

# Operator Manual

## MunchMan<sup>®</sup> II Conveyor



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# Jorgensen Conveyors

## DESCRIPTION

### General

The *Munchman conveyor* can be used to transport virtually all types of chips or cuttings and small-size particles, but it is designed specifically for carrying masses of stringy metal chips. Material is carried on the primary conveyor belt through the entire length of the conveyor, and a secondary belt runs through the inclined and discharge portions of the conveyor which holds onto and even compresses the birds' nests of stringers (Figure 1).

Simultaneously with transport, coolant can be separated, captured, or drained back into the cooling system. The basic application of this type of conveyor is as an elevating conveyor integrated directly into a machine tool, and/or in conveyor system along with other types of conveyors as an elevating conveyor, with chips deposited either into a collecting container or a disposal device.

### Conveyor Casing Construction

The conveyor casing is a welded, watertight unit fabricated from sheet metal sections. Tracks are welded onto the inside of the casing sidewalls. The tracks act as supports and guides for the conveyor belt (Figure 4).

### Drive and Take-Up

The conveyor is driven by an electric motor through a speed reducer (Figure 5). The output of the gearmotor is connected directly to the lower head shaft so that torque is transmitted via the head shaft and twin sprockets to the primary conveyor belt.

Torque is transmitted to the secondary conveyor belt via roller chain and sprockets on the non-drive side of the conveyor (Figure 6).

Alternative options include the headshafts driven by an indirect drive system comprised of a motor, speed reducer, roller chain and sprockets (Figure 7).

### Conveyor Tail End

The tail end of the typical metal belt conveyor consists of fixed hardened tail hubs welded to the conveyor casing (Figure 4). The tail hubs support and guide the chain as it makes the turn and changes direction.

### Conveyor Medium

The metal belt consists of sheet metal apron plates, mutually linked by axles. Rollers on each end of the axles, in turn, support the axles; the rollers are supported and guided by tracks mounted on the casing. The conveyor apron plates are sandwiched between side wings to contain the product being carried. The side wings are mounted on the axles, between the apron plates and the roller. Some belts are equipped with cross cleats to contain the material as it is lifted up the incline. Side bars are added to increase pulling capacity, based on the application (Figure 3). Conveyor belt pitch – the distance between axles – is either 1-1/2 or 2-1/2 inches (38 or 63 mm).

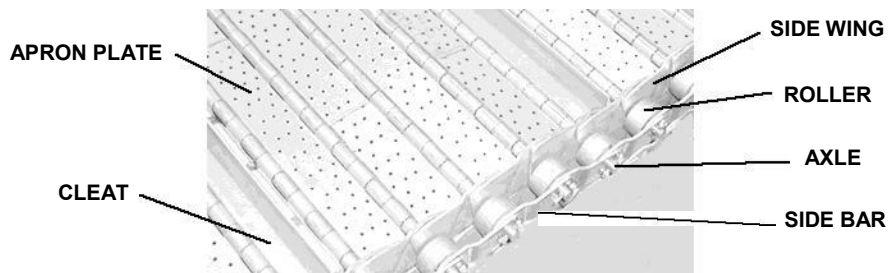
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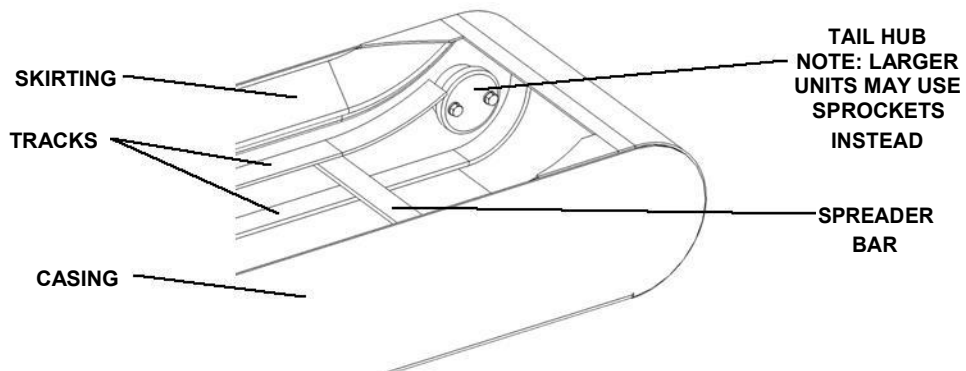
**Figure 1: Discharge end of the conveyor**



**Figure 2: Headshaft**



**Figure 3: Metal belt**

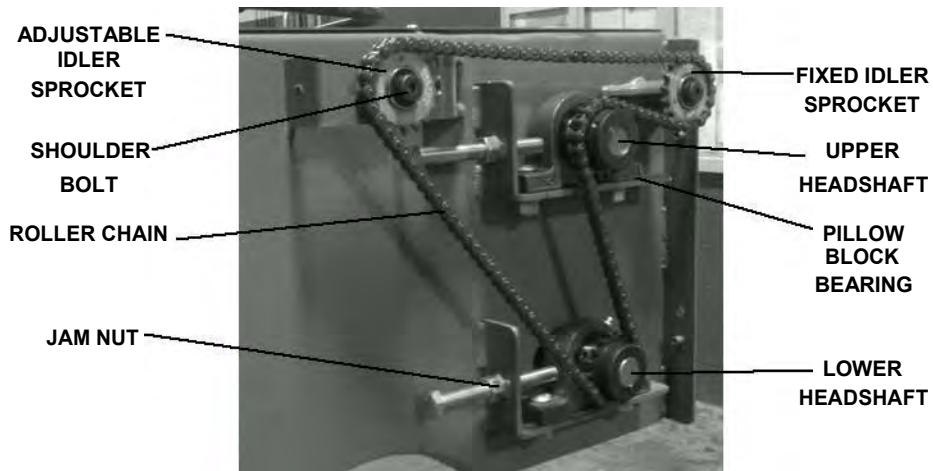


**Figure 4: Tail-end of conveyor without belting**

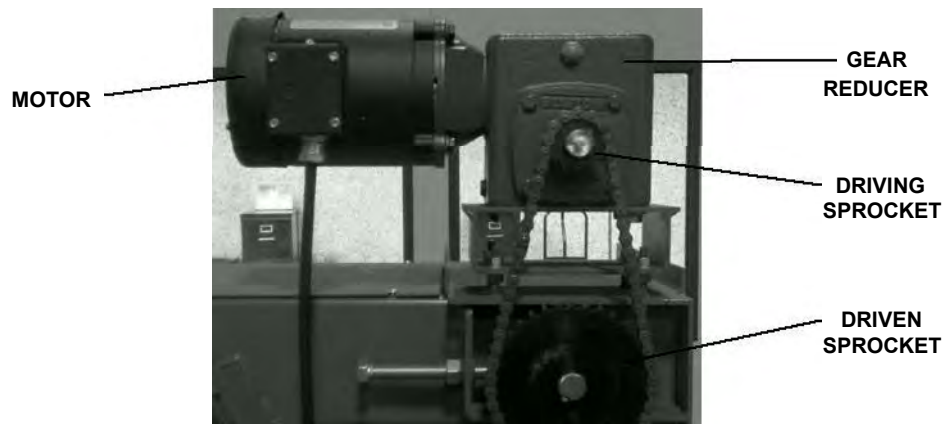
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**Figure 5: Direct drive side of conveyor**



**Figure 6: Non-drive side of conveyor with guarding removed**



**Figure 7: Indirect drive with guarding removed**

## Overload Devices

These conveyors are equipped with a current limiter to prevent damage or injury due to overloading. The current limiter is always used on the direct drive system, but it can also be used on the indirect drive system. This device is an electronic alternative to the mechanical ratchet clutch and other mechanical devices.

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## Current Limiter

The current limiter is a safety device used to protect the conveyor in the event of a jam or overload.

The current limiter senses motor current and, within milliseconds, shuts down the conveyor if the current rises above a preset level. In some cases, contacts are also provided for an audible or visual alarm when shutdown occurs.

Depending on user preference, the current limiter option can be purchased in two different configurations:

1. Mounted in a control ordered with the conveyor and supplied by Jorgensen Conveyors.
2. Mounted in a separate electrical box along with a set of

contactors. Functionally, both configurations operate in the same manner.

## **INSTALLATION**

The conveyor unit is shipped fully assembled. As a safety precaution, be sure to use the proper lifting device to unload the unit.

Uncrate the unit carefully, and inspect for damage that may have occurred during transit. If damage has occurred, notify the carrier immediately. Review this manual in its entirety before beginning installation. If you have any questions, call Jorgensen Conveyors immediately.

This unit has been lubricated, run-in, and tested in our facility. However, transportation can affect factory settings. Check for correct tensioning of the conveyor belt, and verify that all bolts in the take-up assembly and drive unit are tight. If necessary, adjust the unit as directed in this manual.

Check for, and remove, any loose material in the unit, especially from the base of the load section of the unit.

A final assembly drawing, specific to your conveyor unit, has been provided. Refer to this drawing and use the following discussion as a guide on how to proceed with installation.

Move the unit into position.

Place blocking and shimming under the full width of the load section of the unit to distribute weight uniformly. Be sure that the unit is level side-to-side (end-to-end is not important) and that the unit interfaces correctly with the machine.

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**Note:** Some units are equipped with adjustable casters to allow movement of the unit. Others are equipped with adjustable articulated leveling bolts.

Connect all piping and couplings, and verify that all fittings are tight.

Refer to the electrical schematic (shipped with the unit) and connect electric power according to the schematic.

### **START UP INSTRUCTIONS**

Initially (and after prolonged shutdown) be sure that the conveyor drive has been correctly wired and that all covers and shrouds are in place.

Operate the conveyor for approximately 15 minutes to observe and confirm trouble-free operation before placing the unit in service. (The unit is usually operated through pushbuttons located on the machine, although, when requested, the controls can be mounted on the conveyor.)

If the conveyor has been shut down for a prolonged period, proceed as follows:

Check for correct tensioning of the conveyor belt, as describe later under “Metal Belt Tension Adjustment.”

Verify that all bolts in the take-up assembly and drive unit are tight.

Be sure that the roller chain has been properly lubricated (brushed with light-weight oil).

If an unsealed indirect drive speed reducer is used, be sure that the speed reducer is correctly lubricated, as described later in this manual under “LUBRICATION.”

### **SERVICE AND MAINTENANCE**

The conveyor requires regular maintenance, including lubrication, in order to sustain trouble-free operation.

#### **Speed Reducer and Motor**

##### Direct Drive Units

The speed reducer is a two -stage system. The speed reducer is lubricated and sealed by the manufacturer and does not require further lubrication. The motor bearings are also sealed and do not require further lubrication.

##### Indirect Drive Units

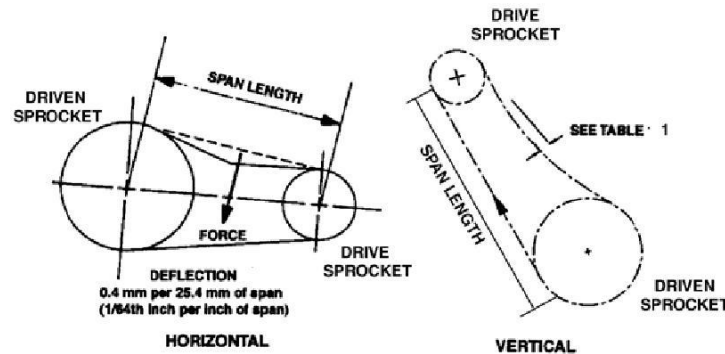
Optionally, conveyors may be equipped with roller chain in conjunction with a speed reducer. These may require periodic lubrication, and the roller chain may require

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occasional adjustment. Recommended lubrication oil is shown later under “LUBRICATION” in Table 2. For unusual temperatures, or to use synthetic oils, contact the manufacturer.

## Roller Chain Adjustment

1. Check sprocket alignment using a straight edge or taut cord stretched across the faces of the drive sprocket and the driven sprocket. The tolerance is  $\pm 0.5$  degrees or 1/8" per foot (3.5 mm per 0.3 m).
2. Check sprockets and components. Be sure that all are in good condition and free from contamination. The roller chain should be lubricated and free from chips or turnings.
3. Check roller chain tension. Deflection of the span shown is in Figure 8 and Table 1.
4. Be sure all setscrews, bolts, and nuts are tight.
5. Lubricate the roller chain by brushing with lightweight oil.



**Figure 8: Roller chain tension adjustment**

**Table 1: Deflection of roller chain between sprockets**

|              |                |                 |                 |                  |                  |                  |                  |                   |                  |
|--------------|----------------|-----------------|-----------------|------------------|------------------|------------------|------------------|-------------------|------------------|
| DRIVE CENTER | 12.7 cm<br>5"  | 25.4 cm<br>10"  | 38.1 cm<br>15"  | 50.8 cm<br>20"   | 76.2 cm<br>30"   | 101.6 cm<br>40"  | 152.4 cm<br>60"  | 203.2 cm<br>80"   | 254 cm<br>100"   |
| Horizontal   | .64 cm<br>.25" | 1.27 cm<br>.50" | 1.91 cm<br>.75" | 2.54 cm<br>1.00" | 3.81 cm<br>1.50" | 5.08 cm<br>2.00" | 7.62 cm<br>3.00" | 10.16 cm<br>4.00" | 12.7 cm<br>5.00" |
| Vertical     | .31 cm<br>.12" | .64 cm<br>.25"  | .97 cm<br>.38"  | 1.27 cm<br>.50"  | 1.91 cm<br>.75"  | 2.54 cm<br>1.00" | 3.81 cm<br>1.50" | 5.08 cm<br>2.00"  | 6.35 cm<br>2.50" |

## **Current Limiter**

**WARNING: When the current limiter stops the conveyor, there may be residual torque on the drive system. It is essential that the conveyor be operated in reverse momentarily to relieve the residual torque. Never**



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**attempt to clear a jam or work on the conveyor without first relieving the torque.**

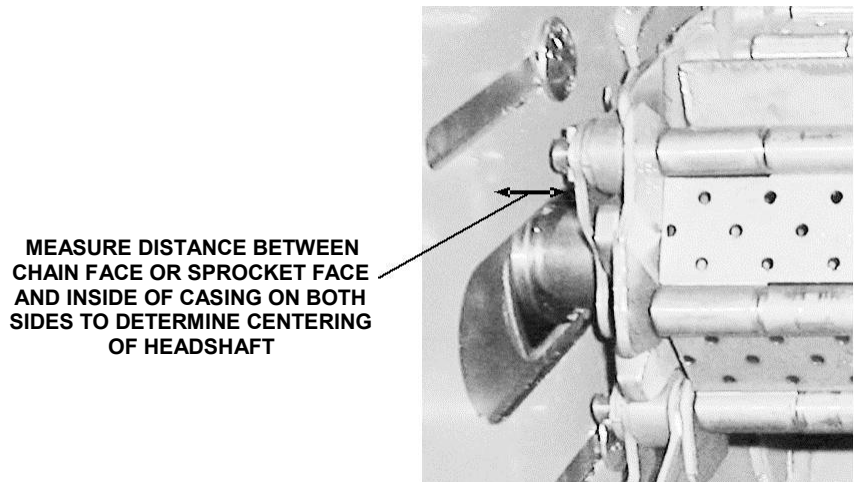
The current limiter's settings are preset at Jorgensen Conveyors. Adjusting the current limiter may result in reduced performance in the conveyor, or damage to the conveyor's components. If adjustments are necessary, refer to the controls documentation provided with the conveyor.

### Inspection and Adjustment of the Headshaft

**WARNING: Failure to follow safety procedures can cause personal injury. Disconnect all electrical power from the conveyor unit before removing the headshaft cover or servicing the headshaft assembly.**

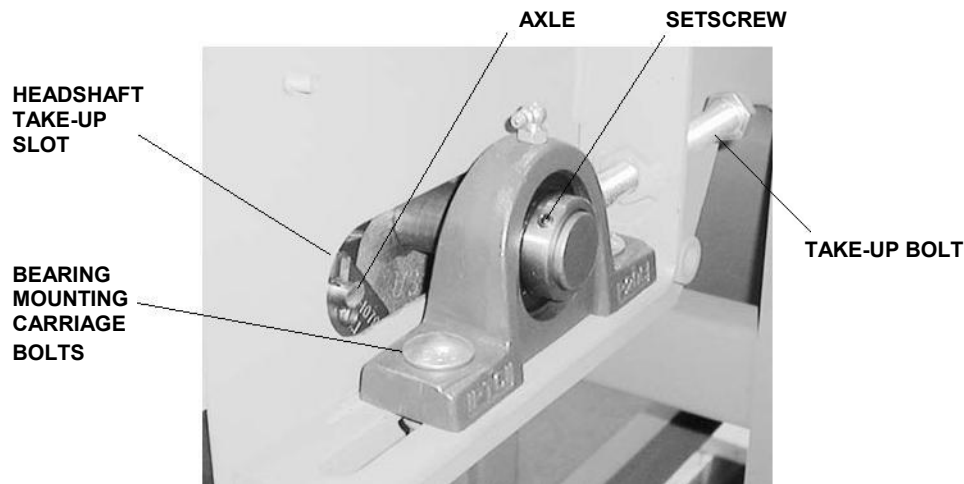
1. Lock out and tag out electrical power to the conveyor unit.
2. Remove any drive system covers.
3. Loosen the shoulder bolt for the adjustable idler sprocket and reposition the sprocket to relieve tension on the roller chain.
4. Disconnect the master link from the roller chain and remove the chain from the sprockets.
5. The headshaft can be now be inspected as follows:
  - A. If the metal belt runs against the sides of the conveyor or wanders from side to side:
    - a. Measure the distance between the headshaft sprocket face (or chain face) and the inside of the casing on both ends of the shaft to verify that the metal belt is centered in the discharge section (Figure 9). If not, proceed as follows:

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**Figure 9: Headshaft centering measurement**

- Loosen the setscrews on the flange bearing or pillow block bearing so that the headshaft can be moved laterally (Figure 10).



**Figure 10: Headshaft take-up slot**

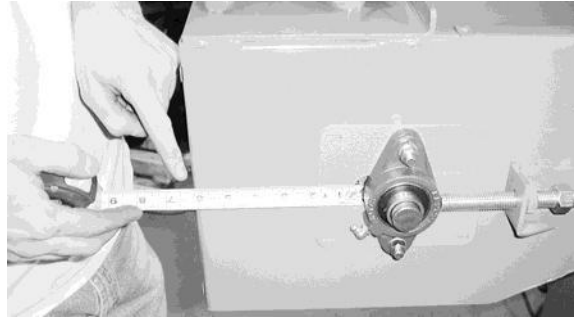
- Move the shaft and sprocket towards the side of the machine having the greatest clearance.
- Measure the distance between the chain face (or sprocket face) and the inside of the casing (Figure 9). Be sure that the sprockets are centered (distance is equal for both sides).

Retighten the bearing block setscrews.

- b. If the metal belt still runs against the side of the conveyor, or if the chain or belt “climbs” the sprockets:

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- Measure the distance between the bearing and the front edge of the casing (Figure 11) to verify that the headshaft is not cocked.

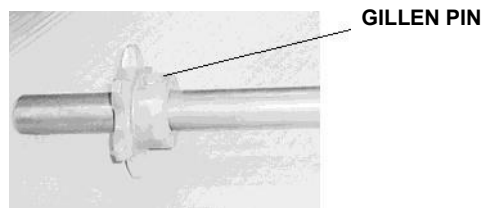


**Figure 11: Checking for headshaft skew**

- If the shaft is skewed, loosen the bearing block mounting carriage bolts on the lagging side and, using the take-up device, balance the position of the headshaft in the discharge section.

Tighten the bearing block bolts.

- c. If the metal belt climbs the sprockets even after steps (a) and (b) have been completed, metal belt tension may be too loose. Check metal belt tension as described under “Metal Belt Tension” below.
- B. If the headshaft turns, but the chain does not move, inspect the headshaft gillen pins or keys (Figure 12). In some cases, a sprocket key is used instead of a pin. If the pins or keys are damaged, refer to “Removal of Headshaft Assembly” below.



**Figure 12: Gillen pin**

- C. If the headshaft has lateral movement in the bearings: Check the headshaft - bearing mounting carriage bolts for tightness (Figure 10). If either is loose, proceed as follows:

Adjust the headshaft so that the chain equal distant between the chain and the inside of the side plate on each side (Figure 9).

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Tighten the headshaft-bearing mounting carriage bolts.

D. Headshaft is seized and does not rotate: refer to “Removal of Headshaft” below.

6. Reinstall the roller chain, and adjust tension.
7. Reinstall all covers and shrouds.
8. Apply electrical power.

### **Metal Belt Tension Adjustment**

1. Conveyor chains eventually stretch with operation so that tension must occasionally be adjusted using the take-up mechanism as follows:

A Lock out and tag out the conveyor.

B Remove covers and guards.

C Loosen the jam nuts and take-up bolts.

**Note:** On indirect drive units, remove the roller chain between the speed reducer and headshaft sprocket to free the headshaft for movement using the take-up device. Remove the master link on the roller chain to remove the chain.

D Loosen the shoulder bolt for the adjustable idler sprocket.

E Reposition the adjustable idler sprocket to relieve tension in the roller chain and add enough slack to adjust the headshafts.

F Adjust the take-up bolts to shift the headshaft in the required direction to increase or decrease tension. Be sure that both sides are tensioned uniformly so that the headshaft is not askew, which would increase wear on the chains and sprockets.

**Warning: Never check belt or chain tension using your hand while the conveyor is operating. Failure to observe this warning can result in severe injury to your hand.**

G Check belt tension with your hand as shown in Figure 13. Belt slack at this position should be approximately 1/2 to 3/4 inch (13 to 19 mm).

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ON THE METAL  
BELT, SLACK AT  
THIS POSITION  
SHOULD BE  
BETWEEN 1/2 AND  
3/4" (13 AND 19 mm).

**Figure 13: Checking Metal Belt Tension**

- G. Tighten the take-up retaining bolts and jam nuts.
  - H. Adjust tension in roller chain. Tighten shoulder bolt for adjustable idler sprocket.
  - I. Remove the tagout and restart the conveyor. Allow the conveyor to operate for 15 minutes and observe that the belt does not drift sideways, which would indicate skewing.
  - J. Install and secure all covers and guards.
2. Check the sprockets annually for indications of wear.
  3. Check conveyor metal belt every six months for indications of wear and damage.
  4. Check the tail hubs (or sprockets on larger units) for wear (Figure 4). Normally, this is not a problem and need only be performed when the conveyor is being completely disassembled.
  5. Verify that all casing bolts are tight and the general condition of the casing every six months.
  6. It is recommended that the conveyor metal belt be removed annually to clean the casing and to check the tracks for wear and damage.

### **Replacing the Headshaft**

#### Removal of the Headshaft Assembly

1. Carefully jog the conveyor until an axle is accessible through the take-up slots. See Figure 14.

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**WARNING: Failure to follow safety procedures can cause personal injury. Disconnect all electrical power from the conveyor unit before removing the headshaft cover or servicing the headshaft assembly.**

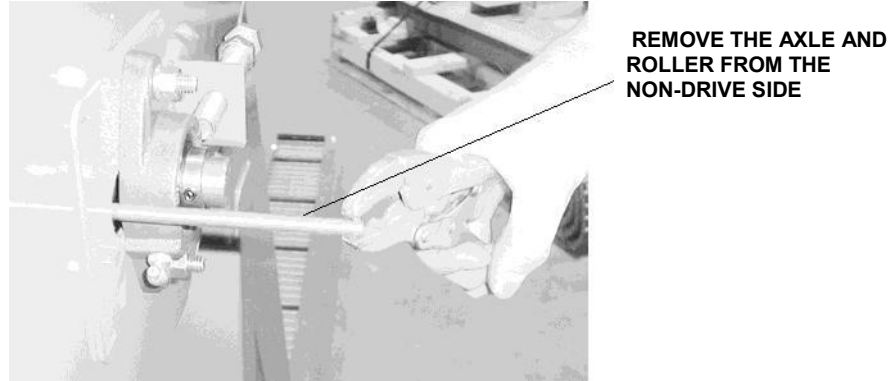
2. Lock out and tag out electrical power to the conveyor unit.
3. Remove all necessary covers and shrouds.
4. On the direct drive system remove the drive motor/speed reducer assembly.
5. Remove the master link on the roller chain and remove all roller chain from the sprockets.
6. Loosen the jam nuts and take-up bolts, and loosen the bearing mounting carriage bolts.
7. At the discharge section, push the headshaft to relieve tension on the metal belt.
8. Remove an axle pin from the drive side of the axle aligned with the take-up slot (Figure 14). Because the axle pins are press fit, it will be necessary to use a hammer and drive pin to remove the axle pin.



**Figure 14: Removing the axle pin**

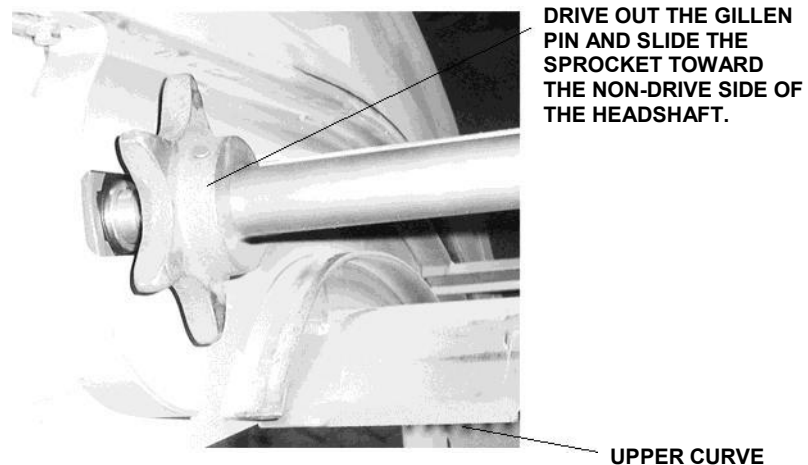
9. Remove the axle from the non-drive side as shown in Figure 15. Install the axle and roller back into the top half of the metal belt to avoid losing the axle, pin, side wings and roller.

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**Figure 15: Removing the axle on a metal belt conveyor**

10. Facing the discharge opening, pull on the lower half of the metal belt until the upper run clears the headshaft; lower the lower run onto the upper curve (Figure 16).
  - F. Loosen the setscrews securing the bearings to the headshaft (Figure 10).
  - G. Remove the roller chain sprocket from the headshaft by removing the setscrew in the sprocket hub.
  - H. Remove the *non-drive* side bearing from the headshaft.
  - I. Via the discharge opening, drive out the gillen pin on the drive end of the headshaft (Figure 16), or loosen set screws in hub if keys are used. With the sprocket now free to move, slide the sprocket toward the non-drive side of the headshaft.



**Figure 16: Removing the gillen pin**

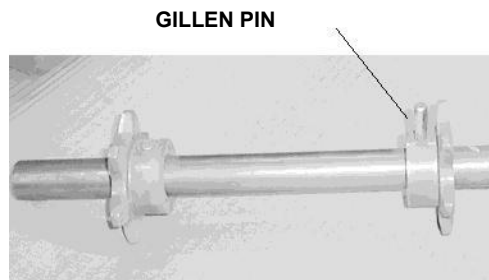
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- J. Push the headshaft towards the drive side, moving it out of the non-drive side bearing plate. Then lower the non-drive end of the headshaft and remove the entire headshaft to a safe working area.

### Installation of the Headshaft Assembly

Installation of the headshaft assembly is basically the reverse of the removal process. Upon completion of installation, refer to “Metal Belt Tension Adjustment” above to complete installation.

1. Slide the headshaft into the drive side of the conveyor and then into the non-drive side.
2. Drive the gillen pin into the holes in the belt sprocket and headshaft (Figure 17), or install the sprocket key if the unit is so equipped.
3. Install the bearings and bearing blocks/flanges and the sprocket on the headshaft. Install the sprocket-mounting setscrew, but do not tighten the bearing block mounting carriage bolts at this time.



**Figure 17: Installing the headshaft**

4. Refer to “Inspection and Adjustment of the Headshaft,” above, and center the sprocket/headshaft assembly in the conveyor.
5. After the sprocket has been aligned, tighten the bearing block and/or flange mounting carriage bolts.
6. Reinstall the metal belt over the headshaft and secure it with the appropriate items.
7. Operate the conveyor for approximately 15 minutes to verify correct alignment.

### **Metal Belt Removal and Installation**

#### Removal

Proceed as follows:

1. Carefully jog the conveyor until an axle is accessible through the take-up slots.



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**WARNING: Failure to follow safety procedures can cause personal injury. Disconnect all electrical power from the conveyor unit before removing the headshaft cover or servicing the headshaft assembly.**

2. Lock out and tag out electrical power to the conveyor unit.
3. Remove all necessary covers and shrouds.
4. On the direct drive unit, remove the drive motor/speed reducer assembly.
5. Remove the master link on the roller chain and remove all roller chain from the sprockets.
6. Loosen the jam nuts and take-up bolts.
7. Loosen the bearing mounting carriage bolts.
8. At the discharge section, push the headshaft to relieve tension on the metal belt.

**Note:** In the following instructions, the metal belt will be removed and lowered to the floor. This may require two persons or even an overhead lift.

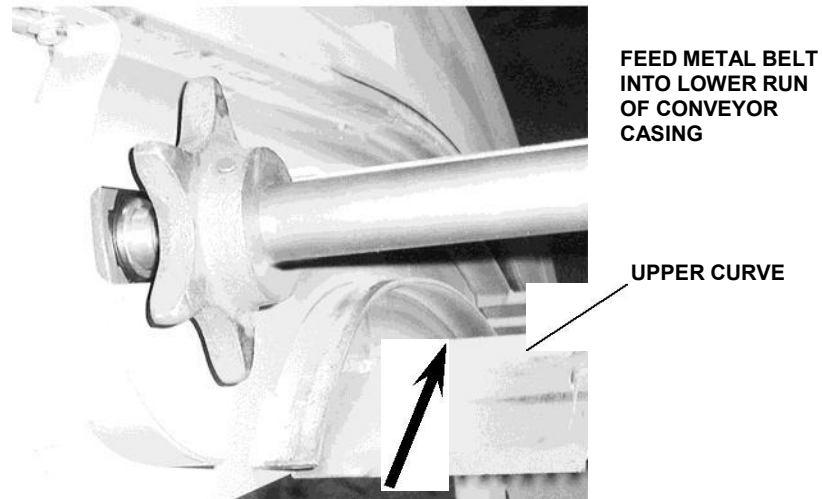
9. Remove an axle pin from the drive side of any axle (Figure 14). Because the axle pins are press fit, it may be necessary to use a hammer and drive pin to remove the axle pin.
10. Remove the axle from the non-drive side as shown in Figure 15. Install the axle and pins, and rollers back into the top half of the metal belt to avoid losing the parts.
11. Facing the discharge opening, pull on the lower half of the metal belt and remove the entire metal belt out of the discharge section. Lower the belt and allow it to fold on the floor beneath the discharge section.
12. Remove all foreign objects from the casing.
13. Inspect the metal belt assembly and casing for worn or damaged parts and repair/replace as required.

### Installation

Installing the metal belt assembly is essentially the reverse procedure discussed under “Removal.” Proceed as follows:

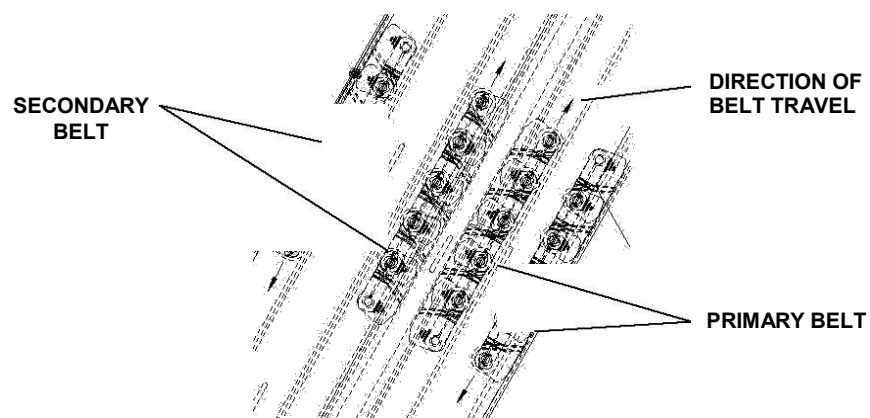
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1. Be sure that the headshaft is pushed all the way back.
2. Feed the end of the metal belt assembly into the lower run of the conveyor casing through the discharge section (Figure 18). Be sure that the wings face downward; i.e. the bottom of the conveyor.



**Figure 18: Installing the metal belt**

3. The primary and secondary belts must be inserted in opposite directions (Figure 19). Use the belt direction indicators on the side wings (Figure 20). The primary belt should be installed before the secondary belt for ease of installation.



**Figure 19: Primary and secondary belt direction**

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**Figure 20: Belt direction indicator**

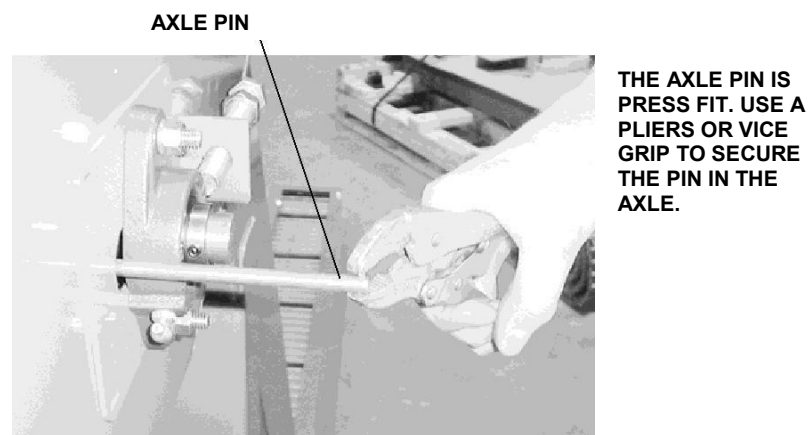
4. Feed (push) the metal belt assembly through the casing, past the tail hub, and up the incline until it comes up to the headshaft sprockets.
5. Pull the top run of the metal belt assembly over the headshaft until the end is centered in the take-up slots.
6. Pull the bottom run of the metal belt assembly to remove any slack.
7. Re-install the chain pins, rollers, or axle/pins through the take-up slots.
8. Install the axle, rollers, axle pins and side wings as follows:

Install the axle through the take-up slot and roller as shown in Figure 21.

The axle pin is press fit. Using a vice grips or press, press the axle pin into the hole provided.

Push the axle all the way through the belt and through the roller on the drive side of the belt.

Install the drive side pin using a hammer and rod as shown in Figure 22.



**Figure 21: Installing the axle and axle pin**

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THE AXLE PIN IS PRESS FIT IN THE AXLE. INSTALL THE AXLE PIN IN THE DRIVE SIDE USING A DRIVING ROD AND HAMMER.

**Figure 22: Installing the axle pin in the drive side**

9. Be sure that all metal belt assembly parts are in their proper position.
10. Reinstall the drive motor/reducer assembly, roller chain, and adjust tension at the headshaft using the take-up bolts and jam nuts as described under “Metal Belt Tension Adjustment.”
11. Secure the pillow block mounting carriage bolts.
12. Operate the conveyor for approximately 15 minutes to observe and confirm trouble-free operation before placing the unit in service.

### LUBRICATION

#### Grease Lubrication

There are a total of 2 grease fittings that require lubrication – one on either end of the headshaft to lubricate the head shaft bearings (Figure 23). Grease all bearings as follows.



ONE GREASE FITTING ON THE BEARING BLOCK ON EITHER SIDE OF THE UNIT.

**Figure 23: Grease fitting location**

For normal operating conditions, apply No. 2 grease through the grease fittings every 90 days. Grease should conform to NLGI No. 2 consistency, and should be free of chemical

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impurities such as free acid or alkali, and mechanical impurities such as dust, rust, metal particles, or abrasives. Add grease slowly until a slight bead forms between the seals.

### Oil Lubrication

The roller chain should be brushed with lightweight oil at regular intervals.

The speed reducer on the direct drive unit is factory lubricated and sealed. It therefore requires not further lubrication.

The indirect drive speed reducer may require periodic oil changes. Check instructions on the reducer.

**NOTE:** When changing oil in a double-reduction unit, be sure the primary and secondary chambers are both changed. When changing oil in a magnetic conveyor, use SAE 30W oil or equivalent.

**Table 2: Suggested Speed Reducer Lubricants**

| AMBIENT TEMPERATURE OF OPERATING ENVIRONMENT | RECOMMENDED OIL                      |
|--|--------------------------------------|
| -30 to 225 °F                                | Mobil SCH 634 Synthetic Oil          |
| 40 to 90 °F                                  | Mobil 60W Cylinder Oil               |
| 80 to 105 °F                                 | Mobil Extra Hecla Super Cylinder Oil |

### TROUBLESHOOTING

| PROBLEM                            | PROBABLE CAUSE  | REMEDY  |
|------------------------------------|---|---|
| Unit does not operate.             | Blown fuse.   | Replace fuse. Determine cause and correct.                                  |
|                                    | Tripped overload relay(s).                              | Determine cause and correct. Reset the relay.                               |
|                                    | Main disconnect off.                                    | Turn main disconnect on.  |
|                                    | No power to the line side of the disconnect.            | Determine reason for no power and correct.                                  |
| Excessive wear on chain or casing. | Conveyor not level or plumb.                            | Level and plumb conveyor.   |
|                                    | Chain or belt assembly misaligned or incorrect tension. | Align chain and/or correct tension. See Maintenance section of this manual. |
|                                    | Damaged or missing chain or belt assembly parts.        | Repair or replace chain.  |
| Clutch ratcheting or slipping.     | Chain/belt misaligned or incorrect tension.             | Align chain and/or correct tension. See Maintenance section of this manual  |

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|   |   |  |
|---|---|--|
|   | Excessive or accumulated loading.                                   | Avoid load buildup by running conveyor continuously. Do not manually surge material into the conveyor. |
|   | Carry-back of material into conveyor.                               | Collection receptacle full. Replace/empty receptacle as required.                                      |
|   | Incorrect clutch tension.   | Refer to clutch section of this manual.  |
|   | Damaged chain or belt.  | Repair or replace chain/belt.  |
|   | Accumulation of conveyed material or foreign objects inside casing. | Clean out conveyor. See Note below:  |
| Excessive wear on chain/belt or casing. | Conveyor not level or plumb.  | Level and plum conveyor.   |
|   | Chain/belt misaligned or incorrect tension.                         | Align chain and/or correct tension. See Maintenance section of this manual                             |
|   | Carry-back of material into conveyor.                               | Collection receptacle full. Replace/empty receptacle as required.                                      |
|   | Damaged chain or belt.  | Repair or replace chain/belt.  |
|   | Accumulation of conveyed material or foreign objects inside casing. | Clean out conveyor. See Note below:  |
| Chain/belt pulses or surges.            | Chain/belt misaligned or incorrect tension.                         | Align chain and/or correct tension. See Maintenance section of this manual                             |
|   | Carry-back of material into conveyor.                               | Collection receptacle full. Replace/empty receptacle as required.                                      |
|   | Damaged chain or belt.  | Repair or replace chain/belt.  |
|   | Accumulation of conveyed material or foreign objects inside casing. | Clean out conveyor. See Note below:  |

Note: To quickly clean out the metal belt conveyor, proceed as follows. Remove all objects or debris from the topside of the chain/belt. Roll up or wad up newspaper and place the newspaper at the tail of the conveyor. Operate the conveyor in reverse. This will carry the paper back into the conveyor so that the paper “wipes out” the inside of the conveyor. Operate the conveyor in the reverse direction until all the paper has been discharged. Repeat this procedure until the casing is clean.

## Jorgensen Conveyors

### WARRANTY

Jorgensen Conveyors, Inc. guarantees the material of our manufacture against defects in material or workmanship under normal and proper use for a period of one year in service or eighteen months from shipment, whichever occurs first. Material which we purchase can be guaranteed by use only to the extent of the original manufacturer's guarantee. We shall not be held liable for damages or delay caused by defective material, or contingent claims of any kind arising from loss of production owing to failure of shipment. Our obligation under this warranty is limited to furnishing new or replacing defective material without charge F.O.B. factory. No allowance will be made for repairs or alterations unless made with our written consent.

Caution should be used in the care and application of our products as the guarantee recited above does not apply where lack of proper maintenance or misapplication exists. We will not be liable for improper storage or handling of our products prior to placement in service.

The within equipment will be specifically designed and manufactured for and will be sold to purchaser for the sole purpose of transporting and conveying raw materials, work in process and finished goods of purchaser. Purchaser does hereby agree to exonerate, indemnify, defend and hold seller harmless of and from all loss, liability and damages which may be suffered by or asserted against the seller, and all costs and expenses which seller may incur because of any claim or claims which may be asserted against seller by any person for death or injury to anyone sustained while riding or attempting to ride upon said equipment.

# Jorgensen Conveyors

## NOTES

Unit serial # \_\_\_\_\_



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