MANUALS FOR ALL CONVEYORS

INSTALLATION and START-UP

OPERATION

MAINTENANCE

PARTS

ACCESSORIES

READ THE APPROPRIATE MANUALS FOR YOUR SYSTEM BEFORE BEGINNING INSTALLATION OR OPERATION !!!
Your system may not contain all types of conveyors

TABLE OF CONTENTS

Inside Cover
Warranty Page
Section 1
Section 2
Section 3
Section 4
Section 5
Section 6
Section 7
Section 8

Electrical Grounding notice and Performance notices
Warranty statement
Installation and Start-Up Overview
Polycord Tray Conveyors
Power and Gravity Roller Conveyors
Rotary Tray Accumulators
Slat and Knuckle Belt Conveyors
Fabric Belt Conveyors
Conveyor Table Plumbing and Accessories
Table and Accessory Parts Quick Reference

Please note that these manuals contain operating information, service parts diagrams, maintenance procedures, and specifications covering our standard system components and certain standard options and accessories. For replacement parts in systems with non-standard or special order components, use the manual as a reference and call Bi-line service with the particular job name and location.

PART NUMBER B500000
Revised November 2010
GROUNDING INSTRUCTIONS!!!

This appliance must be connected to a grounded metal permanent wiring system or an equipment grounding conductor must be run with the circuit conductors and connected to the equipment grounding terminal or lead on the appliance.

Please note:
Bi-line will guarantee product performance only when the conveyors and accessories are properly installed and the start-up procedures are followed.

Bi-line does not guarantee the performance of components and accessories supplied by others.

Bi-line does not guarantee the performance of any Bi-line components, parts, or accessories installed by personnel not approved and authorized in advance by Bi-line Service.

Any field modifications of Bi-line equipment must be approved by Bi-line Service BEFORE the modifications are performed, and these modifications must be performed by personnel approved by Bi-line Service in advance.
Warranty of conveyor systems: Bi-line Systems, Incorporated warrants all new equipment of its manufacture bearing the name of “Bi-line” and installed within the United States and Canada to be free from defects in material and workmanship for a period of one (1) year from the date of installation or fifteen months after the date of shipment by Bi-line, whichever occurs first. The warranty registration card must be returned to Bi-line within ten (10) days after installation. If the warranty card is not returned to Bi-line within the specified period, the warranty shall expire one year from date of shipment.

If a defect in workmanship is found within the warranty period, Bi-line, at its election, will either repair or replace the defective equipment or accept the return of the equipment for full credit. In the event that Bi-line elects to repair, the labor and work to be performed in connection with the warranty will be done during regular working hours by an authorized Bi-line service technician. Defective parts become the property of Bi-line. Use of any replacement parts not authorized by Bi-line will relieve Bi-line of any further liability in connection with its warranty. In no event will the Bi-line warranty obligation exceed Bi-line’s charge for the equipment.

Warranty of new accessories and replacement parts: Bi-line warrants all new parts and accessories produced or authorized by Bi-line to be free from defects in material or workmanship for a period of ninety (90) days from date of invoice. If any defect in material or workmanship is found to exist within the warranty period, Bi-line will replace the defective part without charge.

The following are NOT covered by the Bi-line warranty:

- Replacement of fuses or the resetting of breakers.
- Adjustment of any structural or mechanical components covered by normal maintenance procedures.
- Opening or closing of any utility supply or service valves or electrical current supply devices.
- Adjustment to chemical dispensing equipment.
- The cleaning of valves, strainers, screens, nozzles, or spray pipes.
- Performance of regular maintenance and cleaning as outlined in the operator’s manual.
- Damages resulting from water conditions, accidents, unauthorized alterations, improper use, abuse, tampering, improper installation, or failure to follow operation and maintenance procedures and intervals as outlined in the operator’s manual.

Examples of defects NOT covered by warranty include, but are not limited to:

- Damage to the exterior or interior finish as a result of any of the circumstances listed above.
- Use with a utility service other than that listed on the data plate(s) or rating plate(s).
- Improper connection to a utility service.
- Inadequate or excessive water pressure.
- Corrosion resulting from chemicals dispensed or introduced in excess of recommended concentrations.
- Leaks or damage from such leaks or corrosion caused by improper installation, including those of conveyor or machine connections.
- Damage and leaks as a result of the use of chemicals not recommended for use on Bi-line equipment, or from chemical dispensing equipment installed by others.
- Failure to comply with all applicable building and equipment codes.
- Damage as result of sabotage, labor disputes, or deliberate abuse.

Disclaimer of warranties and limitations of liability:

- The Bi-line warranty is limited to the extent reflected above.
- Bi-line makes no other warranties, express or implied, and including but not limited to any warranty of merchantability or fitness of purpose.
- Bi-line does not authorize any other person, including persons who deal in Bi-line equipment, to change or modify this warranty or create any other obligations in connection with Bi-line equipment.
- Bi-line will not assume any extra costs for installation in any area where there are jurisdictional conflicts with any local trades or unions.
- Bi-line shall not be liable for incidental or consequential damages.
- The remedies set forth above are the exclusive remedies for any defects found to exist in byline equipment and Bi-line parts.
- All other remedies are excluded, including any liability incidentals or consequential damages.
NOTE! **READ THESE INSTRUCTIONS FIRST!**

### INSTALLATION and START-UP OVERVIEW and GENERAL GUIDELINES

#### INSTALLATION

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1-1</td>
</tr>
<tr>
<td>Delivery and preliminary considerations</td>
<td>1-1</td>
</tr>
<tr>
<td>Installation overview</td>
<td>1-2</td>
</tr>
<tr>
<td>Initial assembly</td>
<td>1-2</td>
</tr>
<tr>
<td>Joining and fitting components</td>
<td>1-3</td>
</tr>
<tr>
<td>Leveling and squaring components</td>
<td>1-5</td>
</tr>
<tr>
<td>Welding</td>
<td>1-5</td>
</tr>
<tr>
<td>Piping and plumbing</td>
<td>1-5</td>
</tr>
<tr>
<td>Electrical and Mechanical</td>
<td>1-7</td>
</tr>
</tbody>
</table>

#### START-UP

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start-up inspection and procedures</td>
<td>1-8</td>
</tr>
</tbody>
</table>

**NOTE:** Bi-line Conveyor Systems are custom manufactured for each application and there can be significant differences between installations. The configuration and layout of the equipment and the demands of the particular system will determine what components will be installed. This manual is provided for general operation, maintenance, and service information that applies to our standard builds and regular production options, and it may not reflect the specifics of any custom options. Custom options may be accompanied by supplemental technical information where necessary. For specific information not found here, contact Bi-line service with the location, the job name, and the serial number(s) applicable.
Thank you for choosing Bi-line. You have invested in a quality product that will serve your needs and enhance the operation of your facility for many years when it is installed and maintained correctly. Your machine was assembled, inspected, and thoroughly tested at the factory before being shipped to your facility.

Please read and follow the instructions in the sections of this document. Failure to follow the guidelines and instructions could result in improper operation of the components, and could compromise some or all warranty considerations on the part of the manufacturer. If you have any questions after reading the instructions or you are unsure about any details, contact Bi-line Service before proceeding.

**Product changes**
Bi-line is continually engaged in improving its product lines and reserves the right to make changes in specifications, designs, and manufacturing practices without notice or incurring any obligations.

**Replacement parts**
Use only factory replacement parts for repairs or upgrades. All Bi-line parts and accessories are available through the Bi-line factory authorized service agencies. When ordering parts, please supply all applicable information such as the model number, serial number, voltage and phase where applicable, part numbers, parts descriptions, and the quantities you need.

## Delivery and Preliminary Considerations

### INITIAL DELIVERY INSPECTIONS and PROCEDURES

- Check crating and packing for any obvious shipping damage before the shipper leaves the location. If any damage is found, initiate a damage claim with the shipper's representative before the shipper leaves the site.

- Locate and confirm that all components included in the shipment have arrived. **Note!** Some pieces of equipment may arrive from other locations and/or may be delivered by more than one shipping agent.

- After uncrating and unpacking, examine all components of the system and its accessories for damage and, if damage is found, submit an initial or supplemental damage claim to the shipper as soon as possible.

- In all cases, inform Bi-line Service immediately of any damaged or missing components before proceeding.

**NOTE!** If the system is not put into service immediately, it must be stored in a warm, dry, clean location. Avoid storing in locations where the assemblies will be exposed to weather conditions, direct sunlight, large temperature changes, corrosive atmospheres, condensation or high humidity levels. Ensure that the mechanical systems will remain dry so that the bearings will not be subject to corrosion and the motor windings will not absorb moisture and potentially short to ground upon start-up.
General Installation Overview
What to expect and how to anticipate some aspects of the installation process.

Read this guide before beginning the installation!
• It is the responsibility of the installer to follow the manufacturer's guidelines and requirements. Failure to observe these guidelines and requirements could compromise some or all warranty considerations on the part of Champion and Bi-line. Refer to any special component installation instructions that may be included with job documents for more details regarding special issues.

• Neither Champion nor Bi-line will be responsible for the fitting of equipment supplied by others to a Champion or Bi-line system unless proper documentation and approved drawings for the specific equipment to be joined have been supplied to Champion or Bi-line before the Champion or Bi-line components are manufactured.

DOCUMENTATION
Before you begin the installation, locate and review all P&E drawings and documentation. Verify all utilities in regard to the proper sizes, ratings, and locations as per the approved drawings. If there are discrepancies or missing documentation, please contact Bi-line Service immediately for review. NOTE! Electrical schematics are stored in the electrical cabinets and should remain there for use by service and maintenance personnel.

IMPORTANT! The user is responsible for conforming to all applicable building, electrical, plumbing, ventilation, and safety codes for the location.

INITIAL ASSEMBLY and FITTING OF COMPONENTS
The order in which you move the components into position will be determined by the physical characteristics of the facility, the fitment requirements of the components in the system, and the utility considerations. Joinery sockets are utilized on base leg assemblies and overshelf components to allow separation to meet shipping requirements and facilitate the installation process.

• Use the P&E drawings to identify and determine the location and orientation of each section of the system within the space. This is the time to determine how the components actually fit into the designated space and to plan any modifications, alterations, or additions that may be required. NOTE! Bi-line will support only those modifications to Bi-line equipment that have been previously approved and then performed by approved vendors or organizations.

• Pay special attention to how the components must fit together as this will determine the order of installation of some components. You must then determine the best way to get the components into the final positions.

• If it is necessary to separate the tables from the base assemblies, loosen the set screws in the joinery sockets and separate the table from the base legs. Transport the base assemblies to their locations and set in place, then move the table sections in and set in place. Make sure the legs are fully inserted into the sockets, and then tighten the set screws.
INITIAL ASSEMBLY and FITTING OF COMPONENTS cont.

- Observe any markings that indicate adjoining surfaces, connections, or orientation.

- Use only stainless fasteners and hardware to assemble the Bi-line system. Unless otherwise instructed, use only stainless fasteners and non-corrosive materials for adjoining or attaching the items to be supplied by others.

INITIAL SET UP

- Set all components of the system in place as per the P&E drawings and verify proper relationships and adjoining sections.

- Due to being fitted to walls, floors, and ceilings, components such as accumulator tables, return window frame assemblies, and sight/sound barrier assemblies will likely dictate the placement and alignment of the other components in the system. See the Rotary Accumulator section of this manual for more information.

- If the system is to be connected to a dishwasher, set the dish machine in its final location and align the tables in reference to the machine. Correct as necessary.

- If modifications to the system are required, contact Bi-line immediately for review and approval of modifications.

JOINING and FITTING OF COMPONENTS - Do not perform any permanent fastening of adjoining sections until the aligning and leveling steps have been performed!

Refer to the P&E drawings and examine the actual adjoining surfaces to determine the method by which the sections are joined. How sections and components are joined will vary according to component assembly and function. Sections and components may be joined by bolting or welding, or with any combination of both.

BUTT JOINTS are the simplest and will need to be fill welded and finished once properly positioned. Once the pieces are in position, a simple tack weld should hold the two surfaces together sufficiently for final fill welding. Some butt joints will have factory-supplied sheet metal guide strips spot welded to one side to act as a lap guide. In some cases, it may be necessary for the installing welder to supply a tab for a portion of the table that is not supported by a base assembly until welded.
OFFSET LAP JOINTS are where one or both surfaces to be joined are prepared with an offset break or a strip of sheet metal spot welded to the full length of the joint that will allow the two surfaces to overlap. These joints are to be fill welded and finished on the work surface side of the joint. In most cases, it is not necessary to weld the underside of the joint.

OVERLAP or FITTED JOINTS are the joints where one piece is formed and contoured to mate with or fit over the mating portion of the adjoining component, such as where a table joins a dish machine or another table. Shown above is a table joined with another table at a curb. Consult the P&E drawings to determine whether or not the joint is bolted, welded, or simply fitted in place.
LEVELING AND SQUARING OF COMPONENTS - Do not perform any permanent fastening or welding of components until the aligning and leveling steps have been performed.

In order to ensure proper operation and drainage, it is essential that all components must be properly fitted together, leveled, and aligned with each other, not to walls and floors and other building components.

- Height and level adjustments are made with the adjustable feet on the base assemblies. Use a level and a squaring device as necessary to ensure that all components are ready to be permanently joined and/or fastened in place. **Make sure all of the adjustable feet are in good contact with the floor!**

WELDING

- When performing welding on any of the components, shield any other components that could be damaged by the process.

- Use only the appropriate stainless materials and approved techniques in the welding processes to ensure proper welding strengths, to enhance corrosion resistance, and to prevent warp and dimensional distortion of the components. Stainless TIG is the preferred method for joining Bi-line components. **DO NOT use carbon welding materials when welding any of the stainless components.**

- Finish the welds in such fashion as to guarantee smooth transitions between adjoining sections and to enhance longevity and achieve acceptable appearance. Following these guidelines will reduce the possibilities of poor drainage, and will enhance operation and customer acceptance.

- Once all sections have been permanently adjoined and all peripheral devices installed, check all access panels and covers for proper fit and operation. Resolve any fitment issues as necessary.

- Perform the required caulking and sealing, then finish and trim/remove any excess sealant to meet all applicable codes.

PIPING AND ACCESSORY PLUMBING - See the examples on the next page.

- Once all the sections and bases have been properly located and secured in place, make sure all necessary plumbing utilities are properly placed in regard to the machine components and with regard to workspace considerations. **Minimum incoming water line size is ¾ inch.**

- **Do not install any piping or plumbing of any size smaller than what is specified by Champion and Bi-line.** If reducing is necessary, reduce the line size at the components involved. Inadequate line sizes result in friction losses that reduce the amount of flow available to the components. See the Plumbing Diagram page.

- Check the incoming water FLOWING pressure where the connection to the conveyor components is located. **When all the conveyor flow devices are operating, nominal flowing pressure should be 35 PSI in order to maintain adequate water pressure and flow rates.**

- The ½ inch vacuum breaker and solenoid valve supplied with disposers are adequate for the disposer only. Additional components in the line such as gusher heads, flushing nozzles, etc., will require a minimum of ¾ inch supply lines and comparably sized components in order to maintain the required pressures and flow rates.
PLUMBING DIAGRAMS FOR BI-LINE CONVEYORS

NOTE! These diagrams are intended only to show the proper relationships between plumbing components. Some components shown may be optional equipment and may not be present in all configurations. Some components may be supplied by others. Actual plumbing configurations will be determined by the actual physical system layout and the particular options chosen.

Water Supply Requirements: Unless otherwise specified, the customer's water system should have a minimum ¾ inch supply pipe sizes, 120 degree F minimum hot water temperature, and the customer's water supply should be able to maintain 35 PSI nominal flowing pressure at the Bi-line connection points. A Pressure Reducing Valve (PRV) is recommended for each incoming water line.

Example of stand-alone disposer with vacuum breaker and solenoid valve

Piping Sizes for components supplied by others
Reducing piping sizes increases friction losses and reduces flow rates. Bi-line Systems does not recommend installing any piping sizes smaller than the inlet and outlet sizes of any of the operating components.

Typical Plumbing Layout  Soiled dish conveyor systems with optional integrated disposer plumbing. Specific table configuration will determine actual piping layout.

Items shown in gray are optional or are supplied by others. If supplied by others, items will be located on the customer side of the connection with the exception of the disposer components.

A = Water Hammer Arrestor/Silencer  CWS = Cold Water Solenoid Valve
HWS = Hot Water Solenoid Valve  MV = Mixing Valve
PRV = Pressure Reducing Valve  RPPZ = Reduced Pressure Principle Zone Valve

The illustrations are intended only to show the proper relationships of components and do not represent actual piping layouts.

Bi-line Systems 2005
PIPING AND PLUMBING CONT.

- If vacuum breaker/anti-siphon valves are to be installed, make sure these are located at least six (6) inches above the maximum flow height of any components in the same flow line or the valve will not be functional and may leak. This is especially important with trough and disposer components that can become flooded and the scrapping liquid level can cover the discharges.

- Apply pipe sealing compounds or tape where applicable and take care not to cross-thread any of the fittings.

- Ensure that considerations have been made for insulation and support bracketry where required.

- Ensure that all piping and plumbing done by others meets Champion and Bi-line requirements.

- Ensure that the plumbing and piping installation meets all applicable codes.

ELECTRICAL - All Bi-line conveyors must be properly grounded following National Electrical Code and applicable local codes!

- Make sure that all electrical utilities are adequately rated for the system loading.

- Ensure that all utilities are located properly for the installation and with consideration for the workspace.

- If the installation process requires disassembly of electrical connections, check all motor wiring connections involved for proper phase sequence to ensure proper direction of motor rotation.

- See that all wiring supplied and completed by others meets Bi-line requirements. Make sure that any interconnection wiring for equipment supplied by others is connected properly and meets Bi-line standards.

- See that the electrical installation meets all applicable codes.

MECHANICAL - follow the instructions for each type of conveyor

- Make sure there are no obstructions to proper operation created by the installation process, or by equipment supplied by others, or by the workmanship of others.

- Once all installation has been completed, see that all screens, covers, and panels are in place except for those that must remain out of place for start-up inspection and adjustments. Apply sealant where applicable.

- Clean all installation debris from the tables and exposed drive components. Do not remove any protective film unnecessarily until the equipment is ready for start-up.
Basic Start-up Overview and Checklist
Read this guide before starting the procedure! Failure to follow these guidelines could compromise warranty considerations on the part of Champion and Bi-line.

For specific information about vendor assemblies in this system supplied by Champion or Bi-line, refer to the respective manufacturers’ documents included in the system manuals.

WARNING! HIGH VOLTAGE DANGER! Always be aware when performing mechanical or electrical maintenance procedures. Lockout and tag out the electrical disconnects if necessary.

START-UP INSPECTION and PROCEDURE This may include some peripheral and complementary equipment supplied by others that may be interconnected to the Bi-line system. Make sure these components have also been properly prepared for start-up.

- Remove any remaining protective film from the tables and troughs and panels.
- Check that all caulking and sealing has been done and trimmed except for those panels and covers that must remain off until start-up is completed.
- Check base assemblies for proper assembly, secured fasteners, and foot adjustment for good floor contact.
- Check table system for height, alignments, and check for proper drainage by applying reasonable amounts of water to the table sections. Make sure there are no areas that retain standing water. Check for leaks between adjoining sections and resolve as necessary.
- Check and ensure that any sight/sound barriers, window frames, and any other accessory pieces have been installed properly and that any adjoining components are joined properly to them.
- Check and ensure that all plumbing and piping connections are properly joined, are secure and stable, and that none of the fitted connections are cross-threaded.
- Check that all wiring supplied and completed by others is proper and completed.
- Check the wiring and plumbing of any peripheral equipment where it interfaces with the conveyor system. Ensure that the interface is proper and that its operation will not adversely affect the operation of any equipment supplied by Bi-line or Champion Industries.
- Check and ensure that all utilities voltages and pressures are as specified, both on the supply side as well as at the machine(s).
- Make sure all wire bundles are fed through the wireways and are secured.
• Check all machine mounted electrical boxes for proper field wiring connections.

• Inspect the motor and drive system components before start-up for damage, loose or missing components and fasteners, obstructions, and debris, etc.

• Check drive system for alignment of components and proper tension where applicable.

• Check that the motors are clean and the ventilation is unobstructed. Oily vapor, dust, lint, debris, etc., can accumulate and block motor ventilation which will cause overheating and premature motor failure.

• Check lubrication and oil levels of the components according to the manufacturer's recommendations and instructions. **NOTE! Some mechanical components do not require lubrication.** Consult the appropriate sections of the manuals for more information.

• Check for potential safety and mechanical hazards that may have been inadvertently created during the installation process.

• Open the drains (if equipped with valves) and then open the water supply valves and check for leaks BEFORE switching on any of the electrical supply. Resolve any problems found as necessary to meet codes and standards of operation.

• Turn on the main electrical supply to the machine at the machine disconnect or breaker panel and check for proper voltages and ground connections at the feed side of the control panel BEFORE turning on power at the machine. Resolve any issues found as necessary to meet codes and standards of operation.

• Confirm direction of motor rotation before operating the system! **Improper direction of rotation will result in damage to equipment!** If any of the motors rotate in the wrong direction, check the wiring at the motor for proper phasing. If the wiring is proper on each end, check the wiring at the field interconnections.

• Start the conveyor and check all mechanical and utility operations. Make any necessary adjustments and ensure that the belt(s) run freely in the guides/tracks and that the tension is correct.

• Observe any stop, limit, fault, or accumulation switches for proper operation and adjust as necessary.

• Review the flow and drainage systems as the system operates and make adjustments as necessary. This includes the troughs and spray systems of any scrapping tables included.

• Observe the operation of any spray systems and gusher nozzles and the related drains. Take corrective actions or make adjustments as necessary. This includes any belt cleaning systems and the related drains.

• Apply the expected loading to the conveyor and check for proper operation and tracking. Adjust as necessary. Make sure all components run without vibration, shuddering, etc.
- Check the operation of the peripheral equipment connections such as valves, piping, electrical, etc., and any disposals, pulpers, tray carts, lift systems, etc, that mechanically or electrically interface with the conveyor system.

- Observe the interaction of a dish machine and any peripheral equipment with the conveyor system. Make adjustments as necessary and document any discrepancies for later review.

- When inspection and start-up are completed and no issues regarding the conveyor or accumulator systems remain, put all remaining screens, access panels, and covers, etc. in place and seal where applicable.

Any issues that cannot be immediately resolved by the technicians and representatives on-site must be documented and reported to Bi-line Service as soon as possible.

*See the individual conveyor manuals for more specific checks before start-up.*
NOTES
Revisions:
Update plumbing diagram and add as separate page
Bi-line is continually reviewing its products and manufacturing procedures for ways to improve performance and reliability and to reduce costs to the end user. The information within these manuals is subject to correction and updating as the review process occurs. If you have any questions or concerns please feel free to contact Bi-line Service at any of the phone numbers listed on this page. Thank you for choosing Bi-line.

Section 2  Polycord Tray Conveyors
Section 3  Power and Gravity Roller Conveyors
Section 4  Rotary Tray Accumulators
Section 5  Slat and Knuckle Belt Conveyors
Section 6  Fabric Belt Conveyors
Section 7  Conveyor Table Plumbing and Accessories
Section 8  Table and Accessory Parts Quick Reference

NOTE! Strong solutions used during the warewashing or cleaning processes should be regularly checked for pH levels. pH values below 4.5 or above 9.0 will damage the stainless steel and plastic parts of the machines. Solutions containing chlorine, ammonia, or phosphoric acid are not recommended as these solutions will attack the plastic components, and if not thoroughly flushed away, may damage the stainless steel surfaces also. Always thoroughly clean and flush the conveyor system before leaving the system idle for any length of time.
# POLYCORD CONVEYORS
## OPERATION AND MAINTENANCE MANUAL

<table>
<thead>
<tr>
<th>OPERATION</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation</td>
<td>2-1</td>
</tr>
<tr>
<td>Operator control panel</td>
<td>2-2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CLEANING</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleaning and precautions</td>
<td>2-3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MAINTENANCE</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belt adjustments</td>
<td>2-4</td>
</tr>
<tr>
<td>Inline drive belt routing</td>
<td>2-4</td>
</tr>
<tr>
<td>End drive belt routing</td>
<td>2-5</td>
</tr>
<tr>
<td>Re-direct belt routing</td>
<td>2-5</td>
</tr>
<tr>
<td>Idler/tail belt routing</td>
<td>2-6</td>
</tr>
<tr>
<td>Drive belt routing for Canadian built conveyors</td>
<td>2-6</td>
</tr>
<tr>
<td>Table turn and corner components</td>
<td>2-7</td>
</tr>
<tr>
<td>New polycord belt installation and belt repairs</td>
<td>2-7</td>
</tr>
<tr>
<td>Polycord welding procedures</td>
<td>2-8</td>
</tr>
<tr>
<td>Control panel and electrical cabinet</td>
<td>2-9</td>
</tr>
<tr>
<td>Gearmotor maintenance</td>
<td>2-10</td>
</tr>
</tbody>
</table>

Note: Electrical schematics are stored in the electrical cabinet and should be left there for use by service personnel.
NOTE!
READ THESE INSTRUCTIONS BEFORE INSTALLING OR OPERATING THE CONVEYOR SYSTEM!

Use the P&E drawings to identify all the components in the system, their orientations to each other, and verify how all the components fit together. Check the dimensions of the space and compare it to the P&E drawings. If there are discrepancies, notify Bi-line immediately before going further.

FOLLOW THE INSTALLATION OVERVIEW SECTION FOR DETAILS ON TABLE INSTALLATION.

OPERATION
There may be controls for other conveyors located on this panel. Shown below are the basic control configurations. Consult the instructions for any other conveyors that may be controlled from this panel.

Typical Conveyor Control Panel Layouts

![Diagram of conveyor control panel layouts]

IMPORTANT!
When placing trays on a conveyor with turns, always leave sufficient spacing between trays so that the trays can negotiate the turns without binding against each other or jamming.

Continued on next page
**OPERATION, cont.** Read this page carefully before beginning operation!

**This pushbutton STARTS the conveyor.**
Always make sure the conveyor is clear to operate before starting!!! Secure all scrap pans and screens in place and close all access doors before starting the conveyor. Failure to do so could cause injury or damage or both.

For Manual Advance conveyors, the START switch on the main panel or on the Remote station must be pressed before the black pushbutton on the Manual Advance Station will advance the conveyor. See Manual Advance Station below.

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**Optional START-STOP stations** may be located at any point along the conveyor route. The switches operate in the same manner as the START-STOP switches on the main control panel. Each START-STOP Station operates only one (1) conveyor.

**Manual Conveyor Advance Station.** These stations are applied to conveyors that do not run continuously once started, and are usually positioned at workstations along the conveyor route. The conveyors controlled by these stations will advance only as long as the black pushbutton is pressed.

To operate, press the green START pushbutton for that conveyor on the main panel or a remote START-STOP Station to enable the conveyor, then press the black conveyor advance pushbutton to advance the conveyor. The belt wash and rinse systems on these conveyors operate only while the advance pushbutton is being pressed.
CLEANING

DO NOT SPRAY WATER DIRECTLY INTO ANY ACTUATOR SWITCHES, OPTICAL DETECTION DEVICES, OR ELECTRICAL PANELS OR BOXES.

Strong solutions used during the warewashing or cleaning processes should be regularly checked for pH levels. Any pH value below 4.5 or above 9.0 will damage the stainless steel and plastic parts of the machines. If it is necessary to use a strong solution to clean the surfaces, all residue should be thoroughly flushed away from all surfaces and components immediately, and the table surfaces should be wiped down with a soft cloth to prevent corrosive damage to the components and to avoid water spotting.

Keeping the conveyor system clean is essential to proper operation and sanitation guidelines.

For general cleaning,
- Clean stainless steel surfaces with a soft cloth and a mild detergent intended for use with stainless steel.
- Flush with clean water or wipe down with a clean wet cloth, and then wipe dry to avoid streaking and spotting.
- Chlorinated detergents and sanitizing agents will damage stainless steel unless thoroughly flushed or wiped away.

During the work periods, keep the conveyor relatively clean of accumulated debris.

At the end of each meal period or for shutdown, stop the system and turn the power switch off.
- Clean away any accumulated food debris from the table surface.
- Start the conveyor and clean the belting with a clean wet towel by gently gripping the belting in the middle of the table with the towel and allow the belt to run through the towel until the belt is clean.
- If the conveyor is equipped with optical detection devices, DO NOT USE ABRASIVES OR DIRTY WIPING CLOTHS ON THE LENSES.
- Wipe the table surfaces down with a soft clean cloth to prevent spotting.
- Empty and clean the Sediment Tray, if equipped.
BELT ADJUSTMENTS
Depending on the particular drive units, belt adjustments are made either by adjusting the height of the Drive Gearmotor in the guides with the jack screw, or at the Idler/Tail locations with the snubber sheaves, but not both.

BELT TENSION
Proper tension is achieved when the belt can be lifted with little effort approximately 1.5 inches (38 mm) from the top of the guide blocks in the middle of the length of the table, or approximately 2 inches (50 mm) from the table surface before becoming noticeably tighter.

Too much tension will damage or break the belt due to stress on the vulcanized joints in the belt and will cause premature wear of the drive components. Insufficient tension will cause the belt to run erratically and will result in the belt becoming separated from the guides and sheaves.

Inline Drive Routing

For units with adjusting slots, belt tension is adjusted here. Loosen the bolts on both ends of the axle and move the axle in the slot until proper tension is achieved. Make sure to maintain proper axle alignment.

For units with threaded rods, belt tension is set here. Adjust the height of the motor plate with the nuts on the threaded rods.

To increase tension, loosen the lower nuts and tighten the upper nuts. To decrease tension, loosen the upper nuts and tighten the lower nuts.

NOTE! All adjustment nuts should be turned the same number of turns in order to maintain proper sheave alignment.
End Drive Routing

POLYCORD Part Number B500357 - specify length needed

Wheel Guard Part Number B300718

Idler Pulley

Snubber Pulley

Drive Pulley

MOTOR Part Number B500074

GEAR REDUCER

Motor Plate

For units with adjusting slots, belt tension is adjusted here. Loosen the bolts on both ends of the axle and move the axle in the slot until proper tension is achieved. Make sure to maintain proper axle alignment.

Pulleys

3.5 inch Part Number B500325-SS
4.1 inch Part Number B500326-SS
4.8 inch Part Number B501215-SS

Wheel Guard Part Number B501125

Pulleys

3.5 inch Part Number B500325-SS
4.1 inch Part Number B500326-SS
4.8 inch Part Number B501215-

Adjust sheave height here. Top surface of poly cord should be high enough to carry the trays without dragging on any table surfaces.

Guided Block Part Number B300720

Table Surface

Pulleys

3.5 inch Part Number B500325-SS
4.1 inch Part Number B500326-SS
4.8 inch Part Number B501215-SS

Adjust snubber tension here, if equipped. Snubber may be fixed and adjustments are made at the Drive Gearmotor or elsewhere in the system.

FOR UNITS WITH ADJUSTING SLOTS, BELT TENSION IS ADJUSTED HERE. LOosen THE BOLTS ON BOTH ENDS OF THE AXLE AND MOVE THE AXLE IN THE SLOT UNTIL PROPER TENSION IS ACHIEVED. MAKE SURE TO MAINTAIN PROPER AXLE ALIGNMENT.

NOTE! All adjustment nuts should be turned the same number of turns in order to maintain proper sheave alignment.

For units with threaded rods, belt tension is set here. Adjust the height of the motor plate with the nuts on the threaded rods.

To increase tension, loosen the lower nuts and tighten the upper nuts. To decrease tension, loosen the upper nuts and tighten the lower nuts.

Re-Direct Idle Routing - Belt Drop style

POLYCORD Part Number B500357 - specify length needed

Wheel guard Part Number B300718

Guide Block Part Number B300720

Table Surface

Pulleys

3.5 inch Part Number B500325-SS
4.1 inch Part Number B500326-SS
4.8 inch Part Number B501215-SS

Adjust sheave height here. Top surface of poly cord should be high enough to carry the trays without dragging on any table surfaces.

Snubber Pulley

Idler Pulley

Re-Direct Pulley

Adjust snubber tension here, if equipped. Snubber may be fixed and adjustments are made at the Drive Gearmotor or elsewhere in the system.

NOTE! All adjustment nuts should be turned the same number of turns in order to maintain proper sheave alignment.
**Idler/Tail Routing - Return Belt Lift Style**

**POLYCORD** Part number B500357 - specify length needed

- Guide Block
- Table Surface
- Wheel Guard

**Guide Block** Part Number B300720

**Pulleys**
- 3.5 inch Part Number B500325-SS
- 4.1 inch Part Number B500326-SS
- 4.8 inch Part Number B501215-SS

**Snubber Pulley**

Adjust sheave height here.

Adjust snubber tension here, if equipped. Snubber may be fixed and tension adjustments are made at the Gearmotor or elsewhere in the system.

**Wheel Guard** Part Number B300718

**Drive Routing for Bi-line Polycord Systems Manufactured in Canada**

**POLYCORD** Part Number B500357 - specify length needed

- Guide Block
- Table Surface
- Guide Block

**Guide Block** Part Number B300720

**Idler Pulleys**
- 3 inch Part Number BC04508
- 5 inch Part Number BC04509

**Idler Pulley** 5 inch

**Turnbuckle** Adjust initial polycord tension here.

**Tubcuckle**

**From outside sheave**

**To inside sheave**

**Idler Pulleys**
- 3 inch Part Number BC04508
- 5 inch Part Number BC04509

**Double Sheave Drive Pulley**

**Motor**

Gearmotor Assembly Part Number BC04507

**Gear Reducer** Part Number BC04506

**SIDE VIEW**

Illustration is not to scale
**NEW POLYCORD BELTING**

If there are turns in the conveyor system, this process will likely require two personnel, one to feed and one to thread the polycord without kinking and twisting.

1. **Do not feed the polycord directly from the carton.** Uncoil the polycord and make sure it will lie out straight before attempting to thread it through the conveyor.

2. **There must be absolutely no kinks or twists in the polycord when threading the cord onto the conveyor or the cord will not track properly.** Poor tracking will cause the belt to come off the pulleys and out of the guides and can result in damage to the polycord.

3. **In order to properly weld the two ends together, install the polycord in such a manner as to have clear access on the table surface to the two ends.** The center of a straight run section of a table is recommended, since that is where the tension measurement is made.

4. **The welds must be done properly in order for the polycord to perform properly and remain durable.** See instructions on the next page.
The objective when welding is to fuse the nylon center cord ends together and to fuse the poly cord body without contaminating either. The melting and carbonization points of the two materials are different, so it is necessary to melt the polycord body over a greater distance in order to properly fuse the nylon. If the joint is done properly, the excess melted polycord body can be neatly trimmed away leaving a joint that is hardly visible.

1) MEASURING FOR THE CUT
Make sure the polycord is properly routed through all the sheaves and that any adjustable pulleys are positioned at the approximate center of adjustment. Pull together and overlap the ends and have someone check for tension while the Polycord is held tightly in position. Place a mark approximately in the center of the distance the ends are overlapped with each other. That mark on the overlapped pieces is where the cuts will be made.

2) CUTTING
Both ends must be cut square and cleaned thoroughly for several inches from the cut.

3) DRILLING
Use a 1/8 inch drill bit and drill the nylon center cord out to a depth of 3/8 to 1/2 inch. Make sure the drill is straight and does not slip to the side and cut into the polycord body or you will have to cut and start over. Clean all nylon fragments from the drilled area. Nylon fragments will plasticize and blacken during welding which will contaminate and weaken the weld.

4) WELDING
Follow the instructions for the particular welding kit you have. If you have no experience, it is a good idea to use two short pieces of polycord to practice a weld or two before performing a weld on the conveyor polycord. NOTE! Always allow the welds to cool 5 minutes before trimming or applying tension to the belt. The weld should look similar to the illustrations below when the welding process is correct. The melted excess polycord body should be symmetrical all the way around.

5) TRIMMING and FINISHING
Trim the melted excess off the joint flush with the unmelted surfaces. If the weld is correct, there will be no black carbonized nylon particles visible and the weld should be hardly visible.
CONTROL PANEL COMPONENTS

NOTE! The actual layout and quantity of control components will vary with the configuration of the conveyor system, the number of conveyor drives, and the options installed.

GREEN PUSH BUTTON
Part Number B502109

CONTACT BLOCK N.O.
Part Number B502107

RED PUSH BUTTON
Part Number B502110

CONTACT BLOCK N.C.
Part Number B502108

CONTACT BLOCK MOUNTING ADAPTER
1 required per pushbutton
Part Number B502106

Pushbutton parts also used in Remote START-STOP Stations.

Remote START-STOP enclosure P/N B502284

PILOT LAMPS, each
Part number B502176

230V CIRCUIT BREAKER/DISCONNECT
Part Number B500138

230V COVER BOOT
Part Number B500338

OR

480V DISCONNECT OPERATOR (on door)
Part Number B500621

480V DISCONNECT, 4 pole (inside cabinet)
Part Number B500622

SPEED CONTROL

Single Conveyor
Part Number B501158

Two Conveyor, single control Knob
Part Number B501224

Knob only
Part Number B501158-1

Conveyor Manual Advance Station
Palm Switch Assembly Part Number B501611
Enclosure Part Number B502283

CONTROL CABINET INTERIOR COMPONENTS - General Configuration

Shown is a general layout of components and their approximate locations. The number and types of components and the presence of timers will vary with conveyor types, system configurations, and optional equipment. Not all components shown will be present in all configurations.

Control Transformer
230V P/N B500104
460V P/N B502471

Motortronics
230V P/N B501018
460V P/N B502467

Mitsubishi
230V P/N B502437

Fuse Blocks
250V Part Number B500793
600V Part Number B500792

Fuses for 24 Volt
1 amp P/N B500801
2 amp P/N B500802

Fuses for 600 Volt
1 amp P/N 112901
10 amp P/N 100913

Relays, each
24VAC 4 pole
Part Number B500604

AC Variable Speed Drive 1

AC Variable Speed Drive 2
If equipped, see Drive 1 for part numbers.

Repeat Cycle Timer
Part Number B500608

Timer Socket (not shown)
Part Number B500599

Terminal Blocks

Base electrical cabinet BOM numbers are B701354 for 18 inch, and B701355 for 24 inch.
GEARMOTOR MAINTENANCE

CHECK THE MOTOR AND GEARBOX EVERY 6 MONTHS for leakage and oil level. Make sure the motor ventilation is not blocked with debris, lint, residue, etc.

If adding oil, do not mix oil types. If changing the oil, flush the gearbox with petroleum oil until all traces of contaminants are removed. Replace the drain plug and fill to the proper level with the recommended oil and replace the fill plug. Do not overfill.

It is recommended that the gearbox oil be changed after the first 250 hours of operation, and thereafter every 10,000 hours for mineral oils, and every 20,000 hours for synthetics. Do not overfill.

TYPICAL LUBRICANTS for all gearboxes
Oils VG220, CLP 220, PGLP 220, and PGLP 460 complying with DIN 51502 and 51517 are suitable. DO NOT MIX OIL TYPES!

Suggested oils for all gearboxes
Mineral oils:  Shell Omala EP220 or equivalent

Synthetic oils:  Shell Omala HD220 or equivalent

NOTE! DO NOT MIX OIL TYPES in service or as waste! Synthetic oils with a polyglycol base (PGLP, etc.) must be kept separate from mineral oils and are to be disposed of as special waste.
**ROLLER CONVEYORS**

**POWER ROLLER**

**GRAVITY ROLLER**

**OPERATION AND MAINTENANCE MANUAL**

For all units delivered after July 1, 2006

<table>
<thead>
<tr>
<th>OPERATION</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control panel and operating instructions</td>
<td>3-1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CLEANING</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructions and precautions</td>
<td>3-3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MAINTENANCE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>General Power Roller Layout</td>
<td>3-4</td>
</tr>
<tr>
<td>Power Roller Drive system</td>
<td>3-4</td>
</tr>
<tr>
<td>Gravity Roller System</td>
<td>3-5</td>
</tr>
<tr>
<td>Control panel and electrical cabinet components</td>
<td>3-6</td>
</tr>
<tr>
<td>Gearmotor maintenance</td>
<td>3-7</td>
</tr>
</tbody>
</table>

Note: Electrical schematics are stored in the control cabinet and should be left there for use by service personnel.
POWER ROLLER CONVEYORS

NOTE! READ ALL INSTRUCTIONS BEFORE YOU BEGIN INSTALLATION OR OPERATION!

These instructions are intended to guide the installer and provide a method of anticipating some of the aspects of custom conveyor installations. Table assembly and installation instructions are included in the Installation and Start-up Overview section at the beginning of this manual. It is important for the installer and all supervisory personnel involved in the installation to read the Installation Overview section BEFORE beginning any portion of this process. Failure to follow the installation, operation, and maintenance procedures may affect warranty considerations on the part of Bi-line.

OPERATION

Power roller conveyors are designed to carry standard 20” by 20” dish racks to a gravity roller conveyor or a dish machine. The conveyor operates as a low-pressure accumulation system by utilizing a “clutch” type mounting of the rollers that allows the roller to stop turning while the chain continues to run. This arrangement eliminates the need for stopping and restarting the conveyor to accommodate rack handling back-ups or momentary stops.

NOTE! When loading racks onto a conveyor with turns, always leave 6 to 8 inches between racks in order to maintain sufficient spacing for the racks to negotiate the turns in the conveyor path.

The conveyor speed is controlled by a variable speed AC motor drive controller, and conveyor speed is preset to run at optimum for the specified ware handling system. If necessary, conveyor speed can be adjusted at the motor controller by qualified service personnel. An optional control mounted on the main control panel allows speed adjustments by turning the speed control knob clockwise to increase the speed and counterclockwise to reduce the speed.

Conveyor Start/Stop controls are provided as standard equipment on the main control panel, and remote Start/Stop stations are provided as an option and may be mounted at any location along the conveyor routing. All controls are interwired per UL, USNEC, and CSA, and meet all safety requirements.

Before starting, open drain valves and water valves as necessary, and make sure all screens and scrapping equipment and devices are in position.
OPERATION, cont
There may be controls for other conveyors located on this panel. Shown below are the basic control configurations. Consult the instructions for any other conveyors that may be controlled from this panel.

Typical Conveyor Control Panel Layouts

Multiple conveyors with optional controls for primary

Multiple conveyors with optional controls for both

This pushbutton STARTS the conveyor.
Always make sure the conveyor is clear to operate before starting!!!
Secure all scrap pans and screens in place and close all access doors before starting the conveyor. Failure to do so could cause injury or damage or both.

For Manual Advance conveyors, the START switch on the main panel or on the Remote station must be pressed before the black pushbutton on the Manual Advance Station will advance the conveyor. See Manual Advance Station below.

RED pilot lamp indicates when the conveyor is activated.

This pushbutton STOPS the conveyor.

Optional START-STOP stations may be located at any point along the conveyor route. The switches operate in the same manner as the START-STOP switches on the main control panel. Each START-STOP Station operates only one (1) conveyor.
CLEANING

DO NOT SPRAY WATER DIRECTLY INTO ANY ACTUATOR SWITCHES, OPTICAL DETECTION DEVICES, OR ELECTRICAL PANELS OR BOXES.

NOTE! Solutions used during the warewashing or cleaning processes should be regularly checked for pH levels. Any pH value below 4.5 or above 9.0 will damage the stainless steel and plastic parts of the machines. Solutions containing chlorine, ammonia, or phosphoric acid are not recommended. If it is necessary to use a strong solution to clean the surfaces, the residue should be thoroughly flushed away from all surfaces and components immediately, and the surfaces should be wiped down with a soft cloth to prevent corrosive damage to the components and to avoid water spotting.

Keeping the conveyor system clean is essential to proper operation and sanitation guidelines.

- **For general cleaning**, clean stainless steel surfaces with a soft cloth and a mild detergent. Flush with clean water and wipe dry. Chlorinated detergents and sanitizing agents will damage stainless steel unless thoroughly flushed away.

- **During the work periods**, use the wash down hose and the scrapping station spray hoses to keep the conveyor relatively clean of accumulated debris. Empty and rinse the scrap pan(s) in the drain end of the table.

- **At the end of each meal period**, stop the system, empty and clean the scrap tray(s), and gently wash down the conveyor and table surfaces with the wash down hose and/or spray nozzles.

- **For shut down or at the end of the work shift**,  
  - Thoroughly wash down the conveyor system, the tables, and trough system and drains, including the conveyor return tracks and return trough under the table. **Do not spray water directly into any actuator switches or optical detection devices mounted on the equipment, or into electrical panels or boxes.**
  - Thoroughly wash the food debris from the rollers and trough skate wheels, especially in the roller and skate wheel bearing areas. Debris must be kept out of these bearing areas in order for the rollers and wheels to turn easily.
  - Use a soft cloth to wipe off any debris or film buildup from the lens surfaces of any optical detection devices mounted on the table system. **Do not use abrasives or dirty cleaning cloths on the lenses.**
  - Remove and clean the scrap screens thoroughly and replace. Make sure the screens are properly seated.
  - Wipe down the table surfaces with a soft clean cloth to prevent spotting.
MAINTENANCE

POWER ROLLER CONVEYORS

General Power Roller Layout

Parts listed are for US versions unless otherwise noted

**TOP VIEW**

- Gearmotor inline mounted
  (Shown with cover off)
- Roller Assembly, see below
- Sediment Drawer
  (if equipped)
  Part Number B702822-1
- Drive System Cover

**SIDE VIEW**

- Gearmotor underslung mounted
- Cover

NOTE:
Systems manufactured in our Canadian facilities may have some custom application components. For parts not listed here, please call Bi-line Service with the job name and parts details.

<table>
<thead>
<tr>
<th>Straight Section Roller</th>
<th>Tapered Roller for curved sections</th>
<th>Roller Shafts</th>
</tr>
</thead>
<tbody>
<tr>
<td>22 inch B701175-1</td>
<td>22 inch B701194-1</td>
<td>24.625 inch B501177-1</td>
</tr>
</tbody>
</table>

For Canadian manufactured units, roller complete w/ shaft:

- Straight Section Roller, 24.125 inch Part Number BC04503
- Tapered Curve Section Roller multi-piece 27.5 inch Part Number BC04504

- Roller Assemblies
  - Roller Bearing, 2 per straight roller, 4 per curved split roller Part Number B500295-1
  - Shaft Bearing, 2 per shaft Part Number B700293-F

- Roller Sprocket, 1 per roller
  - Part Number B501931-SS (US)
  - Part Number BC04502 (Can.)

- Idle Sprocket
  - Part Number B501179

- Sprocket Bearing
  - (not shown)
  - 2 required per sprocket Part Number B502134

- UHMW Chain Guide - specify length required
  - Straight sections Part Number B501841
  - Curved sections Part Number B501842

- Chain, specify length
  - Part Number B500285 straight
  - Part Number B500285-SB curved

- Master Link (not shown) 1 per chain Part Number B501252
- Half Link (not shown) 1 per chain Part Number B503059
MAINTENANCE, cont.

Parts illustrated are for US versions unless otherwise noted. Systems manufactured at our Canadian facilities may have custom application components. For parts not listed here, please call Bi-line Service with the job name and parts details.

GRAVITY ROLLER CONVEYORS

General Gravity Roller Layout and Parts

Gravity Roller Assembly with Hex Shafts
- Roller Assembly, single: Part Number B702734 - specify length, PVC or SST, and shaft material
- Roller Assembly, double: Part Number B702760 - specify length, PVC or SST, and shaft material
- Hex Shaft: Part Number B502732 - specify length and material (aluminum or stainless steel)

For Canadian manufactured units:
- Roller with shaft, 14.88 inch: Part Number BC04498
- Roller with shaft, 20.0625 inch: Part Number BC04499
- Roller with shaft, 10 inch: Part Number BC04500

END DRIVE CHAIN ROUTING

Drive Chain Tension Adjustment
Loosen the attaching bolts and move the gearmotor in its slots in the direction required to adjust the drive chain. Be sure to maintain proper chain alignment! The chain should have a slight amount of slack when properly adjusted. Tighten the securing fasteners.

POWER ROLLER CONVEYORS

UNDERSLUNG DRIVE CHAIN ROUTING and TENSIONING (Motor mounted below table level, BOM 701205-1 & -2)

Drive Chain Tension Adjustment
Loosen the sprocket slide bracket jam nut on the jack screw. Adjust chain tension by turning the jack screw which causes the sprocket glide block (not shown) to move inward and outward in its slots. The chain should have a slight amount of slack when properly adjusted. Tighten the jam nut.

END DRIVE CHAIN ROUTING

Drive Chain Tension Adjustment
Loosen the attaching bolts and move the gearmotor in its slots in the direction required to adjust the drive chain. Be sure to maintain proper chain alignment! The chain should have a slight amount of slack when properly adjusted. Tighten the securing fasteners.

Table Limit Switch
Part Number 111165

Switch Spring Rod
Part Number 111166

Drain Strainer, 6 inch
Part number 304816

Drain, with tail piece (not shown)
Part Number 0503928

General Gravity Roller Layout and Parts

Gravity Roller Assembly with Hex Shafts
- Roller Assembly, single: Part Number B702734 - specify length, PVC or SST, and shaft material
- Roller Assembly, double: Part Number B702760 - specify length, PVC or SST, and shaft material
- Hex Shaft: Part Number B502732 - specify length and material (aluminum or stainless steel)

For Canadian manufactured units:
- Roller with shaft, 14.88 inch: Part Number BC04498
- Roller with shaft, 20.0625 inch: Part Number BC04499
- Roller with shaft, 10 inch: Part Number BC04500

END DRIVE CHAIN ROUTING

Drive Chain Tension Adjustment
Loosen the attaching bolts and move the gearmotor in its slots in the direction required to adjust the drive chain. Be sure to maintain proper chain alignment! The chain should have a slight amount of slack when properly adjusted. Tighten the securing fasteners.

POWER ROLLER CONVEYORS

UNDERSLUNG DRIVE CHAIN ROUTING and TENSIONING (Motor mounted below table level, BOM 701205-1 & -2)

Drive Chain Tension Adjustment
Loosen the sprocket slide bracket jam nut on the jack screw. Adjust chain tension by turning the jack screw which causes the sprocket glide block (not shown) to move inward and outward in its slots. The chain should have a slight amount of slack when properly adjusted. Tighten the jam nut.
CONTROL PANEL COMPONENTS

NOTE! The actual layout and quantity of control components will vary with the configuration of the conveyor system, the number of conveyor drives, and the options installed.

CONTROL CABINET INTERIOR COMPONENTS - General Configuration

Shown is a general layout of components and their approximate locations. The number and types of components and the presence of timers will vary with conveyor types, system configurations, and optional equipment. Not all components shown will be present in all configurations.

- **Control Transformer**
  - 230V: Part Number B500104
  - 460V: Part Number B502471

- **AC Variable Speed Drive 1**
  - Motortronics: 230V P/N B501018
  - 460V P/N B502467
  - Mitsubishi: 230V P/N B502437

- **Fuse Blocks**
  - 250V: Part Number B500793
  - 600V: Part Number B500792

- **Fuses for 24 Volt**
  - 1 amp: P/N B500801
  - 2 amp: P/N B500802

- **Fuses for 600 Volt**
  - 1 amp: P/N 112901
  - 10 amp: P/N 100913

- **Relay Sockets, each**
  - Part Number B500598

- **Relays, each**
  - 24VAC 4 Pole
    - Part Number B500604

- **Repeat Cycle Timer**
  - Part Number B500608

- **Timer Socket**
  - (not shown)
  - Part Number B500599

- **Control Panel Components**

Conveyor Manual Advance Station
- Palm Switch Assembly: Part Number B501611
- Enclosure: Part Number B502283

Remote START-STOP enclosure: P/N B502284

START

STOP

Green Push Button

Red Push Button

PILOT LAMPS, each
- Part number B502176

230V CIRCUIT BREAKER/DISCONNECT
- Part Number B500138

230V COVER BOOT
- Part Number B5000338

OR

480V DISCONNECT OPERATOR (on door)
- Part Number B5000621

480V DISCONNECT, 4 pole (inside cabinet)
- Part Number B500622

CONTACT BLOCK N.O.
- Part Number B502107

CONTACT BLOCK N.C.
- Part Number B502108

CONTACT BLOCK MOUNTING ADAPTER
- 1 required per pushbutton
- Part Number B502106

Pushbutton parts also used in Remote START-STOP Stations.

Base electrical cabinet BOM numbers are B701354 for 18 inch, and B701355 for 24 inch.
CHECK THE MOTOR AND GEARBOX EVERY 6 MONTHS for leakage and oil level. Make sure the motor ventilation is not blocked with debris, lint, residue, etc.

If adding oil, do not mix oil types. If changing the oil, flush the gearbox with petroleum oil until all traces of contaminants are removed. Replace the drain plug and fill to the proper level with the recommended oil and replace the fill plug. Do not overfill.

Gearmotor Service Intervals
It is recommended that the gearbox oil be changed after the first 250 hours of operation, and thereafter every 10,000 hours for mineral oils, and every 20,000 hours for synthetics. Do not overfill.

TYPICAL LUBRICANTS for all gearboxes
Oils VG220, CLP 220, PGLP 220, and PGLP 460 complying with DIN 51502 and 51517 are suitable. DO NOT MIX OIL TYPES!

Suggested oils for all gearboxes
Mineral oils: Shell Omala EP220 or equivalent
Synthetic oils: Shell Omala HD220 or equivalent

NOTE! DO NOT MIX OIL TYPES in service or as waste! Synthetic oils with a polyglycol base (PGLP, etc.) must be kept separate from mineral oils and are to be disposed of as special waste.
NOTES

Revisions:
Add information for Canadian versions and update Operation section for clarity.
Correct and update part numbers as per updated Bills of Materials
ROTARY TRAY ACCUMULATOR
OPERATION AND MAINTENANCE MANUAL

INSTALLATION
Getting started ................................................................. 4-1
Accumulator pan, tray return window, riser ........................................ 4-2
Base leg assemblies, accumulator panels ........................................... 4-3
Carrier panels ........................................................................ 4-4
Wireform carriers, sight/sound barrier, overshelf, wiring ................... 4-5
Tray return load fault sensor positioning ........................................... 4-6

OPERATION
Operation ............................................................................... 4-7
Basic operator panel and quick reference ........................................... 4-8
Cleaning ............................................................................... 4-9

MAINTENANCE
Maintenance and care ................................................................ 4-10
Drive system components ................................................................. 4-11
Control cabinet and operator panel components ................................ 4-12

NOTE: Electrical schematics are stored in the control cabinet and should remain there for use by service personnel.
GENERAL INSTALLATION, OPERATION, AND CARE PROCEDURES FOR ROTARY TRAY ACCUMULATORS

Due to the custom design nature of kitchen layout and dish handling systems, this is a general guide to component installation and is intended to give the installer a fair assessment of what to expect as the installation progresses. Always refer to the P&E drawings to determine the actual layout and combination of components, and which instructions will apply to the particular installation. Failure to follow the installation guidelines could compromise warranty considerations on the part of the manufacturer.

Getting started
Locate all the parts of the accumulator and all its accessories. Use the P&E drawings to identify all the components and verify how all the components fit together.

Note!
Before you begin the installation, read the Installation and Start-up Overview guidelines FIRST!

The accumulator end of the sight/sound barrier rests on this cover. See P&E drawings for details.

Standard overshelf brackets attach to the scrapping side of the Top Cover. See P&E drawing for details.

Side View

All panels and covers are secured by truss head screws.
Accumulator Pan and Tray Return Window Sill
Depending on the particular configuration, the tray return window sill and the adjoining accumulator pan are usually installed first and leveled to specification since the rest of the accumulator components will be adjusted in reference to these pieces. Once the accumulator and other components are set in place and welded, only minor adjustments to the table and sill components will be possible. The other window components will have to be fitted to the opening and welded and finished to specification.

NOTE! The accumulator table may be a single assembly or it may be two or more tables that must be joined by welding and the weld seams finished. Always refer to the P&E drawings for details.

- Set the return window sill portion of the table in place and, if separate, fit the adjoining components to it and level the components by adjusting the base feet.

- Once the table piece and the window opening components are in place and set to final specification, determine whether or not it may be best to go ahead and weld these components now. Once the next components to be installed are set in place, it will become difficult to adequately access the bottom side of the table and window interface, or to make any adjustments.

- Set the component sections in place as necessary, then align and level to specs. Check for proper alignment and fit, and then tack weld the sections together, recheck alignment and level, then complete and finish the welds. Keep in mind that the fit and finish of the table welds, especially at the accumulator riser, will affect the fitting of the tray accumulator to the table. **NOTE! The table must be straight, level, and square where the accumulator frame bolts to it. (See illustration)**

*NOTE! Layout configurations are custom and will vary from one installation to another. See P&E drawings.*
The stainless hardware used to attach the accumulator to the riser may be packed in a bag secured to the frame rail. If not, it will be installed in the lower frame rails of the accumulator. If so, remove the stainless hardware that is placed in the lower internal frame rail.

- Set the accumulator frame on top of the riser, align the fastener holes, and center it to the table and the window opening.

- Re-check the alignment of the accumulator with the window and the riser. Locate the holes/slots punched into the lower frame rails of the accumulator where it rests on the table. Install the stainless hardware and secure the accumulator to the riser flange and the base leg top flanges.

Accumulator Side and End Panels

These must be installed before the Carrier Panels can be hung.
Carrier Panels and Wireform Carrier Baskets

Install the accumulator side and end panels (see the Side Panel View, Page 3). Install the screws at the top and bottom flanges that hold the carrier panels to the upper and lower frame rails respectively.

Wireform Carrier Baskets

The wireform carrier baskets attach to the carrier panels by inserting the dog-leg bends of the carrier into the holes on the carrier panels and allowing the baskets to rest properly against the panels. The carrier baskets are designed for transporting one tray per basket.

Illustrations are not to scale
Sight/Sound Barrier
The Sight/Sound Barrier is custom constructed to meet the specific characteristics of the particular installation. Refer to the P&E drawings for details on the type of barrier and its mounting details.

- Locate the sight/sound barrier assembly and its mounting pieces. The wall end of the barrier must be centered with the tray return window and is usually secured to the inside wall above the window with anchors, and to the top center panel of the accumulator.

- Once the return window installation is complete, install any control system electronic sensors in the window opening and connect the wiring. See the Tray Fault Sensor Positioning page.

- After the sight/sound barrier is in place, locate the gray NEMA 4 electrical box located on the sight/sound barrier. The wiring in the gray electrical box is to be run from the box to the accumulator main power control panel.

Tubular Overshelf with Rinse Spray
If there is an overshelf to be installed, there will be vertical tubing with tubular sockets and horizontal brackets to go with the spray unit shelf. There are two types of brackets that tie the overshelf to the accumulator. Refer to the P&E drawings to determine which type of brackets and attachments are a part of this installation.

- One type bolts to or is welded to the top side panels. **NOTE! If the overshelf brackets are bolted through the top side panels of the accumulator, the bolts must be located above the drive chain to ensure proper clearances.**

- The second type is secured to the top center panel of the accumulator. The actual method of attaching this style of bracket to the accumulator top panel will vary according to the custom design aspects of the sight/sound barrier.

- Place the vertical tubes in the table sockets, but do not tighten the set screws until all the overshelf parts are installed and aligned. The tubular socket of the bracket is to be placed over the upper end of the vertical tubing, and the accumulator end of the bracket is to be bolted through or welded to the appropriate panel of the accumulator.

- The overshelf brackets are adjustable for length if necessary by loosening the screws in the adjustment slots near the vertical tube end of the brackets, and sliding the outer portion toward or away from the tubing. Once the overshelf is adjusted to the desired position, check the level as you tighten the fasteners on the brackets and the set screws in the leg sockets.

Electrical Wiring

- Connect all machine interconnect wiring at the appropriate junction boxes, then connect the machine wiring to the conveyor control panel. Wire numbers are applied at all junction and terminal block points.

- Make sure that all the wiring is properly secured in the wireways, boxes, and flexible conduit, and ensure that the flexible conduit is secured so as to prevent interference with the mechanical components.

- Connect the service wiring to the main control panel, ensuring that all wiring meets all applicable utility codes.

Other Utilities
Follow the guidelines contained in the Installation Overview section for all other utility concerns.
TRAY RETURN LOAD FAULT SENSOR POSITIONING

Depending on configuration, the sensor may be machine-mounted on a bracket assembly or it may be located on the interior wall of the accumulator room above the return window. Positioning requirements for proper operation are the same regardless of the mounting methods.

The sensor face surface should be approximately even with the top of the window opening.

If signal falsing is experienced, the sensor may be receiving reflections from the stainless steel surfaces of the window opening components.

To eliminate any reflections from the stainless steel surfaces of the window header, move the sensor downward and/or inward until the face is just below the edge of the window header and far enough away from the vertical surfaces to avoid side reflections.

Illustrations are not to scale
OPERATION

ACCUMULATOR CONTROLS
The Accumulator control panel should be located near the first work station for convenience and safety concerns. The panel may also contain the controls for more than one conveyor. Consult the instructions for each type of conveyor for the respective details of operation.

- **Optional Conveyor START-STOP Stations**
  Depending on system layout and options chosen, there may be optional START-STOP stations located at work stations. Each START-STOP station will operate only one conveyor system.

- **Optional Conveyor Advance Switches**
  For any accompanying belt conveyors.
  If one or more belt conveyors are supplied to carry soiled dishes away from the accumulator, these conveyors can run automatically or may be equipped to operate only on demand. See the operating instructions for the particular conveyor for more information.

- **Tray Loading Sensor**
  A sensor is placed above the tray return window area to detect improperly loaded trays or obstructions in the carrier basket path. When an improperly positioned object comes into the range of the sensor, the accumulator drive circuit is interrupted and the accumulator stops. When the obstruction is removed, the drive signal is restored and the accumulator resumes operation.

Tray Loading
The wireform carrier baskets are designed for **ONE (1)** tray only. The practice of loading the carrier baskets with more than one tray at a time will cause the loading to be unstable, will encourage further overloading, and will only increase the ware handling time. More importantly, overloading will compromise the drive system performance.

Conveyor Speeds
Work station dwell time and system accumulation capacity along the routes of the various conveyors will be factors in determining the most efficient speeds for the conveyors. The variable speed feature of the conveyors will allow the conveyor speeds to be set to match work station demand and to avoid ware handling jams.

**Conveyor Shut-off and Conveyor Jam Switches for any accompanying conveyors.**
Rotary tray accumulators can be accompanied by belt conveyor systems that carry the soiled dishes away from the accumulators after scrapping. The conveyors can be equipped with optional conveyor jam switches and conveyor shut-off switches. The switches can take the form of an electronic or optical sensor, or they may be a simple mechanical lever limit switch type.

- **Conveyor Shut-Off switches** will stop the particular conveyor when a rack or dish moves past the sensor or contacts the shut-off bar. This arrangement allows the personnel time to accomplish a task before restarting or advancing the conveyor. To restart the system, clear the shut-off switch and press the **START** pushbutton, or press and hold the **Conveyor Advance** pushbutton (if equipped) until the next objects reach the work station.

- **Conveyor jam (if equipped)** switches will allow the passage of articles which are in proper position on the conveyor but will stop the conveyor when an object or a carrier that is out of place passes the sensor or contacts the switch lever or bar. To restart the conveyor, clear the obstruction and press the **START** pushbutton or the **Conveyor Advance** pushbutton (if equipped).
BASIC OPERATOR PANEL

There may be controls for other conveyors located on this panel. Shown below is the basic control configuration for the Rotary Tray Accumulator. Consult the operating instructions for any other conveyors that may be controlled from this panel.

Typical Conveyor Control Panel Layouts

This pushbutton STARTS the accumulator.
Always make sure that the conveyor is clear to operate before pressing this button!!! Secure all scrap pans and trays in place and close all access doors before starting any conveyor. Failure to do so could result in injury or damage or both.
Optional remote operator stations for this conveyor operate in the same manner.

RED pilot lamp indicates when the accumulator is activated.

This pushbutton STOPS the accumulator.

CIRCUIT BREAKER
Turns ON main power to all the components in the control cabinet.

Main DISCONNECT

Optional* RED pilot lamp indicates there is something physically interfering with the accumulator operation and that the conveyor has stopped. Clear the problem and press the START button if necessary to resume operation.

The speed control allows the operator to vary the speed of the accumulator to accommodate system loading.

Typical Conveyor Control Panel Layouts

Multiple conveyors with optional controls for primary

Multiple conveyors with optional controls for both

Conveyor Manual Advance Station

Remote START-STOP

START
GREEN
CARRIER JAM
TRAY LOAD FAULT
SPEED
STOP
RED

RED pilot lamp indicates a tray loading problem or other obstruction on the tray return side of the accumulator and that the conveyor has stopped. The sensor is located inside the upper portion of the return window frame. Clear the fault and the conveyor will resume operation.
CLEANING THE ACCUMULATOR

For proper sanitation and good maintenance practices, the accumulator and accompanying tables and troughs should be cleaned at the end of every work shift and readied for the next. The cleaning process offers a good opportunity to inspect and make note of any maintenance issues that may occur.

CAUTION!

Solutions used during the warewashing or cleaning processes should be regularly checked for pH levels. Any pH value below 4.5 or above 9.0 will damage the stainless steel and plastic parts of the machines. Solutions containing chlorine, ammonia, or phosphoric acid are not recommended. If it is necessary to use a strong solution to clean the surfaces, the residue should be thoroughly flushed away from all surfaces and components immediately, and the surfaces should be wiped down with a soft cloth to prevent damage to the components and to avoid water spotting.

CLEANING PROCEDURES

Do not apply a direct hose spray to any of the accumulator surfaces above the top level of the carrier panel surfaces as the water may enter or splash up into the drive system.

- Remove the wire carrier baskets from the carrier panels as necessary and clean them with soap and water to remove any food particles and debris. Rinse the wire baskets with plenty of clean water and allow them to dry in a clean location.

- Use a soft wet cloth and soap and water to thoroughly clean the carrier panels in place. Lightly rinse away any soap or cleaning solutions with a gentle hose stream to the carrier panels from an angle above the top of the panels.

- Use a gentle hose stream to wash debris from the bearing areas on the carrier panel roller assemblies.

- Thoroughly clean and rinse the accumulator table and window sill pan.

- Thoroughly clean and rinse the overshelf units, scapping tables and troughs. Perform the proper cleaning procedures on other conveyors, tables, and accessories in the system, such as disposal units and pulpers according to the manufacturers’ recommendations.

- Remove any standing water on the table surfaces. If you have used any cleaning solutions in the process, be sure to remove any remaining traces or damage and spotting will occur.

- Wipe down all the cleaned conveyor and table and accessory surfaces with a clean cloth that is sufficiently dry as to not leave streaks and spots.

- Place the wire carrier baskets back on the carrier panels when the cleaning process is completed.
ACCUMULATOR MAINTENANCE AND CARE

The accumulator is relatively maintenance free, and unless a problem is indicated, a complete maintenance inspection every six months and proper lubrication is all that is required. Keeping the accumulator clean goes a long way toward extending the service life.

DAILY
At the end of the workday, check the accumulator for any signs that maintenance might be required, and look to see that there are no damaged or worn components. If there are any unusual noises or operating malfunctions with the accumulator, report them to maintenance personnel as soon as possible for inspection. Follow the cleaning recommendations in the Cleaning section of this manual.

EVERY SIX (6) MONTHS

- Remove the accumulator's drive cover and inspect all the components of the drive system for wear or damage. Replace any worn parts as soon as possible since worn components will accelerate wear on the other system components and increase operating expenses.

- Check the drive motor and gearbox for accumulated dust and obstructed ventilation passages. Remove any oily residue and dust from the exterior of the motor. Oily residue will cause dust to build up and potentially block proper ventilation. If leakage is found, make a determination of the source and whether or not any major maintenance is needed.

<table>
<thead>
<tr>
<th>TYPICAL LUBRICANTS for all gearboxes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oils VG220, CLP 220, PGLP 220, and PGLP 460 complying with DIN 51502 and 51517 are suitable. <strong>DO NOT MIX OIL TYPES!</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Suggested oils for all gearboxes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mineral oils:</strong> Shell Omala EP220 or equivalent</td>
</tr>
<tr>
<td><strong>Synthetic oils:</strong> Shell Omala HD220 or equivalent</td>
</tr>
</tbody>
</table>

**NOTE! DO NOT MIX OIL TYPES in service or as waste!** Synthetic oils with a polyglycol base (PGLP, etc.) must be kept separate from mineral oils and are to be disposed of as special waste.

- Inspect the drive chain, the sprockets and dogs, the caterpillar chain tension, and conveyor track for wear. Proper chain tension is set during factory assembly and should need no further adjustments.

- The caterpillar chain should require little or no resetting of tension. Do not run the accumulator with a chain that is too loose or too tight. Doing so will inhibit proper accumulator operation and will cause severe damage to the drive system and tracking components. Contact Bi-line Service before attempting to reset chain tension. A loose chain may indicate a drive system problem.

- Drive chain lubrication done at the factory should be sufficient for most applications. Any lubricating of the chain in service should be limited. Contact Bi-line Service before lubricating the Drive Chain or the Caterpillar Chain.

- Check for and properly tighten any loose fasteners, and replace any missing fasteners.
**CATERPILLER CHAIN**

**CONVEYOR TRACK**

**TOP VIEW**

**SIDE VIEW**

**DRIVE CHAIN**

**NOTE:**
ENGAGE CONVEYOR CHAIN & DRIVE CHAIN DOG ONLY AS SHOWN TO PREVENT DAMAGE.

**CHAIN TENSION**
Grasp pendant between thumb and forefinger at least 2 feet past the drive in the direction of travel and pull back and forth. Proper tension should permit approximately +/- 0.25 inch of movement. Call Bi-line Service before attempting to adjust the drive chain or the caterpiller chain.

**CHAIN BREAKING LOAD IN EXCESS OF 4,000 lbs.**
CONTROL PANEL COMPONENTS

NOTE! The actual layout and quantity of control components will vary with the configuration of the conveyor system, the number of conveyor drives, and the options installed.

Pushbutton parts also used in Remote START-STOP Stations.

CONTROL CABINET INTERIOR COMPONENTS - General Configuration

Shown is a general layout of components and their approximate locations. The number and types of components and the presence of timers will vary with conveyor types, system configurations, and optional equipment. Not all components shown will be present in all configurations.

Base electrical cabinet BOM numbers are B701354 for 18 inch, and B701355 for 24 inch.
4-NOTES

Update control panel information and add part numbers. Replace old style accumulator section with new style.
SLAT and KNUCKLE BELT CONVEYORS
OPERATION AND MAINTENANCE MANUAL

INSTALLATION
Return Monorail ................................................. 5-1

OPERATION
Control panel layout ............................................. 5-2
Operation .............................................................. 5-3

CLEANING
Cleaning and precautions ....................................... 5-4

MAINTENANCE
Conveyor types and parts ....................................... 5-5
Drive cabinet and wash chamber .............................. 5-7
Belt wash system .................................................... 5-10
Control panel and electrical cabinet parts .................... 5-11
Gearmotor maintenance .......................................... 5-12

Note: Electrical schematics are stored in the electrical cabinet and should remain there for use by service personnel.
SLAT BELT and KNUCKLE BELT CONVEYORS

NOTE!

READ THESE INSTRUCTIONS BEFORE INSTALLING OR OPERATING THE CONVEYOR SYSTEM!

Use the P&E drawings to identify all the components in the system, their orientations to each other, and verify how all the components fit together. Check the dimensions of the space and compare it to the P&E drawings. If there are discrepancies, notify Bi-line immediately before going further.

Return Monorail Installation for US versions - Follow the INSTALLATION OVERVIEW section for general instructions installation.

*NOTE: This type of UHMW plastic guide is also used on the table surface in turns to trap the belt and ensure that it moves without corner binding. Due to the custom nature of the applications, there may be other types of bracketry in place along with those shown above. Units manufactured in our Canadian facility may differ slightly from these illustrations. For all replacement guides, brackets, and drain pan parts, call Bi-line Service.
**Return Monorail Installation, cont.**

**Operation**
- There may be controls for other conveyors located on this panel. Shown below are the basic control configurations. Consult the instructions for any other conveyors that may be controlled from this panel.

**Before starting the conveyor,**
- Turn on the main disconnect switch on the control panel
- Open any drain valves as necessary
- Open any water shutoff valves as necessary
- Check detergent solution level
- Make sure the conveyor system is clear to operate

---

**Installation tips**
- All table sections must be properly aligned and leveled before the tables are joined or the belt will not track properly and could jam.
- Return track sections, especially turns, must be checked and properly aligned before the tables and tracks are joined.
- The return drain pan sections must be properly aligned under the return track and lapped in the direction of the flow (toward the tail tank) or the pans will leak. Each succeeding return pan section should be lapped under the preceding section and sealed.
- Apply silicone sealant to the lapped ends where necessary at final fitting, assemble, and allow the sealant to cure before start-up begins.

**Don’t forget! Before you set the conveyor in its final location,**
- Are there any utility connections, switches, covers, or other components that mount on the wall side that need to be in place?
- Has sealant been applied where necessary in places that will not be accessible once set in place?
- Have all components supplied by others that are to be fitted to the conveyor system before it is set in place been completed?

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**Canadian versions**

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Top Track Guide</strong> - Straight</td>
<td><strong>Return Track Guide</strong> - Straight</td>
</tr>
<tr>
<td>Part Number BC04481</td>
<td>Part Number BC04480</td>
</tr>
</tbody>
</table>

**Curve Belt Guides** – 1 each required

- Inside curve  Part Number BC04482
- Outside curve  Part Number BC04483

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**OPERATION** - There may be controls for other conveyors located on this panel. Shown below are the basic control configurations. Consult the instructions for any other conveyors that may be controlled from this panel.

**Typical Conveyor Control Panel Layouts**

**Multiple conveyors with optional controls for primary**

**Multiple conveyors with optional controls for both**

**Conveyor Manual Advance Station**

---

**Before starting the conveyor,**
- Turn on the main disconnect switch on the control panel
- Open any drain valves as necessary
- Open any water shutoff valves as necessary
- Check detergent solution level
- Make sure the conveyor system is clear to operate

---

**continued on next page**
OPERATION, cont. Before beginning operation, read this page carefully!

This pushbutton STARTS the conveyor.

Always make sure the conveyor is clear to operate before starting!!! Secure all removable scrap pans and screens in place and close all access doors before starting the conveyor. Failure to do so could cause injury or damage or both.

For Manual Advance conveyors, the START switch on the main panel or on the Remote station must be pressed before the black pushbutton on the Manual Advance Station will advance the conveyor. See Manual Advance Station below.

Optional Remote START-STOP stations may be located at any point along the conveyor route. The START-STOP switches operate in the same manner as the START-STOP switches on the main control panel. For Manual Advance conveyors, the START switch on the main panel or on the Remote station must be pressed before the black pushbutton on the Manual Advance Station will advance the conveyor.

Manual Advance Station. These stations are usually positioned at workstations along the conveyor route. The conveyors controlled by these stations will advance only as long as the black pushbutton is pressed.

To operate, press the green START pushbutton for that conveyor on the main panel or a remote START-STOP Station to enable the conveyor, then press one of the black conveyor advance pushbuttons to advance the conveyor. Note: The belt wash and rinse systems (if equipped) on these conveyors will operate only while the advance pushbutton is being pressed.
CLEANING

Do not spray water directly into any switches, optical detection devices, or electrical panels or boxes.

NOTE! Solutions used during the warewashing or cleaning processes should be regularly checked for pH levels. Any pH value below 4.5 or above 9.0 will damage the stainless steel and plastic parts of the machines. Solutions containing chlorine, ammonia, or phosphoric acid are not recommended. All cleaning solutions should be thoroughly flushed away from all surfaces and components immediately to avoid corrosive damage to the components, and the surfaces should be wiped down with a soft cloth to avoid water spotting.

- **At the end of each meal period**, allow the belt wash system to complete at least one cleaning cycle, then turn the conveyor off by pressing the STOP button and turning OFF the Main Disconnect.
  - Hose down the inside of the drive and tail tanks, and then empty and clean the scrap baskets. **CAUTION! The conveyor should be stopped before placing hands inside the drive or tail end tanks!** Make sure the drains are clear and free flowing.
  - Turn the Main Disconnect ON, start the conveyor, and allow the belt wash system to cycle completely through at least one wash and rinse cycle.

- **For shut down or at the end of the work shift**.
  - For automatic systems, allow the belt wash system to completely cycle before shutting down the conveyor.
  - For manual advance conveyors, press and hold the black button in until the entire length of the belt has been washed and the rinse portion of the cycle has stopped, then stop the conveyor system and turn off power at the control panel. The belt wash/rinse cycle can take up to several minutes to complete, depending on the length of the conveyor.
  - Thoroughly wash down the conveyor system, the tables, and the trough system and drains, including the conveyor return tracks and return trough under the table. **Do not spray water directly into any actuators switches or optical detection devices mounted on the equipment or electrical panels or boxes.**
  - Thoroughly wash the food debris from the belt return rollers and any trough skate wheels, especially in the roller and skate wheel bearing areas. Debris must be kept out of these bearing areas in order for the rollers and wheels to turn easily.
  - Use a soft cloth to wipe any debris or film buildup from the lens surfaces of any optical detection devices mounted on the table system. **Do not use abrasives or dirty wiping cloths on the lenses.**
  - Open the access doors on the drive and tail tanks and use a hose to gently clean the interiors of the tanks of all debris. Allow the scrap screens to catch the debris removed in the process. Make sure the drains are clear and free flowing.
  - Remove the scrap screens, clean them thoroughly, and then replace. Make sure the screens are properly seated.
  - Remove the spray manifolds by loosening the nut on the large plastic union inside the tank, clean out any debris inside the pipes and spray jets, then replace.
**Cleaning, continued**

- Wipe the table surfaces down with a soft clean cloth to prevent spotting.

**CONVEYOR SLATS and LINKS**

**CAUTION!** Strong solutions used during the warewashing or cleaning processes should be regularly checked for pH levels. **Any pH value below 4.5 or above 9.0 will damage the stainless steel and plastic parts of the machines.** If it is necessary to use a strong solution to clean the surfaces, the residue should be thoroughly flushed away from all surfaces and components immediately, and the stainless surfaces should be wiped down with a soft cloth to prevent damage to the components and to avoid water spotting.

The conveyor slats can be removed and replaced without having to remove the conveyor from the tables. Damaged and sufficiently warped slats can cause cutlery and flatware to catch and damage other slats and components in the system and should be replaced as soon as possible.

**Pin and Slat type**

The pin type slat is directional and is designed primarily for straight conveyor runs. The belting is available in various widths and is constructed from HDF plastic slats connected together with stainless steel pins. Type HDF plastic is a low-friction wear-resistant and self lubricating material that does not require maintenance beyond cleaning.

The undersides of the slats are marked **OUT** and **IN**. The symbols indicate the direction that the pins should be installed and removed, and the lines on the “IN” symbol indicate the splined end of the pin.

Remove the pins from the affected slats and the adjoining slats as necessary by placing a small straight punch into the “OUT” end of the pins and tapping the punch with a hammer to drive the splined portion of the pin out of the slat. To install the pin, insert the pin into “IN” side of the slat and tap into position until the pin is fully seated.
**Chain and Slat type**

To replace the slats, place the portion of the chain where the slat is to go on a solid surface or object small enough to fit between the tabs on the slat. Do not use anything under the chain that has sharp or pointed surfaces that could dent, scratch, or damage the conveyor table or damage the chain. Align the cleared areas in the slat with the pins on the chain and use the heel of your hand to give the top of the slat a sharp smack to seat the slat onto the chain pins.

**Knuckle Belts**

The knuckle belt conveyor has two types of plastic knuckle links connected together with stainless steel knuckle pins. The pins are spline punched on the ends to grip the inside of the hole for the pin in the plastic link. The tabbed “drive” links are the same design as the knuckle links with the addition of a raised tab on the top side that contacts with the lower edge of the rack and pulls or pushes the racks along the conveyor surface. Drive link spacing will vary with the customer requirements.

If it is necessary to separate the links, the pins can be driven out with a punch and a small hammer. When re-installing the pins, it is suggested that you make sure the pins are rotated in the holes so that the punched edges of the pin do not line up with any previous score marks.

Do not lubricate the belt chain! It is designed to run “clean” to meet health and sanitary regulations.

Illustrations are not to scale.

If replacing belt sections, two (2) master links Part Number B501252 will be required.

---

**Knuckle belt** Part Number B504433 - specify the length and the number of standard links between knuckle links or the distance in inches between knuckles.
**DRIVE CABINET and WASH CHAMBER with SCRAP BASKET**

Components will be reversed between Right-to-Left and Left-to-Right configurations.

---

**Drive Chain Sprocket**, 2 per conveyor  
Part Number B500276-S

**Shaft Key, SS** (not shown) 1 per sprocket  
Part Number B301060

*Belt Return Roller* (inside tank, not shown)  
12.25 inch  Part Number B701142-10R  
12.00 inch  Part Number B701142-12R  
23.25 inch  Part Number B701142-21R  
Bearing  Part Number B500295

---

**Drive Chain**, sold per foot  
Part Number B500754S

**Master Link**, 1 per chain  
Part Number B500380S

**Half Link**, 1 per chain  
Part Number B503059

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**Belt Return Roller**, rubber coated or SS. Some systems may have custom components and roller lengths and materials may vary accordingly. Measure carefully and confirm the length before ordering replacements. Call Bi-line Service with roller dimensions and job name when necessary.

- Plastic Plug ½ inch (not shown) 4 each required  
  Part Number 108418
- Plastic Plug Nut, (not shown) 4 each required  
  Part Number 108417
- Fiber Washer, (not shown) 4 each required  
  Part Number 109034
- Magnetic Door Catch (not shown) 2 per cabinet  
  Part Number 109988

**Scrap Screen**, 1 inside each tank.  
Part Numbers listed below. See daily cleaning instructions.

- Dual 7.5 and 10 inch  Part Number B701802-1  
- Single 12 inch  Part Number B701802-2  
- Single 7.5 and 10 inch and Knuckle Belt conveyors  Part Number B701802-6

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**Do not lubricate slat belt chain. It is designed to run “clean” to meet health & sanitary regulations.**

**Anti-Jam Plate**  
For 7.5 or 10 inch single belt  
Part Number B701445-S10

For 12 inch single belt  
Part Number B701445-S2

For Dual 7.5 or 10 inch belts  
Part Number B701445-D10

---

**Magnet for Hamlin switch**, Part Number B500260

Magnet mounts on underside of the anti-jam plate here on the end closest to the drive chain cabinet.
**DRIVE CABINET and WASH CHAMBER, cont.**

**Chain and Slat Drive Sprocket**
- 1 per shaft single belt, 2 per shaft double belt
- Part Number B501845 (US)
- Part Number BC04491 (Can.)

**Knuckle Belt Drive Sprocket**
- Part Number B504434

**Drive Shaft**
- Chain & Slat and Knuckle Belts
- Length* Part Number US models
  - 17 inch B500735
  - 19 inch B500735-2
  - 28 inch B500735-3
  
  &ndash; Canadian BC04492
  
  For other shaft lengths, call Bi-line Service with dimensions and job name.

**Chain and Slat Belt Tail (Idle) Sprocket**, 1 per single belt, 2 per dual belt
- Part Number B501845-1 (US)
- Part Number BC04497 (Can.)

**Knuckle Belt Tail (Idle) Sprocket**
- Part Number B504435

**Tail (Idle) Shaft**
- Length* Part Number
  - 12 inch B300937
  - 19 inch B300937-1
  - 23 inch B300937-5
  - 18 inch B300937-6
  
  &ndash; Canadian BC04496
  
  For models equipped with shaft bearings, use P/N 109958
  
  Canadian built models use Part Number BC04494

**Pin & Slat Belt Drive Sprocket**, 2 pieces
- 1 per shaft single belt, 2 per shaft double belt
- Part Number B500669

**Sprocket Key** (not shown) P/N B301060

**Drive Shaft**

**Pin and Slat Belt Drive Sprocket**
- Length* Part Number
  - 17 inch B500735
  - 19 inch B500735-2
  - 28 inch B500735-3
  
  *For other shaft lengths, call Bi-line Service with dimensions and job name.

**Tail (Idle) Sprocket**, 2 piece
- 1 per shaft single belt, 2 per shaft double belt
- Part Number B500664

**Pin and Slat Belt Tail (Idle) Shaft**
- Length* Part Number
  - 17.00 inch B301766
  - 10.25 inch B301766-1
  - 14.00 inch B301766-2
  - 13.00 inch B301766-4
  - 16.25 inch B301766-7

**Collars** required
- Part Number 104713

**Bearing**
- 2 per shaft
- Part Number 109958-S (US)
- Part Number BC04486 (Can.)

**Gasket**
- 2 per shaft (not shown)
- Part Number 104638

**V-ring Seal**
- 2 per shaft (not shown)
- Part Number 109743

**NOTE!** Shaft bearing assemblies are equipped with Zerk type grease fittings and should be checked and lubed at least twice yearly with a multi-purpose grease.
DRIVE SYSTEM MAINTENANCE SCHEDULES

Weekly
- Check all slats or knuckles for proper position and condition. Replace any missing or broken or damaged slats as soon as possible.
- Check for any abnormal noises, belt misalignments, loose fasteners, and operator reports of malfunctions.
- Check for and remedy any water leaks in the plumbing, the table systems, or the accessories.
- Inspect the condition of the controls and check for proper operation.

Monthly
- In addition to the Weekly maintenance inspections, check the flex belt chain tension. While the factory setting for tension is intended for long term service, as with all mechanical devices, the chain and sprockets and guides will require maintenance inspections at regular intervals. If the belt does not track properly, especially in turns, it may be due to improper tension. Inspect the complete belt routing for evidence of wear or damage of the components or other causes and remedy the situation as soon as possible to avoid lengthy downtime and to reduce maintenance expenses.
- Open the drive cabinet and inspect the drive chain and sprockets for wear and tension, then adjust if necessary. If the chain can no longer be adjusted within the range of the chain tensioner, replace the chain. If the tensioner block is worn, replace it. The Drive Chain should be lubricated at least twice yearly with a small amount of suitable multi-purpose grease. Wipe any excess off so as to prevent buildup of dust and debris.
- Do not lubricate the slat belt chain - it is designed to run “clean” to meet health and safety laws and regulations.

Every six (6) months
- Complete all the items in the weekly and monthly schedules and adjust or service as necessary.
- Check the gearmotor assembly as per the instructions in the Gearmotor Maintenance section (Page 12).
- Inspect all the exposed drive system components for wear and lubrication and follow the maintenance guidelines for the components.
- Inspect the tables and base assemblies for position and condition. Take immediate action on any components needing attention.
BELT WASH SYSTEM  See also DRIVE CABINET and WASH CHAMBER

The belt wash system has wash and rinse spray arms located in the wash chamber in the drive cabinet that operates automatically when the conveyor is activated. There is a scrap basket located in the drive tank that will need to be emptied and cleaned at least daily.

The system utilizes a detergent pump mounted in the drive cabinet and controlled by a repeat cycle timer mounted in the control panel that is activated when the conveyor is activated. The Belt Wash System is fed by ½ inch cold and hot water lines entering the drive cabinet. Water temperature and pressure is controlled by a mixing valve (see diagram). The nominal rinse spray water pressure is 15-30 psi and the nominal water temperature is 100 degrees F (37 degrees C). Higher temperatures can cause warping of the belt slats. Use of chemicals with pH less than 4.5 or higher than 9 will damage the conveyor slats!

When the wash timer is activated, the water solenoid valve is opened and the water is applied to both the wash and rinse spray arms. The detergent pump draws detergent from a remote container and injects it into the wash spray arm manifolds. When the wash portion of the cycle ends, the detergent pump stops and the water solenoid remains open for a period set by the timer for rinsing the detergent and debris from the belt. The usual timing is for one complete belt rotation in the wash mode followed by one complete rotation in the rinse mode. The timers can each be adjusted from 0.5 to 6 minutes. Note: Belt wash timers on Manual Advance Conveyors operate only when the black pushbutton on the Manual Advance Station is pressed. To complete a wash – rinse cycle, the Manual Advance pushbutton must be pressed and held for a period that will allow the system to complete two complete rotations.

**Flow Diagram and Parts List**

- **Vacuum Breaker, ¼ inch**
  - Part Number 107069
- **Vacuum Breaker Bracket**
  - (not shown)
  - Part Number 900836
- **Connector, 3/8 tubing to ¼ NPT**
  - Part Number B502032
- **Plastic Tubing, 3/8 inch**
  - Specify length
  - Part Number B500741
- **Chemical Feed Pump**
  - Part Number B500761
- **Spray Pipe Fittings**
  - Part Number 0510881
- **Spray Pipe Kit**
  - 2 per tank, includes nozzles
  - Part Number B701983-4
- **Spray Pipe Nozzles**
  - 3 per pipe (included in B701983-4)
  - Part Number 0508376
- **Needle Valve, ¼ inch**
  - Part Number 050537
- **Solenoid Valve, ¼ inch**
  - Part Number 050537
- **Brass Elbow, ¼ inch**
  - Part Number B500237
- **Brass Tee, ¼ inch**
  - Part Number B500236
- **Plastic Tee, ¼ inch**
  - Part Number B500233
- **Brass Reducing Bushing**
  - Part Number B501813
- **Spray Pipe Nozzles, 3 per pipe**
  - (included in B701983-4)
  - Part Number 0508376
- **Hot and Cold Water Lines**
  - Adjust the Mixing Valve for a temperature of 100 degrees F (38 degrees C). Maintain 15-20 PSI minimum incoming flow pressure.

**Belts**

- **Mixing Valve, 3/8 NPT**
  - Part Number B500743
- **Connector, ¼ NPT x 3/8**
  - Part Number B502032
- **Detergent Solution**
- **Stainless Adapter**
  - Part of Chemical Pump
- **Plastic Connector**
  - Part of Chemical Pump
- **Detergent Solution**
- **Transformer**
  - Part Number B501347
- **Motor**
  - Part Number B501342
- **Tube**
  - Part Number B501343
- **Rotator**
  - Part Number B501344
- **Plate**
  - Part Number B501345
- **Housing**
  - Part Number B501346
- **Spray Pipe Nozzles, 3 per pipe**
  - (included in B701983-4)
  - Part Number 0508376
CONTROL PANEL COMPONENTS
NOTE! The actual layout and quantity of control components will vary with the configuration of the conveyor system, the number of conveyor drives, and the options installed.

GREEN PUSH BUTTON
Part Number B502109

CONTACT BLOCK N.O.
Part Number B502107

RED PUSH BUTTON
Part Number B502110

CONTACT BLOCK N.C.
Part Number B502108

CONTACT BLOCK MOUNTING ADAPTER,
1 required per pushbutton
Part Number B502106

Pushbutton parts also used in Remote START-STOP Stations.

Remote START-STOP enclosure P/N B502284

START
Green Push Button

STOP
Red Push Button

PILOT LAMPS, each
Part number B502176

230V CIRCUIT BREAKER/DISCONNECT
Part Number B500138
230V Cover Boot
Part Number B500338

OR

480V DISCONNECT OPERATOR (on door)
Part Number B500621
480V DISCONNECT, 4 pole (inside cabinet)
Part Number B500622

SPEED CONTROL

Single Conveyor ......................... Part Number B501158
Two Conveyor, single control Knob .... Part Number B501124
Knob only ............................... Part Number B501158-1

Conveyor Manual Advance Station
Palm Switch Assembly Part Number B501611
Enclosure Part Number B502283

CONTROL CABINET INTERIOR COMPONENTS - General Configuration
Shown is a general layout of components and their approximate locations. The number and types of components and the presence of timers will vary with conveyor types, system configurations, and optional equipment. Not all components shown will be present in all configurations.

Control Transformer
230V P/N B500104
460V P/N B502471

Motortronics
230V P/N B501018
460V P/N B502467

Mitsubishi
230V P/N B502437

Fuse Blocks
250V Part Number B500793
600V Part Number B500792

Relays, each
24VAC 4Pole
Part Number B500604

AC Variable Speed Drive 1

Fuses for 24 Volt
1 amp P/N B500801
2 amp P/N B500802

Fuses for 600 Volt
1 amp P/N 112901
10 amp P/N 100913

AC Variable Speed Drive 2
If equipped, see Drive 1 for part numbers.

Repeat Cycle Timer
Part Number B500608

Timer Socket (not shown)
Part Number B500599

Control Transformer
230V P/N B500104
460V P/N B502471

Motortronics
230V P/N B501018
460V P/N B502467

Mitsubishi
230V P/N B502437

Fuse Blocks
250V Part Number B500793
600V Part Number B500792

Relays, each
24VAC 4Pole
Part Number B500604

AC Variable Speed Drive 1

Fuses for 24 Volt
1 amp P/N B500801
2 amp P/N B500802

Fuses for 600 Volt
1 amp P/N 112901
10 amp P/N 100913

AC Variable Speed Drive 2
If equipped, see Drive 1 for part numbers.

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Part Number B500608

Timer Socket (not shown)
Part Number B500599

CONTROL CABINET INTERIOR COMPONENTS - General Configuration
Shown is a general layout of components and their approximate locations. The number and types of components and the presence of timers will vary with conveyor types, system configurations, and optional equipment. Not all components shown will be present in all configurations.

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24VAC 4Pole
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Fuses for 24 Volt
1 amp P/N B500801
2 amp P/N B500802

Fuses for 600 Volt
1 amp P/N 112901
10 amp P/N 100913

AC Variable Speed Drive 2
If equipped, see Drive 1 for part numbers.

Repeat Cycle Timer
Part Number B500608

Timer Socket (not shown)
Part Number B500599

Base electrical cabinet BOM numbers are B701354 for 18 inch, and B701355 for 24 inch.
**Belt Conveyor Gearmotors**

**Polycord Gearmotors and Power Roller**

**Below-Table Gearmotors**

CHECK THE MOTOR AND GEARBOX EVERY 6 MONTHS for leakage and oil level. Make sure the motor ventilation is not blocked with debris, lint, residue, etc.

If adding oil, **do not mix oil types**. If changing the oil, flush the gearbox with petroleum oil until all traces of contaminants are removed. Replace the drain plug and fill to the proper level with the recommended oil and replace the fill plug. Do not overfill.

**Gearmotor Service Intervals**

It is recommended that the gearbox oil be changed after the first 250 hours of operation, and thereafter every 10,000 hours for mineral oils, and every 20,000 hours for synthetics. Do not overfill.

**TYPICAL LUBRICANTS for all gearboxes**

Oils VG220, CLP 220, PGLP 220, and PGLP 460 complying with DIN 51502 and 51517 are suitable. **DO NOT MIX OIL TYPES!**

**Suggested oils for all gearboxes**

- **Mineral oils:** Shell Omala EP220 or equivalent
- **Synthetic oils:** Shell Omala HD220 or equivalent

**NOTE! DO NOT MIX OIL TYPES in service or as waste!** Synthetic oils with a polyglycol base (PGLP, etc.) must be kept separate from mineral oils and are to be disposed of as special waste.
Revisions: May 31, 2006
Add information to Return Monorail page
Update and add part numbers on drive sections to reflect Canadian-built machines.
Consolidate drive shaft and sprocket drawings to one page.
Revise maintenance instructions for clarity and add maintenance schedule page.
Revise Control Panel section for clarity and add part numbers.
Note: Electrical schematics are stored in the electrical cabinet and should remain there for use by service personnel.
**CONTROL PANEL AND OPERATION**

**This pushbutton STARTS the conveyor.** Always make sure the conveyor is clear to operate before starting!!! Secure all scrap pans and screens in place and close and secure all access doors before starting the conveyor. Failure to do so could cause injury or damage or both.

For **Manual Advance conveyors**, the START switch on the main panel or on the Remote station must be pressed before the black pushbutton on the Manual Advance Station will advance the conveyor. See Manual Advance Station below.

**CIRCUIT BREAKER**

Turns main power on and off to the control system and the drive motors.

**MAIN DISCONNECT**

Optional **Remote START-STOP stations** may be located at any point along the conveyor route. The START-STOP switches operate in the same manner as the START-STOP switches on the main control panel. For **Manual Advance conveyors**, the START switch on the main panel or on the Remote station must be pressed before the black pushbutton on the Manual Advance Station will advance the conveyor.

**RED Pilot Lamp**

Indicates the Accumulation or Table Limit Switch has been activated and the conveyor belt is stopped. When the switch arm is cleared, the conveyor will resume.

**GREEN Push Button**

This pushbutton STARTS the conveyor

**RED Push Button**

This pushbutton STOPS the conveyor

**STOP**

**SPEED**

**OPTIONAL** Speed Control allows the operator to vary the speed of the conveyor to meet system loading.

Optional Remote START-STOP stations may be located at any point along the conveyor route. The START-STOP switches operate in the same manner as the START-STOP switches on the main control panel. For **Manual Advance conveyors**, the START switch on the main panel or on the Remote station must be pressed before the black pushbutton on the Manual Advance Station will advance the conveyor.

**Manual Advance Station**. These stations are usually positioned at workstations along the conveyor route. The conveyors controlled by these stations will advance only as long as the black pushbutton is pressed.

**To operate**, press the green START pushbutton for that conveyor on the main panel or a remote START-STOP Station to enable the conveyor, then press one of the black conveyor advance pushbuttons to advance the conveyor. Note: The belt wash and rinse systems (if equipped) on manual advance conveyors operate only while the advance pushbutton is being pressed.
CLEANING

DO NOT SPRAY WATER DIRECTLY INTO ANY ACTUATOR SWITCHES, OPTICAL DETECTION DEVICES, OR ELECTRICAL PANELS OR BOXES.

Strong solutions used during the warewashing or cleaning processes should be regularly checked for pH levels. Any pH value below 4.5 or above 9.0 will damage the stainless steel and plastic parts of the machines. If it is necessary to use a strong solution to clean the surfaces, all residue should be thoroughly flushed away from all surfaces and components immediately. Table surfaces should be wiped down with a soft cloth to prevent corrosive damage to the components and to avoid water spotting.

Keeping the conveyor system clean is essential to proper operation and sanitation guidelines.

For general cleaning,

- Clean stainless steel surfaces with a soft cloth and a mild detergent intended for use with stainless steel.
- Flush with clean water or wipe down with a clean wet cloth, and then wipe dry to avoid streaking and spotting.
- Chlorinated detergents and sanitizing agents will damage stainless steel unless thoroughly flushed or wiped away.

During the work periods, keep the conveyor relatively clean of accumulated debris.

At the end of each meal period or for shutdown, stop the system and turn the power switch off.

- Clean away any accumulated food debris from the table surface including the table surfaces under the belt.
- Clean both sides of the belting with a clean wet towel by gently wiping the belting as it travels with the towel. Advance the belt as necessary to clean all the belt surfaces until the full length of the belt is cleaned.
- If the conveyor is equipped with optical detection devices, DO NOT USE ABRASIVES OR DIRTY WIPING CLOTHS ON THE LENSES.
- Wipe the table surfaces down with a soft clean cloth to prevent spotting.
- Empty and clean the scrap screens and trays, if equipped.
Adjust belt tension at the Take-Up Assemblies by loosening the locknuts on each side of the Tail Pulley shaft and adjusting the nuts on the threaded rods to apply or release tension on the Tail Pulley (P). Proper tension should allow approximately 2 inches of belt lift in the center of the table top. NOTE: When adjusting the take-up, the pulley must be kept in proper alignment or the belt will not track properly in the center of the pulley. When the desired tension is reached and the pulley is properly aligned, secure the fasteners.

Adjust drive chain tension by loosening the four fasteners on the gear reducer case and sliding gearmotor until there is approximately ½ inch of movement in the center of the longest straight section of the chain, then tighten fasteners. Make sure the gearmotor sprockets and drive pulley sprockets are properly aligned with the chain and with each other.
CONTROL PANEL COMPONENTS

NOTE! The actual layout and quantity of control components will vary with the configuration of the conveyor system, the number of conveyor drives, and the options installed.

GREEN PUSH BUTTON
Part Number B502109

CONTACT BLOCK N.O.
Part Number B502107

RED PUSH BUTTON
Part Number B502110

CONTACT BLOCK N.C.
Part Number B502108

CONTACT BLOCK MOUNTING ADAPTER,
1 required per pushbutton
Part Number B502106

Pushbutton parts also used in Remote START-STOP Stations.

Remote START-STOP enclosure P/N B502284

START

STOP

Pilot Lamps, each
Part number B502176

230V CIRCUIT BREAKER/DISCONNECT
Part Number B500138

230V COVER BOOT
Part Number B500338

OR

480V DISCONNECT OPERATOR (on door)
Part Number B500621

480V DISCONNECT, 4 pole (inside cabinet)
Part Number B500622

SPEED CONTROL

Single Conveyor
Part Number B501158

Two Conveyor, single control Knob
Part Number B501224

Knob only
Part Number B501158-1

Conveyor Manual Advance Station

Palm Switch Assembly P/N B501611

Enclosure P/N B502283

CONTROL CABINET INTERIOR COMPONENTS – General Configuration

Shown is a general layout of components and their approximate locations. The number and types of components and the presence of timers will vary with conveyor types, system configurations, and optional equipment. Not all components shown will be present in all configurations.

Control Transformer
230V P/N B500104
460V P/N B502471

Motortronics
230V P/N B501018
460V P/N B502467

Mitsubishi
230V P/N B502437

Fuse Blocks
250V Part Number B500793
600V Part Number B500792

Relays, each
24VAC 4Pole
Part Number B500604

AC Variable Speed Drive 1

Motortronics
230V P/N B501018
460V P/N B502467

Mitsubishi
230V P/N B502437

Fuses for 24 Volt
1 amp P/N B500801
2 amp P/N B500802

Fuses for 600 Volt
1 amp P/N 112901
10 amp P/N 100913

Relay Sockets, each
Part Number B500598

Terminal Blocks

Repeat Cycle Timer
Part Number B500608

Timer Socket (not shown)
Part Number B500599

Base electrical cabinet BOM numbers are B701354 for 18 inch, and B701355 for 24 inch.
Belt Conveyor Gearmotors

CHECK THE MOTOR AND GEARBOX EVERY 6 MONTHS for leakage and oil level. Make sure the motor ventilation is not blocked with debris, lint, residue, etc.

If adding oil, do not mix oil types. If changing the oil, flush the gearbox with petroleum oil until all traces of contaminants are removed. Replace the drain plug and fill to the proper level with the recommended oil and replace the fill plug. Do not overfill.

Gearmotor Service Intervals
It is recommended that the gearbox oil be changed after the first 250 hours of operation, and thereafter every 10,000 hours for mineral oils, and every 20,000 hours for synthetics. Do not overfill.

Polycord Gearmotors and Power Roller
Below-Table Gearmotors

TYPICAL LUBRICANTS for all gearboxes
Oils VG220, CLP 220, PGLP 220, and PGLP 460 complying with DIN 51502 and 51517 are suitable. DO NOT MIX OIL TYPES!

Suggested oils for all gearboxes
Mineral oils: Shell Omala EP220 or equivalent
Synthetic oils: Shell Omala HD220 or equivalent

NOTE! DO NOT MIX OIL TYPES in service or as waste! Synthetic oils with a polyglycol base (PGLP, etc.) must be kept separate from mineral oils and are to be disposed of as special waste.
NOTES
Fabric Belt section added February 5, 2008
CONVEYOR TABLE PLUMBING AND ACCESSORIES

BASIC PLUMBING LAYOUT .................................................. Page 7-1
MIXING VALVE DETAIL .................................................. Page 7-2
WASHDOWN HOSE AND RINSE SPRAY PLUMBING .................. Page 7-3
  Rinse Spray Hose and associated parts
  Washdown Hose and associated parts
TABLE FLUSHING DETAIL .................................................. Page 7-4
TROUGH ASSEMBLY DETAILS ........................................... Page 7-5
  Trough Gusher detail
  Trough Accessories
Any additionally specified or required components such as Pressure Reducing Valves, Backflow Preventer Valves, Master Solenoid Valves, etc. should be installed in the area between the valve and the first branch.

Items in gray supplied by others unless otherwise specified

*Some installations utilize the solenoid valve to supply both the Disposer and the Trough Gusher nozzle. This arrangement may be adequate if only one gusher nozzle is installed. Two gusher nozzles will likely require more flow than the ½ inch plumbing of the disposer is able to handle.
MIXING VALVE DETAIL
(Drawings are not to scale)

Copper Example
- ½ inch Copper
- Copper ½ F to ½ NPTM Adapter
- ½ NPTF Check Valve
- 112866

CPVC Example
- CPVC ½ F to ½ NPTM Adapter
- 0504654
- CPVC ½ to ¼ Reducing Coupling or Reducing Bushing
- Cut and insert ½ inch CPVC pipe here

Brass Example
- Brass 3/8 NPT to ½ NPTM Reducing Nipple
- 0502605
- Brass 3/8 NPT Close Nipple
- 100998

Hot/Cold Mixing Faucet
- Part Number B500742

MATCH A
To Washdown Hose and Rinse Spray Piping
WASHDOWN HOSE & RINSE SPRAY PLUMBING

Rinse Spray Hose

Spray Nozzle
(1.42 GPM max @ 60 PSI)
Part Number B502145

Flex Hose Manifold Adapter
Part Number B502159

Flex Hose w/fittings
Part Number B502144 – X
X = length of hose

Washdown Hose and Rear Trigger Spray Nozzle

Wall Mounted Hanger
(not shown)
Part Number B502930

Spray Nozzle
Part Number B502928

Hose, 25 feet w/fittings
Part Number B502929

Rinse Spray Manifold

SST ½ NPT Street Elbow 100516

Brass 5/8 X ½ NPTM Barbed Fitting 112798

SST M12 Clamp 113269

5/8 Reinforced Hose (cut to length)
0509302 (per foot)

SST M12 Clamp 113269

Brass 5/8 X ½ NPTM Barbed Fitting 112798

Brass Tee ½ NPT 102514

Brass ½ X 4.5 NPT Nipple 102572

MATCH A
From Mixing Valve Outlet

Washdown hose attaches here

7-3
Table Flushing Detail
Shown bottom mounted

- ½ NPT Brass Elbow
- ½ F to ½ NPTM Copper Adapter
- ¾ inch Copper Tubing
- ½ inch Copper Tubing
- ¾ inch *Copper Tubing* (per foot)
- ⅝ inch *Copper Tubing* (per foot)

End View
- SST ½ NPTF Street Elbow 100516
- Table Flushing Manifold
- Table Flushing Nozzles B502208
- SST ½ Locknut 100547 (2 required)
- SST ½ x 5.5 NPT RTOE Nipple 114062
- Brass ½ NPT Elbow 102435
- SST M12 Clamp 113269
- Brass ½ x ⅝ NPTM Barbed Fitting 112798
- 5/8 Reinforced Hose - Cut to length - 0509302 (Per foot)

Top View
- ¾ inch Copper Tubing 107314
- ⅝ inch Copper Tubing 107380 (per foot)
- Back of Table
- Main Trunk
- 3/4 3/4
- 1/2 Copper Reducing Tee 107454
- SST ½ NPTF Street Elbow 100516
- Table Flushing Manifold
- Table Flushing Nozzles B502208
- SST ½ Locknut 100547 (2 required)
- SST ½ x 5.5 NPT RTOE Nipple 114062
- Brass ½ NPT Elbow 102435
- Brass ½ NPTF Street Elbow 100516
- SST ½ Locknut 100547 (2 required)
- SST ½ x 5.5 NPT RTOE Nipple 114062
- Brass ½ NPT Elbow 102435
TROUGH GUSHER DETAIL

Shown bottom mounted

Side mounting will require additional piping and standard adaptation pieces shown in these drawings.

TROUH ACCESSORIES

Skate Wheels
Part Number B500298

6 inch Drain Strainer
Part Number 304816
Nut is ¼-20 SS Ny-Lok

Scrap Trough Silverware Magnet
Includes SST cover and magnet
Part Number BL701634

Magnet only
4x6x1 (not shown)
Part Number B500061
<table>
<thead>
<tr>
<th><strong>Skate Wheels</strong></th>
<th><strong>Optical Sensors</strong></th>
<th><strong>6 inch Drain Strainer</strong></th>
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</thead>
<tbody>
<tr>
<td><img src="image" alt="Skate Wheels" /></td>
<td><img src="image" alt="Optical Sensors" /></td>
<td><img src="image" alt="6 inch Drain Strainer" /></td>
</tr>
<tr>
<td><strong>Part Number</strong> B500298</td>
<td><strong>Direct Sense</strong> Part Number B501490</td>
<td><strong>Part Number</strong> 304816</td>
</tr>
<tr>
<td><strong>Nut</strong> Part Number B500576</td>
<td><strong>Part Number</strong> B502397</td>
<td><strong>Nut is ¼-20 SS Ny-Lok</strong></td>
</tr>
<tr>
<td><strong>Mount</strong> Part Number B502398</td>
<td></td>
<td><strong>Part Number</strong> 304816</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Rear Trigger Spray Nozzle and Hose</strong></th>
<th><strong>Scrap Trough Silverware Magnet</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Spray Nozzle</strong> Part Number B502928</td>
<td><strong>Includes SST cover and magnet</strong> Part Number BL701634</td>
</tr>
<tr>
<td><strong>Hose</strong> 25 feet w/fitting Part Number B502929</td>
<td><strong>Magnet only</strong> 4x6x1 (not shown) Part Number B500061</td>
</tr>
<tr>
<td><strong>Wall Mounted Hanger</strong> (not shown) Part Number B502930</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Mobile Table Caster Assemblies</strong></th>
<th><strong>Slat Belt Tail Cover</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5 inch with Brake</strong> B500118-1</td>
<td><strong>For single belts</strong></td>
</tr>
<tr>
<td><strong>Flex Hose w/fitting</strong> Part Number B502144 - X X = length of hose</td>
<td>7.5 inch B703303-1A</td>
</tr>
<tr>
<td><strong>Spray Nozzle</strong> (1.42 GPM max @ 60 PSI) Part Number B502145</td>
<td>10 inch B703303-S10</td>
</tr>
<tr>
<td><strong>Adapter</strong> B502159</td>
<td>12 inch B703303-S12</td>
</tr>
<tr>
<td><strong>For dual belts</strong></td>
<td><strong>10 inch</strong> B703303-D10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Pre-rinse Spray Hose</strong></th>
<th><strong>Anti-J am Plate</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Magnetic Reed Switch for Anti-J am Switch on Slat Conveyors</strong> <strong>Hamlin Mfg.</strong> Part Number 111090-1</td>
<td><strong>For 7.5 or 10 inch single belt</strong> Part Number B701445-S10</td>
</tr>
<tr>
<td><strong>Magnet for Hamlin switch</strong> Mounts on Anti-J am Plate Part Number B500260</td>
<td><strong>For 12 inch single belt</strong> Part Number B701445-S2</td>
</tr>
<tr>
<td><strong>Magnets mount on underside of the anti-jam plate here. Check original to determine which side.</strong></td>
<td><strong>For Dual 7.5 or 10 inch belts</strong> Part Number B701445-D10</td>
</tr>
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