

# S-Series Combine and Front End Equipment Optimization

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“Ready To Harvest” for Corn Grain Loss



John Deere Harvester Works

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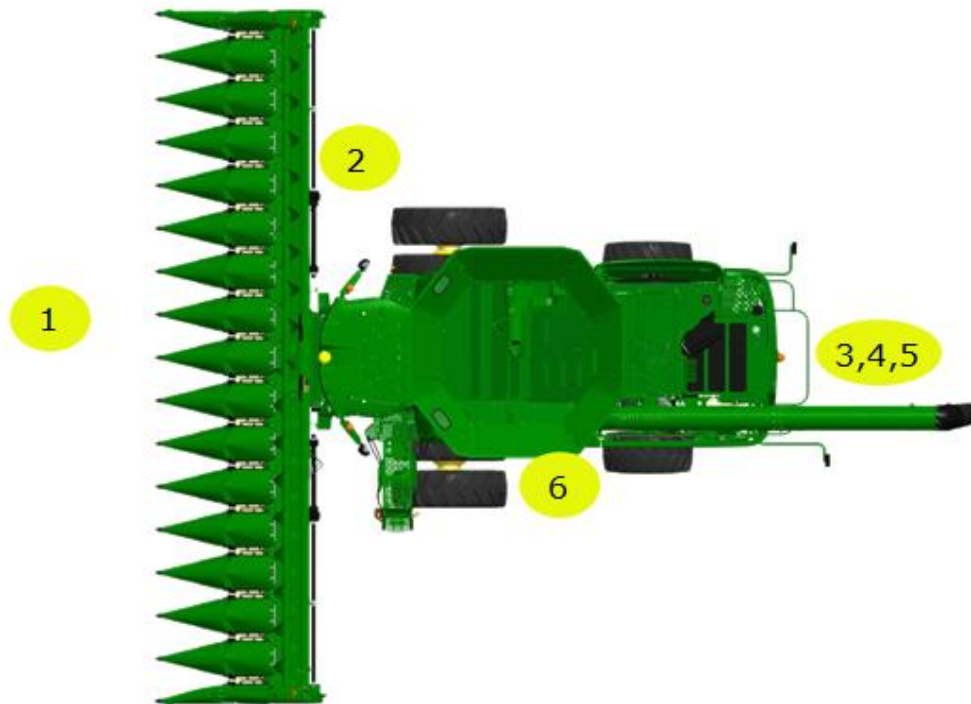
## Preface

The content of this material is intended to help you know how to choose the best configuration and set up an S-Series combine and front end equipment to manage grain loss.

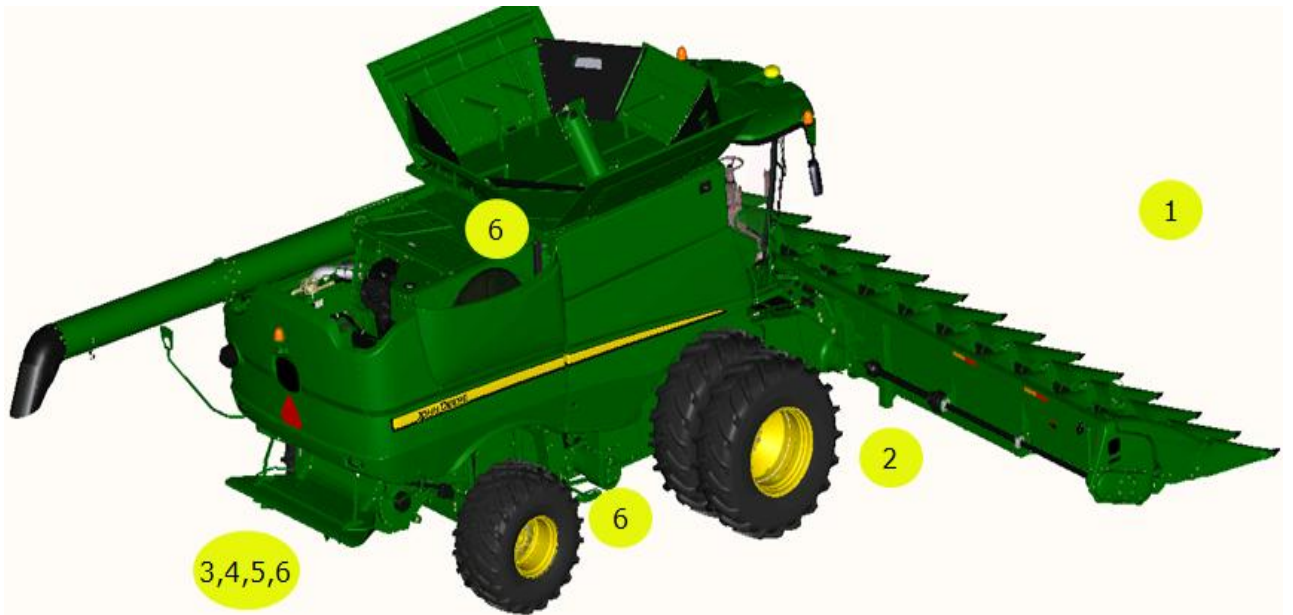
Setup and Adjustment recommendations are intended as a starting point before harvest season. Additional adjustments and fine tuning will be necessary depending on crop moisture and harvest conditions.

Crop setting checklists and Grain Quality Tips are a quick reference for configurations and operating speeds to help optimize grain quality.

## Grain Loss or Grain Leak?



1. Preharvest losses.
  2. Header losses.
  3. Threshing losses.
  4. Separator losses.
  5. Shoe losses.
  6. Leakage losses.
- Is it a leak or a loss?



1. Preharvest losses.
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6. Leakage losses.

Is it a leak or a loss?

# Determining Grain Loss

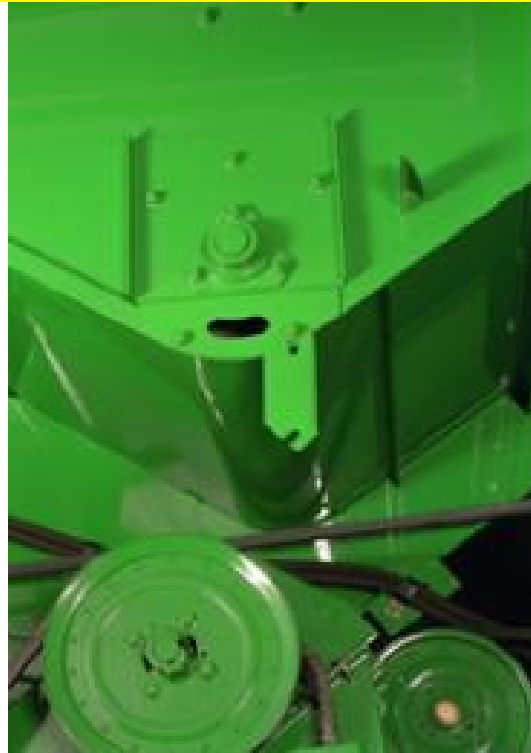
## Leakage Losses

Leakage losses can occur almost anywhere on the combine.

To guard against leakage, inspect the combine to see that all inspection doors are in the proper position and closed securely.

Also check for torn seals, damaged sheet metal or holes. All leaks must be repaired before accurate measurements of losses can be made. Otherwise it is difficult to determine where losses are occurring.

How to check for grain leaks: Harvest at normal operating speed and stop the combine. Raise the cornhead and look on the ground under the combine. Any kernels on the ground would be coming from directly above that area.



## Pre Harvest Losses

- Preharvest losses are those which occurred in the field before harvest. Such losses show up as ears and or kernels on the ground as a result of wind shatter, lodging, down crop or weather conditions.
- Corn and soybeans are two common crops which may have preharvest losses.
- To determine preharvest losses, walk the field and check in the uncut crop and look for kernels on the ground as well as whole ears.



## Header Losses

These losses occur when the header is operated improperly or when the crop tends to shatter easily. Losses can be caused by faulty adjustment or poor operation.

Usual causes of corn head losses are:

- a. Ears missed by gathering chains.
- b. Butt shelling of kernels from cobs by impact with deckplates.
- c. Ears tossed because of improper chain speed.
- d. Ears deflected to ground by too fast of a ground speed.





## Measuring Grain Loss

- Raise the Chopper/Spreader and drop residue in a windrow.
- Stop combine in the field.
- In a one square ft. area count the number of seeds found.
- Check other random area over the width of cut and average the kernel count.
- Subtract the preharvest seed count and the header loss seed count, from the combine grain count when trying to determine the % combine loss.



### How Much Is Too Much?

Most customers will tell you they don't want to see any losses.

1% to 2% would be acceptable.

Assuming that a yield of 180 bushels per acre, 1% loss would equal 1.8 bushels per acre.

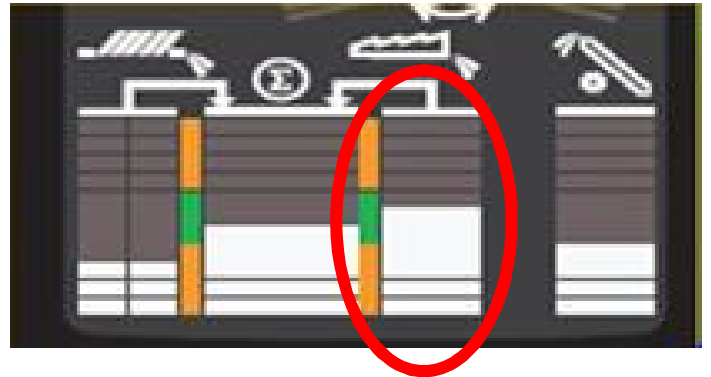
Refer to your GoHarvest App and calculate 1% loss assuming the customer has an 8 row corn head. How many kernels would you expect to find in 1 square foot behind the combine?

Answer: 14 to 15 kernels per square foot.

## Separator Rotor Loss

Determine what your rotor loss is first:

1. Unthreshed kernels left on the cob  
–Poor Threshing
2. Free Grain out of the rotor – Poor Separation



Unthreshed rotor losses are:

1. Whole cobs with kernels still attached
2. Small pieces of cob with kernels still attached.



Cob Size

1. The size of the cob effects the concave setting and whether or not a complete threshing job is done.
2. Splits, crushed or broken cobs are not desirable and indicate concaves are too tight



## Unthreshed Rotor Loss

1. Be sure concaves are level front to rear and clearance zeroed out.
2. Whole cobs with kernels still attached. – Close concave one number at a time on the display until all kernels are removed from the cobs.
3. Broken pieces of cob with kernels still attached. – Concaves with too tight of clearance causes broken and split cobs. Open the concaves until cobs coming out of the rotor are rounds.



## Free Grain Rotor Loss

Kernel losses are usually caused by:

- Too much trash material in the threshing and separator rotor sections. Kernels cannot separate from the trash. – Open Deck Plates to minimize trash intake.
- Running the rotor too slow. - Slow rotor speed cannot separate kernels from trash. Faster rotor speed thins out the mat of material and centrifugal force separates the heavier kernels and increases separator capacity
- Running the concave too wide open. MOG material stalls out and does not move through the threshing section into the separator section.



The vanes in the top covers is what moves material through the rotor cage.

If the concave is too far open the crop material is lazy and moves slowly and kernels do not separate.

Close the concave

## Recommendations for Improving Rotor Loss

Start rotor speed @ 400 RPM

Start concave clearance @ 30

Be sure separator grate spacers are installed between the rail and grate to lower the grates down.



Adjust ground speed to keep the separator full. Driving too slow is worse than driving too fast.



Reduce Tailings elevator return levels by opening the sieve.

Adjust deckplates spacing and backshaft speed to reduce stalk and leaf material in the separator.



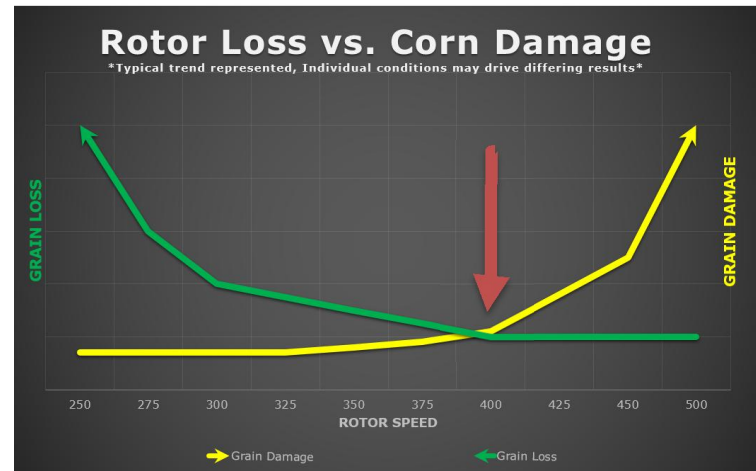
## Rotor Loss and Grain Damage

This graph describes the relationship between rotor loss and grain damage.

For many years with Walker combines, the theory that threshing at slow speed as possible gives the best grain quality.

Today most corn customers run rotor speeds in the 325-350 rpm range.

Starting rotor speed at 400 rpm actually lowers rotor loss, without increasing grain damage, and also increases separator capacity.



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## Shoe Loss Sensors

In higher moisture corn (>25%) or green weedy conditions, the shoe loss sensors can plug over with corn husks and trash.

The shoe sensors do not detect loss, and since the separator/rotor sensor is the only one receiving any kernel strikes, this can lead to a misguided perception that the rotor loss is excessive.

Clean regularly or remove every other plastic finger to allow trash to fall through.

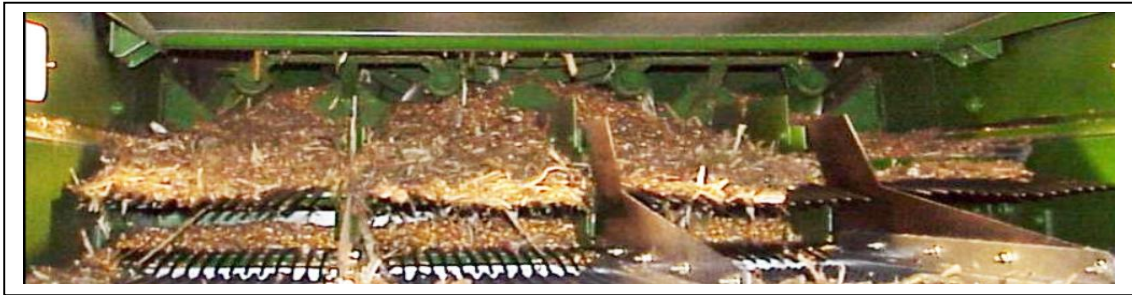
Be sure to calibrate sensors correctly since more material is contacting the sensors



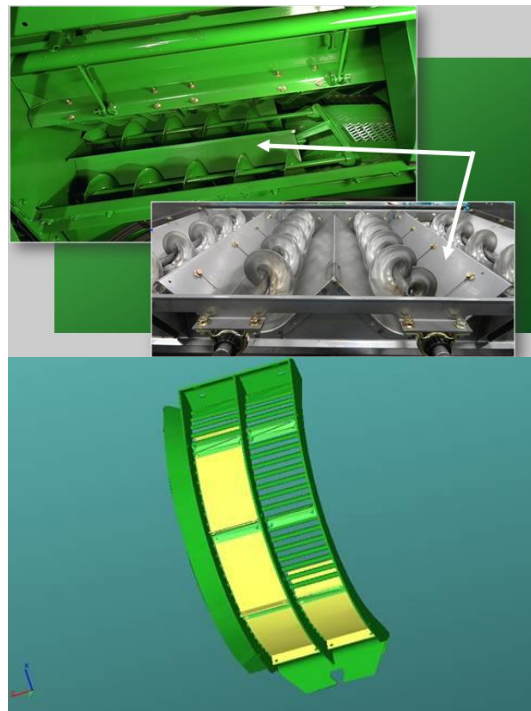
## Shoe Loss Adjustments

- Perform a power shutdown and look at the cleaning shoe where the conveyor augers dump onto the chaffer.

All four divided chaffer bays should be evenly filled.



If they are not evenly filled, balance out the shoe evenly by adjusting the auger bed deflectors or adding round bar concave sectionalized covers.

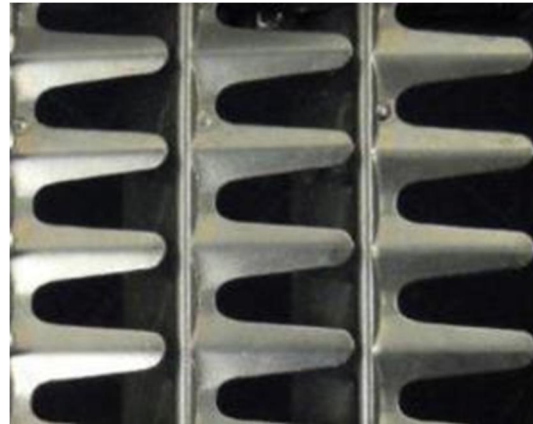




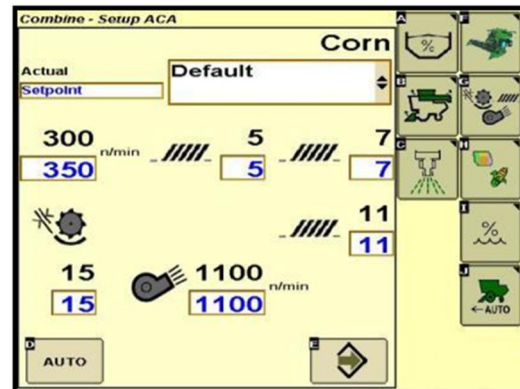
## Recommendations for Improving Shoe Loss

1. Run the cleaning fan at 1350 rpm.

2. Be sure Deep Tooth Chaffer is installed.



3. Be sure chaffer and sieve are calibrated so the openings exactly matches the cab display settings.



4. If openings do not match, follow the Factory Cal procedures.



## Wet >25% Moisture Corn Adjustment Checklist

1. Corn Head Auger Down
2. Deck plates tight
3. Feederhouse Chain Speed – 22T or 26T sprocket
4. Feederhouse Drum Up
5. Feed Accelerator on Low Speed (Large Diameter) 430 RPM
6. BH81486 Feed Accelerator Smooth Wear Strips are recommended.
7. Backshaft Speed 500-580 RPM / 3<sup>rd</sup> Gear 5 Speed
8. Cleaning Fan speed - 1000- 1350 RPM
10. Rotor Speed - 350-450
11. Concave Clearance - 20-35
12. Deep Tooth Chaffer - Front 15-20
13. Dual Zone Chaffer Rear manual = Closed
14. Sieve = 10-14

## Dry < 25% Moisture Corn Adjustment Checklist

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1. Corn Head Auger Down
2. Deck plates half to closed
3. Feederhouse Chain Speed 26T sprocket
4. Feederhouse Drum Up
5. Feed Accelerator on Low Speed (Large Diameter) 430 RPM
6. Regular serrated Feed Accelerator wear strips
7. Backshaft Speed 500-580 RPM / 3<sup>rd</sup> Gear 5 Speed
8. Cleaning Fan speed 1000- 1350 RPM
9. Rotor Speed = 350-450 RPM
10. Concave Clearance - 20-35
11. Deep Tooth Chaffer Front - 15 - 20
12. Dual Zone Chaffer extension Rear manual -5 level/ 10 sidehill
13. Sieve - 10-14

## Popcorn - Food Corn Adjustment Checklist

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1. Corn Head Auger Down
2. Deck plates tight
3. Feederhouse Chain Speed – 22 or 26T sprocket
4. Feederhouse Drum Up
5. Feed Accelerator Slow Speed Kit 320 RPM BH81691
6. Swept-back Smooth FAST wear strips BH81486
7. Low Backshaft Speed 500-580 RPM / 3<sup>rd</sup> Gear 5 Speed
8. Cleaning Fan speed 1200-1300 RPM
9. Rotor Speed = 300-425 RPM
10. Concave Clearance - 26-30
11. General Purpose Chaffer - 10-14
12. Dual Zone Chaffer Rear manual - Closed
13. Sieve - 5-8

## Grain Quality Tips for High Moisture Corn, Food Corn, Popcorn

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1. Check concaves for level front to rear. Concaves out of level may cause a pinch point increasing damage potential.
2. Calibrate and "Zero" the concave position sensor.
3. Check all the auger flighting to be sure there are no sharp edges.
4. Only run perforated screens on Clean Grain elevator doors in dry corn. Door perforations may have a tendency to scuff the kernels in certain conditions and moisture.
5. Do not unload grain tank completely empty.  
Leave some grain in the tank to cover the augers to minimize damage.
6. Do not fill the grain tank over top of the loading auger  
The corn boiling up above the loading auger can add to grain damage.
7. Do not unload the grain tank at high idle.
8. Minimize free grain in tailings/rethresher as much as possible.
9. Do not run deck plates wide open. May cause ear butt shelling.
10. Do not run cornhead auger in up position. Flighting will scuff kernels on the ears.
11. If new parts that contact the crop have been installed, run the combine in crop other than corn, to shine up any rough edges.  
Threshing elements, FAST Wear Strips, augers, etc

## NOTES

