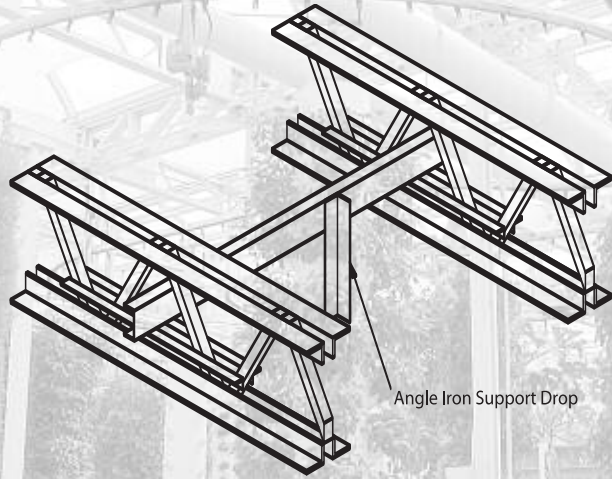
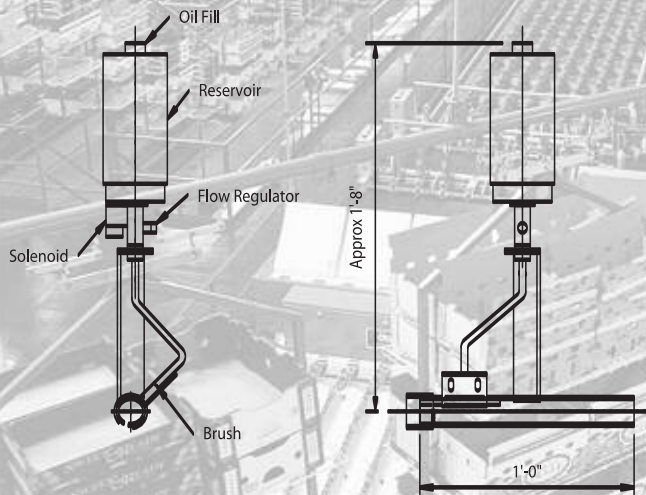


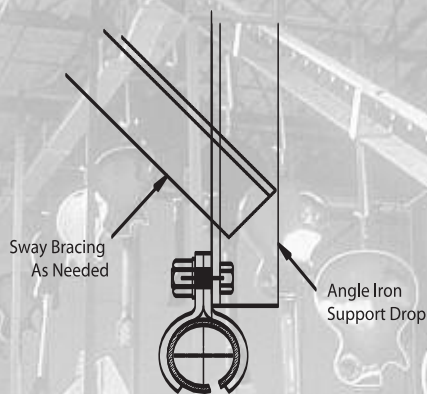
Chainveyor® Installation and Maintenance Manual



Bar Joist Suspension



Lubricator



Single-Track Hanger Clamp

INCREASED EFFICIENCY. HIGHER THROUGHPUT.
GREATER PRODUCTIVITY.

OVERHEAD CONVEYOR
SOLUTIONS



LAUYANS & COMPANY, INC.
Innovative Engineering Solutions in Material Handling

IMPORTANT SAFETY INSTRUCTIONS

Continued compliance with safety standards, including industry standards, OSHA, and other Federal, State, and local codes or regulations is the responsibility of the user of the conveyor installation. However, initial compliance in design of the equipment is the responsibility of the designer and installer of the system. Placement of guards and other safety equipment in accordance with such safety standards is dependent upon the area and use to which the system is put. A safety study must be made of the conveyor application, and guards should be installed wherever appropriate. As the manufacturer, we will insist on compliance with such safety standards, and will not knowingly sell our product to anyone who fails to so comply.

Ten Commandments of Conveyor Safety

- 1. Thou shall not operate conveyor with chain or other protective guards removed.*
- 2. Thou shall not walk, ride, or climb on moving conveyor.*
- 3. Thou shall not touch moving conveyor parts.*
- 4. Thou shall not wear loose clothing or uncovered long hair that can get caught in moving parts.*
- 5. Thou shall not start conveyor without visual or audible "all clear".*
- 6. Thou shall not walk under conveyor where product can fall.*
- 7. Thou shall not work near conveyor without knowing how and where to shut it "off".*
- 8. Thou shall not repair or replace electrical or air devices without power and air "off".*
- 9. Thou shall not remove jammed product with conveyor running.*
- 10. Thou shall not provide maintenance to moving conveyor parts.*

"WORK SAFELY TODAY FOR A HAPPY TOMORROW"

Introduction

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INSPECTION

When a shipment of Chainveyor® parts arrives all items should be checked against the packing slip and inspected for any shortage or damage in transit.

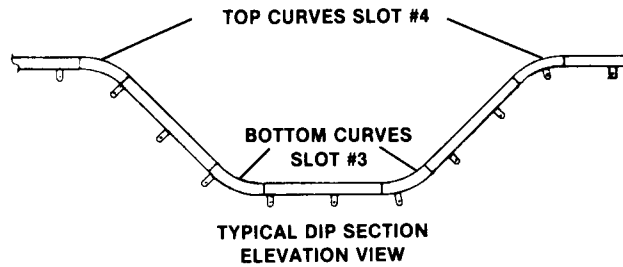
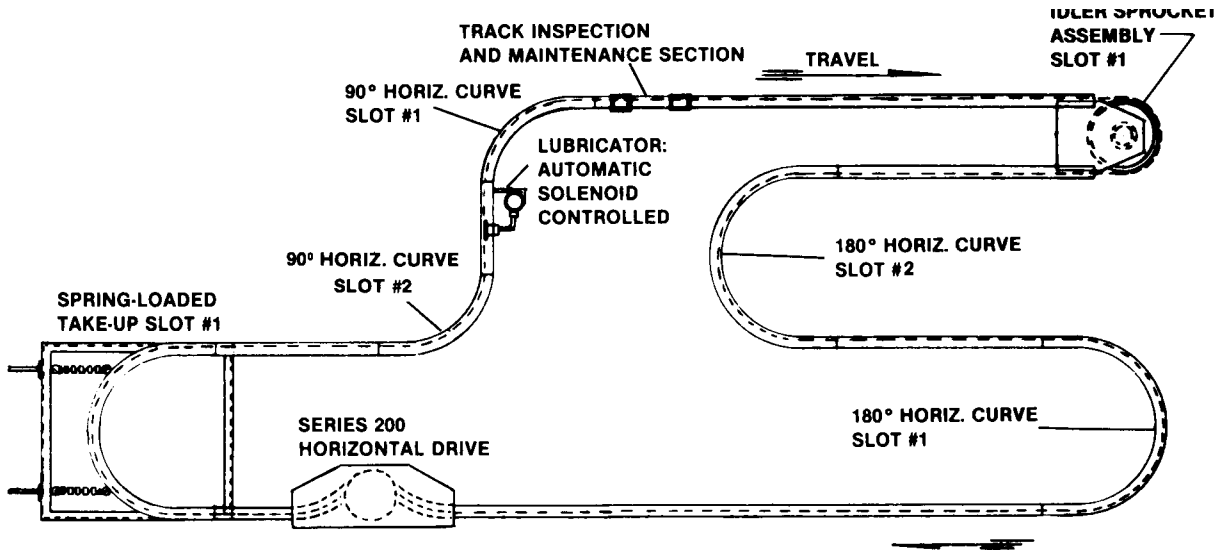
IMPORTANT....

The extreme flexibility and lightweight design of Chainveyor® requires that the chain and other moving parts operate within limited clearances. Installation must, therefore, be exacting to the point of maintaining necessary clearances and alignment in joining track and curves.

Proper installation of a Chainveyor® system is not difficult, but the equipment must be installed strictly in accordance with instructions, so that it will function properly and provide all the advantages built into its original design.

Explanatory Diagram

Illustration of Chainveyor® Components and Track Slot Position Relative to Drive Location



The diagram shown above illustrates the relative position of the track slot. It is important to note that the mounting position of the drive unit determines the position of the track slot on every horizontal curve of the conveyer. If the drive unit was mounted on the opposite side of the track from that shown then all the curves indicated as having slot position number 1 would be slot position number 2 and vice-versa.

Chainveyor® Components

TRACK



CHAIN



INSPECTION SECTION



TAKE-UP SLEEVE



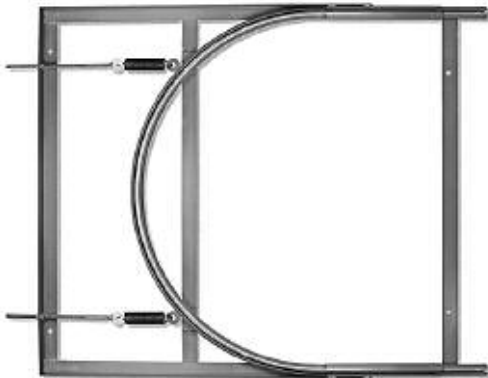
LUBRICATOR



AIR OPERATED ESCAPEMENT



SPRING TAKE-UP



FROG



ACCESSORIES



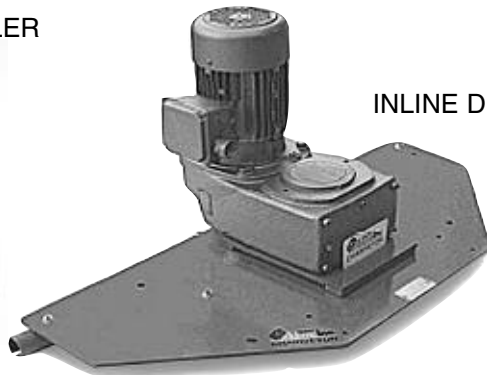
CARRIER



VFD CONTROLLER



INLINE DRIVE

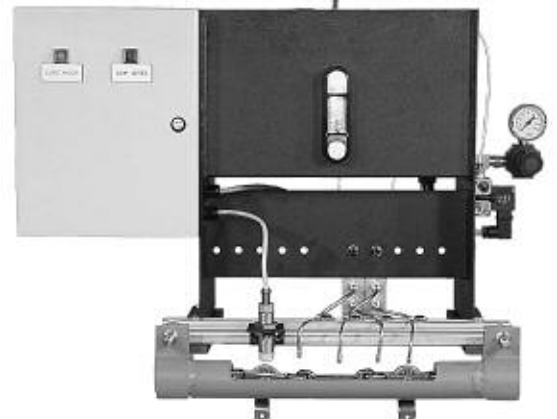


DOUBLE CROSSBAR CARRIER

IDLER SPROCKET TURN



DRIVE DOGS



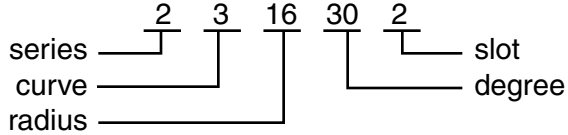
CONVEYOR LUBRICATOR

200 and 300 Power

PART NUMBERS

Standard equipment is referenced by a part number. Interpretation is possible only on standard curves.

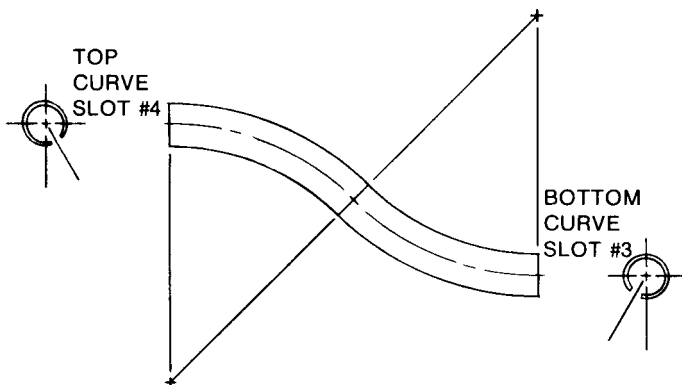
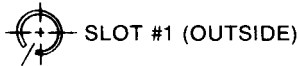
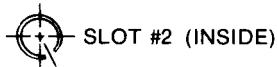
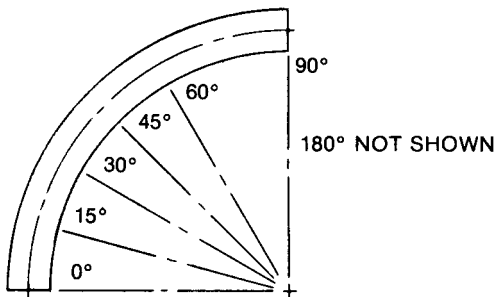
EXAMPLE: 200 Series, 16" Radius, 30° Curve w/#2 slot



BEFORE YOU START

Study this manual carefully

Lauyans & Company, Inc. cannot be responsible for misapplication or faulty installation. Familiarize yourself with the components that make up your system. Particular attention must be given to the curved track sections, since small degree turns can easily be mistaken one for another.



Top and bottom curves will work with either slot #1 or #2 by turning end for end.

	Slot Offset	Std. Radius	Track Size
Series 200	20°	16"	1 5/8" Dia.
Series 300	30°	24"	2 3/8" Dia.

RECOMMENDED HANGING MATERIAL

Series 200 - 1 1/2" x 1 1/2" x 3/16" angle

1/2" pipe

1/2" solid rod

Series 300 - 1 1/2" x 1 1/2" x 3/16" angle

3/4" pipe

3/4" solid rod

Determine maximum weight per foot the conveyor must handle. Hangers should be placed as follows:

Up to 20 lb. per ft.- hangers on 10 ft. centers.

Up to 50 lb. per ft.- hangers on 7 ft. centers.

Over 50 lb. per ft.- hangers on 5 ft. centers.

INSTALLATION

Before actual conveyor installation is started clearly mark the path of the entire conveyor according to the drawing furnished with the system, using chalk or crayon on the plant floor. Double check clearances and equipment locations. Confirm that building dimensions conform to the drawing specifications.

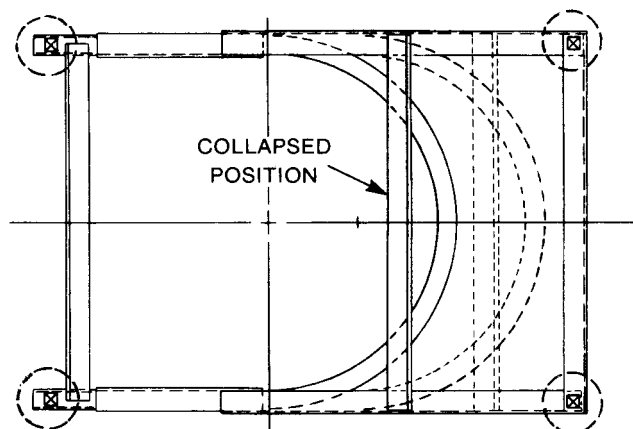
INSTALL TAKE-UP FIRST

Accurately position and install the take-up. This will establish the proper track slot position for the entire system.

Support this unit in four places and provide adequate sway-bracing.

Unit should be suspended from the rear corners or the sides near the back of the angle frame. At the front, suspend by either the frame angle or the track sections at inlet and outlet. Do Not suspend by the moveable frame angle.

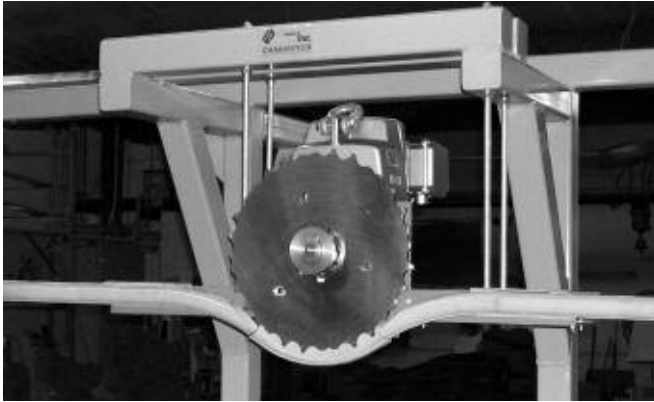
Fully collapse the take-up mechanism (screw, spring or counterweight). Leave take-up in this position until after chain is inserted into system.



SECOND, INSTALL DRIVE

Establish exact location and position of the drive, then install the hanging material required to support the drive. An angle iron "box" type frame is recommended and should not be more than 24" above drive base.

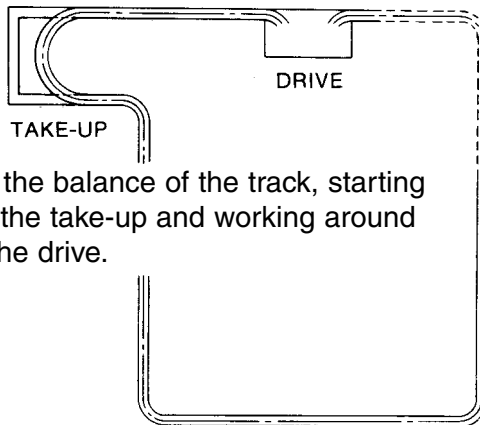
Drive unit is suspended by 1/2" threaded rods through four (4) holes in the base plate. Adjust the bottom nuts to place the track at the required elevation and using a bubble-type level, level the base across both directions. When complete system is installed the four (4) bottom nuts can be welded lightly to the base plate to prevent slippage and misalignment.



NEXT, INSTALL TRACK AND CURVES

Track Installation

First, install track from drive to take-up. The drive should be located as close as possible to the take-up. There should not be any type of curve (horizontal or vertical) between the drive and take-up unit.



Second, install the balance of the track, starting at the outlet of the take-up and working around the system to the drive.

Make sure all horizontal curves are installed level to insure accurate slot location.

A minimum of 12" of straight track must be installed between all vertical and horizontal curves.

When making inclines or declines, i.e., elevation changes, determine length of straight track required

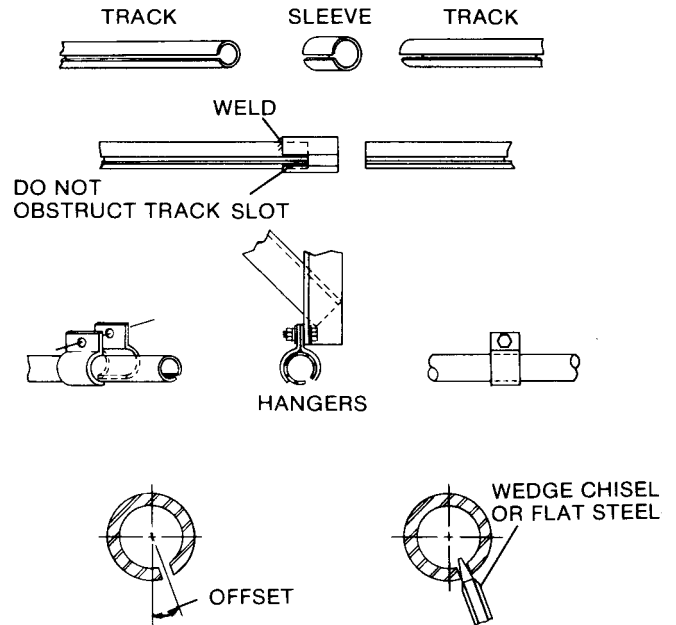
and assemble to top and bottom curve on the floor. Then install complete elevation change section into system.

WELDING PROCEDURE

Use mild steel welding rod 1/8" or 3/32" diameter on all track joints, welding sleeves, etc. Use a repair rod for welding steel to cast iron. Do not "over weld" or burn through. Make a continuous weld up to the edge of the slot. Stop short of the slot to avoid beads within the track.

INSTALLING THE TRACK

All track is shipped in 10 ft. lengths. Track ends must be cut square and deburred. Inside burr must be removed with a round hand file.



**SERIES 200=20°
SERIES 300=30°
POSITIONED SLOT**

**SERIES 200=1/4"
SERIES 300=1/2"
ALIGNING SLOT AT JOINTS**

Drive welding sleeve halfway onto one track with slot unobstructed. Weld sleeve in place. Hang and align the next track section leaving the hanger clamps slightly loose. Drive section end into welding sleeve on previous section. Align the slots perfectly by driving a wedge into the slots. While holding in place, weld the sleeve to the track. Tighten the hanger clamps.

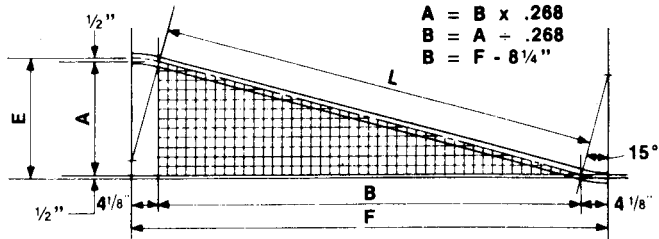
Level and adjust to elevation. Sway brace as necessary. Follow this procedure for the entire system making sure that each section is properly hung and sway braced.

Formulas

HOW TO DETERMINE LENGTH OF STRAIGHT TRACK IN INCLINES AND DECLINES.
 Use the charts and formulas below to calculate the length of straight track required in elevation change sections.

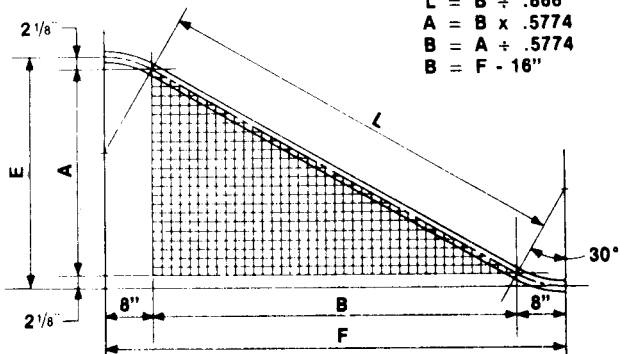
16" RADIUS CURVES

15° ELEVATION CHANGE



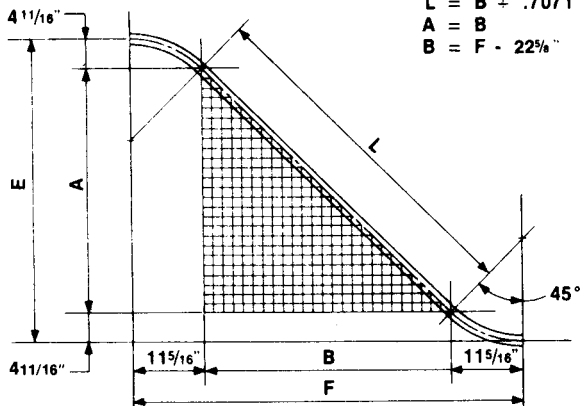
$$\begin{aligned} A &= E - 1'' \\ L &= A \div .259 \\ L &= B \div .966 \\ A &= B \times .268 \\ B &= A \div .268 \\ B &= F - 8\frac{1}{4}'' \end{aligned}$$

30° ELEVATION CHANGE



$$\begin{aligned} A &= E - 4\frac{1}{4}'' \\ L &= A \div .500 \\ L &= B \div .866 \\ A &= B \times .5774 \\ B &= A \div .5774 \\ B &= F - 16'' \end{aligned}$$

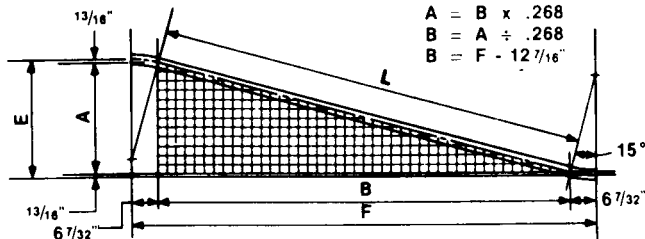
45° ELEVATION CHANGE



$$\begin{aligned} A &= E - 9\frac{3}{8}'' \\ L &= A \div .7071 \\ L &= B \div .7071 \\ A &= B \\ B &= F - 22\frac{5}{8}'' \end{aligned}$$

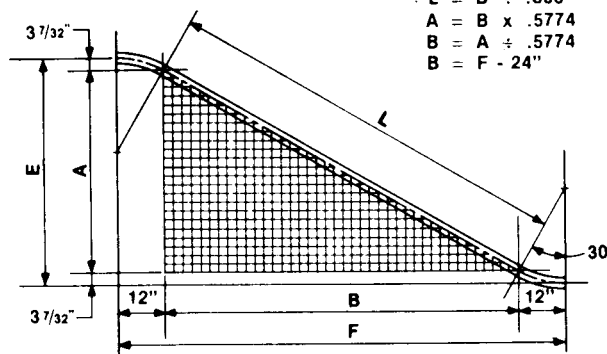
24" RADIUS CURVES

15° ELEVATION CHANGE



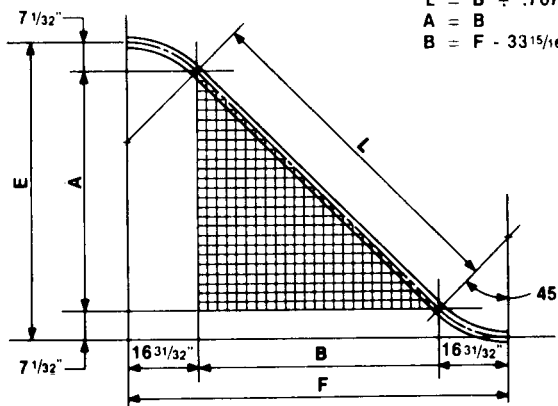
$$\begin{aligned} A &= E - 1\frac{1}{2}'' \\ L &= A \div .259 \\ L &= B \div .966 \\ A &= B \times .268 \\ B &= A \div .268 \\ B &= F - 12\frac{7}{16}'' \end{aligned}$$

30° ELEVATION CHANGE



$$\begin{aligned} A &= E - 6\frac{7}{16}'' \\ L &= A \div .500 \\ L &= B \div .866 \\ A &= B \times .5774 \\ B &= A \div .5774 \\ B &= F - 24'' \end{aligned}$$

45° ELEVATION CHANGE



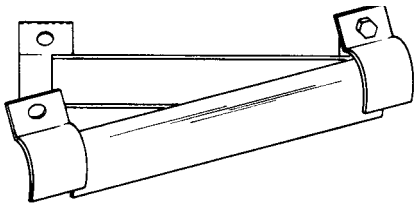
$$\begin{aligned} A &= E - 14\frac{1}{16}'' \\ L &= A \div .7071 \\ L &= B \div .7071 \\ A &= B \\ B &= F - 33\frac{15}{16}'' \end{aligned}$$

INSTALLING INSPECTION SECTIONS AND LUBRICATORS

Each unit consists of a short length of track and although they can be installed in sequence as the system track loop is being installed another method is recommended which allows fast and easy installation. Recommended method of installing is to complete the entire track system installation then determine location for inspection station or lubricator, cut out a short piece of track, i.e. inspection section 200=1', 300=1'6", lubricators 200 and 300=1', and install unit. This method helps keep any track misalignment to a minimum.

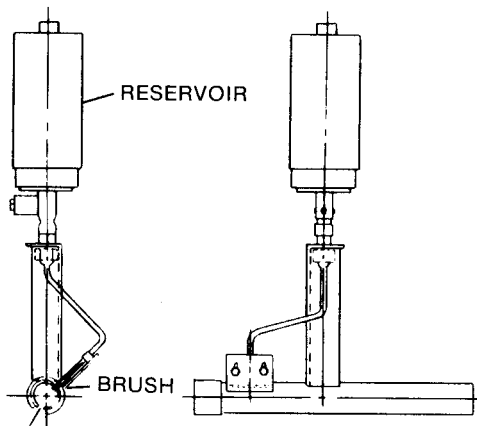
INSPECTION SECTION

Install inspection section where specified. Note that only the bottom half of the unit (the one the chain wheels ride on should be welded). The top half piece must remain removable.

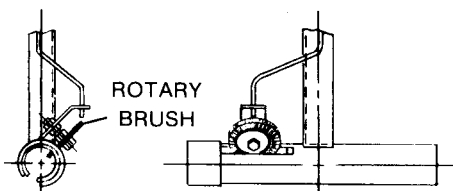


LUBRICATOR SECTION

Install the lubricator section where specified. Note that the brush-side is opposite the slot. Solenoid must be wired to proper electrical control circuits to give desired operation. (See lubrication section).



SERIES 200 (STRAIGHT BRUSH)

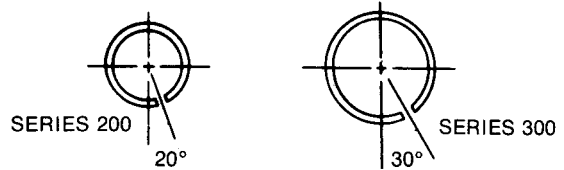


SERIES 300 (ROTARY BRUSH)

CHECK SLOT ANGLE

After all of the track and the inspection and lubrication sections have been installed, start at the drive or take-up and check the slot angle position throughout the complete system.

Place angle finder across the track slot near each hanger clamp and using a pipe wrench, rotate track to correct offset angle.



When slot has been positioned to correct angle the hangers must be tightened securely and tack welded to the track to prevent slippage.

When welding on hanger, weld only half of the clamp to track, preferably the half that is not welded to the hanger steel.

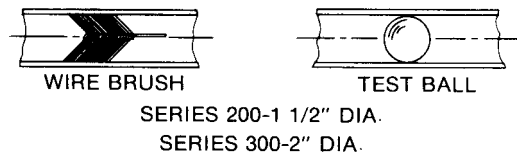
CHECK TRACK JOINTS

Check **ALL** track joints. They must be smooth and free of any obstruction or protrusion. Slots must be properly aligned. If not, file or grind any protrusions in slot until smooth.

The ideal tool for removing protrusions is a portable grinder with 6" diameter x 3/32" thick abrasive disc.

CLEAN OUT TRACK

Clean out the track by pulling a wire brush through the entire system to remove any rust and scale. This should be followed by a dampened rag of solvent or paint



thinner, then dry rags until the inside of track is clean. Next, pull the test ball through the entire system. If any hangups are located they must be removed. Most hangups will occur at joints. The obstruction can be removed with a rotary file or the track joint can be repaired or replaced by cutting track 6" each side of joint and installing new 1 foot long section of track.

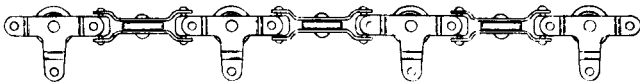
CHAIN

Series 200-shipped in 10 foot and 50 foot lengths

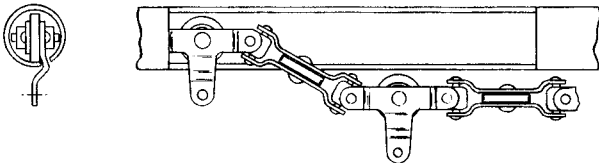
Series 300 - shipped in 50 foot lengths

Assemble chain, **making sure to keep it clean**, and feed into the installed track system.

NOTE: Be certain in assembling the chain that all of the pendants face the same direction and that rivets are peened (Series 200) or bolts are tightened (Series 300) to a point where they will hold in place but not to a point where the joint will freeze or be stiff in operation.



Feed chain into the system at the drive or an inspection section.



When the chain has been pulled into the entire system and is properly engaging all sprockets in the system, pull it as tight as possible.

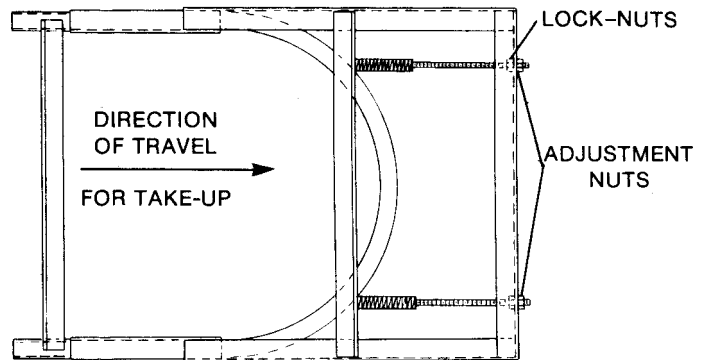
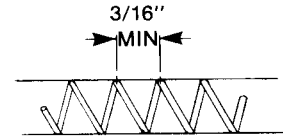
Shorten chain length as necessary and connect the two ends together.

BEFORE STARTING UP THE SYSTEM

Adjust take-up to remove chain slack.

TAKE-UP ADJUSTMENT

If spring take-up is supplied, adjust take-up bolts until springs are extended to approximately 3/16" between coils. Loosen the locking nuts while making take-up adjustments, re-tighten after proper adjustment is made.



If counterweighted take-up is used, apply counterweights supplied with system.

START-UP ADJUSTMENTS IMPORTANT NOTE

Closely observe take-up during initial start-up and adjust as necessary to remove slack. Sufficient tension must be maintained to prevent the chain "hang-ing-up" at outlet of the drive.

The chain does not stretch but does "straighten out" under tension thus lengthening the chain.

If the chain lengthens to the point where take-up capacity is exceeded the chain must be shortened.

To shorten chain, collapse take-up to minimum. At inspection section or drive remove chain pitches as necessary while maintaining correct pendant spacing (Series 200=6"; Series 300=8"). Reconnect ends of chain and readjust take-up.

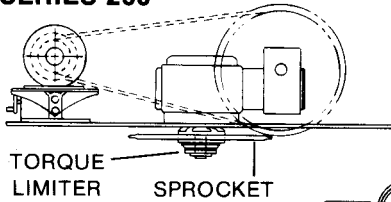
DRIVE ADJUSTMENT

Electrical wiring should be completed before making these adjustments.

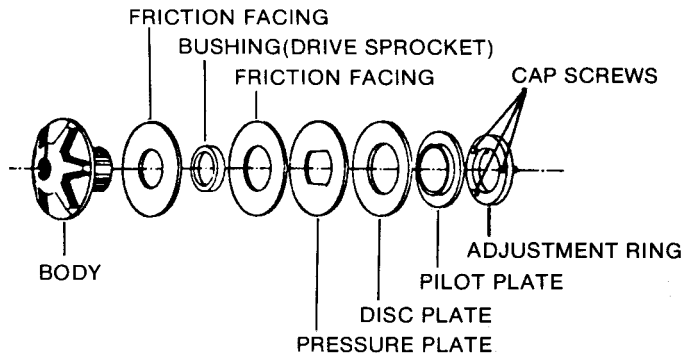
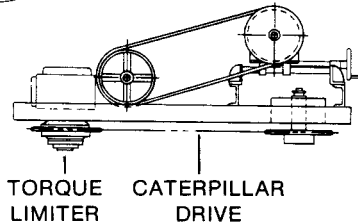
TORQUE LIMITER

The drive unit is equipped with a safety overload torque limiter. This is supplied assembled but must be adjusted in the field.

SERIES 200



SERIES 300



ADJUSTING PROCEDURE

1. Loosen the three cap screws in the adjustment ring until they no longer protrude through the ring.
2. Screw the adjusting ring on until finger tight.
3. Check that the disc springs are centered on the pilot plate.
4. Tighten each cap screw, finger-tight plus 1/2 turn.
5. Start conveyor and run for 10 minutes or approximately 100 revolutions of torque limiter. Slippage must occur to break in the friction discs.
6. Stop conveyor and tighten each cap screw 1/6 turn. Restart and check. Repeat as necessary until chain is driven without slipping.
7. Start loading the conveyor. If slippage occurs tighten each cap screw 1/2 turn; restart and check. Repeat as necessary until system achieves maximum load conditions.
8. Make two opposite marks on the sprocket and the torque limiter. Start and run conveyor for 3-5 minutes. Stop and check if slippage has occurred. If not, then Torque limiter is properly adjusted. Otherwise, repeat as necessary, adjusting cap screws 1/6 turn each until no slippage occurs.

CONVEYOR SPEED/MANUAL

Speed Change; make adjustment with motor running.

- To Increase Speed, adjust motor base in (towards reducer)
- To Decrease Speed, adjust motor base out (away from Reducer).

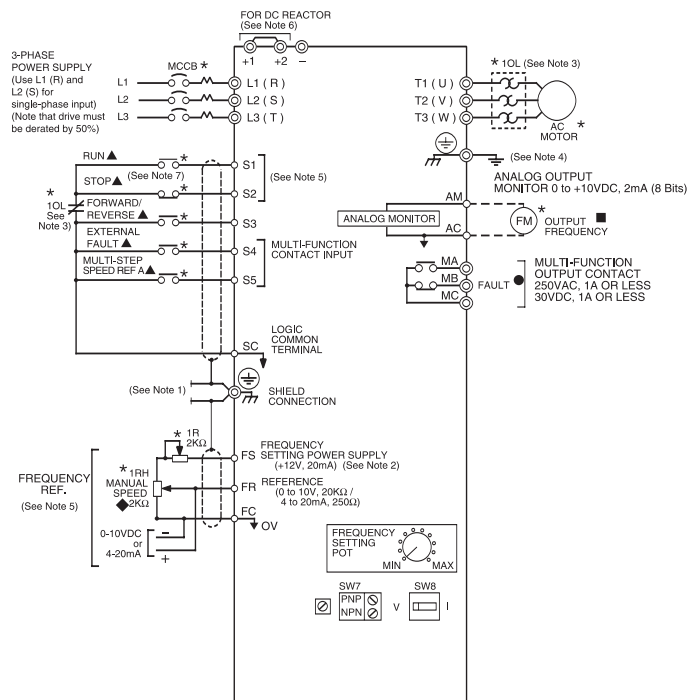
CONVEYOR SPEED/ELECTRICAL

Speed Change; make adjustments with motor either stopped or running by turning the speed dial on the VFD Controller. Some Electrical Panels are equipped with a remote push-button Key Pad

Checking Speed; simple method (with conveyor running).

- Series 200 FPM; count pendants passing a given point in 30 sec.
- Series 300 FPM; count pendants passing a given point for 40 sec.

VFD STANDARD CONNECTIONS



Standard Connections (3-Wire Control)

After wiring is complete, verify that:

- All wiring is correctly installed.
- Excess screws and wire clippings are removed from inside of unit.
- Screws are securely tightened.
- Exposed wire does not contact other wiring or terminals.

CHECK FOR LUBRICATION

Check for proper oil level in reducer.

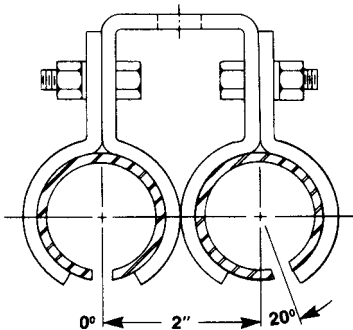
Add lubricant to lubricator. Lubricate chain following procedure outlined under Adjustment of Automatic Brush Type Lubricators in Lubrication section of this manual.

SYSTEM IS NOW READY FOR PRODUCTION

POWER AND FREE INSTALLATION NOTES

In general, these systems are installed in the same manner as plain power systems. They are however, more complex and frequently require large numbers of electrical controls and sensors. Also, they are normally engineered systems and will be supplied with a full complement of drawings which must be followed closely.

TRACK: Hang and weld the same as plain power track but the free track only has a -0- degree slot offset. Follow the same precautions to insure smooth, snag-free joints.

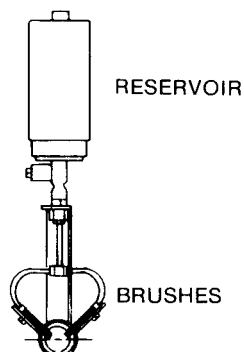


INSPECTION SECTIONS: Used for convenient insertion or removal of free carriers. Install where specified the same as on power systems, except with 0 degree slot offset in free track.

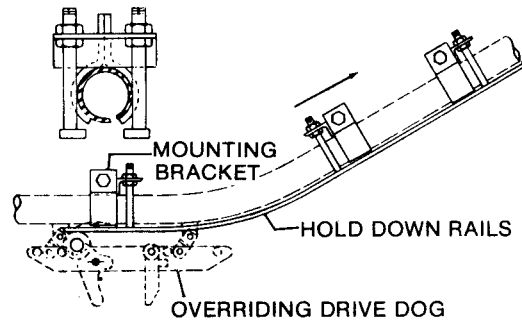
LUBRICATOR: Free lubricator has two brushes. Track mounting section is designed for vertical support of oil reservoir and solenoid. Install where specified.

Solenoid valve should be wired into the power-drive circuit and be energized by a limit switch located to sense carriers as they pass the lubricator.

Lubricator must be adjusted so free trolleys are kept "moist" but do not drip. This will require a heavier flow rate than the main power line lubricator because of the intermittent operation of the lubricator solenoid by carriers.

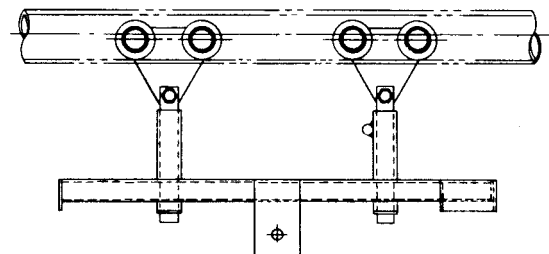


HOLD DOWN BARS: On systems using overriding drive dogs, install hold down bars along the pow track on inclines. They must be installed with their lower face approximately 3/8" below the bottom of the power track. Position so that the top wheels of the overriding drive dogs ride squarely on the bars and there is no interference between nuts and bolts of drive dogs and the bars.



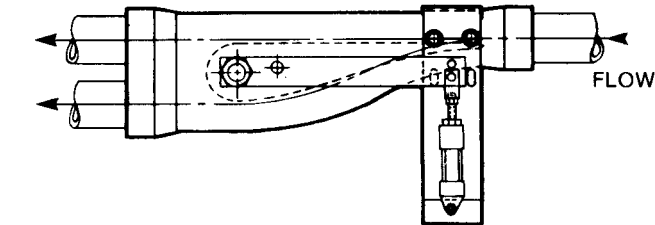
During start-up, the bars must be adjusted so that drive dogs have a little freedom of movement and are not binding tight. In addition, where the dog wheels first contact the bars, the bar on the pendant **bolt head** side should be bent down slightly. This will cause the dog to swing to one side but will "flip" the dog wheels to the back, lowered position preventing jam-ups arm excessive hold-down pressures that can result if the dog wheels enter the incline in the forward, high position.

FREE CARRIERS: Feed, into track at inspection section, making sure that carrier is correctly aligned in the direction of travel. Swivels and attachments must move freely and should be oiled accordingly, depending on the application.

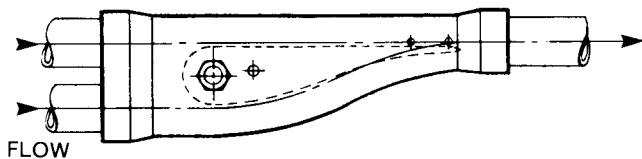


SWITCHES AND FROGS: Use on free track only. Align and weld, using same procedure and precautions as regular track. Be sure tongues and switching mechanism move freely and do not snag carriers. Install control mechanism according to drawings supplied and/or manufacturers instructions.

Check and lubricate every three months or 500 operating hours.



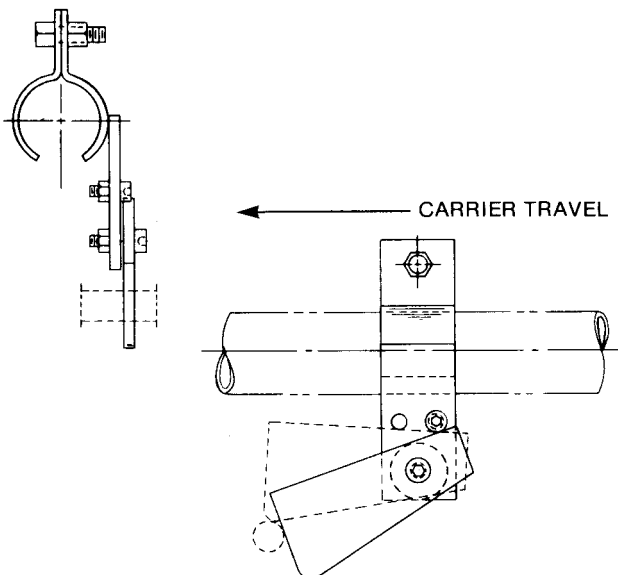
SWITCH (DIVERGE OPERATION)



FROG (MERGE OPERATION)

ANTI-ROLL BACK DEVICE: Use on free track inclines to prevent loose carriers running back down the incline. Install on free track incline. Be sure the unit is positioned to allow free passage of carriers moving up the incline.

Check for free movement and lubricate every six months or 1000 operating hours.



DRIVE DOGS: Two types: overriding and non-overriding. Install at the intervals specified and with overriding drive dogs correctly aligned in the direction of travel (pusher arm to the rear).



NON OVERRIDING DRIVE DOG



OVERRIDING DRIVE DOG

When attaching drive dogs to the chain pendants be sure the bolts are installed with the heads all on the same side. Nuts used are self-locking and must not be over-tightened: swivels must pivot freely.

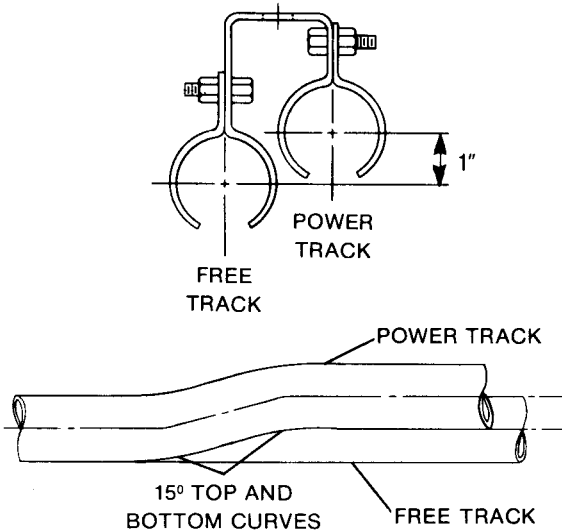
NOTE: If system is synchronized, all spaces between drive dogs must be even. If chain must be shortened after installation, enough must be removed to maintain this spacing!

Lubricate drive dog assemblies with LPS-1 lubricant every six months or 1000 operating hours.

Repair or replace any bent or damaged drive dogs immediately. If a drive dog is removed from a synchronized system it must be replaced by a spare before system is started again.

POWERED ACCUMULATION LINE: Requires use of overriding drive dogs.

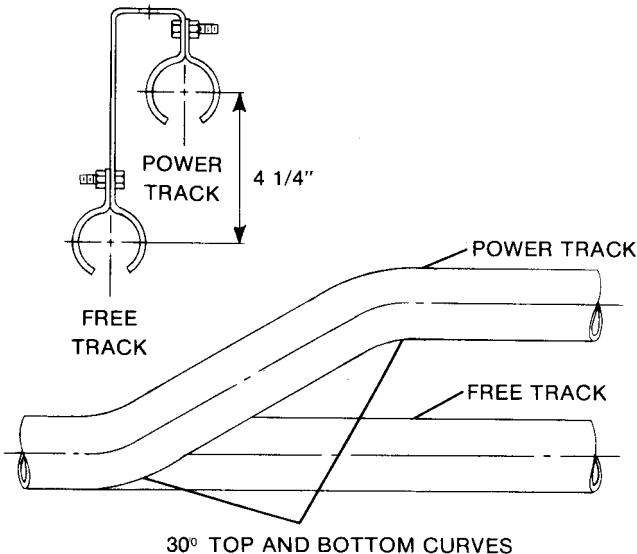
These are installed similar to regular transportation lines except that the powered line is set at a one inch higher elevation, than the free line. This necessitates using offset dual track hanger clamps, and 15° vertical curves.



GRAVITY ACCUMULATION: May be used with either overriding or non-overriding drive dogs.

These are installed similar to regular transportation lines, except the powered line is set at a minimum of 2" higher elevation than the free track.

Typically, this difference in center lines will be 4 1/4", using standard 30° vertical curves. Special 4 1/4" offset dual track hanger clamps would be supplied. If the power track is not required to run parallel to the free line, use single hanger clamps for each line. When hanging gravity lines, the specified pitch must be maintained to assure carrier flow.

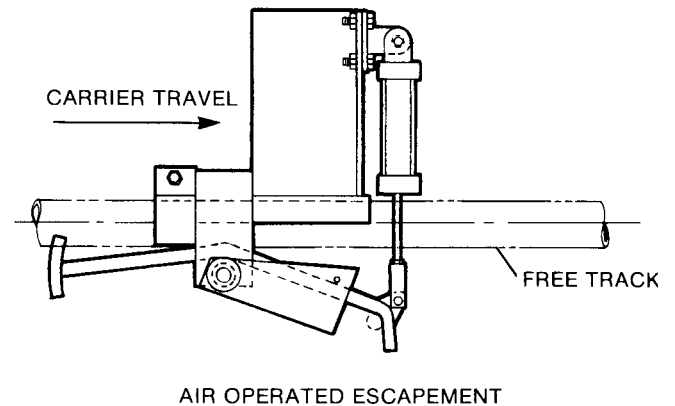
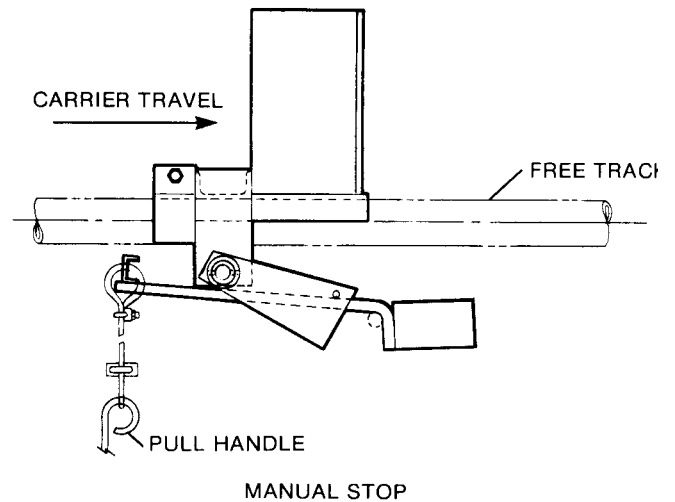


ESCAPEMENTS & STOPS: Use at outlet of either powered or gravity accumulation lines or when controlled flow or singulation is required.

Using attached hanger clamp, position the unit on the free track where specified. Be sure the channel base rests firmly on the track. When correctly positioned weld in place.

Operating mechanism must move freely and not interfere with carriers or other components.

On air operated units connect air lines and electrical wiring as required.



Lubrication

CHAIN LUBRICATION

If after a period of time the chain develops a “gummy” condition and the wheels no longer spin freely, the chain may need to be cleaned. First, determine if much grit has developed in the chains lubricant. Take samples from the chain at several points in the system. Test the samples for grit by rubbing between the fingers.

1. If much coarse grit is detected the chain should be removed and thoroughly cleaned by a hot caustic solution, degreaser, or some other means to remove all of the lubricant, grit and any foreign matter. Then a high pressure air blast should be applied to each wheel bearing and joint for final cleaning.

The track must also be cleaned. Use a flue brush followed by solvent-saturated rags as described in the “Installing the track” section of this manual and blow clean with high pressure air.

After the chain is reinserted into the system it should be “flooded” with oil as outlined under “Adjustment of Automatic Brush Type Lubricators” or grease applied if no oiler is used.

2. If no grit is present and a lubricator is used, empty the lubricator and refill with Wynn’s Friction Proofing Oil or similar oil additive. Run the system until all bearings spin freely. Then drain the lubricator and refill with regular operating oil selected for the application.

3. If no grit is present and the chain is grease packed (no lubricator), the chain will need to be removed and cleaned as outlined in Item 1 above.

ADJUSTMENT OF AUTOMATIC BRUSH TYPE LUBRICATORS

On initial run-in of a new system which requires the use of a lubricator or when replacing the chain, the chain must first be flooded with oil to lubricate all bearings and joints. After the chain is flooded with oil the lubricator is then adjusted to a maintenance flow rate. This procedure is outlined below.

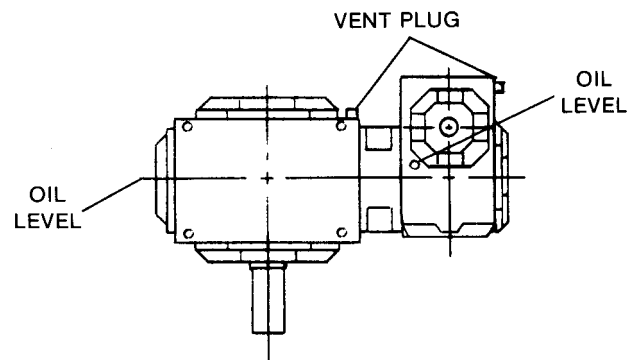
1. Adjust the brush in-tight against the chain so the bristles are somewhat “bent”.
2. Adjust the lubricator flow for 2 to 4 drops per minute when the conveyor is running approximately 10 FPM.
3. Run the chain 3 to 5 complete cycles. This should flood the chain with oil.
4. After flooding the chain, readjust the lubricator brush to where it is just touching the chain.

ADJUSTMENT OF AUTOMATIC BRUSH TYPE LUBRICATORS (Continued)

5. Reduce the lubricator flow rate to approximately one drop per minute.
6. When the system is in operation the chain should be kept moist with oil. Increase or decrease the lubricator flow rate as required.

GEAR REDUCER LUBRICATION

Frequent oil level inspection with the unit not running, (preferably when warm) should be made by removing the proper oil level plug to see that the oil level is being maintained. If low (without replacing oil level plug) add lubricant through one of the upper openings until it comes out the oil level hole.



FREQUENCY OF SERVICE

- | |
|--|
| After 1st 100 Hrs. - Change Oil |
| 100 Operating Hrs. - Check Oil Level |
| 2000 Hrs. or Every 6 Months - Change Oil |

Safety Precautions

WARNING: MAKE NO ADJUSTMENTS ON THE CONVEYOR WHILE IT IS IN MOTION.

BEFORE MAINTENANCE

1. Since maintenance functions are generally to be performed while the conveyor is off, the main power switch to the conveyor should be locked in the open or off position. This will prevent anyone inadvertently applying power to the system while maintenance personnel are working on the system.

2. Do not perform any work on the system while it is running unless the nature of the maintenance absolutely requires operation of the system. When the system must be operated to perform maintenance procedures, allow only experienced maintenance personnel, who have been instructed on the operation of the conveyors, to do the work.

DURING MAINTENANCE

1. Do not wear loose clothing while performing maintenance on operating equipment.

2. Be alert to hazardous conditions, such as sharp edges and protruding parts.

3. When using mechanical aids, hoists, cables, and other equipment to perform maintenance, use with

extreme care, so no damage is done or conveyors, pulleys, rollers, etc. get out of alignment or could cause a dangerous condition when the conveyor is turned back on.

4. Poor housekeeping practices can lead to accidents and inefficient conveyor operation. Clean up spilled lubricants and other material as completely and promptly as possible, especially material caught or lodged in the movable parts — but only when the conveyor is off.

AFTER MAINTENANCE

1. Do a walk-around of the conveyor and make certain all safety devices and guards are in place and all tools or maintenance equipment have been removed from the conveyor area.

2. Make certain all personnel are clear of the conveyor and are made aware that the conveyor is about to be started.

3. Only authorized personnel should be permitted to restart the conveyor following maintenance or any emergency shut-off.

REMEMBER:

CONDITIONS EXIST ON ANY CONVEYOR THAT CAN CAUSE INJURY TO PERSONNEL. NO MANUAL COULD COVER ALL HAZARDOUS CONDITIONS THAT MIGHT DEVELOP. THEREFORE, PERSONNEL INVOLVED SHOULD BE CONSTANTLY ON THE ALERT FOR ANY UNSAFE CONDITIONS AND USE ALL POSSIBLE CARE, ALONG WITH COMMON SENSE AND STRICT ADHERENCE TO ACCEPTED SAFETY STANDARDS TO ESCAPE INJURY.

Maintenance

MAINTENANCE INSPECTION CHART

ITEM	DAILY	WEEKLY	MONTHLY	ANNUALLY
Lubricator	<ul style="list-style-type: none"> • Oil level 		<ul style="list-style-type: none"> • Needle valve setting • Solenoid • Brush contact 	<ul style="list-style-type: none"> • Pipe fittings
Take-up	<ul style="list-style-type: none"> • Initial - 80 hrs. 	<ul style="list-style-type: none"> • Adjustment 	<ul style="list-style-type: none"> • Lubrication 	<ul style="list-style-type: none"> • Slot wear
Drive		<ul style="list-style-type: none"> • Oil leakage 	<ul style="list-style-type: none"> • Speed • Belt stretch or wear • Reduced oil level • Sprocket wear • Torque limiter adjustment • Power tube wear 	
Chain		<ul style="list-style-type: none"> • Lubrication 	<ul style="list-style-type: none"> • Excessive slack • Broken or bent pendants • Excessive wear 	<ul style="list-style-type: none"> • Lubricant build up • Length • Bearing condition
Track			<ul style="list-style-type: none"> • Sag • Cracked welds 	<ul style="list-style-type: none"> • Slot Wear
Curves			<ul style="list-style-type: none"> • Cracked welds 	<ul style="list-style-type: none"> • Slot Wear
Idlers			<ul style="list-style-type: none"> • Lubrication 	<ul style="list-style-type: none"> • Sprocket Wear • Power Tube Wear

Troubleshooting (by components)

ITEM PROBLEM	EFFECT	CAUSE
<p>TRACK – Slot wear</p> <p>Slot spreading</p>	<p>Pendant wear Load is canted, vertical, chain wheels fall through slot.</p> <p>Load sway</p>	<ul style="list-style-type: none"> • Improper slot location or lack supports. • Imbalanced loads. • Carrier malfunctioning. • Broken or bent pendants. • Lack of support or overloading. • Overloading
<p>CHAIN – Broken or bent pendants</p> <p>Sticky bearings</p>	<p>Conveyor stalls</p> <p>Increased chain pull</p>	<ul style="list-style-type: none"> • Imbalanced load. • Improper loading or unloading. • Lack of clearance for load fixtures • Compound curves in system • Lubricant build up with contaminants.
<p>LUBRICATOR – Not lubricating</p> <p>Lubricant not getting into wheels. Lubricant dripping from chain pendants.</p>	<p>Increased chain pull</p>	<ul style="list-style-type: none"> • Reservoir empty, solenoid failure. • Needle valve defective. • Clogged piping. • Brush out of adjustment. • Needle valve out of adjustment.
<p>DRIVE – Excessive chain pull</p> <p>Chain jam at outlet power tube</p> <p>Belt slippage</p> <p>Drive Motor running hot</p> <p>Sprocket lug wear</p>	<p>Torque limiter slippage/ VFP Controller Faults Out</p> <p>Torque limiter slippage/ VFP Controller Faults Out</p> <p>Excessive noise</p> <p>Overloads kick out</p> <p>Chain falls off sprocket</p>	<ul style="list-style-type: none"> • Overloading carrier jam. • Bent pendant. • Torque limiter out of adjustment. • Lack of take-up tension or not enough weights to take-up. • Lack of chain lubrication. • Lack of take-up tension. • Sprocket alignment. • Reducer low on lubrication. • Worn or broken gearing. • Undersized motor. • Faulty motor. • Belt slippage. • Sprocket alignment • Overloading.
<p>TAKE-UP – Curve extended with little tension Curve won't move, take-up collapses</p>	<p>Chain will jam at outlet power tube</p> <p>Springs over extend</p>	<ul style="list-style-type: none"> • Too much chain in system. • Uneven loading.
<p>IDLERS – Sprocket doesn't rotate freely</p> <p>Power tube wear</p>	<p>Excessive noise</p> <p>Chain jams in power tube</p>	<ul style="list-style-type: none"> • Lack of lubrication. • Overloading. • Sprocket alignment.
<p>HORIZONTAL CURVES – Slot wear</p> <p>Deformed inside radius</p>	<p>Pendants wear</p> <p>Chain jams</p>	<ul style="list-style-type: none"> • Curves not level. • Compound curve in system. • Bent pendants. • Excessive chain pull.
<p>VERTICAL CURVES – Slot rolling open</p>	<p>Chain jams</p>	<ul style="list-style-type: none"> • Excessive chain pull.

Troubleshooting (by operational symptoms)

OPERATIONAL SYMPTOMS	PROBABLE CAUSE	REMEDY
1. Conveyor stalled and motor stopped	<p>A. Motor overloaded and torque limiter is adjusted too tight</p> <p>B. Electrical failure</p>	<p>A. Loosen torque limiter, check motor. Proceed with (2) when motor is again operational.</p> <p>B. Check-out and repair controls, motor or wiring.</p>
2. Conveyor stalled and motor still running; torque limiter slipping continuously	<p>A.Chain disengaged from drive sprocket due to:</p> <ol style="list-style-type: none"> 1. Broken or badly worn drive sprocket 2. Misaligned drive sprocket 3. Worn or damaged power tubes or chain retainer 4. Chain jammed in exit power tube <p>B. Dirty, dry or gummy chain</p> <p>C. Load or carrier snagged or jammed</p> <p>D. Damaged carriers jammed</p> <p>E. Chain snagged at track joint</p> <p>F. Chain snagged near horizontal or vertical curve due to worn slot. Slot spread open and/or chain wheels failing into slot.</p> <p>G. Overriding drive dog jammed against hold down bars at an incline</p> <p>H. Carriers accumulating at incline</p>	<p>A. 1. Replace sprockets 2. Align sprocket center line with power tube center line. 3. Replace power tubes or chain retainers. These cannot be repaired or bent back into shape. 4. Manually operate the V-belt drive in reverse until jammed link releases. Check and tighten takeup.</p> <p>B. Clean chain if necessary and relubricate. Chain should be kept "moist" to "wet" but not so "wet" that it drips. Track should also be cleaned if chain is removed. If chain is dry, check the automatic lubricator, adjust or replace as necessary.</p> <p>C. Walk the system until jam or snag is located. Normally, simple guarding to prevent swinging and/or better housekeeping should eliminate the problem.</p> <p>D. Locate and repair damaged carriers.</p> <p>E. 1. Make sure chain is pulled tight in direction of travel. Walk the system while attempting to move each pendant in succession, A distinct difference in chain tension will exist at the site of the snag. Grind smooth any projections found or remove any debris. 2. In addition to track, the chain may also be damaged. Mark the chain at the site of snag and advance chain to nearest inspection section or drive. Inspect carefully for broken side-plates, pulled off or improperly peened rivets, and repair accordingly.</p> <p>F. 1. Replace worn track section(s). 2. Observe action of loads near worn area. If slot wear appears to be caused by loads swinging, install backstop or guard rail to reduce swing. 3. Check and correct any unbalanced or irregular loads or conditions.</p> <p>G. By hand, back up the chain until I dog is clear: 1. If dog wheels are forward, adjust hold down bar to serve as wheel flipper. See page 14. 2. If dog wheels are back, readjust hold down bars so dogs move through freely. 3. If hang up is due to a protruding bolt or a wheel jammed against a hold down bar, move the bars "in" or "out" as necessary.</p> <p>H. Hold down bars set too high and drive dogs are overriding. Readjust bars, see page 14.</p>

Troubleshooting (by operational symptoms)

OPERATIONAL SYMPTOMS	PROBABLE CAUSE	REMEDY
3. Conveyor surges torque limiter slipping intermittently.	Same basic causes as in 2 C, D, and E above	<p>A. Check frequency of slippage:</p> <ol style="list-style-type: none"> 1. Once/chain revolution: one particular link, pendant or carrier hanging up in one place only. Locate and repair both problems. 2. One/carrier: each carrier is catching on the same obstruction. Locate cause and repair-as in 2 C and D. 3. One/pendant: repair track misalignment as in 2 E. <p>B. Only during start-up and/or with uneven loading: check all other conditions and if satisfactory, torque limiter must be adjusted to carry the heavier load condition.</p>
4. Power chain running, flow of free carriers stopped.	<p>A. Carriers jammed at switch with one carrier "split" between two lines</p> <p>B. Carriers jammed at frog or automatic switch</p> <p>C. Carriers jammed at horizontal curves</p>	<p>A. 1. Reposition the "cancellation" limit switch that changes the switch position after a carrier passes through.</p> <ol style="list-style-type: none"> 2. Adjust the switch operating mechanism so tongue shifts and seats positively and quickly 3. Check for electrical problems causing erratic switch operation. 4. If the above checks do not solve the problem, carefully monitor, the system for "pushers". See "5" below. <p>B. This condition is normally the result of desynchronization:</p> <ol style="list-style-type: none"> 1. Check for "pushers" in the system, see "5" below. 2. Check and repair frog tongue: it must move freely. 3. If merging is manually controlled, be sure personnel are instructed in proper procedures. <p>C. 1. Eliminate "pushers" from system - see "5" below.</p> <ol style="list-style-type: none"> 2. If system was designed for carriers to push each other through curves it will have stabilizer bars at the curves. These may need to be adjusted: they must not be so tight that carriers bind or so loose that carriers tip excessively and interlock.
5. Otherwise untraceable jam-ups occurring at track points requiring synchronization	A. "Pushers" in the system. This occurs when one carrier breaks loose from its drive dog and is "pushed" along by the next carrier in line	<p>A. 1. Locate and repair damaged drive dogs.</p> <ol style="list-style-type: none"> 2. Check and adjust if necessary the hold down bars at inclines. 3. Check drive dog spacing: See that all are uniform and that no dogs are missing. 4. Personnel may be inadvertently moving or overriding carriers in the system. 5. Check and repair limit switches and/or sensing devices. These may be damaged or simply have bent actuating levers. <p>NOTE: If the above do not solve the problem a general preventive remedy is to install an escapement stop prior to major jam locations. This will allow only one carrier at a time to proceed.</p>

Stock Parts List

PART NO's		DESCRIPTION
200 POWER	300 POWER	
2020900	3021901	CHAIN
2020901		CHAIN, HAND PACKED W/GREASE
2010019	3010019	TRACK
2011900	3011900	TRACK INSPECTION SECTION
2050900	3050900	TRACK HANGER CLAMP
2055900	3055900	TRACK WELDING SLEEVE
2001900		TRACK TEST BALL
2002901	2002901	ANGLE FINDER
2040900	3040900	LUBRICATOR, 110V
2200900		180° CURVE TAKE-UP/SPRING LOADED, 32" SPREAD, SLOT 1
2201900		180° CURVE TAKE-UP/SPRING LOADED, 32" SPREAD, SLOT 2
2250900	3250900	TAKE-UP SLEEVE
	3150931	DRIVE, INLINE CATERPILLAR
2150931		DRIVE, INLINE 8 TOOTH HORIZONTAL
2171930		DRIVE, CORNER - 8 TOOTH HORIZ., 180°, SLOT 1
2122930		DRIVE, CORNER - 8 TOOTH HORIZ., 180°, SLOT 2
2161930		DRIVE, CORNER - 8 TOOTH HORIZ., 90°, SLOT 1
2162930		DRIVE, CORNER - 8 TOOTH HORIZ., 90°, SLOT 2
2230900		IDLER SPROCKET TURN, 180° HORIZ., 11 $\frac{3}{8}$ " P.D., SLOT 1
2231900		IDLER SPROCKET TURN, 180° HORIZ., 11 $\frac{3}{8}$ " P.D., SLOT 2

HORIZONTAL CURVES	SERIES 200		SERIES 300		VERTICAL CURVES	SERIES 200		SERIES 300	
	SLOT 1	SLOT 2	SLOT 1	SLOT 2		SLOT 3	SLOT 4	SLOT 3	SLOT 4
16"R 180°	2316181	2316182			16"R 90°	2316903	2316904		
90°	2316901	2316902			60°	2316603	2316604		
60°	2316601	2316602	NA	NA	45°	2316453	2316454	NA	NA
45°	2316451	2316452			30°	2316303	2316304		
30°	2316301	2316302			15°	2316153	2316154		
24"R 180°	2324181	2324182	3324181	3324182	24"R 90°			3324903	3324904
90°	2324901	2324902	3324901	3324902	45°	NA	NA	3324453	3324454
45°	2324451	2324452	3324451	3324452	30°			3324303	3324304
30°			3324301	3324302					
36"R 180°	2336181	2336182	3336181	3336182					
90°	3336901	3336902							
48"R 180°	2348181	2348182							

PART NO's 200 FREE	DESCRIPTION
2010019	TRACK
2050900	TRACK HANGER CLAMP-SINGLE
2051900	TRACK HANGER CLAMP-DOUBLE
2046900	LUBRICATOR, 110 VOLT
2314185	HORIZ. CURVE, 180°, 14" RADIUS-SLOT 5
2318185	HORIZ. CURVE, 180°, 18" RADIUS-SLOT 5
2318905	HORIZ. CURVE, 90°, 18" RADIUS-SLOT 5
2700900	FROG, CAST, RIGHT HAND ENTERING
2701900	FROG, CAST, LEFT HAND ENTERING
2460900	DRIVE DOG, NON OVERRIDING
2469900	DRIVE DOG, OVERRIDING
2741900	ANTI-ROLL BACK
2750800	LIMIT SWITCH BRACKET

NOTE: THIS LIST CONTAINS ONLY STOCK ITEMS, IF NON-STOCK ITEMS ARE REQUIRED REFER TO PEP TECHNICAL MANUAL.

Lauyans & Company, Inc. was founded in March of 1986 and located offices in Louisville, Kentucky with the sole intention of serving the material handling and conveyor market. Our offerings include Custom Designed Conveyors and Special Design Handling Equipment, Chainveyor® Overhead Conveyor Systems, Pick 'N Place Automated Transfer Systems, HSR™ Horizontal Carousels, VSR® Vertical Carousels and High Cube™ Vertical Lift Modules.

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LAUYANS  & COMPANY, INC.
Innovative Engineering Solutions in Material Handling

2929 West Chestnut Street
Louisville, KY 40211
Voice (502) 772-9000
Fax (502) 772-1047
www.lauyans.com
www.gregoryadams.com
E-Mail: info@lauyans.com



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