

Maxi-Lift Inc.



GEAPS North Central Conference Bucket Elevator Troubleshooting

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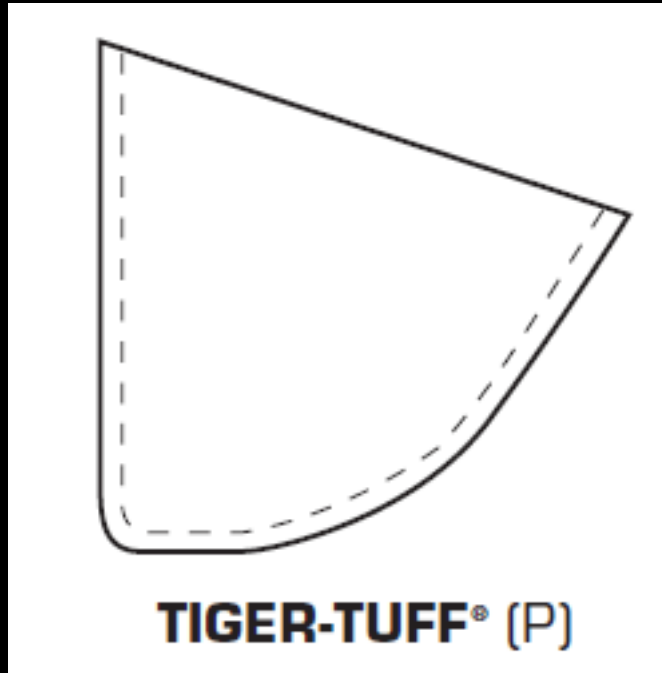


Today's Topics

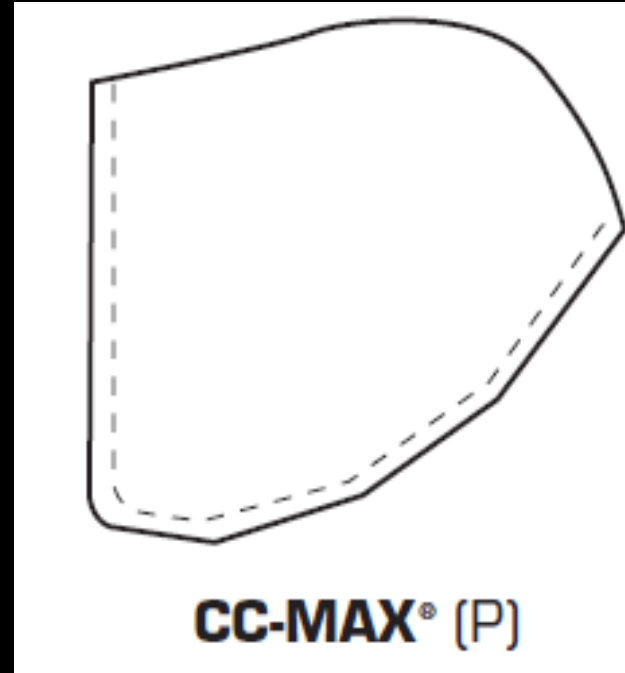
- Bucket Styles
- Speed and Discharge
- Venting
- Trouble Shooting



Prominent bucket Styles



Calumet

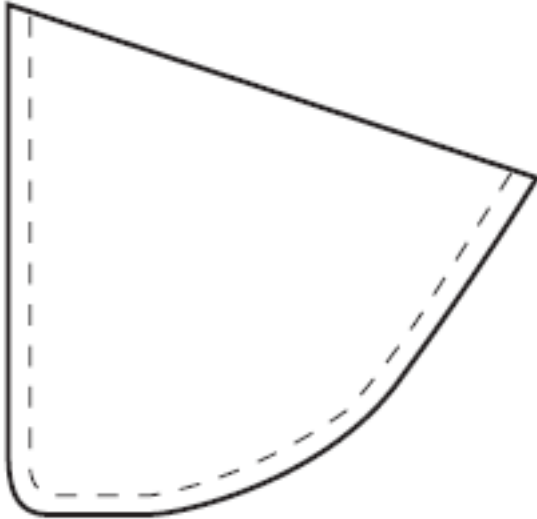


CC-B



Calumet Style

- Smooth Belly allows gentler filling and discharge

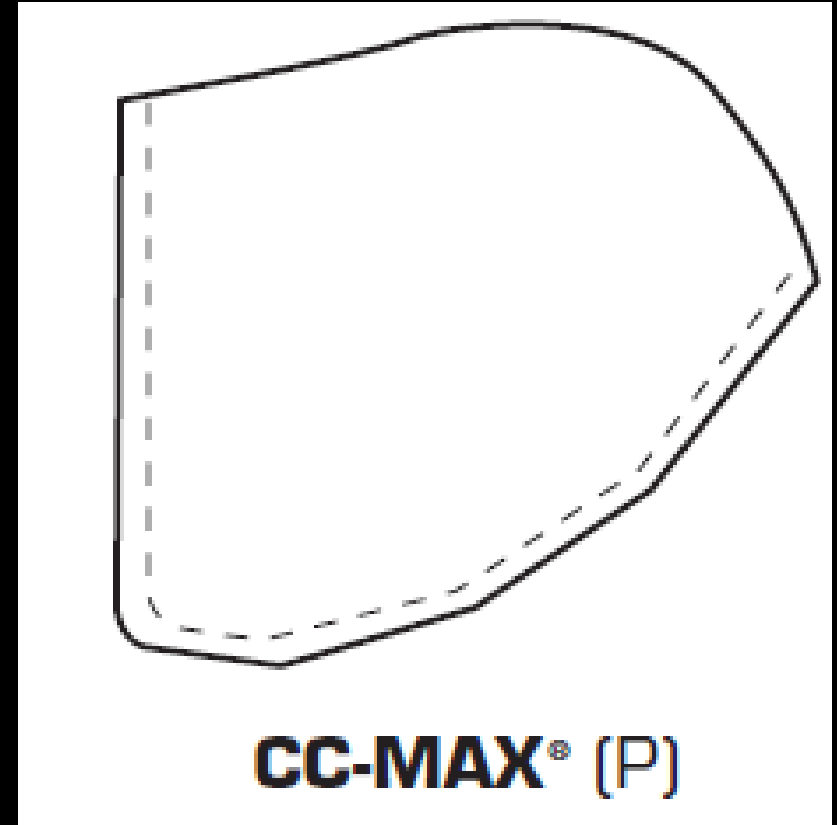


TIGER-TUFF® (P)



CC-B

- Used break forming to make radius
- Characterized by high ears





DISCHARGE

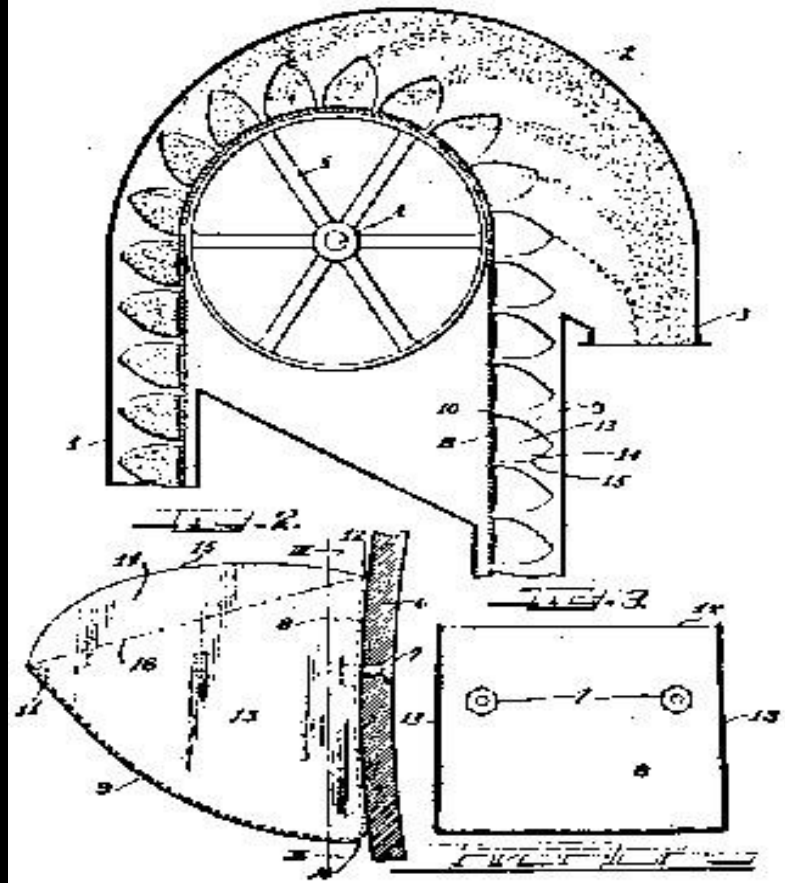
- Generally they are interchangeable.
- Calumet buckets have higher front lip positions and will begin to discharge and finish discharging later than CC Style buckets.



Operating Speeds

- Speed primarily dictated by commodity handled.
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- Secondarily dictated by pulley dia./bucket projection ratio.
 -
- Complete speed charts in full catalog and online
 -

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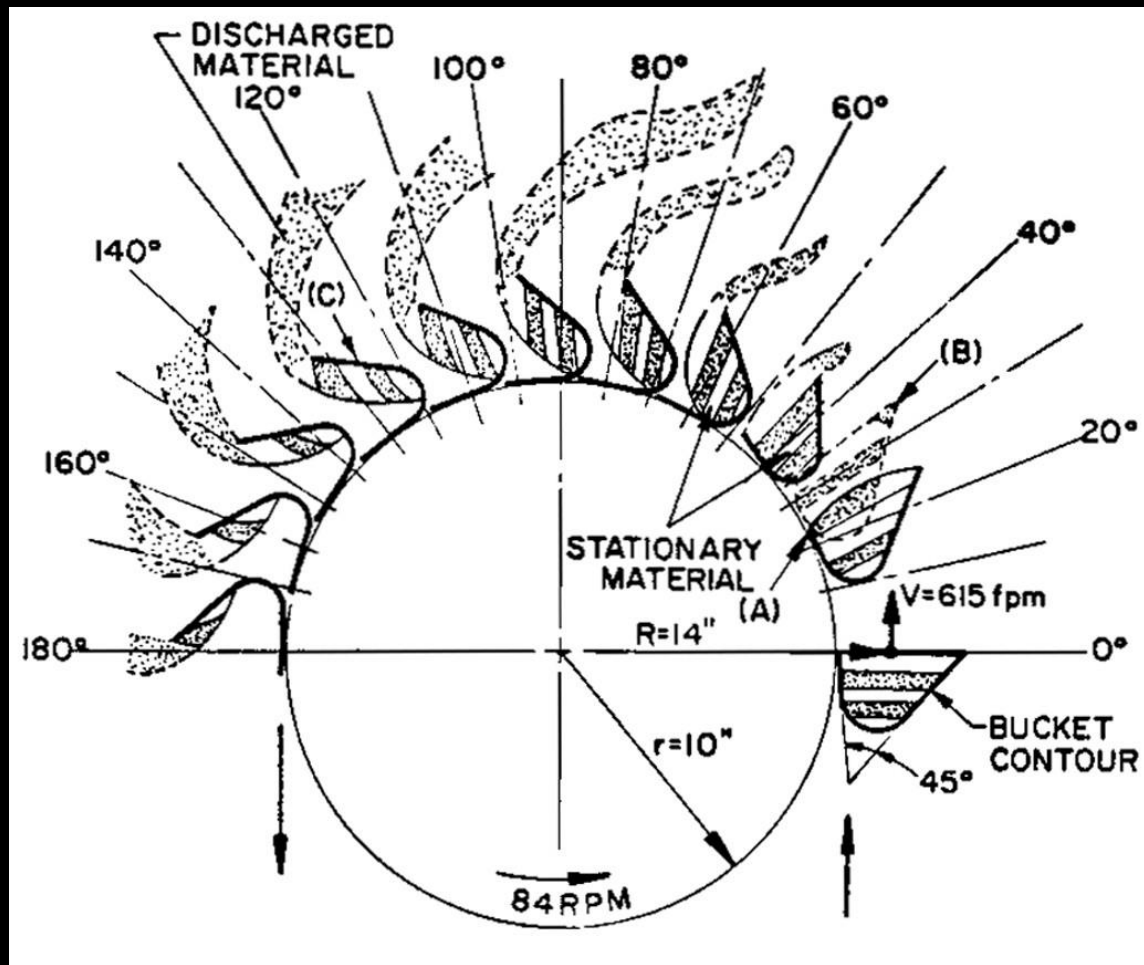
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Bucket Discharge

- Determined by belt speed, and commodity being conveyed.
- Elevator will begin to discharge at about 30-40 degrees before top dead center
- Complete discharge should occur at approximately 80 degrees below top dead center.

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Discharge Position

- As speeds and capacities have gone up, throat position has gone down
- Most manufacturers have a minimum position of 45° below centerline of head shaft



Bucket Discharge

- In theory, capacity can be gained by increasing belt speed.
- Practical application can be tricky



Speed Increase Effects

- Earlier Discharge
- Higher throw trajectory
- Increased air volume
- Reduction of time window
- Increase in commodity damage



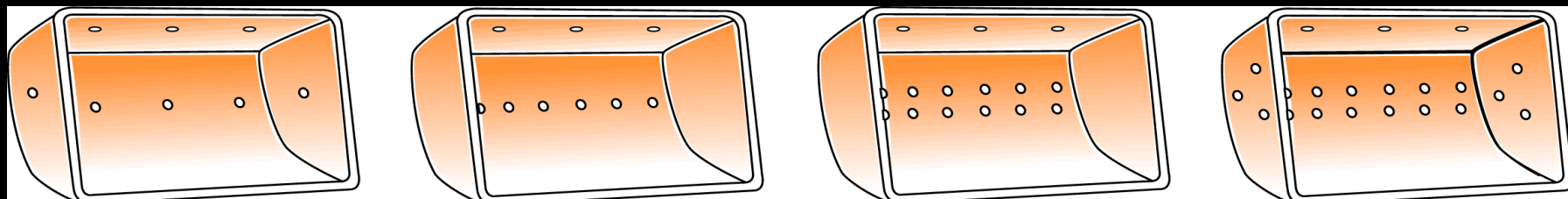
There are some general rules that used to be followed for estimating:

1. The head pulley should be 5x's the cup projection. (no longer standard)
2. The cup spacing should be projection + 2". (now 1" is common)
3. Water level is a conservative estimating figure for most free flowing agricultural applications.



Bucket Venting

Aids in fill and discharge of light fluffy, or poor flowing materials.
Service provided at a nominal charge.



**Standard
Vent**

#2 Vent

#3 Vent

#4 Vent

**Same holes in
body as
mounting
holes**

**Twice as many
holes in body
as mounting
holes**

**Four times as
many holes as
mounting
holes**

**Same as #3
Plus three
holes in each
end**

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Bucket Venting

It is virtually impossible
to have too much venting.
When in doubt, vent!



Air Movement

- Buckets are not unlike fan blades.
- The more buckets, the more air movement
- Positive pressure in boot, Negative pressure in Head section

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ELEVATOR TROUBLESHOOTING

Causes, Effects, Solutions



Three Categories

- Discharge
 - Down-legging
 - Back-legging
- Bucket Filling
 - Uneven Fill
 - Incomplete Fill
- Premature Bucket Failure
 - Wear
 - Cracking



Discharge Back-legging

- Back-legging describes elevated material falling down the up leg.
 - Causes
 - Speed too fast
 - Buckets worn
 - Obstruction in head or throat
 - Over-filling of buckets



Discharge Down-legging

- Down-legging describes elevated material falling down the down leg.
 - Causes
 - Speed too fast/slow
 - Wiper damaged or missing
 - Throat position too high
 - Buckets un-vented
 - Obstruction in Throat
 - High moisture/Sticky Material
 - Air Pressure in Leg



Bucket Fill Problems

– Causes

- Misguided inlet
- Buckets un-vented
- Pulley/inlet position not optimal
- Speed too fast
- Vertical spacing
- Inlet undersized
- Buckets worn
- Air Pressure in Leg
- Obstruction



Excessive Bucket Wear

- Misguided or poor feeding
 - Buckets must dig to fill
 - Material overloading one side causing misalignment
- Improper bucket Material
- Application tends to cake or build up in trunking
- Severe down legging causing heavy digging



PREMATURE BUCKET FAILURE

- Causes
 - Improper hardware selection
 - Over-torqued hardware
 - Incorrect bucket or belt size
 - Misaligned belt
 - Excessive digging
 - Poor inspection practices
- Solutions
 - Must install a locking device
 - Use proper torque settings
 - Ensure buckets and belting are proper widths
 - Install digger buckets
 - Regular inspections to replace damaged buckets