Belt Installation, Tracking, and Maintenance Guide

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Revised 00/00/18
ISO 9001 Certified

Solaris Oilfield, Ex. 1135, p. 1
Solaris Oilfield v. Masaba, IPR2024-01179

TABLE OF CONTENTS

INTRODUCTION.....3

THE RUNNING DIRECTION OF A CONVEYOR BELT.....4

SECTION 1 PRE-INSTALLATION.....5

1-1 VISUAL INSPECTION.....*5*

1-2 CONVEYOR PREPARATION.....*5*

SECTION 2 INSTALLION.....6

2-1 ENDLESS BELTS.....*6*

2-2 LACED BELTS.....*7*

SECTION 3 TENSIONING.....8

3-1 TENSIONING PROCEDURE.....*8*

3-2 BELT STRETCH FORMULA.....*9*

SECTION 4 TRACKING.....9

SECTION 5 TROUBLESHOOTING CONVEYOR BELT PROBLEMS.....11

Solaris Oilfield, Ex. 1135, p. 2
Solaris Oilfield v. Masaba, IPR2024-01179

INTRODUCTION

Thank you for choosing LEWCO, Inc. for your material handling needs. This manual has been prepared by LEWCO engineers for use in familiarizing personnel with the design, installation, operation and maintenance of LEWCO Conveyor Products. Information presented herein should be given careful consideration to assure safe, optimum performance of the equipment. Manual should always be accessible to the operators for quick reference.

This manual should be used in conjunction with applicable drawing(s), data sheets, and component manufacturer's literature attached hereto that clarify specific features, installation, utility connections, operation, etc.

If you have any questions regarding this manual or the use of your LEWCO Conveyor Products, please contact us by phone at (419) 625-4014 ext. 4003 or by email at conveyorsales@lewcoinc.com.

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NOTICE: No installation or operation of equipment should take place until this manual has been studied and understood by the person(s) responsible.

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Solaris Oilfield, Ex. 1135, p. 3
Solaris Oilfield v. Masaba, IPR2024-01179

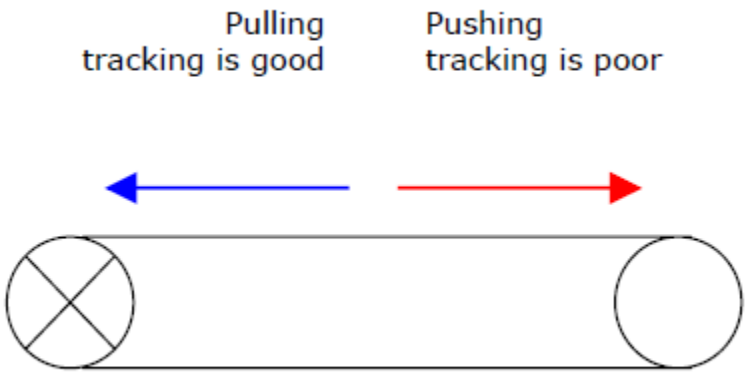
THE RUNNING DIRECTION OF A CONVEYOR BELT

It is generally recommended to run the belt in one direction, which is from the idle end (take-up end) towards the drive pulley (drive end). The Drive pulley pulls the belt rather than pushing it. Running the belt in this direction allows for pretty high loads. This is because the belt is pulled tight onto the drive pulley during operation, which eliminates slippage between the drive pulley and the belt and allows the full transfer of torque from the motor to the belt. This configuration also is best as far as tracking of the belt is concerned.

From the other hand the shorter and wider the belt, the better a push operated belt conveyor will work. This is again due to the friction that can be achieved between the drive roller and the belt. A wider roller has more surface area and allows for more friction. The weight placed onto the conveyor must be kept low in this mode of operation. This is because the pushing of the belt encourages separation between the drive pulley and the belt. This is reducing needed friction between the drive pulley and the belt. The torque from the motor cannot be transferred to the belt and the result will be a slipping pulley.

Tracking the belt is often an issue when running a belt conveyor in reverse. Again this is because of the potential slippage of the drive pulley. If the conveyor is to be run in reverse only and load weight is kept very low then good tracking of the belt should be easy.

So it is possible to run conveyor backwards but Lewco always recommends to run the belt in one direction, which is from the idle end (take-up end) towards the drive pulley (drive end). Also Lewco cannot guarantee maintaining same speed with minimal wear when running belt in opposite direction.



Solaris Oilfield, Ex. 1135, p. 4
Solaris Oilfield v. Masaba, IPR2024-01179

SECTION 1 – PREINSTALLATION

1-1 VISUAL INSPECTION

Prior to installing the conveyor's belt, it is important to ensure the system is completely free of:

- Dirt and debris, which can impede operation and shorten belt life
- Residue of any kind, which can cause increased friction during operation
- Damage to any part

After unpacking the conveyor, visually inspect all pulleys and rollers for anything that could prevent proper operation. This includes scratches, particulates, or residue on any surface that comes into contact with the belt.

Examine the length of the belt, checking for debris as well as tears, twists, or deformations that could prevent the belt from tracking properly. If the belt is V-guided (V-guided belts are ideal for reversing and side exiting applications where belt tracking might otherwise be difficult to maintain), verify the guide is straight along the entire belt.

1-2 CONVEYOR PREPARATION

Before beginning the installation process, have a firm understanding of the belt routing for the conveyor. Use provided drawings as a reference to ensure the belt is routed along the correct path.

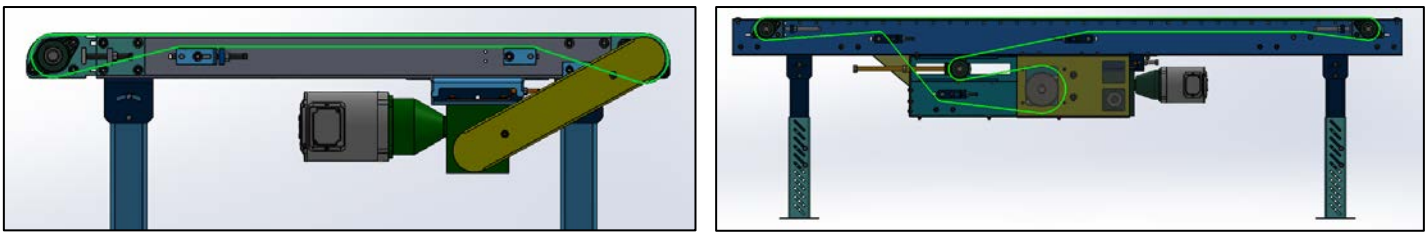


Figure 1 – Example Belt Paths Shown in Green

Tighten all butt couplings and support mounting bolts to prevent conveyor frame movement. Ensure all adjustable pulleys and rollers are perpendicular to the conveyor frame and their axes are parallel. This will allow consistent tracking adjustments to be made. The conveyor should look like figure 2, with distances "A" equal to each other, and distances "B" equal to each other.

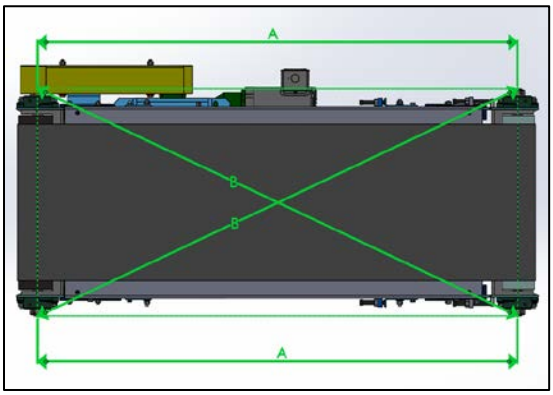


Figure 2 – Conveyor Frame Square with Rollers

Solaris Oilfield, Ex. 1135, p. 5
Solaris Oilfield v. Masaba, IPR2024-01179

SECTION 2 – INSTALLATION

The life of a conveyor belt depends greatly on the way its installation is carried out and the treatment it receives during operation. In fact, it is rare that a conveyor belt “wears” out, more often it is mechanically damaged due to outside forces or incorrect tracking.

It is important to inspect the following items before any new belt is installed on a conveyor:

- The alignment of head and tail pulleys to ensure they are square and parallel.
- The condition of the head pulley lagging which may be worn or lifting.
- Check any support rollers which may be seized and ensure they rotate freely.
- Check the overall condition of the frame and its components for misalignment.

Determine if the conveyor belt is endless or laced. Endless belts will be formed in a continuous, unbroken loop without joint in the process of production. Laced belts will arrive as a single long strip with included lacing to secure the ends together.

2-1 ENDLESS BELTS

Endless belts are generally only installed on conveyors with an overall length of less than 240 inches.

If an endless belt is used on a conveyor with an overall length greater than 240 inches, it will be installed by the customer on site the same way as a laced belt. The customer will require the assistance of a local belting professional or contractor to fuse the belt ends together. Refer to section 3-2 installation instructions if provided with one of these belts.

For endless belts installation, partial frame disassembly may be required, including removing:

- Some frame components (side rails)
- At least one pulley
- Crossties
- The conveyor supports

After removing the necessary obstructing parts:

- Slip the belts over the remaining pulleys and rollers
- Ensure the belt routing matches the drawing reference.
- If the belt is V-guided, ensure the guide is seated in all V-guide grooves (generally, a single V-profile in the center of the belt is sufficient)
- Reinstall the removed parts,
- Re-check all pulleys and rollers for bolt tightness and parallel axes.
- Proceed to tensioning.

Solaris Oilfield, Ex. 1135, p. 6
Solaris Oilfield v. Masaba, IPR2024-01179

2-2 LACED BELTS

For laced belts:

- Feed one end of the belt over the takeup pulley.
    - On end-drive conveyors, there will be a single takeup pully, identifiable by its lack of lagging (high-friction coating, see figure 3).
    - On center-drive conveyors, there will be a takeup pulley on each end. In this case, start with either end of the conveyor.
- Take the other end of the belt and route it through the entire conveyor, taking care to follow the path laid out in the drawing.
- This should result in the two belt ends meeting on top of the conveyor (see figure 4).
- Install the lacing to form a complete belt loop.
- Ensure all pins and clips in lacing are undamaged and secure.
- Proceed to tensioning.

Figure 4 – Belt Ends Laced Together on Top of Conveyor

Solaris Oilfield, Ex. 1135, p. 7
Solaris Oilfield v. Masaba, IPR2024-01179

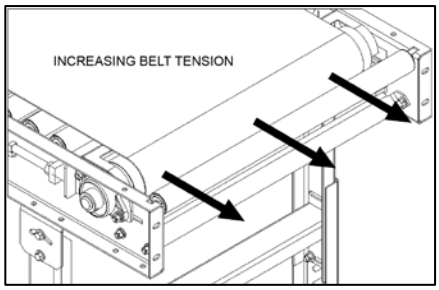
SECTION 3 – TENSIONING

3-1 TENSIONING PROCEDURE

All parts, which are in contact with the conveyor belt, cause friction. Pollution of pulleys, rollers, the slider bed and the belt itself will increase friction. To drive a conveyor belt without slippage and to track it in a proper way, a certain belt tension is necessary. The tension applied has to be such that there is no slippage on the driving pulley when the belt is started at full load.

To properly tension the conveyor belt:

- Use the adjustable takeup pulley, begin by applying just enough tension so that the belt conforms to the surface of the pulleys.
- When applying this pretension, ensure takeup pulley remains square to frame



- Referencing the belt manufacturers specifications, determine the proper amount of belt tension. This value is given as a percent of belt length, typically around 0.5%.

- Using tape as marker, mark out a distance of 50 inches on the flat top portion of the untensioned belt.
- This has to be done on the left as well as the right side of the conveyor belt.
    - If the conveyor is too short to allow this distance to be measured, use a distance that is half the overall length of the conveyor.
    - Record this as the STARTING DISTANCE.
- Tension the belt using the take-up pulley and let it turn a few times to equally divide the belt tension over the belt.
- Adjust the pulley in small increments, ensuring it remains square to the frame as the belt is stretched.
    - After each adjustment, measure the distance between the two tape markers and record this as the STRETCHED DISTANCE.
    - Using the formula below, calculate the percent of belt stretch.
- If the stretch is below the manufacturer's specifications, adjust the takeup pulley to provide additional tension and record the new STRETCHED DISTANCE.
- Repeat until the correct amount of tension is applied, keeping adjustments small to avoid over-tensioning the belt.
- In case of applications with a medium load an elongation of 0.5% should be sufficient
    - Over-tensioning can cause damage to the belt or pulleys, as well as suboptimal conveyor performance.

- When finished, run the belt forward for several full rotations. A properly tensioned belt with all rollers square to the frame should track properly. If it does not, proceed to the tracking section.

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Solaris Oilfield, Ex. 1135, p. 8
Solaris Oilfield v. Masaba, IPR2024-01179

3-2 BELT STRETCH FORMULA

$$BELT\ STRETCH\ \% = \frac{STRETCHED\ DISTANCE - STARTING\ DISTANCE}{STARTING\ DISTANCE} \times 100$$

SECTION 4 – TRACKING

The following conditions are essential for problem-free belt tracking:

- The supporting structure must be rigid and stable.
- All pulleys and rollers must be fitted at right angles to the running belt. Adjustable pulleys and rollers are only to be adjusted after the belt has been properly run in.
- All parts of the installation that come into contact with the belt are to be protected from dirt and soiling and to be cleaned if necessary

Before making any tracking adjustments, inspect all pulleys and rollers for damage, wear, or debris. Replace worn or damaged parts. Ensure the belt lacing is secure (if using a laced belt). Check tracking after corrective measures. If tracking issues persist, begin making tracking adjustments.

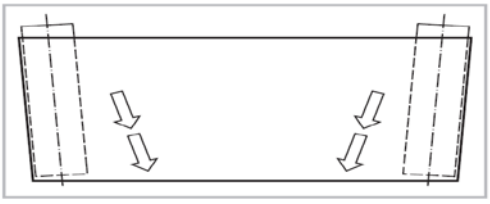

Figure Y

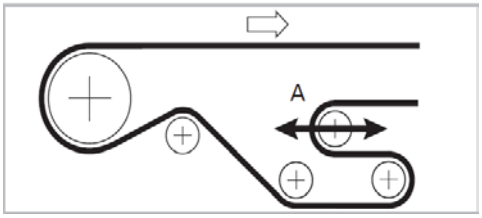

Figure W

Tracking Rule 1:

The belt tracks to the side with the least tension (Figure Y)

Tracking Rule 2:

In group of pulleys and rollers the one that the belt first makes contact with has the larger tracking effect (Figure W: roller A)

Tracking Rule 3:

The belt tracks to the side to which it first makes contact with the roller (Figure X)

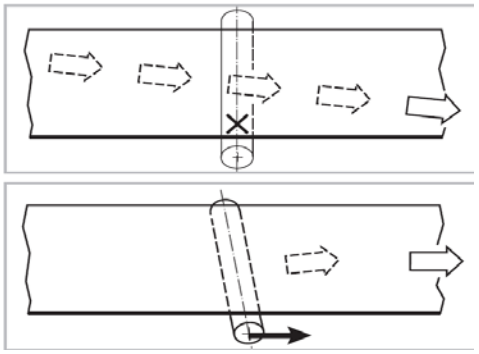

Figure X- The conveyor belt is tracking right, so the right hand side of the roller is adjusted by tightening its tension screw

Tracking adjustments are made using the conveyor's snubber rollers, which are the adjustable rollers closest to the drive and take-up pulleys:

- Chose the snubber roller immediately upstream of the most visible tracking issue.
- The belt moves to the direction where it first touches the pulley. Tighten the snubber roller tension screw on the same side that the belt is moving towards, 1-2 turns at a time.
- Run the conveyor forward several rotations after each adjustment to observe the impact of the change.
- Continue adjusting until tracking is maintained.

Solaris Oilfield, Ex. 1135, p. 9
Solaris Oilfield v. Masaba, IPR2024-01179

- Tighten the snubber roller tension screw on the same side that the belt is moving towards, 1-2 turns at a time.
- Run the conveyor forward several rotations after each adjustment to observe the impact of the change.
- Continue adjusting until tracking is maintained.
- If the conveyor does not have snubber rollers, perform the adjustments on the adjustable take-up pulley.

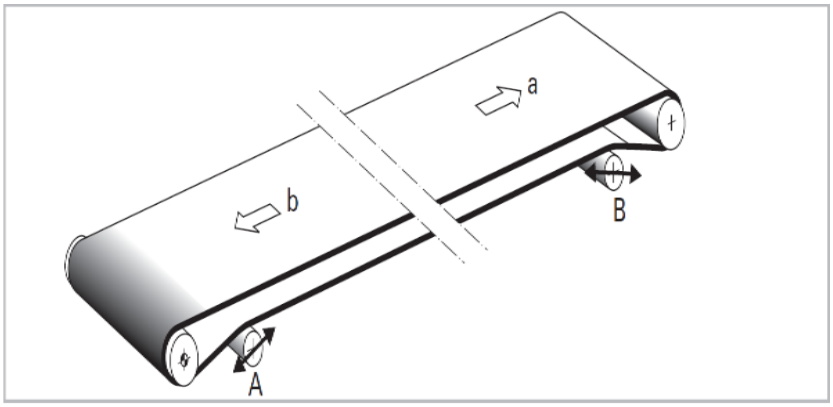

Figure Z- Snubber roller A tracks the belt correctly in running direction a, snubber roller B tracks the belt correctly in running direction b.

Unlike cylindrical-conical drive and take-up pulleys, adjustable snubber rollers are not self-tracking. This means when belt running direction changes, the pivoted position of snubber rollers must be reset. As this is not practicable, the use of adjustable snubber rollers for belt tracking **is not recommended for reversing operation.**

However, exception to this rule can be made for long conveyors. If there is sufficient distance between the adjustable snubber rollers, they can be used even for reversing operations as well. See Figure Z.

In this case run the conveyor in reverse and repeat the tracking adjustment process with the opposite snubber roller. Properly tracking a reversible conveyor can take many iterations in both directions and requires patience.

Tracking issues can be caused by:

- Improper off-center belt loading
- Frozen or jammed pulleys
- Frame or structure crooked/not level
- Material build up on pulleys/rollers
- Pulleys/rollers out of line
- Unequal belt length on left and right sides (belt was not cut straight)

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Solaris Oilfield v. Masaba, IPR2024-01179

SECTION 5 – TROUBLESHOOTING

CONVEYOR BELT PROBLEMS

- **Belt Stretches Excessively**

1. Tension on the belt is too high	1. Reduce tension to where the belt will run without slippage.

- **Belt Creeps to one side**

1. Improper off center belt loading	1. Load in direction of belt run, at belt speed on center of belt.
2. Frozen or jammed rollers	2. Lubricate rollers, square rollers if necessary
3. Frame crooked or not level	3. Check alignment by stretching a string along frame edge, make correction, level frame.
4. Drive pulley or roller out of line	4. Realign the pulley/rollers perpendicular to the belt center line or move pulley/roller end in direction of belt has shifted.

Solaris Oilfield, Ex. 1135, p. 11
Solaris Oilfield v. Masaba, IPR2024-01179