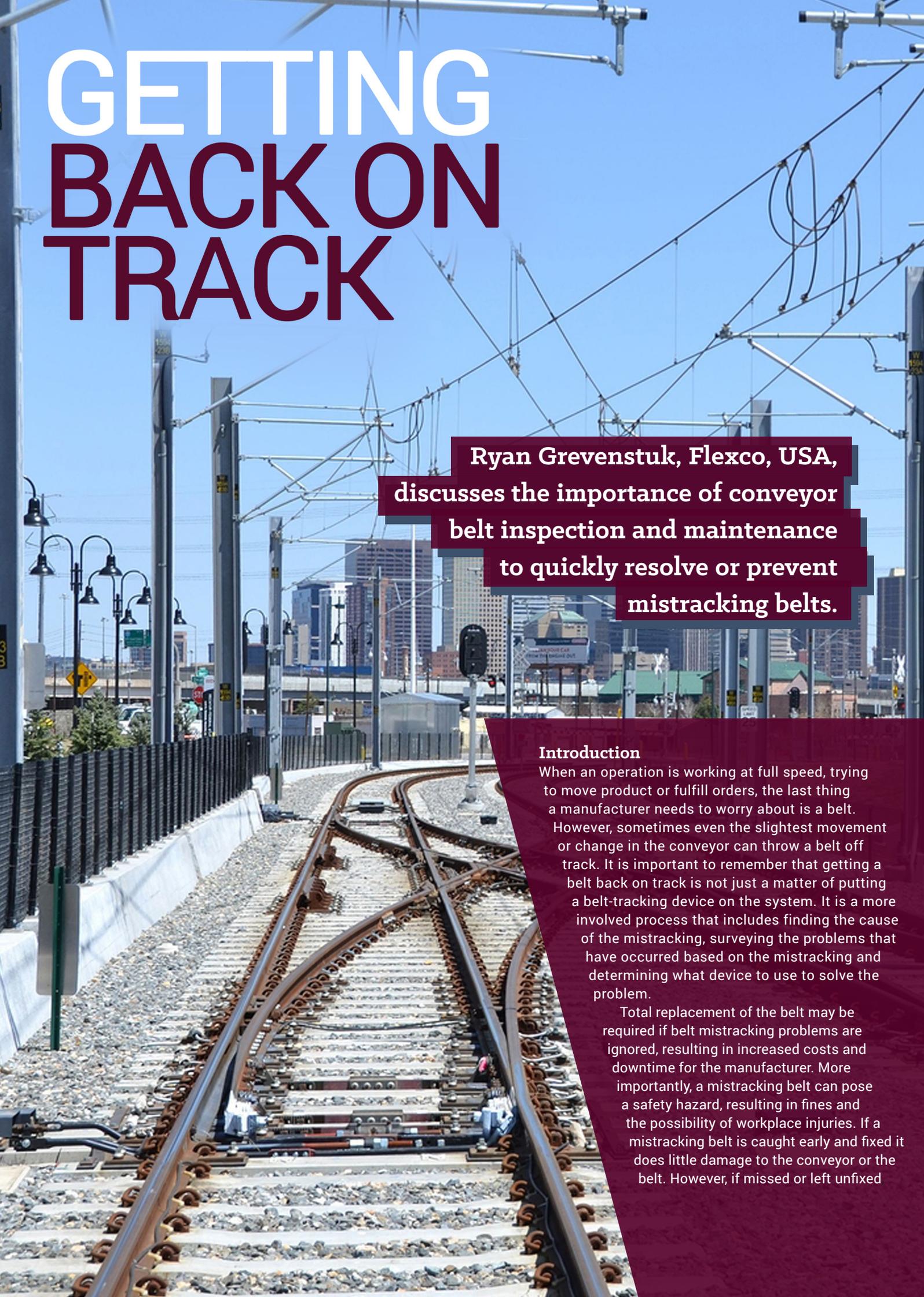


GETTING BACK ON TRACK



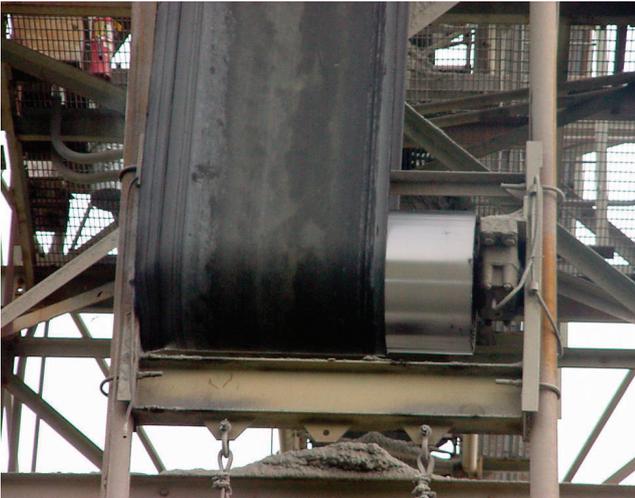
Ryan Grevenstuk, Flexco, USA, discusses the importance of conveyor belt inspection and maintenance to quickly resolve or prevent mistracking belts.

Introduction

When an operation is working at full speed, trying to move product or fulfill orders, the last thing a manufacturer needs to worry about is a belt. However, sometimes even the slightest movement or change in the conveyor can throw a belt off track. It is important to remember that getting a belt back on track is not just a matter of putting a belt-tracking device on the system. It is a more involved process that includes finding the cause of the mistracking, surveying the problems that have occurred based on the mistracking and determining what device to use to solve the problem.

Total replacement of the belt may be required if belt mistracking problems are ignored, resulting in increased costs and downtime for the manufacturer. More importantly, a mistracking belt can pose a safety hazard, resulting in fines and the possibility of workplace injuries. If a mistracking belt is caught early and fixed it does little damage to the conveyor or the belt. However, if missed or left unfixed

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Many belt tracking devices have guide rollers that help actuate the movement of the belt tracking device.



other types of damage can occur. If a belt is constantly hitting a structure, it could not only cause damage to the structure itself, but also shave layers off the belt until there is little left. The width of the belt could also be affected, reducing the amount of material it can carry.

What causes mistracking?

When trying to fix mistracking, the first thing that needs to be explored is why it is occurring. The best way to go about this is by performing a conveyor assessment. A conveyor assessment is a full inspection of the conveyor that can help determine any problems that need to be fixed or equipment that needs to be updated, replaced or added. When searching for the cause of mistracking, special attention should be paid to splices, the conveyor structure and any material buildup or damage to the idlers and pulleys.

Improper belt preparation before splicing can be a major source of mistracking. When going over a pulley, an improperly squared belt can have a tendency to wander back and forth on the conveyor structure, which can lead to damaged structures, improper loading and other related issues. In this case, the belt needs to be taken offline and the splice must be replaced using proper belt squaring techniques.

The structure of the conveyor can also cause the belt to wander from side to side. Over time, several factors can change the structural integrity of a conveyor structure, including weather. If the structure was not built to withstand winds blowing across it, the structure may have to be reinforced for stability. Weather can also affect the belt itself, causing it to mistrack. Strong winds, for example, can blow the belt off to the side if the conveyor is not enclosed. When combined with snow and rain, the resulting pressure on one side of the belt can push it offline. The same is true with the sun shining on one side of the belt and not the other, heating the belt and causing it to wander.

Misalignment of rollers and pulleys can also lead to belt mistracking. Even the slightest difference in one roll can pull the belt off track. Improperly positioned head pulleys, tail pulleys and bend pulleys can also contribute to mistracking.

Material buildup may be one of the most common causes of belt mistracking. When materials build up on idlers and pulleys it throws the rollers off, causing the belt to wander. This buildup can also change the tension of the belt, which can result in shorter life of the actual belting and other components such as cleaners. Belt cleaners are an effective way to keep idlers and pulleys free of carryback material. Installing a cleaning system will go a long way toward keeping belt mistracking and other common system problems caused by carryback in check.

The results of mistracking

Mistracking can cause a variety of problems, including materials spillage. When a belt mistracks,

Squaring belt ends

Squaring the belt ends is a job that takes only a few minutes and offers real paybacks in extending belt splice life. A splice applied on a belt that is properly squared will have the tension evenly distributed across the splice. Properly squared splices will help prevent mistracking.

Prior to any work undertaken on the conveyors, the power must be turned off and the belt 'locked out'. Other safety precautions outlined in the operator's manual should be followed. The following steps will help ensure that a belt is properly squared:

1. Mark the actual centre points in belt width at intervals of 3 to 5 ft, for a distance back from the intended splice area of 15 to 20 ft.
2. Using either a steel rule or a chalk line, mark the average centre line through the points measured in step 2.
3. Using a square, draw a line perpendicular to the average centre line across the belt width.
4. For even greater accuracy in preparing the squaring line and with belts with worn edges, mark two lines (B&C) an equal distance from the centre line in the area where the splice will be installed, running parallel to the centre line.
5. Measure back from the intended splice area a distance equal to approximately three times the belt width and drive a nail or awl at this point on the centre line. Using the nail or awl as a pivot point, swing an arc, marking the belt across the full width.
6. Where this arc intersects the two smaller lines marked parallel to the average belt centre, align a steel rule through these points. The resulting line is the true square.
7. Mark this line and cut the belt at this line using a belt cutter.

it is common to look at what may be falling off the conveyor because of the change in the belt's path. Whether conveying larger materials or miniscule materials such as sand, spillage represents lost revenue and, in many instances, huge safety risks.

In other cases belt mistracking can cause damage to a belt and conveyor structure, which could lead to serious problems. In some cases, layers of the belt can be shaved off the sides and material can spill off the topside onto the area around it. Additionally, as the width of the belt decreases, the amount of material able to be carried on the belt is reduced, cutting into profits.

Fixing the problem

Ideally, the way to fix a belt that is mistracking is to go straight to the source and eliminate the problem. While some repairs are easy and will train a belt to function properly, others are cost prohibitive (moving or remodelling the structure) and some are beyond a manufacturer's control (weather conditions). When

permanent structural changes cannot be made, devices must be used to help track the belt correctly.

When a manufacturer is on a tight schedule and a large amount of downtime will stall an operation, it can be tempting to employ a quick fix to get the mistracking under control. One of the most common quick fixes involves tying two rollers to the side of the conveyor to keep the belt running to the centre. The problem with this method is that a roller on the edge of the belt is not always effective because belts prefer to pull not push, so the rollers are actually working against the belt.

One way to adjust the belt is to use friction – skewing the roller in comparison to the direction of the belt. Another way is to affect the tension profile. Belts naturally want to 'walk away' from a higher tension. If tension is increased on one edge, it will 'walk' the other way.

Field testing has proved that a combination of friction and tension is the best way to put a belt back on track when the structure cannot be aligned. Many equipment manufacturers offer a steel return roller with an adjacent edge roller that causes the roller to pivot or skew relative to the travel of the belt. The friction of the roller on the belt steers it back. The problem with this method is that the edge of the belt strikes the roller with heavy force without much effect, exerting heavy pressure to the belt edge. This situation can generate high force into the roller and can damage the belt.

To avoid exerting heavy pressure, it is best to utilise a design that provides friction and changes the tension profile by tilting as well as pivoting. When both the friction and tension mechanisms work together, they are more than three times as effective at restoring belts back to the centre of the conveyor.

Pinpointing the mistracking and choosing a device

Before finding a device that can help solve a problem, the type of belt mistracking a manufacturer is experiencing must first be identified. If a belt is constantly mistracking and moving back and forth, it is experiencing wander. A belt that constantly runs to one side is simply mistracking. The appropriate device to choose depends on which type of mistracking is occurring, along with the belt tension and belt speed, thickness, width and whether the belt reverses.

A proper belt positioner is a simple, reliable solution for problem belts that consistently mistrack to one side of the conveyor. A belt positioner works on the return side belt using simple angled rollers mounted in a fixed position to quickly and continuously funnel the belt into the correct path. This is a quick, simple solution for belt tracking problems caused by conveyor misalignment mishaps, ground shifts or on temporary systems.

However, belt positioners are not meant to work with top-side belt mistracking, or for belts that mistrack from side to side. Ideal for use on belts with

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medium-to-high running tensions, a belt positioner is not appropriate for use on belts with low running tensions.

For top side or return side belts that wander from side to side it is best to choose an active belt tracking device that adjusts based on the movement of the belt. As noted above, an active belt tracking device that affects both friction and the belt tension will most

effectively track the belt. Many of these belt tracking devices will also have guide rollers that help actuate the movement of the belt tracking device. If that is the case, it is important to note that these devices will often not work on reversing belts.

Reversing belts typically need a different style of belt tracking device designed to work in both directions. Before putting a belt-tracking device on a belt it is best to clarify that it will work on reversing belts if the application warrants, otherwise it may do more harm than good.

Keeping an eye on the entire system

In most cases mistracking can be solved by following the procedures listed above, which means a belt can be back on track in no time. Preventive maintenance can signal some of these challenges before they bring an operation to a halt.

Inspecting and performing maintenance on all of the conveyor system components should be part of an overall maintenance plan. Time and money can be saved with scheduled work stoppages for maintenance and by replacing equipment before it causes damage to other components in the system. The amount of effort put into proactive maintenance will decrease the amount of unexpected downtime, help ensure employee safety and help an operation run more efficiently. 🌐