Model 9165/9265 Live Roller Conveyor
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1 Product Safety

1.1 Danger/Warning/Caution Convention

This product is furnished with safety guards and warning labels. When this equipment is applied at your facility, additional guards and warnings may be required because specific applications might create residual hazards that could not be anticipated or eliminated when the equipment was designed. Therefore, examine your installation and provide any additional required safety measures. Danger, warning, and caution conventions are explained in the following table:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
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<tbody>
<tr>
<td><img src="image" alt="DANGER Symbol" /></td>
<td>Danger statements indicate an imminently hazardous situation that if not avoided, WILL result in death or serious injury.</td>
</tr>
<tr>
<td><img src="image" alt="WARNING Symbol" /></td>
<td>Warning statements indicate a potentially hazardous situation that if not avoided, COULD result in death or serious injury.</td>
</tr>
<tr>
<td><img src="image" alt="CAUTION Symbol" /></td>
<td>Caution statements indicate a potentially hazardous situation that if not avoided, will result in minor or moderate injury. It may also be used to alert against unsafe practices.</td>
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1.2 General Safety

![DANGER Symbol](image) Never operate this equipment with missing, disabled, or inoperative safety devices. Operating equipment in this condition will result in serious injury or death. Immediately remove equipment in this condition from service.

![WARNING Symbol](image) Severe personal injury or damage to property may occur in the event of:

- Incorrect use or operation of the equipment, including allowing untrained personnel to interface with or come into contact with the equipment. Only properly trained and authorized personnel are to operate this equipment.
- Incorrect or insufficient maintenance of the equipment. Only properly trained and authorized personnel are to service and maintain this equipment.
Do not perform adjustments, maintenance or other work on this equipment without following OSHA Lock-Out/Tag-Out requirements and state and local requirements. The purpose of this procedure is to protect all persons involved against unexpected restart. Personnel should be alerted to the hazard of stored energy which may exist after the power source is locked out. Refer to ANSI Z244.1 and OSHA 29 CFR 1910.147 for minimum requirements. Failure to follow these requirements may result in equipment damage, serious injury, or death.

If any defects relating to operating safety and reliability are detected or if any damage occurs, affected parts of the system must be taken out of operation immediately. Failure to do so may result in serious injury or death.

Climbing, sitting, walking, or riding on equipment at any time may result in serious injury or death.

Under continuous operation, the external surface of various powered components might reach temperatures significantly above ambient temperature. Contact with unprotected skin may cause burns.

1.2.1 Personnel

- Personnel must be informed about the location and operation of emergency stops and power disconnect points.
- Personnel must be alerted to potential hazards of entanglement in conveyors caused by such items as long hair, loose clothing, and jewelry. These hazards, if not avoided, could result in serious injury or death.
- Personnel must report to a supervisor all unsafe conditions or anything out of the ordinary that is observed prior to operating the system. Remove equipment in unsafe conditions from service immediately.
1.2.2 Equipment

- Use the equipment exclusively for appropriate conveyor loads that it is designed to handle safely.

- Do not perform any unauthorized conversion or modification of the system, equipment, or safety devices. Such modifications could degrade safety and expose personnel to risk of serious injury or death.

- Never connect or disconnect any electrical cables while power is applied to the equipment as this can result in damage to the equipment or serious injury or death resulting from electric shock. Lock-out/tag-out equipment prior to service.

1.2.3 Operation

- Prior to start up, operators are to visually confirm that all personnel are clear of the conveyor.

- During initial equipment startup, personnel must be notified prior to startup by the operator or via audible and/or visual indications followed by a delay.

- If safety devices are defective or if they do not function reliably, the equipment must not be put into operation. Notify your supervisor that equipment is not safe to operate and remove equipment from service.

1.2.4 Maintenance

- A routine safety inspection plan must be implemented before each shift change and startup of the equipment.

- Maintenance (other than observation) must not be performed while a conveyor is in operation or motion unless proper maintenance or service requires the conveyor to be in motion. In which case, personnel shall be made aware of all hazards and how the task may be safely accomplished.
2 Equipment Summary

The 9165 model is live-roller transportation conveyor. Driving force is supplied by a narrow power transmission belt which presses against the bottom of the rollers. Spring-loaded skate wheels push up on the belt causing it to drive the rollers.

The Model 9265 APC (Automatic Pressure Conveyor) is an air-operated live roller accumulation conveyor that offers zero-line-pressure accumulation. Roller driving force is supplied by a narrow power transmission belt which presses against the bottom of the rollers. The belt rides on rollers equipped with low friction sealed ball bearings on the skate assemblies mounted on top of each pressure assembly and air actuator. When accumulation is not taking place, an air actuator raises each skate assembly so the belt can drive the carrier rollers.

This model also offers dynamic accumulation. The air actuators raise the skate assemblies at reduced pressure. This provides zero-gap accumulation with only light line pressure, so that cartons are not damaged and operators can remove cartons from the line if necessary. Non-contact accumulation is also available.

Figure 1 Model 9165/9265 Live Roller Conveyor
3 General Frame or Bed Assembly Installation

3.1 Unit Position and General Alignment

Any measurements locating the unit from the building structure must be taken at each end of the unit. Do not use intermediate measurements as these will make the unit follow the building line which may not be straight. See the project systems drawings for specific installation information.

**WARNING**

Do not perform adjustments, maintenance or other work on this equipment without following OSHA lockout/tagout requirements and state and local requirements. The purpose of this procedure is to protect all persons involved against unexpected restart. Personnel should be alerted to the hazard of stored energy which may exist after the power source is locked out. Refer to ANSI Z244.1 and OSHA 29 CFR 1910.147 for minimum requirements. Failure to follow these requirements may result in equipment damage, serious injury, or death.

Position and align components as follows per the systems drawings:

- Elevate
- Cross level
- Locate to the centerline.

See Figure 2 for a reference guideline.

Figure 2  Locating the Center of the Unit
3.2 Floor Supported Equipment

3.2.1 Floor Support Height Adjustment

To adjust the height of the floor supports:

1. Loosen the two bolts, Figure 3 - (1), located on the floor support leg (2).

2. Adjust the leg up or down to ascertain the desired height required for the floor supports.

3. Once the desired height has been set, tighten the two bolts.

Figure 3 Adjusting Support Stand Height
3.2.2 Attaching Floor Supports to Conveyor Bed

Once you have determined floor support positioning based on the system layout drawing, use the following procedure to connect the floor supports to the conveyor sections.

4. Position the floor support assembly, Figure 4 - (3), underneath the conveyor section.

5. Use two bolts (2) on each side to secure the floor support to the conveyor side channel (1) (torque: 37 ft/lb). Install supports at bed joints except where interference occurs.

Figure 4 Installing Floor Supports Bolts
3.2.3 Installing Floor Supported Conveyor Sections

1. Position and align the conveyor bed at the desired location (see section 3.1). See the system layout drawings for specific location.

2. Secure the floor supports to the floor (see section 3.2.4).

3.2.4 Securing Floor Supports

3.2.4.1 Lagging to Concrete or Masonry

INFO Explosive type anchors are not to be used.

1. Intermediate floor supports are anchored with a minimum of 3/8” diameter bolts. Stands over 5” high will be anchored with a minimum of 1/2” diameter bolts.

2. The end floor supports for each conveyor and floor supports for drives will be anchored with a minimum of 1/2” diameter bolts.

3. Anchoring is accomplished by drilling into the floor and inserting a suitable bolt anchor.

4. Anchor bolts for equipment that is subject to unusual vibration will be a minimum of 1/2” diameter.

3.2.4.2 Lagging to Plywood

1. Intermediate floor supports will be anchored with a minimum of 3/8” diameter through bolts. Stands over 5” high will be anchored with 1/2” diameter minimum through bolts.

2. The end supports for each conveyor and support stands for drives will be anchored with 1/2” diameter through bolts.

3. Length of bolts will vary with the thickness of the plywood.
3.2.5  Ceiling Supported Equipment

3.2.5.1  Attaching Ceiling Hangers to Conveyor Sections

Once you have determined ceiling hanger positioning based on the system layout drawing, use the following procedure to connect the ceiling hangers to the conveyor sections.

1. Position the ceiling hanger assembly underneath the conveyor section.
2. Secure the ceiling hanger to the side channel (from underneath).

INFO  Header steel and ceiling attachment designs and configurations may vary considerably between applications and international markets due to local steel and or concrete construction standards. As such, consideration must be put into the interface between the conveyor attachment points and the respective ceiling support configuration. (See Model 3500.03 Service Manual for more information.)

3.2.5.2  Ceiling Hanger Height Adjustment

To adjust the height of the ceiling hangers:

1. Loosen the jam nut located on each ceiling hanger take-up screw. (See Figure 5.)
2. Adjust the hanger up or down to ascertain the desired height required for the ceiling hanger.
3. Once the desired height has been set, tighten the jam nuts.
3.2.5.3 Installing Ceiling Supported Conveyor Sections

Position and align the conveyor bed at the desired location (see section 3.1). See the system layout drawings for specific location.
4 9165 Live Roller Transportation

Excess length of photoeye cable has potential to contact the power transmission belt and wear through the photoeye cable. This condition typically occurs when photoeye connections are made at bed joints on CRH beds with arm brackets. The photoeye extension cables (or any other loose cables/air tubing) MUST be tie wrapped at bed joints to avoid interference with the power transmission belt and damage to the photoeye cable.

To install a 9165 Live Roller Transportation unit:

1. Lay out all the conveyor bed sections as shown in the layout drawing.
   - Flow arrows are provided on the side channels of the bed sections. These bed sections must be installed with the flow arrows pointing toward the discharge end of the conveyor.
   - All beds are shipped as charge, intermediate, or end beds.

2. Assemble conveyor beds with supports located at 12 ft bed joints when possible. Support locations should not exceed 12 ft apart. All bed joints require a splice plate kit (p/n K0079-36CAA).

3. Install the MCS Heavy Duty Tape Drive Assembly. See the MCS Heavy Duty Tape Drive Installation Guide for instructions for installing the drive onto a 9165 conveyor unit.

4. Install the power transmission belt (see section 0).
Excess length of photoeye cable has potential to contact the power transmission belt and wear through the photoeye cable. This condition typically occurs when photoeye connections are made at bed joints on CRH beds with arm brackets. The photoeye extension cables (or any other loose cables/air tubing) MUST be tie wrapped at bed joints to avoid interference with the power transmission belt and damage to the photoeye cable.

To install a 9265 Live Roller APC unit:

1. Lay out all the conveyor bed sections as shown in the layout drawing.
   - Flow arrows are provided on the side channels of the bed sections. These bed sections must be installed with the flow arrows pointing toward the discharge end of the conveyor.
   - All beds are shipped as charge, intermediate, or end beds.
   - Model 9265 LR APC units should not allow for accumulation on skew beds. Model 9165 skew beds should be used on the charge end of Model 9265 conveyors when skew is required.

2. Assemble conveyor beds with supports located at 12 ft bed joints when possible. Support locations should not exceed 12 ft apart. All bed joints require a splice plate kit (p/n K0079-36CAA).

3. Install the MCS Heavy Duty Tape Drive Assembly. See the MCS Heavy Duty Tape Drive Installation Guide for instructions for installing the drive onto a 9265 conveyor unit.

4. Install end pulley assemblies for charge and discharge applications (see section 10.2.2).

5. Install the power transmission belt (see section 6).
6. For mechanical sensing, connect the 3-ribbon tubing from the charge end of the downstream bed section to the air manifold on the discharge end of the last sensor-pressure assembly on the upstream bed (see Figure 6).

Figure 6  9265 MS 3-Ribbon Bed-to-Bed Connection
7. For electronic sensing, connect the 3/8-inch air supply tubing from the charge end of the downstream bed section to the air manifold on the discharge end of the last sensor-pressure assembly on the upstream bed.

8. Connect the valve control cable from the charge end of the downstream bed section to the discharge end of the last sensor-pressure assembly on the upstream bed (see Figure 7).

Figure 7 9265 ES Valve Control Cable Bed-to-Bed Connection

INFO The graphic above depicts a Single Zone Controller. The process is basically the same for Dual Zone Controllers. If the distance between sensor-pressure assemblies is greater than 36-inches for Single Zone Controller or 72-inches for a Dual Zone Controller, a valve control extension cable (p/n F0038-00141) may be required for connecting bed sections.
9. On each of the bed sections, return rollers were mounted on the conveyor side channel, opposite the drive side, for shipping purposes (see Figure 8).

Remove each return roller from the shipping position to the installed position on the drive side. The installed position for the return roller on the drive side is directly opposite the shipping position.

Figure 8  Return Rollers Position

10. Install safety labels as applicable.
5.1 Manifold Connections

INFO See Application Drawing - A9200 for pneumatic diagrams.

Manifold air lines supply regulated air from the regulator assembly (located on the discharge end of the drive assembly), to the tubing and other pneumatically operated optional components on each conveyor unit.

Use the following steps to install and connect manifold air lines on each unit, starting from the regulator assembly (drive unit) downstream, to the end pulley assembly on the discharge bed:

1. Locate the 7-psi distribution manifold kit for the unit (p/n K0078-38BAA for 100 ft or K0078-38BAB for 200 ft). The 7-psi distribution manifold kit includes:
   - 100 or 200 feet of 1/2-inch poly tubing
   - 1/2 to 3/8-inch union
   - 1 foot of 3/8-inch poly tubing
   - 3/8-inch Tee
   - Tinnerman clips

2. Locate the manifold connection kits (p/n K0078-38DAA) for the unit. Each manifold connection kit includes:
   - 1/2-inch Tee
   - 1/2 to 3/8-inch reducer
   - 1-1/2 feet of 3/8-inch poly tubing
   - 3/8-inch Tee

3. Connect 1/2-inch poly tubing (7-psi distribution manifold line) to the 1/2-inch fitting Figure 9 – (10), on the regulator assembly.

4. Route the 1/2-inch poly tubing downstream on top of the bed crossmembers and centered on the bed sections along the entire length of the unit. Use the Tinnerman clips supplied with the manifold kits to secure the tubing to the crossmembers.

5. Install a manifold connection kit in the 7-psi distribution manifold line at the regulator location and at every bed joint downstream on the conveyor unit.

INFO The distance between manifold connections should not exceed 24 feet.

   a. Cut the 7-psi distribution manifold line at the bed joint and install a 1/2-inch tee in the line.

   b. Cut the 7-psi (right-hand) supply line, and install a 3/8-inch tee.

   c. Connect the 3/8-inch poly tubing to the 3/8-inch tee installed in the supply line.
Figure 9  Model 9265 Regulator Assemblies

WITHOUT DELAYED START

WITH DELAYED START
5.1.1 Discharge Connections

5.1.1.1 Standard Discharge

INFO: See Application Drawing - A9200 for pneumatic diagrams.

Use the following steps to complete the installation of the manifold air lines at the discharge end of a conveyor unit having standard discharge (air) controls:

1. Install the following air line fittings into the discharge end of the 2-1/2-inch long tubing exiting the last sensor-pressure assembly (or electronic valve assembly):
   - Install a 3/8-inch plug cap into the left-hand line.
   - Install a 3/8-inch union into the middle of the line.
   - Install a 3/8-inch tee into the 7-psi (right-hand) supply line.

INFO: Right-hand and left-hand designations are made when looking in the direction of product flow.

INFO: The right-hand 3-ribbon tubing line is the 7-psi supply line to all the sensor-pressure assemblies on the mechanical sensing conveyor.

2. Locate a 1/2 to 3/8-inch reducer and 1-inch long piece of 3/8-inch poly tubing from the 7-psi distribution manifold kit. Route and connect the 7-psi distribution manifold line (1/2-inch poly tubing) to the 3/8-inch tube tee fitting installed in the tubing line, using the items above.

3. Using a short piece of 3/8-inch poly tubing, connect one end to the 3/8-inch union on the 3/8-inch tee that is installed in the 7-psi supply line.

5.1.1.2 Controlled Discharge

INFO: See Application Drawing - A9200 for pneumatic diagrams.

Use the following steps to complete the installation of the manifold air lines at the discharge end of a conveyor unit having controlled discharge (electric) controls:

INFO: If a slug discharge kit or dynamic accumulation kit is going to be installed, skip step 1.

1. Install a 3/8-inch plug cap into the left-hand tubing line.

2. Locate the 1/2 to 3/8-inch reducer and 1-inch-long piece of 3/8-inch poly tubing from the 7-psi distribution manifold kit. Route and connect the 7-psi distribution manifold line (1/2-inch poly tubing) to the 3/8-inch tee coming from the discharge control valve using these items.

3. For dynamic accumulation, an additional 3/8-inch poly tube will be routed from the discharge zone solenoid valve and along the top of the sensor pressure assemblies, for the full length of the conveyor.
4. At each electronic sensor-pressure assembly or sensor pneumatic sub-assembly, a 3/8” x 3/8” x 1/4” tee will connect to the exhaust tube.

5. Two 3/8-inch plugs are required at the beginning of the 3/8-inch poly tubing at the charge end of the unit. Tubes need to be plugged to prevent air from exiting the system.

INFO The dynamic accumulation air valves are the same part for both electronic and mechanical sensing.

5.1.1.3 Unit-to-Unit Air Connections

INFO See Application Drawing - A9200 for pneumatic diagrams.

Use the following steps to complete the installation of the manifold air lines on APC units having unit-to-unit air connections:

1. Locate a 3/8-inch tee, 1/2 to 3/8-inch reducer, and 1-inch long piece of 3/8-inch poly tubing from the 7-psi distribution manifold kit. Connect 7-psi distribution manifold line (1/2-inch poly tubing) to the 7-psi (right-hand) supply line on the tubing between the last and second to last pressure assembly on the upstream unit.

   a. Cut the 7-psi supply line on the tubing, and install a 3/8-inch tee.

   INFO Do not connect the supply line between the units.

   b. Route and connect the 7-psi distribution manifold line (1/2-inch poly tubing) to the 3/8-inch tee installed in the tubing line using the 1/2 to 3/8-inch reducer and 1-inch long 3/8-inch poly tubing.

2. For electronic sensing, separate a length of tubing and connect it to the fitting exiting the electronic sensor on the last sensor-pressure assembly of the first unit. Route and connect the tubing to the fitting entering the electronic sensor on the first sensor-pressure assembly of the second unit. Secure the tubing so it does not contact moving components such as belts and pulleys.

3. For mechanical sensing, separate both the tubing lines entering and exiting the pneumatic block from the last sensor-pressure assembly. Remove the middle tubing lines from the fittings on the pneumatic block. Install 3/8” plug caps into the left hand lines and in the 7 psi (right hand) supply lines.
5.2  Air Valve Kits

5.2.1 Dynamic Accumulation Valve Kit

INFO: See Application Drawing - A9200 for pneumatic diagrams.

Use the following steps to install a dynamic accumulation valve kit into the discharge bed of a conveyor having standard discharge (air) or controlled discharge (electric) controls:

1. Locate the dynamic accumulation valve kit specified on the layout drawing. This kit includes a regulator/solenoid operated air valve assembly mounted to a bracket with tube fittings, muffler and solenoid connector installed.

2. Locate the high-pressure manifold kit. This kit includes:
   - 100 or 200 feet of 3/8-inch poly tubing
   - 3/8-inch tee
   - Tinnerman clips

3. Attach the mounting bracket for the dynamic accumulation valve assembly (and regulator/valve) to the inside of the bed side channel opposite the drive side near the discharge end of the unit using two 3/8 x 3/4-inch bolts and lock washers (see Figure 10).

4. Connect the air supply from the regulator assembly (drive unit) to the dynamic accumulation valve assembly using the poly tubing and fittings from the high-pressure manifold kit.
   a. Cut the 3/8-inch poly tubing going from the regulator assembly to the take-up cylinder and install a 3/8-inch tee.
   b. Connect the 3/8-inch poly tubing to the installed 3/8-inch tee.
   c. Route the 3/8-inch poly tubing downstream on the unit on top of the bed crossmembers and centered on the bed sections along the entire length of the unit to the dynamic accumulation valve assembly. Use the supplied Tinnerman clips to secure the poly tubing to the crossmembers.
   d. Connect the 3/8-inch poly tubing (high-pressure supply line) to the 3/8-inch fitting on the input end of the regulator on the dynamic accumulation valve assembly.
5. Connect the output end of the dynamic accumulation valve assembly to the 2-1/2-inch long tubing exiting the last sensor-pressure assembly.
   a. Connect 3/8-inch poly tubing to the output end of the solenoid valve on the dynamic accumulation valve assembly (see Figure 10).
   b. Route the 3/8-inch poly tubing across the bed to the discharge end of the tubing.
   c. Install a 3/8-inch union into the left-hand tubing.
   d. Connect the 3/8-inch poly tubing to the 3/8-inch union installed in the tubing line.

6. Secure all tubing so it will not contact moving components.

7. Wire the solenoid connector on the dynamic accumulation valve according to the electrical schematics supplied.

8. Install safety labels as applicable.

Figure 10  Model 9265 ES and MS Dynamic Accumulation Valve Mounting
5.2.2 Slug Discharge Valve Kit (Mechanical Sensing)

INFO See Application Drawing - A9200 for pneumatic diagrams.

Use the following steps to install a slug discharge valve kit into the discharge bed of a conveyor having standard discharge (air) or controlled discharge (electric) controls:

1. Locate the slug discharge valve kit specified on your layout drawing. This kit includes:
   - 3-way solenoid-operated air valve mounted to bracket with tube fittings, muffler and solenoid connector installed
   - 60-inch piece of 3/8-inch poly tubing
   - 18-inch piece of 3/8-inch poly tubing
   - 3/8-inch 90-degree elbow

2. Assemble the slug discharge valve mounting bracket (and valve) to the inside of the bed opposite the drive side near the discharge end of the unit using two 3/8 x 3/4-inch bolts and lock nuts (see Figure 11).

3. Connect the slug discharge valve to the discharge end of the 2-1/2-inch long 3-ribbon tubing exiting the last sensor-pressure assembly.
   a. Connect the 60-inch piece of 3/8-inch poly tubing to the 3/8-inch fitting attached to air valve assembly on the side opposite the muffler (see Figure 11).
   b. Route the 3/8-inch poly tubing across the bed to the discharge end of the 2-1/2-inch long 3-ribbon tubing.
   c. Connect the other end of the 3/8-inch poly tubing to the left-hand 3-ribbon tubing line using the 3/8-inch 90-degree elbow.
   d. Secure all tubing so it will not contact moving components.

4. For units with a standard discharge, connect the slug discharge valve to the 7-psi distribution manifold line (1/2-inch poly tubing) as follows (see Figure 11):
   a. Connect the 18-inch piece of 3/8-inch poly tubing to the 3/8-inch fitting attached to the air valve assembly on the muffler side (see Figure 11). Route the poly tubing to the 7-psi distribution manifold line for connection.
   b. Retrieve a 1/2-inch tee and 1/2 to 3/8-inch reducer from a manifold connection kit.
   c. Cut the 7-psi distribution manifold line and install the 1/2-inch tee.
   d. Install the 1/2 to 3/8-inch reducer in the end of the installed 1/2-inch tee.
   e. Connect the 18-inch 3/8-inch poly tubing to the 3/8-inch end of the reducer.
5. For units with a controlled discharge, connect the slug discharge valve to the 3/8-inch poly tubing coming from the 7-psi distribution manifold line to the controlled discharge air valve as follows:
   a. Connect an 18-inch piece of 3/8-inch poly tubing to the 3/8-inch fitting attached to the air valve assembly on the muffler side (see Figure 11). Route poly tubing to the 3/8-inch poly tubing air line located between the 1/2-inch distribution manifold line (tee fitting) and the controlled discharge air valve for connection.
   b. Retrieve a 3/8-inch tee from a manifold connection kit.
   c. Cut the 3/8-inch poly tubing coming from the 7-psi distribution manifold line to the controlled discharge air valve and install a 3/8-inch tee.
   d. Connect the 18-inch 3/8-inch poly tubing to the installed 3/8-inch tee.

6. Determine the length of conveyor (from the discharge end) that is to operate in slug discharge. Slugs can be used in all beds or in just a few beds.

    INFO  Avoid using more slug beds than necessary, to minimize power required to the drive.

7. At the desired distance (slug length) from the discharge end, cut the left-hand 3-ribbon tubing line and plug the upstream end of the line using a 3/8-inch plug cap.

8. If the slug length is 40 feet or less, plug the downstream end of the cut 3-ribbon tubing line using a 3/8-inch plug cap.

9. If the slug length is greater than 40 feet, install a second slug discharge valve kit as follows:
   a. Assemble the slug discharge valve mounting bracket (and valve) to the inside of the bed opposite the drive side at the charge end of the slug, using two 3/8 x 3/4-inch bolts and lock nuts (see Figure 11).
   b. Connect a 60-inch piece of 3/8-inch poly tubing to the 3/8-inch fitting attached to air valve assembly on the side opposite the muffler (see Figure 11).
   c. Route the 60-inch 3/8-inch poly tubing across the bed to the downstream end of the cut 3-ribbon line.
   d. Connect the 60-inch 3/8-inch poly tubing to the downstream end of the cut 3-ribbon line using a 3/8-inch 90-degree elbow.
   e. Connect an 18-inch piece of 3/8-inch poly tubing to the 3/8-inch fitting attached to the air valve assembly on the muffler side. Route poly tubing to the 7-psi distribution manifold line for connection.
   f. Retrieve a 1/2-inch tee and 1/2 to 3/8-inch reducer from a manifold connection kit.
   g. Cut the 7-psi distribution manifold line and install the 1/2-inch tee.
h. Install the 1/2 to 3/8-inch reducer into the other end of the installed 1/2-inch tee.

i. Connect the 18-inch 3/8-inch poly tubing to the 3/8-inch end of the reducer fitting.

10. Secure all tubing so it will not contact moving components.

11. Wire the solenoid connector on the slug discharge valve(s) according to the supplied electrical schematics.

Figure 11 Slug Discharge Valve Mounting (Mechanical Sensing)
5.2.3 Slug Release and Disconnect Assemblies (Electronic Sensing)

A slug release interface assembly (part number F0038-00146) and slug disconnect assembly (F0038-00150) are used to control slug operation.

1. Mount the slug disconnect assembly on the side channel at the farthest point upstream of the slug operation. Locate the assembly inline between the valve and control assemblies (see Figure 12, Figure 13, and Figure 14 for schematics.)

2. Mount the slug release interface assembly on the side channel downstream from the slug disconnect assembly.

3. Attach the slug release interface assembly tee cable to the electronic valve assembly furthest downstream from the slug locations.

4. To terminate the slug release signal, use slug disconnect assembly (p/n F0038-00150) connected between valve assembly cables.

Figure 12 Single Zone Controller Slug Discharge Simplified Electrical Schematics
Figure 13  Dual Zone Controller (2x2) Slug Discharge Simplified Electrical Schematics
Figure 14  Dual Zone Controller (M12 Snap) Slug Discharge Simplified Electrical Schematics

- **Power Supply Assembly**
  - F0038-00166 (No Cables)
  - F0038-00210, Cut
  - F0038-00156 Included in Kit

- **Conveying Direction**
- **Photo Sensor Assembly**

- **Zone 1 & 2**
  - Drive Bed
  - Valve & Control

- **Zone 71 & 72**
  - Slug Disconnect Cable
  - F0038-00214

- **Zone 79**

- **Slug Zones 73-79**

- **Set Switch #5 (ZR1)**
  - On - for Zone Release
  - Off - for Slug Release (Default)

- **Extension Cable 48”**
  - Where Required
  - F0038-00210 or F0038-00211 (12 Foot)

- **Power Supply Cable**
  - Locate at or near Zone 1
  - F0038-00210, Cut

- **Cable, 2-Cond, Class II**
  - (05251-27340 or Other)

- **DC-AC Interface Module**
  - 05149-00002 with 05252-10802 AC Cable
  - 05252-10610 Y-Cable for "Remote Input"
5.3 Air Supply

To prevent damage to the pressure regulators, make sure the pressure adjusting screws are released completely before the air supply is turned on.

Use the following steps to connect, regulate and test the air system in each unit:

1. Perform the following inspections and adjustments on all the air pressure regulators on the unit:
   - Make sure the pressure adjusting screws are released completely on all the air pressure regulators (air pressure adjusted to zero).
   - Remove the plastic dust caps from the regulator exhaust ports (if present).

2. Install a low air pressure switch in the air supply line to the conveyor so the conveyor shuts down whenever the air pressure drops too low.

   Low pressure switch selection is based on the following criteria:
   - For applications where only Heavy Duty Tape Drives are controlled and no other air devices are controlled use K0070-5715A Pressure Switch which activates at 80 psi and deactivates at 70 psi. This switch may be located locally near the drives take-up.
   - For applications where only Heavy Duty Tape Drives along with other air controlled devices are controlled from one source use K00715-717J Pressure Switch which activates at 90 psi and deactivates at 72 psi. Typically this switch would be located inside of a control cabinet.

   INFO In installations with several conveyors, it is not necessary to have one low-pressure switch per conveyor. Choose only one or two points in the air supply line to install the air pressure switch or switches.

3. Connect an 80 psi minimum compressed air supply to the intake on the regulator assembly located on the discharge end of the drive assembly. (See Figure 9.)

4. Adjust the air pressure to the take-up (0-160 psi gauge) to 80 psi.

5. Adjust the small regulator (0-15 psi gauge) to 7 psi.

6. Carefully check the take-up air system to verify that there are no air leaks or kinks in the air lines.

   INFO Brushing on soapy water can test for air leaks in joint connections.

7. Shut off the air supply to the unit.
6 Power Transmission Belt

INFO Install the Standard or Heavy Duty Tape Drive prior to installing the power transmission belt. See the MCS Tape Drive Installation Guide for instructions.

An endless power transmission belt is standard. A non-standard field-spliced belt is shipped with square cut ends. Once the field-spliced belt is threaded correctly through the unit, the ends must be finger-cut and joined together using a belt splicing kit (p/n 01631-00409).

6.1 Power Transmission Belt Options

There are two power transmission belt options that may be used with either MCS Tape Drive assembly. Each option has a secondary option for the bottom side of the belt; either covered or coverless.

- The standard 30 mm wide belt may be used on units that require low belt pull up to a maximum of 233 lb. This belt is available with a fabric covered bottom or a coverless smooth bottom depending on application (see Figure 15 which applies equally to the 30 mm wide belt).

- The heavy duty 45 mm wide belt is to be used on units that require higher belt pull up to a maximum of 350 lb. This belt is available with a fabric covered bottom or a coverless smooth bottom depending on application (see Figure 15).
Figure 15  Power Transmission Belt Bottom Options

- **45 mm Covered Belt**
  - Textured Top of Belt
  - Fabric Covered Bottom of Belt

- **45 mm Coverless Belt**
  - Textured Top of Belt
  - Smooth Bottom of Belt
6.1.1 **Standard 30 mm Wide Belt**

The standard 30 mm (1.2”) wide belt is an aramid-reinforced flat belt that is 4 mm (0.157”) thick.

Criteria for use:

- Maximum belt pull for this belt is 233 lb.
- Speed 50-600 fpm
- Part numbers:
  - Endless belt (P/N: 04451-45301)
  - Square cut (P/N: 04451-45300)
  - Coverless endless belt (P/N: 04451-45013)
  - Coverless square cut (P/N: 04451-45012)
- See section 6.1.3 for approved applications for this belt.

6.1.2 **Heavy Duty 45 mm Wide Belt**

The heavy duty 45 mm (1.8”) wide belt is an aramid-reinforced flat belt that is 4 mm (0.157”) thick.

Criteria for use:

- Maximum belt pull for this belt is 350 lb.
- Speed 50-600 fpm
- Part numbers:
  - Endless belt (P/N: 04451-45021)
  - Square cut (P/N: 04451-45041)
  - Coverless endless belt (P/N: 04451-45011)
  - Coverless square cut (P/N: 04451-45010)
- See section 6.1.3 for approved applications for this belt.
6.1.3 **Approved Belt Usage Matrix**

Table 1  Power Transmission Belt Allowed Usage

<table>
<thead>
<tr>
<th>Application</th>
<th>30 mm Wide Belt</th>
<th>45 mm Wide Belt</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Covered</td>
<td>Coverless</td>
</tr>
<tr>
<td>Heavy Duty drive, NO PTOs</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Heavy Duty drive, NO PTOs, WITH slave drive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heavy Duty drive, WITH PTOs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heavy Duty drive, WITH PTOs, WITH slave drive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard drive, NO PTOs</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Standard drive, WITH PTOs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6.1.4 **Endless vs. Square Cut and Belt Length**

See Table 2 for a comparison of endless vs. square cut belts. This information applies to both 30 mm and 45 mm wide belts. Endless belts are recommended for 9165/9265, 9167, and 9170 conveyor.

Table 2  Belt Application

<table>
<thead>
<tr>
<th>Endless Belt</th>
<th>Square Cut</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Installation or Replacement</td>
<td>New Installation, Replacement, or Repair</td>
</tr>
<tr>
<td><strong>Standard Tape Drive</strong></td>
<td><strong>Standard Tape Drive</strong></td>
</tr>
<tr>
<td>2 times the conveyor length + 30&quot;</td>
<td>2 times the conveyor length + 48&quot;</td>
</tr>
<tr>
<td><strong>Heavy Duty Tape Drive</strong></td>
<td><strong>Heavy Duty Tape Drive</strong></td>
</tr>
<tr>
<td>2 times the conveyor length + 79&quot;</td>
<td>2 times the conveyor length + 97&quot;</td>
</tr>
<tr>
<td></td>
<td>(includes extra belt for the finger spliced joint).</td>
</tr>
</tbody>
</table>

**INFO** For **Standard Tape Drive** assemblies, these belt lengths are based on the take-up being located 1 inch from the shortest position.

**INFO** For **Heavy Duty Tape Drive** assemblies, these belt lengths are based on the drive tube and take-up tube being mounted at their minimum distance of 64 3/4" (see Figure 16).

<table>
<thead>
<tr>
<th>Endless Belt</th>
<th>Square Cut</th>
</tr>
</thead>
<tbody>
<tr>
<td>No cutting and joining required.</td>
<td>Ends must be finger cut and joined.</td>
</tr>
<tr>
<td></td>
<td>Order belts square cut. Finger cut is not available from the belt vendor.</td>
</tr>
</tbody>
</table>
6.1.4.1 Belt Length Additions

- For 9170 PTO transportation beds, add 1/16" to belt length.
- Add 3/8" to belt length for each transmission belt bypass (down and back up).

6.2 Power Transmission Belt Installation

Install a power transmission belt into each unit as follows.

**CAUTION** Running the drive motor in the wrong direction with the power transmission belt installed will damage the belt.

1. Verify that the drive motor is wired for the correct motor rotation. This may be done by pushing on the drive motor and observing the rotation of the drive pulley. Reverse the wiring if running in the wrong direction.
2. Verify that the steerable end pulleys at both the charge and discharge ends of the conveyor are adjusted square to the side channels.
   a. Measure the distance from the sides of the end pulleys to the side channels on both sides of the pulley. This distance should be the same.
   b. If the distance is not the same, square the pulleys by adjusting the take-up screw fastened to the hex axle.
3. Remove any carrier rollers and O-ring drive belts from both ends of the conveyor that obstruct access to the belt path.
4. Locate the power transmission drive belt that was shipped with your unit.
5. To assist in threading a field-spliced power transmission belt between the carrier rollers and the skate assembly wheels, tape a yardstick or similar flat, stiff item to one end of the belt.

**INFO** Make sure that the item used to thread the power transmission belt is not wider than the belt.

6. With the blue side of the power transmission belt facing up, thread the belt between the carrier rollers and the skate assemblies downstream until the discharge end of the conveyor has been reached.

**INFO** The blue (up) side of the power transmission belt is the belt surface used to drive the carrier rollers. The white (down) side of the belt is the belt surface that rides on the skate assemblies and is driven and steered by the various pulleys.

7. When you reach the end pulley on the discharge end of the conveyor, remove the tape and yard stick from the end of the power transmission belt (if applicable).

8. Wrap the power transmission belt around the steerable end pulley on the discharge bed and thread it back upstream on the conveyor on top of the return rollers (blue side down).

**INFO** The return belt must run on the return rollers above the crossmembers.

**CAUTION** Do not twist, bend or crimp the power transmission belt. This can damage the belt.

9. Install the belt through the drive:

   a. When the end of the power transmission belt reaches a Heavy Duty Tape Drive assembly route the belt as shown in Figure 17. Refer to section 10.1 for more detailed information in regards to routing an endless belt through the drive.

---

**Figure 17** Heavy Duty Tape Drive Belt Path

---
b. When the end of the power transmission belt reaches a Standard Tape Drive assembly, route the belt as shown in Figure 18.

Figure 18 Standard Tape Drive Belt Path

10. Continue threading the power transmission belt through the underside of the conveyor until you reach the steerable end pulley on the charge end, and slide the power transmission belt over the pulley.

11. For the field-spliced power transmission belt, bring the two ends of the belt together (blue side up).

Prior to splicing the power transmission belt ends, ensure the belt has been threaded correctly through the conveyor. The blue side should be driving the rollers, and the return belt should be correctly located above crossmembers.

a. The belt ends should overlap a minimum of 11 to 12 inches. If the belt overlap is greater than 14 inches, cut the overlapped end of the belt off at 14 inches.

b. Cut the finger splice ends in the power transmission belt ends using the tools and instructions provided in the belt joining kit (p/n 01631-00409).

Use power transmission belt Finger Puncher FP-200R to cut finger splice ends for each finger splice joint. A user manual and video tape are provided for instructions.

c. Join the finger-spliced ends of the power transmission belt together using the tools and instructions provided in the belt joining kit.

Use power transmission belt Heating Press PCF-2210R to join finger-spliced ends together. A user manual and video tape are provided for instructions.

12. Unlock the skate wheel assemblies from the retracted position (if applicable), and turn on the air supply to the unit to tension and track the power transmission belt. The belt should be tracked at control pressure of 7 psi.

The take-up air cylinder extends a maximum of 6-inches. 2 to 4-inches is recommended during belt installation.
13. Inspect the power transmission belt path throughout the unit to ensure there are no obstructions or interfering air lines. Re-route any air lines that may possibly contact the belt.

14. Replace the bottom guard on the drive unit.

15. Re-install any previously removed carrier rollers and O-ring drive belts on the charge and discharge ends of the conveyor.
7 Initial Start-up and Adjustment

**WARNING**  
Do not perform any adjustments on this conveyor until the electrical power to the unit is shut down, tagged and locked out.

7.1 Running the Power Transmission Belt

1. Release the spring retainer on all pressure supports (model 9165 only).
2. Verify that the entire conveyor is clear of obstructions and personnel.
   
   **INFO**  Running the drive motor in the wrong direction with the power transmission belt installed will damage the belt.

3. Connect air and power to the unit. Check the air fittings for leaks and the motor for proper rotation.
4. Turn the air supply on.
   
   **INFO**  Verify that the air pressure regulator to the take-up (0 to 160 psi gauge) is set at 80 psi and all other air pressure regulators are set at 7 psi.

5. Start the conveyor.
6. Verify that the return belt runs on all return rollers. Also verify that the belt runs clear of all air lines.
7. Check the power transmission belt tracking by observing belt travel at the steerable end pulleys and at the drive pulley. Perform the following inspections and, if necessary, make adjustments to center the belt on the pulleys:
   
   a. If mis-tracking is observed on the charge steerable end pulley, adjust the pulley to correct.
   b. If mis-tracking is observed on the discharge steerable end pulley, adjust the pulley to correct.
   c. If mis-tracking is observed on the drive pulley, adjust the take-up end pulley to correct.

**CAUTION**  Premature wear to the skate wheels and power transmission belt will result if the power transmission belt is not continuously tracked in the center of the skate wheels.

8. Adjust the control air pressure to 7 psi.
9. Verify that the power transmission belt runs in the center of the skate wheels along the entire length of the unit. If the power transmission belt does not run in the center of the skate wheels in a specific bed, use tie rods to square the carrier rollers to the belt, and track the belt to the center of the skate wheels. (See section 7.3.)

10. Verify that the grooved rollers on the charge and discharge ends of the unit are turning and that the slave belts remain in position during operation.

11. Shut down the conveyor.

7.2 Final Settings

1. Regulate the air pressure to the rest of the unit as specified in Table 3.

<table>
<thead>
<tr>
<th>Regulator</th>
<th>Location</th>
<th>Pressure Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main</td>
<td>First regulator in air system. Located at the discharge end of drive assembly (charge bed).</td>
<td>80 psi</td>
</tr>
<tr>
<td>Control</td>
<td>Located next to the main regulator at the discharge end of drive assembly (charge bed).</td>
<td>7 psi</td>
</tr>
<tr>
<td>Dynamic Accumulation</td>
<td>Located inside the bed near the discharge end of the conveyor.</td>
<td>4 psi</td>
</tr>
<tr>
<td>Intermediate Brake</td>
<td>Located outside of bed on intermediate brake controls panel.</td>
<td>12 psi</td>
</tr>
</tbody>
</table>

2. Carefully check the rest of the air system to verify that there are no air leaks or kinks in the air lines.

   **INFO**: Joint connections can be tested for air leaks by brushing on a solution of soapy water.

3. If you have a controlled discharge end assembly with a brake, perform the following test before running the conveyor:
   
   a. With the 3-way solenoid valve de-energized, verify that the brake pads are up and the skate assemblies in the last zone are down.
   
   b. Energize the 3-way solenoid valve, and verify that the brake pads are down and the skate assemblies in the last zone are up.

4. If you have an intermediate brake assembly, perform the following test before running the conveyor:
   
   a. With the 3-way solenoid valve de-energized, verify that the brake pads are up and the skate assemblies in the corresponding zone are down.
   
   b. Energize the 3-way solenoid valve, and verify that the brake pads are down and the skate assemblies in the corresponding zone are up.
INFO If the solenoid valve is not working properly when energized, check the manual override lever on the top of the valve to verify that it is in the correct position.

INFO If there is not sufficient drive pressure on the carrier rollers, check for pinched, leaky, or disconnected air lines.

5. Adjust the photo sensors in the brackets so the reflectors receive the beam correctly and the amber light illuminates.
   - If the green light illuminates, it is indicating that the photoeye is receiving power, but is not aligned with the reflector.
   - If the amber light illuminates and is flashing, it is indicating that the photoeye is poorly aligned with the reflector and is receiving a weak signal.
   - If the amber light is illuminated and not flashing, the photoeye is properly aligned with the reflector.
   - If no light illuminates, the photoeye is not receiving power.

7.3 Power Transmission Belt Tension and Tracking

7.3.1 Tensioning

7.3.1.1 Standard Tape Drive with Spring Take-up

Loosen the jam nuts on the spring take-up to relieve belt tension.

Tighten the jam nuts on the spring take-up to tension the belt. Compress spring to between 5 1/8" and 5 3/8". If belt slips on drive sheave, tighten spring as required. Spring length must not be less than 5". Do not over tighten.

7.3.1.2 Standard Tape Drive with Pneumatic Take-up

To relieve belt tension, turn off the air supply to the pneumatic cylinder. The take-up pulley will slide forward.

To restore belt tension, turn on the air supply to the pneumatic cylinder.

7.3.1.3 Heavy Duty Tape Drive

To relieve belt tension, turn off the air supply to the pneumatic cylinder and bring the take-up pulley to the retracted position.

To restore belt tension, move the take-up from the retracted position and turn on the air supply to the pneumatic cylinder.
7.3.2 Tracking

If the power transmission belt is not tracking in the center of the flanged skate wheels, adjustments are made at the end cap assemblies with the steerable end pulleys (see 7.3.2.1) or at the Standard Tape Drive assembly (if applicable) (see 7.3.2.2). If the belt continues to mis-track, verify the bed is square (see 7.3.2.2), and the Heavy Duty Tape Drive is square to the conveyor frame (if applicable) (see 7.3.2.4).

7.3.2.1 Steerable End Pulley

Use the following procedure to adjust the power transmission belt tracking using a steerable end pulley (see Figure 19):

1. Remove the first three grooved carrier rollers.

2. Loosen the jam nut securing the current tracking adjustment screw setting.

3. With the conveyor running, decide whether to steer the belt toward the non-drive or drive side of the conveyor. Turn the tracking adjustment screw clockwise to steer the belt toward the non-drive side of the conveyor. Turn the tracking adjustment screw counterclockwise to steer the belt toward the drive side.

**INFO** Adjust tracking using small increments, allowing the belt to make a couple of revolutions through the conveyor to properly observe the results of these adjustments.

**INFO** When tracking the belt at the charge end pulley, in beds with skewed carrier rollers, adjust the end pulley so there is 1/16-inch of clearance between the edge of the belt and the bearing belt guides.

4. When tracking adjustments are complete, shut down the conveyor.

5. Tighten the jam nut to secure the tracking adjustment screw setting.

6. Replace grooved carrier rollers.
7.3.2.2 Standard Tape Drive

Belt tracking adjustments can be made at the Standard Tape Drive if it is installed on the conveyor unit.

**WARNING**

Prior to making belt tracking adjustments at the Standard Drive, turn off the power and lock out/tag out the PDP or other power disconnect point according to your facilities guidelines. Make sure all forms of energy are isolated.

Once the unit is locked out/tagged out, the Standard Tape Drive guards may be removed for visibility regarding belt tracking.

While making actual adjustments, the conveyor unit MUST remain locked out/ tagged out.

After an adjustment is made and all personnel are clear of the equipment, run the conveyor to verify belt tracking status. If additional adjustment is required, the conveyor unit MUST be turned off and locked out/ tagged out again.

Repeat this process until satisfactory belt tracking is achieved.

Failure to follow these requirements may result in equipment damage, serious injury, or death.
There are tracking adjustment screws on the motor mount that is bolted to the drive crossmember (see Figure 20). Loosen the bolts securing the motor mount to the crossmember and use the adjustment screws to adjust the drive pulley until correct belt tracking is achieved.

There is also a steerable pulley on the take-up subassembly Figure 20 – (2) that can be used to further track the belt on the return path.

Figure 20  Standard Tape Drive

7.3.2.3 Squaring Beds

To square the conveyor bed, measure diagonally across the top of each bed section between points X-X and Y-Y. (See Figure 21.) These points should be the corresponding roller holes nearest the bed ends, not the ends of the bed side channels. Compare the two diagonal measurements. If the measurements differ by more than 1/8 inch, square the bed as follows:
Figure 21  Tie Rod Adjustments

1. Loosen the support or splice plate mounting hardware on one side of the bed section. (See Figure 22.)

Figure 22  Squaring the Conveyor Beds

2. If the conveyor bed has tie rod diagonal braces (recommended every 2-10 beds on a unit), loosen them.

3. Use a pry bar or wedge to pry the bed side channels apart until the X-X and Y-Y dimensions are equal (bed is square).

4. Tighten the support or splice plate mounting hardware.

5. Tighten the tie rods, being careful to avoid over-tightening them and bowing in the side channels.
7.3.2.4 **Square the Heavy Duty Tape Drive Unit**

The Heavy Duty Tape Drive unit must be level and aligned with the conveyor frame.

1. Verify that the hat shaped brackets on the drive and take-up assemblies are at 90° angles from the crossmembers.

2. Measure the distance from the outside edge of both the take-up assembly housing and the drive assembly housing to the inside edge of the conveyor frame. The measurements should be the same. (See Figure 23.)

3. Lay a 4 ft. level between the bottom surface of the drive housing and the bottom surface of the take-up housing. Adjust the mounting angles and fasteners until the both housings are level with each other. (See Figure 23.)

4. Tighten the mounting hardware on the mounting brackets for both the drive and take-up housings. Torque to 18 to 22 ft lb.

5. Tighten the hardware on the hat shaped brackets and take-up assembly mounting brackets. Torque to 18 to 22 ft lb.
8 Accessories

8.1 Belt Bypass Kit

The belt bypass kit (p/n K0411-24) is available for use within Model 9165/9265 assemblies to lower the power transmission belt when Model 2467 or 2466 Right Angle Transfers or Models 8300 Segmented Belt-on-Roller kits are used.

INFO 0.01-inch of flat belt length must be added for each belt bypass kit installed. Install the belt bypass kit at the end of a zone.

1. Remove all interfering pressure support assemblies, skate assemblies, and eight carrier rollers from the section of conveyor where the belt bypass kit is to be installed.

2. Remove finger guards and set them aside.

3. Using the mounting spacer adapters Figure 24 – (5), bolt the belt bypass assemblies (1) and (2) onto the belt side of the side channel in the location where the flat belt needs to be lowered.

4. Route the Nitta belt through the belt bypass assemblies.

5. Re-route the air and electrical components around the belt bypass kit:
   a. Plug the unused outlet of the dual actuator (if applicable).
   b. Connect the 1/2” pink tubing from last sensor-pressure assembly in the zone to the next sensor-pressure assembly at the beginning of the next zone.
      INFO A manifold connection kit may also be used to connect the two sensor-pressure assemblies.
   c. Route electrical connections from the last electronic valve assembly to the next electronic valve assembly downstream from the belt bypass kit. Use a valve control extension cable (p/n F0038-00141) to span the gap.
   d. Secure all tubing and air lines, ensuring they do not interfere or contact the Nitta flat belt.

6. Install the grooved carrier rollers (3) and O-rings (4) over the belt bypass kit, positioning the grooves opposite the drive belt side of the conveyor.

7. Replace finger guards.
Figure 24  Belt Bypass Kit Installation
8.2 Bottom Guards

If the optional bottom guards are provided with your unit(s), install the bottom guards as follows (see Figure 25).

1. Lay out the proper combination of bottom guards for each bed arrangement. See Table 4 for the right combination of bottom guards.

<table>
<thead>
<tr>
<th>Bed Arrangement</th>
<th>Bed Length</th>
<th>Guard Length(s) Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intermediate</td>
<td>5’</td>
<td>43-3/4”</td>
</tr>
<tr>
<td></td>
<td>6’</td>
<td>71-3/4”</td>
</tr>
<tr>
<td></td>
<td>7’</td>
<td>67-3/4”</td>
</tr>
<tr>
<td></td>
<td>10’</td>
<td>47-3/4” &amp; 71-3/4”</td>
</tr>
<tr>
<td></td>
<td>12’</td>
<td>(2) 71-3/4”</td>
</tr>
<tr>
<td>Intermediate w/ Center Drive</td>
<td>10’</td>
<td>23-3/4” &amp; 27-3/4”</td>
</tr>
<tr>
<td></td>
<td>12’</td>
<td>35-3/4” &amp; 39-3/4”</td>
</tr>
<tr>
<td>End (Charge or Discharge)</td>
<td>12’</td>
<td>55-3/4” &amp; 71-3/4”</td>
</tr>
<tr>
<td>End (Charge) w/ End Drive</td>
<td>12’</td>
<td>63-3/4”</td>
</tr>
<tr>
<td>End (Charge/Discharge) w/ Center Drive</td>
<td>12’</td>
<td>(2) 31-3/4”</td>
</tr>
<tr>
<td>Double End w/ End Drive</td>
<td>12’</td>
<td>47-3/4”</td>
</tr>
<tr>
<td>Double End w/ Center Drive</td>
<td>12’</td>
<td>23-3/4” &amp; 27-3/4”</td>
</tr>
</tbody>
</table>

2. For each bottom guard, install the 8-inch mounting brackets to the bottom flange of the bed side channels using the provided 3/8-inch mounting hardware. Use the following guidelines when installing mounting brackets:
   - Use the mounting brackets to support both ends of each guard on both sides of the unit.
   - If applicable, a single bracket can be used to support the ends of two abutting guards.

3. Place the bottom guards on the portions of the brackets that hang below the bottom flange on the bed side channels.
Figure 25  Bottom Guard

- Bed Side Channels
- 3/8" Locknut
- 3/8" Flat Washer
- 3/8-16 x 1" LG. BOLT
- Bottom Guard
9 Linear Sorter Installation Notes

If you are installing a 2400 linear sorter using a 9165 unit as transportation, consider the following during installation to optimize performance of the sorter.

9.1 Speed Variations

Speed variations can be caused by mis-racked or bowed beds. Often a remedy for bowed beds, when squaring rods do not work, is skewing rollers.

Skewing rollers on a 2400 linear sorter will cause drag on the cartons thus impacting tracking.

9.2 Power Transmission Belt Tracking

Tracking the power transmission belt through a unit with PTOs and belt bypass kits is significantly more difficult than a standard 9x65 unit without these add-ons.

The flange bearings on the bypass kits (Figure 26) and on the PTOs (Figure 27) are particularly unforgiving to a mis-tracked power transmission belt and will slice through the belt and pull out the impregnated cords quickly. Figure 28 shows a mis-tracked belt riding up on the flange bearing of a PTO.

Figure 26 Flange Bearings on the Bypass Kits
Figure 27  Flange Bearings on the PTOs

Figure 28  Mis-tracked Belt Riding up on Flange Bearing of PTO
A mis-tracked power transmission belt could also cut through the flat drive bands which power the transfer rollers on a 2466 HS RAT. Note the limited clearance between bands for the power transmission belt to pass through in Figure 29.

Figure 29  Power Transmission Belt Clearance

To ensure proper belt path, take extra care when tracking the power transmission belt using bearing belt guides where required. Also it is imperative to verify that the flange bearings are square to the mounting plate and therefore the side channel (Figure 30). Slight imperfections in the angle of the flange bearings sets will cause enough influence on the power transmission belt to create issues in the next device (PTO, RAT, bypass etc).
Figure 30  Square Flange Bearings
10 Supplemental Information

10.1 Power Transmission Belt Routing through Drive

The following steps describe the procedure for routing the endless power transmission belt through the MCS Heavy Duty Tape Drive Assembly. See section 6.1 for power transmission belt installation instructions.

INFO: The blue (up) side of the power transmission belt drives the carrier rollers. The white (down) side of the drive belt rides on the skate assemblies and is driven and steered by the various pulleys.

1. Place the power transmission belt at the discharge end of the unit. Thread the belt around the steerable end pulley, over the snubber roller, and over the return rollers and crossmembers until you reach the take-up assembly.

2. Remove protective guards as needed to access the Heavy Duty Tape Drive components.

3. Remove the cylinder Figure 31 – (27) and yoke assembly (30) from the end of the take-up housing (20).
   a. Unbolt the take-up side cover (59) from the take-up housing.
   b. Unbolt the end guard (26) from the take-up housing.
   c. Slide the take-up pulley (23), slide blocks (21), and attached components to the very end of the take-up housing, and unhook the yoke assembly by tipping the cylinder end downward until the hook disengages the take-up pulley hex axle (22).

4. Remove the take-up pulley, slide blocks, and attached components from the open end of the take-up housing.
5. Route the power transmission belt through the take-up housing. Insert the take-up pulley and slide block assembly through the looped belt at the open end of the take-up housing (see Figure 32).

Figure 32 Power Transmission Belt Routing at the Take-up Pulley

6. Assemble cylinder, end guard, and yoke assembly onto the open end of the take-up assembly housing at the downstream end.
   a. Slide the take-up pulley and slide block assembly to the very end of the take-up housing, keeping the endless belt in position on the pulley.
   b. Tilt the yoke bracket upward and engage the hook portion of the bracket onto the take-up disks of the take-up pulley assembly (see Figure 33).
   c. Slide the take-up pulley and slide block assembly into position in the take-up housing.
   d. Bolt the cylinder end guard into place.
   e. Bolt the take-up side cover into place.

Figure 33 Assemble the Yoke and Cylinder onto the Take-up Frame
7. Ensure the skate assemblies are locked-down (model 9165 only).

8. Slide the top portion of the power transmission belt over the skate wheel assemblies, under snubber pulley, and continue routing toward the drive assembly. Feed the bottom portion of the power transmission belt toward the drive assembly. Remove any obstructions from the belt path.

9. Unbolt the drive end guard Figure 31 – (6) from the end of the drive housing (1).

10. Slide the drive snubber pulley (3) out of the slots on the drive assembly housing, and loop the power transmission belt around the drive snubber pulley.

11. Align the power transmission belt over the top and bottom of the drive pulley, and slide the drive snubber pulley back into place in the slots in the drive housing. (See Figure 34.) Carefully guide the belt into place and pull up the belt slack.

Figure 34 Power Transmission Belt Routing at the Drive Snubber Pulley

12. Replace the drive end guard.

13. Verify that the blue side of the drive belt is up and that the drive belt is correctly routed as shown in Figure 17.
10.2 End Cap Assembly Kits

Model 9165/9265 end cap assembly kits may be ordered separately and require field installation. Use the following sections to install and end cap assembly kit if required. See End Cap Assembly Drawings G0011 or G0156 for additional information.

10.2.1 9165 End Cap Assembly Kits

Model 9165 end cap assembly kits include all of the parts and pieces to transform a 9165 intermediate bed assembly into a charge or discharge end bed.

INFO Differences in belt lengths for this assembly are accommodated by the drive assembly.

10.2.1.1 9165 End Cap Assembly

1. At the charge end of the conveyor assembly, remove eight (3-inch roller centers) or twelve (2-inch roller centers) carrier rollers (see Figure 35).
2. Remove finger guards as needed to access the location for the end cap assembly.
3. Remove the last skate wheel and pressure assembly from the side channel.
4. Bolt the end pulley assembly to the side channel on the belt side of the conveyor.
5. Align the snubber assembly bracket to the end pulley assembly frame and bolt through the snubber assembly bracket, end pulley assembly frame, and into the side channel on the belt side of the conveyor.
6. Install the end pulley crossmember at the charge end.
   a. Bolt the end pulley crossmember to the side channel on the non-belt side of the conveyor.
   b. On the belt side, align the crossmember to the holes in the end pulley assembly and bolt in place.
7. Insert the take-up bolt through the washer and slide into the slot in the end pulley crossmember. Add the washer and jam nut to the other side of the end pulley crossmember and fasten the take-up bolt end through the end pulley assembly take-up pulley hex axle.
8. Install the end cap guard onto the side channels below the end pulley assembly.
9. Install grooved rollers, O-rings, and finger guards.
Figure 35  9165 End Cap Assembly
10.2.2 9265 End Cap Assembly Kits

The model 9265 end cap assembly kits include all of the parts and pieces to transform a model 9265 intermediate bed assembly into a charge or discharge end bed.

INFO See End Cap Assembly Drawing - G0011 for pneumatic diagrams when using Single Zone Controllers or G0156 when using Dual Zone Controllers.

INFO Differences in belt lengths for this assembly are accommodated by the drive assembly.

10.2.2.1 9265 Charge End Cap Assembly

1. At the charge end of the conveyor unit, remove components shown in Figure 36 (see section 10.2.1.1 for more details if necessary).

2. Disconnect the air tubing and remove the last pressure assembly from the side channel.

3. Install the End Pulley Assembly, End Pulley Crossmember, Take up Screw, and Snubber Assembly (see Figure 36 and reference the instructions in section 10.2.1.1 if necessary).

4. Lift the skate wheel assembly in the first downstream pressure assembly to access the air actuator located beneath it. Remove the existing black dual connection actuator and install the blue single connection Silastic actuator (p/n 04300-30511) in its place.

5. Connect actuators with 1/4” OD x 11-inch long tubing supplied with the end pulley assembly.

6. For electronic sensing, insert one end of 3/8” OD x 3-inch long tubing supplied with the end pulley assembly into the barbed end of the Electronic Sensor Pressure Assembly in the second downstream pressure assembly. Cap the tube with the 3/8” plug cap.

7. For mechanical sensing, insert one end of 3/8” x 3-inch ribbon tubing supplied with the end pulley assembly into the barbed end of the sensor pneumatic sub-assembly in the second downstream pressure assembly. Cap the ends of the ribbon tubing with three 3/8” plug caps (see Figure 37).

8. Verify air tubing does not interfere with the power transmission belt path and install end cap guard onto the side channels below the end pulley assembly.

9. Install grooved rollers, O-rings, and finger guards.
Figure 36  9265 ES Charge End Cap Assembly

Figure 37  9265 MS End Cap Assembly Tubing
10.2.2.2 9265 Discharge End Cap Assembly with Electric Controls

1. At the discharge end of the conveyor unit, remove finger guards and carrier rollers as described in section 10.2.1.1.

2. Remove pressure assemblies to allow for the end pulley assembly to be installed (see Figure 38).
   a. For Single Zone Controllers:
      o Disconnect the air tubing and remove 2nd to the last pressure assembly from the side channel.
      o Remove the last pressure assembly with the valve and move it upstream 1 location and reconnect air tubing.
   b. For an “EVEN” Dual Zone Controller:
      o Disconnect the air tubing and remove the last pressure assembly from the side channel.
      o Plug the Zone #2 port (last zone) on the Dual Zone Controller (see G0156 for diagram; plug included in kit).
      o LEAVE the last zone photo sensor connected.
      o DO NOT CHANGE any of the Dual Zone Controller switches.
   c. For an “ODD” Dual Zone Controller:
      o Disconnect the air tubing and remove 2nd to the last pressure assembly from the side channel.
      o Remove the last pressure assembly with the valve and move it upstream 1 location and reconnect air tubing.
      o Plug the Zone #1 port (last zone) on the Dual Zone Controller (see G0156 for diagram; plug included in kit).
      o LEAVE the last zone photo sensor connected.
      o DO NOT CHANGE any of the Dual Zone Controller switches.

3. Install the End Pulley Assembly, End Pulley Crossmember, Take up Screw, and Snubber Assembly. See Figure 39 and reference the instructions in section 10.2.1.1 if necessary.

4. Lift the skate wheel assembly in the first downstream pressure assembly on the belt side of the conveyor to access the air actuator located beneath it. Connect the first and second actuator with 1/4” OD x 13-1/2 inch long tubing supplied with the end pulley assembly.

5. Lift the skate wheel assembly in the second downstream pressure assembly on the belt side of the conveyor to access the air actuator located beneath it. Connect the second and third actuator with 1/4” OD x 11-inch long tubing supplied with the end pulley assembly.

6. Install the two pressure assemblies and brake pad assemblies on the non-belt side of the conveyor at the end of the discharge bed.
7. Lift the brake pad assembly on the first downstream pressure assembly and connect one end of the 1/4” OD x 11-inch tubing to the air actuator located beneath the brake pad assembly. Insert one end of the 1/4” OD x 16-inch tubing to the other barb on the same actuator.

8. Lift the brake pad assembly on the second downstream pressure assembly and connect the other end of the previously installed 1/4” OD x 11-inch tubing to the blue single connection Silastic actuator located beneath the brake pad assembly.

9. Align the controlled discharge air valve to the side channel between the brake pad and pressure assemblies on the non-belt side of the conveyor, and bolt into place with the hardware provided.

10. Connect the other end of the 1/4” OD x 16-inch long tubing from the first downstream brake pad and pressure assembly to the 1/4-inch tube x 1/8” NPT connector on the controlled discharge air valve.

11. Connect one end of the 1/4” OD x 46-inch long tubing to the 1/4-inch tube x 1/8-inch NPT elbow connector on the controlled discharge air valve.

12. Connect the other end of the 1/4” OD x 46-inch tubing to the air actuator on the first downstream pressure assembly on the belt side of the conveyor.

13. Connect one end of the 1/4” OD x 36-inch long tubing to the 1/4-inch tube x 1/8-inch NPT elbow on the controlled discharge air valve. Insert the 1/2-inch x 3/8-inch reducer union at the other end of the tube.

14. Verify that the air tubing does not interfere with the belt path and install the end cap guard onto the side channels below the end pulley assembly.

15. Install grooved rollers, O-rings, and finger guards.
Figure 38  Modifying Pressure Support Locations

- **Single Zone Controller**
- **Flow**
- **SQC Valve**
- **Pressure Support**
- **Remove**
- **Move**
- **End of Unit**

- **"Even" Dual Zone Controller**
- **Flow**
- **DZC Valve**
- **Pressure Support**
- **Remove**
- **Zone 1**
- **Zone 2**

- **"Odd" Dual Zone Controller**
- **Flow**
- **Remove**
- **Move**
- **End of Unit**
- **DZC Valve**
- **Zone 1**

Supplemental Information
Figure 39 9265 Discharge End Cap Assembly with Electric Controls
10.2.2.3 9265 Discharge End Cap Assembly with Air Controls

1. At the discharge end of the conveyor unit, remove components shown in Figure 40 (see section 10.2.1.1 for more details if necessary).

2. Disconnect the air tubing and remove the last pressure assembly from the side channel.

3. Install the End Pulley Assembly, End Pulley Crossmember, Take up Screw, and Snubber Assembly (see Figure 40 and reference the instructions in section 10.2.1.1 if necessary).

4. Lift the skate wheel assembly in the first downstream pressure assembly to access the air actuator located beneath it. Remove the existing black dual connection actuator and install the blue single connection Silastic actuator (p/n 04300-30511) in its place.

5. Connect one end of the 1/4" OD x 13-1/2" long tubing to the single connection actuator barb.

6. Insert the 1/4" x 1/4" x 1/4" tee into the other end of the 1/4" OD x 13-1/2" long tubing.

7. Cut the 1/4" OD x 11-inch long tubing in half. Slide both halves of the previously cut tubing over each end of the 1/4" x 1/4" x 1/4" tee.

8. Connect one end of the tubing over the actuator in the second downstream pressure assembly, and the other end of the tubing over the actuator in the third pressure assembly.

9. Verify that the air tubing does not interfere with the belt path and install the end cap guard onto the side channels below the end pulley assembly.

10. Install grooved rollers, O-rings, and finger guards.
Figure 40  9265 ES End Cap Assembly with Air Controls
10.3 Taper Lock Bushings

This is a generic procedure that applies to all taper lock bushings with setscrews.

**CAUTION**

Make sure that a Taper Lock bushing is not under belt tension when the bushing is being removed. Otherwise, Taper Lock bushing threads will be damaged, making the bushing unusable, and other equipment damage could occur.

10.3.1 Removal

1. Remove all screws holding the bushing(s) in place.
2. Insert screws in the bushing holes as indicated by a blackened circle (see Figure 41). Loosen the bushing by alternately tightening the screws.

![Figure 41 Taper Lock Bushings](image)

10.3.2 Replacement/Installation

1. Clean the shaft, bore of bushing, outside of bushing, and hub bore of all oil, paint, and dirt, and file away any burrs.
2. Insert the bushing into the hub. Match the hole pattern, not the threaded holes (each completed hole will be threaded on one side only).

**INFO** If two bushings are used on the same component and shaft, fully tighten one bushing before working on the other.

**CAUTION** Do not lubricate the bushing taper, bushing bore, hub taper, or the shaft. Doing so could result in breakage of the product.

3. Lightly oil the setscrews, and thread them loosely into the half-threaded holes indicated by a clear circle within a circle (see Figure 41).
4. With the key on the shaft, position the assembly on the shaft, allowing for the small axial movement that occurs during the tightening procedure.
Stake the key behind the bushing by marking the key with a chisel. If the key goes through the bushing, repeat on the other side. Do not mar the shaft.

Do not use worn hex key wrenches. Doing so might result in a loose assembly or might damage the screws.

5. Alternately and progressively torque the setscrews to the recommended torque settings (see Table 5).

INFO When installing a bushing in sintered steel product (such as a sheave or coupling), follow the torque recommendations on the product hub if present.

Where bushings are used with lubricated products such as chains, gears, or grid couplings, be sure to seal all pathways (where lubrication could leak) with RTV or a similar material.

6. Without hitting the bushing directly with a hammer, dimple the face of the bushing in four places using a drift punch or sleeve. Also dimple around the key as shown in Figure 42 to help lock the key in place.

Figure 42 Dimple the Bushing
Table 5  Taper Lock Bushing Torques

<table>
<thead>
<tr>
<th>Bushing No.</th>
<th>Torque (lb/in)</th>
<th>Torque (lb/ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1008, 1108</td>
<td>55</td>
<td>4.6</td>
</tr>
<tr>
<td>1210, 1215, 1310</td>
<td>175</td>
<td>14.6</td>
</tr>
<tr>
<td>1610, 1615</td>
<td>175</td>
<td>14.6</td>
</tr>
<tr>
<td>2012</td>
<td>280</td>
<td>23.3</td>
</tr>
<tr>
<td>2517, 2525</td>
<td>430</td>
<td>35.8</td>
</tr>
<tr>
<td>3020, 3030</td>
<td>800</td>
<td>66.7</td>
</tr>
<tr>
<td>3535</td>
<td>1,000</td>
<td>83.3</td>
</tr>
<tr>
<td>4040</td>
<td>1,700</td>
<td>141.7</td>
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<td>2,450</td>
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</tr>
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<td>6050, 7060, 8065</td>
<td>7,820</td>
<td>651.7</td>
</tr>
<tr>
<td>10085, 120100</td>
<td>13,700</td>
<td>1,141.7</td>
</tr>
</tbody>
</table>

7. Repeat hammering and re-torque until the recommended torque no longer turns the setscrews.

**CAUTION**
The bushing must be square with the hub after installation is complete. Any deviation greatly weakens the bushing’s holding ability.

8. Re-inspect screw tightness with a torque wrench after initial run-in, and periodically thereafter. Repeat steps 5, 6 and 7 if a bushing is loose.

**WARNING**
Make sure all guards removed to gain access to the bushing have been re-installed before restarting the conveyor, or serious injury could result.
10.4 Bearing Setscrews and Cap Screws Torque Specs

When replacing sprocket, sheave, and bearing collar setscrews, tighten to the setscrew torques listed in Table 6, using a torque wrench.

When replacing Dodge D-LOK mounted bearings and Sealmaster Skwezloc bearings, tighten the cap screws to the torque listed in Table 7, using a torque wrench:

Table 6 Bearing Setscrew Torques

<table>
<thead>
<tr>
<th>Setscrew Thread</th>
<th>Hex Wrench Size</th>
<th>Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pound - Inches</td>
</tr>
<tr>
<td>#10</td>
<td>3/32”</td>
<td>36</td>
</tr>
<tr>
<td>1/4”</td>
<td>1/8”</td>
<td>87</td>
</tr>
<tr>
<td>5/16”</td>
<td>5/32”</td>
<td>165</td>
</tr>
<tr>
<td>3/8”</td>
<td>3/16”</td>
<td>290</td>
</tr>
<tr>
<td>7/16”</td>
<td>7/32”</td>
<td>430</td>
</tr>
<tr>
<td>1/2”</td>
<td>1/4”</td>
<td>630</td>
</tr>
<tr>
<td>5/8”</td>
<td>5/16”</td>
<td>1270</td>
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</table>

<table>
<thead>
<tr>
<th>Setscrew Thread (mm)</th>
<th>Hex Wrench Size (mm)</th>
<th>Torque (nm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M6</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>M8</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>M10</td>
<td>5</td>
<td>28.5</td>
</tr>
</tbody>
</table>

Table 7 Bearing Cap Screw Torques

| D-LOK and Skwezloc Cap Screws |
|-------------------------------|-----------------|-------------|---------|
| Cap Screw Thread | Hex Wrench Size | Torx Wrench Size | Torque  |
|                  |                 |                 | Pound - Inches | Pound - Feet |
| #8               | 1/8”            | T-25             | 66 | 5.5 |
| #10              | 5/32”           | T-27             | 86 | 7.2 |
| 1/4”             | 3/16”           | T-30             | 171 | 14.3 |
| 5/16”            | 1/4”            | T-45             | 380 | 31.2 |

INFO Skwezlock bearings use Torx cap screws.
When replacing such bearings, please also note the following:

- Clean the shaft and bearing bore thoroughly, as necessary.
- Be sure that the bearing is not on a worn section of the shaft.
- For tighter fits, tap the inner ring face only, but DO NOT hammer on the housing.
- The bearing outer ring OD is spherical and swivels in the housing to accommodate misalignment. Snug hold-down bolts, and use the shaft to swivel each bearing until the final position is in the center, with free movement top-to-bottom as well as side-to-side. Pass the shaft through both bearings without forcing. This prevents pre-loading of the bearings.
- If applicable, tighten hold-down bolts. Turn the shaft by hand.
  
  **INFO** Resistance to turning should be the same as before full tightening of hold-down bolts.

- Replace any setscrews with knurled-cup screws with a locking patch.
- For setscrew-mounted bearings, tighten the setscrew alternately, using the appropriate hex wrench. Do not overtighten. Install the setscrew either by tightening the setscrew and backing it off 1/2 turn or by tightening until the setscrew meets the shaft or key, and complete the tightening with a torque wrench.
  
  **INFO** Do not drill through the setscrew holes for spot drilling of the shaft.

- For eccentric collar-mounted bearings, slide the collar against the cam end of the inner race. Use a punch in the hole provided in the collar; tap the collar smartly in the direction of shaft rotation.

- For D-LOK and Skwezloc collar-mounted bearings, be sure the collar is square and tight against the shoulder on the inner ring. Tighten the cap screw using the appropriate hex wrench.

- For cap screw-mounted bearings, do not overtighten. Install the cap screw either by tightening and backing it off 1/2 turn or tighten until the cap screw is snug, and complete the tightening with a torque wrench.

- For expansion bearings (H-E Series), locate the inner unit in the housing to allow expansion in the desired direction before locking it to the shaft.