McGinty Conveyors, Inc.

Zig-Zag
Parts & Maintenance Manual

McGinty Conveyors, Inc
5002 West Washington Street
Indianapolis, IN 46241
Phone: (317)-244-3353
Fax: (317)-240-4323
www.mcgintyconveyors.com

CONVEYORS

WARRANTY AND LIMITATION OF LIABILITY:
Seller warrants to Purchase that the material and workmanship of its equipment is of good quality and free of defects. Seller agrees to furnish the Purchaser, without charge, F.O.B. Seller's plant at Aurora, Illinois, or F.O.B. Distributor's stock a replacement part for any part or parts of the equipment proving defective in either material or workmanship within a period of one (1) year from date of shipment**,** but this shall be of no force and effect unless**:** Purchaser give Seller immediate notice of defective part or parts; Purchaser affords Seller opportunity to inspect defective part or parts; materials still property of original owner; material is still part of the original installation operating under normal usage (8) eight hours per day and (5) five days per week constitutes normal usage; and material is properly maintained and lubricated.

Seller's liability under this warranty shall be limited to furnishing part or parts as necessary. Any expense relative to installation shall not be borne by seller. Equipment damaged as a result of exposure to corrosive or abrasive substances shall not be replaced under this warranty. The above warranties do not cover parts which upon inspection are determined by seller to have been subject to misuse, neglect, alterations, accident, abuse, damage or damage by fire, flood or other similar casualty. Seller reserves the right to install or to supervise the installation of any replacement part or parts and to perform or supervise any adjustment incidental to the satisfactory operation of the equipment.

Seller does not warrant parts or components not of its manufacture. The manufacturers of electric motors and controls, air and hydraulic components and certain other items extend a (1) one-year warranty. Defective material of this type must be reported to the Seller for appropriate action through vendor. Our sole responsibility is to notify vendor of complaints.
This writing is intended by Seller and the Purchaser as a final expression of warranties to be made by Seller and is intended also as a complete and exclusive statement of the terms of said warranty. This warranty is in lieu of all other warranties, express or implied, including any warranty of merchantability, or fitness for a particular purpose there are no warranties, which extend beyond those set forth herein.

TERMS OF PAYMENT:
Net 30 days, unless otherwise agreed.

ENTIRE AGREEMENT:
There are no understandings between Seller and Purchaser except as set forth in these standard terms and conditions of sale. No other conditions, course of dealing or trade usage shall be considered a part of this agreement unless agreed to in writing by the parties hereto.

RECEIVING/SAFETY

RECEIVING

This manual has been prepared to assist you in the initial erection of the Zig-Zag Conveyor system, its proper operation, and for maintenance purposes. It is important that all persons who come in contact with the conveyor, whether in operating or maintenance responsibility, be thoroughly familiar with the contents of this manual.

Richards-Wilcox design and manufacturing experience has been incorporated into this conveyor system and its rugged design and ease of maintenance, will enable it to deliver many years of trouble free service.

As with any piece of machinery, proper operations and lubrication are critical. Inspection of the components before operation and lubrication on a scheduled basis, will pay dividends by reducing down time and maintenance costs. This manual contains information of specific assemblies designed for your Over-way system. It should be used in conjunction with the distribution drawings of the component assemblies furnished as part of the system. Any part variations in the assemblies will be shown on this subassembly drawings.

SAFETY

READ THIS OPERATION AND SERVICE MANUAL.
Safety is basically common sense. There are standard safety rules but each situation has its own peculiarities, which cannot always be covered by rules. Therefore, be ever watchful for safety hazards and correct deficiencies promptly.

Lack of attention to the NOTES and INSTRUCTIONS on this manual can result in: accidents, personal injury, reduction in efficiency and worst of all, loss of life.

The complete observance of one simple rule would prevent many thousands of serious accidents each year.

THAT RULE IS:
NEVER attempt to clean, oil, or adjust any machine while it is in operation.

WARNING
DO NOT REMOVE GUARDS, OR REPAIR MACHINERY WHILE IN MOTION

PRE-INSPECTION/ERECTION

PRE-INSPECTION
Your Richards-Wilcox conveyor components where carefully inspected and when possible complete units tested and properly created at the factory. The entire shipment including loose parts, was thoroughly checked before it was shipped.

Despite all precautions and the use of heavy-duty crates, assembly problems may arise due to poor handling methods. Inspect all components before erection. Tracks and especially curves may be distorted just by dropping them. If any crates are damaged upon arrival at your site, keep accurate records of all broken crates or damaged materials and contact the carrier immediately.

Track curves can be distorted and should be checked closely. The lips should be on the same plane and the track should not be twisted.

ERECTION

If a clear floor space is available, outline the path of the conveyor on the floor. This will enable you to start at a fixed point of the system, such as a drive or switch, and locate definite positions for other components.

Drawings furnished with your system indicate exact dimensions. All dimensions must be held as close as possible. In some cases where dimensions must be held exactly, the drawings will carry a notation to that effect. With proper care during erection, there will be few problems.

Several lengths of track may be welded together on the floor and then raised into position. Use the R-W standard welding jig (See Welding Jig section in this Manual) for all track joints. Where vertical curves occur, lay the vertical curve out on the floor to the required dimensions and cut the straight track to the proper length between the top and bottom vertical curves. Weld the straight track into place. Care must be exercised to insure the lips of all the tracks are level.

After the track has been erected and before the conveyor chain is installed, all power track should be checked by pulling a 10’0” length of chain through the entire system using a piece of rope. Make sure that it negotiates all curves freely. Any rough spots or bad welds causing the chain to hang-up must be removed.

- ✓ Care should be taken not to get dirt and weld flash into the moving parts of the automatic components. All components should be completely tested mechanically and electrically before the conveyor is put into use. See sections for each of the individual components.

ERECTION NOTES

1. This is an engineered system. All warranties and guarantees on the equipment are void if the system is not installed in accordance with these points.

2. All elevations shown are from the floor line to the top of the power track.

3. Care must be taken to be sure that all devices are located properly. The mark or tag on each unit must be coordinated with the layout drawing(s).

4. Power track crossover loops must be installed exactly as indicated on the layout drawings. It is important that these loops be installed correctly to provide the proper relationship between the release pusher dog and the pickup pusher dog. When these loops have been fabricated, insert a length of chain with the properly spaced pusher dogs. Pull the chain tight on each end.

5. The resulting trail from the front of the release pusher dog to the front of the pickup pusher dog should match with the dimension noted on the system layout for each loop. If the measured trail between dogs varies more the +/- 2" from the design trail, recheck the fabricated loop dimensions and correct as needed. Some conveyors require exact pusher dog spacings (no odd spaces). This will be noted on the system layout drawing(s). Each conveyor is equipped with take-up units to allow for this arrangement.

6. Take-ups must be installed in accordance with the assembly drawing. Chain travel must be from inner (stationary) sleeve to the outer (moveable) sleeve. Take-up sleeves must be level and parallel with each other.

CONVEYOR MAINTENANCE

Conveyor reliability is largely dependent on adequate maintenance procedures that are performed regularly.

A Program of inspection and correction that is scheduled for definite time periods is referred to as "Preventive Maintenance" and is highly desirable because it prevents small problems from growing into conveyor stoppages.

Preventive maintenance programs are effective only when scheduled for reasonable time periods and monitored. This requires that a log or record be kept of each inspection. The record must show dates, deficiencies found, and corrective action taken. A sample of a log sheet is appended at the end of this section.

CAUTION
NOTE THAT INSPECTIONS SHOULD BE PERFORMED WHILE CONVEYOR IS OPERATING AND THEN THOSE ITEMS

REQUIRING "HANDS ON", SUCH AS CHECKING OIL IN A GEARBOX, MUST BE DONE WHEN THE CONVEYOR HAS BEEN STOPPED.

All conveyors should be inspected at (3) month intervals, based on single shift operations. The inspection interval should be shortened to (2) months for double shift operations, and to (1) month for three shift operations.

Maintenance logs and inspection sheets become valuable historical data and can be reviewed to determine frequent problems that may be addressed for corrective action to remove the problem. They may also note items that will require attention at a future time.

In this way, maintenance shut-downs may be scheduled for convenient time that do not impact regular operations.

DANGER
DO NOT ATTEMPT "HANDS ON" INSPECTION OR ANY MAINTENANCE PROCEDURES ON A MOVING CONVEYOR. DISCONNECT AND LOCKOUT ALL POWER (ELECTRICAL AND PNEUMATIC) BEFORE WORKING ON ANY CONVEYOR.

Maintenance procedures should be performed only by qualified personnel who are familiar with overhead conveyors.

GENERAL INSTRUCTIONS

The following items should be checked BEFORE any testing is done and BEFORE operating the system:

- Lubricate the bearings and other parts of the drive unit before starting up the conveyor system.
- Check oil levels in power unit. Refer to the manufactures instructions attached to the unit.
- Check current and voltage with motor nameplates.
- During the first month or two of operation check and adjust the conveyor chain take-ups frequently to allow for seating and wearing of the chain.

- Lubricate the conveyor chain properly. Start the lubricator periodically but feed oil slowly so the chain obtains the proper lubrication but does not drip oil.

- Establish a periodical routine for checking the lubrication of the conveyor. Very little lubrication is required but trouble will develop if the conveyor is neglected. During the first several months the conveyor is in operation check and tighten all bolts on the joint brackets, and tighten nuts on hanger bolts periodically to be sure thy have not been loosened by vibration.

Track Welding Jig
Part#TR-155

Description

The track welding jig is a specially designed unit made of a material that will not fuse during welding.

Welding Two Pieces of Track

1. Place the jig in the ends of two pieces of track, with the bolt projecting out of the slot in the track, so half of the jig is in the end of one piece of track and the other half is in the end of the other.

2. Tighten the bolt until the edges of the track are aligned both horizontally and vertically (See figure).

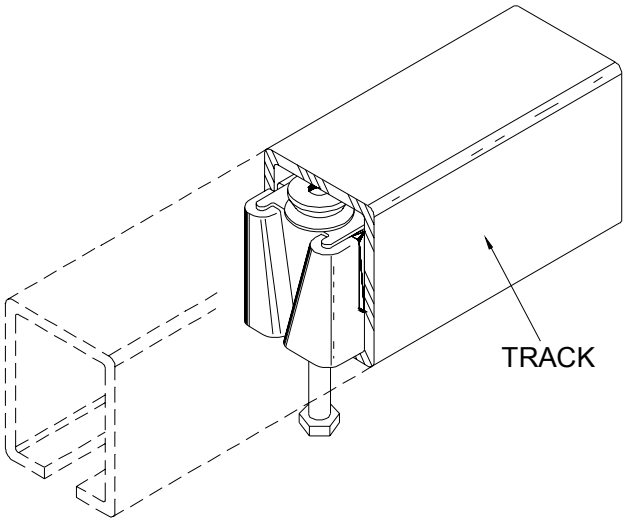
3. For welding Over-way track, align the ends of the load track using C-clamps and spacer blocks as needed. Note: The inside bottom lips of the load track must be flush and in line before welding. The 1-3/4" gap between the channels must be held to +/- 1/16"

4. Weld the joint across the top and the sides of the clamped track.

5. Weld to top, bottom, and sides of the load track.

6. Loosen the welding jig and slide it to the next joint.

(See next page)



TRACK WELDING JIG

Inspecting Track Joints

1. Attach a rope to a short length of chain.

2. Draw the chain through the track.

3. Remove any weld flash or other obstructions.

CAUTION
CHECK ALL JOINTS INSIDE OF THE TRACK AFTER INSTALLATION TO SEE THAT THEY ARE SMOOTH. IF THEY ARE NOT SMOOTH THE CHAIN MAY CATCH WHEN TRAVELING THROUGH THE TRACK.

Inspecting Load Track Joints

1. Insert one carrier in the track.

2. Pull the carrier through all the sections by hand.

3. Remove any flash and smooth the rough joints. Any misalignment in the load track greater that 1/16” must be tapered by grinding or filing at an angle of 30 or less.

Conveyor Chain
Part #CH-1974 & CH-1974-300

Description

The chain in your system is all steel construction with a pulling capacity of 600 lb. and a 450F maximum operating temperature. It is constructed using vertical and lateral ball bearing wheels. The chain is the major item in the system, and every effort must be made to guard against those elements which are harmful to it. By system design and possibly protective shrouds the following can be guarded against:

- The 450F (232C) operating temperature is a maximum. If this is exceeded, the hardness is reduced in certain critical parts, reducing the life of the chain.

- Exceeding the recommended chain pull of 600 lb. accelerates wear in the chain, chain wheel bearings, track curves, and drive units.

- Exposure to acidic solutions, corrosive vapors and liquids removes lubrication, corrodes bearings and pin joints, etc., to effectively shorten the useful life of the chain.

- Abrasive laden air, found in foundry and sand blast applications, are particularly harmful.

- Vapor degreasers are often designed to allow the vapor level to extend above the conveyor. The chain is then completely stripped of lubricant on each complete circuit. An automatic mist spray oiler can be installed just “down stream” from the degreaser, but it is difficult to apply a sufficient amount of oil in one pass. An inadequate amount of lubrication causes wear and shortened chain life.

Chain Assembly

1. Place the link roller (C) inside of the horizontal link (B) and move into position between the sides of the vertical wheel unit (A).

2. Without forcing, insert the link pin (D) throughout the assembly and rotate it until the head of the pin (D) is against the side of the wheel unit (A).

3. Insert the cotter pin (E) through the link pin (D) and spread the end of the cotter pin.

   ✓ The chain is shipped coiled and oiled with a rust inhibitor at the factory. Always assemble the chain on a clean surface (paper) to keep the chain from grit and dirt which can shorten the life of the chain.

- ✓ Be sure the chain is NOT assembled upside down (See Chain Assembly Drawing).

- ✓ Additional roller bushings and connecting pins are contained in a sack attached to each section of chain or sent in bulk.

Installing the Chain into the Track

1. Connect additional lengths of chain as described above.

2. Remove the two split side rails on the bottom of the drive plate (See the Drive Unit section of this manual).

3. Attach a piece of rope or wire to end link (A).

4. Thread the chain into one of the open ends of the track below the drive unit plate with the side rails removed.

5. Insert link (A) with the rope attached first.

6. As additional lengths of chain are assembled, pull chain through track using the rope.

7. When all of the chain is installed in the track attach a small block or come-a-long to both ends of the chain and draw together until the chain is taut.

8. Assemble the two ends together using the Chain Assembly procedures above. The chain should have as little slack as possible.

9. Replace the two split side rails on the bottom of the drive plate.

10. Start the drive and run at a slow speed for testing. **DO NOT** run the system without the proper lubrication on the chain. The oil applied on the chain from the factory is a rust inhibitor and should not be used as a lubricant for operation.

11. Adjust the track take-up(s) to remove extra slack left in the chain (See Take-Ups section of this manual).

12. Check the action of the pusher dogs in the chain to see that the chain is being driven through the track smoothly.

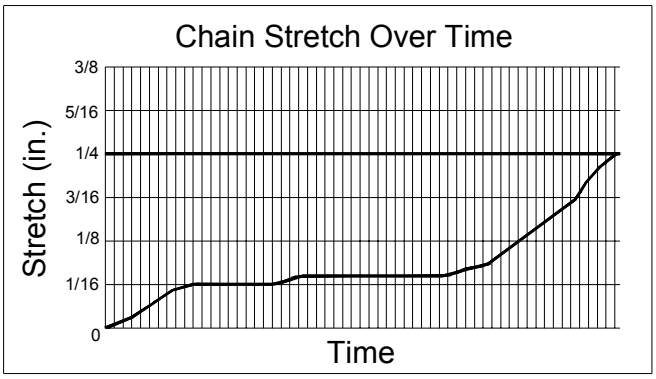
Chain Wear

Chain wear is a normal result of conveyor operation and should be monitored regularly. As the conveyor chain wears it will appear to "stretch" in length. The maximum amount of stretch is ¼" per foot of chain. When the maximum amount of stretch is reached the conveyor chain should be replaced.

The conveyor chain is manufactured with six-inch pitches (the chain repeats every six inches). To measure the chain stretch, measure a length of chain, divide the length by the number of chain pitches measured, and then subtract six inches.

$$\text{Chain Stretch} = \left(\frac{\text{Length (in.)}}{\text{Number of Pitches}} - 6 \text{ in.} \right) * \left(2 \frac{\text{Pitches}}{\text{Ft.}} \right)$$

When the chain stretch is measured it should be recorded. By graphing the chain stretch on regular intervals, the scheduled chain replacement can be planned.
(Continued on next page).

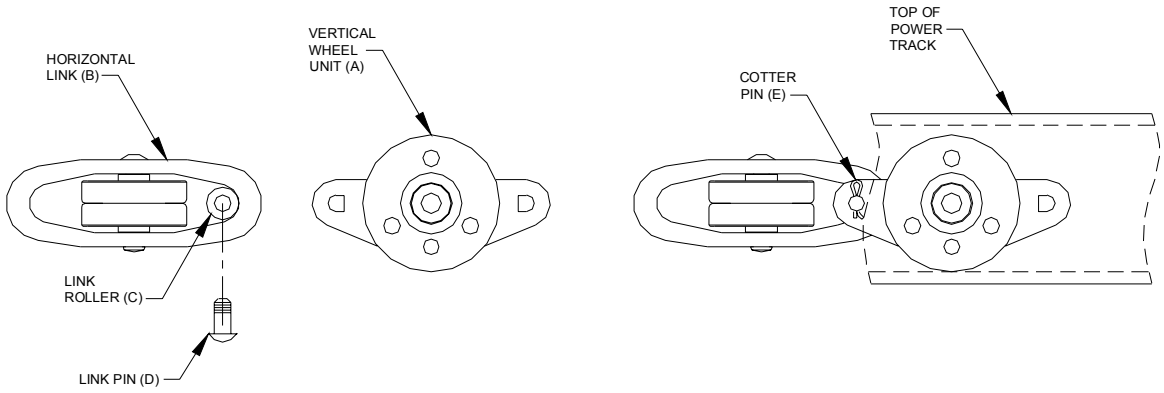


The following items should be checked BEFORE any testing is done and BEFORE operation of the system:

- ✓ Lubricate the bearings and other parts of the drive unit before starting up the conveyor system. Grease the drive chain periodically.
- ✓ Check oil levels in power unit. Refer to the manufactures instructions attached to the unit.
- ✓ Check current and voltage with motor nameplates.
- ✓ During the first month or two of operation check and adjust the conveyor chain take-ups frequently to allow for seating and wearing in of the chain.

- ✓ Lubricate the conveyor chain properly. Start the lubricator periodically but feed oil slowly so the chain obtains the proper lubrication but does not drip oil.

CAUTION
BE SURE THE CHAIN IS NOT ASSEMBLED UPSIDE DOWN.
(SEE CHAIN ASSEMBLY DRAWING).



Lubrication

Chain Lubricants

The choice of a lubricant is governed partly by the application. The user is obligated to consult their supplier for proper oil, based on the conditions to be encountered. In seeking this recommendation, attention must be given to temperature and the general operating environment. Ordinary petroleum derivatives leave a carbon residue when subjected to high temperatures. This is very harmful to wheel chain bearings. A high-temp synthetic type lubricant is suggested. In situations where the conveyor is exposed to high humidity, the oil should also contain a residue-free rust inhibitor. The ideal oil in all circumstances should have a penetrate to carry the lubricant rapidly to all chain parts.
Some signs that your system needs more lubrication are squeaking chain wheels and/or increased motor amperage. To tell if your system is over lubricated look for oil on the floor and/or on the product.

DO NOT RUN CHAIN UNTIL THE LUBRICATION SYSTEM IS FILLED AND FUNCTIONAL.

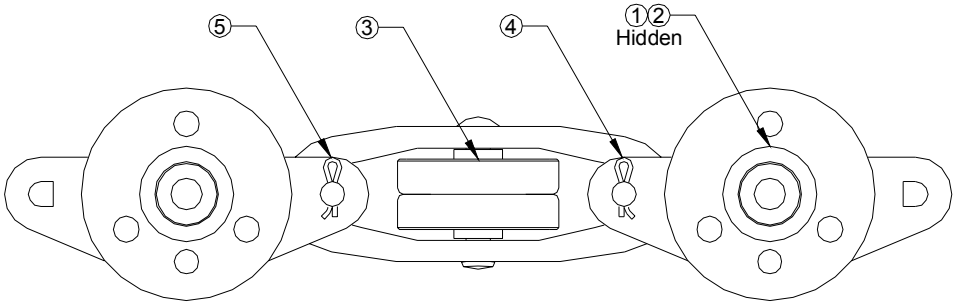
The following chart lists the chain lubrication points.

Lubrication Point	Description
1	Vertical Wheel Bearings
2	Vertical Wheel Bearings
3	Lateral Wheel Bearings

4	Vertical Link Roller
5	Vertical Link Roller

- ✓ If Molybdenum Disulfide based oils are used, the supplier must provide assurance that the “Moly” particles will stay in suspension and not settle out and clog tubes, brushes, orifices, etc.

The chain lubrication diagram below shows the lubrication points.



Inspection Section
Part #TR-820

Description

The inspection track section if formed out of 3/16” track and facilitates inspection and maintenance at points other than the drive unit. It may be placed in any run of strength track.

The section if made with the top and sides open down to the center of the chain. This allows for full inspection of the chain for proper lubrication, chain tension, and the general condition of the conveyor chain. The opening is covered by a removable housing and is equipped with a handle.

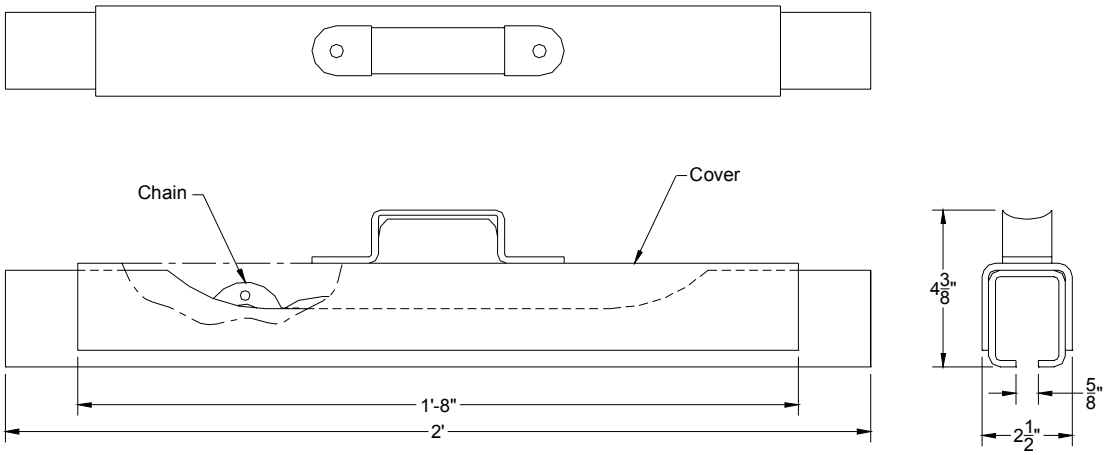
The most desirable location for this section is between a drive unit and a take-up.

Installation

1. Use the Layout Drawings to find the location(s) of the inspection section(s) for your system.

2. Weld the section to the chain track as outlined in the welding jig section of this manual.

DANGER
NEVER REMOVE THE COVER OR WORK ON THE CHAIN WHILE MACHINERY IS IN MOTION. ALWAYS SHUT OFF POWER AND LOCKOUT BEFORE ATTEMPTING MAINTENANCE OR INSPECTION.



Frame & Screw Take-Ups

Part #TU-1687 & TU-1700 & TU-1990

Description

Take-ups control the variation in length of the conveyor chain resulting from elongation and wear keeping the chain slack at a minimum. The chain develops looseness as a result of normal wear in the various joints. It is necessary to prevent loose chain from collecting at the outgoing end of the drive. This, in turn prevents the Dogs from releasing the chain links. This creates excess noise, and will eventually jam the drive. This condition is first noticed at the “down stream” end of the drive unit or at the bottom of the first decline beyond the drive. The adjustment in the take-ups permit several movements before it is fully extended, then the slack can be removed from the system.

Installation (Framed Take-up)

Part #TU-1687

3. Use the Layout Drawings for your system to find the position of the framed take-up units.

4. Attach ½” threaded rod to support steel at the locations shown on the installation drawing.

5. Lift the framed take-up unit and align with the ends of the track and drop rods.

6. Weld the track ends as described in the welding jig section of this manual.

7. Attach hardware package

Installation (Spring Take-Up Pkg.)
Part #TU-2686

1. Thread one nut onto screw take-up rod.

2. Place washer, spring, and second washer onto rod.

3. Insert rod into hole in the moveable angle.

4. Fasten square flange to the angle using the (4) cap screws and nuts.

5. Extend the moveable 180° track section to its maximum extension.

6. Grease the inner telescoping track that slides into the larger outer track section.

7. Fully collapse the take-up. It will be adjusted after the chain is installed.

Installation (Hardware Pkg. – Air)
Part #TU-1700

1. Secure clevis bracket to moveable angle using (4) cap screws and nuts.

2. Secure rod end of cylinder to the clevis bracket.

3. Fasten the air regulator the frame member using (4) cap screws.

4. Connect the air line between the regulator and the cylinder cap end port.

5. Connect the air supply to the regulator.

6. Grease the inner telescoping track that slides into the larger outer track section.

7. Adjust the air regulator to minimum pressure. Reset to 60-80 PSI after the chain has been installed.

8. No further scheduled maintenance or adjustments are required for the air take-up.

Installation (TU-583 Screw Take-up Fittings)
Part #TU-583

1. Use the Layout Drawings to find the 583 screw take-ups for your system.

2. Weld the screw sleeves ((Part #076267) to the ends of the exposed chain tracks as outlined in the welding jig section of this manual.

3. Complete the rest of the 180 curve using a straight track section as needed. Slide the hangers (Part #TU-1912) onto the 180 curve before welding, this will help minimize assembly time later.

4. Attach the hangers to the take-up and connect to the support steel.

Installation (TU-1990 Screw Take-Up Fittings)
Part #TU-1990

1. Follow the installation techniques described for the TU-583 take-up package.

CAUTION
DO NOT OVER TIGHTEN THE CHAIN. THIS WILL CAUSE THE CHAIN TO SURGE OR PULSATE, WEAR RAPIDLY, AND PLACE ADDITIONAL STRAIN ON THE DRIVE UNIT. THE CHAIN SHOULD BE ADJUSTED SO THAT THE CONVEYOR WORKS SMOOTHLY AND THE CHAIN DOES NOT "PILE UP" AT THE HEAD OF THE DRIVE UNIT.

- ✓ The take-up also aids in the removal of excess chain at the maintenance section by retracting the take-up giving the chain enough slack to be removed.

- ✓ Your system will have a pre-engineered quantity of take-up units at locations indicated on the Layout Drawings. Normally, the take-ups will be positioned close to the output drive side of the drive unit. This allows the take-up to control chain movements with the least amount of tension.

- ✓ Take-ups in your system may also be used for "Dog Trails". See the "Dog Trail" section of this manual and the Layout Drawings for the take-ups that perform this function.

- ✓ DO NOT repaint the inner telescoping section. This section must stay greased so it will move freely.

TU-1687 Framed Take-Up

ID	QTY	Part Number	Description
1	4	023610	Washer, 5/16” Flat, ZC
2	1	073302	P1233A Movable Track Weldment
3	2	086563	Screw, 3/8”-16 Stover Lock, ZC
4	1	TU-1688	Stationary Frame Assembly
5	1	TU-1689	Support Angle Assembly
6	2	20500081	Bearing
7	2	092479	Nut, 3/8”-16 Stover Lock, ZC
8	2	20501447	6203-2RS

TU-2686 Spring Take-Up Pkg.

ID	QTY	Part Number	Description
1	2	023710	Washer, 1” Flat, ZC
2	1	073318	P1239 Takeup Spring
3	4	087084	Screw 3/8”-16 x 1 HHCS
4	4	091930	Nut, 3/8”-16 Hex, ZC
5	1	091980	Nut, 1 Hex, ZC
6	4	092682	Washer, 3/8” Split Lock
7	1	TU-2684	Adj. Rod Ass’y, Ftu Scr

TU-1700 Air Take-Up Pkg.

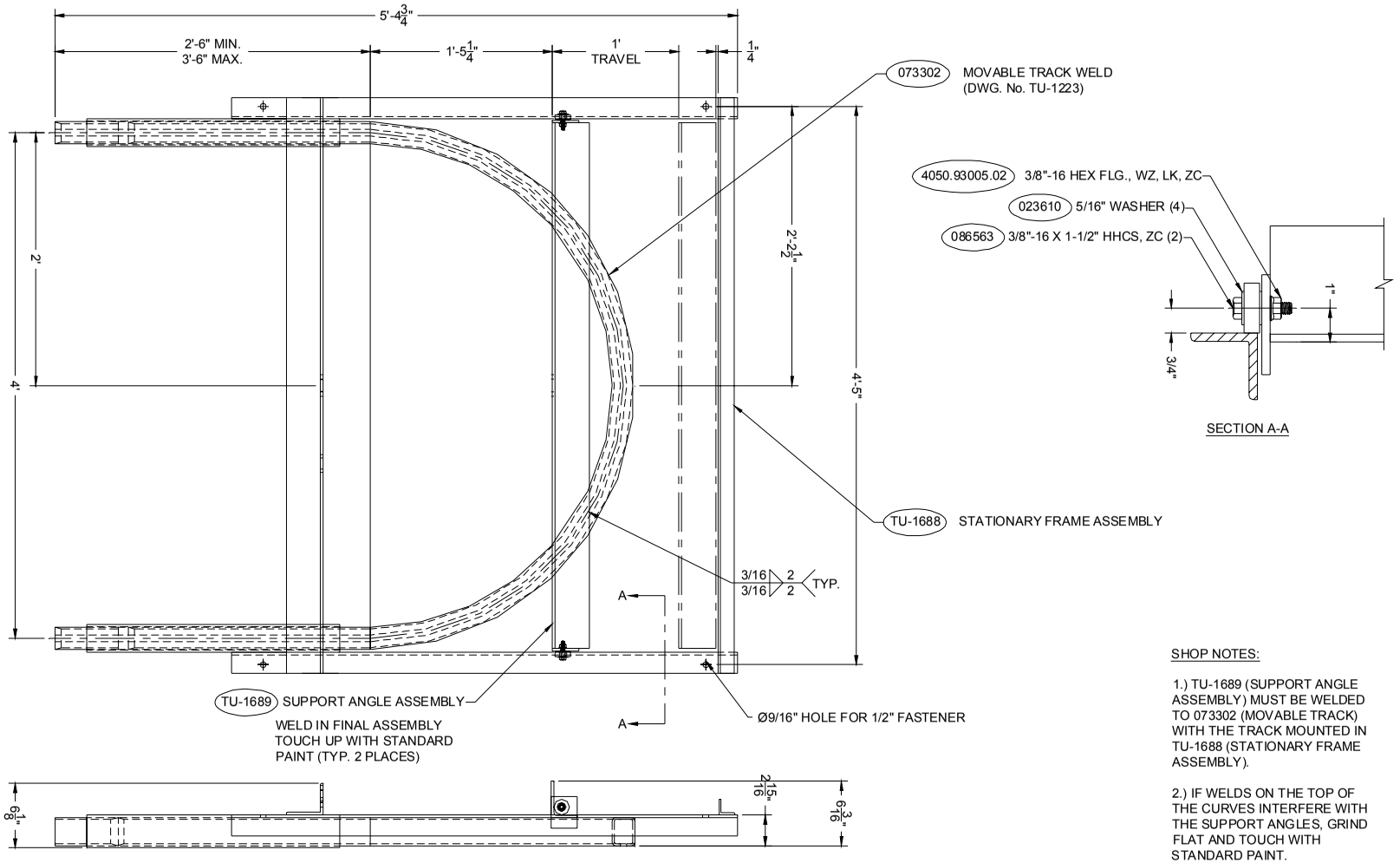
ID	QTY	Part Number	Description
See installation drawing for part numbers and quantities.			

TU-583 Screw Take-Up Fittings

ID	QTY	Part Number	Description
1	2	073309	P1230 Two Wheel Carrier
2	2	075626	P197 Support Track
3	2	076267	P295 Screw Takeup
4	4	092291	Nut, ½”-13 Hex Jamb, ZC
5	2	092683	Washer, ½” Split Lock
6	1	191145	Instruct, G126 2035 Inst
7	2	TU-1912	Bracket Proper, Pnt

TU-1990 Screw Take-Up Fittings

ID	QTY	Part Number	Description
1	2	073309	2035 P1230 Two Wheel Carrier
2	4	092291	Nut, ½”-13 Hex Jamb, ZC
3	2	092683	Washer, ½” Split Lock, ZC
4	1	191145	G126 2035 Inst Sheet
5	2	TU-1912	Bracket Proper, Pntd
6	2	TU-1989	Support Track
7	2	TU-1991	Screw Takeup Ass’y, 4’-0”



SHOP NOTES:

1.) TU-1689 (SUPPORT ANGLE ASSEMBLY) MUST BE WELDED TO 073302 (MOVABLE TRACK) WITH THE TRACK MOUNTED IN TU-1688 (STATIONARY FRAME ASSEMBLY).

2.) IF WELDS ON THE TOP OF THE CURVES INTERFERE WITH THE SUPPORT ANGLES, GRIND FLAT AND TOUCH WITH STANDARD PAINT.

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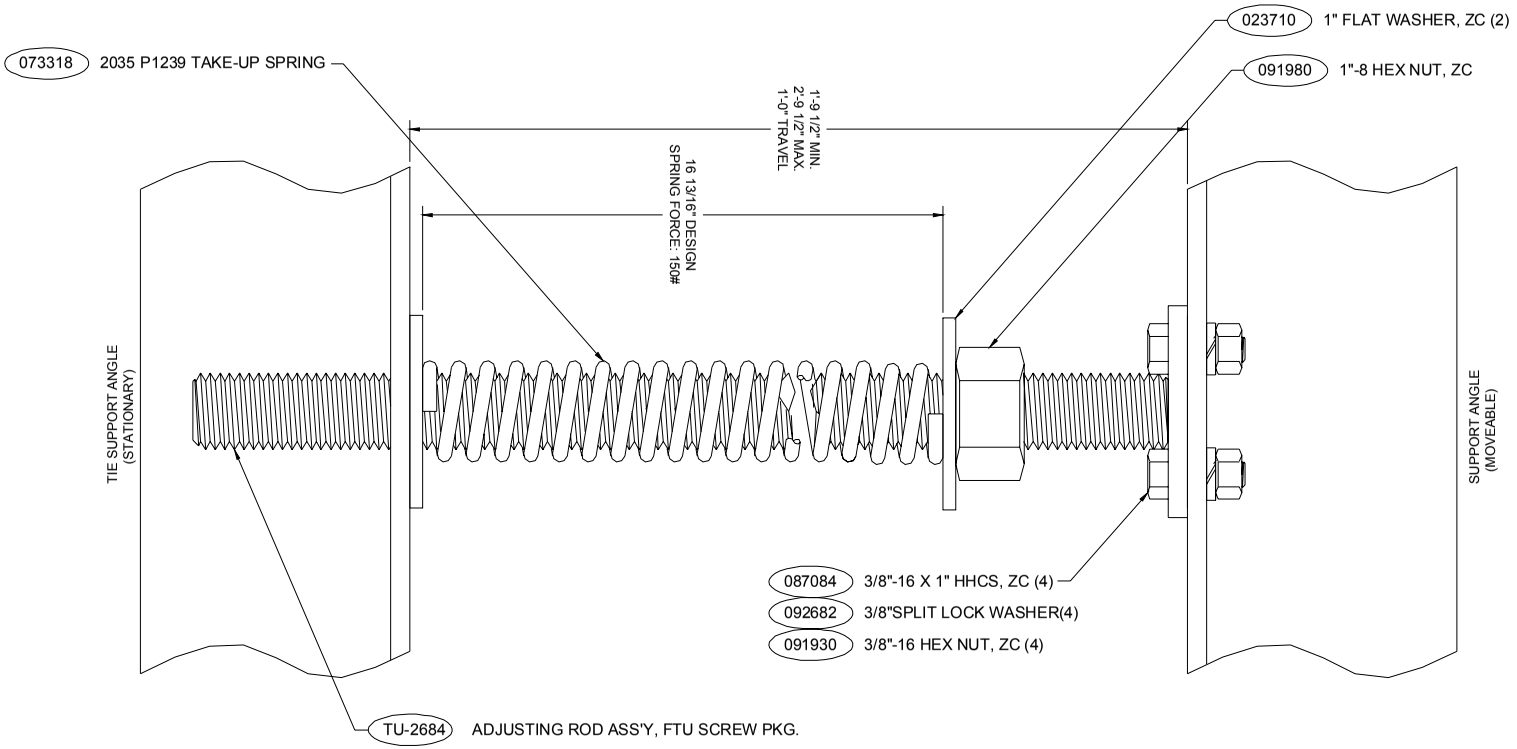
#	Revision	Date	Name
8			
7			
6			
5			
4			
3			
2			
1			

Title: Frame Take-Up 'Basic' Ass'y
Drawn by: JQuinlan
Checked by: JMcGinty III
Scale: NTS
Dwg. #: TU-1687
Date: April 3, 2002
Size: A
Sheet: 1 of 1



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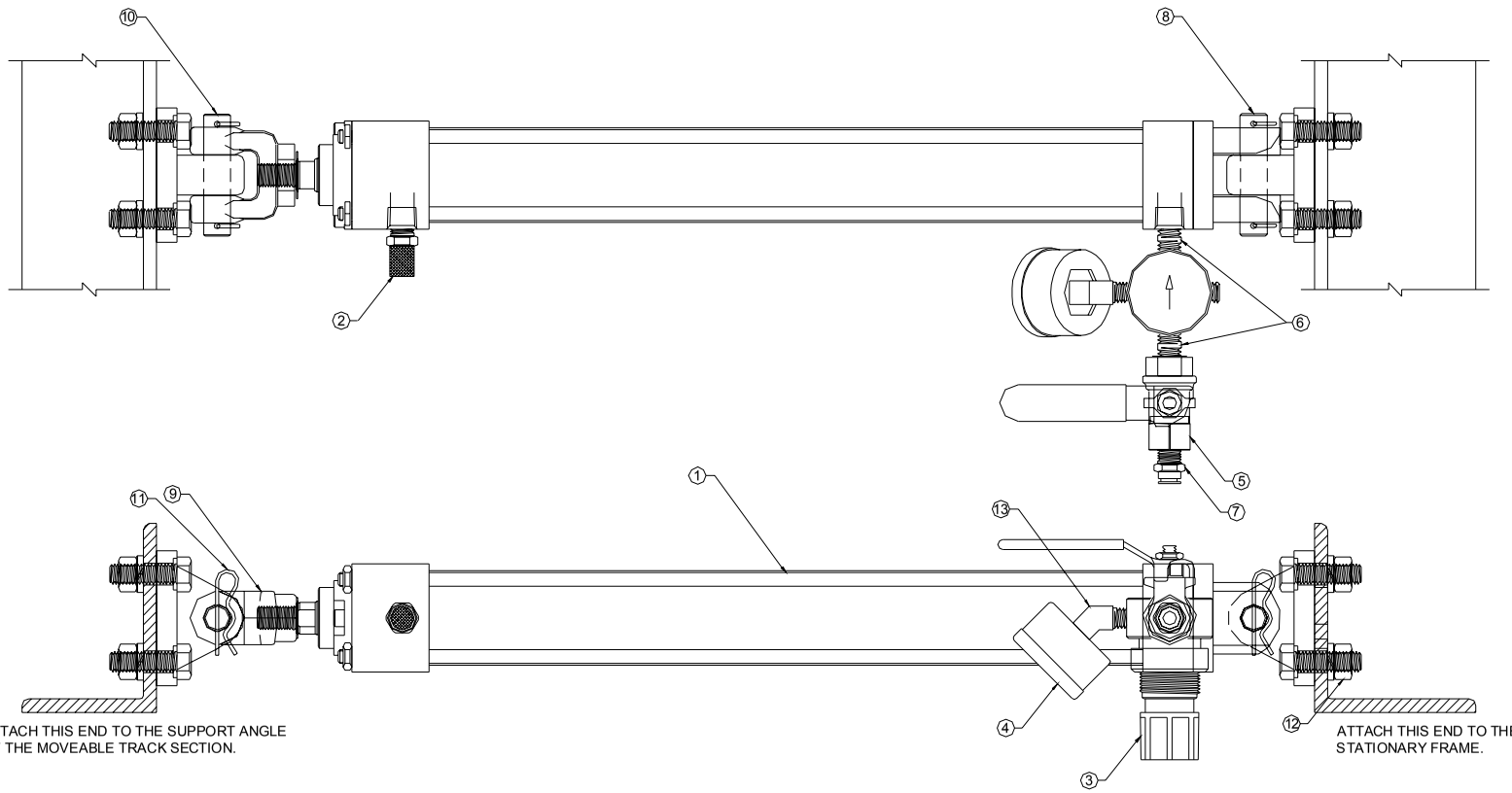
#	Revision	Date	Name
8			
7			
6			
5			
4			
3			
2			
1			

Title: Spring Take-Up Package
Drawn by: JQuinlan
Checked by: JMcGinty III
Scale: NTS
Date: April 3, 2002
Size: A
Dwg. #: TU-2686
Sheet: 1 of 1



Q.A. NOTE:
ITEM 12 (FASTENERS 8 OF EACH) WILL BE IN A SEPERATE BAG IN THE BOX ALONG WITH THE ASSEMBLED AIR CYLINDER AND A INSTALLATION SHEET.

NOTE:
ADJUST THE AIR REGULATOR TO MINIMUM PRESSURE. RESET TO 60-80 PSI. AFTER THE CHAIN HAS BEEN INSTALLED

ITEM	QTY.	DESCRIPTION
13	1	ANDERSON #124A-A, 45° INSTALLED IN GAUGE
12	1	ACESSORY BAG: 3/8"-16 X 1-1/4" BOLTS, NUTS, AND LOCK WASHERS, 8 OF EACH
11	4	J CLIPS
10	2	#BDP-05H PIVOT PINS
9	1	#BDC-05 ROD CLEVIS
8	2	#BDEB-05 EYE BRACKET
7	1	LEGRIS, #3175-56-14, 1/4" NPT, 1/4" TUBE FITTING, INSTALLED IN BALL VALVE
6	2	ANDERSON 1/4" NPT PIPE NIPPLE, #112-A-B
5	1	DYNAQUIP BALL VALVE, #VMH2-A9JP-1/4, INSTALLED IN REAR INLET
4	1	MASTER PNEUMATIC GAUGE, #70MDD, INSTALLED IN REAR PORT
3	1	MASTER PNEUMATIC REGULAR, #R56-2, 1/4" NPT, INSTALLED IN REAR PORT
2	1	P2MN MUFFLER, INSTALLED IN FRONT PORT
1	1	AIR CYLINDER, 1-1/2" BORE X 12" STROKE, DETACHABLE REAR CLEVIS MOUNT, 1/4" NPT, 7/16"-20 ROD, PORTS IN POSITION 2, #P2AK-12A11-AAAO (PNEUMATIC ACTUATOR)

#	Revision	Date	Name
8			
7			
6			
5			
4			
3			
2			
1			

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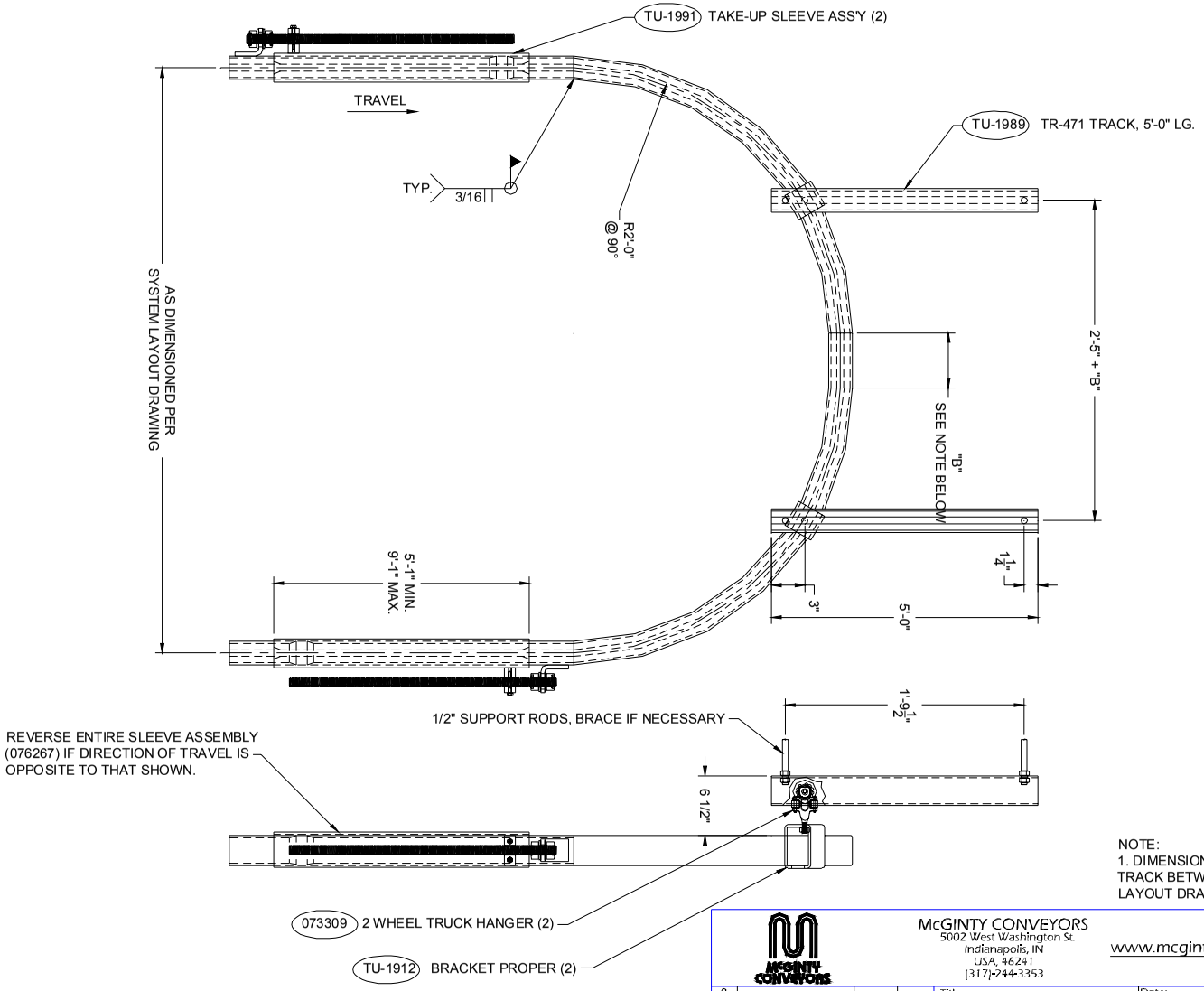
(317)-244-3353
www.mcgintyconveyors.com

Title: Spring Take-Up Package
Date: April 3, 2002
Size: A
Drawn by: JQuinlan
Checked by: JMcGinty III
Scale: NTS
Dwg. #: TU-2686
Sheet: 1 of 1



NOTE:
1. DIMENSION "B" = STRAIGHT TRACK BETWEEN CURVES PER LAYOUT DRAWING.

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#	Revision	Date	Name
8			
7			
6			
5			
4			
3			
2			
1			

Title: Take-Up Installation Drawing
Drawn by: JQuinlan
Checked by: JMcGinty III
Scale: NTS
Dwg. #: TU-1990
Sheet: 1 of 1
Date: April 3, 2002
Size: A

Drive Unit

General

The drive unit must be installed in the proper location, usually the highest point in the system, and leveled before any straight track is installed. The unit should be installed so that the conveyor chain can be fed into a drop or dip in the track so slack chain will be taken away from the head of the drive unit. In installations where a dip in the conveyor is not possible, the drive can be raised above the level of the conveyor providing a dip ahead of the drive.

Refer to your system drawings for the proper location of the drive unit(s). Check drawings to insure that you install the drives in the proper places in the system.

Important

Check for proper lubrication and adjustment before operating this drive unit.

Note

Where the conveyor must be kept level throughout the system care must be taken so that chain does not pile up in the drive unit.

Installation

1. Place the drive unit into place and brace using light angles or wood braces.

Note

The power unit is heavy. Make sure you secure it properly before starting to weld.

2. Weld the drive unit to the track sections using the welding jig. Refer to Welding Jig Section of the Manual.
3. Remove all bracing after unit is welded in place.
4. Make all electrical connections to the power line as per electrical installation drawings.
5. Verify proper lube level in the drive.
6. Start drive and note direction of travel of the pusher dogs. The pusher dogs. The pusher dogs that will contact chain must travel in the direction that the conveyor will run.
7. If the drive is running in the wrong direction, check wiring diagrams and reverse wires as necessary.

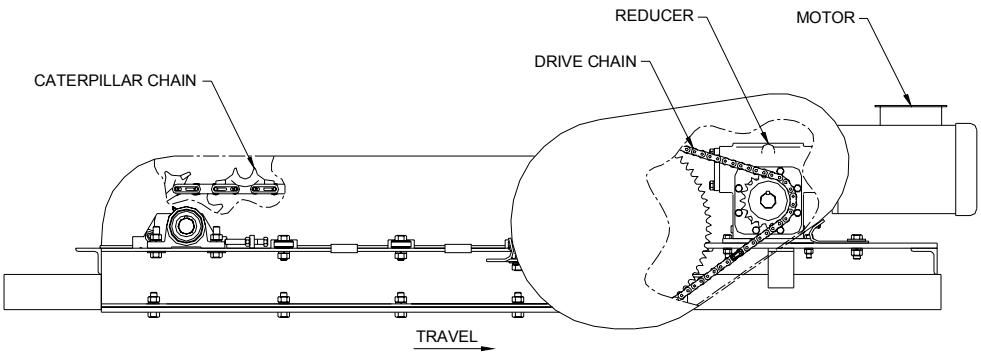


FIGURE 1
DRIVE UNIT

Speed Reducer

The speed reducer on your drive unit was filled at the factory, however it should be checked and adjusted if necessary. Refer to the speed reducer manual enclosed the drive unit.

Friction Clutch

The friction clutch is used as a safety check for the chain pull. The clutch has been factory adjusted.

The cup type spring washer is designed so that it will continue to exert the proper force even after the friction linings are worn thin.

CAUTION

THE CLUTCH UNIT WILL NOT OPERATE PROPERLY IF OIL CONTAMINATES THE FRICTION LININGS. ANY GREASE OR OIL ON THESE LININGS WILL CAUSE THE SPROCKET TO SLIP WITH LITTLE OR NO CHAIN PULL.

Caterpillar Chain Adjustment

The reversible chain (Caterpillar chain), Refer to Figure 1, should have the excess slack removed periodically. After one month of operation it should be adjusted.

To adjust the caterpillar chain:

1. Remove guard and loosen hold-down nuts (A) and adjustment nuts (B) on the pillow blocks opposite the reducer. Refer to Figure 2
2. Turn adjusting bolt (C) evenly on both blocks until the chain as approximately a ½" play at the middle of the span.
3. Tighten nuts (A) and (B).
4. Replace guard.

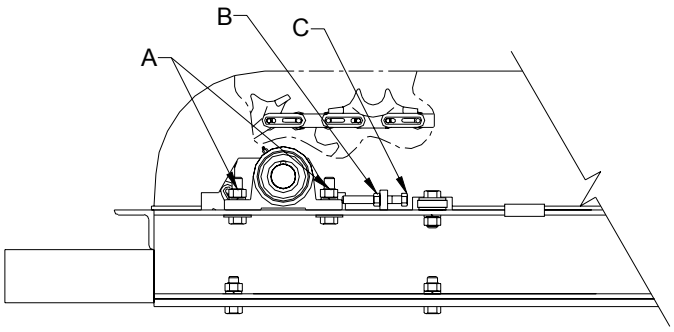
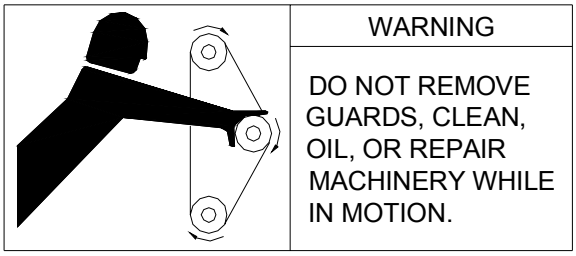


FIGURE 2
ADJUSTMENT BLOCK



NEVER OPERATE DRIVE UNIT WITHOUT GUARDS IN PLACE.

Drive Chain Adjustment

The drive chain should also be checked and adjusted at the same one month interval as the caterpillar chain. If it has more that ½" of play it should be adjusted. The reducer has four (4) adjusting bolts used to hold the reducer in place, Refer to Figure 3.

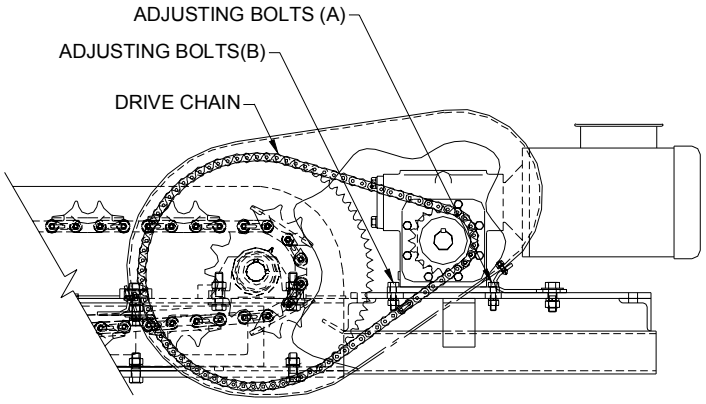


FIGURE 3
DRIVE CHAIN ADJUSTMENT

To adjust the drive chain:

1. Remove the guard if not already done in the last step.
2. Loosen the two (2) front hold down bolts (A).

3. Loosen the two (2) rear hold down bolts (B), but not loose enough to allow the unit to slide.
4. Using a piece of wood and a mallet gently strike the reducer until the chain has approximately ½" plat at the middle of the span.
5. Tighten the two (2) front hold down bolts (A), this will cause the reduce unit to go forward and down giving the chain a ¼" play in the middle of the span.
6. Tighten the two (2) rear hold down bolts.
7. Replace guard.

Make sure the distance between the head shaft and the idler shaft is equal on both sides and square with the conveyor track. Refer to Figure 4.

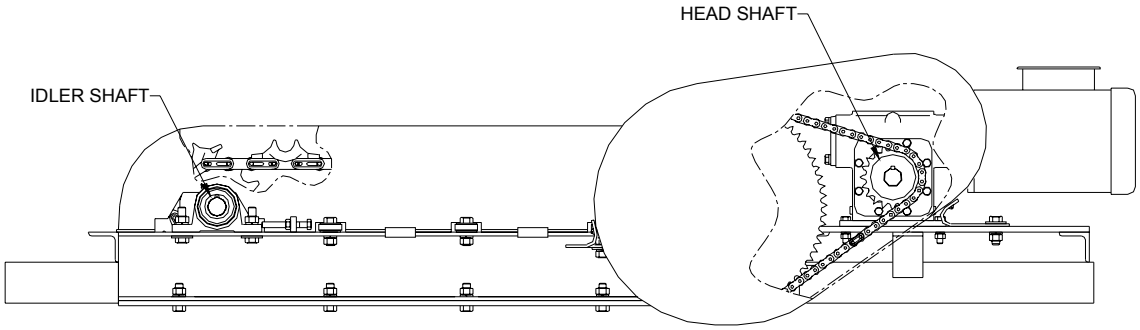
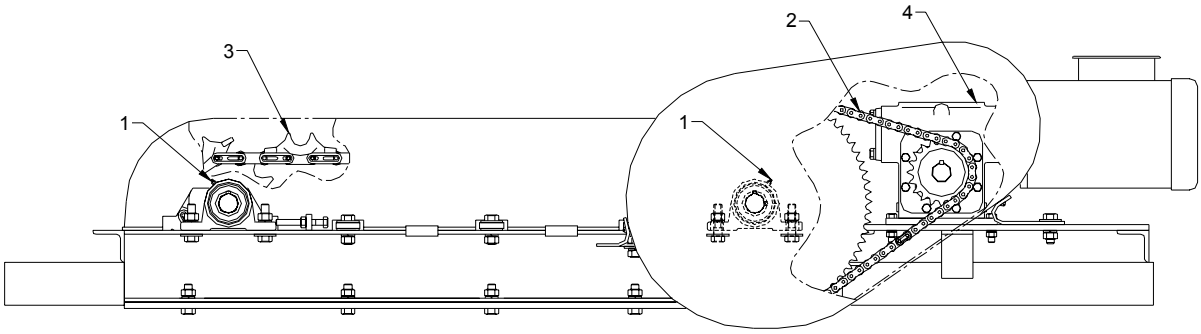


FIGURE 4
HEAD AND IDLER SHAFTS

Lubrication
Winsmith Speed Reducer Lubrication

1. FACTORY FILLING. Winsmith speed reducers are filled to the proper level prior to shipment with the appropriate grade of oil for operation in an industrial environment. The oil level should be checked prior to operation, using the oil level plug provided for that purpose. Refer to Figure 5..

2. AMBIENT TEMPERATAURE. If ambient temperatures are low or high, the type of lubricant installed at the factory may be unsuitable.



DRIVE UNIT LUBRICATION CHART

Interval	Item	Point No.	Quantity	Type
Monthly	Conveyor Drive Shaft Bearings	1	1 Fitting ea. Brgn. 2 shots	NGLA #2 Lithium Grease
Monthly	Conveyor Drive Roller Chain	2	Brush or Spray	Chain Lube
Monthly	Conveyor Drive Caterpillar Chain	3	Brush or Spray	Chain Lube
Monthly	Conveyor Drive Motor Gear Reducer Unit	4	Check and Fill to Level Mark	SAE 12 Oil
Annually	Conveyor Drive Motor Gear Reducer Unit	4	Drain and Refill Oil	SAE 12

3. INITIAL OIL CHANGE. The oil in a new speed reducer should be drained at the end of 250 hours of operation (30 days for 8 hour per day service, 15 days for 16 hour service, 10 days for 24 hour service).

4. OIL CHANGING. When changing oil for any reason, it should be remembered that oils of various types may not be compatible. Therefore, when changing to a different oil, it is recommended that the housing be completely drained and thoroughly flushed with a light flushing oil prior to refilling with the appropriate lubricant. Under normal conditions, after the initial change, the oil should be changed after every 2500 hours of operation, or every six months, whichever occurs first. Under severe conditions (rapid temperature changes, moist, dirty or corrosive environment) it may be necessary to change oil at intervals of one to three months. Periodic examination of oil samples taken from the unit will help establish the appropriate interval. If a speed reducer is to stand idle for an extended period of time, (such as when used as a spare) it is recommended that the unit be filled completely with oil to protect interior parts from rush and corrosion due to condensation inside the housing. Be sure to drain the oil to the proper level before placing the speed reducer into service.

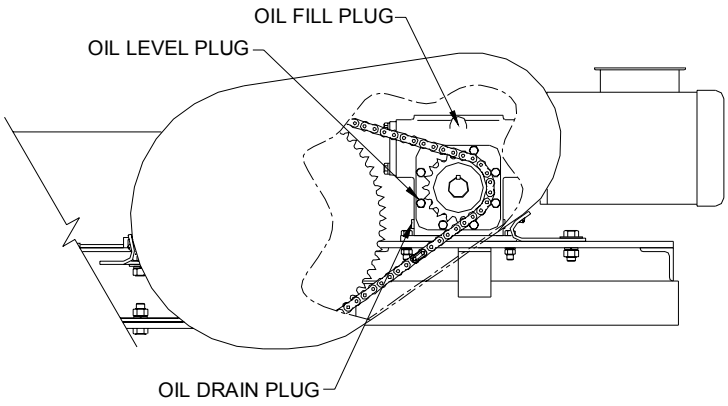


FIGURE 5
WINSMITH GEAR REDUCER OIL LEVELS

5. GREASE FITTINGS. Some Winsmith reducers are equipped with grease fittings to lubricate bearings not adequately lubricated by the oil splash. These fittings should periodically be pressure lubricated with a short fiber grease with a work penetration of 310 to 340 at 77° F and an ASTM drop point of 250° F minimum.

6. OIL TEMPERATURE. Speed reducers in normal operation can generate temperatures up to 200° F depending on the type of reducer and the severity of the application (loading, duration of service, ambient temperatures). Excessive oil temperatures may be the result of one or more of the following factors:

   A. OVERLOADS. An overload, due to the original selection of a unit too small for the application, or increasing loads on the speed reducer to a point where its rating is exceeded after it has been in service for a period of time. Always check the speed reducer rating when increasing driven loads or increasing the horsepower rating of the motor or other prime mover.

   B. OVERFILLING OR UNDERFILLING. If a speed reducer is overfilled with oil, the energy used in churning the excessive oil can result in overheating. If this occurs, shut down the drive, remove the oil level plug and allow oil to drain until oil ceases to drain for the level hole, reinstall the oil level plug, and restart the drive. If the speed reducer is under filled, the resultant friction can cause overheating. If this occurs, fill the speed reducer to the oil level plug hole.

   C. INADEQUATE COOLING. In order to dissipate internally generated heat, the speed reducer must be installed in such a way that air can circulate freely. Tightly confined areas (inside cabinets, etc.) should be avoided. If this is not possible, forced air cooling by means of a separate blower or a fan integral to the speed reducer should be used.

OIL RETENTION.

1. VENT PLUGS. To prevent loss of oil during shipment, Winsmith speed reducers are shipped with a brass pin in the vent hole in the filler and vent plug. This pin must be removed before the reducer is put into operation. Failure to remove the brass pin can result in pressure build up which can pump oil through the seals. If the speed reducer is installed in an atmosphere containing exceptional amounts of moisture or dust, a shielded or hooded vent plug should be used.

2. OIL SEALS. Although Winsmith uses high quality oil seals and precision ground shafts to provide a superior seal contact surface, it's possible that circumstances beyond Winsmith's control can cause oil seal leakage (defective seal, damage during shipment or installation, etc.). When replacing a shaft oil seal, using the following suggestions will help to insure leak-free operation and long seal life.

a. When installing a new seal, wrap the shaft with light shim stock or heavy paper to protect the seal lip from being damaged by a rough shaft or cut by the sharp edge of the keyway.

b. A sealant should be used between the O.D. of the seal and the I.D. of the bore into which the seal is installed. The seal bore should also be free of any burrs, nicks, or scratches.

c. Be sure that the seal is not cocked in the seal bore. The outer face of the seal should be flush with the surface into which it is mounted.

ELECTRIC MOTOR

Electrical connection of the motor is to be carried out as per the system layout drawings. The wiring, fusing, and grounding must be in accordance to the National Electrical Code and local codes.

When the motor is connected to the load for proper direction of rotation and started, it should start quickly and run smoothly. If this is not the case, immediately shut the motor off and investigate the cause. The cause could be; low voltage, the motor is misconnected, or the load is too great.

It is recommended that the motor current be checked after it has been operating a short time and compared to the nameplate current.

MOTOR LUBRICATION

This is a ball bearing motor. The bearings have been given initial lubrication at the factory. Motors without grease fittings are factory lubricated for normal bearing lift.

LUBRICATING INTERVALS FOR MOTORS WITH REGREASING CAPABILITIES

New motors having been in storage for a year should be relubricated using the procedure below. The following lubrication intervals are suggested as a guide for long operating life. (SEE NEXT PAGE)

Worm Gear Reduces

Ambient Temperature	-30 to 15° F	16 to 50° F	51 to 110° F	111 to165° F
Max. Operating Temp.	150° F	185° F	200° F	200° F
Viscosity @ 100° F. SUS		1919 to 2346	2837 to 3467	4171 to 5098
Compounded with:	3% to 10% fatty or synthetic fatty oils or mild EP additives			
AGMA Lubricant No.		#7 Compound	#8 Compound	#8A Compound
Cities Service Co.	Citgo EP Comp. 68	Citgo Cyl. Oil 400-S	Citgo Cyl. Oil 680-7	Citgo Cyl. Oil 680-7
Fiske Bros. Refining	APG-80	Lubriplate CP Gear Oil #7	Lubriplate CP Gear Oil #8	Lubriplate CP Gear Oil #8A
Gulf Oil Corp.	SL460 E.P.	Transgear EP 460	Transgear EP 680	Transgear EP 800
Keystone Div.	KSL365	KSL366	K-600	K-620
Mobil Oil Corp.	SHC 634	Mobil 600W	Mobil 600 Super	Mobil Extra Hecia Super
Shell Oil Corp.	Omala 68	Omala 460	Omala 680	Omala 800
Sun Oil Corp.	Sunep 1050	Sunep 1110	Sunep 1150	Sunoco Gear Oil 8 AC
Texaco Inc.	Meropa 68	Vanguard Cyl. Oil 460	Honor Cyl. Oil 680	650T Cyl. Oil 1000
American Lub., Inc.		Ind. Gear Oil 140	AGMA #8 Gear Oil	AGMA #8 Gear Oil
Chevron	NL Gear Comp. 100	NL Gear Comp. 460	NL Gear Comp. 680	NL Gear Comp. 1500

Chart A

Hours of Service Per Year	Suggested Relube Interval		
	NEMA FRAME SIZE		
	42 to 215T	254 to 326T	364 to 447T
5000 Hrs. Continuous Normal Operation	5 yrs. 2 yrs.	3 yrs. 1 yrs.	1 yrs. 9 months
Seasonal Service Motor is idle for 6 months or more.	1 yr. (beginning of season)	1 yr. (beginning of season)	1 yr. (beginning of season)
Continuous high ambients, dirty or moist locations, high vibration, or where shaft end is hot (pump fans).	6 months	6 months	6 months

LUBRICANT

Baldor motors are pre-greased normally with Shell Oil Company's "Dolium R". Several equivalent greases which are compatible with Baldor furnished grease are Chevron Oil's "SRI No. 2" and Texaco Inc. "Premium RB".

GREASING PROCEDURE

Over greasing bearings can cause premature bearing failure. If the motor is equipped with an Alemite fitting, clean the fitting tip and apply grease gun.

Use 1 to 2 full strokes on motors in NEMA 215 frame and smaller.

Use 2 to 3 full strokes on NEMA 254 thru NEMA 365 frames.

Use 3 to 4 strokes on NEMA 404 frames or larger.

On motors having drain plugs, remove the grease drain plug and operate motor for 20 minutes before replacing drain plug.

On motors equipped with slotted head grease screws, remove screw and apply grease tube in hole.

Insert 2 to 3 inch length of grease string into each hole on motors in NEMA 215 frame.

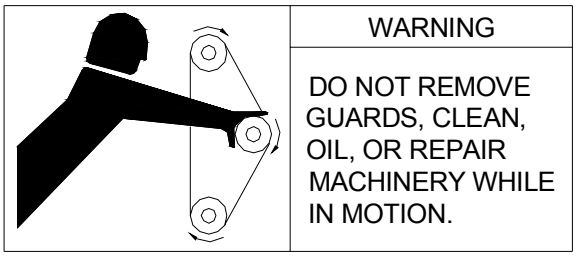
Insert 5 to 5 inch length of grease string into each hole on large motors.

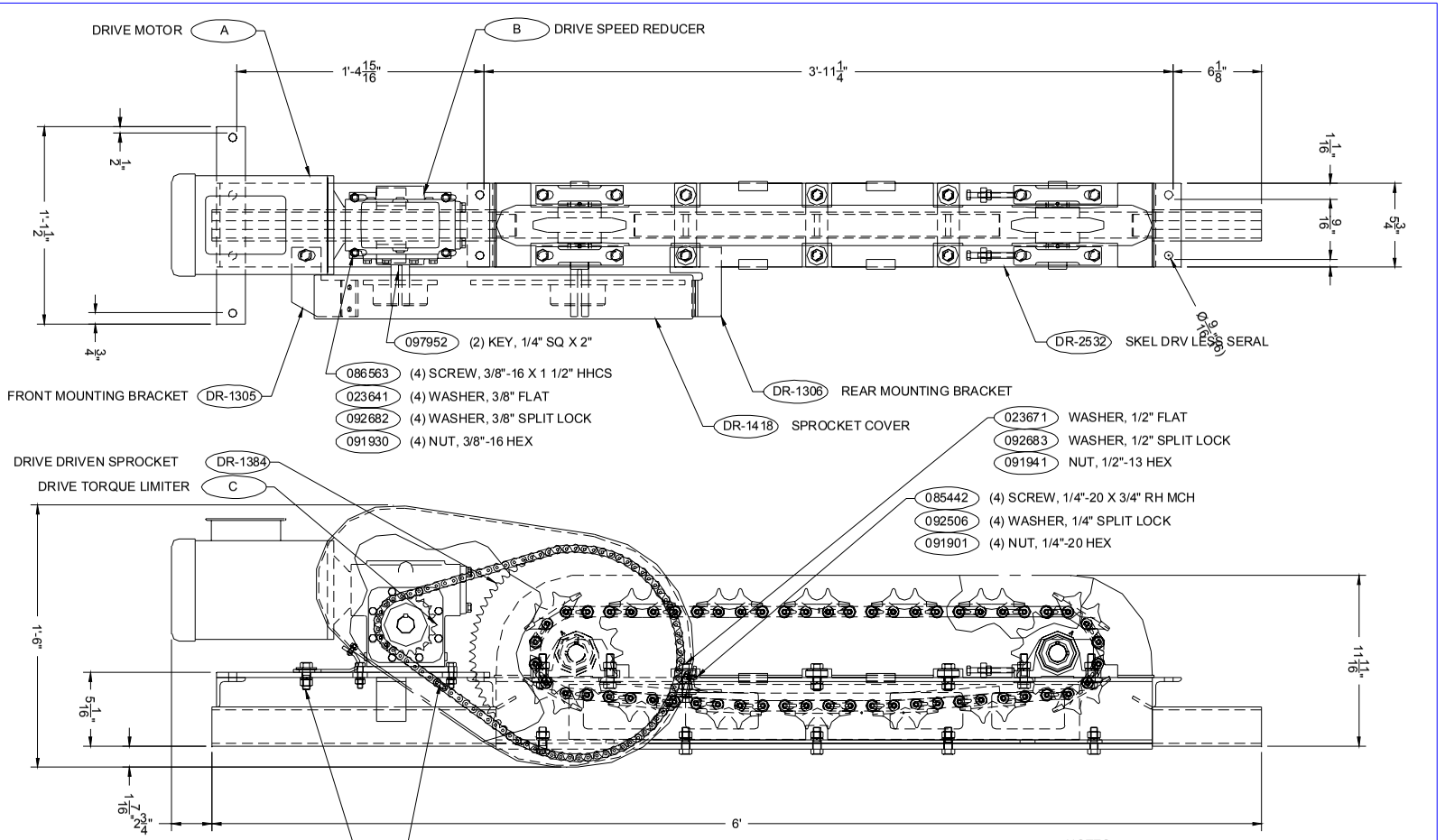
On motors having drain plugs, remove the grease drain plug and operate motor for 20 minutes before replacing drain plug.

CAUTION
DO NOT LUBRICATE MOTORS, REMOVE, OR REPLACE DRAIN PLUGS WHILE MOTOR IS IN OPERATION.

Keep grease clean.

DO NOT mix petroleum grease and silicone grease in motor bearings.





NOTES:

1.) CAPACITY = 600 POUNDS DRAW BAR PULL.
2.) CHAIN SPEED = 12 TO 45 FEET PER MINUTE.
3.) MOUNT MOTOR WITH JUNCTION BOX ON TOP.

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#	Revision	Date	Name
8			
7			
6			
5			
4			
3			
2			
1			

Title: Drive Unit
Drawn by: JQuinlan
Checked by: JMcGinty III
Date: April 3, 2002
Size: A
Scale: NTS
Dwg. #:
Sheet: 1 of 1

Drive Unit Material List

ID	QTY.	PART NUMBER	DESCRIPTION
1	4	023641	WASHER, 3/8" FLAT, ZC
2	2	023671	WASHER, 1/2" FLAT, ZC
3	1	073765	CRATES, DRIVE UNITS
4	4	085442	SCREW, 1/4"-20 X 3/4" RH MCH, ZC
5	4	086563	SCREW, 3/8"-16 X 1-1/2" HHCS, ZC
6	2	088660	SCREW, 4 X 3/16" RH DRIVE, ZC
7	1	089170	SCREW, 1/2"-13 X 1-1/2" HHCS, ZC
8	4	091901	NUT, 1/4"-20 HEX, ZC
9	4	091930	NUT, 3/8"-16 HEX, ZC
10	2	091941	NUT, 1/2"-13 HEX, ZC
11	4	092506	WASHER, 1/4" SPLIT LOCK, ZC
12	4	092682	WASHER, 3/8" SPLIT LOCK, ZC
13	2	092683	WASHER, 1/2" SPLIT LOCK, ZC
14	5	096870	CHAIN, ROLLER, #50, RIVETED STANDARD ROLLER TRANSMISSION CHAIN (ANSI B29.1-1963, R1972)
15	2	097952	KEY, 1/4" SQ X 2"
16	1	098280	CONNECTING LINK, #50 CHAIN
17	1	098300	OFFSET LINK, #50 CHAIN
18	1	DR-579	SERIAL NUMBER PLATE
19	1	DR-1305	FRONT MOUNTING BRACKET
20	1	DR-1306	REAR MOUNTING BRACKET
21	1	B	DRIVE SPEED REDUCER ORDERING SPECIFICATION FOR SPEED REDUCER: SPEED REDUCER TO BE RIGHT ANGLE, SINGLE STAGE WORM GEAR ASSEMBLY WITH A GEAR RATIO OF (SEE DRIVE UNIT CHART). REDUCER TO BE IN A GRAY IRON CASE OF THE (MOTOR FRAME PER CHART) HOLLOW INPUT BORE (CLOSE COUPLED) TYPE, FOR BASE MOUNTING, WITH A SINGLE OUTPUT SHAFT GEAR REDUCER ASSEMBLY. REDUCER DESIGNED AND MANUFACTURED IN ACCORDANCE WITH AGMA MULTI-TEMPERATURE SYNTHETIC OIL INTENDED FOR USE IN WORM GEAR SPEED REDUCERS. THE REDUCER MUST HAVE THE MECHANICAL OUTPUT TORQUE CAPACITY TO PROVIDE A 1.50 SERVICE FACTOR. SLOW SPEED SHAFT TO BE TURNED Ø1 1/8" WITH 1/4" X 1/8" KEYWAY. SEE DRIVE UNIT CHART COLUMN "B" FOR WINSMITH MODEL AND ASSEMBLY NUMBERS.
22	1	C	DRIVE TORQUE LIMITER ORDERING SPECIFICATION FOR TORQUE LIMITER: TORQUE LIMITING DEVICE TO BE UNIT WHICH WILL LIMIT THE TORQUE TRANSMITTED BY THE DRIVE SYSTEM BY SLIPPING WHEN THE TORQUE DEMAND EXCEEDS A PRESET VALUE. IT SHOULD AUTOMATICALLY RE-ENGAGE WHEN THE OVERLOAD CONDITION HAS PASSED. THE TORQUE AT WHICH THE UNIT SLIPS IS TO BE ADJUSTABLE AND SHOULD BE PRESET TO A VALUE OF (SEE DRIVE UNIT CHART). ASSEMBLY SHOULD HAVE 1 1/8" BORE WITH STANDARD KEYWAY AND SETSCREW. ASSEMBLY SHOULD BE FURNISHED WITH 5/8" PITCH (SEE CHART) TOOTH RC50 ROLLER CHAIN SPROCKET OF THE APPROPRIATE BORE AND FINISH. SEE DRIVE UNIT CHART COLUMN "C" FOR MODEL AND ASSEMBLY NUMBERS.
23	1	DR-1384	DRIVE DRIVEN SPROCKET 50 B 72 SPROCKET BORE = 1.250, LTB = 1.24 TO 1.63 HUB Ø = 2.5 TO 3.25 KEYWAY = .25 X .125 2 DRILL AND TAP: 5/16"-18 MATERIAL 12L14 OR C1020 TOL. BORE +.002 - 0 FINISH: BLACK OXIDE OR NONE NO. OF SET SCREWS: 2
24	1	DR-1390	REPLACEMENT LINER
25	1	DR-1418	SPROCKET COVER
26	3	DR-2508	LABEL, SAFETY, CEMA CHR930001
27	2	DR-2509	LABEL, SAFETY, CEMA, CHR930009
28	1	DR-2532	SKEL DRV LESS SERAL W/2060 CH SEE NEXT SHEET
29	1	A	DRIVE MOTOR SEE DRIVE UNIT CHART COLUMN "A" FOR MODEL AND ASSEMBLY NUMBERS

DR-2532 SKEL DRV LESS SERAL W/2060 CH

ID	QTY.	PART NUMBER	DESCRIPTION
1	1	MSDS005	MSDS, HYSPIN AW32, CASTROL IND.
2	1	MSDS006	MSDS, MOBIL DTE 24
3	2	089020	SCREW, 3/8"-16 X 3 HHCS FT, ZC
4	15	089170	SCREW, 1/2"-13 X 1- 1/2" HHCS, ZC
5	9	089190	SCREW, 3/8"-16 X 1-1/2" HH FT, ZC
6	2	091930	NUT, 3/8"-16 HEX, ZC
7	24	091941	NUT, 1/2"-13 HEX, ZC
8	24	092683	WASHER, 1/2" SPLIT LOCK, ZC
9	2	097952	KEY, 1/4" SQ X 2"
10	26	150012	P1952 SPL 1/2" WASHER THIN
11	2	DR-870	DIRECTION OF CONVEYOR LABEL
12	2	DR-1279	DRIVE TRACK LIP
13	1	DR-1280	FRAME COVER
14	1	DR-1281	WLDT, BAR, BACK-UP
15	4	DR-1286	PILLOW BLOCK, DRIVE
16	1	DR-1302	DRIVE COVER
17	4	DR-1303	SPRING CLIP
18	1	DR-1374	DRIVE FRAME
19	1	DR-2533	IDLER SHAFT
20	1	DR-2534	DRIVE SHAFT
21	2	DR-2535	SPROCKET C2062H, 12T, C HUB
22	1	DR-2536	DRIVE CHAIN, C2062
23	1	DR-2582	NAME PLATE 3.88" X 15.00"

DR-1371 DRIVE UNIT

DRIVE UNIT			MOTOR (A)						SPEED REDUCER (B)					TORQUE LIMITER (C)			
MCGINTY NUMBER	SPEED FPM	ACTUAL FPM	PART NUMBER	RELIANCE MODEL	H/P	RPM	FRAME	ENCLOSURE	MCGINTY NUMBER	WINSMITH MODEL	RATIO	ASSEMBLY	FRAME	MCGINTY NUMBER	DALTON MODEL	TEETH	TORQUE PRESET IN.-LBS.
DR-1371	16	15.86	DR-2580-001	P56X1337	3/4	1730	FM56C	TENV-EM	DR-1380	924MDT	50:1	R	56C	DR-1382	OSD-362	22	740-900
DR-1371-00-2	0.22	0.22	DR-2580-001	P56X1337	3/4	1730	FM56C	TENV-EM	DR-1380-14	924MDTD	3600:1	LU-R	56C	DR-1382	OSD-362	22	740-900
DR-1371-00-3	0.25	0.25	DR-2580-001	P56X1337	3/4	1730	FM56C	TENV-EM	DR-1380-14	924MDTD	3600:1	LU-R	56C	DR-1383	OSD-362	25	840-1020
DR-1371-00-5	0.5	0.49	DR-2580-001	P56X1337	3/4	1730	FM56C	TENV-EM	DR-1380-12	924MDTD	2000:1	LU-R	56C	DR-1382-27	OSD-362	27	908-1100
DR-1371-00-8	0.75	0.79	DR-2580-001	P56X1337	3/4	1730	FM56C	TENV-EM	DR-1380-10	924MDTD	1000:1	LU-R	56C	DR-1382	OSD-362	22	740-900
DR-1371-01	1	1.01	DR-2580-001	P56X1337	3/4	1730	FM56C	TENV-EM	DR-1380-10	924MDTD	1000:1	LU-R	56C	DR-1382-28	OSD-362	28	740-900
DR-1371-01-2	1.22	1.20	DR-2580-001	P56X1337	3/4	1730	FM56C	TENV-EM	DR-1380-09	924MDTD	750:1	LU-R	56C	DR-1383	OSD-362	25	740-900
DR-1371-01-5	1.5	1.59	DR-2580-001	P56X1337	3/4	1730	FM56C	TENV-EM	DR-1380-08	924MDTD	500:1	LU-R	56C	DR-1382	OSD-362	22	740-900
DR-1371-02	2	1.95	DR-2580-001	P56X1337	3/4	1730	FM56C	TENV-EM	DR-1380-08	924MDTD	500:1	LU-R	56C	DR-1382-27	OSD-362	27	740-900
DR-1371-02-5	2.5	2.64	DR-2580-001	P56X1337	3/4	1730	FM56C	TENV-EM	DR-1380-07	924MDTD	300:1	LU-R	56C	DR-1382	OSD-362	22	740-900
DR-1371-03	3	3.00	DR-2580-001	P56X1337	3/4	1730	FM56C	TENV-EM	DR-1380-07	924MDTD	300:1	LU-R	56C	DR-1383	OSD-362	25	740-900
DR-1371-03-5	3.5	3.36	DR-2580-001	P56X1337	3/4	1730	FM56C	TENV-EM	DR-1380-07	924MDTD	300:1	LU-R	56C	DR-1382-28	OSD-362	28	740-900
DR-1371-04	4	3.96	DR-2580-001	P56X1337	3/4	1730	FM56C	TENV-EM	DR-1380-06	924MDTD	200:1	LU-R	56C	DR-1382	OSD-362	22	740-900
DR-1371-04-5	4.5	4.51	DR-2580-001	P56X1337	3/4	1730	FM56C	TENV-EM	DR-1380-06	924MDTD	200:1	LU-R	56C	DR-1383	OSD-362	25	740-900
DR-1371-05	5	4.87	DR-2580-001	P56X1337	3/4	1730	FM56C	TENV-EM	DR-1380-06	924MDTD	200:1	LU-R	56C	DR-1382-27	OSD-362	27	740-900
DR-1371-053	5.3	5.29	DR-2580-001	P56X1337	3/4	1730	FM56C	TENV-EM	DR-1380-05	924MDTD	150:1	LU-R	56C	DR-1382	OSD-362	22	740-900
DR-1371-06	6	6.01	DR-2580-001	P56X1337	3/4	1730	FM56C	TENV-EM	DR-1380-05	924MDTD	150:1	LU-R	56C	DR-1383	OSD-362	25	740-900
DR-1371-07	7	6.73	DR-2580-001	P56X1337	3/4	1730	FM56C	TENV-EM	DR-1380-05	924MDTD	150:1	LU-R	56C	DR-13828	OSD-362	28	740-900
DR-1371-08	8	7.93	DR-2580-001	P56X1337	3/4	1730	FM56C	TENV-EM	DR-1380-04	924MDTD	100:1	LU-R	56C	DR-1382	OSD-362	22	740-900
DR-1371-09	9	9.01	DR-2580-001	P56X1337	3/4	1730	FM56C	TENV-EM	DR-1380-04	924MDTD	100:1	LU-R	56C	DR-1383	OSD-362	25	740-900
DR-1371-10	10	10.09	DR-2580-001	P56X1337	3/4	1730	FM56C	TENV-EM	DR-1380-04	924MDTD	100:1	LU-R	56C	DR-1382-28	OSD-362	28	740-900
DR-1371-11	11	11.05	DR-2580-001	P56X1337	3/4	1730	FM56C	TENV-EM	DR-1380-03	924MDTD	75:1	LU-R	56C	DR-1382-23	OSD-362	23	740-900
DR-1371-12	12	12.01	DR-2580-001	P56X1337	3/4	1730	FM56C	TENV-EM	DR-1380-03	924MDTD	75:1	LU-R	56C	DR-1383	OSD-362	25	740-900
DR-1371-13	13	13.22	DR-2580-001	P56X1337	3/4	1730	FM56C	TENV-EM	DR-1380-02	924MDT	60:1	R	56C	DR-1382	OSD-362	22	740-900
DR-1371-14	14	13.82	DR-2580-001	P56X1337	3/4	1730	FM56C	TENV-EM	DR-1380-02	924MDT	60:1	R	56C	DR-1382-23	OSD-362	23	740-900
DR-1371-15	15	15.02	DR-2580-001	P56X1337	3/4	1730	FM56C	TENV-EM	DR-1380-02	924MDT	60:1	R	56C	DR-1383	OSD-362	25	740-900
DR-1371-17	17	16.58	DR-2580-001	P56X1337	3/4	1730	FM56C	TENV-EM	DR-1380	924MDT	50:1	R	56C	DR-1382-23	OSD-362	23	740-900
DR-1371-18	18	18.02	DR-2580-001	P56X1337	3/4	1730	FM56C	TENV-EM	DR-1380	924MDT	50:1	R	56C	DR-1383	OSD-362	25	740-900
DR-1371-19	19	18.74	DR-2580-001	P56X1337	3/4	1730	FM56C	TENV-EM	DR-1380	924MDT	50:1	R	56C	DR-1382-26	OSD-362	26	740-900
DR-1371-20	20	20.18	DR-2580-001	P56X1337	3/4	1730	FM56C	TENV-EM	DR-1380	924MDT	50:1	R	56C	DR-1382-28	OSD-362	28	740-900

DR-1372 DRIVE UNIT

DRIVE UNIT			MOTOR (A)						SPEED REDUCER (B)					TORQUE LIMITER (C)			
MCGINTY NUMBER	SPEED FPM	ACTUAL FPM	PART NUMBER	RELIANCE MODEL	H/P	RPM	FRAME	ENCLOSURE	MCGINTY NUMBER	WINSMITH MODEL	RATIO	ASSEMBLY	FRAME	MCGINTY NUMBER	DALTON MODEL	TEETH	TORQUE PRESET IN.-LBS.
DR-1372	45	45.05	DR-2580-002	P14X1485	1-1/2	1730	FE145TC	TEFC-XE	DR-1381	924MDT	20:1	R	145TC	DR-1383	OSD-362	25	840-1020
DR-1372-21	21	20.72	DR-2580-002	P14X1485	1-1/2	1730	FE145TC	TEFC-XE	DR-1381-04	924MDT	40:1	R	145TC	DR-1382-23	OSD-362	23	774-940
DR-1372-22	22	21.63	DR-2580-002	P14X1485	1-1/2	1730	FE145TC	TEFC-XE	DR-1381-04	924MDT	40:1	R	145TC	DR-1382-24	OSD-362	24	807-980
DR-1372-23	23	22.53	DR-2580-002	P14X1485	1-1/2	1730	FE145TC	TEFC-XE	DR-1381-04	924MDT	40:1	R	145TC	DR-1383	OSD-362	25	840-1020
DR-1372-24	24	23.43	DR-2580-002	P14X1485	1-1/2	1730	FE145TC	TEFC-XE	DR-1381-04	924MDT	40:1	R	145TC	DR-1382-26	OSD-362	26	875-1060
DR-1372-25	25	24.33	DR-2580-002	P14X1485	1-1/2	1730	FE145TC	TEFC-XE	DR-1381-04	924MDT	40:1	R	145TC	DR-1382-27	OSD-362	27	908-1100
DR-1372-26	26	25.23	DR-2580-002	P14X1485	1-1/2	1730	FE145TC	TEFC-XE	DR-1381-04	924MDT	40:1	R	145TC	DR-1382-28	OSD-362	28	942-1145
DR-1372-27	27	26.43	DR-2580-002	P14X1485	1-1/2	1730	FE145TC	TEFC-XE	DR-1381-03	924MDT	30:1	R	145TC	DR-1382	OSD-362	22	740-900
DR-1372-28	28	27.63	DR-2580-002	P14X1485	1-1/2	1730	FE145TC	TEFC-XE	DR-1381-03	924MDT	30:1	R	145TC	DR-1382-23	OSD-362	23	774-940
DR-1372-29	29	28.83	DR-2580-002	P14X1485	1-1/2	1730	FE145TC	TEFC-XE	DR-1381-03	924MDT	30:1	R	145TC	DR-1382-24	OSD-362	24	807-980
DR-1372-30	30	30.03	DR-2580-002	P14X1485	1-1/2	1730	FE145TC	TEFC-XE	DR-1381-03	924MDT	30:1	R	145TC	DR-1383	OSD-362	25	840-1020
DR-1372-32	32	31.72	DR-2580-002	P14X1485	1-1/2	1730	FE145TC	TEFC-XE	DR-1381-02	924MDT	25:1	R	145TC	DR-1382	OSD-362	22	740-900
DR-1372-34	34	33.16	DR-2580-002	P14X1485	1-1/2	1730	FE145TC	TEFC-XE	DR-1381-02	924MDT	25:1	R	145TC	DR-1382-23	OSD-362	23	774-940
DR-1372-35	35	34.60	DR-2580-002	P14X1485	1-1/2	1730	FE145TC	TEFC-XE	DR-1381-02	924MDT	25:1	R	145TC	DR-1382-24	OSD-362	24	807-980
DR-1372-36	36	36.04	DR-2580-002	P14X1485	1-1/2	1730	FE145TC	TEFC-XE	DR-1381-02	924MDT	25:1	R	145TC	DR-1383	OSD-362	25	840-1020
DR-1372-38	38	37.48	DR-2580-002	P14X1485	1-1/2	1730	FE145TC	TEFC-XE	DR-1381-02	924MDT	25:1	R	145TC	DR-1382-26	OSD-362	26	875-1060
DR-1372-40	40	39.65	DR-2580-002	P14X1485	1-1/2	1730	FE145TC	TEFC-XE	DR-1381	924MDT	20:1	R	145TC	DR-1382	OSD-362	22	740-900
DR-1372-42	42	41.45	DR-2580-002	P14X1485	1-1/2	1730	FE145TC	TEFC-XE	DR-1381	924MDT	20:1	R	145TC	DR-1382-23	OSD-362	23	774-940
DR-1372-44	44	43.25	DR-2580-002	P14X1485	1-1/2	1730	FE145TC	TEFC-XE	DR-1381	924MDT	20:1	R	145TC	DR-1382-24	OSD-362	24	807-980
DR-1372-47	47	46.85	DR-2580-002	P14X1485	1-1/2	1730	FE145TC	TEFC-XE	DR-1381	924MDT	20:1	R	145TC	DR-1382-26	OSD-362	26	875-1060
DR-1372-49	49	48.66	DR-2580-002	P14X1485	1-1/2	1730	FE145TC	TEFC-XE	DR-1381	924MDT	20:1	R	145TC	DR-1382-27	OSD-362	27	908-1100
DR-1372-51	51	50.46	DR-2580-002	P14X1485	1-1/2	1730	FE145TC	TEFC-XE	DR-1381	924MDT	20:1	R	145TC	DR-1382-28	OSD-362	28	942-1145
DR-1372-53	53	52.86	DR-2580-002	P14X1485	1-1/2	1730	FE145TC	TEFC-XE	DR-1381-01	924MDT	15:1	R	145TC	DR-1382	OSD-362	22	740-900
DR-1372-56	56	55.26	DR-2580-002	P14X1485	1-1/2	1730	FE145TC	TEFC-XE	DR-1381-01	924MDT	15:1	R	145TC	DR-1382-23	OSD-362	23	774-940
DR-1372-58	58	57.67	DR-2580-002	P14X1485	1-1/2	1730	FE145TC	TEFC-XE	DR-1381-01	924MDT	15:1	R	145TC	DR-1382-24	OSD-362	24	807-980
DR-1372-60	60	60.07	DR-2580-002	P14G9258	2	1730	FD145TC	TEFC-EM	DR-1381-01	924MDT	15:1	R	145TC	DR-1383	OSD-362	25	840-1020
DR-1372-68	68	67.28	DR-2580-002	P14G9258	2	1730	FD145TC	TEFC-EM	DR-1381-01	924MDT	15:1	R	145TC	DR-1382-28	OSD-362	28	942-1145
DR-1372-80	80	79.29	DR-2580-002	P18G3882	3	1730	182TC	TEFC-EM	DR-1381-05	924MDT	10:1	R	145TC	DR-1382	OSD-362	22	740-900
DR-1372-90	90	90.10	DR-2580-002	P18G3882	3	1730	182TC	TEFC-EM	DR-1381-06	924MDT	10:1	R	145TC	DR-1383	OSD-362	25	840-1020

PEERLESS – WINSMITH, INC. ILD-90 TYPE SE SPEED REDUCERS
INSTALLATION OPERATION AND LUBRICATION INSTRUCTIONS

I. SELECTION

The selection of the appropriate speed reducer for a given application requires that all factors affecting the operation of the unit be given careful consideration.
Service factors must be applied to catalog ratings depending on the type of prime mover used, severity of the application and duration of daily service. If you have any questions relative to the suitability of your Winsmith speed reducer for your particular application, refer to the selection section of the appropriate Winsmith catalog, contact your Winsmith representative or distributor, or contact Winsmith directly.

II. INSTALLATION

1. Shaft Alignment

A. The various drive members (motor, speed reducer, couplings, sprockets, sheaves, gears, etc.) should be aligned as accurately as possible to guard against unusual stresses and overloads imposed by misalignment.
B. If a prime over shaft is to be directly connected to the high speed (input) shaft or if the slow speed (output) shaft is to be directly connected to the driven shaft, flexible couplings should be used. It should be remembered that even flexible couplings have limited ability to accommodate misalignment. Care must be taken at installation to insure that shaft alignments are within the limits recommended by the coupling manufacturer. Use of a rigid coupling to connect speed reducer shafts to other drive components is not recommended as it is almost impossible to obtain exact alignment between two shafts.
C. A common base plate supporting the motor and reducer will help preserve the original alignment between reducer and motor shafts. If a structural steel base is used, the plate should be at least equal in thickness to the diameter of the bolts used to fasten the speed reducer to the base plate. Also, for sufficient rigidity, the design in general including angle or channel members should be substantial enough to prevent flexing under vibration. After the first week or two of operation all of the bolts and nuts used to fasten the reducer and motor, pedestal, etc., to the base plate should be retightened. Vibration tends to loosen the nuts even if tight initially. Dowelling the motor and speed reducer to the base plate will help insure that alignment is maintained.

2. Mounting Positions

A. Single reduction units are designed to accommodate most standard mounting positions. All standard single reduction models are equipped with an internal splash shield located near the worm. This shield deflects the oil from the vent, preventing leakage when the vent plug is adjacent to the worm (as on the DT or DV standard mounting). When this location is used as a drain (as on the DV sidewall, worm under), drainage will be better facilitated if

done at or near the operating temperature. Filling from this location is not recommended, as the shield will impede the oil flow rate. Bearings are splash lubricated provided the input speed is 1160 RPM or greater. Contact the factory when input speeds fall below this.

B. Double reduction models are built to accommodate one mounting position as specified during order entry. Standard mounting positions, furnished unless otherwise specified. Note that the mounting position relates to the main housing orientation. Standard units have an oil level common to both housings and do not use an intermediate oil seal. The vent plug is located in the main housing where the slower worm speed eliminates the need for a vent shield. Grease fittings are used to lubricate bearings when oil splash does not serve this purpose (as with the DV or DL upper slow speed bearing).

3. VENTING

During operation, the heat generated by the gearbox will cause the air and lubricant inside the unit to expand. A vent plug is used to equalize the resulting pressure, the location of which is dependent on the model and mounting position. Before putting the unit into service, review and relocate the vent plug (if necessary) as shown for appropriate model and mounting position. Double reduction models are vented in the main housing only. To prevent loss of oil during shipment, the vent plug includes a brass pin which must be removed prior to operation. If a speed reducer is installed in an atmosphere containing exceptional amounts of moisture or dust, a shielded or hooded vent plug should be used. For intermittent duty applications, where the operating temperature does not rise more than about 20 degrees F, internal pressure build-up is minimal and venting is not necessary. Some models are available with an optional internal expansion chamber allowing units to be totally sealed. Contact the factory for more details.

4. C-Flange Motor Mounting Procedures

A. Mounting Motor to C-Flange Reducer With Hollow Input Shaft

Check motor and reducer mounting registers for nicks that would interfere with assembly. Remove if necessary.

Remove protective plastic plug from reducer input shaft. The bore has been coated with an anti-seize compound

Align the motor shaft and key with keyway in bore and slide motor up to flange.

Position the motor conduit box as desired.

Using the fasteners supplied, secure the motor to the reducer. Draw down evenly so as not to bend the motor shaft. Tighten fasteners to 200 inch pounds.

B. Mounting Motor to C-Flange Reducer With Coupling Adaptor

Check motor and reducer mounting registers for nicks that would interfere with assembly. Remove if necessary.

When assembling the motor and coupling, the coupling halves should be equally spaced on each shaft to insure adequate engagement. The following describes a method for doing this.

First determine the assembled shaft clearance by measuring the distance from the C-Flange face to the reducer shaft end and subtracting the motor shaft length. Mount and secure the motor shaft coupling half with the spider end extending one half the clearance distance beyond the motor shaft. Mount the reducer coupling half and coupling spider on reducer shaft in its approximate position but do not secure.

Locate the motor conduit box in the desired position and secure the motor to the reducer flange using the fasteners provided. Tighten to about 200 inch pounds.

Using the access hole in the flange, slide the coupling together and tighten the set screw.

5. Unit Assembly/Disassembly Instructions

Contact the factory for an instruction manual.

III. LUBRICATION & MAINTENANCE

Factory Filling

Winsmith speed reducers are filled to the proper level for the standard mounting position with the appropriate grade of oil for operation in a 51° F to 110° F temperature environment. The oil level should be checked and adjusted (if necessary) prior to operation, using the oil level plug provided and while the unit is oriented in its operating position.

Ambient Temperature

If the operating ambient temperature is outside the range specified above, then refer to lubrication chart and refill the unit with the correct grade based on actual

ambient temperatures. See below for additional information regarding oil changes.

Oil Changing

When changing oil for any reason, it should be remembered that oils of various types may not be compatible. Therefore, when changing to a different oil, it is recommended that the housing be completely drained and thoroughly flushed with a light flushing oil prior to refilling with the appropriate lubricant. The oil level should be rechecked after a short period of operation and adjusted, if necessary. When changing double reduction models, each housing should be drained and filled independently, even though there may be a common level.

INITIAL OIL CHANGE
The oil in a new speed reducer should be changed at the end of 250 hours of operation. (30 days for 8 hour per day service, 15 days for 16 hour service, 10 days for 24 hour service).

SUBSEQUENT OIL CHANGES
Under normal conditions, after the initial oil change, the oil should be changed after every 2,500 hours of operation, or every six months, whichever occurs first. Under severe conditions (rapid temperature changes, moist, dirty, or corrosive environment) it may be necessary to change oil at intervals of one to three months. Periodic examination of oil samples taken from the unit will help establish the appropriate interval.

SYNTHETIC OILS
Synthetic lubricants can be advantageous over mineral oils in that they generally are more stable, have a longer life, and operate over a wider temperature range. These oils are appropriate for any application but are especially useful when units are subjected to low start-up temperatures or high operating temperatures. However, continuous operation above 225° F may cause damage to the seals or other components. It is recommended that the initial oil be changed or filtered after the first 1500 hours of operation to remove metal particles that accumulate during break-in. Subsequent oil changes should be made after 5000 hours operation if units are operating in a clean environment.

Long Term Storage or Infrequent Operation

If a speed reducer is to stand idle for an extended period of time, either prior to installation or during use, it is recommended that the unit be filled completely with oil to protect interior parts from rust and corrosion due to internal condensation. Be sure to drain the oil to the proper level before placing the speed reducer in service. A long term storage option is available on new units. Contact the factory for details.

Low Input Speeds (Under 1160 RPM)

When input speeds are less than 1160 RPM, grease fittings will be required to lubricate any bearings not partially covered by the normal oil level. Such units are considered non-standard and necessitate factory modification. These fittings should periodically be pressure lubricated with a short fiber grease with a work penetration of 310 to 340 at 77° and an ASTM drop point of 250° F minimum. If this condition exists and units are without the appropriate grease fittings, please contact the factory.

Oil Temperature

Speed reducers in normal operation can generate temperature up to 200° F depending on the type of reducer and the severity of the application (loading, duration of service, ambient temperatures). Excessive oil temperatures may be the result of one or more of the following factors:

A. Overloads
   Overloads may be due to the original unit selection being too small for the application, or increased loads on the speed reducer to a point where its rating is exceeded after it has been in service for a period of time. Always check the speed reducer rating when increasing driven loads or increasing the horsepower rating of the motor or other prime mover.

B. Overfilling Or Underfilling
   If a speed reducer is overfilled with oil, the energy used in churning the excessive oil can result in overheating. If this occurs, shut down the drive, remove the oil level plug and allow oil to drain until oil ceases to drain from the level hole, reinstall the oil level plug, and restart the drive. If the speed reducer is underfilled, the resultant friction can cause overheating and possible damage. If this occurs, fill the speed reducer to the oil level plug hole and check the gearing for excessive wear.

C. Inadequate Cooling
   In order to dissipate internally generated heat, the speed reducer must be installed in such a way that air can circulate freely. Tightly confined areas (inside cabinets, etc.) should be avoided. If this is not possible, forced air cooling by means of a separate blower should be used.

Oil Seals

Although Winsmith uses high quality oil seals and precision ground shafts to provide a superior seal contact surface, it is possible that circumstances beyond Winsmith's control can cause oil seal leakage (defective seal, damage during shipment or installation, etc.) When replacing a shaft oil seal, using the following suggestions will help to insure leak-free operation and long seal life.

A. When installing a new seal, cover the keyway and any other surface discontinuity with smooth tape to protect the seal lip from being damaged.

B A sealant should be used between the O.D. of the seal and the I.D. of the bore into which the seal is installed. The seal bore should also be free of any burrs, nicks, or scratches.

C. Be sure that the seal is not cocked in the seal bore. The out face of the seal should be flush with the surface into which it is mounted.

LUBRICANTS

Worm Gear Reduces

For special applications that involve severe ambient temperature extremes or a seasonal amount of oil requirement, use Mobil SHC 629.

Ambient Temperature	-30 to 15° F	16 to 50° F	51 to 110° F	111 to165° F
Max. Operating Temp.	150° F	185° F	200° F	200° F
Viscosity @ 100° F. SUS		1919 to 2346	2837 to 3467	4171 to 5098
Compounded with:	3% to 10% fatty or synthetic fatty oils or mild EP additives			
AGMA Lubricant No.		#7 Compound	#8 Compound	#8A Compound
Cities Service Co.	Citgo EP Comp. 68	Citgo Cyl. Oil 400-S	Citgo Cyl. Oil 680-7	Citgo Cyl. Oil 680-7
Fiske Bros. Refining	APG-80	Lubriplate CP Gear Oil #7	Lubriplate CP Gear Oil #8	Lubriplate CP Gear Oil #8A
Gulf Oil Corp.	SL460 E.P.	Transgear EP 460	Transgear EP 680	Transgear EP 800
Keystone Div.	KSL365	KSL366	K-600	K-620
Mobil Oil Corp.	SHC 634	Mobil 600W	Mobil 600 Super	Mobil Extra Hecia Super
Shell Oil Corp.	Omala 68	Omala 460	Omala 680	Omala 800
Sun Oil Corp.	Sunep 1050	Sunep 1110	Sunep 1150	Sunoco Gear Oil 8 AC
Texaco Inc.	Meropa 68	Vanguard Cyl. Oil 460	Honor Cyl. Oil 680	650T Cyl. Oil 1000
American Lub., Inc.		Ind. Gear Oil 140	AGMA #8 Gear Oil	AGMA #8 Gear Oil
Chevron	NL Gear Comp. 100	NL Gear Comp. 460	NL Gear Comp. 680	NL Gear Comp. 1500

2035 Drive Clutch
Part # See Drive Unit Chart

Description

The 2035 Drive Clutch is a nit that limits the torque transmitted by the drive system to the drive chain by slipping when the set maximum load is reached. The unit is able to re-engage when the overload is eliminated. Adjusting a single nut sets the torque. The clutch is set at the factory (See Drive Unit Chart for torque setting). This is **not** the torque setting for the clutch hex nut. It is the input torque at which the clutch starts to slip.

Installation and Adjustment

1. Remove the drive sprocket cover located on the side of the drive unit.

2. The friction clutch is located on the output shaft side of the gear reducer.

3. Remove the #50 roller chain from the clutch and drive sprocket.

4. Remove the clutch unit from the gear reducer shaft by loosening the set screw (9) and sliding the unit off of the output shaft.

5. Before setting the clutch remove all oil, dirt, grease, and rust from the pressure plate, friction discs, and center sprocket. The center gear should be ground to a 32 micro inch finish. This insures that the clutch slips and engages at the proper torque setting.

6. Clamp the sprocket in a bench vice.

7. Tighten the adjusting nut (7) until it is flush with the bellville spring (6).

8. There are two methods for applying torque to the unit: Use a square socket on the thread end of the hub (1) or use a stub shaft in the ID bore of the hub (1).

9. Tighten the adjusting nut (7) until the sprocket slips (See Drive Unit Chart for torque setting). Test the setting by using the method described in step 8. Do not tighten the adjusting nut to completely flatten the bellville spring (6).

10. Tighten the adjusting nut set screws (8).

11. Reinstall the clutch unit on the drive and tighten the set screw (9).

Alternative Method

There is an alternative method to the one described above. This method should achieve sufficient results until the clutch can be adjusted in the proper method previously described.

1. Remove the drive sprocket cover located on the side of the drive unit.

2. Loosen the adjusting nut set screws (8).

3. Tighten the adjusting nut (7) to 45 ft-lb. It is necessary to stop the chain from moving using this method.

4. Tighten the adjusting nut set screws (8).

5. Install the drive sprocket cover.

WARNING
DO NOT REMOVE GUARDS, OR REPAIR MACHINERY WHILE IN MOTION.

Conveyor Troubleshooting
Problems, causes, explanations & corrections

To use this Troubleshooting Guide:

First, find the problem you are having under the number, No. 1 Slipping Clutches etc.

Then find the cause A, B, C, etc.

Then look under the explanation for your problem.

Example:

The clutch is slipping (No. 1) and the conveyor chain is backing into the drive (D).

In this case, you would look under Explanation and Correction (1-D).

NO. 1 – SLIPPING OF CLUTCHES

Causes:
A – Conveyor overload.
B – Conveyor chain elongated ¼" or more per foot.
C – Conveyor chain not lubricated.
D – Slack conveyor chain backing into drive unit.

E – Misaligned track joints.
F – Pinched track.
G – Take-up sleeves out of alignment.
H – Take-up sleeves installed backward.
I – Drive unit caterpillar chain damaged.
J – Drive head and idler shaft out of alignment.
K – Drive chain tracks damaged or worn.
L – Drive plate deeply grooved at each side of center slot.
M – Drive unit clutch discs worn out.
N – Drive chain guide damaged.
O – Worn conveyor track curves.
P – Pendant, hook or load hang ups.
Q – Chain corrosion from process equipment.
R – Sub freezing temperatures.

Explanation – 1 – A

The friction and mechanical overload clutches are designed to accommodate the starting load, so slipping of clutches occurs at about 900 lb. of chain pull.

Therefore, if a conveyor is actually overloaded, the clutch slips to protect the chain and drive mechanism from damage.

Correction – 1 –A

The product and product hook should be weighted accurately and a chain pull calculation made. Should the calculated chain pull be in excess of the rated capacity, an additional drive or drives must be added.

Explanation – 1 – B

If the conveyor chain should be elongated ¼" or more per foot it will not feed through the drive unit without a jam resulting. The drive caterpillar dogs cannot cam down and hook into the lateral link of the conveyor chain. Instead, the point of the dog rides on or near the top of the lateral link, thus forcing the link downward and eventually bending the center guide. In addition, the downward pressure will, in time, roll out the lips of the drive chain tracks.

To determine the actual amount of chain elongation, measure twenty 6" chain pitches. For instance, if the pendants are on 12" centers, measure from the center of one pendant to the center of the tenth pendant. This would normally be 10'0". If it should be 10'2-1/2", or chain is elongated ¼" per foot. Chain must be tight or have some tension on it when the measurement is taken. Incidentally, ¼" per foot is the maximum stretch the caterpillar chain will tolerate.

If time permits, one side of the drive chain track should be removed. This will show the action of the caterpillar chain dog coming down on top of the lateral link. In addition, if this condition exists, it may also be shown by observing the conveyor chain at the inspection section. Near the tangent point of 180 degree end on top of the lateral links, there will be gouges or indentations where the caterpillar dogs have made contact. Incidentally, showing a maintenance man the items indicated above may eliminate future service trips.

Corrections – 1 – B

Replace the chain. Also, replace the drive caterpillar chain, drive chain guide and drive chain tracks, if they are damaged. Above all, urge the customer to properly lubricate the new chain for maximum life.

Explanation – 1 – C

Conveyor chains, which are permitted to run without lubrication, will often require 50% more effort for movement and clutches may slip. This is one of the reasons that the chain is dipped in rust preventative oil prior to shipment from the factory. The factory rust preventative does <u>not</u> provide adequate lubrication for normal use, and the chain must be properly oiled before operation. Unless lubrication is applied on a regular basis, rapid wear will occur and the chain life may be reduced drastically, because of bearing wear and elongation.

Correction – 1 – C

Various oilers were developed for the proper application of lubricants. It does have a fine adjustment for oil volume on each output tube. When properly regulated, it will apply the right amount of lubricant with minimal drippage. However, the oiler must be set for the individual conveyor since length, speed, washers and ovens determine the amount of oil required. In critical systems where oil drippage is a problem, the oiler should be placed in a return line where the product is not being carried. In addition, an automatic electric timer may be necessary so the chain can be lubricated at predetermined and fixed intervals.

Explanation – 1 – D

In a single drive system, the slack or loose chain will collect immediately in front or downstream of the drive unit, unless there is a decline just beyond. In this case, the slack will accumulate at the bottom of the aforementioned decline. In a level system without an automatic take-up or where a downward track slope is too far downstream from the drive, or where there is an incline in front of the drive, the loose chain will gather immediately in front of the drive and eventually it will crowd back into the drive chain and jam it. Usually, this will bend or damage the drive chain guide and possibly the drive chain itself.

Correction – 1 – D

In a multi-drive system, the two or more drives may not be properly spaced. The drive with the lightest load will tend to run a little faster so all of the system's slack will congregate in front of it. In this case, an automatic take-up downstream of the drive is indicated.

If it is a flat or level system, install an automatic take-up. In either arrangement, the drive unit should be located just upstream of the take-up so the chain will feed directly into it. Should the drive be upstream of an inclined track slope, the drive should be relocated to a point at the top of a downward slope. In addition, the drive chain guide and chain should be replaced if damaged.

Explanation – 1 – E

On occasion the track ends are not matched and are welded in place with a pronounced step at the joint. Also, even though the track walls and bottom surface are aligned the edges of the track lips may not be matched, due to manufacturing tolerances. Either of these problems can hang up the chain and slip a clutch.

Correction – 1 – E

In a new system, a ten-foot length of chain should be pulled around the entire track, both clockwise and counterclockwise. The wire used to tow the chain will help the operator to detect any bad joints. This should always be done prior to installing the entire conveyor chain. Since it is difficult to grind or file the mismatched joints to an acceptable condition, it is advisable to saw through the joint weld, realign and reweld. Also where the track lip edges do not match, the protruding corners may be hand filed or ground to permit smooth passage of the pendants.

Explanation – 1 – F

The conveyor tracks, straight and curved, has a 5/8" slot at the bottom when manufactured. However, being thrown on and off trucks and rough handling at the job site plus welding, often causes the slot to be decreased. When this happens, the track width is reduced in some cases to a point where the chain will not pass freely. The restriction can jam the chain.

Correction – 1 – F

Passing a ten-foot section of chain through the track will locate any pinched sections of track. In addition, a visual inspection will detect the narrow points. If the slot, at any point, is less that 9/16" wide, it is too narrow. To correct, the slot can be widened with a pry bar and hit with spherical end of a heavy ball peen hammer on the top of the track, in the center, opposite the pry bar. This will spread the track side walls to desire slot width.

Explanation – 1 – G

Often times shop mechanics will adjust the take-ups but will not extend both sleeves the same distance. This tends to throw the loose track ends out of alignment with the take-up sleeve. The resulting misalignment, particularly when the take-up is fully extended, can cause an obstruction, which will stall the chain.

Correction – 1 – G

Adjust the take-up so the movable track extends the same distance from both outer sleeve ends.

In the case of spring-loaded and air cylinder take-ups, it is imperative that the take-up assemblies be parallel with each other and level. Otherwise, the tracks will not move freely in the sleeves.

Explanation – 1 – H

An instruction sheet accompanies all take-up units. The direction of chain travel is shown. If the instructions are not followed and the sleeves are reversed, the vertical chain wheels must climb upon the end of the movable inner track. The causes a rough passage of the conveyor chain and can result in pulsation, and possible chain stoppage.

Correction – 1 – H

Remove take-up units and reverse as indicated in the instructions.

Explanation – 1 – I

The drive chain, after long wear, overloads etc., will become a source of trouble resulting in jamming of the drive. A rivet may pull out, links may break, etc. Removal of one side of the drive chain track and top cover will usually reveal the trouble.

Correction – 1 – I

Replace with a new chain. While certain chains can be field repaired, it is usually advisable to install a new one, plus a new drive chain guide, if the latter appears to be worn or bent.

A damaged drive chain can shut down a conveyor. Therefore all Zig-Zag users should be urged to keep a spare drive chain and a drive chain guide on hand.

Explanation – 1 – J

The drive and idler shafts of the drive unit get out of alignment because of drive take-up adjustment. If one take-up bearing is advanced more than its mate is, the two shafts are no longer parallel. This tends to cause the drive dogs to twist sideways and they often move down onto the side plate of the conveyor chain, thus jamming the drive. In addition, the side links will wear away the sides of the idler shaft sprockets.

Correction – 1 – J

Readjust the two drive take-ups so the head and idler shafts are parallel. The take-ups should be extended to a point where no slack remains in the drive chain.

Explanation – 1 – K

The drive chain track lips are sometimes rolled or peened downward to a point where the drive dogs do not hook into the lateral conveyor chain link. The drive will finally jam, due to the drive dogs bearing on top of the lateral chain link.

Correction – 1 – K

Replace the drive chain tracks.

Check the drive chain guide and drive chain. Replace either or both, if damaged.

Check conveyor chain. If elongated more than ¼" per foot, replace.

- ✓ The drive chain tracks may become damaged because of elongated conveyor chain. This allows the dogs to bear on or near the top of the conveyor chain lateral links, which places an abnormal downward.

Explanation – 1 – L

The chain in the drive chain assembly has hardened rollers, which bear on the drive plate, topside. The downward force of the dogs on the chain rollers becomes greater as the conveyor chain elongates and the dogs bear higher on the end of the conveyor lateral forged link. This wears away the plate and the roller chain side links drag to increase the pull and finally shear the pin or slip the
clutch.

Correction – 1 – L

Replace the drive plate. A better idea is to remove the drive and replace with a skeleton drive and reuse the existing drive motor, drive chain, sprockets, clutch and cover. In addition, the conveyor chain should be replaced if elongation exceeds ¼ per foot

Explanation – 1 – M

Frequent jams in a Zig-Zag system will cause the overload friction clutch to slip. Eventually, the friction discs will wear out the drive stops.

Correction – 1 – M

Replace the two friction discs and readjust the clutch as per instructions issued with the drive. Also, locate and correct that which is causing the hang-ups.

Explanation – 1 – N

As indicated previously, the drive chain guide becomes bent as a result of a damaged drive chain or a badly elongated conveyor chain, or both.

Correction – 1 – N

Replace the drive chain guide. In addition, check for the cause of the bending which may be a damaged drive chain or a conveyor chain elongated beyond the ¼" per foot.

Explanation – 1 – O

In 400# systems the horizontal and vertical track curves are not heat-treated. When the chain pull in such a system exceeds about 500# at any given curve, the radial loading on the chain wheels is great enough to cause a deformation of the track wear surface. This is called peening. The top vertical curve is the most vulnerable because the two lips are unsupported at the center at the slot. If the overload continues to exist, the lips of the top vertical curve will finally roll downward until the chain wheels come through and the drive jams. Meanwhile, the "tow in" of the vertical wheels causes the wheel to deteriorate rapidly.

In horizontal and bottom vertical curves the peening or rolling action is manifested by a definite bulge. In some cases, the hardened lateral chain wheels will finally cut through the wall of the horizontal or bottom vertical curves.

Correction – 1 – O

The reason for the high chain pull should be discovered (see item 1-A). This may necessitate an additional drive, better lubrication, or a new chain. Along with these corrections, the damaged curves must be replaced.

Explanation – 1 – P

A clutch may slip because the product hook or product catches and hangs up on a conveyor guard, building steel, washer, etc. In addition, a production worker will often purposely jam the drive by hooking the product carrier on a column or other stationary object.

Correction – 1 – P

Locate the interference point or points. Sometime, a simple sheet metal fender will serve to contain or prevent a product hook from swinging out to catch on a guard, column, etc.

If the drive has a friction clutch, a steady tension is maintained on the conveyor chain and the product hook will not disengage itself.

Explanation – 1 – Q

Chain corrosion resulting from acidic washers and hot caustic paint strippers causes great harm to the #2035 conveyor chain, unless proper precautions are taken. The most common problem, and the worst, are the washers, which use phosphoric acid solutions to etch the product for better paint adhesion. If the spray of the solution is allowed to reach the chain, the wheel races and ball bearings are etched or pitted. Continued exposure to the liquid will finally erode wear surfaces of the bearings until the balls drop out. In addition, the connecting pin, hourglass roller and lateral forged link wear rapidly.

In certain other processing equipment through which the conveyor passes, steam, water sprays, etc. also take their toll. Rusting results and chain replacement follows in short order.

Correction – 1 – Q

The customer must be made aware of the problem and advised to install sanitary hooks with triple baffles through the critical areas of the equipment. It is also important to advise the customer that no overhead chain conveyor will withstand or endure the attack of acid.

Explanation – 1 – R

When a conveyor is subjected to sub-freezing temperatures, various parts tend to become coated with frost and if allowed to stop, the chain will finally freeze. Wheel bearings coated with ice will not rotate and the drive unit will not develop enough force to start the conveyor. While this problem is more common in applications involving freezers, it also occurs when a conveyor is used both inside and outside of a building in sub-freezing weather. When going from a heated to a cold area, moisture condenses on the chain and freezes. However, a system that is completely outside rarely creates a problem since moisture will not condense and freeze on the chain. The only problem in this situation is the gearbox of the drive unit. The grease in the speed reducer congeals and becomes solid. When this occurs, the motor does not have sufficient power to drive the gear train.

Correction – 1 – R

If the system is experiencing problems from subfreezing temperatures, consult the factory for possible corrective action.

No. 2 – Chain Pulsation

Causes:
A – Slack chain.
B – Misaligned track joints.
C – Excessive chain pull.
D – Pinched track.
E – Excessive chain length.
F – Defective drive.

Explanation – 2 – A

If too much slack chain is allowed to develop in a conveyor, and especially in a long system, the chain will accelerate and coast enough to telescope. This stops it shortly, after which it surges ahead. The action described is due, in large part, to the normal elasticity of the chain. The longer the chain, the more pronounced the surge. Also, the greater the chain pull, the greater the surge.

Correction – 2 – A

Adjust the take-up to remove slack. In a long or level conveyor, it is preferable to use a spring loaded, or an air operated take-up located just downstream from the drive unit. The automatic take-ups may be adjusted to keep a slight tension on the chain, which absorbs some of the elasticity, thus reducing the surge.

Explanation – 2 – B

Misaligned track joints interrupt the free movement of the chain wheels. While the chain may not jam, a stop at the juncture of the tracks causes the wheels to stop shortly until chain tension increases enough to pull through. Again, elasticity allows the chain to stretch until the wheels break loose. If this is the problem, the chain will surge in 6" increments, which is the vertical chain wheel centers. Usually, the offending joint can be located by inspecting the chain movement, starting at the drive and moving downstream to where the surge stops or lessens.

Correction – 2 – B

If one track is actually offset from the other, correction is made easiest by sawing through the joint and re-welding after alignment with a welding jig. Care should be taken to remove any weld deposits from inside the track prior to re-welding.

Explanation – 2 – C

Systems having excessive chain tensions will often pulsate. The condition is usually more evident just downstream from the drive. In addition, it will be noted that the erratic action diminishes gradually all the way back to the drive where the movement is smooth. Again, the longer the chain, the worse the pulsation.

Correction – 2 – C

To locate the cause of the excessive chain pull, the conveyor chain should be inspected to insure that it is adequately lubricated and that the lateral chain wheels are not sufficiently worn. Worn lateral wheels can cause the vertical chain wheels to slide around the horizontal track curves. If the latter is the case, the chain must be replaced. Should the problem be the lubrication, the chain must be lubricated thoroughly. Should the pulsation persist, determine the product loads (by weighing), load centers and then calculate the draw bar pull. This will probably indicate the need for an additional drive. In addition, in the process of determining the pull, the second drive unit can be located.

Explanation – 2 – D

At start up of a new or revised conveyor, very often a damaged piece of straight or curved track finds its way into the system. This is usually discovered when the conveyor chain is installed. At other times, the track is either shifted after erection and possible re-welded. In any event, the track side walls may close in at one point to create an obstruction sufficient to product pulsation in the chain.

Correction – 2 – D

The pinched track may be located by following the instructions set forth in #2-B. Once located, the problem is easily corrected by hitting the center of the track on top with the spherical end of a ball peen hammer. If the sides of the track are bent inward, the piece in question must be replaced.

Explanation – 2 – E

Any given conveyor with an unusual number of vertical and horizontal curves plus great length will have a tendency to pulsate, regardless of the draw bar pull. As indicated earlier, the chain is somewhat elastic and this elasticity is accentuated by length. Therefore, lubrication must be adequate, chain slack must be held to a minimum and the track joints must be smooth.

Correction – 2 – E

Corrective action may be taken as outlined in #2-A. If this fails to achieve a proper operation, an additional drive must be installed.

Explanation – 2 – F

If a conveyor should be pulsating just back or upstream of the drive unit, it would indicate a problem in the drive.

Correction – 2 – F

By removing the drive chain cover and one side of the drive chain track, it may be found that the drive dogs are not camming down into the lateral chain links. This can occur if the chain is elongated beyond ¼" per foot; the drive chain is damaged or out of alignment; the drive chain guide is bent or; the motor drive chain is too loose and bouncing up and down. An inspection of all drive components is necessary and corrections made as indicated.

No.3 – PREMATURE CONVEYOR CHAIN WEAR

CAUSES:
A – Lack of lubrication.
B – Exposure to abrasives.
C – High temperatures.
D – Corrosion.
E – Drives out of location.
F – Drives out of coordination.

Explanation – 3 – A

A customer may fail to lubricate the conveyor chain because of inadequate maintenance, lack of an oiler or fear of oil drippage. In any case, when the chain is not lubricated, the useful life will be drastically decreased. Without an oil film, the connecting pin joints and bearings will wear rapidly. In addition, the chain tension will mount to accelerate wear.

Correction – 3 – A

Ask the customer's lubrication supplier to recommend a proper lubricant, taking into consideration the operating conditions with special attention to temperatures. If the fear of contamination is great, recommend an oiler, which can be regulated to apply the proper amount of material. In addition, the oiler should be placed in a section of conveyor where the product is not being transported.

Explanation – 3 – B

Often the conveyor will be placed in or near a shot and/or sandblasting machine, or in an area where the air is heavily laden with abrasive particles. The abrasives do find their way into the chain wheel bearings. The oil on the chain actually attracts and holds the gritty substance. In some cases, the bearings clog and the wheels will not rotate. If they do continue to turn, the abrasive dust grinds away the bearing cones, races and balls. The chain will only function for a short period if this condition occurs and replacement will be necessary.

Correction – 3 – B

In the case of a shot or sandblast machine, the conveyor should be located on the machine cabinet top**.** Product hooks can then be suspended through a very narrow slot in the cabinet top with rubber seals at both sides.

Explanation – 3 – C

Certain types of equipment including burn off and glass tempering ovens can operate at temperatures reaching 1000F, and higher. When Zig-Zag, or any other overhead conveyor, is exposed to any temperatures above 450F, the hardened heat treated parts such as pins, wheel cones, races and balls, are softened by annealing. The drop in hardness is almost directly related to the temperature involved. Since the parts mentioned are heat-treated (60 Rockwell, C scale) to accommodate certain loading conditions, any reduction in hardness accelerates wear.

Correction – 3 – C

Remove the conveyor from the heat zone by slotting the top of the oven and installing continuous cover plates on the conveyor. Also, replace the conveyor chain.

- ✓ Please consult the factory for quotation and design for this application.

Explanation – 3 – D

Chain life is drastically shortened when it is exposed to corrosive substances, particularly acids. The problem usually occurs when the conveyor is used to transport parts through certain washers, paint strippers, etc.

Correction – 3 – D

See #1-S.

Explanation – 3 – E

In multi-drive systems, the placement and number of drives is critical. An error in this procedure can cause replacement of conveyor chain at short intervals. It is easy to induce extra tension in the chain by placing a drive upstream from a loaded decline. The force generated by the decline offers help to the drive motor and since all motors in a given system have equal torque, the chain tension is increased.

Correction – 3 – E

Relocate drive to eliminate the problem.

- ✓ Space does not allow for a complete instruction in drive placement. In addition, each system presents its own requirements. Therefore, troublesome jobs should be submitted to the factory for analysis.

Explanation – 3 – F

In certain multi-drive systems, the drive motors fail to coordinate or work together. This results in abnormal tensions, which accelerates wear of the chain.

Correction – 3 – F

This requires that a complete check of the drives be made as follows:

Check all motor nameplates. They must be identical except for the serial numbers.

Check all motor drive sprockets. All must have the same number of teeth.

Check the caterpillar drive sprockets. These all must have the same number of teeth.

Check amperage at each motor. If any motor or motors should indicate readings much higher than the others, this motor should be sent to motor repair for checking and correction.

Preventative Maintenance Table

PREVENTATIVE MAINTENANCE TIME TABLE			
TIME	**DESCRIPTION**	**QTY.**	**TYPE**
Weekly	Conveyor Chain & Carrier Oiler Reservoir	Fill to Level Mark	Supplied by Oiler Vendor
	Chain Slack Take-Up's (First 6 Mos. of Operation)	Adjust as Needed	
Monthly	Conveyor Drive Shaft Bearings	4 Grease Fittings	NGLA #2 Lithium
	Conveyor Drive Roller Chain	Brush or Spray	Chain Lube
	Conveyor Drive Caterpillar Chain	Brush or Spray	Chain Lube
	Conveyor Drive Motor Gear Reducer Unit	Chk & Fill to Mark	SAE 120 Oil
	Chain Slack Take-Up's (After 6 Mos. of Operation)	Adjust as Needed	
Annually	Conveyor Drive Motor Gear Reducer Unit	Drain & Refill	SAE 120 Oil