Sugarbeet Harvester

Checklist –

mouse over 📣 for additional notes in this presentation
# Checklist vs. Slide Rule

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<th>Harvester Slide Rule</th>
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</table>
Row Finder

- Mounts are tight / inspect all welds
- Arms straight, even and move freely
- "T" shaft straight and moves freely
- Arms centered over the row
- Hyd. & Electronics Working properly
- Greased 🧼
**Pinch Point Settings**

Average Weight 2003 - 1.0 lbs to 1.3 lbs
5 year Average - 1.14 lbs to 1.48 lbs

<table>
<thead>
<tr>
<th>Avg Beet Wt. Lbs.</th>
<th>Pinch Point Setting</th>
</tr>
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<tr>
<td>0.9 to 1.2</td>
<td>1 1/2 to 1 3/4</td>
</tr>
<tr>
<td>1.1 to 1.5</td>
<td>1 3/4 to 1 7/8</td>
</tr>
<tr>
<td>1.3 to 1.7</td>
<td>1 7/8 to 2</td>
</tr>
</tbody>
</table>
Pinch Point Angle
## Pinch Point & Depth

### Total Lifted Area (Tons/Acre)

<table>
<thead>
<tr>
<th>Depth</th>
<th>Pinch Point</th>
<th>Actual Lifter Wheel Cut (2&quot; wider)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 1/2</td>
<td>1 5/8</td>
</tr>
<tr>
<td>1 1/2</td>
<td>9.3</td>
<td>9.9</td>
</tr>
<tr>
<td>2</td>
<td>13.4</td>
<td>14.1</td>
</tr>
<tr>
<td>2 1/2</td>
<td>17.9</td>
<td>18.9</td>
</tr>
<tr>
<td>3</td>
<td>23.0</td>
<td>24.2</td>
</tr>
<tr>
<td>3 1/2</td>
<td>28.6</td>
<td>29.9</td>
</tr>
<tr>
<td>4</td>
<td>34.6</td>
<td>36.2</td>
</tr>
<tr>
<td>4 1/2</td>
<td>41.2</td>
<td>42.9</td>
</tr>
</tbody>
</table>

**Difference**

- 15.7 ton
- 18.8 ton
- 21.9 ton

**Difference = Soil Compression & Digging Resistance**
Pinch Points
Wheel Rotation
Close Ups / Wheel Fillers
Paddle Shaft

- Shaft Straight & Welds inspected
- Bearings good & lock collar tight
- Drive chain, gears & slip clutch inspected
- X Paddles Timed
- X Paddle wear & Wheel clearance correct
- Drive Chains oiled & Bearings greased
Apron Shaft & Chain

- Shaft Straight & Welds inspected
- Drive chain, gears & slip clutch inspected
- Bearings good & lock collar tight
- X Apron Chain Tension (worn over 30 to 50%)
- Apron Chain Drive sprockets worn (flip?)
- X Apron to wheel clearance (1.5 - 3"
- X Apron Chain to grab scroll clearance (0.5"
- Drive Chains oiled & Bearings greased
Grabrolls - Rear Delivery
Grabrolls - Side Delivery
Grabrolls

- Inspect bearings (loose or worn)
- X Scrolling in good shape (over 50%)
- X Smooth & Grab tubes (straight & no wear areas)
- X Plastic - chunks missing or worn through
- X Check Lock collars, tappered hubs & shafts
- X Tighten all bolts
- Inspect drive belts / chains & allignment
- X Grab spacing - Pinch side (1-2" tube to tube)
- Drive Chains oiled & Bearings greased
Scrub Chain and Tower

- Inspect Tower for cracks, wear points & loose bolts
- Idler Wheels - check bearings, wear and tightness
- Idler Rollers - check bearings, wear and tightness
- Scrub Chain worn (over 30 to 50% wear)
- Scrub Chain Drive sprockets worn (flip?/replace)
- Tension arms adj. - wheel have 3/4" to 1" clearance
- Scrub Chain to grabroll clearance (0.5"
- Head shaft - bearings, sprockets and drive chain
- Run and inspect Scrub chains alignment
- Drive Chains oiled & Bearings greased
Wheel and Carrier

- Inspect Wheel for wear, cracks (welds) & loose bolts
- Inspect Wheel carrier for cracks & loose bolts
- Wheel carriers - worn - check bearings
- Drive chain, gear & bearings inspected
- Shoe - worn or bent (running centered)
- Knock outs inspected
- Wheel Cleaner inspected
- Drive Chains oiled & Bearings greased
Boom and Mini-Tank

- Inspect Boom for cracks, wear points & loose bolts
- Tank structure sound (tight, welds & fatigue)
- Chain slides - no breaks or excess wear
- Idler Wheels - check bearings, wear and tightness
- Idler Rollers - check bearings, wear and tightness
- Conveyor Chains worn (over 30 to 50% wear)
- Conveyor Chain Drive sprockets worn (flip?/replace)
- Shafts - bearings, sprockets and drive chains
- Run and inspect Conveyor chain alignment
- Hydraulic motors & pumps - tighten bolts & screws
- Drive Chains oiled & Bearings greased
### Speed of Harvester Operation study 1991 - Conducted by NDSU & Uof M Extension

<table>
<thead>
<tr>
<th>Speed (mph)</th>
<th>Sugar %</th>
<th>SLM %</th>
<th>Tare %</th>
<th>Yield (tpa)</th>
<th>Recoverable Sugar / Acre</th>
<th>Rev / Acre*</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>18.10%</td>
<td>1.10%</td>
<td>4.5%</td>
<td>16.3</td>
<td>5,359</td>
<td>$655</td>
</tr>
<tr>
<td>6</td>
<td>18.10%</td>
<td>1.10%</td>
<td>6.0%</td>
<td>14.9</td>
<td>5,073</td>
<td>$599</td>
</tr>
</tbody>
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* Revenue based on ACSC 2003 payment

### Speed of Harvester Operation study 1992 - Conducted by NDSU & Uof M Extension

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<tbody>
<tr>
<td>3</td>
<td>18.25%</td>
<td>1.30%</td>
<td>4.9%</td>
<td>18.1</td>
<td>6,104</td>
<td>$723</td>
</tr>
<tr>
<td>5</td>
<td>18.30%</td>
<td>1.40%</td>
<td>6.0%</td>
<td>17.5</td>
<td>5,877</td>
<td>$695</td>
</tr>
</tbody>
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* Revenue based on ACSC 2003 payment

Recovery provided by NDSU & Uof M Extension.
Speed & Depth

• Keep harvester speed 4 mph or less
• Digging depth should be 2” to 3”

• Indicators for adjustment
  • Excess tare % or large dirt return piles
  • Broken tails or beets in/on the ground
Remember to work safely!

- Use cylinder stops or block equipment when your working under it
- Safety glasses when needed
- Wear gloves when needed
- Shut off tractor before working on equipment

Have a safe and productive harvest