>FBPP 24VDC DISTRIBUTION I/O WIRING</b> DATE: <b>01-15-19</b> DRAWING NAME: SHEET: <b>1005 DF 2059</b></p>					
<p>www.bastiansolutions.com</p>					

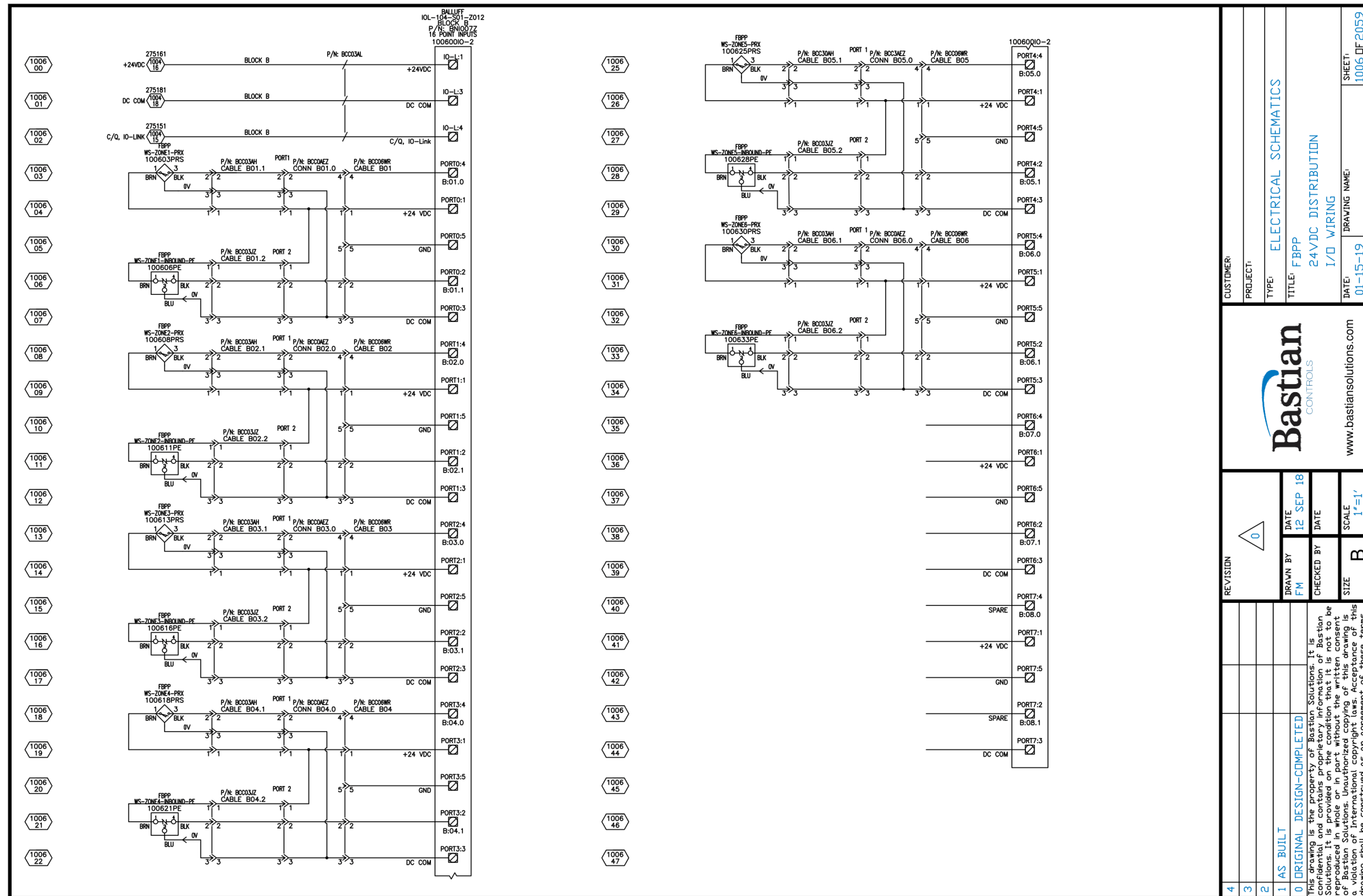


Figure 31-Typical GTPW Electrical Layout, Sheet 7 of 9

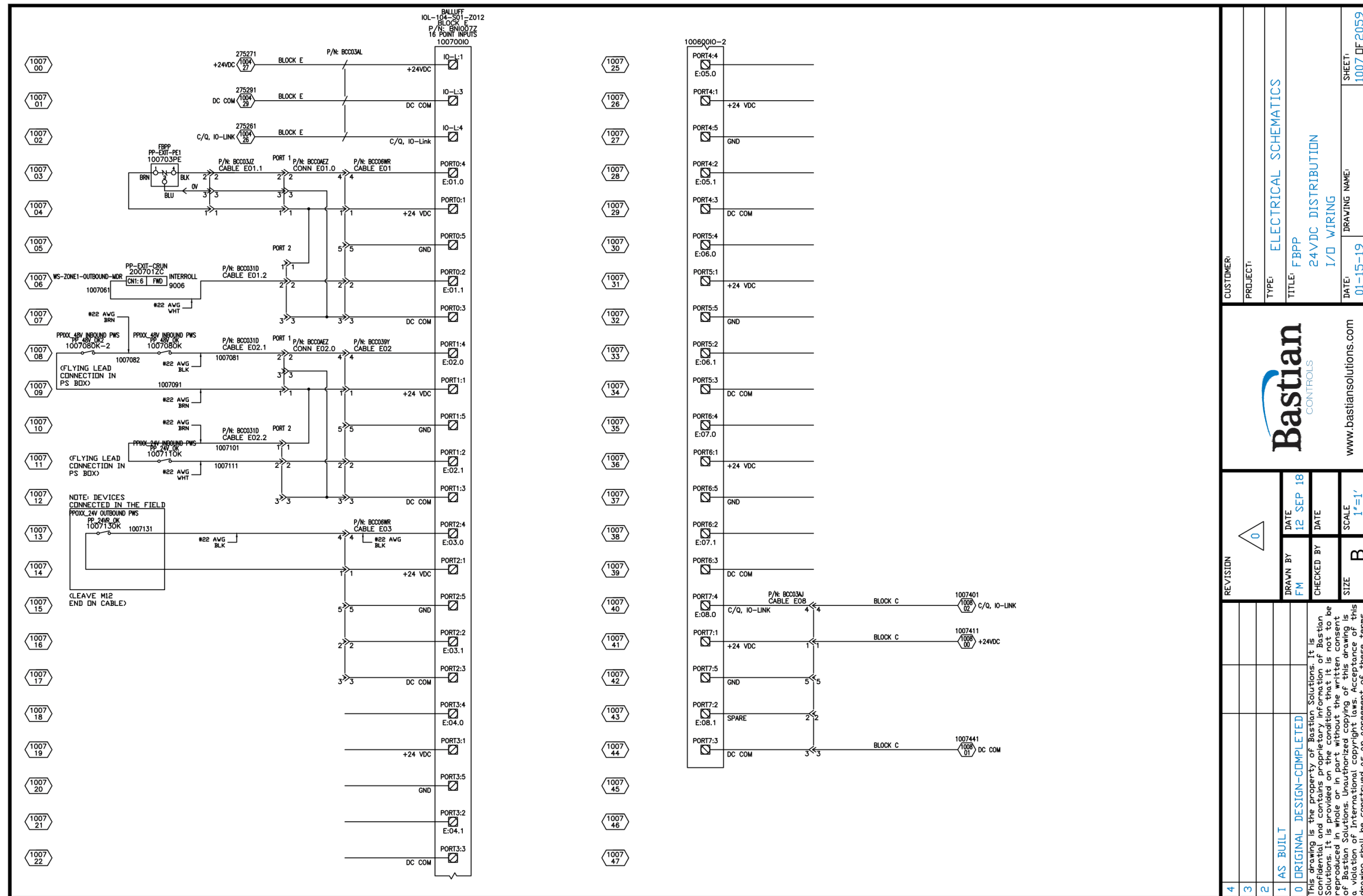


Figure 32-Typical GTPW Electrical Layout, Sheet 8 of 9

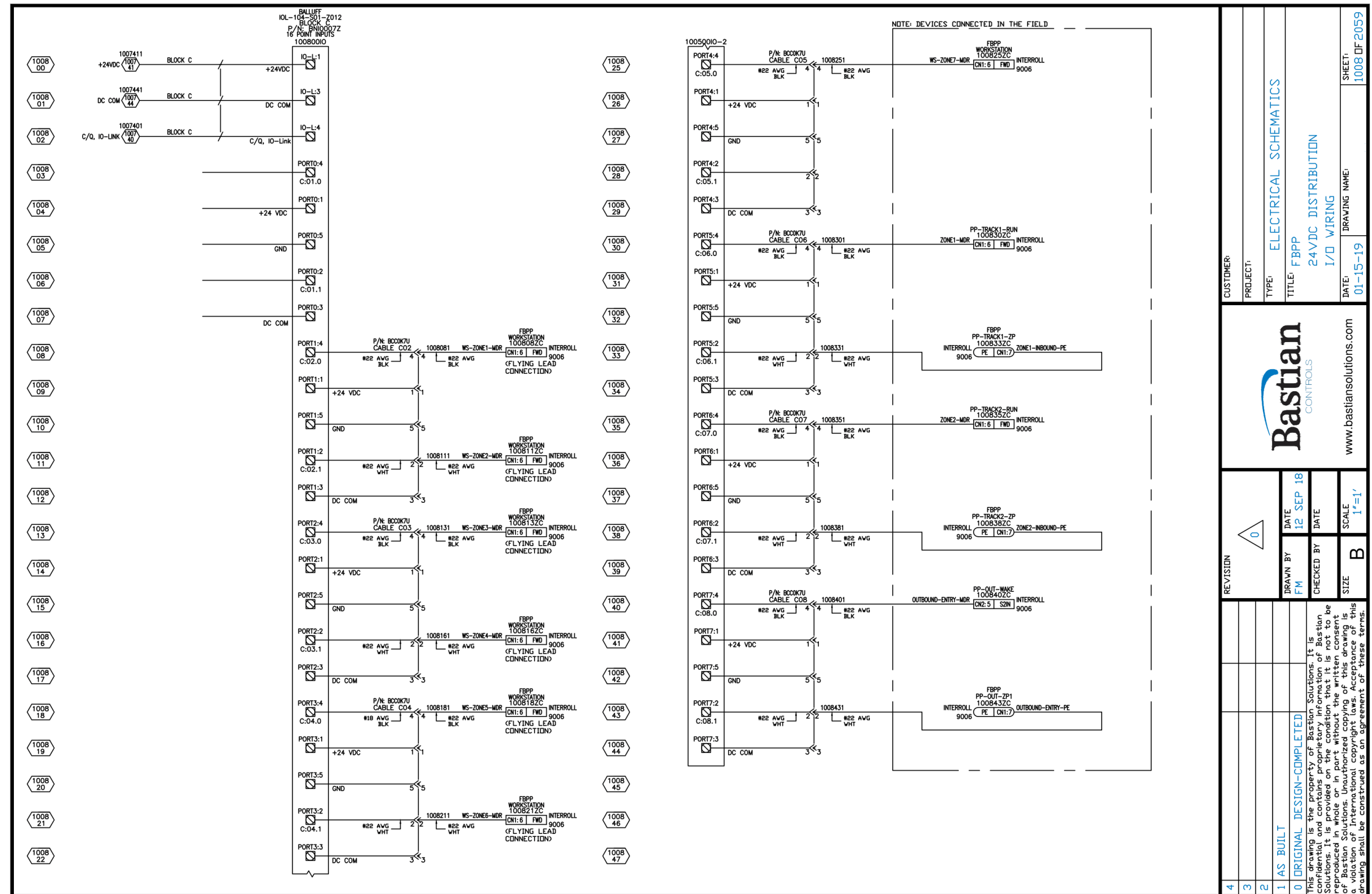


Figure 33-Typical GTPW Electrical Layout, Sheet 9 of 9

**Bastian Solutions Conveyor Installation and Maintenance Manual**

Model: Bastian Solutions GTPW Conveyor

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Bastian Solutions, LLC

1821 Bastian Court

Westfield, IN 46074

Customer Support: [ConveyorSupport@bastiansolutions.com](mailto:ConveyorSupport@bastiansolutions.com)