

# Sugarbeet Harvester

## Checklist –

mouse over  for additional notes in this presentation





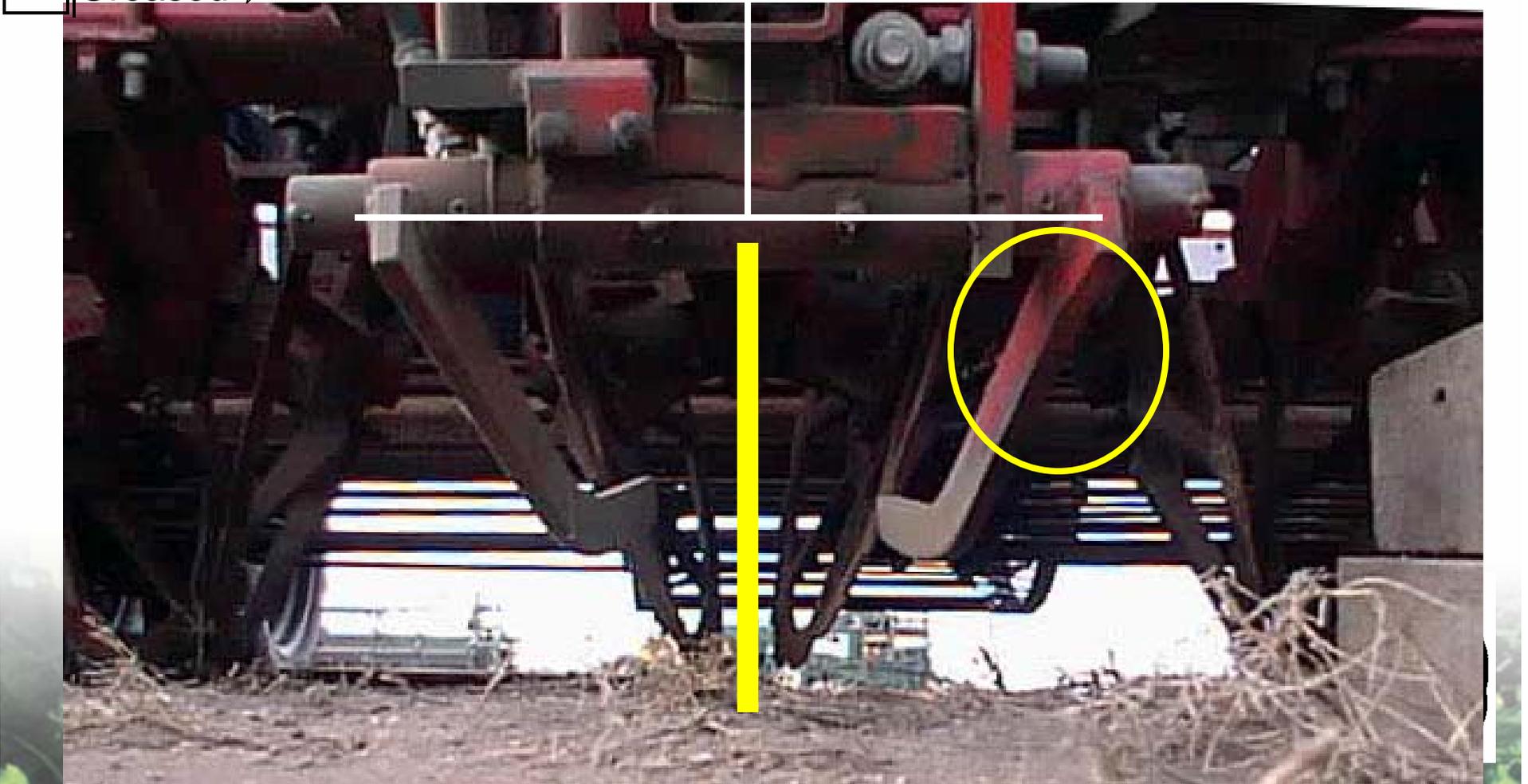
# Checklist vs. Slide Rule

Pre-Field Checklist	Harvester Slide Rule
Hitch & PTO	
	Speed Depth
Row Finder	Row Finder
Lifter Wheels & Struts	Lifter Wheels
Paddle Shaft	Paddle Shaft
Apron Shaft & Chain	Apron Chain
Grabrolls	Grab Bed Rear Delivery Grab Bed Side Delivery
Scrub Chain and Tower	Scrub Elevator
Wheel and Carrier	Wheel Elevator
Boom and Mini-Tank	Tank & Boom Elevator
Structural	
Misc.	



## 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

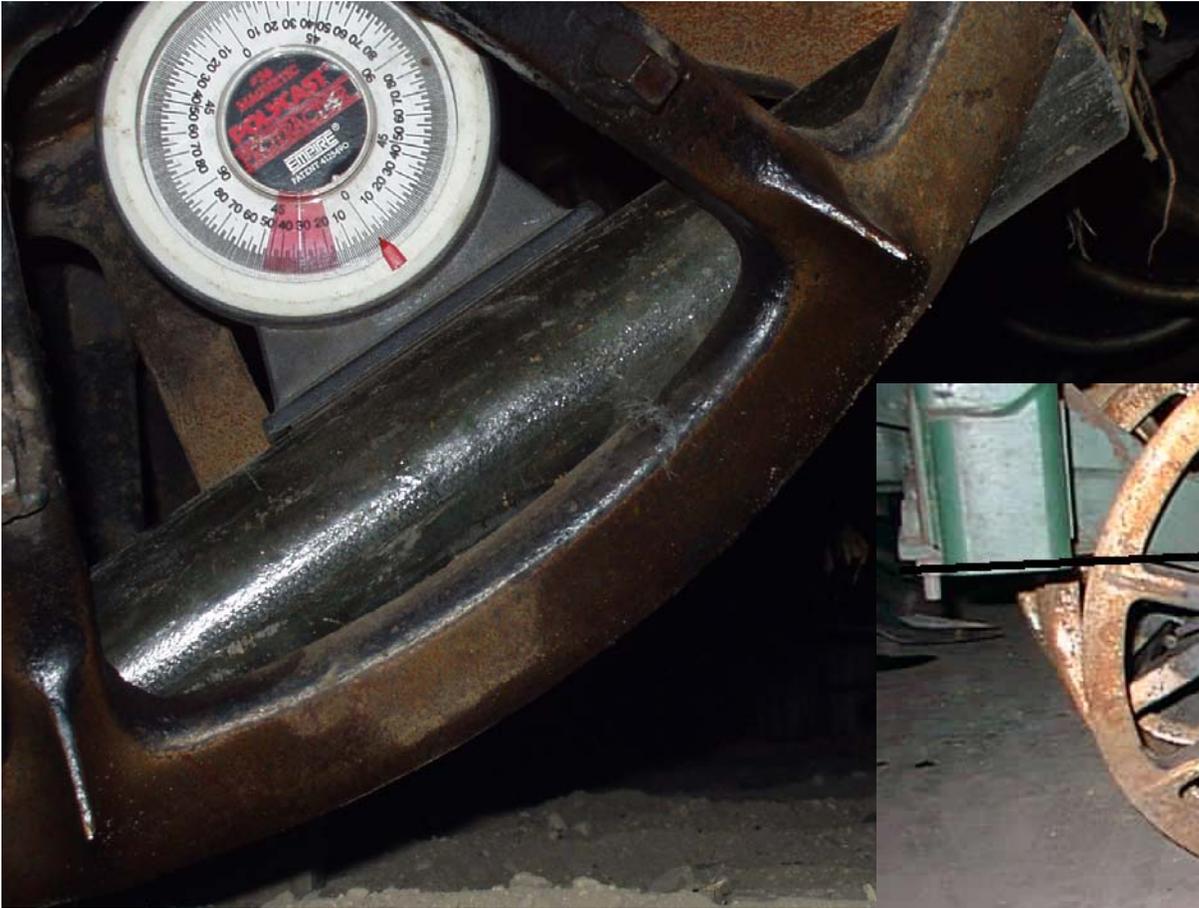
Average Weight 2003 – 1.0 lbs to 1.3 lbs

5 year Average – 1.14 lbs to 1.48 lbs

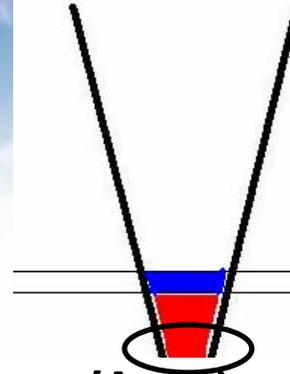
Avg Beet Wt. Lbs.	Pinch Point Setting
0.9 to 1.2	1 1/2 to 1 3/4
1.1 to 1.5	1 3/4 to 1 7/8
1.3 to 1.7	1 7/8 to 2



# 🗨 Pinch Point Angle



# Pinch Point & Depth



Total Lifted Area (Tons/Acre)

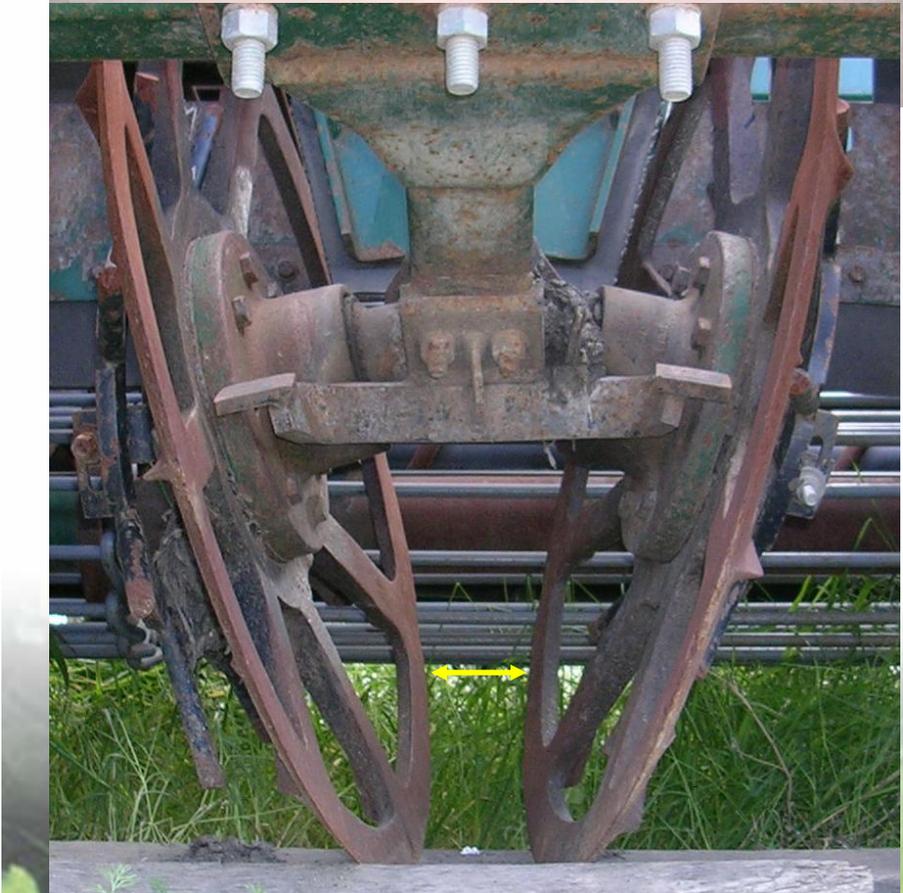
Depth	Pinch Point					Actual Lifter Wheel Cut (2" wider)				
	1 1/2	1 5/8	1 3/4	1 7/8	2	1 1/2	1 5/8	1 3/4	1 7/8	2
1 1/2	9.3	9.9	10.5	11.0	11.6	18.7	19.3	19.9	20.4	21.0
2	13.4	14.1	14.9	15.7	16.5	25.9	26.7	27.5	28.3	29.0
2 1/2	17.9	18.9	19.9	20.9	21.9	33.6	34.6	35.6	36.5	37.5
3	23.0	24.2	25.4	26.5	27.7	41.8	43.0	44.2	45.3	46.5
3 1/2	28.6	29.9	31.3	32.7	34.1	50.5	51.9	53.3	54.6	56.0
4	34.6	36.2	37.8	39.3	40.9	59.7	61.3	62.8	64.4	66.0
4 1/2	41.2	42.9	44.7	46.5	48.2	69.4	71.2	72.9	74.7	76.4

Difference -	15.7 ton	18.8 ton	21.9 ton
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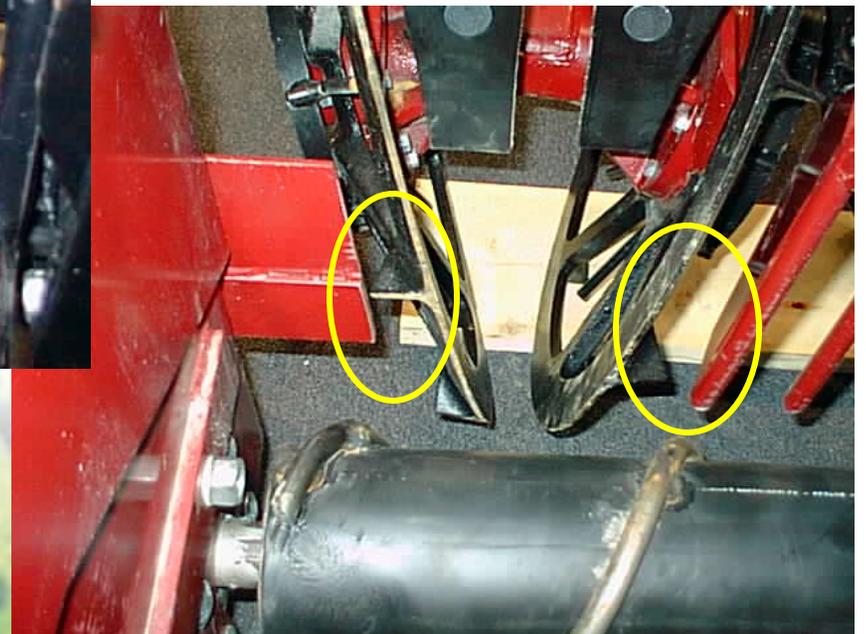
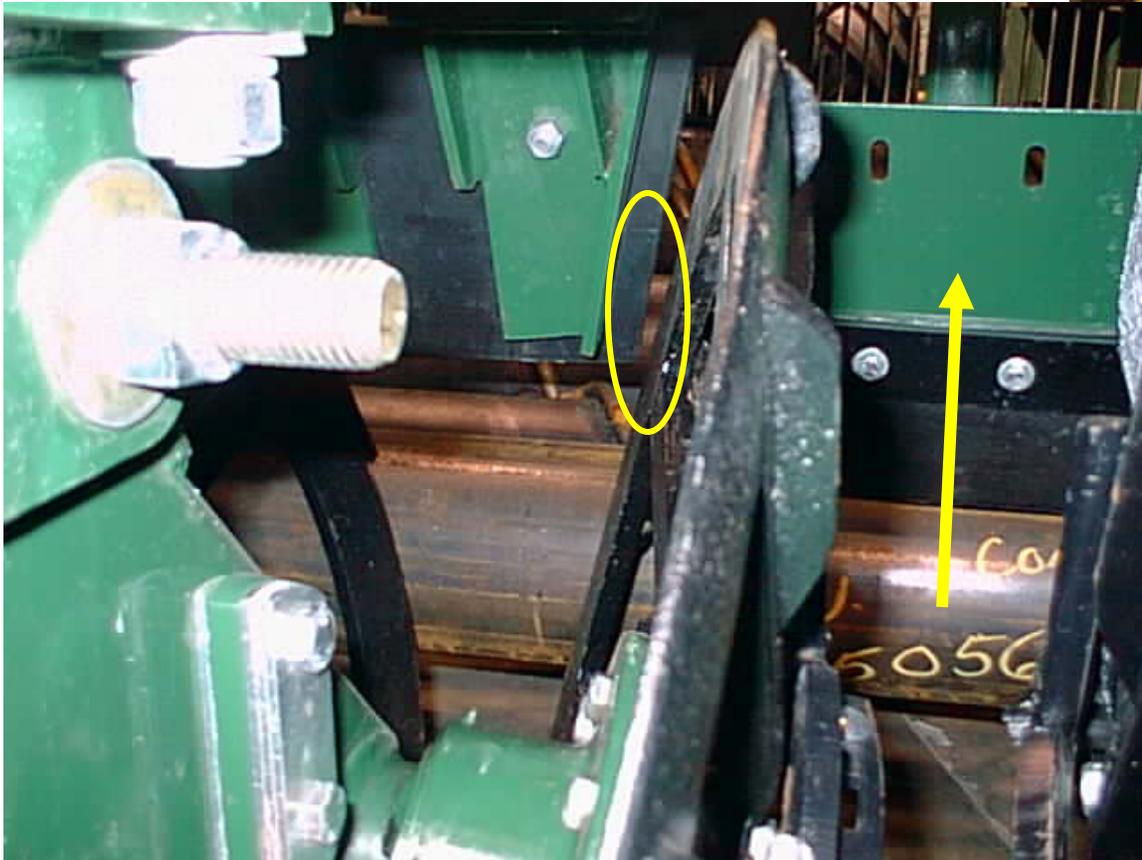
Difference = Soil Compression & Digging Resistance



# Pinch Points

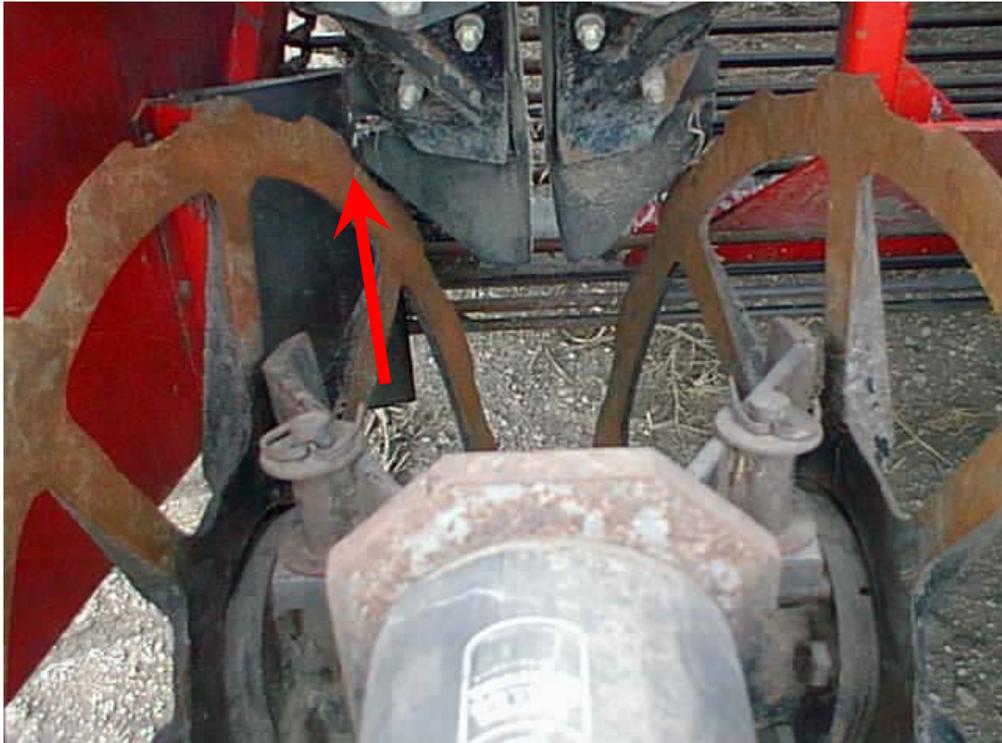


# Wheel Rotation



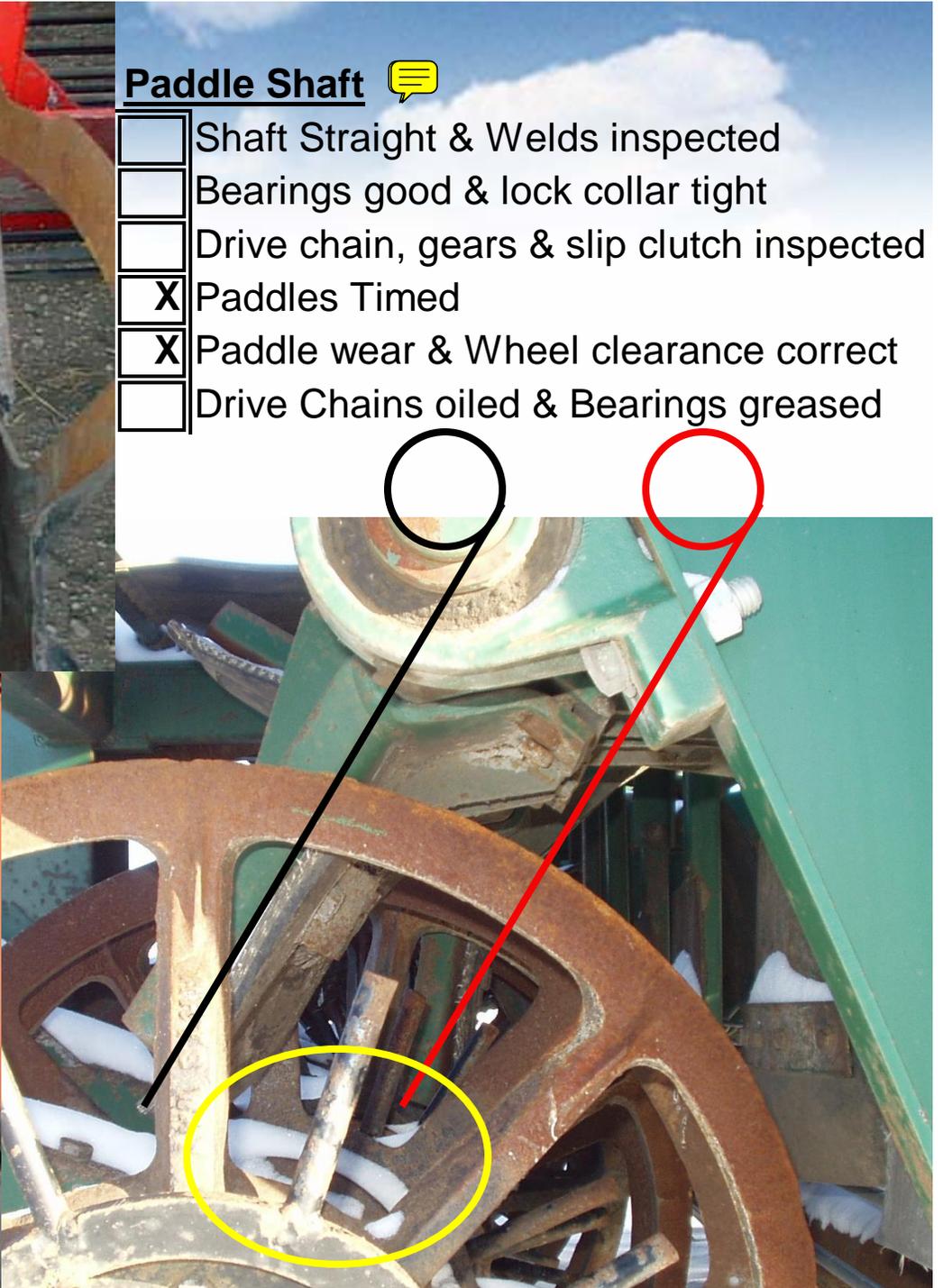
# Close Ups / Wheel Fillers





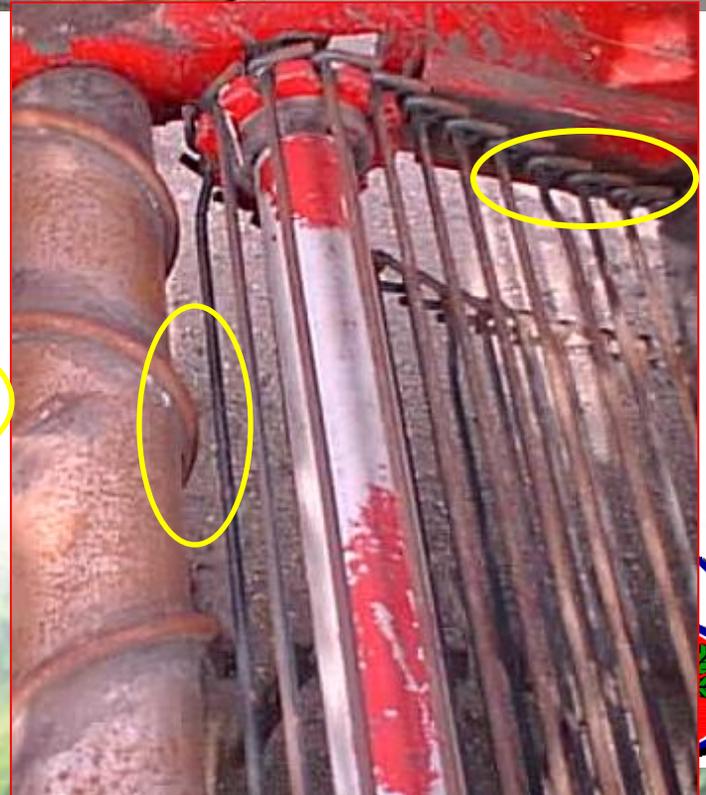
### Paddle Shaft

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

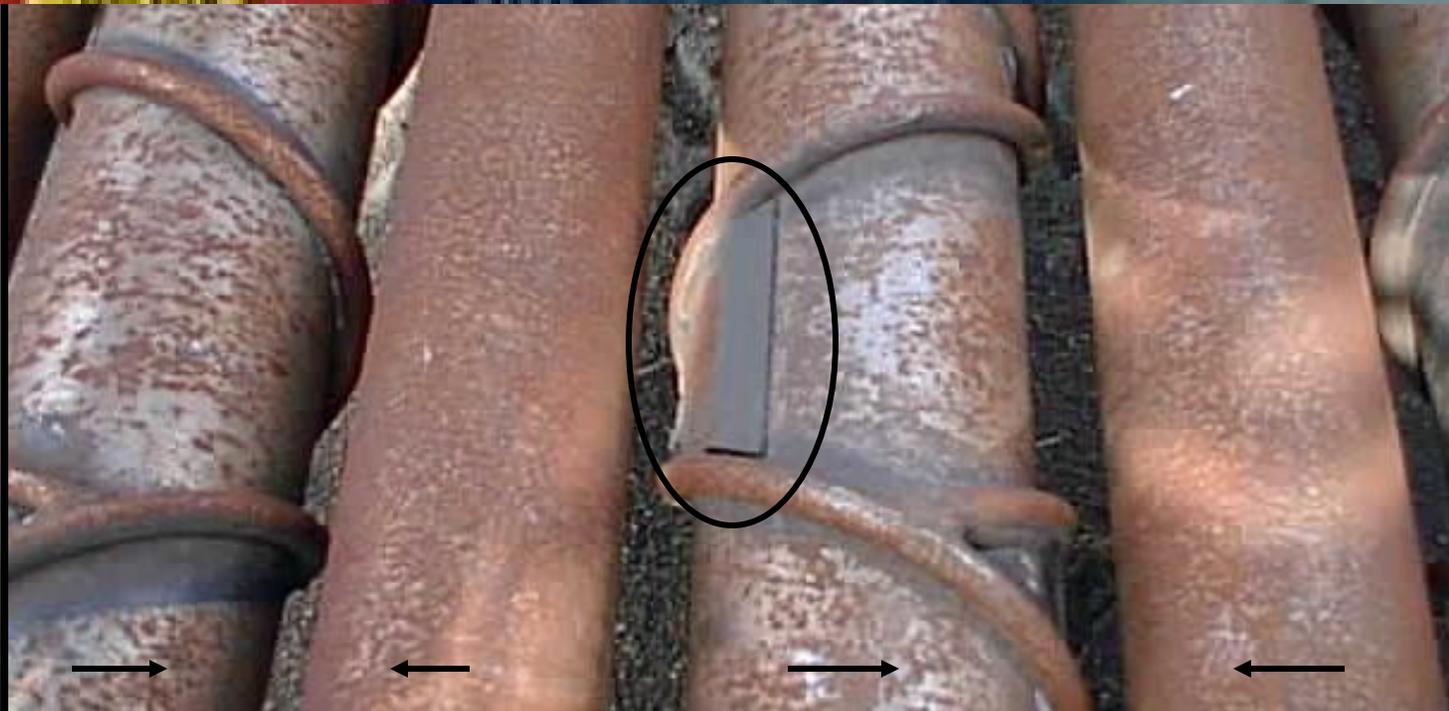
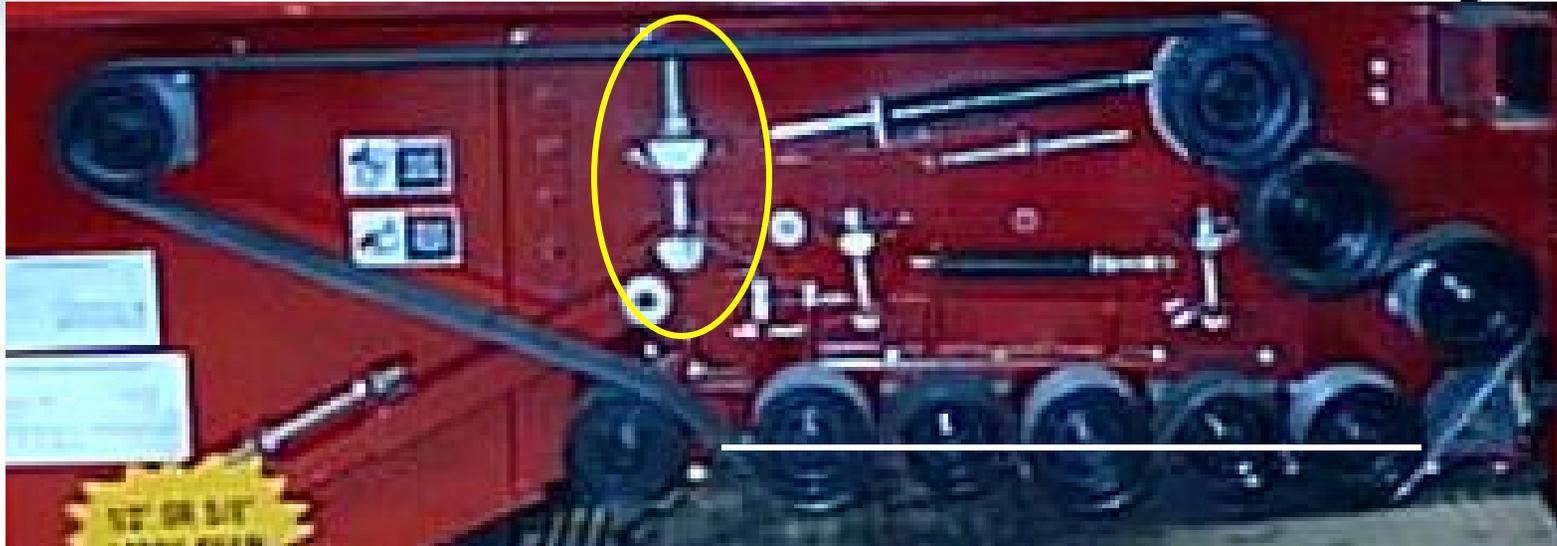


## Apron Shaft & Chain

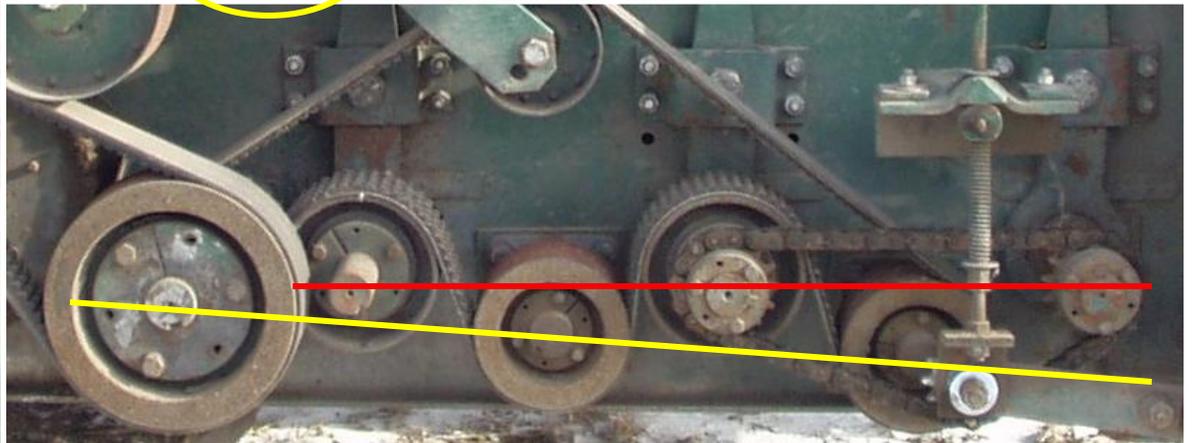
- Shaft Straight & Welds inspected
- Drive chain, gears & slip clutch inspected
- Bearings good & lock collar tight
- Apron Chain Tension (worn over 30 to 50%)
- Apron Chain Drive sprockets worn (flip?)
- Apron to wheel clearance (1.5 - 3")
- Apron Chain to grab scroll clearance (0.5" )
- Drive Chains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



# Grabrolls – Rear Delivery



# Grabrolls – Side Delivery



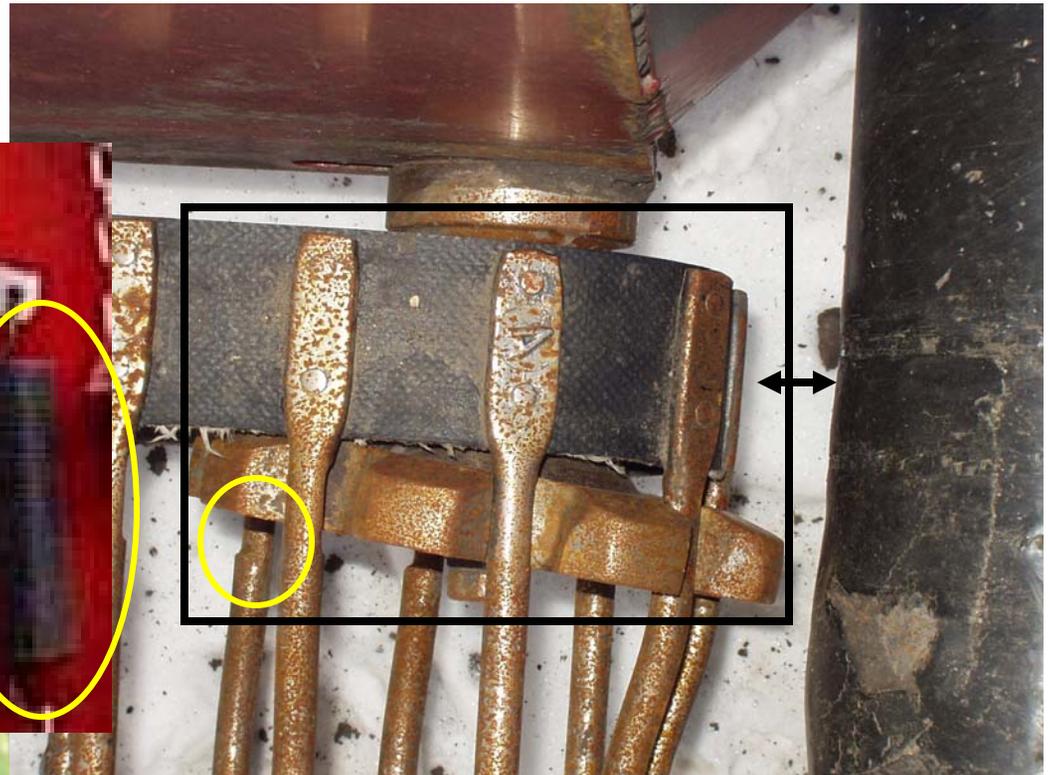
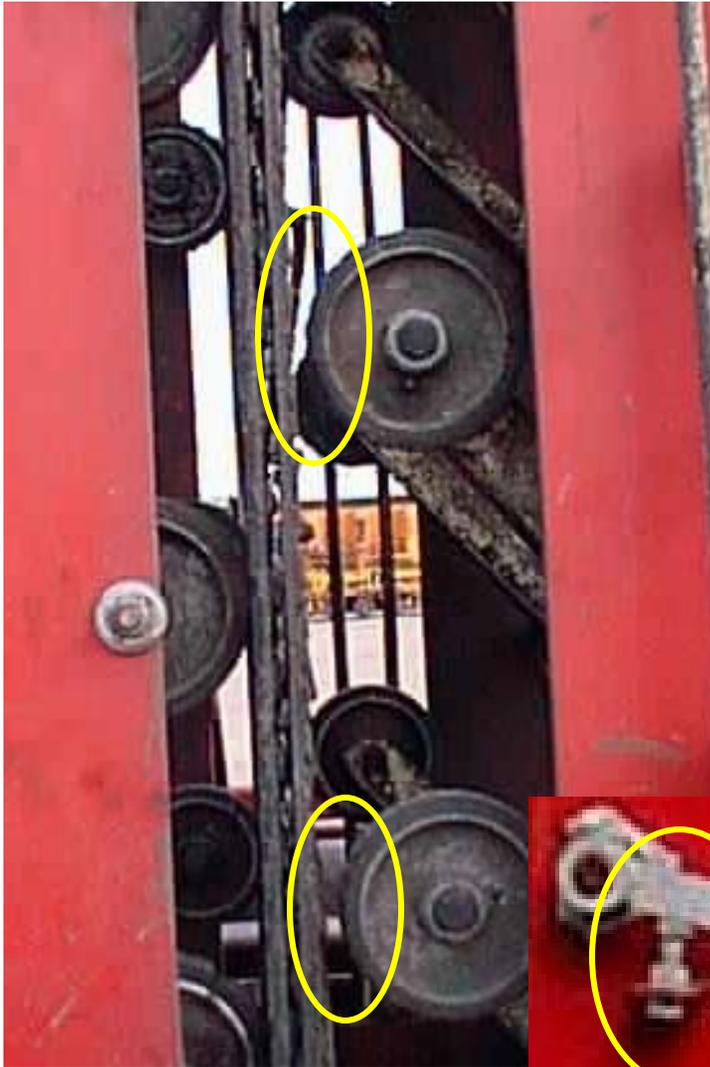
## Grabrolls

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



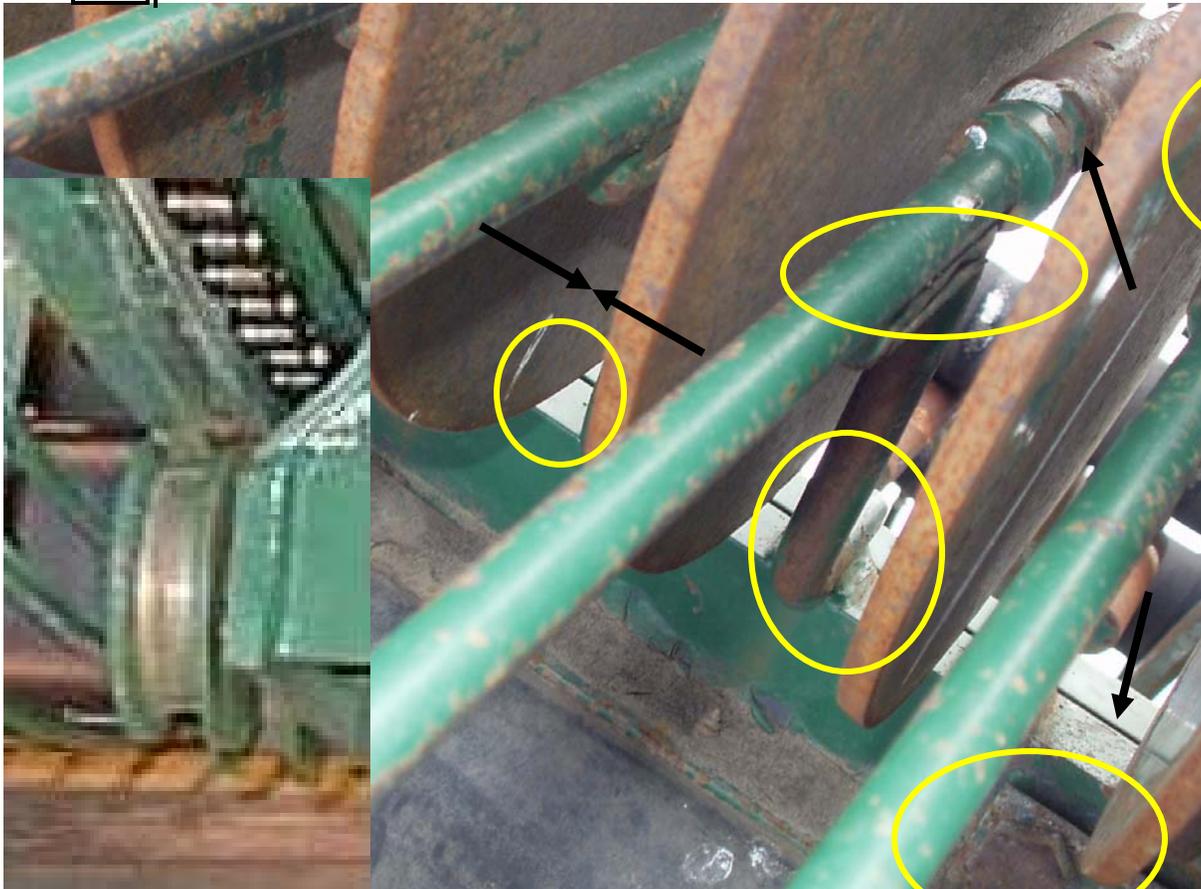
## Scrub Chain and Tower

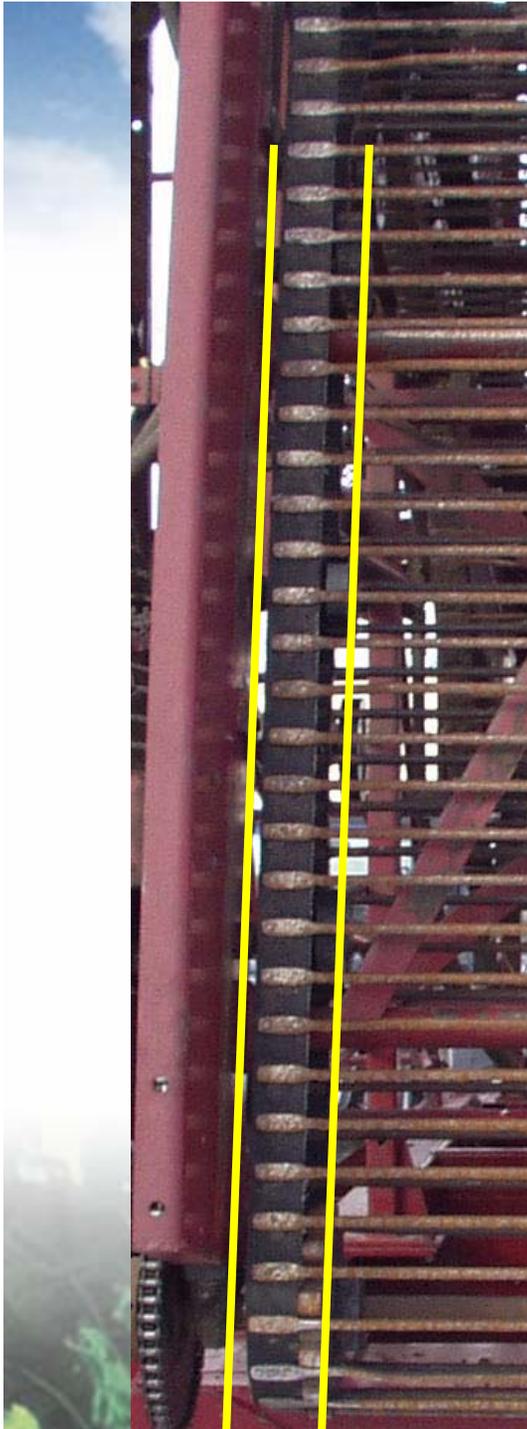
- Inspect Tower for cracks, wear points & loose bolts
- Idler Wheels - check bearings, wear and tightness
- Idler Rollers - check bearings, wear and tightness
- Scrub Chain worn (over 30 to 50% wear)
- Scrub Chain Drive sprockets worn (flip?/replace)
- Tension arms adj. - wheel have 3/4" to 1" clearance
- 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

## Speed of Harvester Operation study 1991 - Conducted by NDSU & Uof M Extension

Speed mph	Sugar %	SLM %	Tare %	Yield (tpa)	Recoverable	
					Sugar / Acre	Rev / Acre*
4	18.10%	1.10%	4.5%	16.3	5,359	\$655
6	18.10%	1.10%	6.0%	14.9	5,073	\$599

\* Revenue based on ACSC 2003 payment

\$56

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

Speed mph	Sugar %	SLM %	Tare %	Yield (tpa)	Recoverable	
					Sugar / Acre	Rev / Acre*
3	18.25%	1.30%	4.9%	18.1	6,104	\$723
5	18.30%	1.40%	6.0%	17.5	5,877	\$695

\* Revenue based on ACSC 2003 payment

\$28



# 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

