

# Magic carpet ride

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Glass conveying is a lot like an egg race — any trip-ups, and it's all over. Here are some tips for keeping hot and cold end conveying systems running smoothly.

## Better alignment and parallelism for longer life

The importance of good alignment can't be overstated — misalignment increases the likelihood of excessive lateral guide wear, chain wear, increased maintenance, and shortened chain life. To align and level new sprockets and idlers for minimal lateral offset, a steel rule is usually adequate. However, the long center distances common in glass conveying systems often require more sophisticated alignment tools, such as lasers. One simple and inexpensive way to align elements is to place a laser-pointing device in the guide groove of one sprocket and direct the beam toward another to be checked; the beam should fall in or near the second sprocket's guide groove.

When sprockets are not parallel, chains may run crooked and interfere with lateral guides, but how closely must sprockets be aligned? It depends on the design and placement of lateral guides. The closer the guides are to the sprockets and the smaller the space between guides, the more

important alignment and parallelism become. Verify parallelism by measuring the distance between sprockets at two different points along sprocket teeth.

Wear plates, or dead plates, should be flat, with no exposed sharp edges. Lateral guides typically have profiles that make contact with chain side plates and do not interfere with chain movement. They should be straight and run parallel to a line extended between the sprockets.

## Chain tensioning

Chain tension should always be kept as low as possible, with just enough tension to provide satisfactory operation. Remember that over-tensioning can be more harmful to a chain than under-tensioning; it accelerates chain and sprocket wear.

During installation, first adjust sprocket positions (and tensioning devices if present) to their initial minimum center distance positions. With the ends brought together and clamped on the dead plate, run the chain the full length of the conveyor. A chain

## Stopping a chain

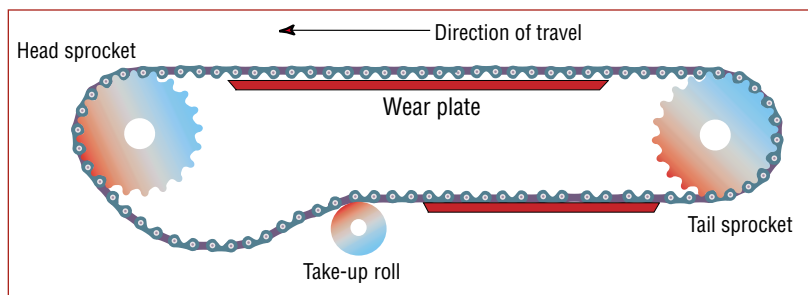
If a chain and sprockets are properly installed, required maintenance should be minimal. When tune-ups are in order, non-lubricated chain shouldn't be idle for more than a few hours. Rust and carbon build-ups quickly cause chain to stiffen; if left too long, it may lock up and become unusable. Cycling the chain every few hours or by spraying the chain with lightweight oil before shutting down can prevent this. The oil can be burned off when the machine is restarted. If a machine is going to be shut down for more than a day it may be advisable to remove the chain and soak it in light penetrating oil.

should be tensioned so that it gently sags between the head sprocket and first idler roll, shortened to remove any excess length, and connected before removing the clamps.

- New chain should run for several complete cycles to verify proper installation. The chain should operate smoothly, running in a nearly straight line between the sprockets, with no noticeable jerking or surging.
- In hot end applications chain lubrication is generally not recommended. If a lubricant is used, it should withstand chain operating temperatures and leave no thick residues, which can block inter-link spaces and interfere with chain flexibility.

## Maintenance

Over time, wear of joint components causes chains to elongate. Periodically this should be visually checked, and the chain



Shown here is a typical glass conveying system. Note that some systems employ automatic-tensioning devices instead.

**Troubleshooting**

**Symptom:** Chain elongates or “stretches” too quickly **Action:** Check for excessive chain tension or insufficient lateral guide clearance. Both of these conditions can produce chain overloads, leading to rapid elongation and short life.

**Symptom:** Pin heads are cracked, chipped, or worn excessively **Action:** Check that lateral guides are straight and properly aligned with no corners or edges that the heads impact. If chain link tips are worn and the bottoms of the heads are rubbing the guides, then it is probably necessary to replace the chain. Also, inspect wear plates for unusual wear or grooves that cause the chain to run lower relative to the guides. If pin heads project excessively from the side of the chain then replacement may be required.

**Symptom:** Chain appears to be splitting **Action:** Check for damaged pin heads.

Damaged or missing pin heads can result in links coming out of the chain. When this occurs, links in the chain’s center migrate outward, creating a gap or split in the center of the chain. A chain that has been damaged in this manner should be replaced.

**Symptom:** Chain jerks or surges **Action:** Check for guides or other machine parts that interfere with free movement. Check pin heads for signs of impact. Check that the connecting pins used to join each section have been properly peened over and that chain lacing is correct. Inspect sprockets for debris accumulation between the teeth.

**Symptom:** Chain speed is not consistent **Action:** This can be caused by connecting used sections of chain with unused sections, a practice not advised. Also, inspect for debris accumulation between sprocket teeth.

**Symptom:** Chain does not run straight **Action:** Check that sprocket shafts are parallel and sprocket faces are aligned.

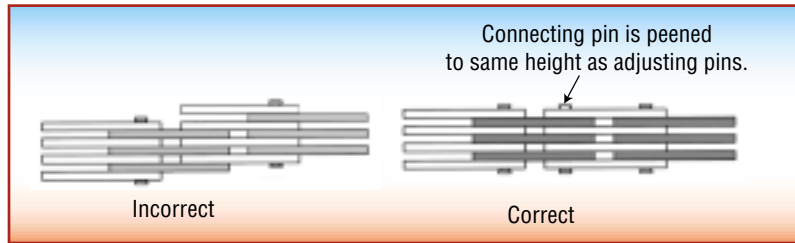
**Symptom:** Chain runs too fast **Action:** If chain speed cannot be adequately reduced with motor adjustment, the chain may have elongated so much that replacement is necessary. Check to see if chain runs on the outer edges of sprocket teeth to verify excess elongation. Also check for accumulation of debris between sprocket teeth.

**Symptom:** Excessive wear on chain guide links **Action:** Inspect sprocket alignment. Also, make sure lateral guides do not force the chain to one side of the sprockets.

**Symptom:** Excessive wear on driving links **Action:** Inspect wear plates for warpage, deep grooves, bending or other damage. These conditions can affect chain tracking.

re-tensioned as necessary. After the limits of sprocket adjustment have been reached, it may be necessary remove a small section.

When chain pitch elongates enough, chain fails to wrap the sprocket and conveyor speed control degrades. These are signs that chain and possibly sprocket replacement is in order. Chain should also be inspected visually for evidence of wear on the pin heads and the link tips. Normal wear of the link tips reduces the



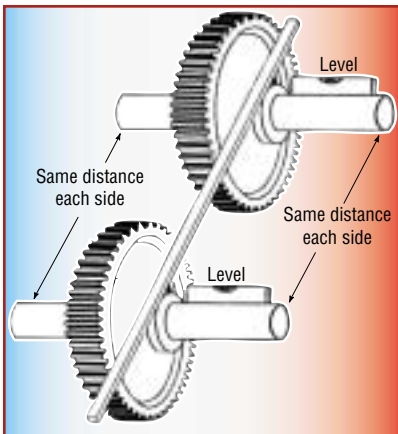
It is important that chain be correctly laced at the connection, and that pins are sufficiently peened to retain the side link plate.

height of the chain over time and may cause the pin heads to rub or impact lateral guides. Wear on a pin head’s bottom surface is a common indicator of lateral guide interference. Broken or cracked pin heads are evidence of the chain impacting some part of the equipment. In some cases, extended operation in highly abrasive environments can result in individual link plates wearing thin. As this occurs, the pin heads may project excessively from the chain’s side. This is an indication that the chain should be replaced because it usually results in pins impacting lateral guides and chain failure.

Sprockets should be replaced if the teeth are worn thin, if a newly

installed, chain does not fully wrap the circumference, or if chain skips teeth during operation. When replacing a chain that has delivered satisfactory performance, it is normally not necessary to re-verify sprocket alignment. However, chain width sometimes varies, making readjusting lateral guides necessary. Also, dead plates should be inspected for warpage or severe grooving, and any debris accumulation should be removed from between sprocket teeth. Once the new chain is installed it should be cycled to confirm smooth operation.

For more information visit [www.ramseychain.com](http://www.ramseychain.com).



For improved alignment of side guide type sprockets, a laser can be placed against a sprocket face in place of a steel rule.