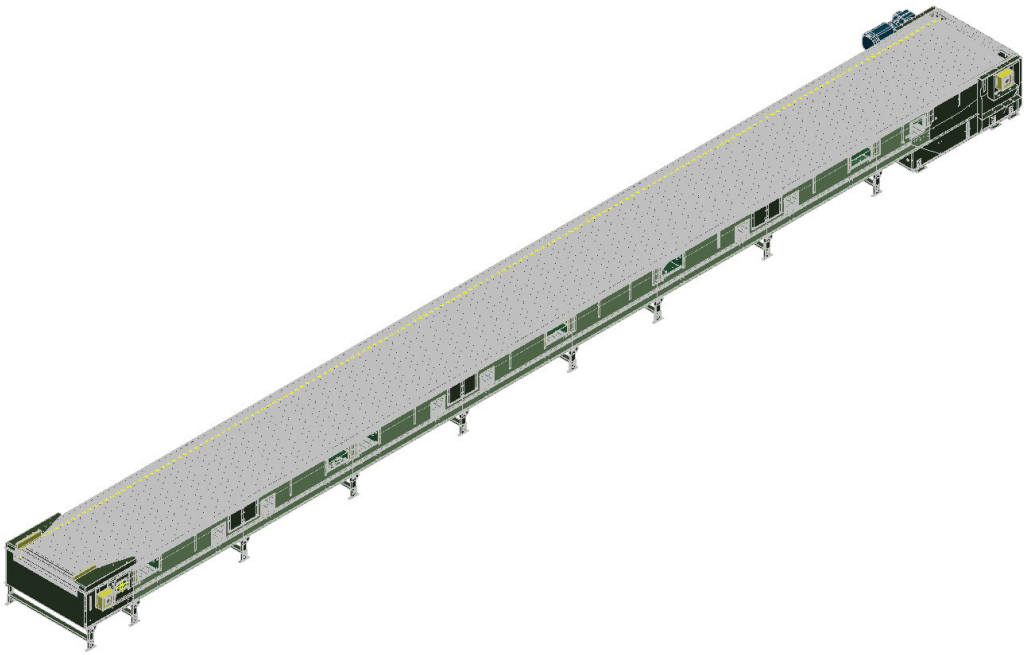
PROSORT LP INSTALLATION AND MAINTENANCE MANUAL



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1 INTRODUCTION

This manual provides guidelines and procedures for installing, operating, and maintaining your conveyor. A complete parts list is provided with recommended spare parts highlighted in gray.

Important safety information is also provided throughout the manual. For safety to personnel and for proper operation of your conveyor, it is recommended that you read and follow the instructions provided in this manual.

1.1 RECEIVING & UNCRATING

- Check the number of items received against the bill of lading.
- Examine condition of equipment to determine if any damage occurred during shipment.
- Move all crates to area of installation.
- Remove crating and check for optional equipment that may be fastened to the conveyor. Make sure these parts (or any foreign pieces) are removed.

1.2 HOW TO ORDER REPLACEMENT PARTS

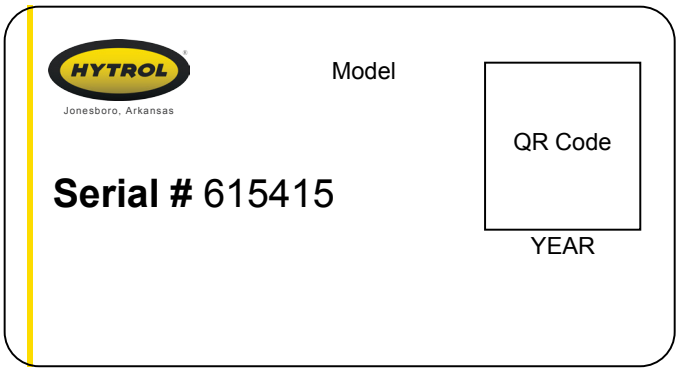
Included in this manual are parts drawings with complete replacement parts lists. Minor fasteners, such as nuts and bolts, are not included.

When ordering replacement parts:

- Contact dealer from whom conveyor was purchased or nearest Hytrol Integration Partner.
- Give Conveyor Factory Order Number/Serial Number.
- Give complete description from Parts List.
- If you are in a breakdown situation, call our Customer Care team at 1-844-4HYTROL.

NOTE

If damage has occurred or freight is missing, contact your Hytrol Integration Partner.



2 SAFETY INFORMATION

2.1 INSTALLATION

GUARDS AND GUARDING

Interfacing of Equipment: When two or more pieces of equipment are interfaced, special attention shall be given to the interfaced area to ensure the presence of adequate guarding and safety devices.

Guarding Exceptions: Whenever conditions prevail that would require guarding under these standards, but such guarding would render the conveyor unusable, prominent warning means shall be provided in the area or on the equipment in lieu of guarding.

Guarded by Location or Position: Where necessary for the protection of employees from hazards, all exposed moving machinery parts that present a hazard to employees at their work station shall be mechanically or electrically guarded, or guarded by location or position.

- Remoteness from frequent presence of public or employed personnel shall constitute guarding by location.
- When a conveyor passes over a walkway, roadway, or work station, it is considered guarded solely by location or position if all moving parts are at least 8 ft. (2.44 m) above the floor or walking surface or are otherwise located so that the employee cannot inadvertently come in contact with hazardous moving parts.
- Although overhead conveyors may be guarded by location, spill guards, pan guards, or equivalent shall be provided if the product may fall off the conveyor for any reason and if personnel would be endangered.

Headroom

- When conveyors are installed above exit passageways, aisles, or corridors, there shall be provided a minimum clearance of 6 ft. 8 in. (2.032 m) measured vertically from the floor or walking surface to the lowest part of the conveyor or guards.
- Where system function will be impaired by providing the minimum clearance of 6 ft. 8 in. (2.032 m) through an emergency clearance, alternate passageways shall be provided.
- It is permissible to allow passage under conveyors with less that 6 ft. 8 in. (2.032 m) clearance from the floor for other than emergency exits if a suitable warning indicates low headroom.

2.2 OPERATION SET-UP

A. Only trained employees shall be permitted to operate conveyors. Training shall include instruction in operation under normal conditions and emergency situations.

B. Where employee safety is dependent upon stopping and/or starting devices, they shall be kept free of obstructions to permit ready access.

C. The area around loading and unloading points shall be kept clear of obstructions which could endanger personnel.

D. No person shall ride the load-carrying element of a conveyor under any circumstances unless that person is specifically authorized by the owner or employer to do so. Under those circumstances, such employee shall only ride a conveyor which incorporates within its supporting structure platforms or control stations specifically designed for carrying personnel. Under no circumstances shall any person ride on any element of a vertical conveyor.

E. Personnel working on or near a conveyor shall be instructed as to the location and operation of pertinent stopping devices.

F. A conveyor shall be used to transport only material it is capable of handling safely.

G. Under no circumstances shall the safety characteristics of the conveyor be altered if such alterations would endanger personnel.

H. Routine inspections and preventive and corrective maintenance programs shall be conducted to ensure that all safety features and devices are retained and function properly.

I. Personnel should be alerted to the potential hazard of entanglement in conveyors caused by items such as long hair, loose clothing, and jewelry.

J. Conveyors shall not be maintained or serviced while in operation unless proper maintenance or service requires the conveyor to be in motion. In this case, personnel should be made aware of the hazards and how the task may be safely accomplished.

K. Owners of conveyor should ensure proper safety labels are affixed to the conveyor warning of particular hazards involved in operation of their conveyors.

CAUTION!

Because of the many moving parts on the conveyor, all personnel in the area of the conveyor need to be warned that the conveyor is about to be started.

2.3 MAINTENANCE / SAFETY LABELS

Refer to ANSI Z244.1-1982, American National Standard for Personnel Protection – Lockout/Tagout of Energy Sources – Minimum Safety Requirements and OSHA Standard Number 29 CFR 1910.147 “The Control of Hazardous Energy (Lockout/Tagout).”

- All maintenance, including lubrication and adjustments, shall be performed only by qualified and trained personnel.
- It is important that a maintenance program be established to ensure that all conveyor components are maintained in a condition which does not constitute a hazard to personnel.
- When a conveyor is stopped for maintenance purposes, starting devices or powered accessories shall be locked or tagged out in accordance with a formalized procedure designed to protect all persons or groups involved with the conveyor against an unexpected start.
- Replace all safety devices and guards before starting equipment for normal operation.
- Whenever practical, DO NOT lubricate conveyors while they are in motion. Only trained personnel who are aware of the hazard of the conveyor in motion shall be allowed to lubricate.

Safety Guards
Maintain all guards and safety devices IN POSITION and IN SAFE REPAIR.

Safety Labels
In an effort to reduce the possibility of injury to personnel working around Hytrol conveying equipment, safety labels are placed at various points on the equipment to alert them of potential hazards. Please check equipment and note all safety labels. Make certain your personnel are alerted to and obey these warnings. See Safety Manual for examples of warning labels.

REMEMBER

Do not remove, reuse, or modify material handling equipment for any purpose other than its original intended use.

3 INSTALLATION

3.1 LOCATION

1. Determine direction of product flow. Figure 1 shows a single sided sorter and Figure 2 shows a dual sided sorter.
2. Refer to “Match-Mark” labels on ends of conveyor sections (Figures 1 and 2). Position sections in letter sequence near installation area.

FIGURE 1

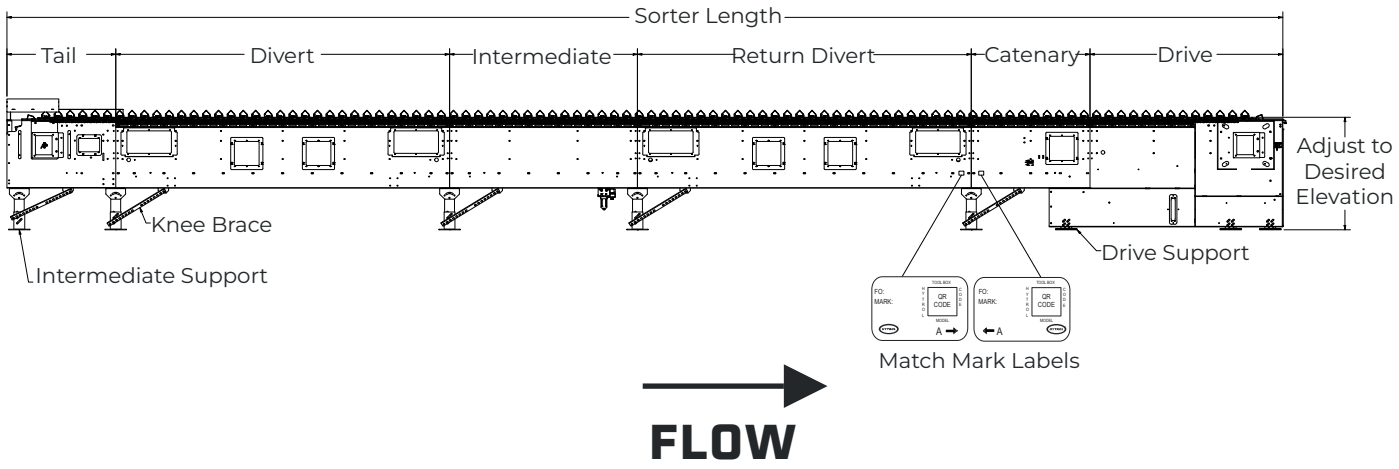
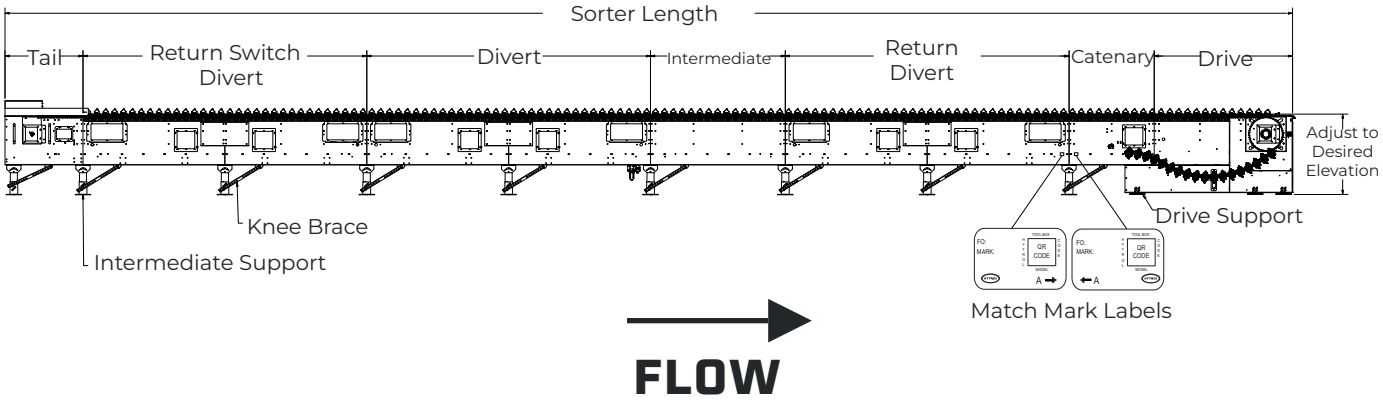


FIGURE 2



3.2 CONVEYOR SET-UP

1. Mark a chalk line on the floor to locate the conveyor center.
2. Attach supports and vibration pads to all conveyor sections (Figure 3). Adjust elevation to required height. Hand tighten bolts only at this time.
3. During installation, check to make sure each bed section is square. Measure the diagonals from corner of the frame. If they are not equal, the frame must be squared. Attach a come-along or another suitable pulling device across the longest corners and pull it until the section is square.
4. Place the infeed (tail) section in position. Locate the two provided threaded rods (on the infeed or discharge end). Use these rods to pull each section together during installation (Figure 3).
5. Install remaining sections, placing unsupported end on extended pivot plate of previous section (Figure 3).
6. Fasten sections together with splice channels and pivot plates (Figure 3). Hand-tighten bolts only at this time.
7. Check if conveyor is level across width and length of unit. Adjust supports as necessary.
8. After all sections have been squared and leveled, tighten all splice channels and support mounting bolts. Lag supports to the floor.
9. Use extrusion alignment bar assembly at each joint alignment of extrusion (Figure 4).
10. Check alignment of wear strip at all section joints. Sand wear strip as necessary for a smooth wear surface (Figure 4).
11. Install bearing profile per section 3.4 BEARING PROFILE INSTALLATION on page 15.
12. Install 1/2” main air line into sections, routing through the large holes in the bed spacers (Figure 3) that are closest to the side channel on one side (only for pneumatic sorter).
    - For single sided: Connect 3/8” air lines at divert switches.
    - For dual sided: Add additional tee to main air line and run to opposite side for switch (Figure 7).
13. For pneumatic sorters: Connect main air line to filter/regulator (Figure 8). Set regulator to working pressure of 60 PSI. Install low pressure switch at farthest point from regulator (Figure 6) and plug on the other end (Figure 9).
14. Install electrical controls and wire motor per section 3.3 ELECTRICAL EQUIPMENT on page 13. Verify correct motor rotation at this time.
15. Check each divert switch to see if it is operating properly per section 5.3 PNEUMATIC DIVERT SWITCH CHECKLIST on page 30. This must be done before carrying chains are installed.

16. Install carrying chains per instructions on section 5.5 CARRYING CHAIN INSTALLATION on page 33.
17. Install chain oiler at infeed and connect to oil lines (Figure 10). Refer to section 5.1 LUBRICATION on page 18 for type of oil required.
18. After mounting, the oiler will need to be adjusted for proper oiling of mounting chains. Adjustment may be made using a combination of solenoid activation time and flow adjustment screws.
    - A good rule of thumb for solenoid adjustment is to turn the oiler on for one complete chain revolution for every 80 hours of operation, if chain is excessively wet, oil every 160 hours of operation.) Typically, chain on the divert side will need slightly more oil. The flow adjustment screws can be altered to achieve volume.

FIGURE 3

SOME PARTS REMOVED FOR CLARITY

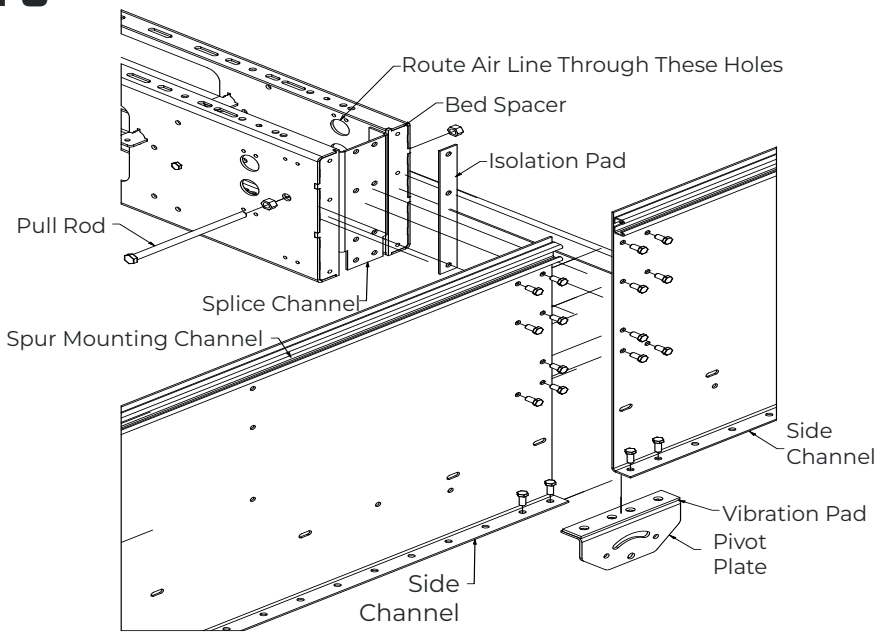
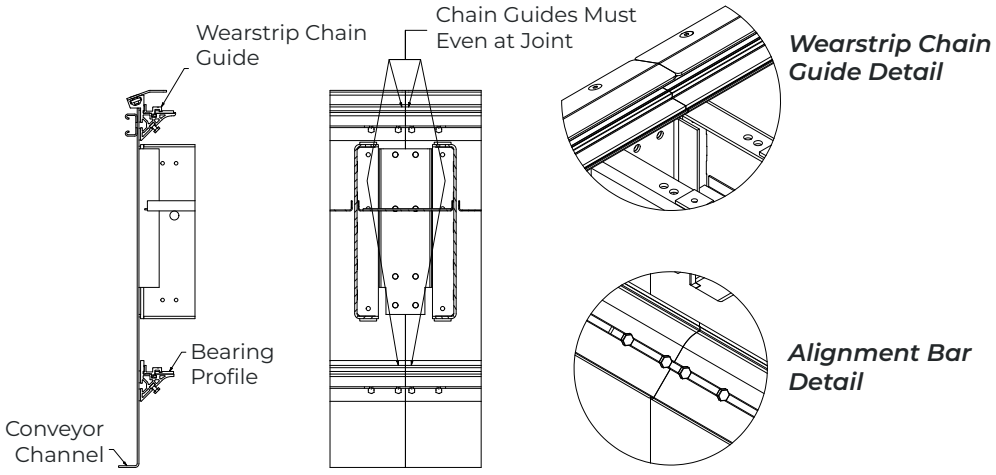


FIGURE 4



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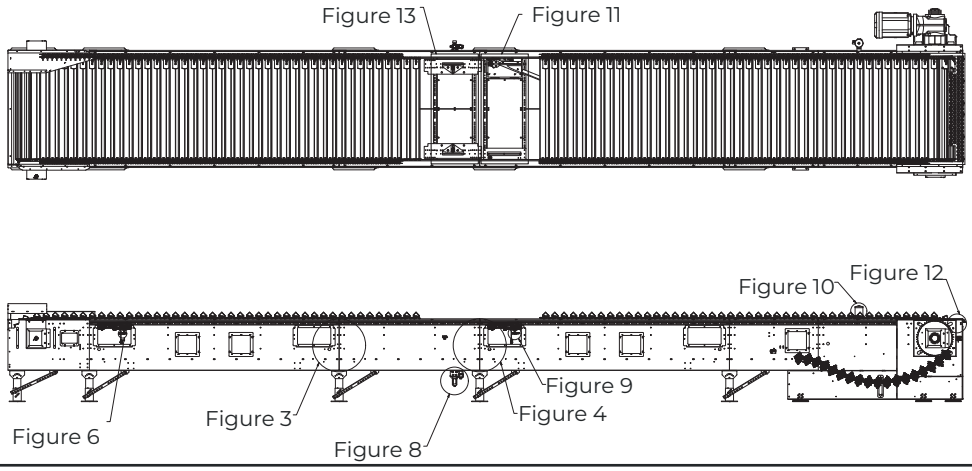


FIGURE 6 END SWITCH

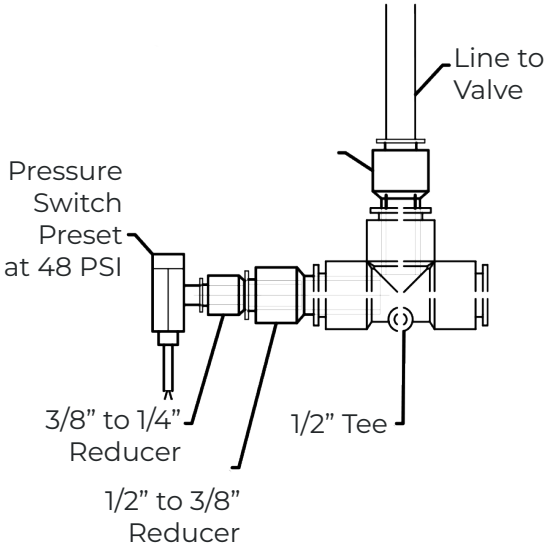
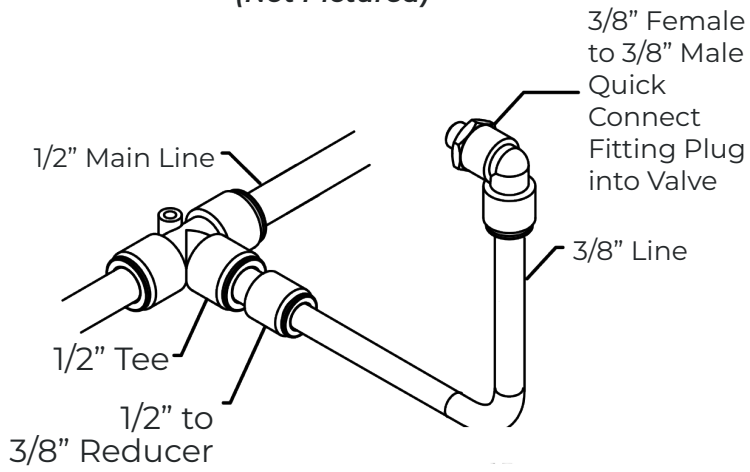


FIGURE 7 INTERMEDIATE SWITCHES

(Not Pictured)



ALL PLUMBING INSIDE THE FRAME

FIGURE 8 FILTER/REGULATOR SET-UP

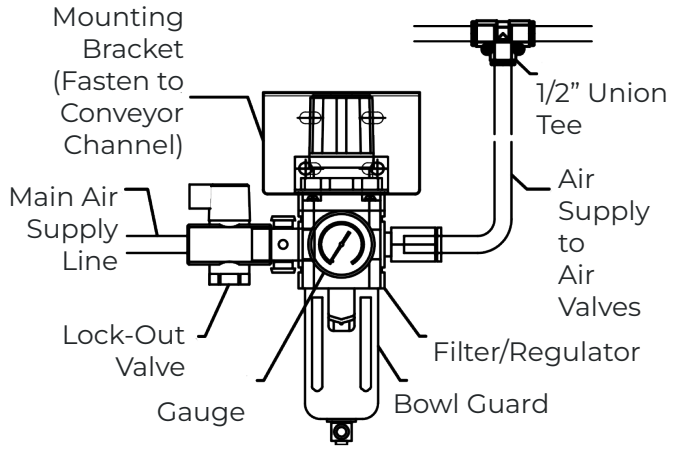


FIGURE 9

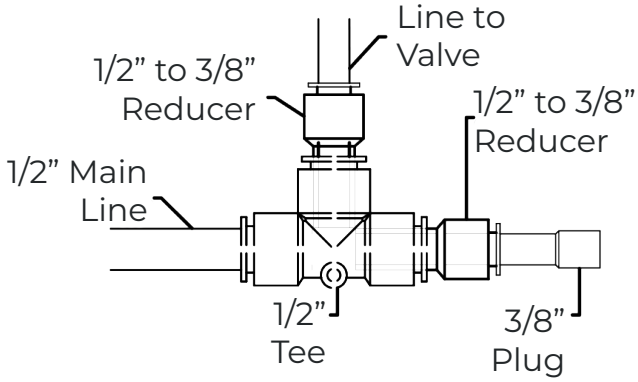


FIGURE 10

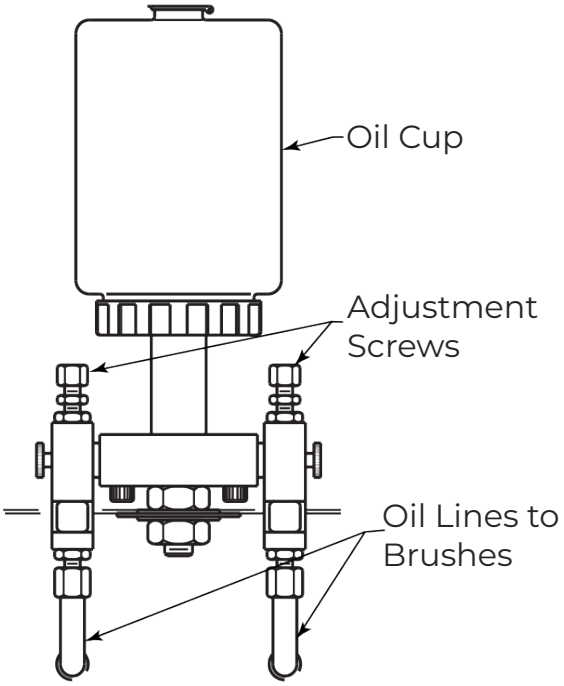


FIGURE 11

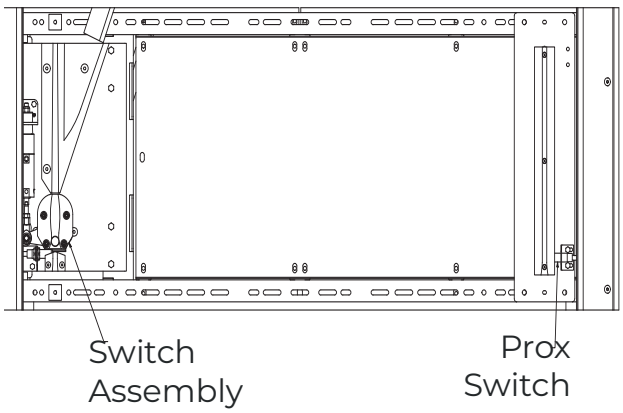


FIGURE 12

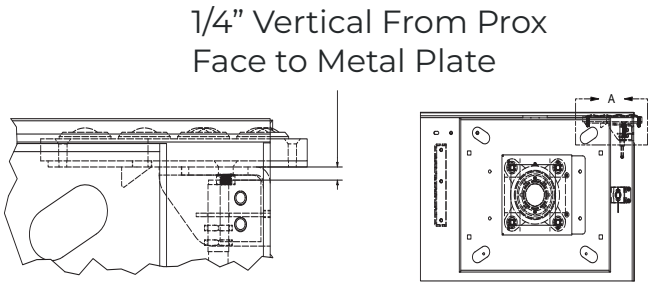
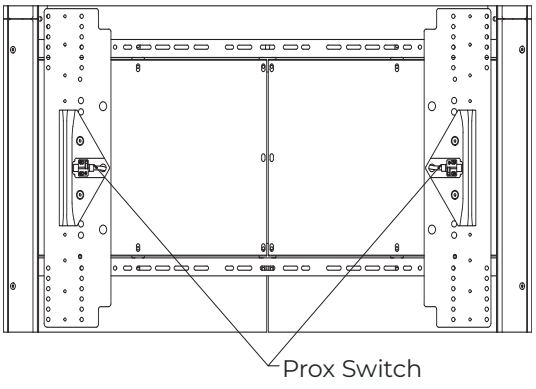


FIGURE 13

LOST BEARING DETECTION



3.3 ELECTRICAL EQUIPMENT

CONTROLS

Electrical Code: All motor controls and wiring shall conform to the National Electrical Code (Article 670 or other applicable articles) as published by the National Fire Protection Association and as approved by the American Standards Institute, Inc.

CONTROL STATIONS

A. Control stations should be so arranged and located that the operation of the equipment is visible from them, and shall be clearly marked or labeled to indicate the function controlled.

B. A conveyor which would cause injury when started shall not be started until employees in the area are alerted by a signal or by a designated person that the conveyor is about to start.

- When a conveyor would cause injury when started and is automatically controlled or must be controlled from a remote location, an audible device shall be provided which can be clearly heard at all points along the conveyor where personnel may be present. The warning device shall be actuated by the controller device starting the conveyor and shall continue for a required period of time before the conveyor starts. A flashing light or similar visual warning may be used in conjunction with or in place of the audible device if more effective in particular circumstances.
- Where system function would be seriously hindered or adversely affected by the required time delay or where the intent of the warning may be misinterpreted (i.e., a work area with many different conveyors and allied devices), clear, concise, and legible warning shall be provided. The warning shall indicate that conveyors and allied equipment may be started at any time, that danger exists, and that personnel must keep clear. The warnings shall be provided along the conveyor at areas not guarded by position or location.

C. Remotely and automatically controlled conveyors, and conveyors where operator stations are not manned or are beyond voice and visual contact from drive areas, loading areas, transfer points, and other potentially hazardous locations on the conveyor path not guarded by location, position, or guards, shall be furnished with emergency stop buttons, pull cords, limit switches, or similar emergency stop devices.

- All such emergency stop devices shall be easily identifiable in the immediate vicinity of such locations unless guarded by location, position, or guards. Where the design, function, and operation of such conveyor clearly is not hazardous to

- The emergency stop device shall act directly on the control of the conveyor concerned and shall not depend on the stopping of any other equipment. The emergency stop devices shall be installed so that they cannot be overridden from other locations.

A. Inactive and unused actuators, controllers, and wiring should be removed from control stations and panel boards, together with obsolete diagrams, indicators, control labels, and other material which serve to confuse the operator.

SAFETY DEVICES

A. All safety devices, including wiring of electrical safety devices, shall be arranged to operate in a "Fail-Safe" manner, that is, if power failure or failure of the device itself would occur, a hazardous condition must not result.

B. Emergency Stops and Restarts. Conveyor controls shall be so arranged that, in case of emergency stop, manual reset or start at the location where the emergency stop was initiated, shall be required of the conveyor(s) and associated equipment to resume operation.

C. Before restarting a conveyor which has been stopped because of an emergency, an inspection of the conveyor shall be made and the cause of the stoppage determined. The starting device shall be locked out before any attempt is made to remove the cause of stoppage, unless operation is necessary to determine the cause or to safely remove the stoppage.

Refer to ANSI Z244.1-1982, American National Standard for Personnel Protection – Lockout/Tagout of Energy Sources – Minimum Safety Requirements and OSHA Standard Number 29 CFR 1910.147 "The Control of Hazardous Energy (Lockout/Tagout)."

WARNING!

Electrical controls shall be installed and wired by a qualified electrician. Wiring information for the motor and controls are furnished by the equipment manufacturer.

3.4 BEARING PROFILE INSTALLATION

The grooved bearing profile will be shipped in a coil similar to Figure 14.

1. Lay the bearing profile in line with the UHMW chain guide wearstrip (Figure 15).
2. Use a hammer to bump the grooved belt (red Novitane belt) under the UHMW (Figures 16 & 17).
3. Continue inserting the grooved bearing profile underneath the UHMW until it all snaps in (Figures 18 & 19).
4. At the beginning of every new strip, a maximum of five feet between screws, at each bed joint and at both ends of every strip of bearing profile, insert a #6-32 x 3/4” self-tapping screw.

As shown in the pictures below, place the #32 drill bit in the groove provided. Position it approximately one inch from the side channel end or 1/2" from the ends of the bearing profile strip. The screw is there to prevent the bearing profile from moving while the sorter is running (Figures 20 to 23).

FIGURE 14

FIGURE 15

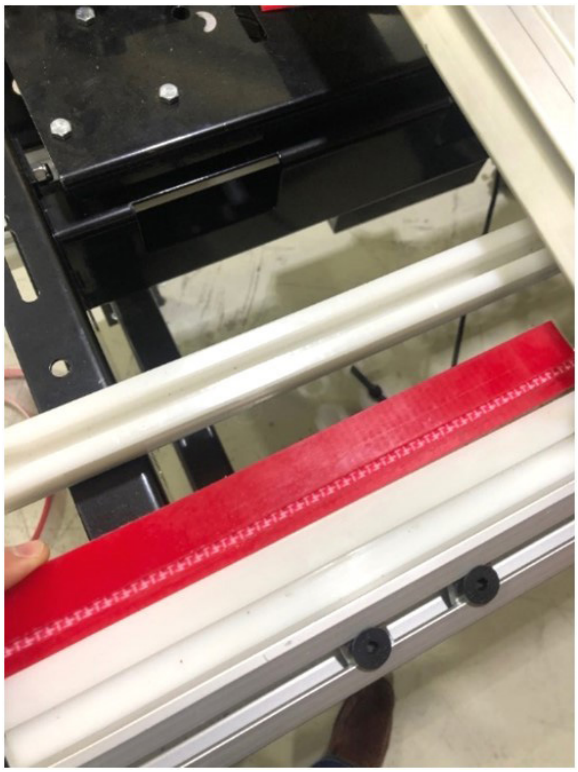


FIGURE 16

FIGURE 17

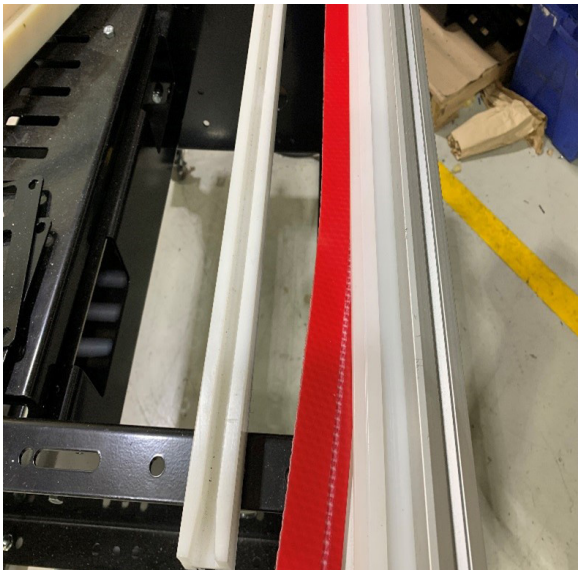


FIGURE 18

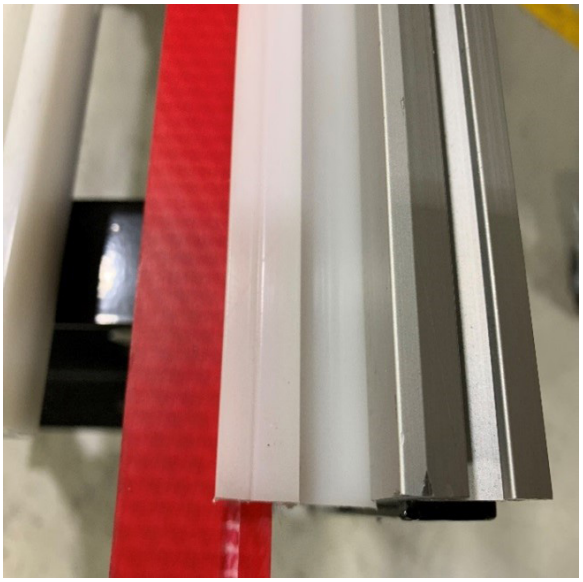


FIGURE 19

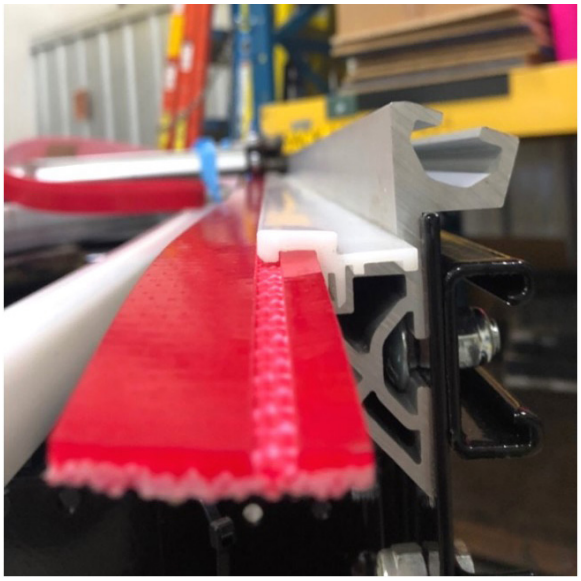


FIGURE 20

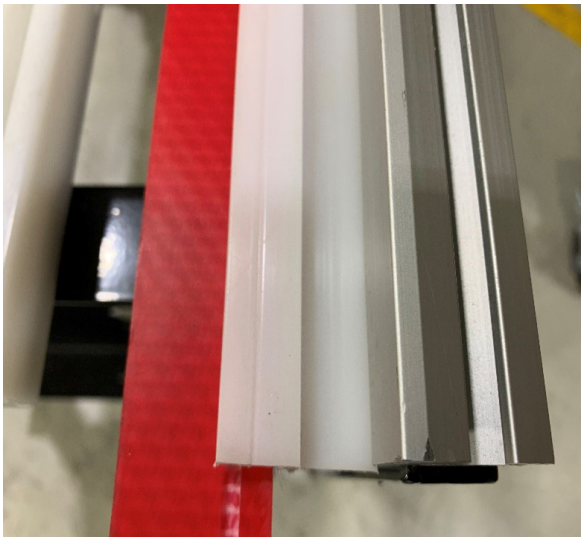


FIGURE 21

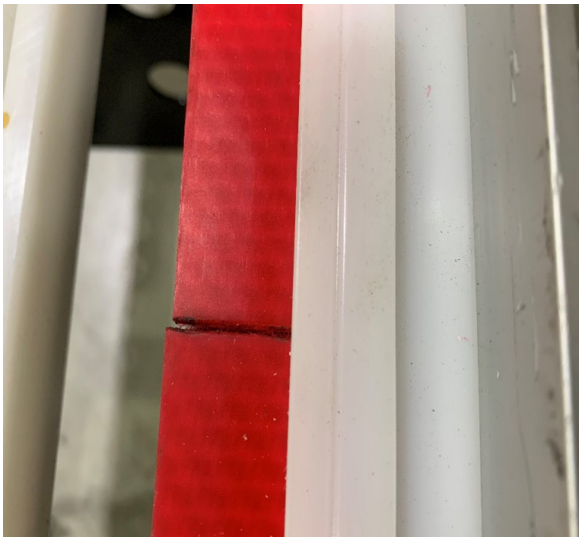


FIGURE 22

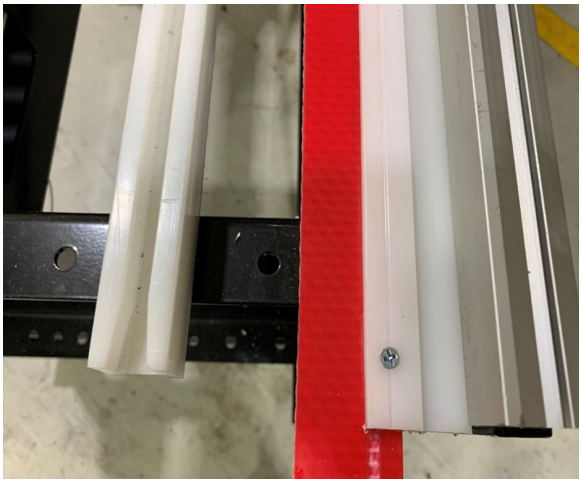
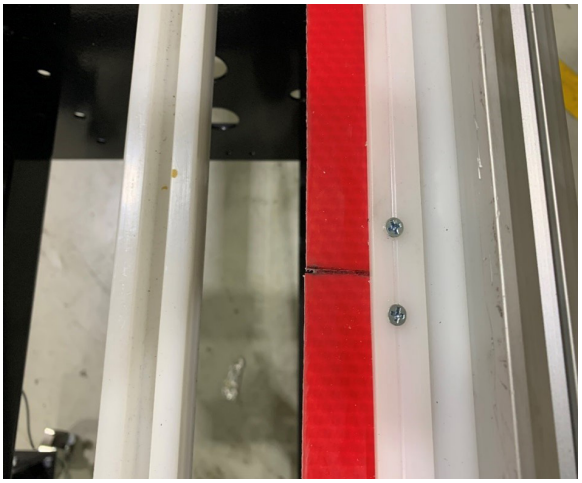


FIGURE 23



4 OPERATION

4.1 CONVEYOR START–UP

Before the conveyor is turned on, check for foreign objects that may have been left inside the conveyor during installation. These objects could cause serious damage during start-up.

After the conveyor has been turned on and is operating, check all moving parts to make sure they are working freely.

CAUTION!

Because of the many moving parts on the conveyor, all personnel in the area of the conveyor need to be warned that the conveyor is about to be started.

5 MAINTENANCE

5.1 LUBRICATION

BEARINGS

A. No grease fitting - Pre-lubricated. No lubrication required.
B. With grease fitting - Re-lubricate approximately every 10 to 12 weeks with lithium base grease suitable for ball bearing service.

RECOMMENDED CHAIN LUBRICANT

A good grade of clean non-detergent petroleum or synthetic oil is recommended. See chart for proper viscosity.

OILER BRUSH ADJUSTMENT

It is very important that the oiler brush comes in contact with the chain for proper lubrication and increased chain life. This can be done by using the adjusting nuts and support brackets (Figure 24).

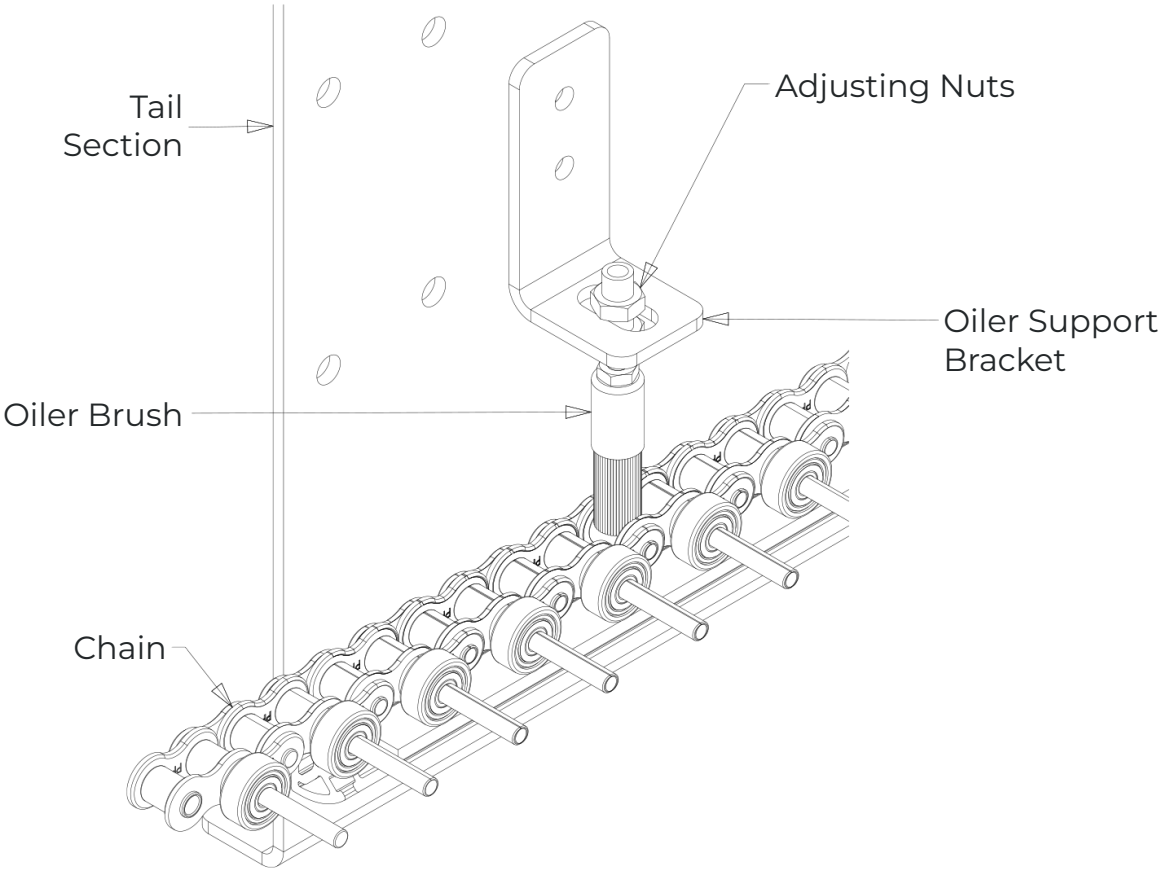
AMBIENT TEMPERATURE DEGREES (°F)	SAE	ISO
20-40 40-100	20 30	46 or 68 100

REDUCERS

See recommendations by manufacturer.

FIGURE 24

OILER BRUSH ADJUSTMENT



5.2 CONTROLLING THE PROSORT

A good software package is essential for proper operation of the ProSort sorter. With proper controls, the sorter will provide accurate, efficient, reliable sorting for many years. However, inadequate controls may result in poor sorter performance and mechanical failures of the sorter itself, including “crashes”.

Hytrol recommends using the Hytrol ProLogix controls package. Every sortation system is different, which means that the controls for the system are custom and unique to that system. These custom controls are provided either by Hytrol, the Hytrol Integration Partner, or a third party.

NOTE

If Hytrol’s ProLogix controls package is not used, Hytrol has the right to void the warranty of the sorter. If components are damaged due to improper control, user may be held responsible for the cost of replacement components and repairs.

Hytrol has built into the sorter some of the controls necessary to operate the divert switches, eliminating the need to control this function externally. Other electrical control components are provided with the sorter to allow the external controls to monitor critical items and to provide an interface between the electrical controls and mechanical sorter. Still, other control components must be provided by the supplier of the custom controls package to ensure proper sorter operation.

This section includes the following information for the custom controls provider:

1. A description of the divert switch control components supplied, their function, and how to interface with them.
2. A description of the other control components provided with the sorter and their intended function.
3. A description of control components that are not included with the sorter that must be provided by the controls supplier.
4. Some controls do's and dont's to assist in design and installation of the controls package.

Please read this section thoroughly and share this information with the controls provider.

DIVERT SWITCH CONTROL

Proper divert switch control is critical for safe and reliable sorter operation. Failure to properly control the divert switch is one of the most common causes of switch damage, and can cause "crashes".

The divert switch functions similar to a switch on a train track. It sends divert shoes to travel either in a straight-through, "non-divert" track or diagonally across the sorter along a "divert track" to push product off the sorter. When the switch is in its "home" position, divert shoes travel through the switch along its straight-through track. When the switch is in its "divert" position, the shoes are sent along the divert track.

The transition of the switch between its "home" and "divert" positions must be accurately timed to prevent sorter crashes. Just as a train track switch cannot be safely operated while a train is passing through the switch, the divert switch cannot be safely operated while a divert shoe is passing through the switch. If the movement of the switch mechanism is not timed to occur only when no shoe is present in the switch, the guide pin of the shoe may collide with the point of the divert block, resulting in damage to the switch and potentially costly downtime.

The ProSort has control components at each divert switch that accurately time the divert switch movement and operation, eliminating the need for the controls provider to do so.

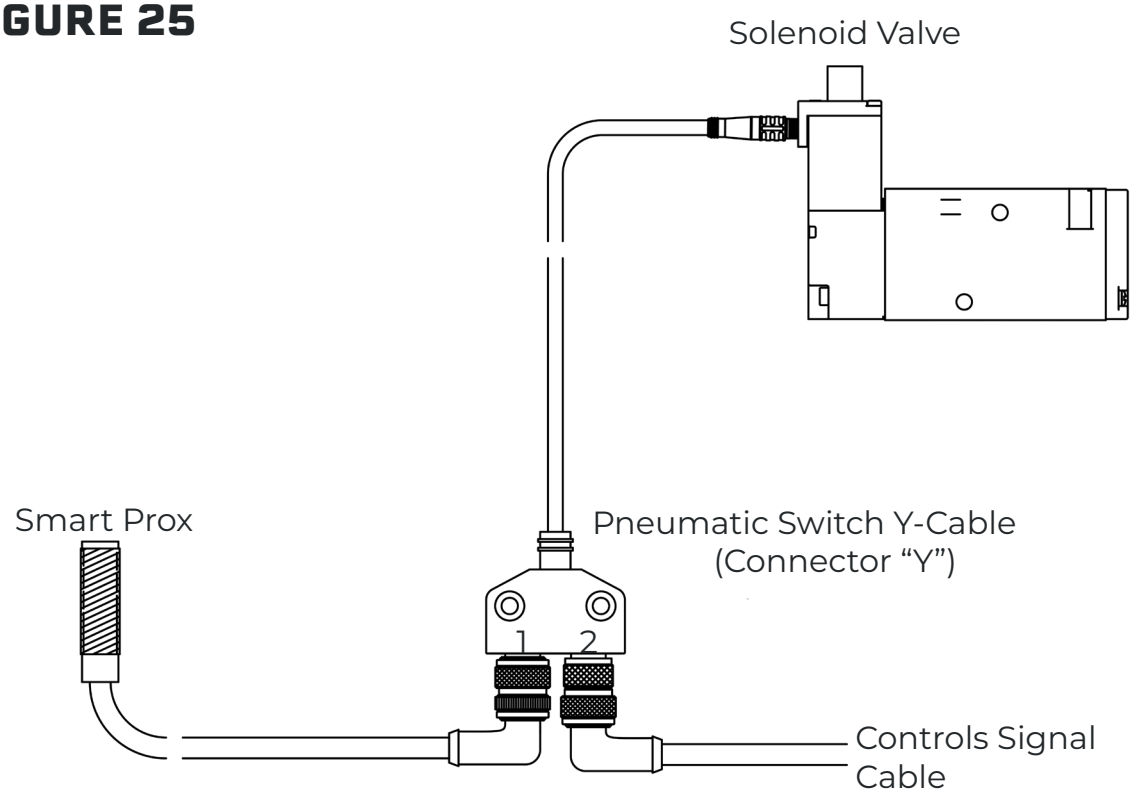
For pneumatic switch sorters, these components are the smart prox and the high-speed solenoid air valve.

PNEUMATIC SWITCH CONTROLS COMPONENTS

SMART PROX

The “smart prox” is a special inductive proximity sensor developed exclusively for Hytrol, that has the “intelligence” needed to control the switch timing built-in. The prox plugs into the Y-cable (Figure 25).

FIGURE 25



PNEUMATIC SWITCH "Y"-CABLE

The Y-cable is used to connect the smart prox, solenoid air valve, and system controls. The male micro cord set from the smart prox connects to terminal #1 of the Y-cable. The pico pigtail on the Y-cable connects to the male plug on the solenoid air valve at the divert switch. The micro cord set with female end plugs to terminal #2 of the Y-cable. The leads from the terminal #2 cord set have the following functions (Figure 25).

- ***PIN #1***—+24VDC power input to the smart prox.
- ***PIN #2***— Proximity output signal (PRX). This lead provides a 24VDC (high) signal each time the smart prox detects a shoe's pin in front of it. This is an optional output to be used at the discretion of the controls provider
- ***PIN #3***—Common voltage lead for the smart prox.
- ***PIN #4***— Divert enable input lead for the smart prox. When a 24VDC (high) signal is given to this lead by system controls, the smart prox waits until it detects another divert shoe then provides a 24VDC output through the Y-cable to the high speed solenoid air valve.

The solenoid air valve then moves the switch to its "divert" position. All shoes traveling through the switch follow the divert track while the enable signal is active (held high).

When the divert signal is removed (taken low), the smart prox waits until it detects another divert shoe, then turns off the output to the solenoid air valve. The switch then returns to its "home" position, sending shoes along its "non-divert" track.

The enable signal (ENA Input) to this lead is the only signal that the system controls must provide in order to control divert switching.

HIGH-SPEED SOLENOID AIR VALVE

The solenoid air valve is used to receive the smart prox output signal and provide air to the proper end of the divert switch cylinder to move and hold the switch in either the "home" or "divert" position. The valve used is specially designed for the high speed operation necessary for proper divert switch timing.

The two solenoid inputs are non-polarized, allowing either lead to be used as input or ground for the valve. The solenoid requires 24VDC, 6W to operate. The solenoid air valve is controlled directly by the smart prox.

Direct control of this valve by the controls package is not required or advised.

AIR PRESSURE SWITCH

The air pressure switch (Figure 6) is used to detect low operating air pressure. Operation of the sorter at air pressures under 50 PSI can cause erratic switching and potential switch damage.

If air pressure falls below this level, the sorter must be shut down until the cause of the pressure drop has been found and remedied. The pressure switch provides a contact-type output which closes at pressures at or above about 48 PSI and opens below that air pressure.

The system controls provider should use this switch to monitor air pressure at the sorter and should shut down the sorter if an open (low) output is detected from the pressure switch.

Refer to the pressure switch manufacturer's installation manual provided with the sorter for wiring instructions.

OTHER CONTROL COMPONENTS SUPPLIED WITH CONVEYOR

VARIABLE FREQUENCY DRIVE CONTROLLER

The variable frequency drive (VFD) is a **required** motor controller for sorter operation with a ramp uptime of 10 seconds:

1. It provides a smooth acceleration of the drive motor, allowing the sorter to slowly "ramp up" to full speed. This protects sorter components from the stress of a full-speed start up.
2. A VFD allows sorter speed to be adjusted to match system speed requirements. It also allows the sorter to operate at a very slow speed during installation "debugging" and when certain mechanical components are checked after servicing.
3. When installed, the sorter can be operated at a slower speed during "off-peak" seasons, reducing energy consumption, noise, and wear.

Refer to the VFD manufacturer's installation manual provided with the sorter for wiring and adjustment instructions.

SAFETY PROXIMITY SWITCHES

There are proximity ("prox") switches mounted at various locations along the "non-divert" path in the sorter to indicate when a divert shoe is out of place, an obstruction has entered the sorter, or when some other event has occurred that could cause damage to the sorter or anger to personnel.

These prox switches are mounted on both pin guide tracks along the top side of the sorter, straight across from one another. The signals are exactly the same as the smart prox in the divert switches.

If either prox switch detects a missing shoe pin or a shoe on the wrong side of the sorter, the system controls must be configured to go to an “emergency stop” condition and shut down the sorter and related equipment.

The shear-off transition roller safety switch is used to detect when the transition roller plate on the discharge end of the sorter has sheared off its mounting plate. This plate is designed to shear off if a stray divert shoe or a foreign object contacts them. The normal output state of the safety proximity switch is “on” (high).

The prox switch can work either with a second of the same switch or the smart prox. Refer to the prox switch manufacturer’s installation manual provided with the sorter for wiring instructions.

CATENARY TAKE-UP PHOTO-EYE

The catenary take-up photo-eye monitors the amount of chain sag occurring in the drive’s catenary area. The photo-eye is a retro-reflective, light-operated type, positioned in the catenary so that if the carrying chains allow the slats to sag below a certain level, the beam of the eye is blocked.

The system controls must be configured to stop the sorter when the photo-eye beam is blocked (photo-eye output is “off” or “low”) and provide an indication to the sorter operator that the chains must be taken up or shortened before operating the sorter further. Catenary eye may momentarily be blocked at start up giving an indication at the HMI to perform maintenance soon. If blocked continuously--don’t run.

Refer to the photo-eye manufacturer’s installation manual provided with the sorter for wiring instructions.

ENCODER

An encoder is included with the sorter to provide a pulse signal to be used for product tracking. The standard encoder provides a square-wave pulse signal of 1 to 64 pulses per revolution of the sorter infeed shaft.

The encoder requires 24VDC power and provides a 24VDC pulse output.

Refer to the encoder manufacturer’s installation manual provided with the sorter for wiring instructions.

CHAIN OILER SOLENOID

The chain oiler is used to provide automatic lubrication of the carrying chains during sorter operation. When the oiler solenoid

valve is energized, oil is gravity fed from the oiler reservoir, through metering valves, to brushes located inside the catenary bed section above the return chains.

The system controls should be configured to activate the chain oiler solenoid for a duration equal to one complete revolution of the carrying chains about every 80 hours of operation, if the chain is excessively wet, oil every 160 hours of operation.

The actual amount of oil applied to the chains is controlled by metering screws. Refer to 3.2 CONVEYOR SET-UP on page 9 for more information.

The chain oiler solenoid requires 24VDC power to operate.

LOST BEARING DETECTION

Two missing bearing detection blocks are used to detect shoes with a missing bearing. A divert shoe without a bearing can cause damage to the sorter. The missing bearing blocks use two proximity switches located around 30 to 35 feet from the discharge end of the sorter on the top side and in each “non-divert” track line to detect the presence of shoe bearings. The missing bearing detector has a normally high (24VDC) signal that will stay active while no missing bearings/pins are detected.

These prox switches work in parallel with each other. One should always be detecting a bearing at the time interval between each shoe based on the sorter’s run speed.

If neither prox switch detects a bearing when there should be one, both signals go low to indicate a missing bearing was detected. Hytrol recommends stopping the sorter if a bearing is missing.

If one prox switch is detecting bearings out of the timing window, this could indicate that one carrying chain has jumped out of time with the other. The sorter will need to be stopped, and the chain set back in time.

The missing bearing prox switches require 24VDC to operate.

CONTROL COMPONENTS NOT SUPPLIED WITH THE CONVEYOR

In addition to control components supplied with the ProSort sorter, there are several components that must be supplied by the system control provider.

Hytrol recommends the following control components be used to protect the sorter from damage due to product jams or other problems:

ADJUSTABLE INSTANTANEOUS MOTOR OVERLOADS

Instantaneous overloads provide protection against sorter “hang-ups” by turning off the drive if a sudden increase in motor current is detected.

By adjusting the overload limit to slightly above the power required to operate the sorter, any extra load on the motor, such as would be caused by a product jam or switch malfunction, would cause the sorter to stop, possibly before significant damage is done to the equipment.

The instantaneous overloads should be installed in the sorter control panel and sized for the proper power requirements.

PHOTO-EYES

Photo-eyes are common components in systems controls. Hytrol recommends that photo-eyes be installed at the following locations to perform listed functions. These are in addition to other photo-eyes needed in the system.

JAM/CONFIRMATION PHOTO-EYE

Photo-eyes mounted on each take-away spur of the sorter, as close to the sorter as possible. See Figure 35 for installation.

These eyes perform two functions:

1. Detect a product jam at the sorter “exit point”. If a package blocks this photo-eye for a longer time than it would take for the package to travel past the photo-eye normally, this indicates the package is jammed. The sorter should be stopped and the jam cleared before restarting the sorter.
2. Divert confirmation. If a divert signal is given to a divert, and no package is detected by the associated jam/confirmation photo-eye, an error has occurred. The sorter should be stopped and the error found and corrected before restarting the sorter.

FULL LINE PHOTO-EYE

Photo-eyes mounted on each divert lane from the sorter, near the infeed end of that lane. These eyes are used to signal the system controls that a particular divert lane is full.

The controls should then send any further packages assigned to that lane to the recirculation line until the full line photo-eye on that lane no longer indicates the full condition.

INDUCTION PHOTO-EYE
A photo-eye mounted at the infeed point of the sorter. This eye is used to perform the following functions:

1. Signal system controls that a particular package has entered the sorter. From this point forward, the package must be tracked using encoder pulses to determine when it reaches the proper divert location.
2. Measure package length so that the system controls may assign the proper number of divert shoes to the package for diverting.
   - Note: Shoes are to be assigned for the entire length of the package plus one extra shoe is to be assigned to the trailing end of the package.
3. Check for proper gap between packages for safe sorting. It is important to check for the proper gap here, even if it has been set prior to this point, to ensure that the packages are truly spaced properly. Attempting to sort packages with too little gap between them can cause jams.
   - Note: The minimum gap necessary for sorting a package is a function of the width of the package. The following chart should be used for checking proper gap.

PROSORT LP18 (SINGLE SIDED)		**PROSORT LP22 (SINGLE SIDED)**	
PACKAGE WIDTH	**MINIMUM GAP**	**PACKAGE WIDTH**	**MINIMUM GAP**
0”<W≤ 15”	10”	0”<W≤ 13"	10”
15”<W≤ 30”	15”	13”<W≤ 26”	16”
30”<W≤ 45"	19"	26”<W≤ 40”	20”
45”<W≤ 54"	22"	40”<W≤ 54”	26”
PROSORT LP18 (DUAL SIDED)		**PROSORT LP22 (DUAL SIDED)**	
PACKAGE WIDTH	**MINIMUM GAP**	**PACKAGE WIDTH**	**MINIMUM GAP**
0”<W≤ 15”	16”	0”<W≤ 13"	16”
15”<W≤ 30”	22”	13”<W≤ 26”	22”
30”<W≤ 45"	26”	26”<W≤ 40”	26”
45”<W≤ 54"	28"	40”<W≤ 54”	32”
W = Package Width			

MISSING SHOE-TOP PHOTO-EYE
Laser photo-eye mounted on the discharge end of the drive assembly, used to detect if shoe tops have broken off (Figure 28).

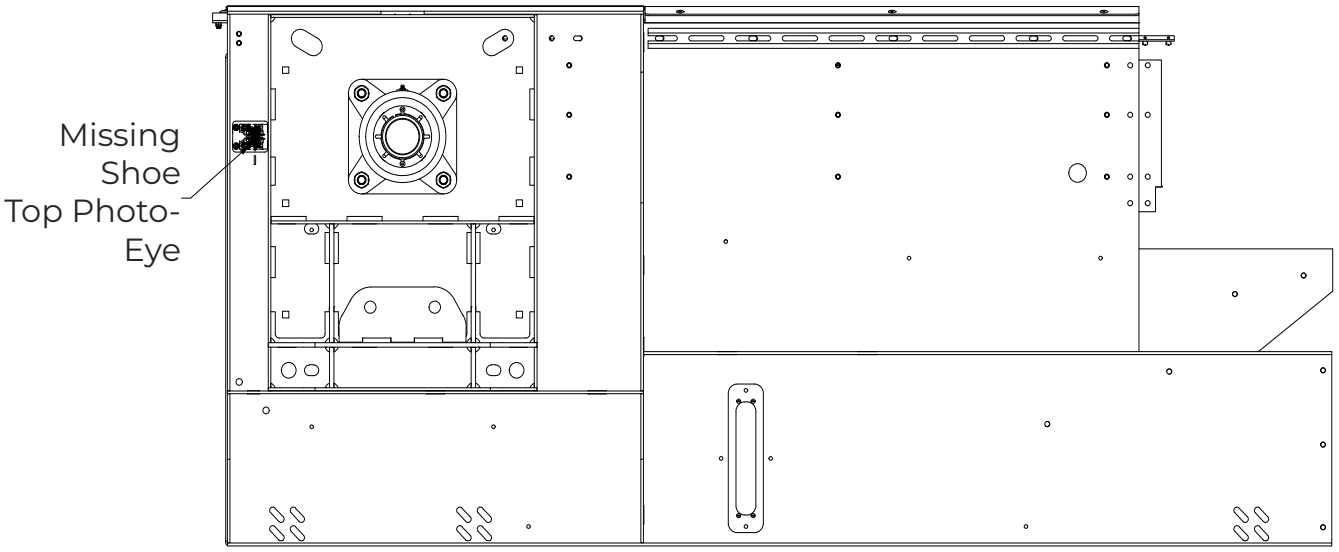
The sorter can usually function properly with a missing shoe top. A stop is recommended if multiple shoe tops are missing in a row to ensure proper diverting.

If there are not a significant number of shoe tops broken off, sorter maintenance can wait until the sorter is shut down to replace the missing shoe tops.

Hytrol recommends displaying a warning if a missing shoe top is detected.

If a missing shoe top is detected and the sorter continues running for 8-12 hours, the sorter should be stopped and maintenance staff should replace the missing shoe tops. If desired, an error reset can be included to allow the sorter to be restarted prior to replacing shoe tops (and delay stopping for another 8 hours).

FIGURE 26



LIGHT CURTAIN (For dual sided sorter shoe return confirmation) On dual sided sorters only, a light curtain photo-eye is included for the induction belt, along with two prox switches on the bottom of the tail assembly.

These components work together to help controls verify that returning shoes are located on the side necessary to divert a package to the correct side of the sorter.

The light curtain photo-eye helps compare the package position to the shoe side detected by prox switches on the bottom of the tail assembly.

The light curtain set-up is necessary to prevent shoe tops from breaking off excessively, or crashing the sorter in some cases.

If a shoe is located on the wrong side of the sorter, it can get pinched by the product as the product is pushed into the mis-located shoe.

In this event, the shoe top will normally break off and require replacement of the breakaway shear pin. To avoid this, it is recommended to verify shoe locations using the light curtain and return verification prox switches prior to diverting a package.

SOME CONTROL DO'S AND DONT'S

The following are recommendations to assist in design and installation of system controls that are interfacing with ProSort sorters.

- DO NOT: Place 24VDC control wires in the same wireway with AC power wires, especially if the AC power exceeds 240 volts. "Noise" produced in the control wires by the power wires may produce undesirable effects.
- DO NOT: Use optional "standard prox output" of the smart prox as a substitute for an encoder. The five-inch spacing between divert shoes does not provide enough tracking resolution to accurately sort packages.
- DO NOT: Use manual override operator of the solenoid air valve to operate a divert switch while the sorter is running. doing so bypasses the switch timing controls and may cause switch damage or a sorter crash.
- DO: treat tripping of any safety switch, motor overload, or low air pressure signal as an emergency stop.

Inspect the safety switch and other parts of the sorter to be sure everything is in good working order before starting or restarting the sorter.

5.3 PNEUMATIC DIVERT SWITCH CHECKLIST

After all ProSort sections are installed and aligned, each divert switch should be checked for proper operations as follows:

1. Before air pressure is supplied to the divert switch solenoid airvalve, manually pivot the switch back and forth between the non-divert and divert positions while checking for a free and smooth pivoting movement. Determine and fix the cause of any switch binding. For proper switch alignment, see Figures 27 and 29.
    - If switch adjustment is necessary, loosen the jam nut on the cylinder rod. Screw cylinder rod into or out of rod end to adjust the switch then tighten jam nut.
2. Turn air pressure on and verify each divert switch is in, or moves to, the home (non-divert) position (Figure 27).
3. Check to ensure that the smart prox is set properly.

The face of the prox switch should be set slightly out of the shoe pin guide path in the switch guide (Figure 28).

5.4 PNEUMATIC DIVERT SWITCH REPLACEMENT

The ProSort is designed for easy removal of divert switch assemblies for maintenance or replacement. Use the following steps to replace a switch assembly.

SIDE REMOVAL

1. Remove the switch cover located on the side of the sorter.
2. Unplug the elbow from the fitting on the solenoid air valve by pushing in the orange flange of the fitting and then pulling on the air line.
3. Disconnect the controls signal cable from Y-cable connector (Figure 25).
4. By reaching through the uncovered hole in the side channel, remove the two bolts at the back side of the switch mounting channel (Figure 30).
5. Push the switch towards the center of the sorter, until the switch mounting plate slides out of the switch mounting guide block.
6. Pivot the switch so that the switch mounting plate can slide under the switch mounting guide block.
7. Remove the switch assembly through the opening in the sorter channel.
8. Check the new switch assembly according to section 5.3 Pneumatic Divert Switch Checklist on page 30.
9. For easier installation, push shoes in switch area towards center of sorter.
10. Install the new divert switch assembly by reversing the removal procedure.

TOP REMOVAL

1. Remove the chain cover and slat/shoe assemblies in the switch area.
2. By reaching through the access holes in the switch mounting channel, remove two bolts at the back side of the switch mounting channel (Figure 29).
3. Push the switch towards the center of the sorter, until the switch mounting plate slides out of the switch mounting guide block.
4. Unplug the elbow from the fitting on the solenoid air valve by pushing in the orange flange of the fitting and then pulling on the air line.
5. Disconnect the prox switch cord set from Y-cable connector (Figure 25).
6. Remove the switch assembly through the top of the sorter.

7. Check the new switch assembly according to section 5.3 PNEUMATIC DIVERT SWITCH CHECKLIST on page 30.
8. Install the new divert switch assembly by reversing the removal procedure.

FIGURE 27

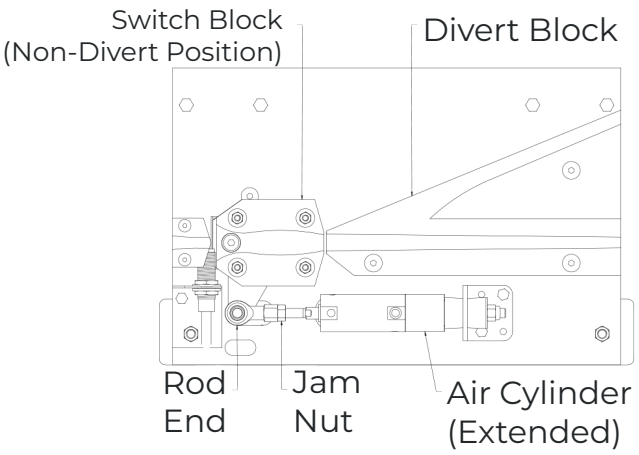


FIGURE 28

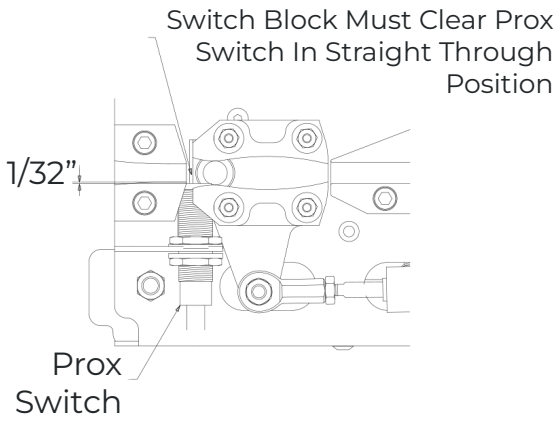


FIGURE 29

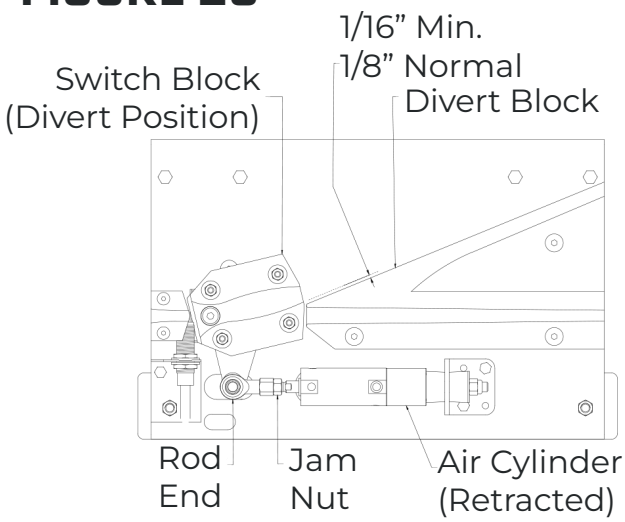
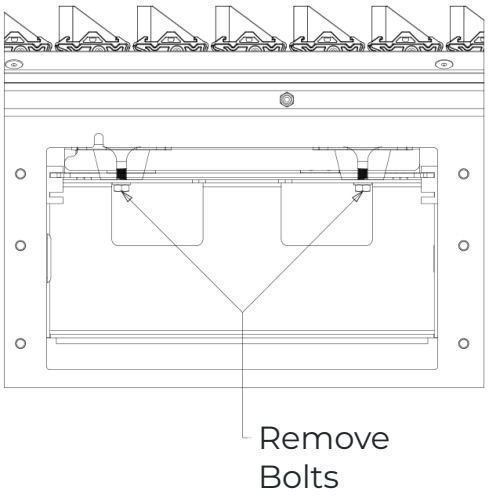


FIGURE 30



5.5 CARRYING CHAIN INSTALLATION

The carrying chains are shipped on marked spools, cut to proper length for each ProSort conveyor. Installation steps are as follow:

1. If motor is connected, disconnect electrical power to drive motor to prevent accidental start-up.
2. Check alignment of chain guides by using two short pieces of chain with slat/shoe assemblies and bearings assembled to pins. This chain/slat/shoe assembly should slide freely through chain guides in direction of travel for entire length of conveyor.
3. Install carrying chains to both sides of conveyor with pins pointed inward. Make sure the pins of each chain are directly opposite each other. While installing chains, it will be helpful to install one slat/shoe assembly every four feet to hold chain in guides.
4. Fasten ends of both chains with connector links shown in Figure 31.
    - Use provided grease packets to fill each cylinder of master link before setting link plate.
5. Install slat/shoe assemblies onto the extended chain pins on one side of conveyor, keeping the beveled face of the shoe toward the discharge end and the side with the rubber insert toward the spur side of conveyor (Figure 32).
    - Lift opposite chain out of chain guide (so chains may be spread apart) and insert extended chain pins into opposite end of slat/shoe assemblies.
6. After all slat/shoe assemblies are installed, check for proper slack in catenary area of drive (Figure 33). Be sure drive and tail shafts are square.
7. If needed, add or remove chain/slats/shoes in five inch increments.
8. Use jog function while sorter is in maintenance mode to move entire carrying chain assembly through the conveyor to check if it operates freely and if anything has been dropped into the conveyor during installation. Inspect divert shoes to make sure they have all been installed on the correct centers. If chains are shortened, it must be in increments of five inches.
9. If motor is installed, reconnect electrical power to drive motor.

FIGURE 31

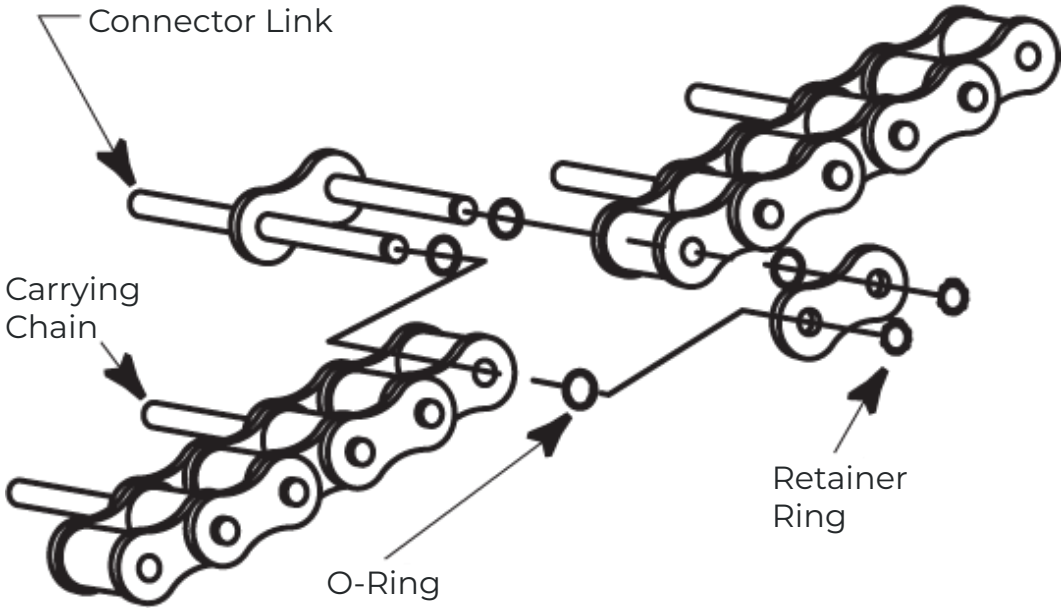
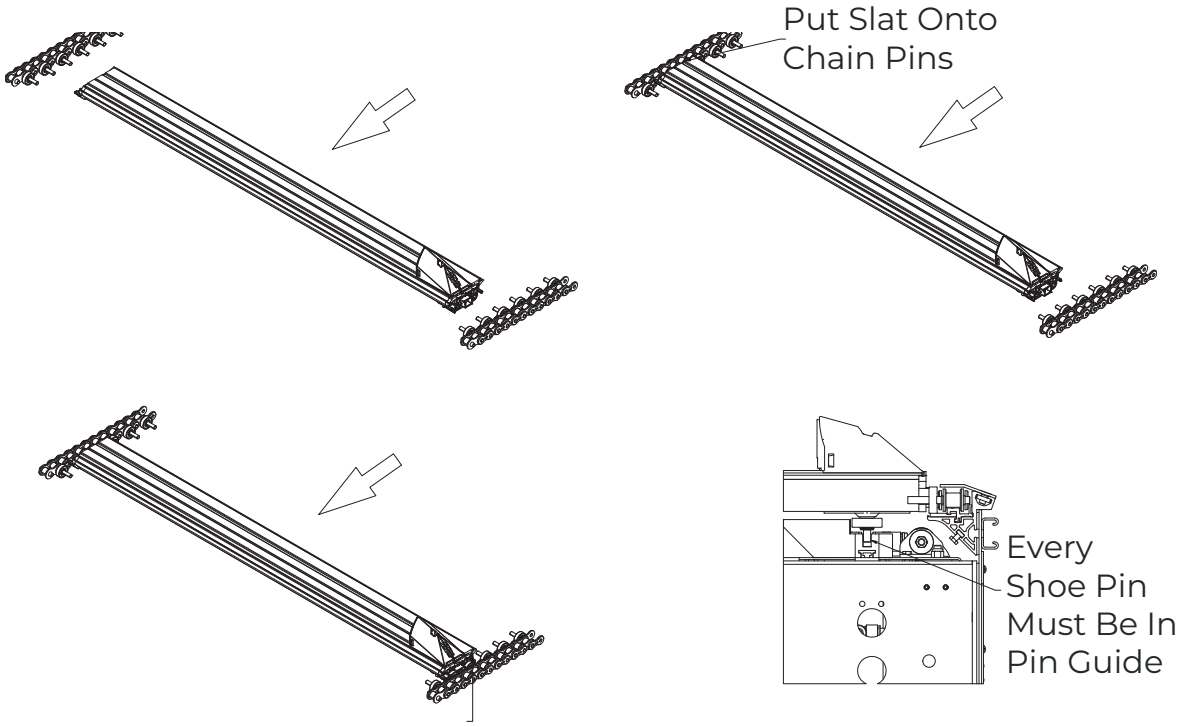


FIGURE 32



Insert Pins On Second Chain Into Slat Bushing.

Ensure Slat Length Runs Perpendicular To Flow Direction.

FIGURE 33

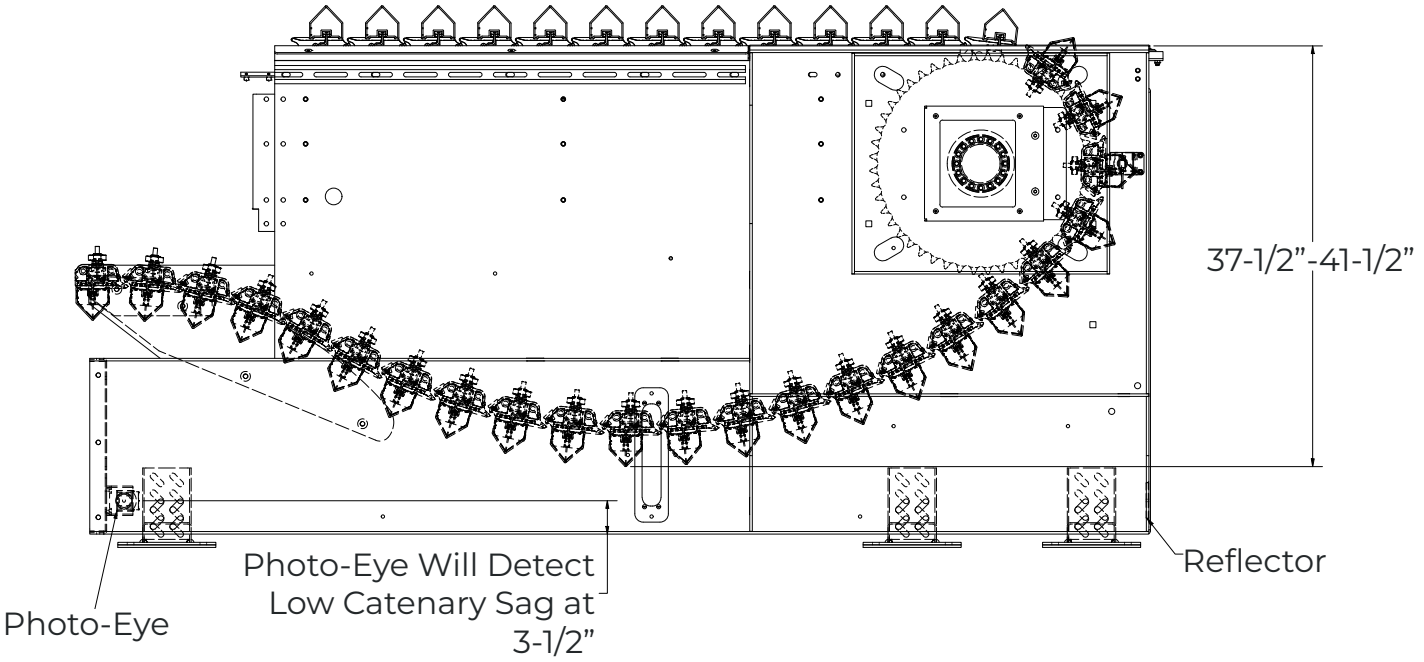
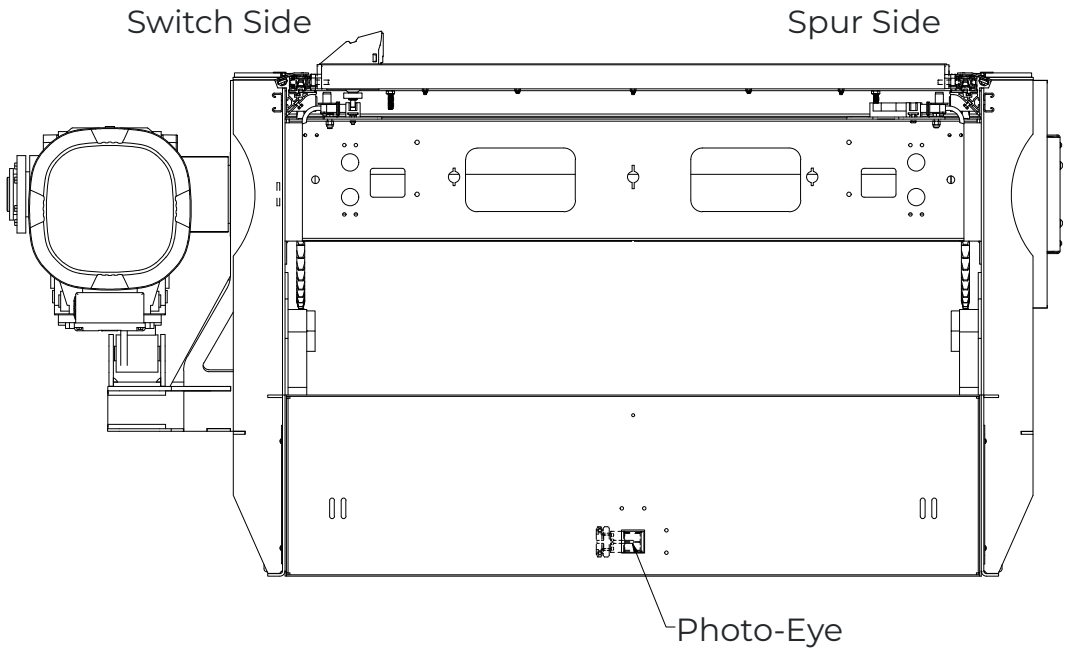


FIGURE 34



5.6 TORQLOC DRIVE GEARMOTOR INSTALLATION

1. Clean the drive shaft and reducer shaft opening with a solvent.
2. Inspect drive shaft for burrs and clean burrs if needed.
3. Insert clamping ring and conical bronze bushing onto drive shaft.
4. Apply anti-seize compound to conical steel bushing.
5. Insert reducer onto shaft.
6. Hand tighten torque arm hardware to drive assembly and gearmotor.
7. Slide conical steel bushing and clamping ring outward, into reducer box.
8. Tighten bolt on clamping ring to 19 ft*lb (25 N*m).
9. Loosen bolts on shrink disk, then press onto shaft on outside of reducer.
10. Push the conical steel counter-bushing into the shrink disk.
11. Hit the conical steel counter-bushing with a rubber mallet until fully seated.
12. Hand tighten bolts on shrink disk.
13. Working in a clockwise bolt pattern, turn shrink disk bolts evenly 60 degrees at a time (1 hex face on bolt) until tightened to 22 ft*lb (30 N*m).
14. Tighten torque-arm mounting bolts.
15. Attach shaft covers.

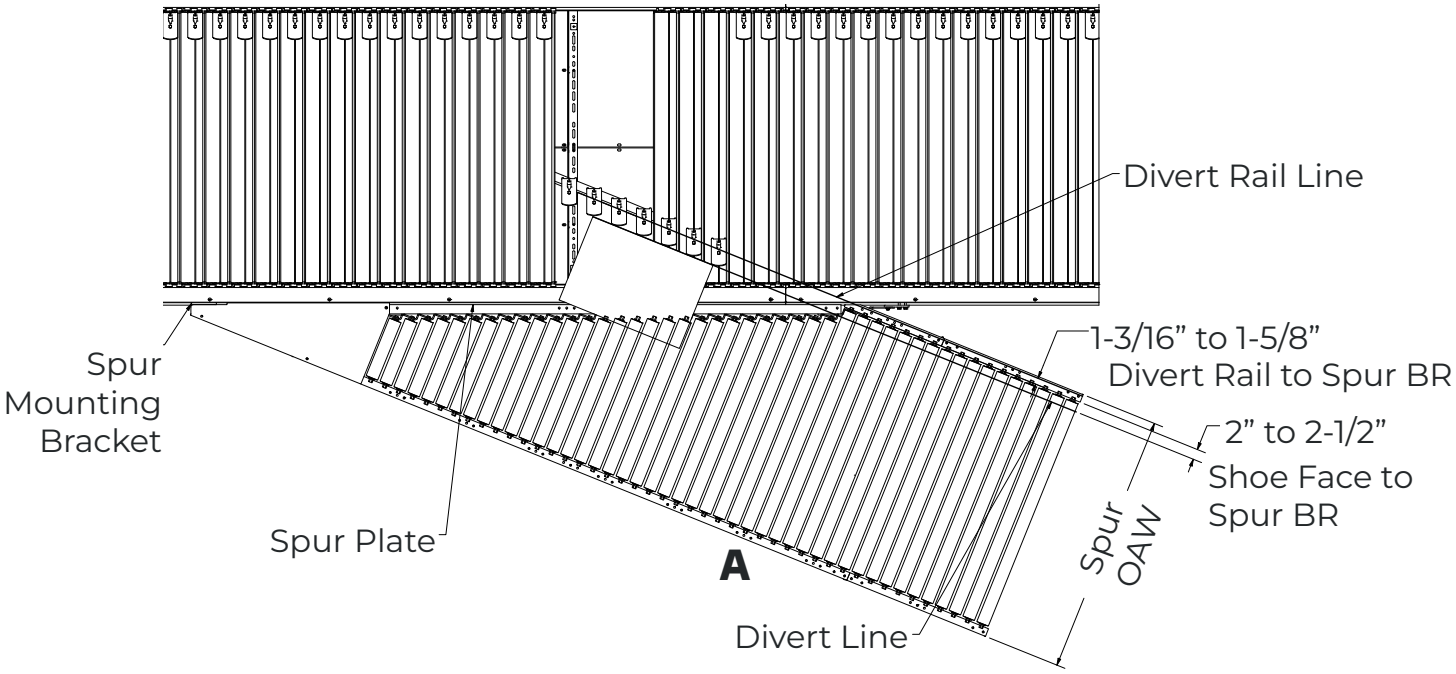
5.7 LOCATING THE SPURS

The take-away spurs must be mounted properly on the divert sections of the ProSort to ensure proper diverting of product.

The following installation guidelines apply to both powered and gravity spurs:

1. Attach spurs to the sorter by bolting the spur attachment bracket to the spur mounting nuts in the unistrut channel located on the sorter side channel as seen in Figure 35. Support the spurs as required. Hand tighten bolts only at this time.
2. Manually place three or more shoes along the divert angle. Place a straight-edge against the shoes to determine the location of the “divert line”. Verify that the distance between the “divert line” and the “BR” of the spur is between 2 inches and 2-1/2 inches (Figure 35).
3. Use the jackbolt assembly to position spurs vertically so that spur rollers/ skatewheels transition smoothly from the bottom of the chain covers (Figure 36). Tighten mounting bolts.

FIGURE 35



DETAIL A: DIVERT CONFIRMATION PHOTO–EYE LOCATION

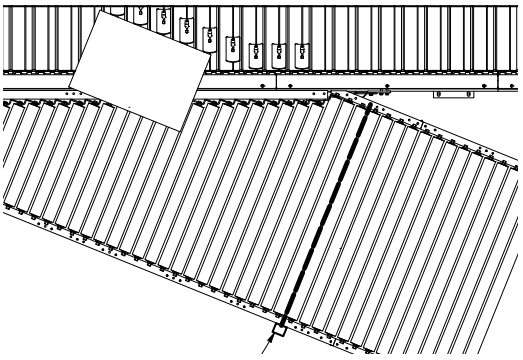
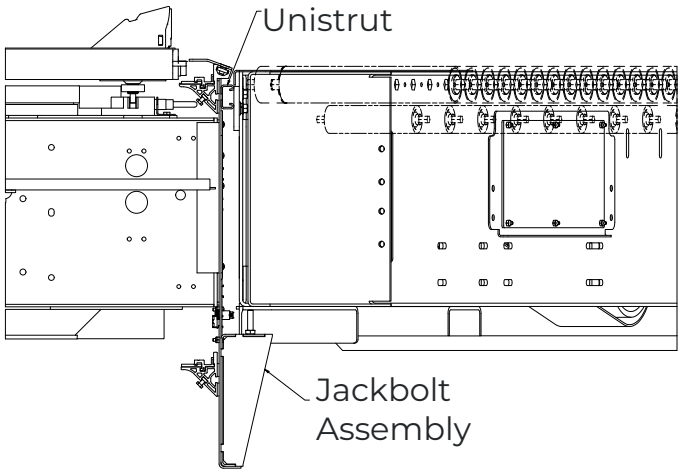


FIGURE 36



5.8 SHOE TOP REPLACEMENT

1. Use a small flat head screwdriver to pop out any remaining shear pin pieces remaining inside the shoe base.
   - This can be accomplished by holding the screwdriver flat head parallel to the slat length, positioning it through the opening on the shoe base and giving it a quick push.
2. Slide new shoe top in place, making sure it is facing correctly for the flow direction of the sorter.
3. Align the shoe top hole with the hole in the shoe base.
4. Place a new shear pin in the shoe top.
5. Use the same flathead screwdriver to pop the shear pin in.
   - This can be accomplished by holding the screwdriver perpendicular to the slat, aligning it to the shear pin center and giving it a quick push.

5.9 INSTALL GUARD RAILS AT DIVERT LOCATIONS

If guard rails are to be installed on the spurs and/or the spur side of the sorter, care should be taken to ensure that the guard rails do not interfere in any way with the boxes being diverted. Particularly, guards should not be installed in a way that produces a sharp edge or point in the divert area.

5.10 DIVERT RAIL ALIGNMENT

If divert rails are not aligned properly, they can cause excess noise and increased wear. If the misalignment is severe enough, it can also cause immediate damage.

To align rails properly for quiet operation, use the included alignment block tool to position rails with an effective “waterfall” to help the shoe bearings transition between components better.

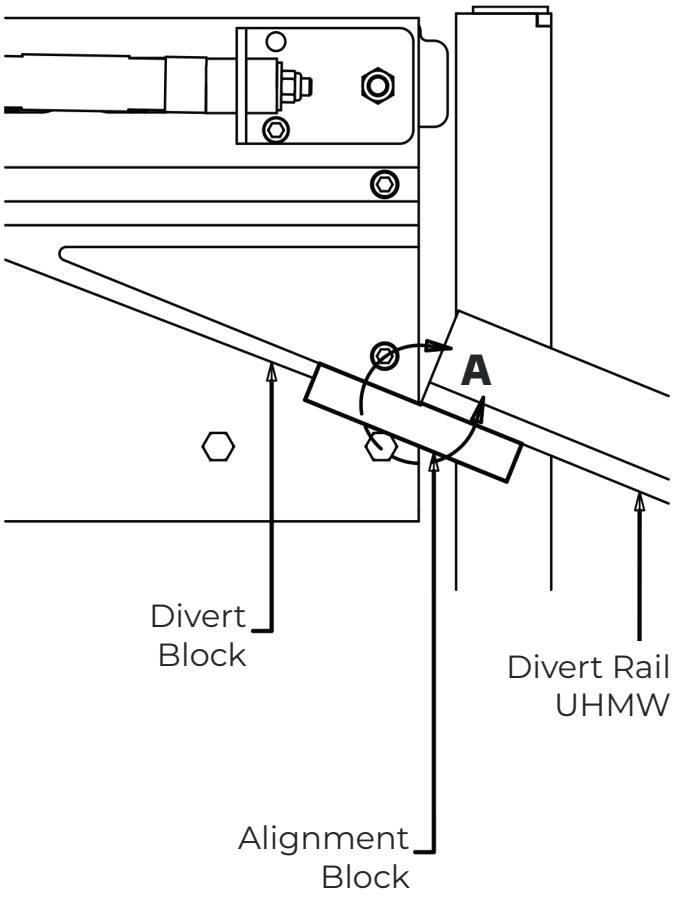
The alignment block tool should be used such that the “upstream” component being in the notched part of the block (Figures 37, 38, and 39).

Divert Switch Alignment Figure 37

Center Switch Alignment Figure 38

Y-Block Alignment Figure 39

FIGURE 37



DETAIL A: FLOW DETAIL

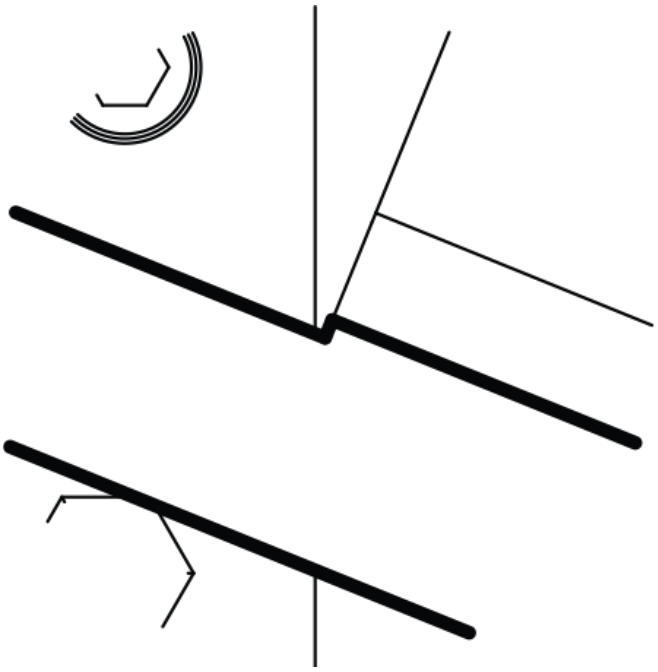


FIGURE 38

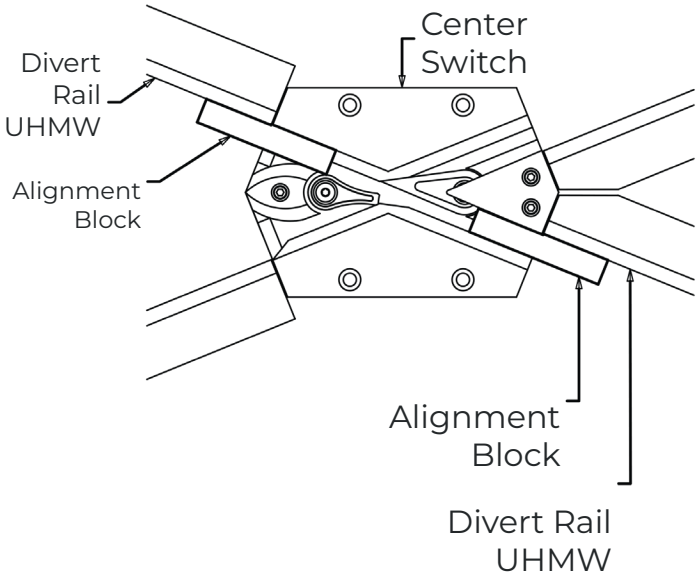
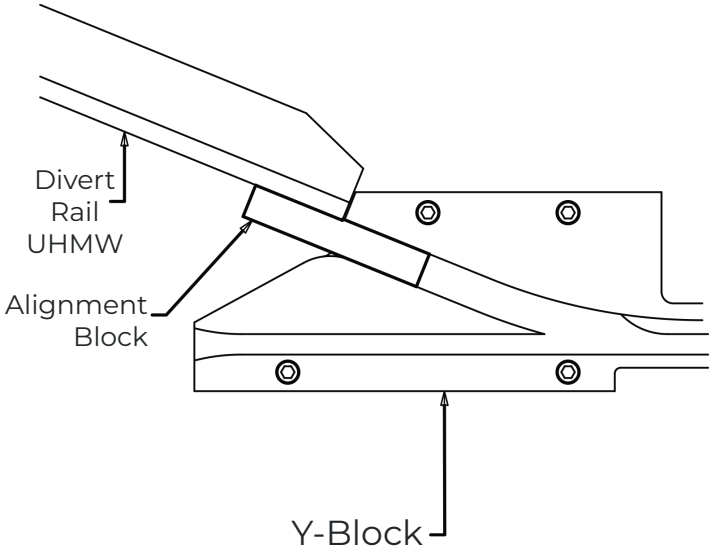
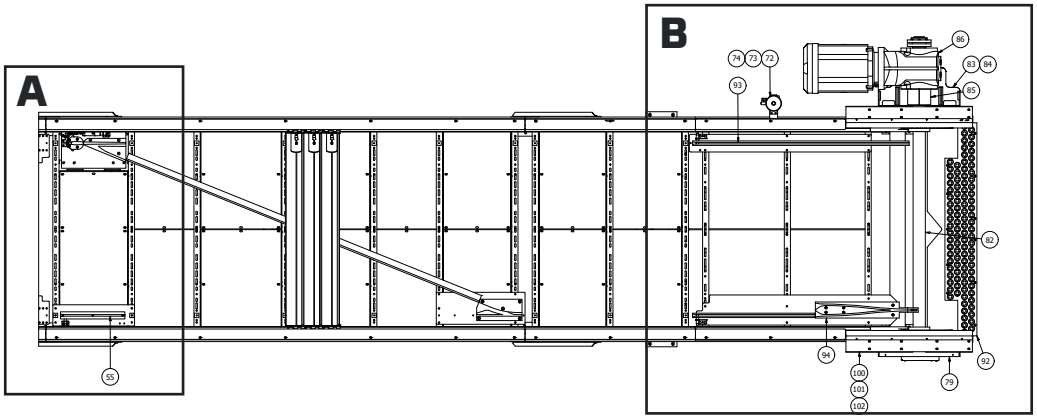


FIGURE 39

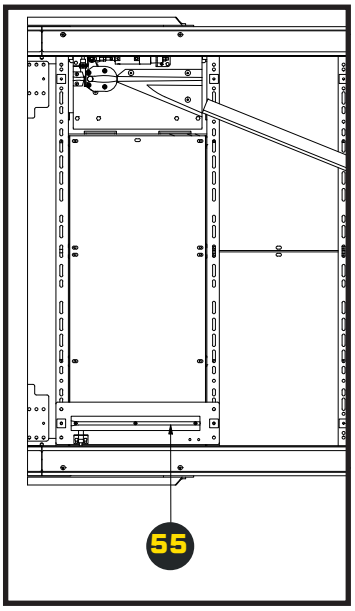


6 PARTS DRAWINGS

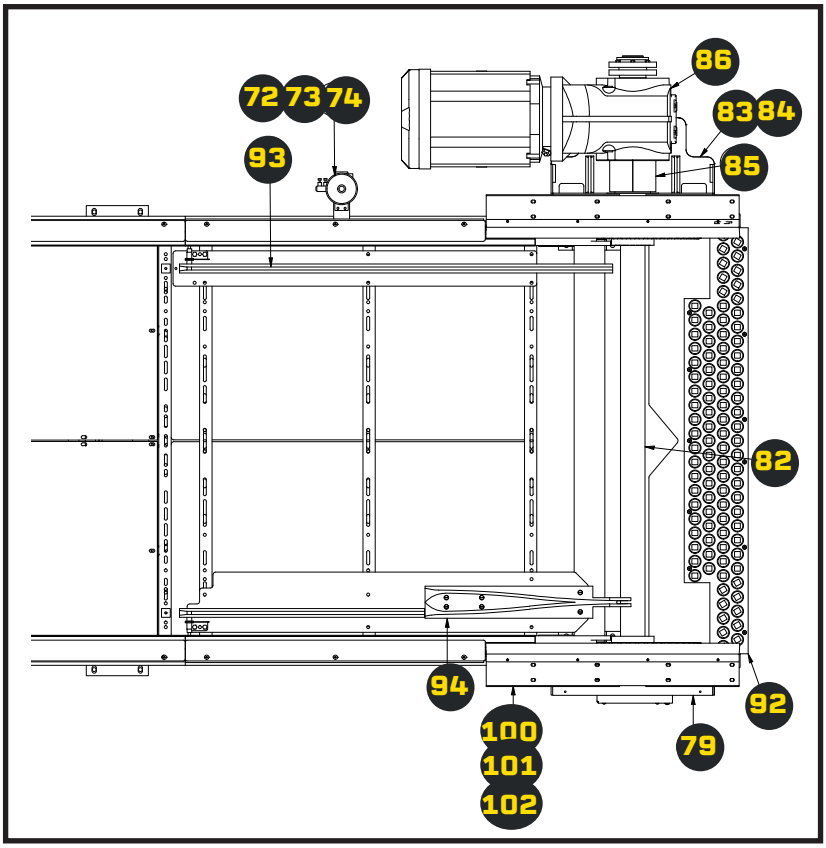
6.1 PROSORT LP18/22 SINGLE SIDED ASSEMBLY – TOP VIEW (CATENARY AND DRIVE SECTIONS)



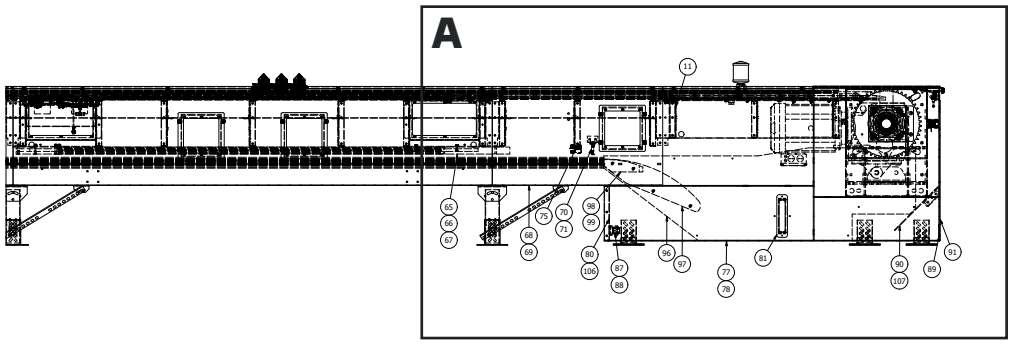
DETAIL A



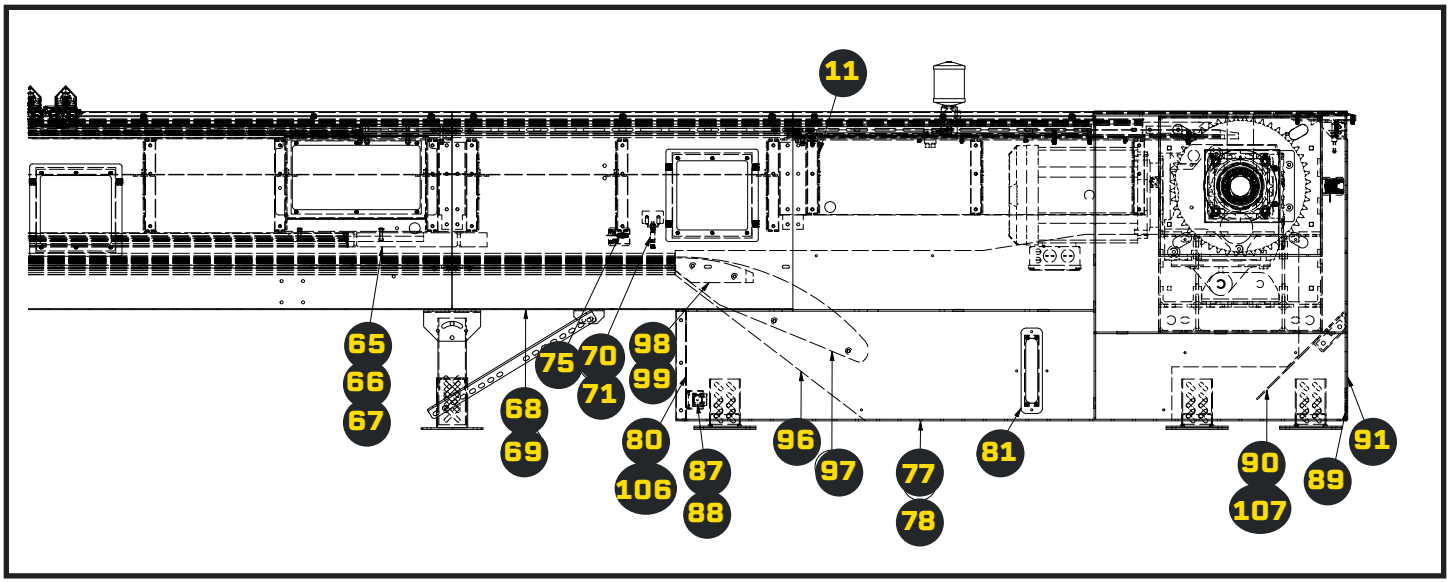
DETAIL B



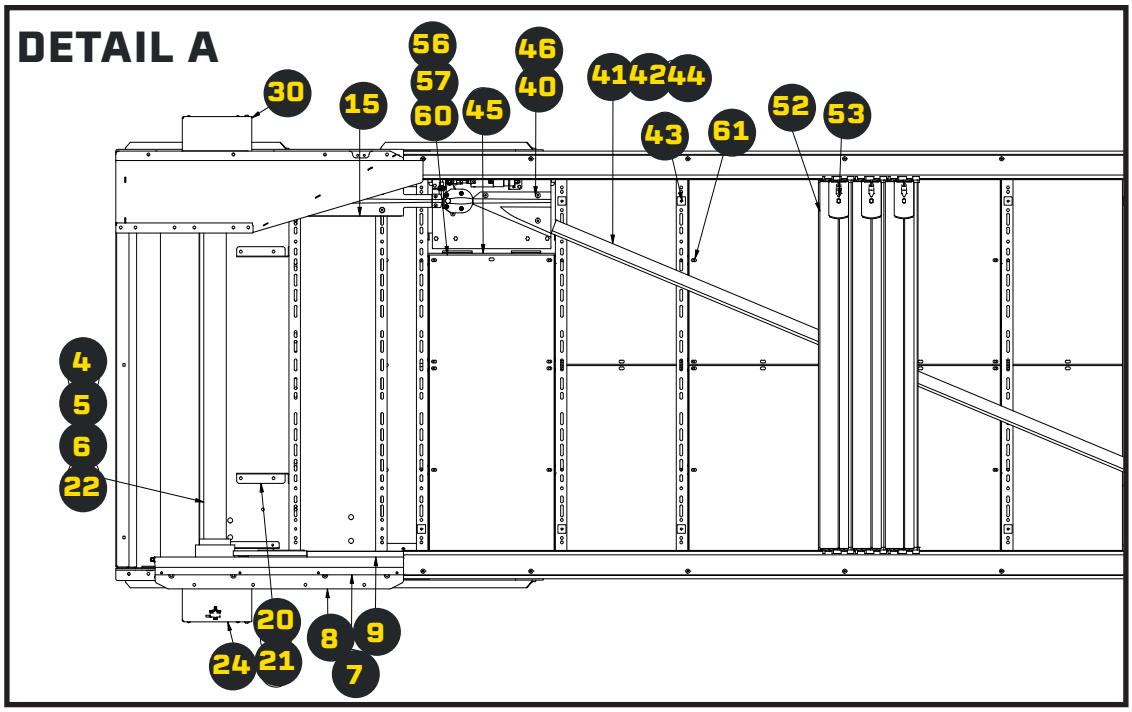
6.2 PROSORT LP18/22 SINGLE SIDED ASSEMBLY – SIDE VIEW (CATENARY AND DRIVE SECTIONS)

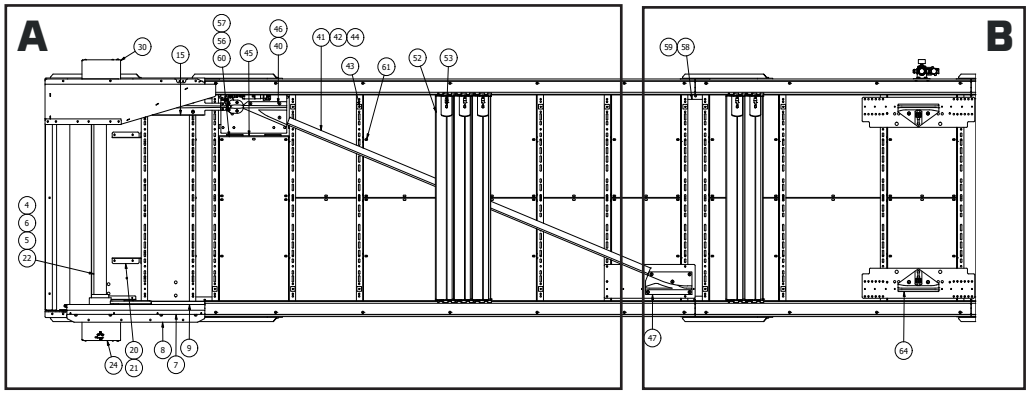


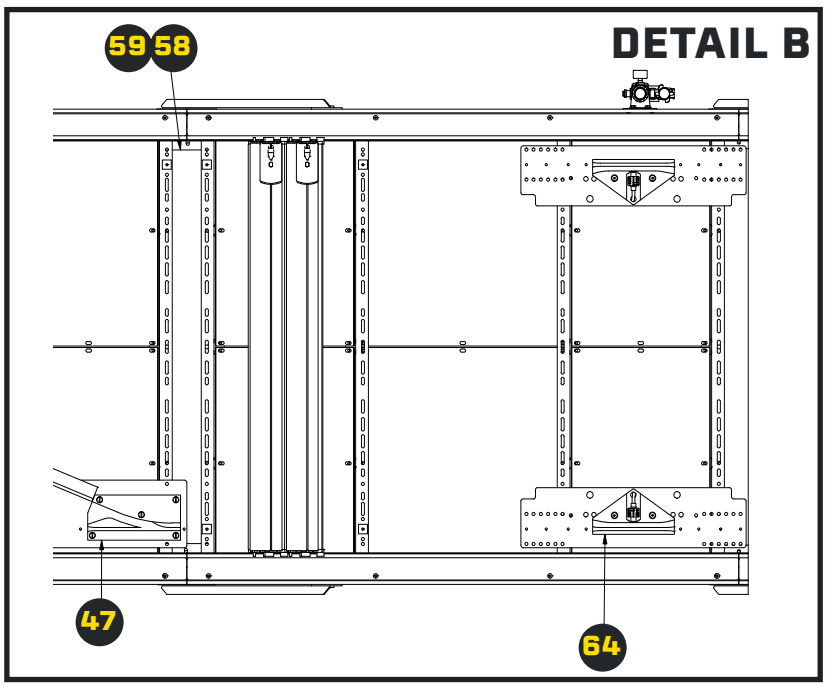
DETAIL A



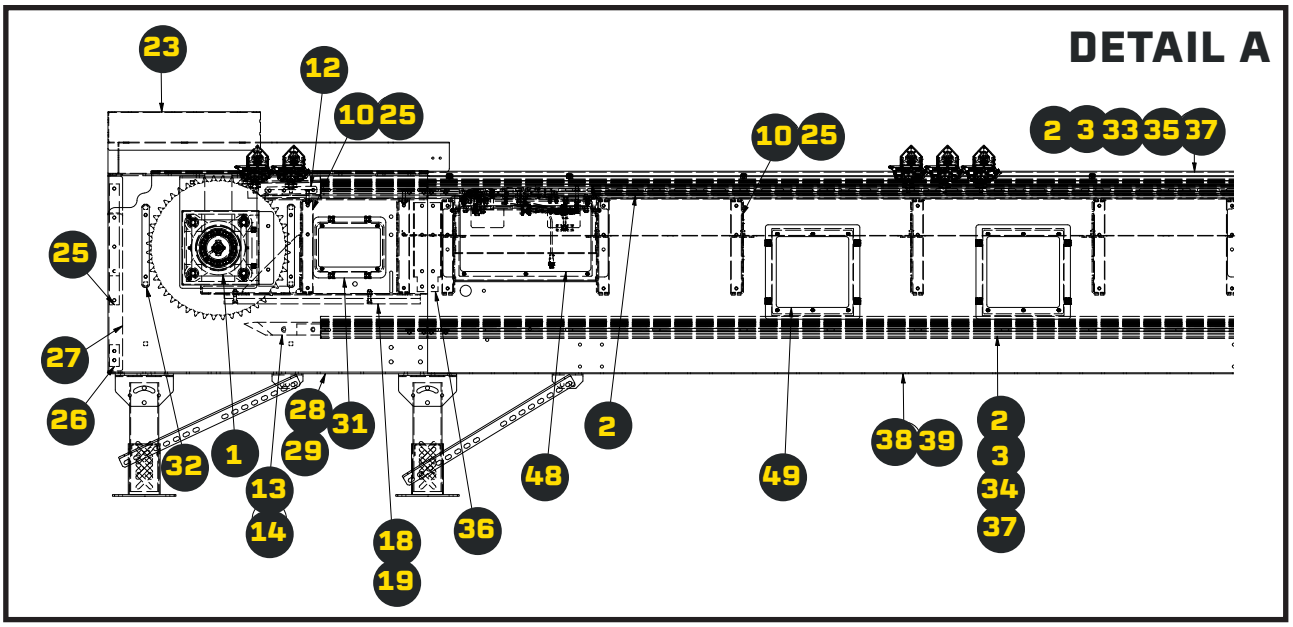
6.3 PROSORT LP18/22 SINGLE SIDED ASSEMBLY – TOP VIEW (TAIL, DIVERT, AND INTERMEDIATE SECTIONS)

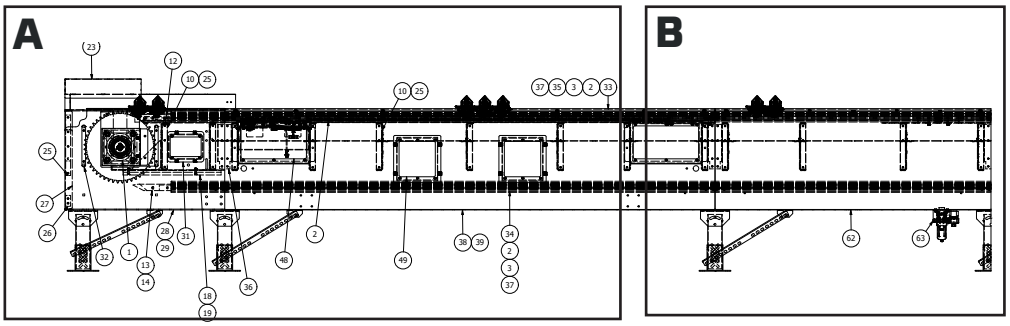




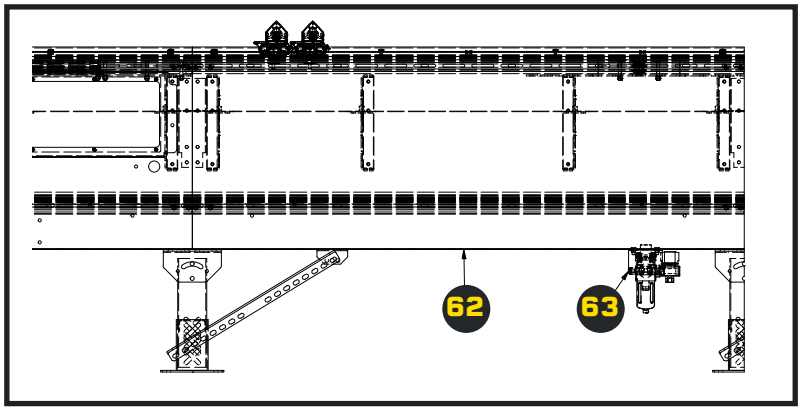


6.4 PROSORT LP18/22 SINGLE SIDED ASSEMBLY – SIDE VIEW (TAIL, DIVERT, AND INTERMEDIATE SECTIONS)





DETAIL B



6.5 PROSORT LP18/22 SINGLE SIDED ASSEMBLY PARTS LIST

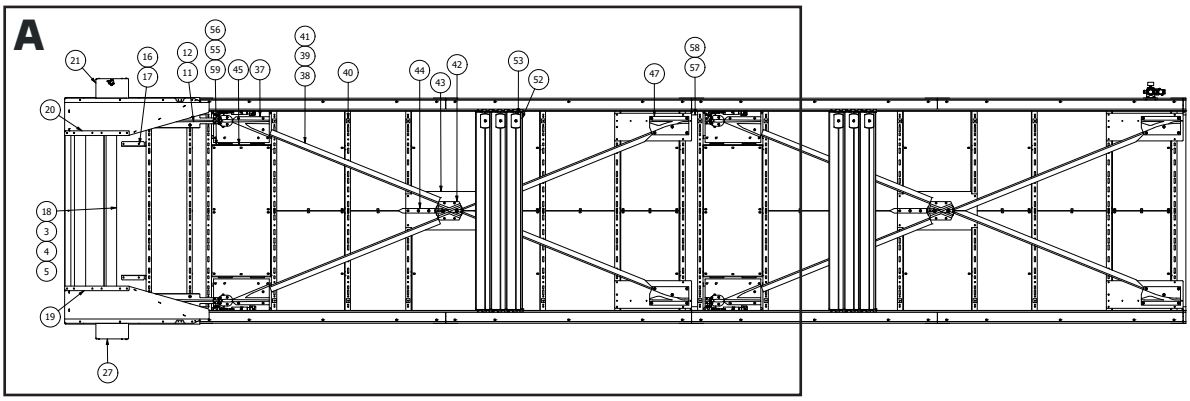
REF #	DESCRIPTION
1	BEARING - CAST IRON, 4-BOLT, 3-7/16"B
2	BEARING PROFILE - NOVITANE
3	CHAIN GUIDE WEARSTRIP - UHMW
4	COLLAR
5	SPROCKET IDLER ASSEMBLY
6	SPROCKET - 100B48H
7	BRUSH HOLDER - 38", TAIL, ALUMINUM
8	BRUSH MOUNTING BAR - 38", TAIL
9	BELT BRUSH - 38"
10	BED SPACER WELD - DIVERT
11	BED SPACER WELD - DRIVE
12	REINFORCING STRAP - SUPPORT BLOCK, 1" X 7"
13	CHAIN GUIDE SUPPORT BLOCK - RIGHT HAND
14	CHAIN GUIDE SUPPORT BLOCK - LEFT HAND
15	PIN GUIDE BLOCK - SYM, SGL SIDE
16	TAIL BLOCK MOUNTING PLATE - SGL SIDED
17	CHAIN GUIDE SUPPORT BLOCK
18	PIN GATHERING BLOCK - TAIL
19	PIN GATHERING BLOCK PLATE - TAIL
20	UNDERSIDE COVER - TAIL
21	UNDERSIDE COVER SUPPORT BRACKET - TAIL
22	TAIL SHAFT
23	TAIL SHOE COVER WELD
24	TAIL BEARING GUARD ASSEMBLY - ENCODER SIDE
25	VIB PAD - 1-3/8" X 12-5/8"
26	VIB PAD - 1-3/8" X 3"
27	TAIL BED SPACER CHANNEL
28	3'8" TAIL CHANNEL - SHOE SIDE
29	3'8" TAIL CHANNEL - NON-SHOE SIDE
30	BEARING GUARD ASSEMBLY - NON-ENCODER SIDE
31	COVER PLATE ASSEMBLY - LEXAN, TAIL
32	HOLE COVER PLATE - TAIL
33	TOP CHAIN GUIDE ASSEMBLY
34	BOTTOM CHAIN GUIDE ASSEMBLY
35	METAL CHAIN COVER
36	SPLICE CHANNEL
37	EXTRUSION ALIGNMENT BAR ASSEMBLY
38	DIVERT SIDE CHANNEL - LEFT HAND
39	DIVERT SIDE CHANNEL - RIGHT HAND
40	SWITCH ASSEMBLY
41	ALUMINUM DIVERT RAIL
42	UHMW C-CHANNEL
43	PIN GUIDE SPACER
44	SLOTTED TRACK SPACER
45	SWITCH MOUNTING CHANNEL WELD
46	SWITCH MOUNTING GUIDE BLOCK
47	DIVERT Y-BLOCK ASSEMBLY
48	COVER PLATE ASSEMBLY - LEXAN, SWITCH
49	COVER PLATE ASSEMBLY - LEXAN, DIVERT
50	PIN GUIDE
51	SPUR MOUNTING CHANNEL
52	SLAT ASSEMBLY (INCLUDES SHOE ASSEMBLY)
53	SHOE ASSEMBLY
54	CHAIN ASSEMBLY
55	PIN CONFIRMATION ASSEMBLY
56	MID PAN MOUNTING PLATE
57	MID PAN CENTER MOUNTING PLATE
58	MID PAN - BED JOINT
59	MID PAN SPLICE CHANNEL COVER
60	MID PAN - SWITCH

[CONTINUED ON NEXT PAGE]

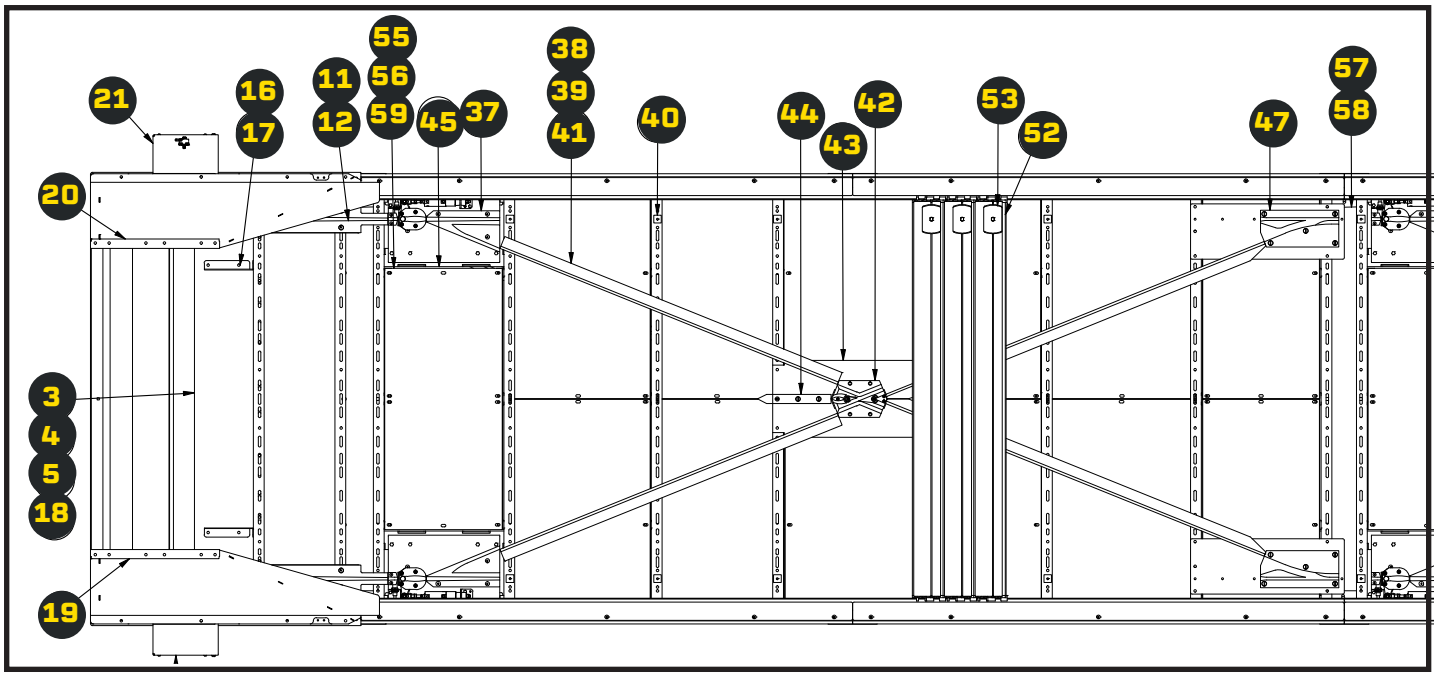
6.5 PROSORT LP18/22 SINGLE SIDED ASSEMBLY PARTS LIST CONT'D

61	MID PAN - INTERMEDIATE
62	INTERMEDIATE SIDE CHANNEL
63	FILTER REGULATOR KIT
64	MISSING BEARING ASSEMBLY
65	RETURN SWEEP BLOCK
66	SWEEP BLOCK MOUNTING PLATE
67	PIN GATHERING ASSEMBLY - RETURN
68	CATENARY SIDE CHANNEL - RIGHT HAND
69	CATENARY SIDE CHANNEL - LEFT HAND
70	OILER BRUSH MOUNTING BRACKET
71	SHANK BRUSH FOR CHAIN LUBRICATOR
72	SORTER LUBRICATOR WITH M12 CONNECTION
73	OILER MOUNTING BRACKET
74	OILER SHORT MOUNTING BRACKET
75	PHOTO EYE - LASER RETRO-REFLECTIVE,LONG RANGE
76	REFLECTOR MOUNTING BRACKET
77	7'10.5"LONG DRIVE SIDE CHANNEL WELD - RIGHT HAND
78	7'10.5"LONG DRIVE SIDE CHANNEL WELD - LEFT HAND
79	SHAFT SUPPORT WELD - 23"LONG
80	DRIVE INFEED END COVER
81	CATENARY WINDOW GUARD
82	DRIVE SHAFT
83	TORQUE ARM WELD
84	TORQUE ARM SUB WELD
85	SHAFT COVER HALF WELD
86	GEARMOTOR
87	PHOTO EYE - RETRO-REFLECTIVE, 10-40 VDC
88	PHOTO EYE MOUNTING BRACKET - BALL SWIVEL
89	REFLECTOR - 3.30"
90	DRIVE TRASH SLIDE WELD
91	DRIVE END PLATE
92	TRANSITION ROLLER ASSEMBLY
93	END PROX ASSEMBLY - NON-DIVERT SIDE, DRIVE
94	END PROX ASSEMBLY - DIVERT SIDE, DRIVE
95	INTERNAL CATCH PLATE - DRIVE
96	CATENARY TAKE-UP WEARSTRIP - 87-7/8"LONG
97	CATENARY BLOCK
98	CATENARY BEARING TRANSITION BLOCK - RIGHT HAND
99	CATENARY BEARING TRANSITION BLOCK - LEFT HAND
100	TOP STIFFENER PLATE - 35-5/8"LONG
101	BRUSH HOLDER - 35-5/8"LONG, DRIVE
102	BELT BRUSH - 35-5/8"
103	REINFORCING STRAP - SUPPORT BLOCK, 1" X 5"
104	CHAIN GUIDE SUPPORT BLOCK - RIGHT HAND, DRIVE
105	CHAIN GUIDE SUPPORT BLOCK - LEFT HAND, DRIVE
106	VIB PAD - 1-3/8" X 15-11/16"
107	VIB PAD - 1-3/8" X 4-3/4"

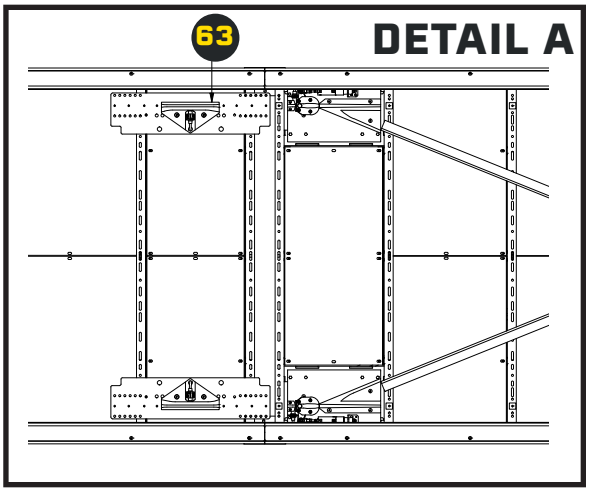
6.6 PROSORT LP18/22 DUAL SIDED ASSEMBLY – TOP VIEW (TAIL AND DIVERT SECTIONS)

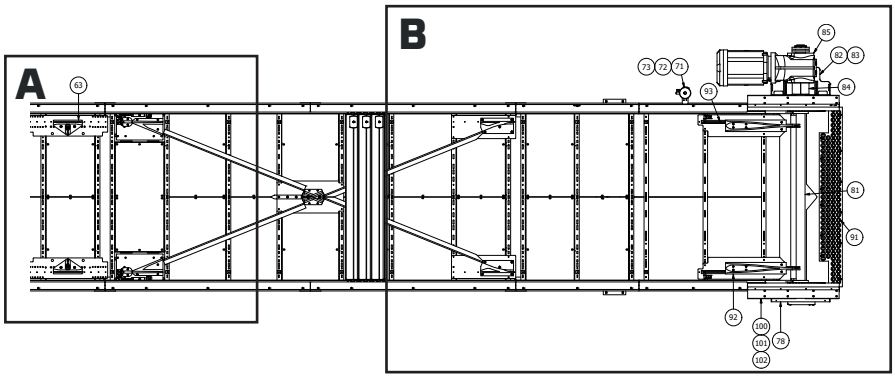


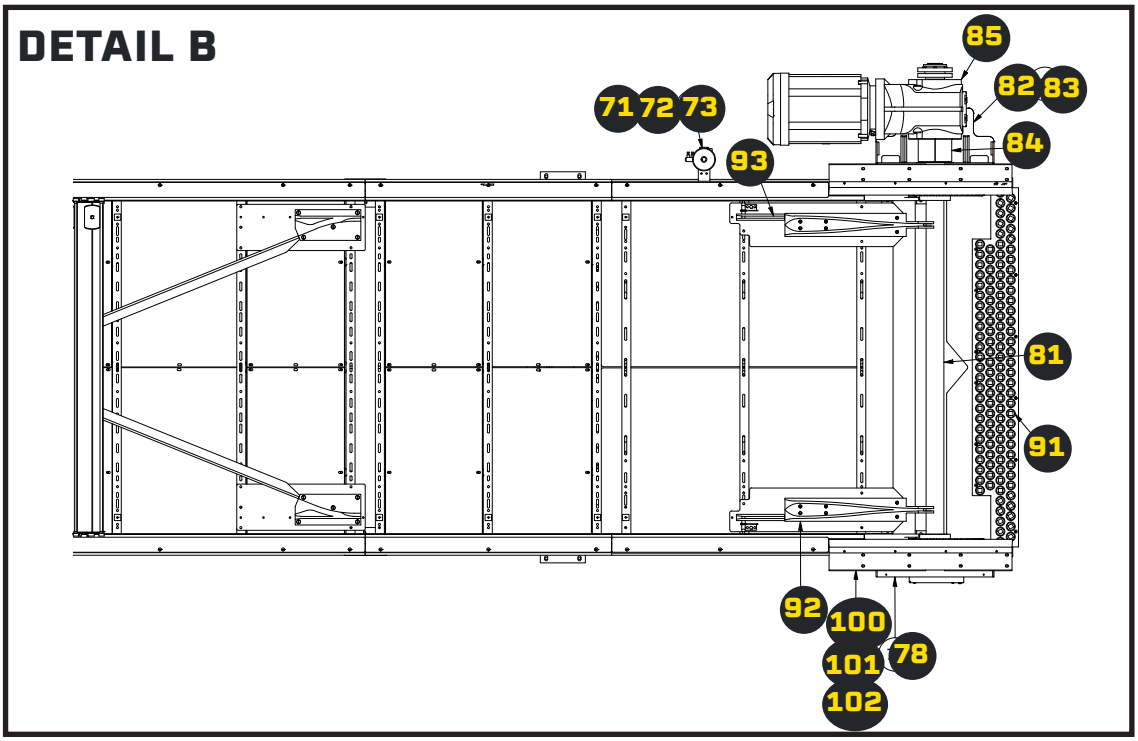
DETAIL A



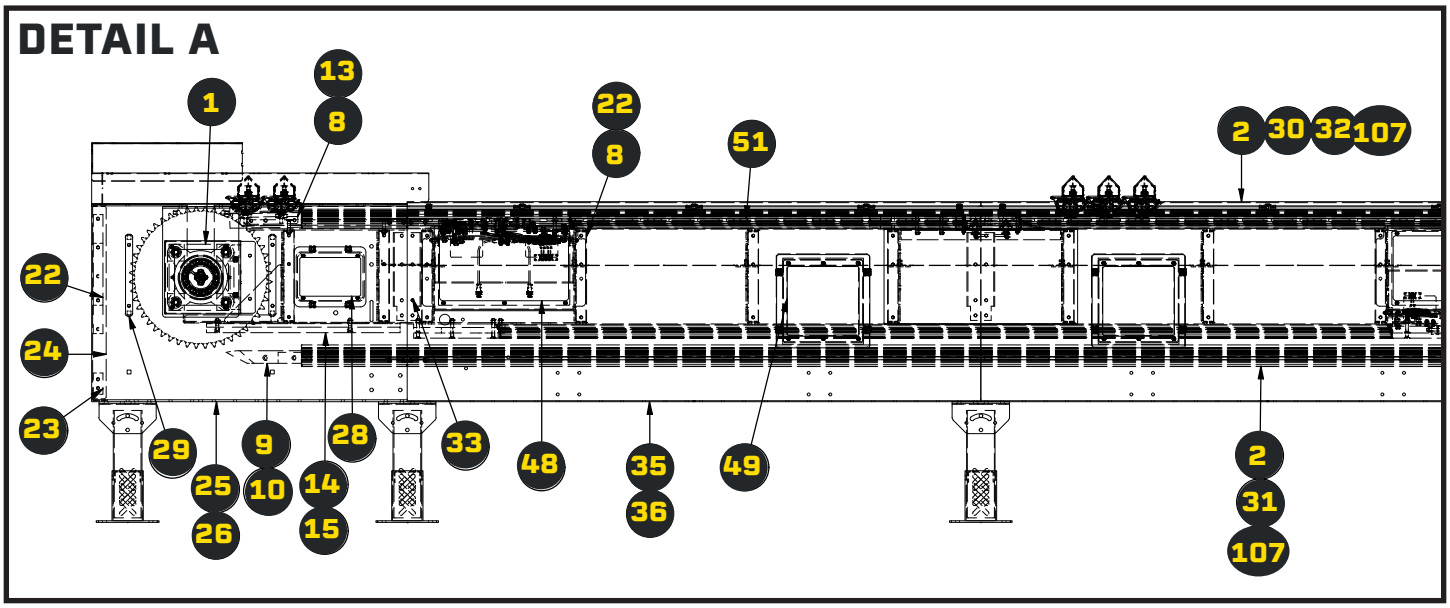
6.7 PROSORT LP18/22 DUAL SIDED ASSEMBLY – TOP VIEW (INTERMEDIATE, CATENARY, AND DRIVE SECTIONS)

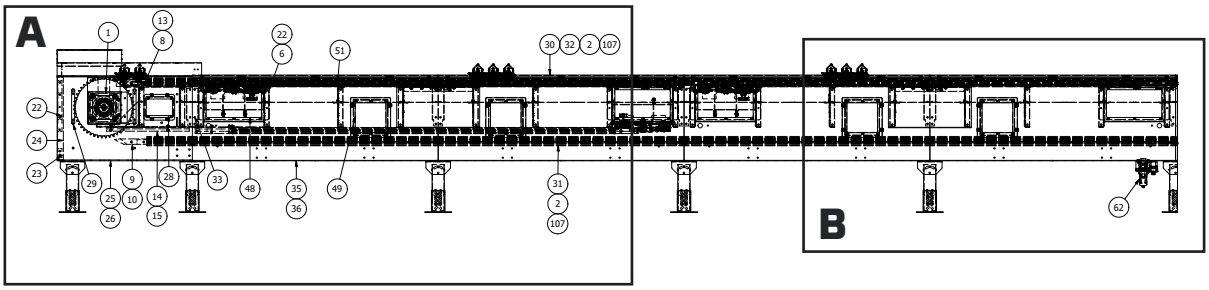


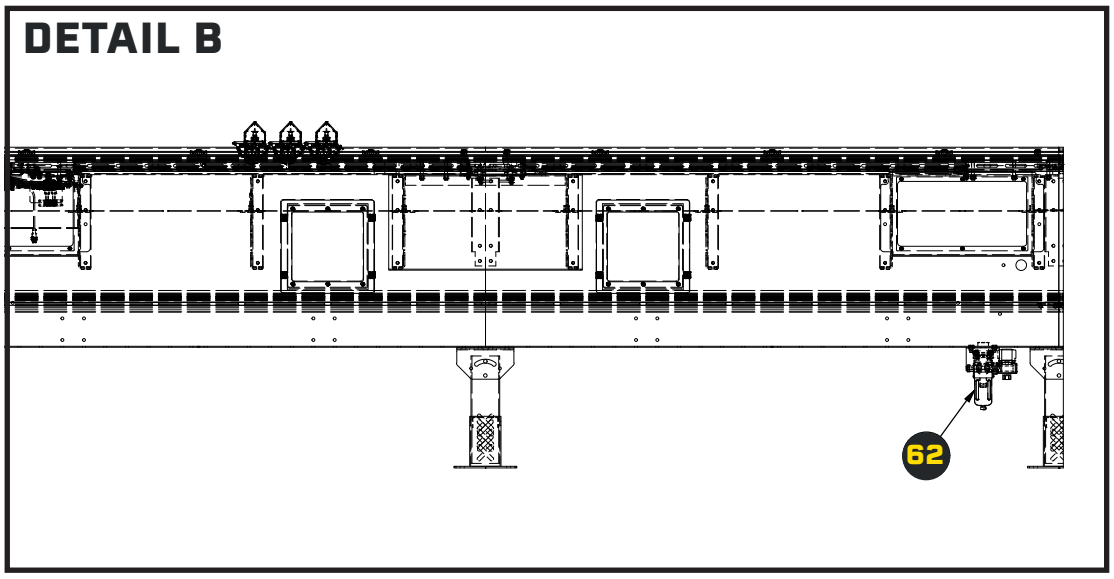




6.8 PROSORT LP18/22 DUAL SIDED ASSEMBLY – SIDE VIEW (TAIL AND DIVERT SECTIONS)

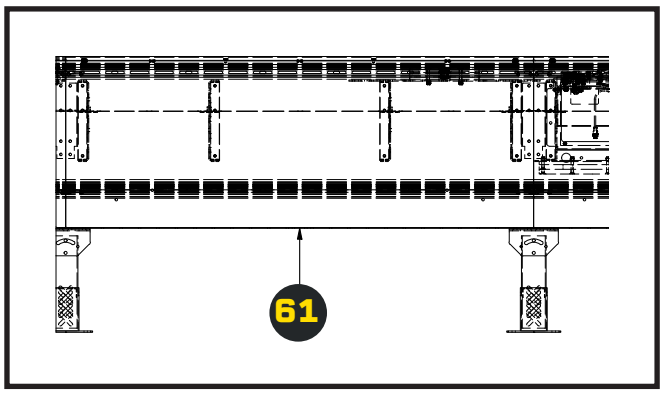


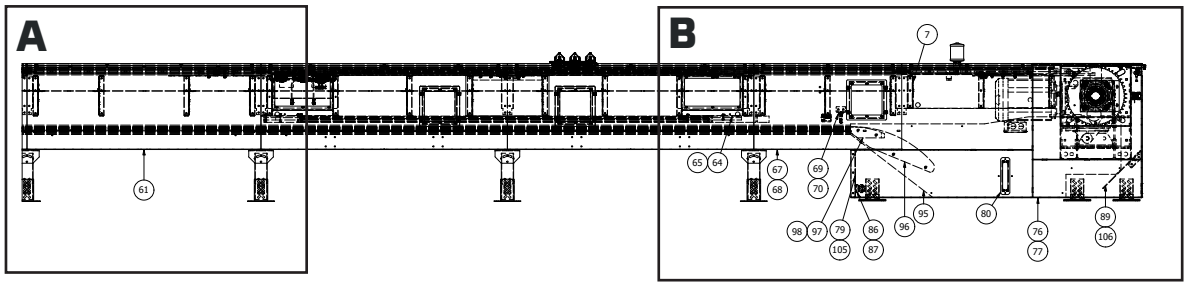




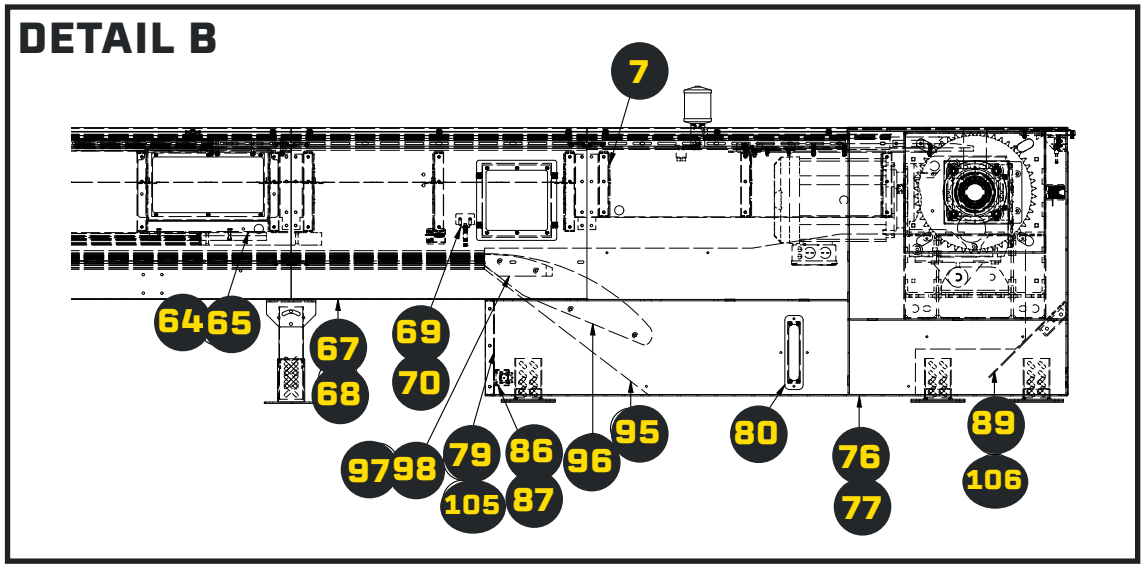
6.9 PROSORT LP18/22 DUAL SIDED ASSEMBLY – SIDE VIEW (INTERMEDIATE, CATENARY, AND DRIVE SECTIONS)

DETAIL A





DETAIL B



6.10 PROSORT LP18/22 DUAL SIDED ASSEMBLY PARTS LIST

REF #	DESCRIPTION
1	BEARING - CAST IRON, 4-BOLT, 3-7/16"B
2	BEARING PROFILE - NOVITANE
3	COLLAR
4	SPROCKET IDLER ASSEMBLY
5	SPROCKET - 100B48H
6	BED SPACER WELD - DIVERT
7	BED SPACER WELD - DRIVE
8	REINFORCING STRAP - SUPPORT BLOCK, 1" X 7"
9	CHAIN GUIDE SUPPORT BLOCK - RIGHT HAND
10	CHAIN GUIDE SUPPORT BLOCK - LEFT HAND
11	PIN GUIDE BLOCK - SYM, SGL SIDE
12	TAIL BLOCK MOUNTING PLATE - SGL SIDED
13	CHAIN GUIDE SUPPORT BLOCK
14	PIN GATHERING BLOCK - TAIL
15	PIN GATHERING BLOCK PLATE - TAIL
16	UNDERSIDE COVER - TAIL
17	UNDERSIDE COVER SUPPORT BRACKET - TAIL
18	TAIL SHAFT
19	TAIL SHOE COVER WELD - RIGHT HAND
20	TAIL SHOE COVER WELD - LEFT HAND
21	TAIL BEARING GUARD ASSEMBLY - ENCODER SIDE
22	VIB PAD - 1-3/8" X 12-5/8"
23	VIB PAD - 1-3/8" X 3"
24	TAIL BED SPACER CHANNEL
25	3'8" TAIL SIDE CHANNEL - RIGHT HAND
26	3'8" TAIL SIDE CHANNEL - LEFT HAND
27	BEARING GUARD ASSEMBLY - NON-ENCODER SIDE
28	COVER PLATE ASSEMBLY - LEXAN, TAIL
29	HOLE COVER PLATE - TAIL
30	TOP CHAIN GUIDE ASSEMBLY
31	BOTTOM CHAIN GUIDE ASSEMBLY
32	METAL CHAIN COVER
33	SPLICE CHANNEL
34	EXTRUSION ALIGNMENT BAR ASSEMBLY
35	DIVERT SIDE CHANNEL - LEFT HAND
36	DIVERT SIDE CHANNEL - RIGHT HAND
37	SWITCH ASSEMBLY
38	ALUMINUM DIVERT RAIL
39	UHMW C-CHANNEL
40	PIN GUIDE SPACER
41	SLOTTED TRACK SPACER
42	MANUAL CENTER SWITCH ASSEMBLY
43	CENTER SWITCH MOUNTING CHANNEL
44	CENTER SWITCH NOSE BLOCK
45	SWITCH MOUNTING CHANNEL WELD
46	SWITCH MOUNTING GUIDE BLOCK
47	DIVERT Y-BLOCK ASSEMBLY
48	COVER PLATE ASSEMBLY - LEXAN, SWITCH
49	COVER PLATE ASSEMBLY - LEXAN, DIVERT
50	PIN GUIDE
51	SPUR MOUNTING CHANNEL
52	SLAT ASSEMBLY (INCLUDES SHOE ASSEMBLY)
53	SHOE ASSEMBLY
54	CHAIN ASSEMBLY
55	MID PAN MOUNTING PLATE
56	MID PAN CENTER MOUNTING PLATE
57	MID PAN - BED JOINT
58	MID PAN SPLICE CHANNEL COVER
59	MID PAN - SWITCH
60	MID PAN - INTERMEDIATE
61	INTERMEDIATE SIDE CHANNEL
62	FILTER REGULATOR KIT
63	MISSING BEARING ASSEMBLY
64	RETURN SWEEP BLOCK
65	SWEEP BLOCK MOUNTING PLATE
66	PIN GATHERING ASSEMBLY - RETURN
67	CATENARY SIDE CHANNEL - RIGHT HAND

[CONTINUED ON NEXT PAGE]

6.10 PROSORT LP18/22 DUAL SIDED ASSEMBLY PARTS LIST CONT'D

68	CATENARY SIDE CHANNEL - LEFT HAND
69	OILER BRUSH MOUNTING BRACKET
70	SHANK BRUSH FOR CHAIN LUBRICATOR
71	SORTER LUBRICATOR WITH M12 CONNECTION
72	OILER MOUNTING BRACKET
73	OILER SHORT MOUNTING BRACKET
74	PHOTO EYE - LASER RETRO-REFLECTIVE,LONG RANGE
75	REFLECTOR MOUNTING BRACKET
76	7'10.5"LONG DRIVE SIDE CHANNEL WELD - RIGHT HAND
77	7'10.5"LONG DRIVE SIDE CHANNEL WELD - LEFT HAND
78	SHAFT SUPPORT WELD - 23"LONG
79	DRIVE INFEED END COVER
80	CATENARY WINDOW GUARD
81	DRIVE SHAFT
82	TORQUE ARM WELD
83	TORQUE ARM SUB WELD
84	SHAFT COVER HALF WELD
85	GEARMOTOR
86	PHOTO EYE - RETRO-REFLECTIVE, 10-40 VDC
87	PHOTO EYE MOUNTING BRACKET - BALL SWIVEL
88	REFLECTOR - 3.30"
89	DRIVE TRASH SLIDE WELD
90	DRIVE END PLATE
91	TRANSITION ROLLER ASSEMBLY
92	END PROX ASSEMBLY - DIVERT SIDE, DRIVE, RIGHT HAND
93	END PROX ASSEMBLY - DIVERT SIDE, DRIVE, LEFT HAND
94	INTERNAL CATCH PLATE - DRIVE
95	CATENARY TAKE-UP WEARSTRIP - 87-7/8"LONG
96	CATENARY BLOCK
97	CATENARY BEARING TRANSITION BLOCK - RIGHT HAND
98	CATENARY BEARING TRANSITION BLOCK - LEFT HAND
99	TOP STIFFENER PLATE - 35-5/8"LONG
100	BRUSH HOLDER - 35-5/8"LONG, DRIVE
101	BELT BRUSH - 35-5/8"
102	REINFORCING STRAP - SUPPORT BLOCK, 1" X 5"
103	CHAIN GUIDE SUPPORT BLOCK - RIGHT HAND, DRIVE
104	CHAIN GUIDE SUPPORT BLOCK - LEFT HAND, DRIVE
105	VIB PAD - 1-3/8" X 15-11/16"
106	VIB PAD - 1-3/8" X 4-3/4"
107	CHAIN GUIDE WEARSTRIP - UHMW

7 TROUBLESHOOTING

7.1 TROUBLESHOOTING GUIDE

TROUBLE	CAUSE	SOLUTION
Conveyor will not start or shuts off automatically during operation.	1. Jam eye blocked. 2. Tripped internal safety switch. 3. Transition roller plate out of position. 4. Proximity switch for internal safety switch or pop-up rollers misadjusted or defective. 5. Low air pressure: a. Regulator set low. b. Air line restricted or broken. c. Air filter clogged. d. Compressor problem. e. Lockout closed. 6. Electrical circuits. 7. Variable speed drive misadjusted or defective. 8. Drive motor defective.	1. Unblock jam eye. 2. Determine cause of tripping: foreign debris, mislocated divert shoes, etc., and correct problem. 3. Determine reason for rollers shifting, correct problem and set to home position. 4. Adjust or replace prox switch. 5. Determine reason for low air pressure and correct problem. See 5a-5e for common causes. 6. Check power and wiring. 7. Refer to variable speed drive manufacturer's manual for troubleshooting. 8. Replace motor.
Conveyor takes a long time to reach speed or conveyor jerks when starting.	1. Variable speed drive misadjusted or defective.	1. Refer to variable speed drive manufacturer's manual for troubleshooting.
Inoperative pneumatic divert switch.	1. No air pressure to cylinder. 2. Air solenoid valve defective. 3. Proximity switch misadjusted or defective.	1. Check air line and filter regulator. Replace if necessary. 2. Replace. 3. Refer to section 5.3 PNEUMATIC DIVERT SWITCH CHECKLIST on page 30.

Divert shoes “jump” during diverting.	1. Divert shoe won’t slide across slat 2. Slats are dirty. 3. Slats are bent. 4. Switch is misadjusted.	1. Check inside of slat and clear out any debris. 2. Clean surface. 3. Replace slat/shoe assembly. 4. Refer to section 5.3 PNEUMATIC DIVERT SWITCH CHECKLIST on page 30.
All pneumatic divert switches inoperative.	1. Lockout is closed. 2. No air pressure at divert switches. 3. Loss of electricity to air solenoid valves. 4. Controls failure.	1. If it is safe to run the system, open lockout. 2. Inspect low pressure switch (Figure 6) and fix any issues. 3. Correct problem. 4. Troubleshoot control system and wiring.

- ***Carrying Chains:*** Check lubrication. Chains will appear moist when properly lubricated.
- ***Slat/Shoe Assemblies:*** Check physical condition of slats and shoes. Replace any damaged slat/shoe assemblies. Check operation. Slats should be clean and straight. Shoes should slide freely on slats. Remedy cause of any binding. Slats may be cleaned by wiping with de-greaser type solvent such as a denatured alcohol.
- ***Divert Switches:*** Check physical condition. Switches must be kept in good physical condition and clear of all foreign matter. Check operation. Check for any loose switches or improperly adjusted switches. Check physical condition of divert blocks. Pay particular attention to the point near the switch block. Replace parts as needed.
- ***Divert Angles:*** Check for any bent areas. Check for loose or missing wear strip. Replace as needed.

8 PREVENTIVE MAINTENANCE

8.1 PREVENTIVE MAINTENANCE CHECKLIST

The following is a general maintenance checklist which covers the major components of your conveyor. This will be helpful in establishing a standard maintenance schedule.

COMPONENT	SUGGESTED ACTION	SCHEDULE		
		WEEKLY	MONTHLY	QUARTERLY
Motor	Check Noise			
	Check Temperature			
	Check Mounting Bolts			
Reducer	Check Noise			
	Check Temperature			
	Check Oil Level			
Carrying Chains	Check Tension			
	Lubricate			
Carrying Chains Sprockets	Check Alignment with Chain Guards			
Slat/Shoe Assembles	Check Physical Condition			
	Check Operation			
Carrying Chain Guides	Check for Wear			
Divert Switches	Check Physical Condition			
	Check Operation			
Chain Oiler	Check Oil Level			
Air Regulator	Check Pressure (60 PSI Normal)			
Air Filter	Check Physical Condition			
Structural	General Check: Check All Loose Bolts, etc. Tightened			
Divert Blocks	Check Physical Condition			
Divert Angles	Check Physical Condition			

Need Assistance?
Contact Us

Hytrol Customer Care:
1-844-449-8765
wecare@hytrol.com
Live Chat