

# OPERATOR MANUAL

## Single Stage Filterveyor®



## **WARNINGS**

- **THIS CONVEYOR IS DESIGNED FOR A SPECIFIC APPLICATION.**
- **CHECK FRAME AND BELT FOR DAMAGE DURING SHIPMENT.**
- **READ THE MANUAL FOR PROPER INSTALLATION AND START-UP.**
- **CONVEYOR MUST BE LEVEL AND PLUMB FOR PROPER OPERATION.**
- **CHECK ALL DRIVE COMPONENTS FOR ALIGNMENT AND TENSION.**
- **CONTROL BOXES AND OTHER ATTACHMENTS MUST BE MOUNTED WITH EXTREME CARE SO AS NOT TO INTERFERE WITH CONVEYOR OPERATION**
- **VERIFY ALL WIRING FOR CORRECT VOLTAGE, CYCLE & AMPERAGE**
- **PROPER CHAIN TENSIONING IS REQUIRED AT INSTALLATION, AND WHEN IN USE FOR 30-45 DAYS, A RE-ADJUSTMENT SHOULD BE PERFORMED.**
- **LOCK OUT AND TAG OUT POWER SOURCE PRIOR TO ANY ADJUSTMENTS OR MAINTENANCE.**
- **KEEP HANDS AWAY FROM CONVEYOR WHEN POWER SOURCE IS NOT LOCKED OUT.**
- **DO NOT STEP ON MOVING DRAG CHAIN.**

## ***DANGER***

***Use OSHA Lockout/Tagout procedures before performing any inspections, adjustments, or maintenance procedures on this equipment. Failure to follow OSHA required procedures at all times without exception could result in severe injury and is against Federal workplace safety laws.***



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## 1.0 DESCRIPTION

### 1.1 GENERAL

Used primarily in machining operations, the Filterveyor is a filtration device that separates fine chips and fine particles from the coolant, returning clean coolant back to the machine.

In contrast to the Dual Stage Filterveyor, which is designed to handle large and fine chips, the Single Stage Filterveyor is designed for those applications in which only small, fine chips are produced. As the name implies, the Single Stage Filterveyor consists of only one stage. See Figure 1.

The Single Stage Filterveyor is similar to a conventional drag flight conveyor in that it is comprised of a load and incline section. However, a filtration drum is added, making it a Filterveyor.

Contaminated coolant enters into the load section along with the chips, which drain by gravity through the drag chain and finally weirs into the filtration drum section.

The filtration drum is a rotating cylinder covered with permanent media. The drag chain from the load section drives the filter drum, while scraping some of the larger chips out of the conveyor to the discharge, dropping them into the collection container.

The filter drum consists of a frame with a filtration media (permanent type) fastened around the circumference. Clean coolant passes through the media by gravity into a clean tank, leaving smaller fine particles behind, adhering to the media.

A spraybar located inside the filter drum washes these particles off the outside of the media. The drag chain cleats, or flights, also scrape up these particles and carry them to the collection container as well as the larger chips.

Clean coolant is pumped out of the Filterveyor's clean tank back to the machine, closing the cycle.

The following sections contain design/construction, installation, startup, maintenance, and trouble-shooting information for the Single Stage Filterveyor.

## 1.2 DESIGN/CONSTRUCTION

### 1.2.1 Casing Construction

The Filterveyor casing is a welded, watertight unit fabricated from sheet metal sections. Tracks are welded

onto the inside of the casing sidewalls (Figure 1A). The tracks act as supports and guides for the drag chain.

### 1.2.2 Drive and Take-Up

The conveyor is driven by a gearmotor. The headshaft may be driven via a chain between the gearmotor and driven sprocket (indirect drive), Figure 1B and 1C. In some cases, the output of the gearmotor is connected directly to the head shaft (direct drive), Figure 1D.

### 1.2.3 Conveyor Tail End

The tail end of the typical drag chain conveyor consists of fixed hardened tail hubs fastened to the conveyor casing (Figure 1A). The tail hubs support and guide the chain as it makes the turn and changes direction. In some cases, sprockets are used instead of the tail hubs (Figure 1E). The sprockets, which are free-wheeling, serve the same function as the tail hubs, and are used for longer conveyors, or where greater chain control is desired.

### 1.2.4 Conveyor Medium

The drag chain assembly is comprised of two strands of 1.25" pitch commercial roller chain, with a series of cleats fastened to them (Figure 1E).

The chains can be repaired, lengthened, or shortened on a link-by-link basis using typical roller chain techniques.

The cleat, which drags fines up the incline of the conveyor, is made of sheet metal bent to form an angled leg. Each end of the cleat is bolted to an attachment (Figure 1E), that is welded to the chain. With this arrangement, a worn or damaged cleat can be replaced easily by removing the bolt on each end, and installing a new cleat.

### 1.2.5 Overload Devices

The conveyor is equipped with either of two devices to prevent damage or injury due to a jam or overloading: 1) a ratcheting slip clutch, or 2) a current limiter. Each is discussed below.

**Ratcheting Slip Clutch (if provided – indirect drive only).** This unit is designed to limit the torque transmitted by the drive system when the torque exceeds a preset value. This is typically caused by overload, shock load, or jamming of the conveyor. The clutch includes an adjustable tension spring that pro-

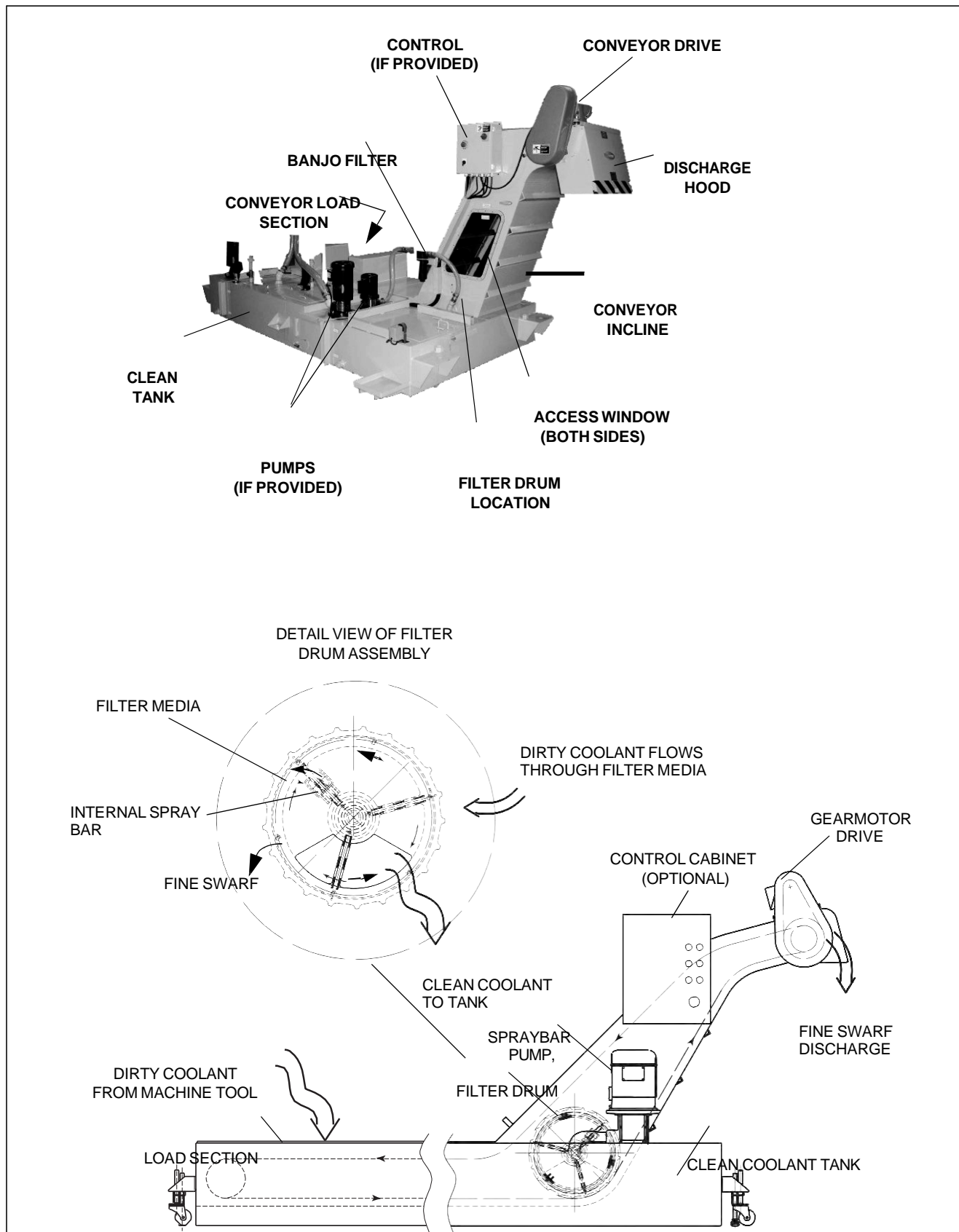
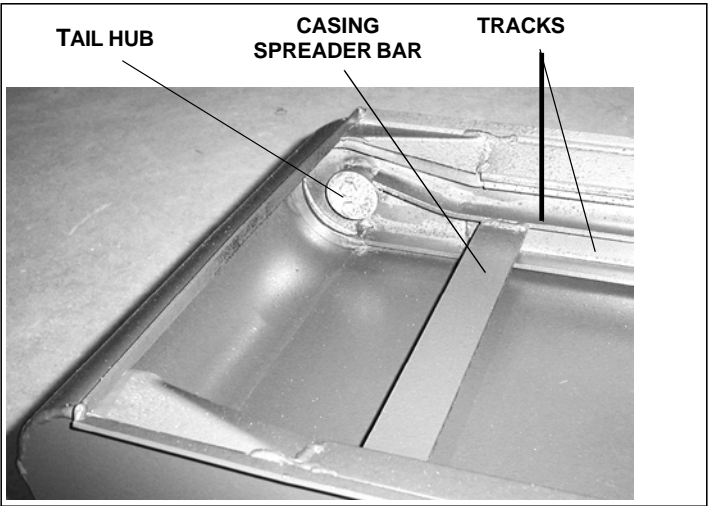
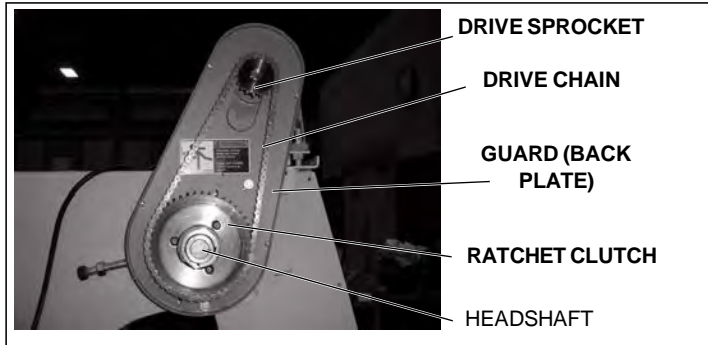


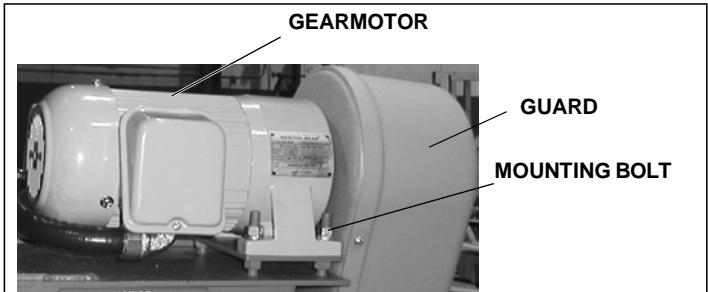
Figure 1. Conveyor Nomenclature (1 of 3)



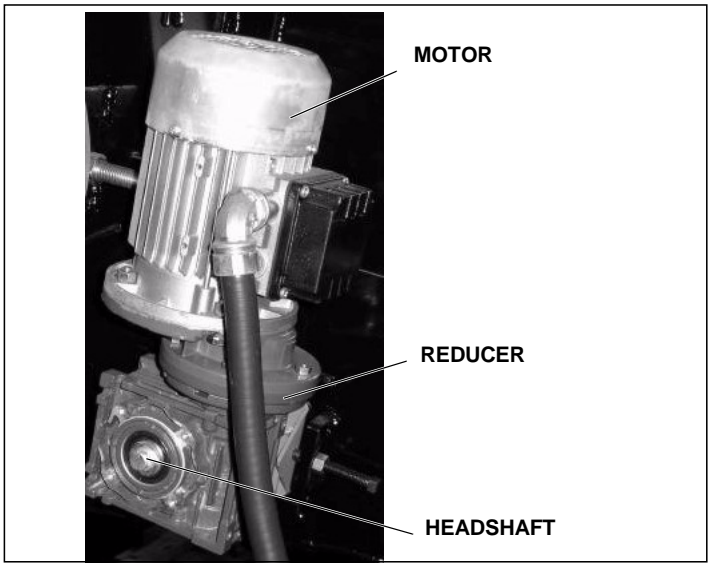
**A. Tail arrangement with tail hub. Note casing construction, common to both tail arrangements**



**B. Indirect drive arrangement**



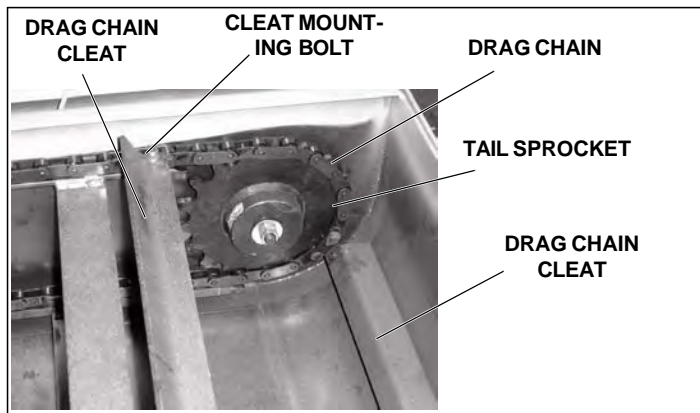
**C. Gearmotor assembly-indirect drive**



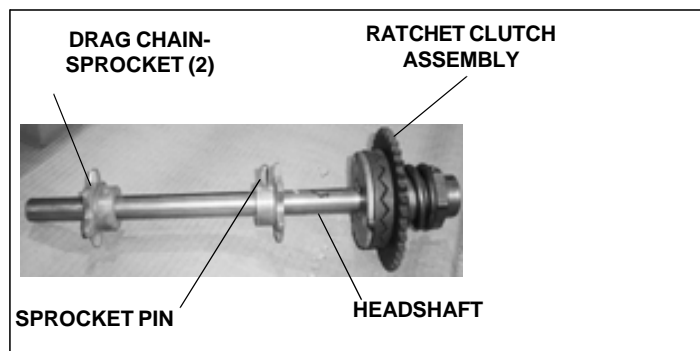
**D. Direct drive assembly consists of gearmotor connected directly to the headshaft.**

**Figure 1. Filterveyor Nomenclature (2 of 3)**

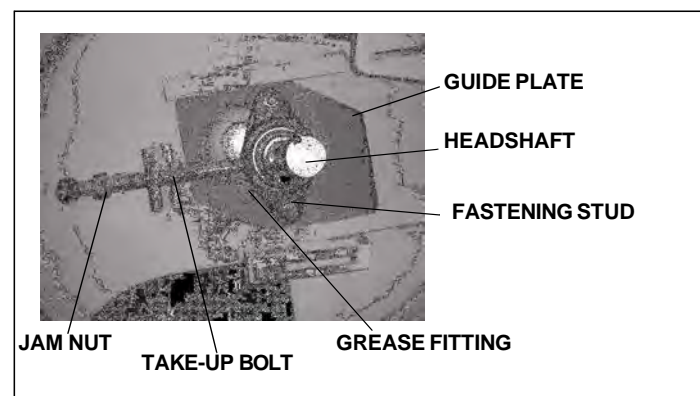




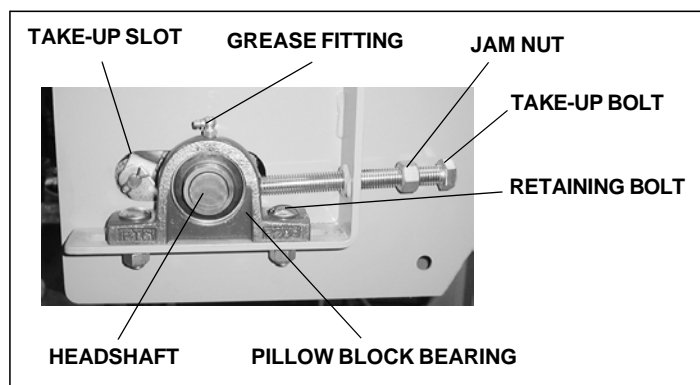
**E. Tail arrangement with chain sprocket. Note drag chain arrangement.**



**F. Headshaft assembly**



**G. Flange bearing and take-up assembly**



**H. Pillow block bearing and take-up assembly/ Note the take-up slot behind the bearing.**

**Figure 1. Conveyor Nomenclature (3 of 3)**

vides pressure on a pair of ratchet-tooth plates. Refer to Figure 1F and 3

.When a severe overload occurs, the ratchet-tooth plates, engaged on the driven sprocket, push the driven sprocket against the spring and slip on the ratchet-tooth plate until the overload is cleared. After clearing the overload, resetting is not necessary.

### Current Limiter (if provided)

The current limiter is a safety device used to protect the conveyor in the event of a jam or overload. This device is an electronic alternative to the mechanical ratchet clutch or other mechanical devices.

The current limiter senses motor current and, within milli-seconds, shuts down the conveyor if the current rises above a preset level. (Contacts can also be 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 separate electrical box along with a set of contactors.
2. Mounted in a control ordered with the conveyor and supplied by Jorgensen Conveyors.

Functionally, both configurations operate in the same manner. The current limiter is most often used on the direct drive system, but it can also be used on the indirect drive system. In this arrangement, the current limiter replaces the ratchet clutch, although the driven sprocket is still used.

## 2.0 INSTALLATION

### 2.1 GENERAL

The Filterveyor 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 Jorgensen Conveyor's 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.

- A. Check for, and remove, any loose material in the unit, especially from the base of the load section.
- B. A final assembly drawing, specific to your Filterveyor, has been provided. Refer to this drawing and use the following discussion as a guide on how to proceed with installation.
- C. Move the unit into position.
- D. Place blocking and shimming under the full width of the load section and clean tank of the unit to distribute weight uniformly. Be sure that the unit is level and that the unit interfaces correctly with the machine.

**NOTE: Some units are equipped with adjustable casters to allow movement of the unit. Others may be equipped with adjustable articulated leveling bolts. Do not move the Filterveyor if filled with coolant.**

### 2.2 ELECTRICAL CONNECTIONS

Refer to wiring diagrams and appropriate control drawings before wiring the unit. Insure that voltage rating for the unit is known before connecting the unit to any power source.

Electrical leads may have become loose during shipment. Verify that all connections are secure, or reconnect as required.

### 2.3 PIPING CONNECTIONS

Both the backflush pump and the machine supply pump are provided as options.

If the back flush pump is supplied by Jorgensen Conveyors no piping connections are required at time of installation. Otherwise the user will need to install a pump, plus a line from the pump's discharge to the Banjo filter. This line should also contain a valve for adjustment of flow to the spraybar. Pipe diameter should be the same as the discharge connection on the Banjo filter (1 1/4" NPT).

If the machine supply pump is included, the user will have to make the piping connections from the pump to the machine. In other cases, the user will have to install a pump as well as the piping. Pipe diameter for this line is the customer responsibility, to ensure that pressure

drop does not cause low flow or pressure at the machine.

### 3.0 START-UP

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

1. Verify that all piping is tight, and leak proof.
2. Verify that drive motor runs in the proper direction. The lower run of the drag chain should move toward the discharge. Refer to the Assembly drawings.
3. Verify that all guards and safety devices are installed.
4. Verify that all pumps rotate in correct direction.
5. Insure that coolant has been added and that tank level is as per the Assembly drawing. Fill only with pre-mixed coolant.
6. Insure that the bowl of the policing filter (Banjo) for the spraybar is secure, and that the valve upstream of the filter is open.
7. Operate the Filterveyor 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, controls can be mounted on the Filterveyor.)
8. The spraybar valve has been adjusted at the factory but may need to be adjusted after installation. Observe the spray pattern, through the access opening, and adjust the valve (if necessary) to obtain forceful streams of coolant through the media, without causing coolant misting or foaming. This adjustment may be optimized by the operator over time.

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

1. Check for correct tensioning of the conveyor drag chain assembly, as described later under "Drag Chain Tension and Adjustment," Section 4.4.
2. Verify that all bolts in the take-up assemblies and drive unit are tight.
3. Be sure that the roller chain on the indirect drive unit has been properly lubricated (brushed with light-weight oil).

## 4.0 SERVICE AND MAINTENANCE

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

### 4.1 GEARMOTOR DRIVE ASSEMBLY

#### 4.1.1 Direct Drive Units

**General.** With this drive arrangement, the gearmotor is mounted directly on the headshaft (Figure 1D); there is no drive chain between the gearmotor and headshaft.

**Removal/Replacement** Proceed as follows:

1. Lock out and tag out electrical power to the conveyor unit.
2. Open the gearmotor terminal box and disconnect the power leads. Using the appropriate wrench, loosen the Seal-Tite connection until the leads can be disengaged from the terminal box.
3. Un-bolt the gearmotor from it's mounting bracket. Pull the gearmotor off of the shaft and place it on a bench.
4. Replace the gearmotor by reversing steps 1-3 above.

#### 4.1.2 Indirect Drive Units

**General.** With this drive arrangement, the gearmotor is mounted remote from the headshaft. The headshaft is driven from a chain that connects the gearmotor sprocket to the headshaft drive sprocket, Figure 1B.

**Removal/Replacement.** Proceed as follows:

1. Lock out and tag out electrical power to the conveyor unit.
2. Open the gearmotor terminal box and disconnect the power leads. Using the appropriate wrench, loosen the Seal-Tite connection until the leads can be disengaged from the terminal box.
3. Remove the chain guard cover exposing the drive chain. Disconnect the drive chain by removing the master link.
4. Relieve tension on the drive chain by loosening the gearmotor mounting bolts (Figure 1C) so the gearmotor can be moved toward the headshaft.

5. Remove (4) Hex. Nuts and lockwashers securing the gearmotor to the mounting plate. Remove the gearmotor.
6. Reinstall the gearmotor by reversing the above steps 2-5.

### Drive Chain Adjustment

Proceed as follows:

1. Using the gearmotor mounting bolts, tension the drive chain according to Figure 2 and Table 1. Check sprocket alignment using a straight edge or taut cord stretched across the faces of the drive sprocket and the driven sprocket (Figure 2). The tolerance is 1/8" per foot ( $\pm 0.5$  degrees or 3.5 mm per 0.3 m).

### 4.1.3 LUBRICATION

The gearmotor is factory lubricated and sealed. It therefore requires no further lubrication. The motor bearings are also sealed and do not require further lubrication.

### 4.2 OVERLOAD PROTECTION

#### 4.2.1 Ratcheting Slip Clutch (if provided - indirect drive only)

This unit is preset at Jorgensen Conveyors, and should only require resetting if clearing an overload does not stop the ratcheting. Refer to Figure 3 and proceed as follows:

Table 1. Deflection of Roller Chain Between Sprockets

Drive Center	5"	10"	15"	20"	30"	40"	60"	80"	100"
Horizontal	.25"	.50"	.75"	1.00"	1.50"	2.00"	3.00"	4.00"	5.00"
Vertical	.12"	.25"	.38"	.50"	.75"	1.00"	1.50"	2.00"	2.50"

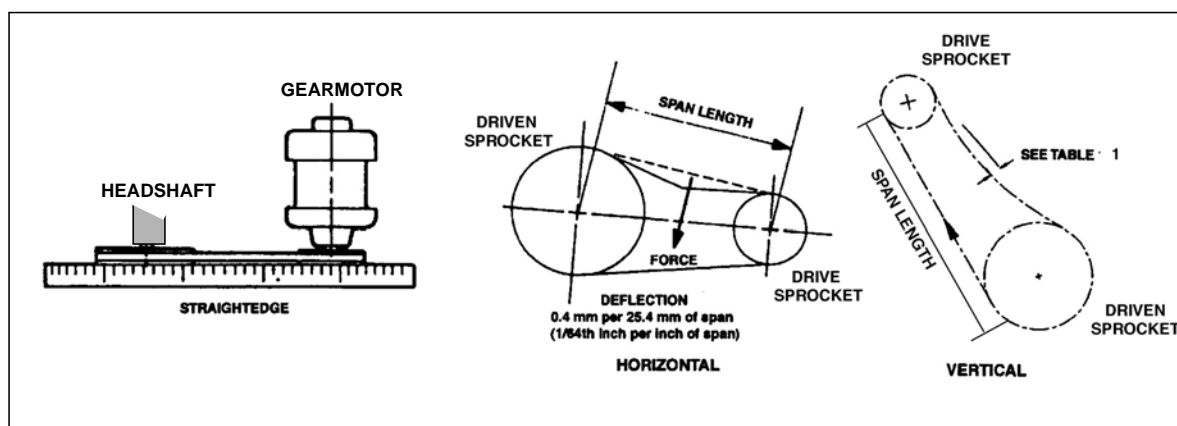


Figure 2. Gearmotor Alignment and Drive Chain Tension Adjustment

2. Check sprockets and components. Be sure that all are in good condition and free of contamination. The roller chain should be lubricated and free from chips or turnings.
  3. Be sure all setscrews, bolts, and nuts are tight.
  4. Lubricate the roller chain by brushing with light-weight oil.
  1. Lock out and tag out electrical power to the conveyor unit.
- WARNING** Failure to follow safety procedures can cause personal injury! Disconnect all electrical power from the conveyor unit before servicing the ratchet slip clutch.
2. Lock out and tag out electrical power to the conveyor unit.
  3. Remove all drive guards and/or covers.
  4. Loosen the setscrew on the clutch-adjusting nut. Tighten the adjusting nut 1/4 turn clockwise.

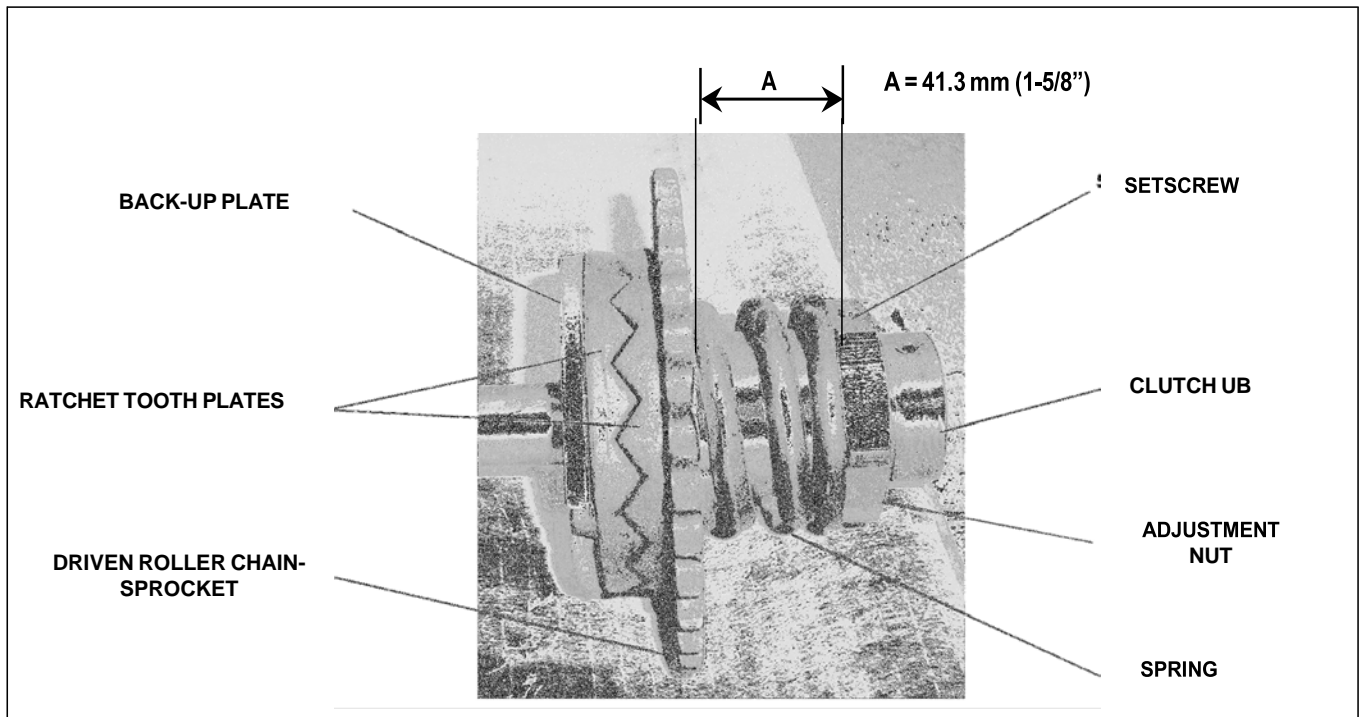


Figure 3. Ratchet Slip Clutch

5. Clear the conveyor of any jamming material or overload.
6. Load the conveyor with the maximum expected chip load.

**NOTE:** The ratchet slip clutch is preset at Jorgensen Conveyors to 1-5/8" (41.3 mm) (A, Figure 3). Do not compress the spring to anything less than 1-1/2" (38.1 mm) as this will disable the clutch.

7. Install guards and covers, and apply electric power, restart the conveyor, and observe operation of the clutch. If the overload (ratcheting) continues, check to determine if the conveyor is jammed by running the conveyor in reverse to clear the jam. If there is no longer a jam, restart the conveyor and continue with Step 9. Otherwise, proceed with Step 8.
8. Repeat steps 6 and 7 until the conveyor runs continuously without ratcheting.
9. After final adjustment, lock the adjusting nut in place with the setscrew.
10. If the conveyor is now functioning properly, replace the guards and covers, and return the unit to service.

The only maintenance required for the ratchet slip clutch is periodic inspection for wear, rust, corrosion, or binding between the ratchet-tooth plates.

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

The current limiter can best be adjusted with the conveyor operating under typical load:

1. With the conveyor running, gradually turn the adjustment screw on the limiter counter-clockwise until the limiter trips out and stops the conveyor.
2. After the conveyor has stopped, turn the adjusting screw a small amount higher and restart the conveyor. If the conveyor runs without being shut down by the current limiter, you are ready to begin normal operation.
3. If the current limiter continues to trip, check to determine if the conveyor is jammed by running the



coveyor in reverse to clear the jam. If there is no jam, restart the conveyor and continue with Step 4.

4. If the limiter still trips, repeat the above procedure until the conveyor runs continuously without tripping out. This setting will be a good starting point; through experience with the specific chips and load procedures, you may want to adjust the limiter accordingly.

### 4.3 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.**

Proceed as follows:

**NOTE: Check the sprockets annually for indications of wear.**

1. Lock out and tag out electrical power to the Filter-veyor.
2. Remove the discharge hood (Figure 1) and any drive system covers as necessary.
3. For the indirect drive:
  - Move the gearmotor assembly on its adjustment screws to relieve tension on the roller chain (Section 4.1.2).
  - Disconnect the master link from the drive chain and remove the chain from the headshaft drive sprocket. Remove covers, as necessary, to expose the headshaft.
4. For the direct drive, remove the gearmotor from the headshaft (Section 4.1.1)
5. The headshaft can now be inspected as follows:

A. If the drag chain 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 sidewall on both ends of the shaft to verify that the drag chain is centered in the discharge section (Figure 4). If not, proceed as follows:

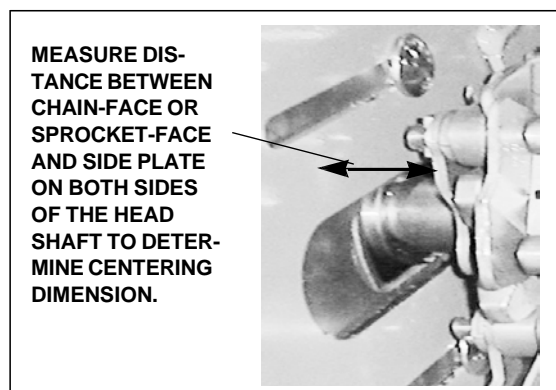
- Loosen the setscrews on the flange bearings or pillow block bearings so that the headshaft can be moved laterally. (See Figure 7 and 8)

- Move the shaft and sprocket towards the side of the machine having the greatest clearance.

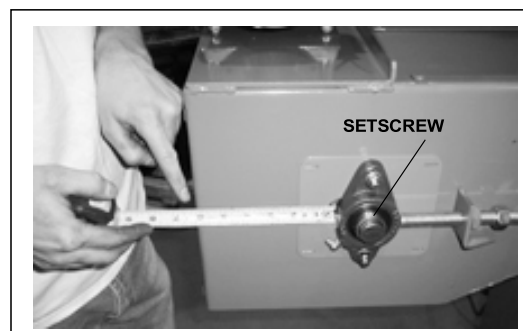
- Measure the distance between the chain face (or sprocket face) and the inside of the sidewall (Figure 4). Be sure that the sprockets are centered (distance is equal for both sides).

- Retighten the bearing setscrews.

b) If the drag chain still runs against the side of the conveyor, or if the chain “climbs” the sprockets:



**Figure 4. Headshaft Centering Measurement**



**Figure 5. Checking for Headshaft Skew**

- Measure the distance between the bearing and the front edge of the sidewall (Figure 5) to verify that the headshaft is not cocked (skewed).

- If the shaft is skewed, loosen the gearmotor mounting bolts to relieve tension on the drive chain (in-direct drive). Then loosen the bearing retaining bolts for both pillow block bearings (note: it is not necessary to loosen

the bolts holding the flange bearing onto the guide plate for direct drive) Using the take-up bolts, balance the position of the headshaft in the discharge section.

- Tighten the jam nuts, bearing retaining bolts and the gearmotor mounting bolts. Readjust drive chain tension, if necessary (indirect drive).

C. If the drag chain climbs the sprockets even after steps (a) and (b) have been completed, drag chain tension may be too loose. Check tension as described under “Drag Chain Tension Adjustment”, Section 4.4. In addition, check condition of the sprockets to make sure they are not worn.

D. If the headshaft turns, but the drag chain does not move, inspect the headshaft sprocket pins or keys. See Figure 1F. (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”, Section 4.5.1.

E. If the headshaft has lateral movement in the bearings check if the bearings are worn. If not, check the setscrews and the headshaft bearing retaining bolts for tightness (Figure 1H). If either is loose, proceed as follows:

- Adjust the headshaft so that the chain is equal distant between the chain and the inside of the side plate on each side (Figure 4).
- Tighten the headshaft-bearing retaining bolts, and/or setscrews.

F. If the headshaft is seized and does not rotate: refer to “Removal of Headshaft Assembly”, Section 4.5.1.

7. Reinstall the gearmotor assembly, or roller chain (indirect drive), refer to Section 4.1. Adjust tension at the headshaft using the take-up bolts and jam nuts as described under “Drag Chain Tension Adjustment”, Section 4.4.
8. Reinstall all covers and shrouds.
9. Apply electrical power.
10. Operate the conveyor for approximately 15 minutes to observe and confirm trouble-free operation

## 4.4 DRAG CHAIN TENSION ADJUSTMENT

**NOTE: Check conveyor drag chain every six months for indications of wear and damage.**

**NOTE: Check the tail hubs (or sprockets) for wear. Normally, this is not a problem and need only be performed when the conveyor is being overhauled.**

Proceed as follows:

Conveyor chains eventually stretch with operation so that tension must occasionally be adjusted using the take-up mechanism as follows (refer to Figures 1G and 1H):

1. Lock out and tag out the conveyor.
2. Remove the discharge hood (Figure 1) and all other necessary covers and guards.
3. Loosen the jam nuts and take-up bolts.

**NOTE: On indirect drive units, remove the roller chain between the gearmotor 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. Refer to Section 4.1.2.**

4. Loosen the bearing retaining bolts on pillow block bearings.
5. Adjust the take-up bolts to shift the headshaft to either increase or decrease tension. Be sure that both sides are tensioned uniformly so that the

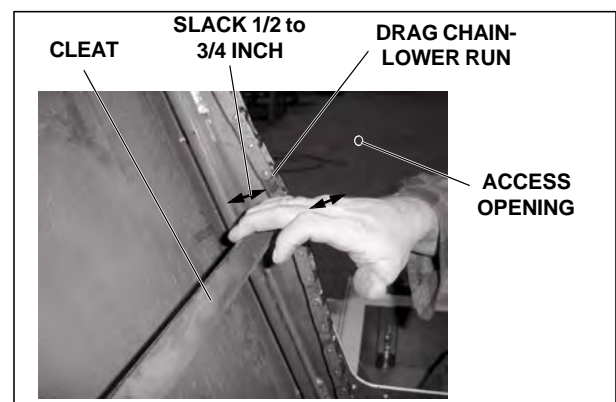


Figure 6. Checking Tension of Drag Chain

Note: Insure power is locked out.

headshaft is not askew, which would increase wear on the chains and sprockets. Refer to Section 4.3.

**WARNING: Never check chain tension using your hand while the conveyor is oper-**

**ating. Failure to observe this warning can result in severe injury to your hand.**

6. Check chain tension as shown in Figure 6. Chain slack at this position should be approximately 1/2 to 3/4 inch (13 to 19 mm).
7. Tighten the take-up bolts, jam nuts, and bearing retaining bolts. Re-install the drive chain and check drive chain tension. Adjust as necessary per Section 4.1.
8. Install and secure all covers and guards.
9. Remove the tagout and restart the Filterveyor. Allow it to operate for 15 minutes, observe movement of the drag chain and adjust to center or eliminate climbing over headshaft sprockets as explained in Section 4.3, "Inspection and Adjustment of Headshaft"

## 4.5 REPLACING THE HEADSHAFT

### 4.5.1 Removal of Headshaft Assembly

Proceed as follows:

1. Carefully jog the conveyor until the master links of the drag chain are on the bottom run, and are accessible through the access openings.

**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 the discharge hood, access covers, and other necessary covers and shrouds.
4. On the direct drive system, remove the gearmotor assembly per Section 4.1.1.
5. On indirect drive units, loosen retaining bolts as necessary and remove the roller chain between the gearmotor and driven sprocket to free the headshaft for movement, Section 4.1.2. Remove the master link on the roller chain to remove the chain.
6. Loosen the jam nuts, take-up bolts, and the bearing retaining bolts.

**NOTE: If the unit is equipped with a ratchet slip clutch, loosen the setscrew on the clutch hub and remove the slip clutch.**

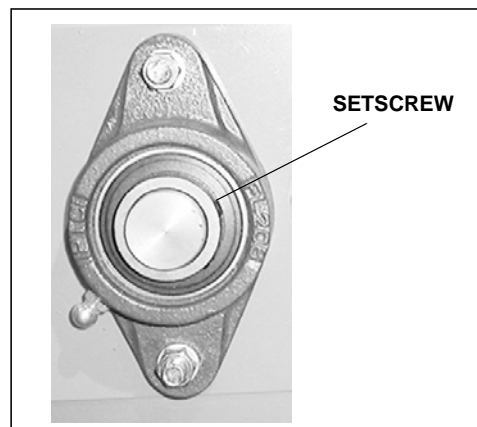


Figure 7. Setscrew on Flange Bearing

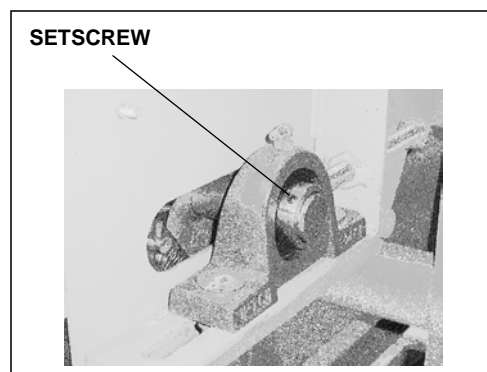


Figure 8. Setscrew on Pillow Block Bearing

7. At the discharge section, push the headshaft toward the tail section of the unit to relieve tension on the drag chain.
8. Working through the access openings, remove the master link from both strands of the drag chain assembly. Grasp the drum side of the drag chain (where the chain assembly has been separated) and pull the bottom run of the drag chain up the incline until the top run is free of the headshaft sprockets.
9. Loosen the setscrews securing the bearings to the headshaft (Figure 7 or 8).
10. Remove the sprocket pins or loosen setscrews in the headshaft sprockets and move the sprockets toward the non-drive end of headshaft.



11. Remove the driven sprocket from the drive side of the conveyor by removing the ratchet clutch. If a ratchet clutch is not used, remove the setscrews or drive pins in the sprocket hub.
12. If pillow block bearings are used, remove nuts/bolts securing the headshaft bearings. Remove bearings.
13. If flange bearings are used, loosen the nuts holding the bearing onto the guide plate, and remove the bearings.
14. Push the headshaft towards the drive side, moving it out of the non-drive side take-up slot. Then lower the non-drive end of the headshaft and remove the entire headshaft to a safe working area.

#### 4.5.2 Installation of Headshaft Assembly

Installation of the headshaft assembly is basically the reverse of the removal process. Upon completion of installation, refer to “Drag Chain Tension Adjustment”, Section 4.4 to complete installation.

1. Slide the headshaft through the drive side frame of the conveyor, slip the headshaft sprockets onto the shaft, then slide the headshaft into the non-drive side frame.
2. For those units equipped with pillow block style bearings, slip the bearings onto the shaft, and fasten the bearings with carriage bolts. Do not tighten the pillow block fasteners at this point.
3. For units fitted with flange style bearings, slip the bearings onto the shaft and bearing mount studs. Using the proper lock washers and hex nuts, fasten the bearings to the bearing guide plate, and tighten.
4. After bearing installation, align the headshaft per Section 4.3 and tighten the bearing setscrews, locking the shaft into the bearing inner races.
5. If keys are used, slip the headshaft sprockets onto the keys provided, and adjust the center distance as required by the drag chain width. Tighten the setscrews in the sprocket hubs, locking them to the headshaft.
6. If sprocket pins are used, position the sprockets over the holes in the headshaft, and insert the pins and drive into place.
7. Re-install the drag chain by pulling the top run of chain up the incline and wrapping it around the sprockets. Continue to pull the top run up while

pushing the bottom run down the incline until the two ends meet in front of the access openings. Working through the access openings, attach the drag chain ends together by installing a master link on each chain strand.

8. Adjust the drag chain tension as described in Section 4.4. Tighten the bearing retaining bolts after the correct belt tension has been made. If locknuts have been provided on the tensioning bolt, lock them down at this point.
9. If a ratchet clutch is used, install the clutch on the drive end of the headshaft. Align the sprocket with that on the gearmotor (see Figure 2). Tighten the setscrews securing the device to the headshaft, and install the drive chain in accordance with Section 4.1.2.
10. For those units equipped with a direct drive, install the shaft-mounted gearmotor on the headshaft drive end. Insure that the key is present and engaged with the gearmotor quill shaft. Attach the gearmotor to its mounting bracket.
11. Re-install the drum access covers. Connect power and run the drive motor to insure that the drive system runs properly, the belt tracks correctly, and that the drum is rotating. Adjust as necessary. Refer to Sections 4.3 and 4.4.
12. Install the Head Section cover and the drive guard.

#### 4.6 DRAG CHAIN ASSEMBLY REMOVAL AND INSTALLATION

**Warning: Lock Out and Tag Out the electrical power source to the system during maintenance.**

##### 4.6.1 Removal

1. Lock out and tag out electrical power to the conveyor unit.
2. Remove the inspection window and the access cover from the Filterveyor sides to gain access to the filter drum.
3. Remove the discharge hood from the front of the Filtration unit. Figure 1.
4. Disconnect the drive chain that connects the gearmotor and headshaft. (If a shaft-mounted gearmotor is used, the gearmotor will have to be removed from the headshaft.) This allows the drum to be rotated by hand. The procedure for disconnecting

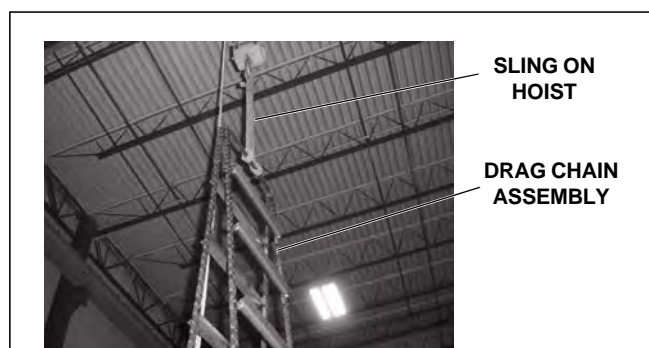


Figure 9. Lifting Drag Chain Assembly With Hoist

these drive components is described in Section 4.1.

5. Rotate the headshaft or drum until the drag chain master links are on the bottom run and accessible from both of the access openings.
6. Loosen the bolts securing the headshaft pillow block bearings to the conveyor, Figure 1H.
7. Turn the headshaft take-up bolts counter-clockwise to allow the headshaft to drop back, creating slack in the filter drag chain assembly.
8. Remove the master links from the drag chain assembly. and pull the free end of the top run of the drag chain assembly out of the casing, allowing

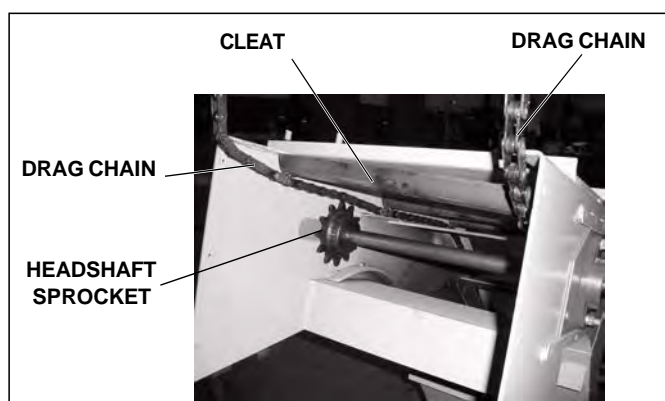


Figure 10. Feeding Drag Chain Assembly Into Discharge Opening (discharge hood removed)

it to drape down in from of the conveyor. Using a hoist or other suitable lifting device, pull the remainder of the drag chain assembly out of the filtration unit, Figure 9.

9. Place the drag chain assembly on the floor and inspect for chain or cleat wear or damage. Inspect all cleat mounting bolts and tighten as necessary.

#### 4.6.2 Installation

1. Position the drag chain assembly on the floor directly in front of the discharge and fully extend it. The cleats should be on top of the chain, with the scraping edge facing away from the unit ("laying back").
2. Using a hoist or other suitable lifting device, lift the chain assembly and place the leading edge of the drag chain assembly on top of the headshaft sprockets, Figure 10. Feed the drag chain assembly down the incline to the filter drum.
3. Position the first chain link (roller link) so that it is on top of the drum and engaged on a tooth on the drum end disc sprocket (both sides) Figure 11.
4. Manually rotate the drum and continue to feed the drag chain assembly into the filter unit, until the first links are laying on the bottom of the casing.
5. Pull this end of the drag chain up the incline until it is opposite the access openings.
6. Remove the drag chain assembly from the lifting device and place the free end of the drag chain assembly under the head shaft sprockets. Allow the free end of chain to slide down the incline. Both chains in the assembly should be aligned link-for-link on the headshaft sprockets.
7. Working through the access openings, bring both ends of the drag chain assembly together and connect them with master links.
8. Adjust chain tension with the take-up bolts, Section 4.4. Check tension as shown in Figure 6. Chain slack at this position should be approximately 1/2 to 3/4 inch (13 to 19 mm).
9. Re-install the drive components (drive chain or shaft-mounted gearmotor) using the procedures outlined in Section 4.1.
10. Re-install the discharge hood and access covers and all other guards and covers that have been removed.
11. Connect power and run the unit. Make adjustments as necessary to insure that the drag chain assembly and drive system move freely, and that the drag chain assembly tracks properly. Adjust if necessary per Section 4.3 and 4.4.

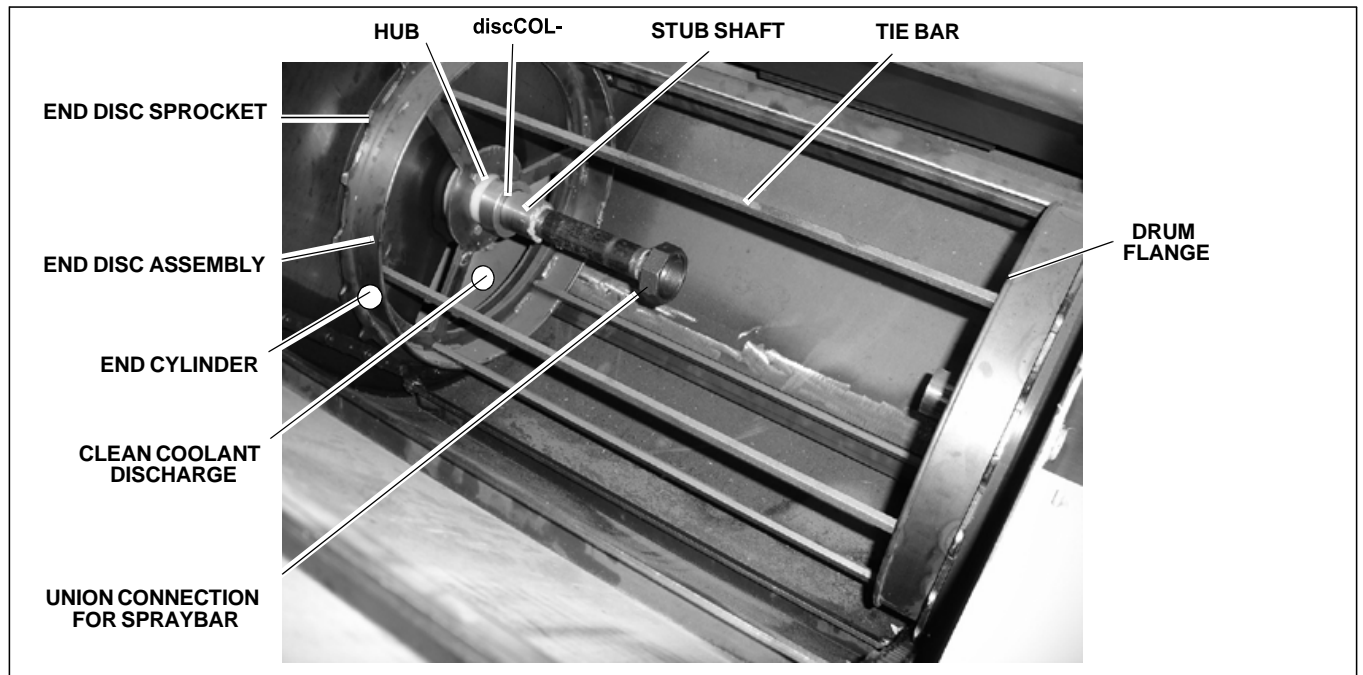


Figure 11. Drum With Media Removed



Figure 12. End Disc Assembly

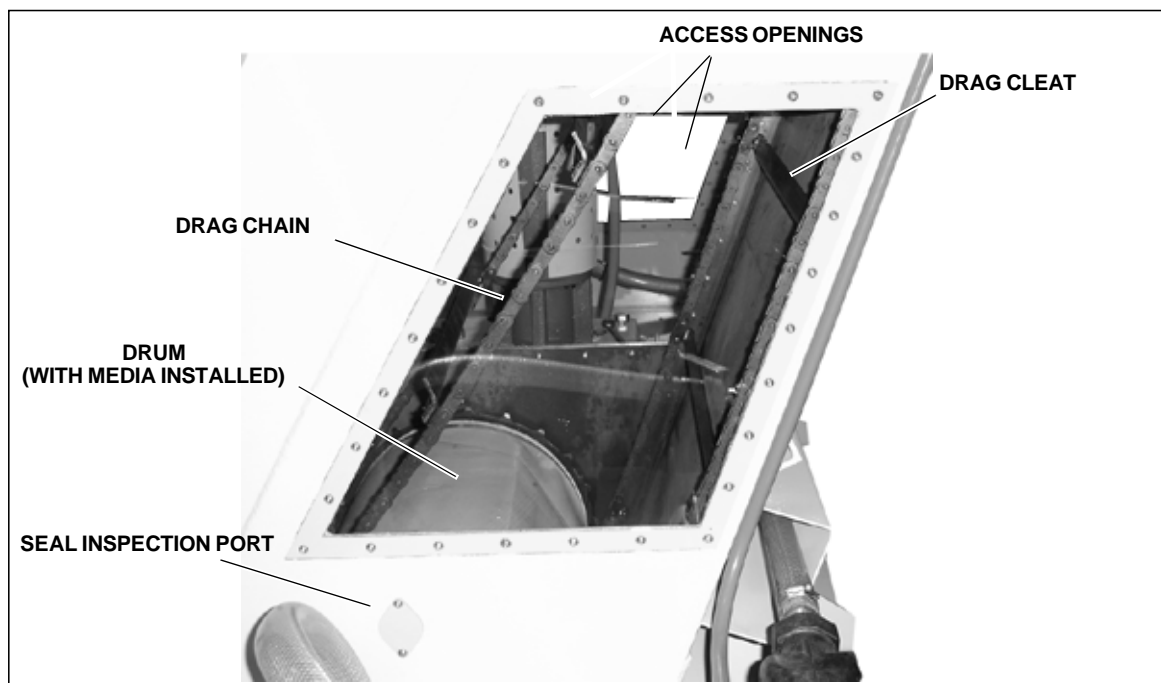


Figure 13. Detail Of Filtration Section Features

## 4.7 DRUM MEDIA REMOVAL AND REPLACEMENT

The filtration media fastened to the drum assembly is a permanent type of media and should provide service for an extended period of time, depending on the severity of service. Refer to Figures 11 and 12 for photographs of the Drum Assembly.

### 4.7.1 Drum Media Removal

The media should be replaced if it is torn, or if is blinded-off to the point that it is not cleaned by the spraybar. In either of these cases, replace the media, by following steps outlined below.

**Warning: Lock Out and Tag Out the electrical power source to the system during maintenance.**

1. Lock out and tag out electrical power to the conveyor unit.
2. Remove the covers from the access openings, Figure 13. These openings provide access to the Drum Assembly.
3. If a shaft-mounted direct-drive gearmotor is used the gearmotor will have to be removed from the headshaft by unbolting the gearmotor from it's mounting bracket. If the Filterveyor is supplied with an in-direct drive, Figure 1B and 1C, disconnect

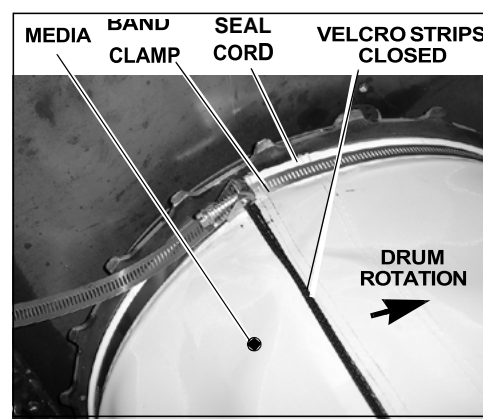
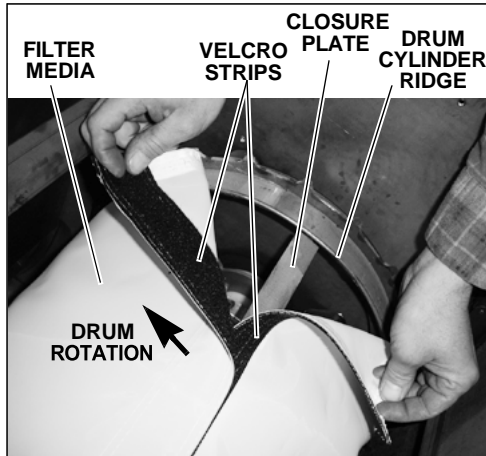


Figure 14. Media Installed on Drum

the drive chain that connects the gearmotor and headshaft. This step allows the drum to be rotated by hand. Refer to Section 4.1 for the procedure for removing these drive components.

4. The media is held onto the drum with large band clamps (hose clamp) on either end, Figure 14. Manually rotate the drum until the adjustment screws of the band clamps are accessible through the access openings. Loosen and remove the clamps.
5. Rotate the drum until the Velcro strip securing the media edges is accessible. Pull the Velcro apart,





**Figure 15. Media Being Removed/Installed on Drum**

Figure 15. The media is now loose and can be slipped around the drum and out one of the access openings.

#### 4.7.2 Drum Media Installation

Proceed as follows:

1. Remove the old media as per the preceding instructions, Section 4.7.1.
2. Rotate the drum until the metal closure plate is accessible, Figure 15. This plate provides a surface against which to close the Velcro strips.
3. Insert the media through one of the access openings (Figure 13) and thread it around the drum. An optional method of installing the media around the drum is to temporarily secure one end of the media to the closure plate and manually rotate the drum until the media is wrapped around the drum.

**Note: When installing media, ensure that the Velcro strips are properly orientated so that they may be closed after installation around drum, and that the lapping edge faces the front of the unit, against the direction of rotation. See Figures 14 and 15.**

4. Insure media edges are against the drum end discs the entire circumference of the drum. Stretch the media and secure the Velcro closure. The Velcro seam should be evenly closed the entire length of the joint as shown in Figure 14.
5. Reinstall the band clamps. Insure that the clamp is placed between the ridge on the drum cylinder and

the seam cord on the media, Figure 14 and 15. Tighten the clamps.

6. Re-install the drive components (drive chain or shaft-mounted gearmotor) using the procedures outlined in Section 4.1.
7. Re-install the access door covers, and all other guards and covers that have been removed.
8. Connect power and run the unit. Make adjustments as necessary to ensure that the drag chain assembly and drive system move freely, and that the drag chain assembly tracks properly. See Sections 4.3 and 4.4.



**Figure 16. Spray Nozzle and Bar**

#### 4.8 SPRAYBAR MAINTENANCE

The spraybar should be maintained on a regular basis to insure proper cleaning of the drum media. Remove the spraybar at least once per year for cleaning; however a more frequent schedule may be beneficial.

##### 4.8.1 Spray Nozzle Cleaning

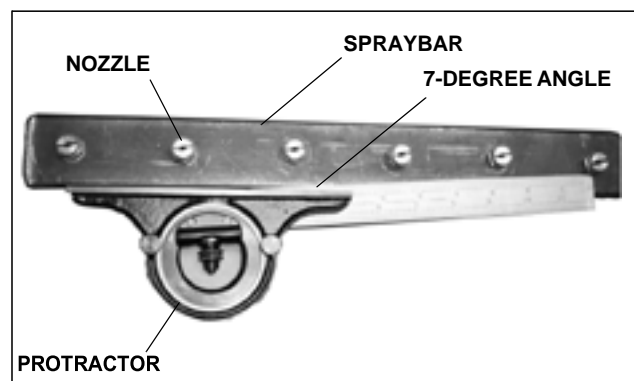
**Warning: Lock-Out and Tag-Out the electrical power source to the system during maintenance.**

1. Run the unit and observe, through the inspection window, the spray pattern of coolant passing through the media. Low or non-existing spray indicates the location of nozzles that need to be cleaned or replaced.
2. Remove the filter drum media per instructions found in Section 4.7.1 of this manual.



**Figure 17. Disconnecting the Union Connection**

3. Insert a fine wire or a Cutting Torch Tip Cleaning Tool into the nozzle to clear any obstruction from the nozzle(s) in question. The spraybar nozzles are shown in Figure 16 and 18.
4. If the nozzle is damaged or plugged to a degree where it cannot be cleared in this manner, remove the spraybar for more extensive cleaning as described in the following section.
5. After the spraybar nozzle(s) have been cleaned, reinstall the filter media as described in Section 4.7.2.



**Figure 18. Setting the Spray Nozzle Angle**

#### 4.8.2 Spraybar Removal and Cleaning

**Warning: Lock Out and Tag Out the electrical power source to the system during maintenance.**

1. Remove the filter drum media per instructions found in Section 4.7.1 of this manual.
2. Reach inside of the drum and, with a wrench, loosen the pipe union, Figure 17, separating the spraybar bar from the drum's internal piping.
3. Lift the spraybar out of the Drum Assembly and remove it from the unit through one of the access openings
4. The spraybar may now be serviced. This would be the time to clean all nozzles, replace damaged nozzles, and flush the spraybar assembly.
5. Using a 9/16 box end wrench or socket, remove all spray nozzles, Figure 16. Nozzles are 1/4" Std. Pipe thread.
6. With all nozzles removed, clean inside of spraybar to remove dirt or debris that could plug fresh nozzles when placed in service.
7. Inspect the nozzles and replace any that are no longer serviceable. Coat the threads of each new or removed nozzle with a non-permanent type Loc-Tite. Turn the nozzle into the spraybar and tighten. The groove in the nozzle face should be at about a 7° angle to the spraybar axis when tight. This setting can be made using a protractor, Figure 18.



**Figure 19. Setting the Spraybar Angle Using a Magnetic Base Protractor**

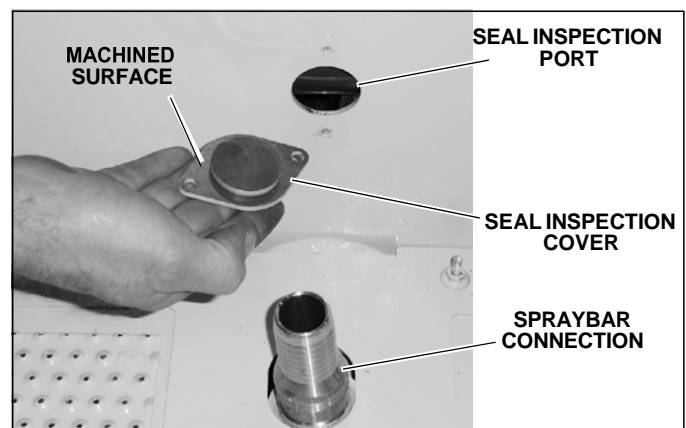
### 4.8.3 Spraybar Installation

Proceed as follows:

1. Rejoin the two halves of the union located inside of the filter drum. Figure 17.
2. Set the spraybar such that it is oriented at a 10 – 15° angle off the horizontal centerline of the filter drum, while facing the incline of the Filterveyor. This can be accomplished using a magnetic-base protractor, Figure 19.
3. Tighten the union adequately to insure that it will not leak or vibrate loose.
4. Reinstall the media on the drum following instructions provided in Section 4.7.2 of this manual.
5. Re-install the drive components (drive chain or shaft-mounted gearmotor) using the procedures outlined in Section 4.1.
6. Re-install the discharge hood and access door covers.
7. Connect power and run the unit. Make adjustments as necessary to ensure that the drag chain assembly and drive system move freely, and that the drag chain assembly tracks properly. See Sections 4.3 and 4.4.

## 4.9 REPLACEMENT OF FILTER DRUM V-SEALS

Inspect the V-seals every 90 days by removing the Seal Inspection Covers (Figure 20) as described

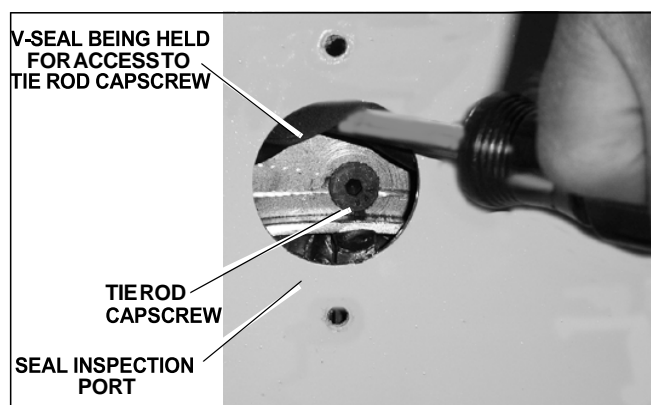


**Figure 20. Seal Inspection Opening**

below. Chips on the face, or cuts/tears in seals, indicate that replacement is necessary.

**Warning: Lock-Out and Tag-Out the electrical power source to the system during maintenance.**

1. Lock-out and tag-out electrical power to the conveyor unit.
2. Remove the inspection window and the access cover from the Filterveyor sides to gain access to the filter drum.
3. Disconnect the drive chain that connects the gearmotor and headshaft. (If a shaft-mounted gearmotor is used, the gearmotor will have to be removed from the headshaft.) This allows the drum to be rotated by hand. The procedure for disconnecting these drive components is described in Section 4.1.
4. Loosen the drag chain assembly and remove it from the conveyor. See instructions in Section 4.6.1 of this manual.
5. Remove the media per Section 4.7.1.
6. Remove the Seal Inspection Covers on both sides of the Filterveyor. Figure 20. These covers are the “football” shaped pieces located just below the access openings on either side of the Filterveyor. Removal of these inspection covers can be accomplished by removing the button head socket cap-screws located on the ends of each cover. The Filterveyor side of the cover has a machined surface which mates with the conveyor casing. Remove the covers by prying evenly and gently around the cover edges to prevent damaging the machined surface.

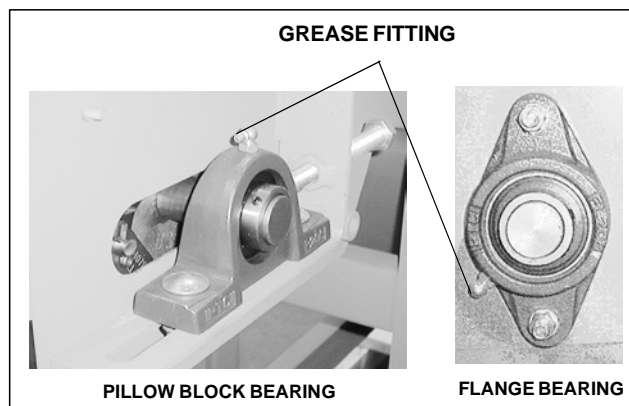


**Figure 21. Seal Capscrew Removal**

7. After removing the Seal Inspection Covers, manually rotate the drum until one of the Tie Rod cap screws is in-line with the seal inspection opening. Push the seal upwards until the capscrew securing the tie rod is exposed, Figure 21. Remove the capscrew.
8. Using the procedure outlined above, remove all of the tie rod cap screws on both sides of the drum; after which all of the tie rods can be removed through the access openings.
9. Loosen the setscrew from the set-collars located on each of the stub axles. Figure 11 and 12.
10. Slide the drum end discdiscs off of their respective stub shafts with V-seals in place.
11. Inspect the end discdisc hubs for serviceability. If wear is found replace with a new part.
12. Inspect the inside wall of the filter casing for wear. Contact the factory if excessive wear is found.
13. Remove the V-seal from each end discdisc and replace with a new seal. Lightly grease the seal lip.
14. Reinstall the end discdiscs, with new V-seals in place, by sliding the end discdiscs back onto the stub shafts.
15. Working through the seal inspection opening, push the seal upwards until the hole for the capscrew is exposed. Place a tie rod into position and secure it with a capscrew. Repeat this procedure for the other end of the tie rod/drum and for the remaining tie rods. Use a non-permanent Loc-Tite on tie rod capscrews.
16. Adjust the end discdiscdiscs so that the tie rods are parallel to the axis of the drum. Tighten the capscrews. Re-install set collars on the stub axles to insure that seals contact inner surface of Filterveyor.
17. Install the media per Section 4.7.2.

18. Re-install the drag chain assembly and drive system per the procedure outlined in Section 4.6.2.
19. Re-install the inspection window and access cover, and the seal inspection covers.
20. Connect power and run the unit. Make adjustments as necessary to ensure that the drag chain assembly and drive system move freely, and that the drag chain assembly tracks properly. See Sections 4.3 and 4.4.

## 4.10 LUBRICATION



**Figure 22. Lube Fitting Location**

### 4.10.1 Grease Lubrication

There are a total of 2 grease fittings that require lubrication, one on either side of the headshaft, to lubricate the head shaft bearings. (See Figure 22) Grease all bearings as follows.

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 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.

### 4.10.2 Oil Lubrication

- The roller chain should be brushed with light-weight oil at regular intervals.
- The gearmotor on the direct drive and indirect-drive unit is factory lubricated and sealed. It therefore requires no further lubrication.

## 5.0 TROUBLESHOOTING CONVEYOR AND FILTRATION UNIT

Refer to Tables 2 and 3 for troubleshooting procedures.



Table 2. Troubleshooting - Conveyor

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 relay.
	Main disconnect off.	Turn main disconnect on.
	No power to line side of disconnect.	Determine cause and correct.
Clutch ratcheting or skipping. Safety device tripping continuously.	Chain assembly misaligned or incorrect tension.	Align Chain and/or correct tension. Refer to maintenance section of this manual.
	Excessive or accumulated loading.	Avoid load buildup by running conveyor continuously. Do not manually surge material onto conveyor.
	Carry-back of material into conveyor.	Collection receptacle full. Replace / empty receptacle as required.
	Incorrect clutch setting.	Refer to "Ratcheting Slip Clutch" section of this manual.
	Damaged chain.	Repair or replace chain.
	Accumulation of conveyed material or foreign objects inside casing.	Clean out conveyor.
Excessive wear on chain or casing.	Conveyor not level or plumb.	Level and plumb conveyor.
	Chain assembly misaligned or incorrect tension.	Align chain and/or correct tension. Refer to Section 4.4 of this manual.
	Carry-back of material into conveyor.	Collection receptacle full. Replace / empty receptacle as required
	Damaged chain.	Repair or replace chain. Refer to Section 4.6 of this manual.
	Accumulation of conveyed material or foreign objects inside casing.	Clean out conveyor.
Chain pulses or surges.	Chain assembly misaligned or incorrect tension.	Align Chain and/or correct tension. Refer to Section 4.4 of this annual.
	Carry-back of material into conveyor.	Collection receptacle full. Replace /empty receptacle as required.
	Damaged chain.	Repair or replace chain.
	Accumulation of conveyed material or foreign objects inside casing.	Clean out conveyor.

Table 3. Trouble Shooting - Filtration Section

PROBLEM	PROBABLE CAUSE	REMEDY
Low coolant level in conveyor.	Insufficient coolant in system.	Add coolant (pre-mixed) to recommended running level.
Excessive fines in clean tank.	Filter media damaged.	Inspect media for tears or holes. Replace if necessary per Section 4.7 of this manual.
	Filter media loose,	Inspect band clamps and tighten if loose. See Section 4.7.
	V-Seals damaged or worn.	Replace seals if necessary. Refer to Section 4.9 of this manual.
	Incorrect media or application, too open.	Contact Jorgensen Conveyors.
	Coolant foams excessively.	Consult coolant supplier.
Low coolant level in clean tank when level in conveyor is high.	Backflush spraybar not functioning.	See spraybar maintenance, Section 4.9.
	Media is old, difficult to clean.	Replace media.
	Coolant foams excessively.	Consult coolant supplier.
	Coolant viscosity too high.	Consult coolant supplier, or contact Jorgensen Conveyors.
Backflush spraybar not functioning.	Valve in inlet line not set correctly.	Reset valve. See Section 3.
	Inlet policing filter (Banjo) dirty.	Clean filter per filter manufacturer's instructions.
	Spraybar nozzles plugged.	Clean or replace nozzles. See Section 4.
	Backflush pump not functioning correctly.	Check power supply to pump.
		Inspect impeller for excessive fines or foreign object.
		Check pump seals. Repair or replace.
Main pump does not supply adequate supply of coolant to machine.	No power to motor.	Inspect power supply circuit and repair.
	Impeller jammed or plugged.	Inspect impeller for excessive fines or foreign object.
	Blockage in main line plumbing or control valve(s) not functioning.	Refer to OEM equipment service manual.
	Pump is rotating in the wrong direction.	Re-wire pump motor.
	Worn or damaged pump seals.	Rebuild or replace pump.

## **A word about Jorgensen Conveyors.....**

Founded in 1950, Jorgensen Conveyors has become a major supplier of engineered conveyor and filtration systems for CNC metal cutting machine tools, and for the metalworking industries in general. No other company offers a broader range of product solutions for the demanding requirements of today's high-speed machine tools. Beyond our expertise in products for machine tools, Jorgensen provides conveyor and material handling solutions for various other metalworking manufacturing applications such as casting and forging operations, heat treating, quenching, parts washing, recycling, chip processing, inspection, assembly and general metal parts handling.

Today Jorgensen Conveyors supplies products across a wide variety of metalworking industries including machine tool builders and manufacturers in automotive, aerospace, construction and agricultural equipment, appliance, semiconductor, etc. Another major customer segment is the contract job shops that make parts and components for all of these industries.

For over 50 years, Jorgensen has built its reputation in the industry by designing and building quality products, and providing responsive customer service. Jorgensen is ISO – certified, and the company is currently owned and operated by third generation descendants of Charles T. Jorgensen, the founder of the company.

# NOTES

## WARRANTY

Jorgensen Conveyors, Inc. guarantees the material of our manufacture against defects in material or workmanship under normal and proper use for 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.

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