

# Elevator Leg Troubleshooting

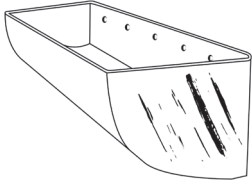
## IDENTIFY PROBLEMS BY EXAMINING ELEVATOR BUCKET WEAR

The centrifugal discharge bucket elevator is very popular in the grain and feed industry for elevating large quantities of bulk material quickly and cost effectively, but when issues arise, it can be difficult to identify the causes.

To diagnose and troubleshoot elevator leg performance problems, it is possible to find clues by examining the plastic buckets for abnormal wear and tear.

### Side Wall Damage

Scrapes or scratches on plastic elevator bucket side walls indicate belt migration on the pulleys, as the buckets are sliding along the side wall of the elevator leg casing. Correct this by leveling the pulley and making sure there are no bent or worn pulley shafts. Increasing belt tension will keep the belt centered on the

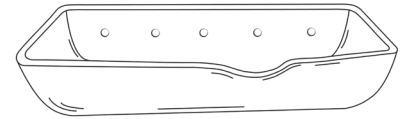


*This article is based on a presentation by Carl Swisher, sales manager, 4B Components Ltd., Morton, IL (309-360-1228), given at the GEAPS Cornbelt and Hoosier chapters' 2018 mini-convention, November 13, in Covington, IN.*

crown of the pulley. In rare cases, the belt may not have been cut straight or the mechanical splices not installed at a 90 degree angle from the belt edges.

### Front Lip Bowed Out

A bowed out front lip suggests that there is an obstruction inside the bucket elevator or that the belt has not been tensioned properly. Check the throat plate for proper adjustment as well as the clearance of the bucket lip in the boot section. Tightening the belt will make it more taut and reduce any “flapping” that might allow the bucket lips to scrape the inside of the casing or launch off the pulley.



A worn bucket face that has become thin from excessive wear also is susceptible to being bowed out due to the weight of the product. If the material being elevated is too heavy for standard HDPE buckets, consider installing buckets made from nylon for greater impact tolerance and rigidity.

### Plastic Bucket Materials

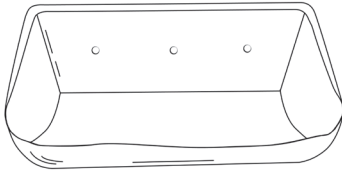
The most common material used in the production of plastic elevator buckets is **high-density polyethylene (HDPE)**. It is relatively inexpensive, made with FDA-compliant resin, and durable enough for most grain and feed applications.

**Nylon** offers superior abrasion and impact resistance for applications such as fertilizer, sand, or high-throughput systems. Nylon also has superior heat tolerance up to 350 degrees F intermittent.

**Polyurethane (urethane)** is another engineered resin that offers abrasion resistance but also flexibility, and adhesion resistance for applications such as sticky animal feeds, sharp-edged inputs, or high-throughput systems.

### Excessive Wear

Although plastic buckets inevitably wear out over time, if the wear is rapid or excessive, the capacity of the bucket will be diminished and replacement will be required. Several causes can drive excessive wear: The input may be too abrasive for the type of plastic being used for the buckets. Switching to a resin with greater abrasion resistance, such as nylon or urethane, may be the solution.



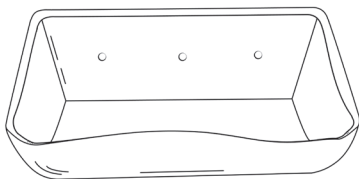
The caking of material in the corners of the boot or casing also can accelerate wear. An alternative to replacing all buckets with a material with greater abrasion resistance is adding a “digger” bucket every seven to 10 buckets in series. Digger buckets usually are made of steel and fabricated to be 1/4-inch greater in length and projection. Their oversized dimensions break-up the crusty or caked material and allow the following plastic buckets to carry the load. It is possible to use a same-sized nylon bucket as a digger with the employment of spacers between the bucket back and the belt to push out the digger the necessary 1/4 inch.

Finally, excessive down-legging can distribute additional material in the boot causing the bucket to dig through the input more than is necessary. Severe down-legging, or material not making it into the outlet hopper and continuing down the casing, can be caused by a multitude of problems from loose belt tension, to improper belt speed, to the wear of the buckets themselves.

Normal bucket wear, as a result of a well-maintained elevator leg, should show a slight degradation of the center front lip with more toward the corners.

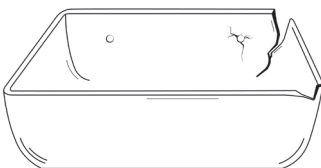
### Sharp Edges

If the bucket presents a sharp front lip, as opposed to a more rounded wear pattern, this could indicate a loose belt causing the bucket to scrape along the bottom of the boot. The input also could be caking in a layer on the bottom of the boot, abrading the bucket to a sharp point. Increasing belt tension or installing digger buckets will help resolve this issue.



### Cracks Between Bolt Holes

Impact to the bucket often is the cause of cracks between bolt holes. The same goes for fractures along bucket seams. Unless an obstruction can be found within the elevator leg, this usually is a one-time occurrence caused by a foreign object entering the leg. Look for loose buckets or bucket pieces in the down-stream process.



Over tightening of the bucket bolt nuts also can cause cracks between bolt holes. The use of a larger fender washer helps protect plastic buckets from the tightening pressure of the nuts and also reinforces the area. ■