

# Ready To Harvest

## OPTIMIZATION GUIDE

### X SERIES AND FRONT-END EQUIPMENT

This optimization guide does NOT replace the Operator's Manual. Follow all safety procedures and operation guidance provided within the Operator's Manual and understand all safety decals prior to operating the equipment.

# HELP WITH THIS DEMO GUIDE

Link to John Deere.com website for more info



Button to play video

Page you are on

Skip between pages

Page

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#

Guide help

Online Value Selling Navigator product landing page

Provides a selection of additional information links

Main navigation bar takes you to start page of each section

"X" button in the upper right corner takes you back  to the selling features overview page

Buttons take you to the specific information in this guide

Page you are on

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Skip to top feature details

# Page you are on

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# Skip to top feature details

# Buttons take you to product feature and customer value details

Safety Reminders

Product Specific Safety Tips

## BEFORE OPERATING EQUIPMENT



READ THE OPERATOR'S MANUAL



BE AWARE OF PERSONAL HEALTH CONDITIONS



FAMILIARIZE YOURSELF WITH MACHINE



CHECK SURROUNDINGS TO AVOID HAZARDS



OPERATE EQUIPMENT SAFELY IN SPECIFIED AREA

## FOLLOW ALL SAFETY PROCEDURES



IF SEATBELT IS PRESENT, WEAR IT



NO CELL PHONE USE WHILE OPERATING EQUIPMENT



IF HELMET IS NEEDED, WEAR IT



IF EYE PROTECTION IS NEEDED, WEAR IT



NO OPEN-TOE OR OPEN-HEEL SHOES WHILE OPERATING EQUIPMENT



IF HEARING PROTECTION IS NEEDED, WEAR IT

[Safety Reminders](#)
**Product Specific Safety Tips**

- Understand all safety decals according to the Operator's Manual.
- Stay clear of harvesting units during operation (cutterbar, augers, reel, and stalk rolls, etc.):
  - Disengage separator and header, shut off engine, set parking brake and remove key before servicing or unclogging machine.
- Always shut off engine, set park brake, and remove key before entering grain tank or working on machine.
- Whenever possible, avoid transporting on public roadways with header attached.
  - Lower the fountain auger and the grain tank access handrail to “transport” position before driving on public roads.
- Be aware that the REAR combine wheels turn for steering.
  - Combines are different from other vehicles like cars or tractors. The rear of the machine can swing out beyond the path of the front wheels while turning (tail swing). Some machine parts also extend further behind the machine than the rear axle, increasing tail swing even further (ex. unloading auger, straw chopper tail).
- Before leaving machine, disengage the header and separator, shut off the engine, move the multi-function control lever to neutral, and apply the parking brake.



Hinged Drapers

Flexible Drapers

Corn Heads

Belt Pickups

## Hinge Draper Overview

HDR

HDF

HDX

1 Cutting

2 Reel

3 Sidebelts

4 Feed Section

5 Top Augers

6 In Cab Adjustment

7 Off Ground Cutting

8 On Ground Cutting

9 Attachments



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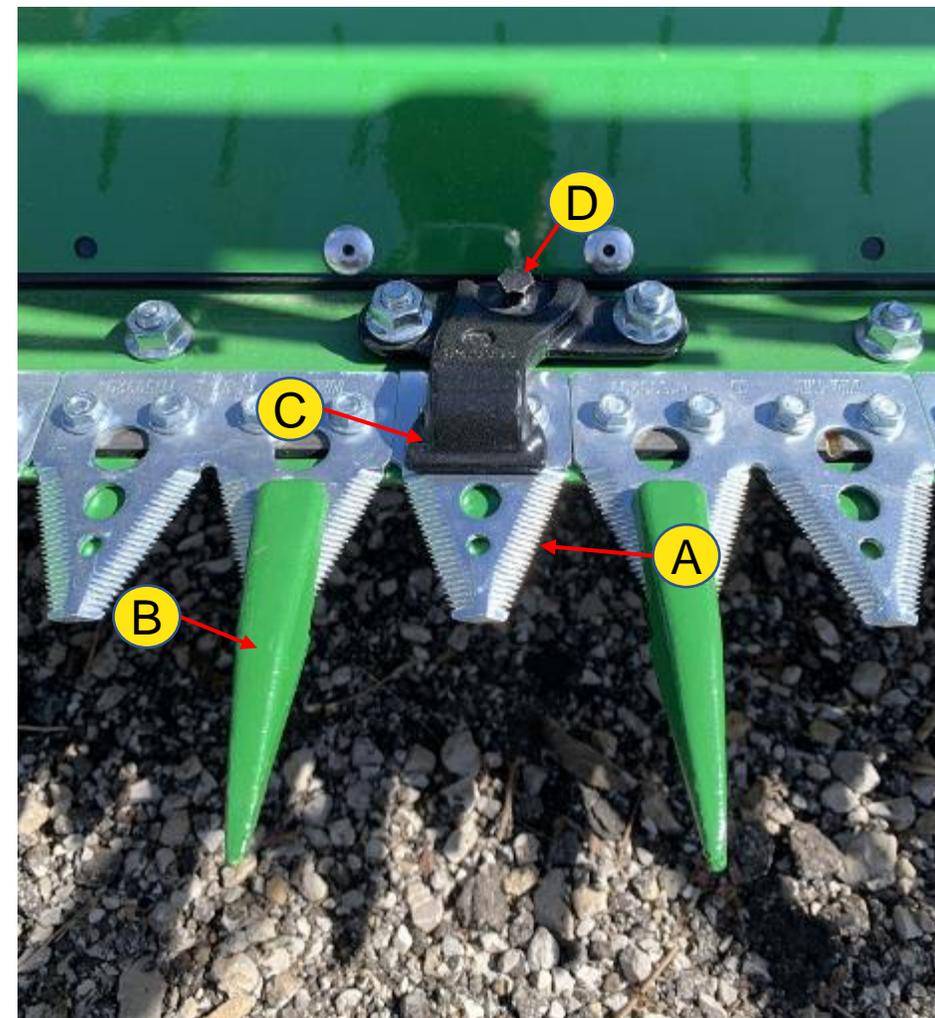
## HD Hold Down Clearance

Hold down clearance is one of the **most important factors** in cutting tough straw. Keeping the knife tight to the guard enables efficient cutting with low power

**To adjust hold downs, see below procedure:**

1. Position knife sections (A) so they are centered on rock guards (B).
2. Slide a 0.50 mm (0.020 in) feeler gauge (business card works well too) under knife hold-down (C).
3. Apply light down pressure on the knife section adjacent to adjustment screw (10mm bolt head) (D).
4. Tighten the adjustment screw until light pressure is applied to the feeler gauge or business card.
5. After hold downs have been adjusted, engage header for 2-3 minutes. Shut header off and check hold downs with your hand for excessive heat. If a hold down is hot to the touch than the hold down is too tight and needs readjusted.

*NOTE: In tough conditions, reduce clearance to optimize cutting performance. To prevent reduction in knife life, only tighten as needed. Minimum hold-down to section clearance is 0.3 mm (0.012 in).*



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## Knife/Guard Good, Better, Best

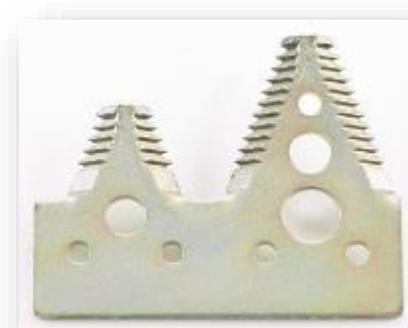
Knife	Fine Tooth	Fine Tooth	Coarse Tooth	Coarse Tooth S/L
Guards	Long	Short	Short	Short
Canola, Wheat, Barely, Flax & Rye	Best	Better	Better	Good
Peas, beans, soybeans, & lentils	Good	Better	Best	Better
No-till soybeans	Good	Good	Better	Best

Long Guards work best in tough straw to penetrate lodged/matted crops

Can cause “pushing” during on ground cutting with high debris

Coarse Sections can work well in green straw tough conditions but can cause flagging in dry straw with high ground speed.

Lentils and Flax cut best with fine knife to better pierce the tough stems for a clean cut



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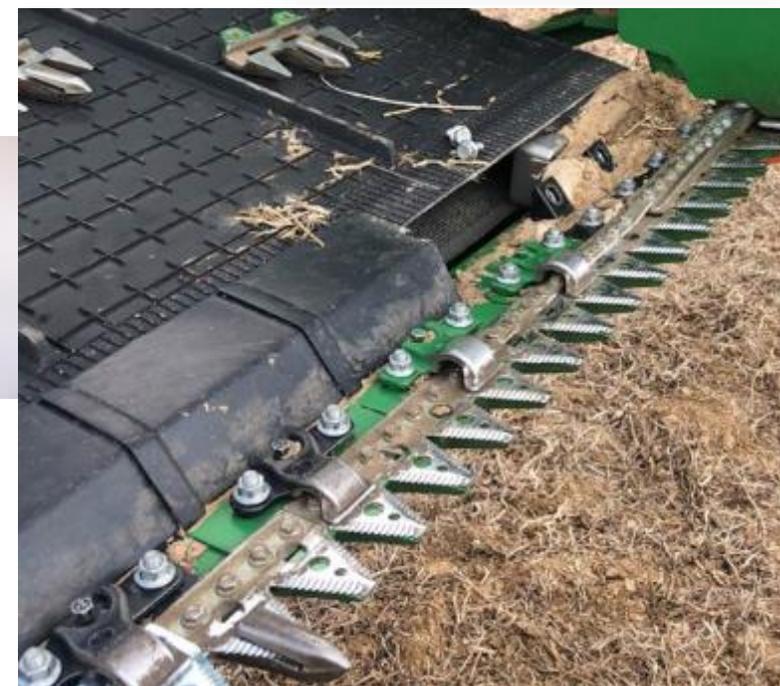
**Non-Clog guards:** have **NO** cross bar between the points removed to prevent stalks from plugging and a blunt nose to prevent stabbing stalks from hair pinning and pushing/ plugging.

**Open Top Knife Guards:** For No Till Double Crop Soybeans in straw stubble with long coarse tooth sections are recommended to prevent straw stubble plugging.

Commonly placed on the outside 3-7 guards of the cutterbar

### Knife/Guard Presentation:

[Knife and Guard Options \(deere.com\)](http://deere.com)



Hold Downs

Knife Selection

Knife Attachments

Hinged Drapers

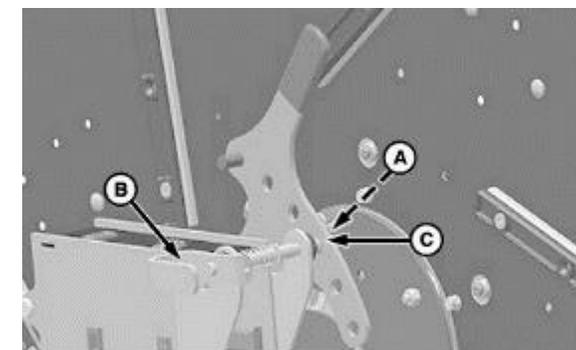
Flexible Drapers

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Belt Pickups

## HD Reel Pitch

- Reel Fingers should be adjusted for crop condition:
  - Most aggressive position (pulled back) for down or tangled crop.
    - May have more crop carry over, “Plant Tossing”
    - If cutting soybeans, lentils, flax, more aggressive and higher reel speed may be needed to clear the cutterbar
  - Middle position for normal crop conditions.
    - Recommended starting position
  - Least aggressive position for tall standing crop.
    - May not be able to dig down crop
- If on ground cutting and adjusting reel pitch, the reel to cutterbar clearance will need to be re-set



Reel Pitch

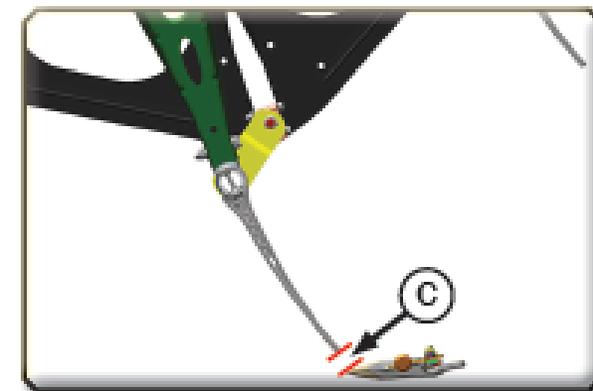
Reel to Cutterbar

Reel Type

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## Setting HD Reel to Cutterbar Gap

- *Please refer to the operator's manual for full procedure on Reel setting*
- Adjust the reel finger pitch so it is in the position used when harvesting. (Most commonly the middle position).
  - Adjusting the pitch changes the reel to cutterbar position slightly, if in crops where this is critical, the reel to cutterbar may need to be adjusted slightly to minimize gap
- Header should be in a frown and cutterbar locked (HDF) when measuring
  - Distance at hinge point (A) should be 15mm (19/32 in)
  - Distance at outer float arms (B) should be 45mm (1 -3/4 in)



Note: It is acceptable if reel fingers to contact the crop ramps (A) during a full frown state. This setting will allow for reel fingers to perform best in the flat position.

[Reel Pitch](#)
[Reel to Cutterbar](#)
[Reel Type](#)

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## Reel Type

- There are 2 types of reels available:
  - Standard reel
    - Best for small grains
      - Allows reel to be set aggressively for down crop and not throw over/plant tossing
  - Flip over reel
    - Best for tall soybeans or crops that wrap
    - Can carry crop over in crops such as peas
    - Reel can lift canola off the belts and shatter pods
    - At high speeds in wheat, it will toss crop

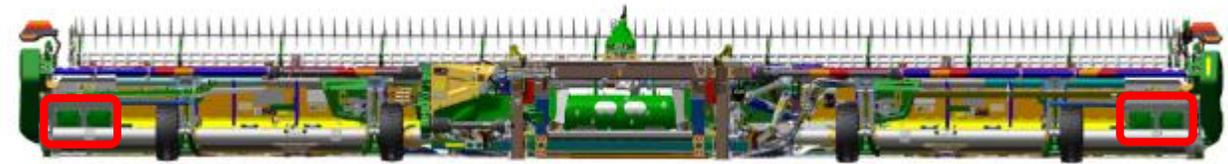
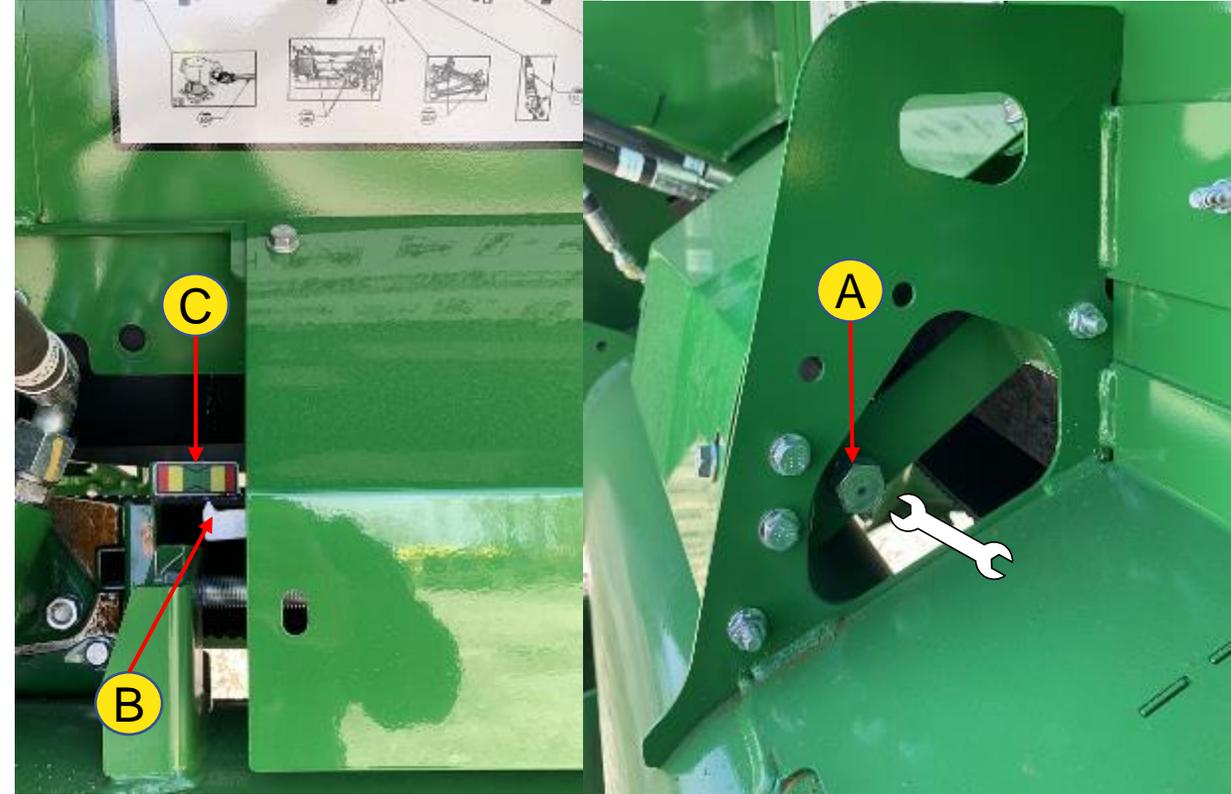
	Small Grains, Canola, & Pulse Crops		Soybeans & On-Ground Crops	
	Standard Reel	Flip Over Reel	Standard Reel	Flip Over Reel
Wrapping	Better	Best	Good	Best
Down Crop	Better		Better	
Side Belt Feeding	Best	Good	Better	
Plant Tossing	Best	Good	Better	
Shatter Loss	Better		Better	

[Reel Pitch](#)
[Reel to Cutterbar](#)
[Reel Type](#)


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## HD Side Belt Tensioning

1. Side belt tension should be checked each day prior to harvest
  2. Use tension nut (A) to increase or decrease belt tension. Use tension indicator (B) to reference the amount of belt tension applied. Indicator should be at the center of the tension gauge (C).
  3. Repeat the tension adjustment on the opposite side of the draper, if necessary.
- If de-tensioning completely for belt or header service, it is recommended to re-check belt tension after the first ~10mins of operation



Hinged Drapers

Flexible Drapers

Corn Heads

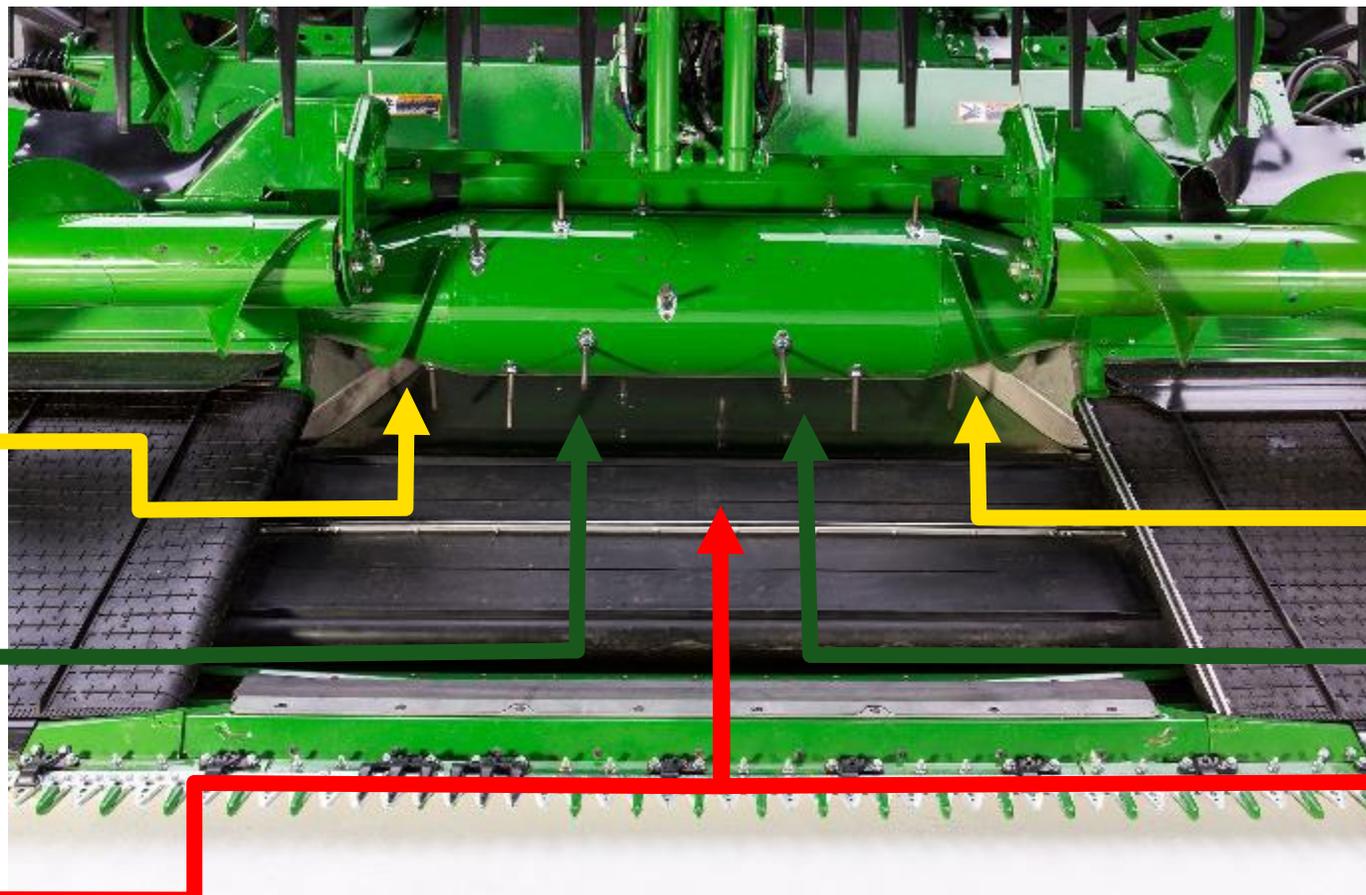
Belt Pickups

## Setting Draper Belt Speed

**Too Slow:** Crop is feed too far on outsides, can cause crop wrapping under belts, and bunching in feed drum

**Optimal:** 2 streams from belts just barely come together making a smooth wide stream of crop entering drum. This ensures each rotor is fed evenly

**Too Fast:** Both belt streams come to together in the center intermixing the crop, creates 1 stream which is difficult to utilize the full width of the separator. Can create slug feeding and drum plugging



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## HD Feed Drum Timing

- With the center feed section in neutral, spin drum until the middle finger is as close to the feed floor as it gets, gap should be 40mm (1.57in). Use handle on RH side of drum to adjust.
- This is best for most conditions and adjustment isn't commonly needed
- If backfeeding, ensure feederchain is in high speed to pull crop away



Rotate handle clockwise to make the fingers more aggressive. More aggressive finger timing is recommended for low volume crops such as dryland wheat, lentils, and flax.

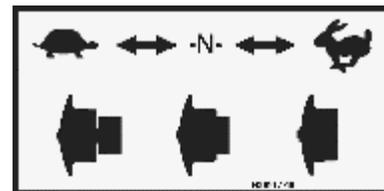
Rotate handle counter-clockwise to make the fingers less aggressive. Less aggressive finger timing recommended for bulky, high-volume crops such as canola

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## HD Two Speed Gearbox

	Low Speed	High Speed
Feed Drum	200 RPM	240 RPM
Center Feed Belt	1000 RPM	1200 RPM

- Low speed crops
  - Soybeans
  - Pulses
  - Edible Beans
  - Dry, low volume canola/rapeseed prone to shatter loss
- High speed crops
  - Wheat
  - Barley
  - Oats
  - Linseed/Flax
  - Green straw or tough conditions in rapeseed/canola



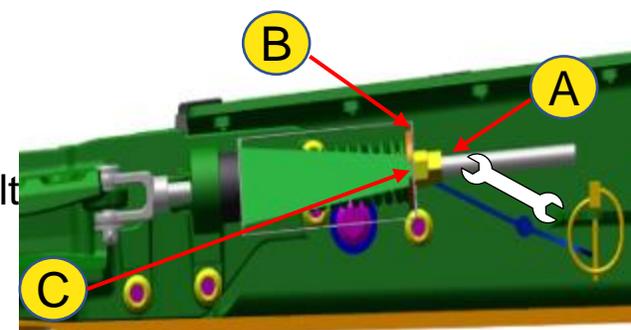
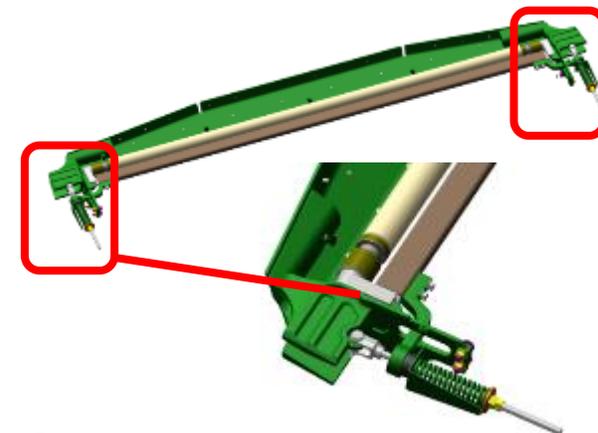
Center Feed Driveshaft

[Finger Timing](#)
[Feed Drum Speed](#)
[Center feed belt tension](#)

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## HD Center Belt Tensioning

1. Locate nuts (A) under the draper on the right-hand side of the center draper belt.
2. Clean all crop residue, debris, and material from the area around the tensioning spring
3. Verify that the nuts and washer (B) are positioned between the end of gauge (C) and the bottom of the step. Repeat on the left-hand side of the center draper belt.
4. If the belt tension is not correct, adjust the center draper belt tension using nuts (A) located under the draper.
  1. Tighten the nuts so the washer (B) is positioned between the end of gauge (C) and the bottom of the step. Repeat on the left-hand side of the center draper belt.
  2. Start the engine, engage the draper, and run at high idle for 1—2 minutes.
  3. Check the operation of the center draper belt.
  4. Verify that the nuts are still tight and readjust as necessary.
5. After operating the draper for 10 hours, recheck the belt tension.



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## HD Top Augers

- Top Augers should run 10% faster than side draper belts. With header engaged watch the flighting of the top augers, the flighting should overtake the 1 belt cleat (see video)
  - If augers are spinning slower than the belts, it can create bunches and slug feed the combine
- Top auger fingers should point at the cutterbar at their most extended position
  - Ensure fingers fully retracted when they cross the stripper to prevent wrapping
  - Refer to operators manual for more details



### Top auger speed control valve



### Fingered top augers



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## In Cab adjustability

- Most functions of the HD drapers are controlled from the cab of the combine and can be set from the auto header height page
- Gauge wheels can be configured to the Command Arm
- Ensure header is in auto header height mode when harvesting -- *Raising the head with feeder house up button while navigating terrain will take head out of auto mode and will greatly decrease performance.*
- To navigate aggressive terrain and keep the header in AHHC mode, adjust height temporarily by raising/lowering gauge wheels with AHHC control knob, HFAT position, or lower feeder house by pressing and holding the down button on command arm.
  - When the operator commands feeder house to lower, the head will stay in Auto mode and will resume it's set point once operator releases the down button.



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## HD Height Sensing/AHHC Mode

- To get the best performance from an HD-Series draper the following AHHC controls need to be enabled: Height Sensing, Height Resume, and Lateral Tilt. To achieve optimal performance, **ALL** of the header automation should be enabled on the HD Draper
- Hinged operation of HD requires Auto Header Height Sensing mode to be **ON at all times**, but for best performance all automated features should be ON.*
- The HD Series drapers use gauge wheels as the sole input for ground following, the distance between the wheels and cutterbar is fixed meaning if the if wheels go up, the cutterbar will go with it.
  - While the 700D drapers have gauge wheels, the HD uses a completely different AHHC system for improved ground following


[In-Cab Adjust](#)
[Auto Header Height](#)
[Down Crop](#)
[Down Force](#)

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## HD Height Sensing/AHHC Mode

- When Cutting off ground and transitioning to down crop, the HD headers can transition to cutting on the ground by a push of a button
  - Similar 700FD/RDF has “Hybrid” mode with the flexible cutterbar
- Configure button “3” on the Command Arm to the following settings to better get down crop:
  - Header on ground with gauge wheels retracted
  - Adjust fore/aft tilt to make cutterbar angle slightly more aggressive
  - Position reel down and fore of cutterbar to gather down crop


[In-Cab Adjust](#)
[Auto Header Height](#)
[Down Crop](#)
[Down Force](#)

Hinged Drapers

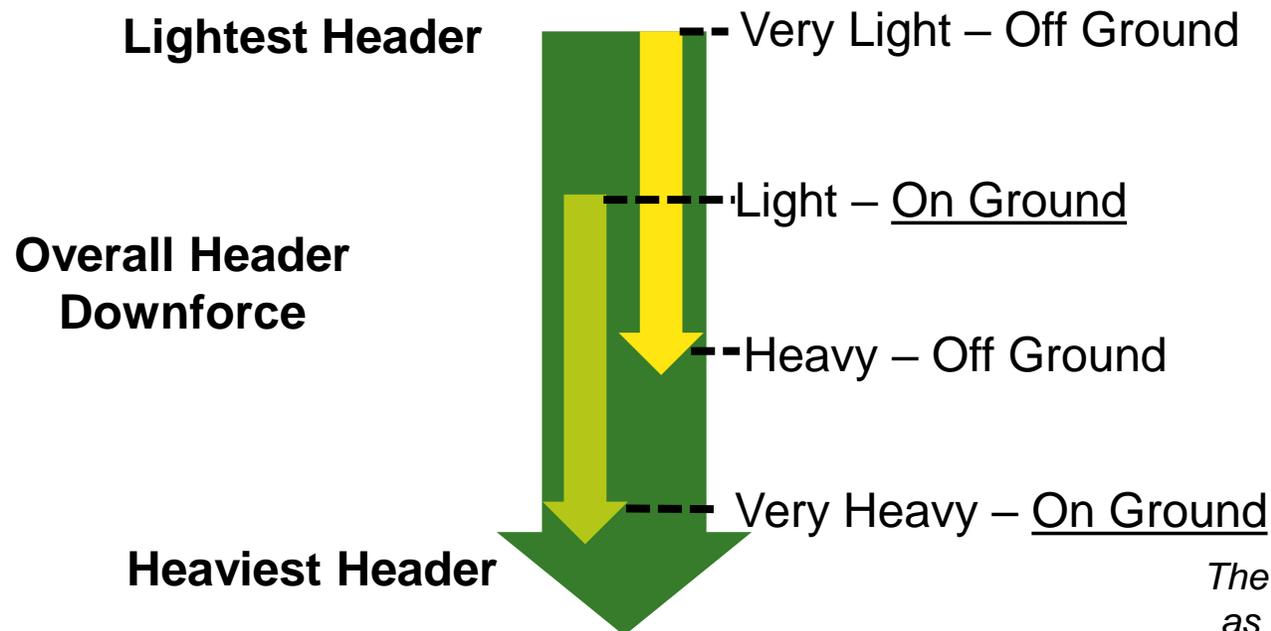
Flexible Drapers

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# HD Header Down Force Page

- Header down force controls how much weight is carried by the combine vs the gauge wheels/cutterbar. The more weight that is being put on the ground the more reactive the draper will be for terrain following. The Lighter the setting, the machine will carry more of the weight, less reactive to terrain, and aids in preventing pushing in soft or damp on ground field conditions.
- Start at "Typical" and adjust from there to current field conditions.



*The advanced tuning page should only be used in extreme conditions as you can over adjust the head and cause it to perform very poorly*

In-Cab Adjust

Auto Header Height

Down Crop

Down Force

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## Hinge Draper (HD) Gauge Wheels

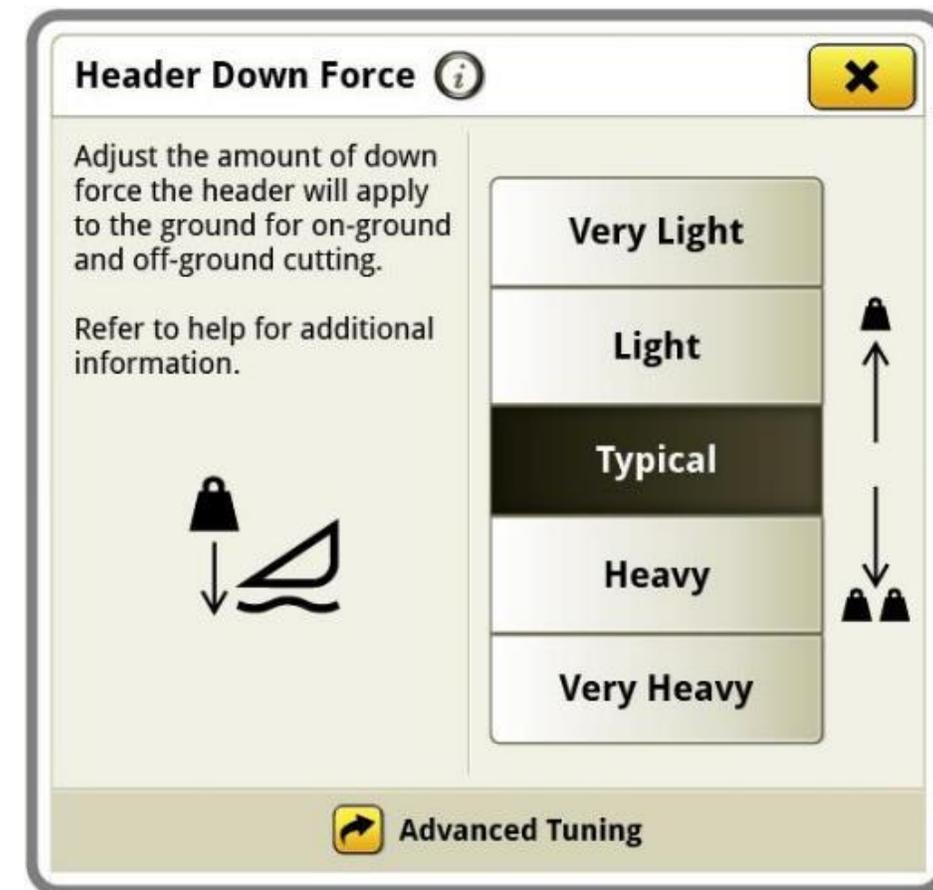
- Gauge wheels are a factory installed option, but **required** for cutting off ground (cereals, canola, etc.)
  - They are not required for cutting on the ground only. (Soybeans, Lentils, etc)
  - The Wing Leveling feature can help cutting off ground without gauge wheels
- Gauge wheels set your cut height for off ground cutting. The distance from the bottom to the gauge wheel to the cutterbar is the cut height and is fixed until adjusted from the cab. The hydraulic cylinder does not actively control the height.
  - When lowering cut height to cut on ground, the wheels will automatically retract
- Cutting on the ground can be done with a push of a button from the Command Arm by pushing “3”
- Mud Scrapers are recommended for operation in wet or sticky conditions



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## HD Header Down Force Page—Off Ground

- Header down force controls how much weight is carried by the combine vs the gauge wheels/cutterbar. The more weight that is being put on the ground the more reactive the draper will be for terrain following. The Lighter the setting, the machine will carry more of the weight, less reactive to terrain, and aids in preventing pushing in soft or damp on ground field conditions.
- **Starting Point:** Typical
- **Off ground cutting:**
  - **Increase Down Force: (Heavy/ V. Heavy)**
    - Aggressive rolling terrain
    - Desire to make the header “move” faster
    - High ground speeds
  - **Decrease Down Force: (Light/ V. Light)**
    - Wet Conditions (Less weight on gauge wheels)
    - Rocks



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## Cutterbar Settings

- In most conditions cutter bar angle should measure  $\sim 11^\circ$ . If “pushing” decrease ground force of the cutterbar to make it lighter first.
  - $11^\circ$  is Optimal setting for largest surface area on skid.
  - Use an angle finder phone app or angle finder on the knife .
- If calibration is done improperly and cutterbar angle is flattened to less than  $5^\circ$ , excessive wear on the center sump door can occur as well as debris accumulation on rear of header.
  - When header is this flat, the gauge wheels may contact the ground even when fully retracted.
- For conditions with rocks and debris, raised height skid shoes will allow for cutterbar to be higher and provide more rock/cutterbar protection in conditions with rocks/debris.
- To allow the knife to flex on the HDF, the flexible cutterbar will need to be “unlocked” manually. The turnbuckles are found on the outside of each wing.


[Cutterbar Settings](#)
[Header Down Force](#)

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## Down Force -- On ground

- **Starting Point:** Typical – Even for hard soil
  - **Increase Down Force (Heavy/ V. Heavy):**  
Increasing header downforce on hard, dry terrain **can lead to excessive skid shoe wear**  
Aggressive rolling terrain where desire to make the header “move” faster  
Only make cutterbar as “heavy” as needed
  - **Decrease Down Force (Light/ V. Light):**  
Wet Conditions (Make cutterbar lighter)
    - Decrease when cutterbar is “pushing” or in soft terrain
- Adding any aftermarket items that change the weight balance of the header (ie. Air Reel), a custom setting in “Advanced Tuning” may be required
  - If doing so, it is recommended to work with your John Deere Dealer to ensure optimized properly.



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## HDR/HDF Attachments

- **Gauge Wheel Scrapers**
  - BXE11270
- **Schumacher crop lifters**
  - Order Code 8116
  - BXE11350 – Set of 20 crop lifters
  - BXE11351 – Set of 5 crop lifters
  - BXE11200 – Storage bracket
- **Crop Flow Divider**
  - Order Code 8606
  - Part number AXE88255
- **Side Knives**
  - BXE11214 & BXE11369



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## Rigid Draper Flexible (RDF) Product Overview

1 Cutting

2 Reel

3 Sidebelts

4 Feed Section

5 Top Augers

6 In Cab Adjustment

7 On Ground Cutting

8 Off Ground Cutting

9 Attachments



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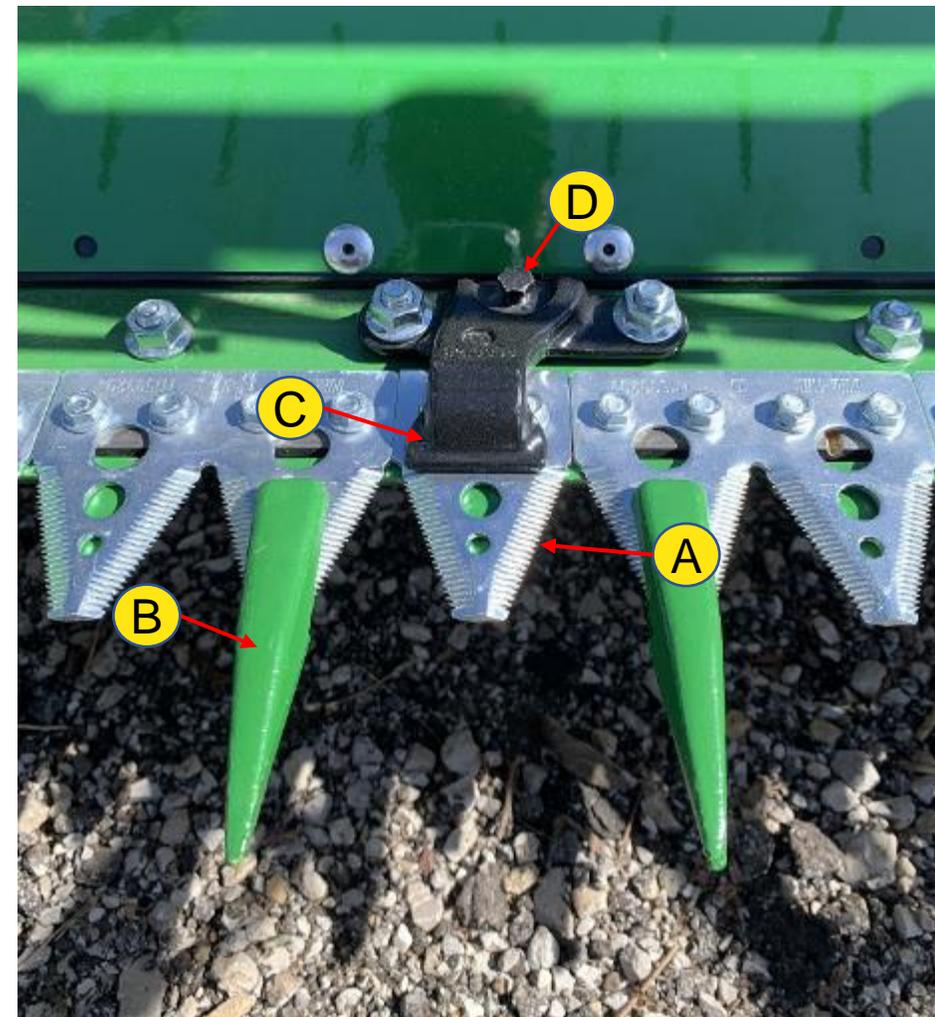
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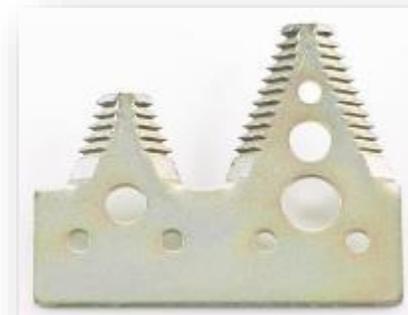
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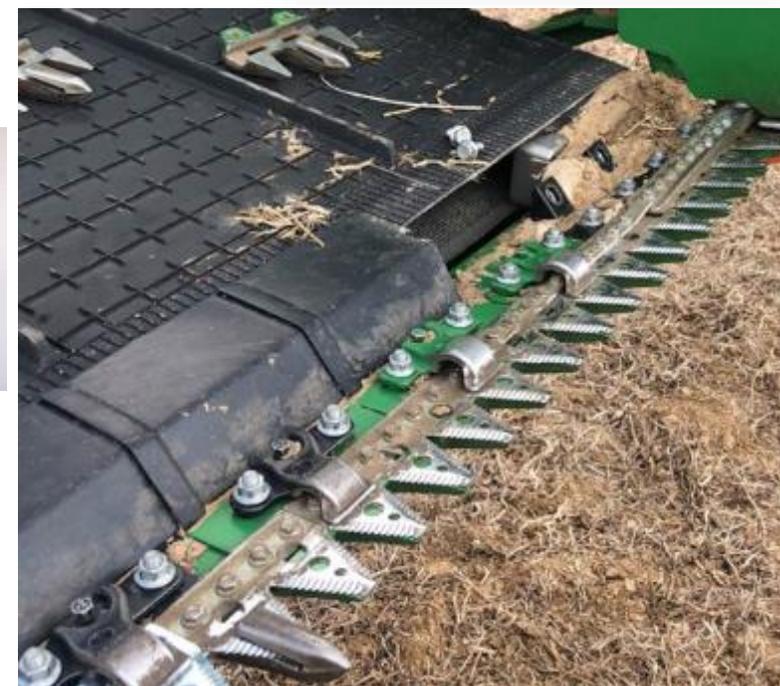
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### Knife/Guard Presentation:



Hold Downs

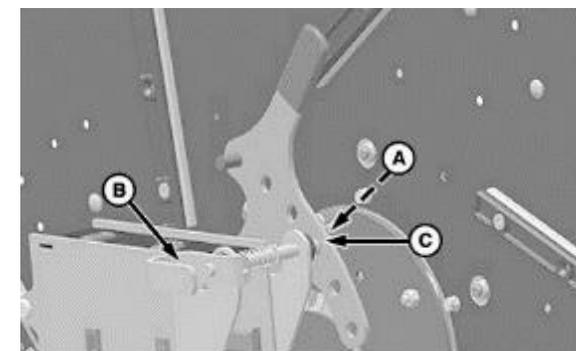
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Knife Attachments

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[Reel Pitch](#)
[Reel Type](#)

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	Small Grains, Canola, & Pulse Crops		Soybeans & On-Ground Crops	
	Standard Reel	Flip Over Reel	Standard Reel	Flip Over Reel
Wrapping	Better	Best	Good	Best
Down Crop	Better		Better	
Side Belt Feeding	Best	Good	Better	
Plant Tossing	Best	Good	Better	
Shatter Loss	Better		Better	

[Reel Pitch](#)
[Reel Type](#)

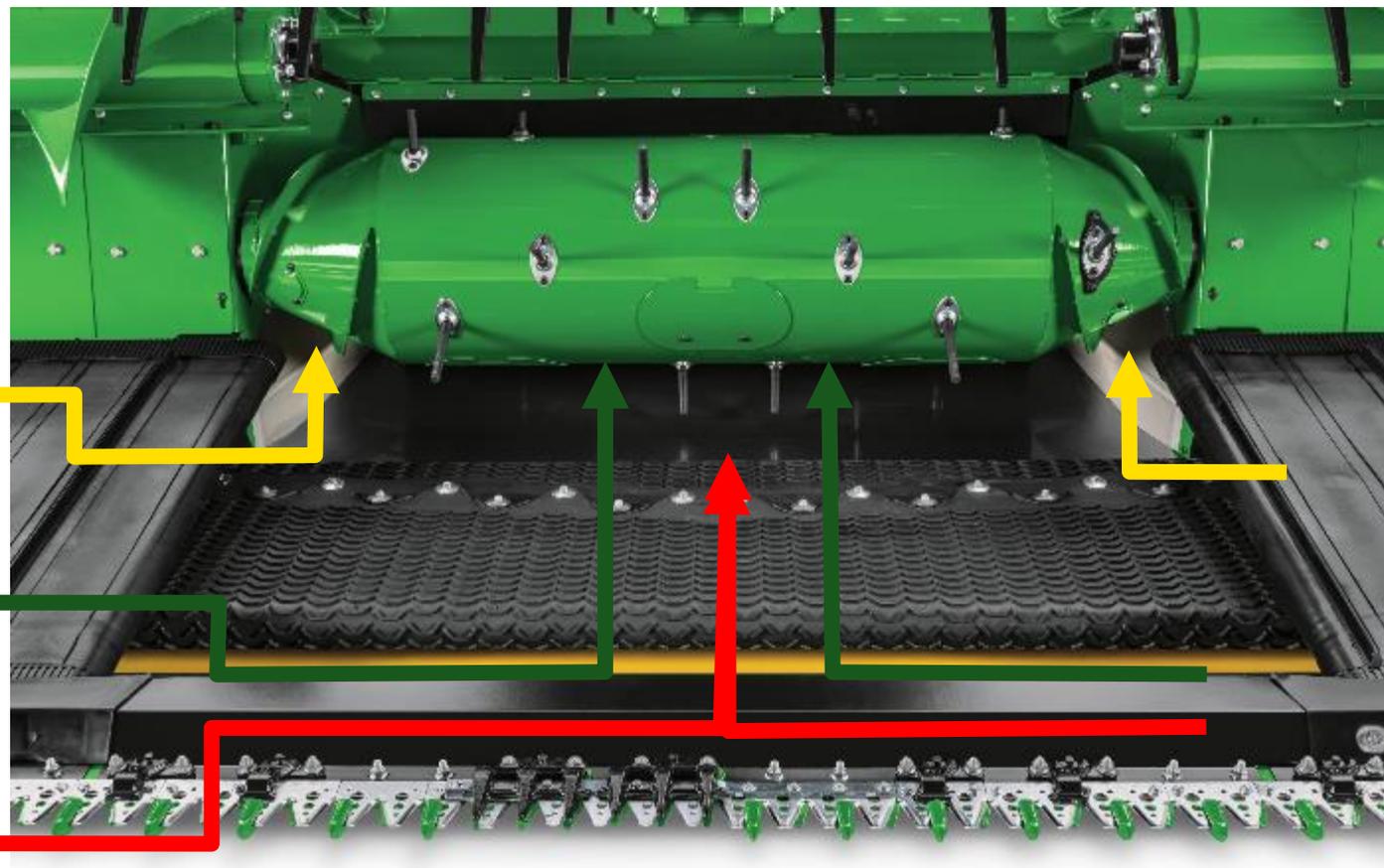
[Hinged Drapers](#)
[Flexible Drapers](#)
[Corn Heads](#)
[Belt Pickups](#)

## RDF Setting Side Belts

**Too Slow:** Crop is feed too far on outsides, can cause crop wrapping under belts, and bunching in feed drum

**Optimal:** 2 streams from belts just barely come together making a smooth wide stream of crop entering drum. This ensures each rotor is fed evenly

**Too Fast:** Both belt streams come to together in the center intermixing the crop, creates 1 stream which is difficult to utilize the full width of the separator. Can create slug feeding and drum plugging



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## RDF Feed Section

	Low Speed	High Speed
Feed Drum	200 RPM	240 RPM
Center Feed Belt	1000 RPM	1200 RPM

- Low speed crops
  - Soybeans
  - Pulses
  - Edible Beans
  - Dry, low volume canola/rapeseed prone to shatter loss
- High speed crops
  - Wheat
  - Barley
  - Oats
  - Linseed/Flax
  - Green straw or tough conditions in Rapeseed/Canola


[Feed Drum Speed](#)
[Center Belt](#)

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## RDF Feed Belt

- **Cleated Belt:**
  - Recommended for Canola and tough cereals. Large cleats grab crop better for positive feeding
  - In pulses, may need to run center section in slow speed to reduce shatter losses
  - Cleated belt cleans out mud better from sump
- **Standard Center belt**
  - Recommended for soybeans
  - Can work in lower volume canola
    - Risk of feeding issues in tough conditions
- **Center Section seal kit**
  - Recommended for canola
  - Can leave installed for cereals, but may experience side belt stalling



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## Rigid Draper Top Augers

- Large 18” augers for feeding high volume crops like canola/rapeseed and field peas
- Ensure auger speed is faster than side belts
  - Auger flighting should pass the belt cleats
  - Faster augers keeps pulling the crop headfirst into the center section
  - If augers are slower than belts, the crop can twist on the belts and cause poor feeding



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## RDF In Cab Adjustments

- Most settings on the RDF can be set from the cab and have customized settings with the 1,2,3 buttons on the control arm
- Belt speed
- Cutterbar pressure
- Reel speed
- Reel position
- Header fore/aft



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## RDF On Ground Cutting

- **Hydrflex Pressure:** Recommend starting at 1700psi
  - **Higher Pressure:**
    - Makes cutter bar rigid
    - Max pressure for off ground cutting
    - Increase pressure in soft ground conditions
    - Less weight on skid shoes
  - **Lower Pressure**
    - Makes cutterbar more flexible
    - More weight on skid shoes
- Cutterbar angle should start at 11° (measured on knife with phone or angle finder)
  - Optimal setting for largest surface area on skid
  - Running header at 5° or flatter can lead to debris build up and accelerated cleanout door wear
  - If running to raise knife, consider raised height skid shoes.



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## RDF Off Ground Cutting

- If desired, Cutterbar can be mechanically locked rigid
  - Install float arm Lockout/shipping brackets
- If header height becomes unstable (bouncing/pivoting) decrease tilt or height sensitivity until it stops



Header
ⓘ ⓘ
✕

---

**Flexible Draper**  
Header Type

224.5 h

30.0 ft

---

Raise / Lower Speed	Tilt Speed	Height Sensitivity	Tilt Sensitivity
 <p>24</p>	 <p>20</p>	 <p>74</p>	 <p>30</p>

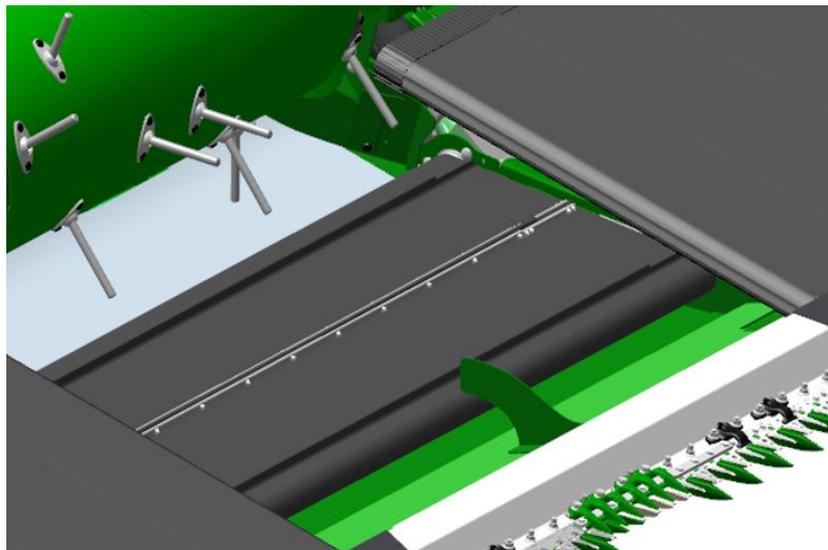
---

Auto Control	Belt Speed	HydraFlex Pressure
 	 <p>55</p>	 <p>650</p>

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## RDF Attachments

- Raise Height Skid Shoes
  - Increases cut height 25mm
  - Protects knife in conditions where still need to cut low but have rocks and other debris
  
- Fourth off ground sensor
  - BXE11090
  
- Center feed seal kit
  - BXE10959
  
- Center feed crop divider
  - BXE11387



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## CF/CR Product Overview

1 Row Unit

2 Stalk Processing

3 End Fender

4 Auger

5 Stalk Deflectors

6 Down Corn



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## Row Unit

### Deckplate Settings:

- Set to no more than 3mm (1/8") larger than cob diameter
- Set to no less than 3mm (1/8") smaller than stalk diameter
  - In dry corn, tight deckplates can take in more material to “cushion” the ears and reduce header loss
- If deckplate resume is enabled, ensure when pressing “2/3” on handle, deckplates move to intended position
- Starting deckplate angle: 20° (found with phone app/angle finder)

### Backshaft Speed:

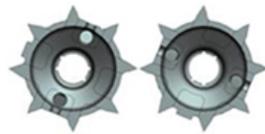
- Starting speed 620rpm and adjust with ground speed
- The stalks should be pulled straight down

If stalks breaking and plugging before entering row units, remove one or both of ear savers



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# Stalk Processing

Stalk rolls without StalkMaster™ corn heads	RowMax Opposed	RowMax Intermeshing	RowMax Chopping
Knife alignment			
Residue size	Good	Good	Better
Residue breakdown	Fast	Faster	Fastest
Soil warm up/dry down	Fast	Faster	Fastest
Wear life	Better	Better	Best
Row unit power consumption	Best	Better	Better
Fuel consumption	Best	Better	Good
Trash intake	Best	Better	Better
Dry stalks	Best	Good	Good
Wet stalks	Best	Better	Better
Down corn	Best	Good	Good
Weight for two stalk rolls	17.2 kg (38 lb)	18.1 kg (40 lb)	19.5 kg (43 lb)
<b>StalkMaster with RowMax opposed stalk roll</b>			
Residue size	Best		
Row unit power consumption vs. opposed without StalkMaster	Good		
Weight	Additional 19.1 kg (42 lb) per row for StalkMaster components		
<b>General stalk roll parts information</b>			
Number of knives	8	8	8
Aftermarket part numbers* (left-hand)	HXE110671	HXE110675	HXE141569
Aftermarket part numbers* (right-hand)	HXE110672	HXE110676	HXE141570
Compatibility	Model year 2012 and newer 600C / 600FC and 700C / 700FC for StalkMaster and non-StalkMaster row units; factory-installed option code for model year 2020 Corn Heads		

**Click above to help determine which John Deere Stalk Roll to suggest to your customer\***

Hinged Drapers

Flexible Drapers

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## End Fender

- Active End fender speed is adjusted from the cab with the Dial-A-Speed knob on Command Arm
- The End divider can be raised to keep ears from falling over the edge of the header.
  - This can be left up when folding



Hinged Drapers

Flexible Drapers

Corn Heads

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## Auger

- On CF/CR corn heads the auger position for most conditions is in the down position from the floor.
- CF/CR heads have rolled auger troughs from factory and prevent ears from splitting and kernel scalping from the auger.
- The stripper clearance should be  $\sim 1/4$ " (6mm)
- Raising the auger can be done if experiencing plugging in conditions with excessive trash intake



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## CF/CR Stalk Deflectors

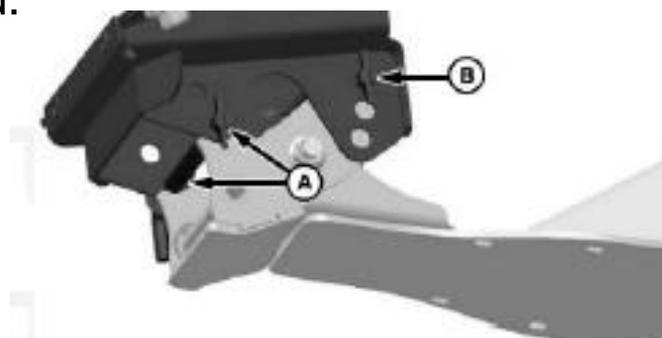
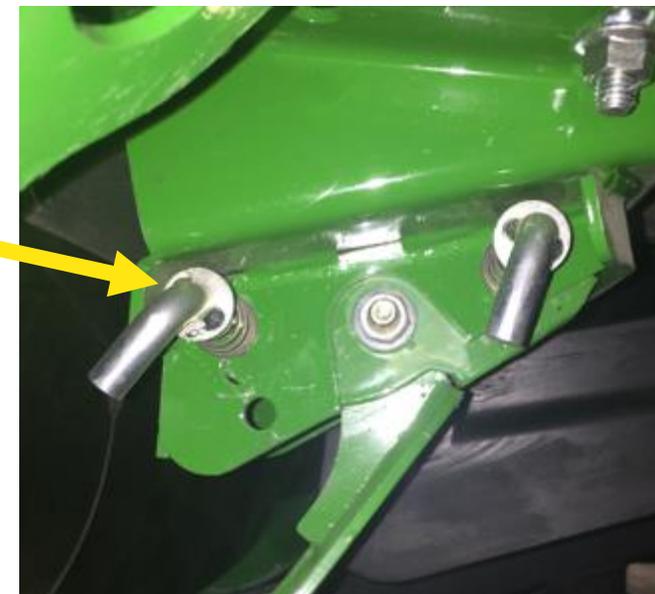
Stalk Deflectors can be adjusted to various positions depending on harvesting height. The top hole is recommended for general harvest.

If stalk stomping performance is not adequate, set the shoe assembly to the middle hole.

If the stalk stomping performance is still not adequate, set the shoe assembly to the bottom hole.

The bottom hole is intended for rare use in cases where the operator desires high clearance between the ground and corn head.

- In down or short corn conditions and very low positions, they may need to be removed to prevent row unit plugging.
- The pins can be adjusted to trailing position to raise them out of the way.



H129520—UN—24MAR20

High Clearance Position

A—Adjustment Hole (high clearance)  
B—Rear Pin

1. To adjust for front-end equipment trailer clearance, place the front pin into the high clearance adjustment hole (A) as shown.
2. Ensure that rear pin (B) is positioned in the top hole as shown.



Hinged Drapers

Flexible Drapers

Corn Heads

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## Down Corn:

- Heel header rearwards to flatten deckplates
  - Snouts may need adjusting to lower points.
- Stalk deflectors may need to be removed to get header low enough and not plug row units
- Cornhead storage stands will need to be raised
- Remove ear savers
  - Especially if stalks breaking or plugging before entering the row unit
- Gathering chains may need to be timed to so the lugs on the left and right side are directly opposed
- Gathering chain paddles can be installed to help conveyance in extreme dry conditions where a lot of trash is being taken in.



Hinged Drapers

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## BP15 Product Overview

1 Crop Shield

2 Feed Auger Spacer

3 Gauge Wheels

4 Picking angle

5 Adjustable Windscreen

6 Two Speed Sprocket

7 Harvesting Tips



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## BP15 Crop Shield

- Top beam mounted crop shield
  - Has 3 positions for adjustment
- Polycarbonate clear plastic
- Factory or dealer installed bundle



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## BP15 Feed Auger Spacer Adjustment

- The feed auger spacer is a field installed bundle used in high volume crops. This bundle is used to lock the auger in the raised position.
- Locking the auger up can aid in throughput in extreme conditions if auger plugging is experienced, however the extra 45mm of clearance will also allow larger rocks and other debris into the combine instead of stopping at the BPU auger
- The 55mm floating feed auger allows the auger to adapt to varying windrow profiles caused by variations in crop stand prior to swathing, poor swathing job or wind events that merged adjacent swaths.



**Without Feed Auger Spacer**



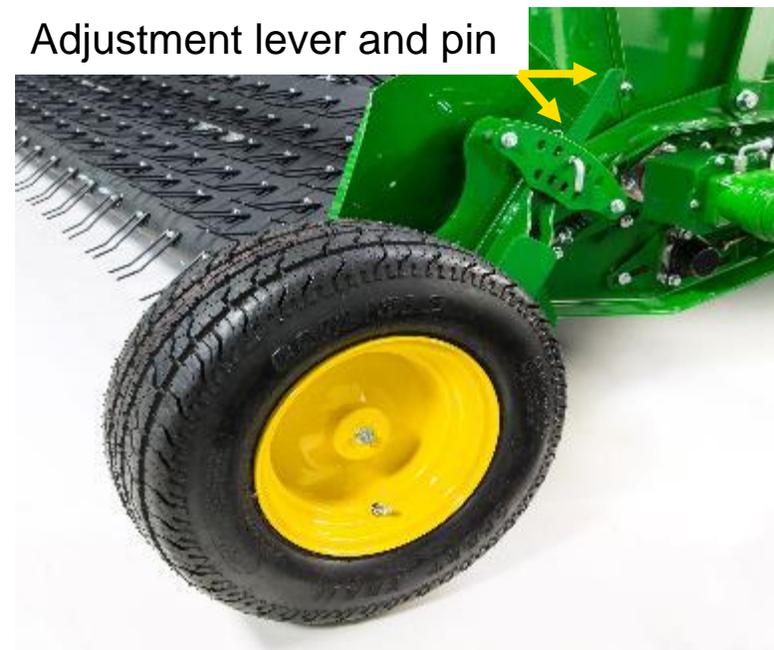
**With Feed Auger Spacer**

[Hinged Drapers](#)
[Flexible Drapers](#)
[Corn Heads](#)
[Belt Pickups](#)

## BP15 Gauge Wheels

- BP15 features large 20" picking unit gauge wheels and toolless 9 position height adjustment
  - This adjustment enables the picking belt to be optimized for various crops as well as rocky conditions
- Gauge wheels may need to be adjusted if the picking angle is adjusted significantly

Adjustment lever and pin



Hinged Drapers

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## BP15 Picking Angle

- Feeder House position effects the picking angle of the header-- 20°-25° is recommended to start
- Gauge wheels may need to be adjusted to get proper finger clearance to ground
- The flatter the picking angle, the more combing of the ground to get crop pushed into stubble

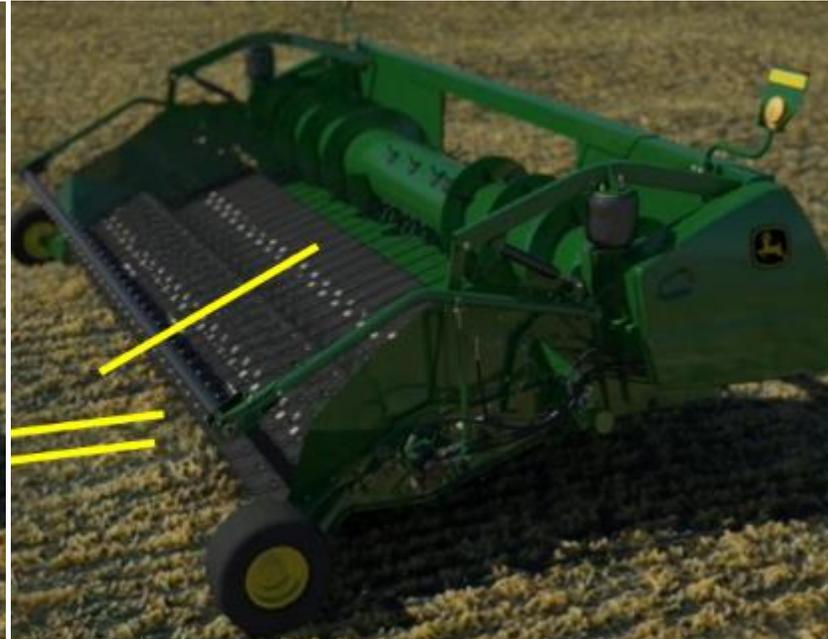
### Low pitch angle

Light crop, easier to get on belts



### Medium pitch angle

Normal Conditions



### Steep pitch angle

Rocky Conditions



Hinged Drapers

Flexible Drapers

Corn Heads

**Belt Pickups**

## BP15 Windscreen Adjustments

- Windscreen eliminates crop bunching and crop overriding the top of auger by deflecting crop downward
- The windscreen can be adjusted in multiple ways:
  - Fore/Aft Adjustability Range 253 mm (9.9 in)
  - 3 finger pitch positions.
- Normal Conditions:
  - Position fiberglass rods to point at top of auger

### BP15 Windscreen Pitch Adjustment



[Hinged Drapers](#)
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## BP15 2 speed auger

- The BP15 features a two-speed drive for high volume crops such as Canola and high yielding wheat.
- **15-tooth** drive sprocket (181 RPM) is used for most crops and conditions.
- **18-tooth sprocket** provides a 20% increase (218 RPM) in speed of the auger when used.
- If your combine is equipped with a variable speed feeder house drive you can run your back shaft speed at 550 RPM instead of changing drive sprockets.

Two-speed drive sprocket  
(15T & 18T)



[Hinged Drapers](#)
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## BP15 Harvesting Tips

### Make a good swath!

- Do not excessively compress windrow in stubble
- Make windrow wide
  - X9 Opening is 1720mm/67in
  - Windrows made with high draper speeds and heavy in the middle make crop harder for combine to pull back apart in tough conditions
- Always try to keep the combine centered in the swath to ensure even feeding with the X9. This ensures both rotors are fed evenly and not causing an overload on one rotor which can cause reduced performance.
- Adjust windscreen pitch to allow for smooth even feeding while keeping contact with swath.
- Make sure auto control modes are turned on for best performance.
- Ensure belt speed is set appropriately to allow for even feeding.
  - **Belt speed too fast:** Windrow torn apart as it elevates onto header
  - **Belt Speed too slow:** crop is pushed ahead of header or does not release from stripper
- Ensure air bag is properly inflated (**Do not exceed 689 kPa/100psi**).
  - Header height sensing will not function correctly when inflated higher than check gauge.
    - Refer to Owners Manual for procedure on setting Air bags
    - In muddy conditions can increase pressure to take weight off gauge wheels,



[Feeder House](#)
[Platform Tilt](#)
[Speed](#)
[FAST](#)
[Attachments](#)

## Feeder House

- X Series combines have a pivoting feeder house mid-floor to raise and lower as the crop mat enters
- Ensure conveyor chain is tensioned properly and remove half links as chain stretches
  - When chain cannot be tensioned after all 4 half-links are removed, it should be replaced
- There are 2 types of feeder house chains:
  - **6 pitch (1 slat per 6 chain links)**
    - Comes with Round Bar concave selection
    - Best for corn to orient ears into feed accelerator
      - Minimizes grain damage
    - Still can work for small grains without issues
  - **12 pitch (1 slat per 12 chain links)**
    - Comes with small and large wire concave selections
    - Best for high volume straw crops
    - Can be used in corn but grain quality may be compromised
- The X Series feeder house drum is self adjusting to crop volume and does not have an up or down adjustment to raise/lower per crop.



## Feeder House Reversal

- When operator reverses the header engage switch, a reversing page will appear on the CommandCenter™ display. **Keep the switch in the reverse detent position** and use the on-screen commands until the plug is resolved and the operator is ready to resume forward harvest.
- On the reversing page the operator will:
  1. Reverse the plug or object
  2. Push the Feed button to advance the material into the separator
  3. If unable to get the material to advance into the separator the operator can work the plug back and forth until the plug is resolved
- When reverse modulation is engaged the feed accelerator and separator will continue to operate at 100% speed. The feeder house and head will only operate at 10% speed.
  1. This allows the plug to be slowly fed and processed by the separator.



Feeder House

**Platform Tilt**

Speed

FAST

Attachments

## Feeder House Tilt

- The faceplate of the feeder house can be adjusted from the cab
- Angle can also be pre-set with auto header functions on the command arm

### Pivoted Forward:

- Knife closer to ground at aggressive angle for low podding crops
- Can get under downed crop
- Increased chance of stone intake

### Pivoted Rearward:

- Less “pushing” in soft ground
- Easier for crop to fall on the belts
- Knife out of debris/stones

*On ground cutting starting knife angle – 11°*

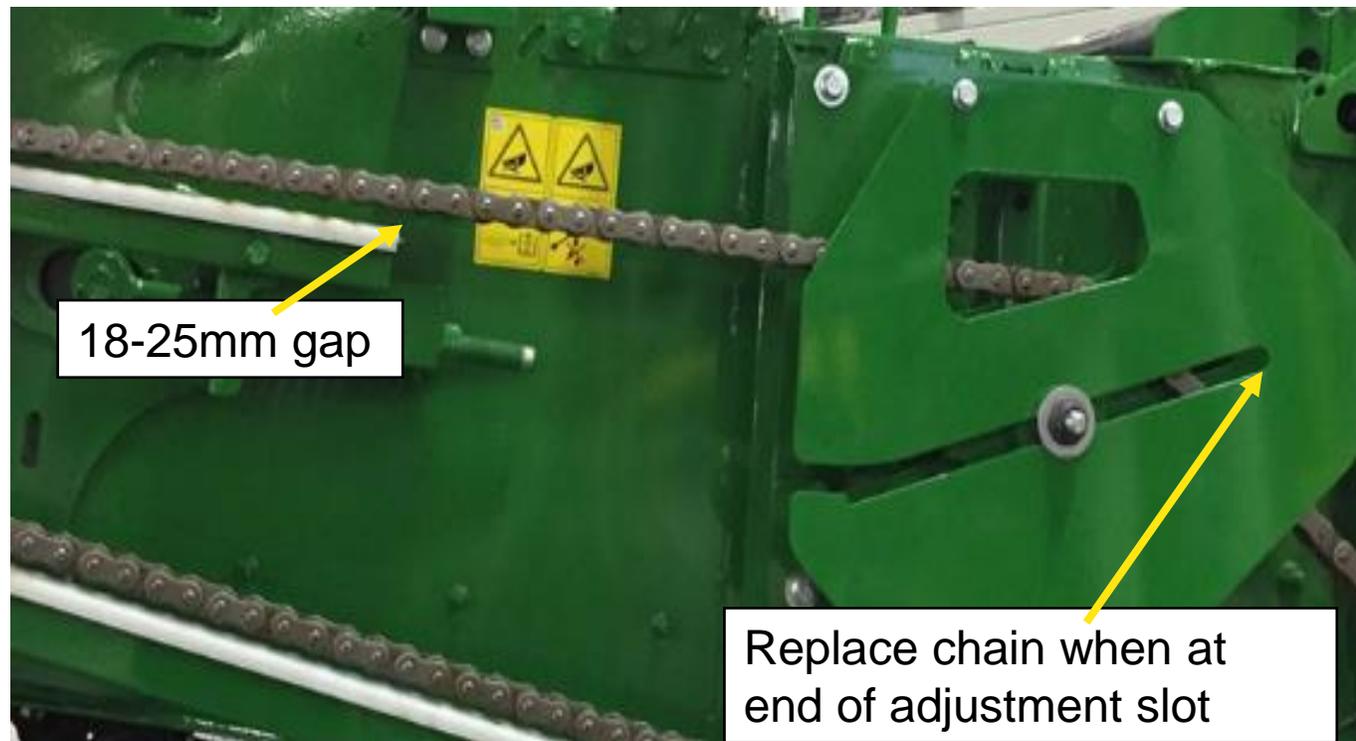
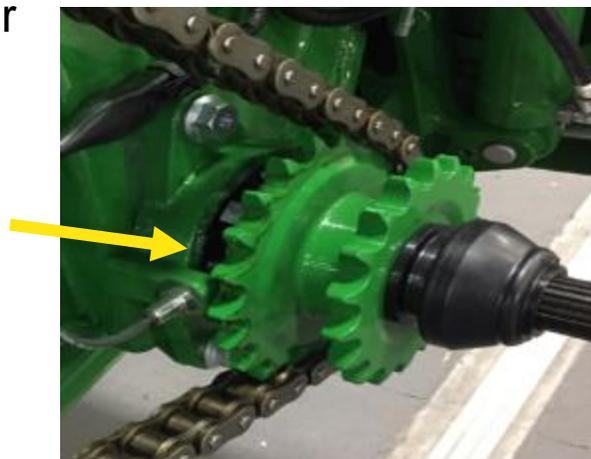
*Corn Head starting deckplate angle – 20°*

*\*found with phone app or angle finder*



## Conveyor Chain Speed

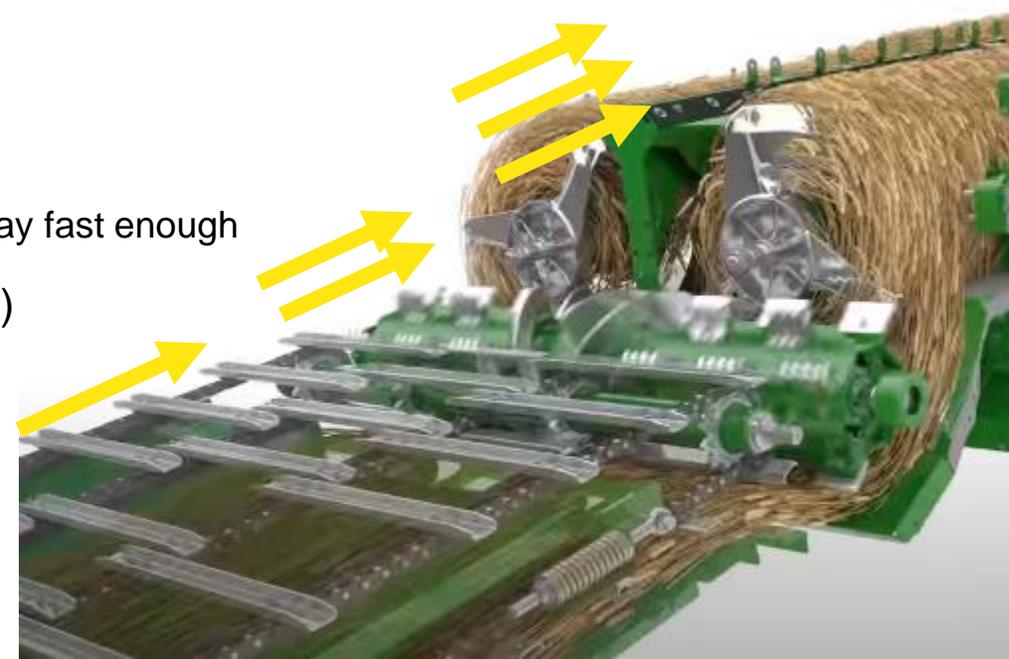
- Conveyor chain speed can be changed with 22t or 18t sprocket on the right side of the feeder house
  - 22T** - Faster Sprocket Speed for Tough Feeding straw condition
    - \* Dry Barley straw is “Slippery” and high speed is recommended
  - 18T** – Slower Sprocket speed for all other conditions
- Running faster speed when not needed can accelerate chain wear and increase grain damage.



[Feeder House](#)
[Platform Tilt](#)
[Speed](#)
**FAST**
[Attachments](#)

## Feed Accelerator Stone Trap

- The FAST helps reject foreign debris and feeds material in the rotors .
- As material is conveyed into the machine, the crop should be slowly accelerated at each step from the header, feeder house, FAST, rotor. This helps to slowly thin the straw mat out as it goes through the machine and reduce slugs and improves threshing.
- If there is a significant change in speed, it can damage straw and grain.
  - 22t FH → 1000rpm FAST needs faster rotor (600-700rpm+)
  - Crop Continually pulled crop apart as enters machine
  - 22t FH → 440rpm FAST = FAST plugging
  - High Speed feeder house sprocket and slow FAST cannot take crop away fast enough
- Slow speed drive is available for edible beans, popcorn, etc (320-780rpm)
  - BXE11137



## Attachments

- Feeder House Dust fan Code 8310
- Kit number AON10439
  - Fan improves visibility by reducing dust and is recommended for customers harvesting large grain crops where dry and dusty conditions are present.
  - Use in small grains will depend on conditions but is generally not recommended or needed. Dry rapeseed/canola would be an exception to this.
- FAST unplugging tool – used for manually reversing the FAST during plugging situations. AXE81273
- FAST Slow down pulley BXE11414
  - Edible beans, popcorn, etc (320-780rpm)
- Stone trap, Rock rejection flap - BXE11413



## Concave Offerings

### Small Wire:

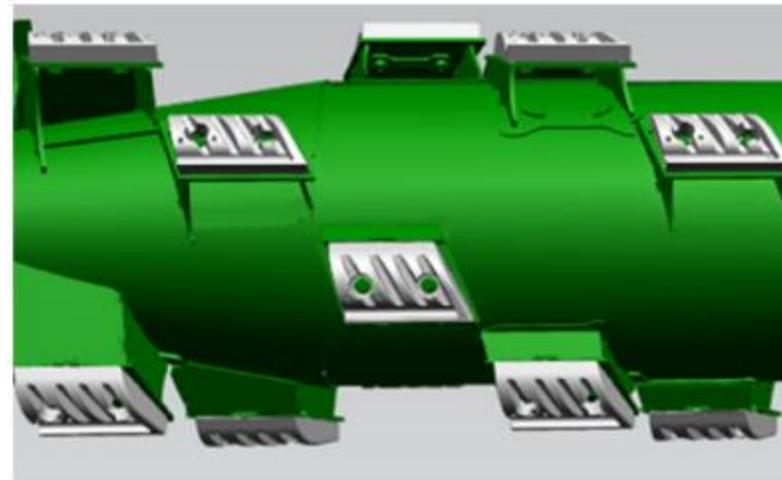
- Most universal small grains concave

### Large Wire:

- High Separation
  - Used in crops with wet tough straw
- Increased Chaff on cleaning system in dry conditions
- Can plug with corn leaves

### Round Bar:

- Least aggressive (Recommended for corn)
- Round bars prevent plugging with corn husks



[Concave types](#)
[Small Grains  
Concaves](#)
[Coarse Grains  
Concaves](#)
[Concave Adjust](#)
[Threshing Speed](#)
[Threshing Attachments](#)

## Small Grain Concave Configurations

### Three Small Wire:

- Best in dry and difficult to thresh conditions
- In certain hard threshing conditions add concave covers to aid in threshing

### Three Large Wire:

- High separation
- Increases chaff on cleaning system
  - Not recommended for dry conditions due to excessive cleaning load
- Reduced threshing--May need to use up to 6 covers to thresh wheat
- Multi crop versatility in Pulses – will need to add covers for wheat

### Small, Small, Large Wire:

- Increased separation over three small wires in wet conditions
- Increased chaff on cleaning system in dry conditions
- Multi crop versatility in Pulses
  - Run 30+ concave in pulses to minimize damage
  - May need to switch middle concave to large wire or round bar for chickpeas

### Concave Covers:

- Recommended in hard to thresh conditions
  - Installing a cover to thresh white caps will result in more capacity than closing concaves below 5mm and increasing rotor to 1300rpm due to the increased power consumption



[Concave types](#)
[Small Grains  
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[Coarse Grains  
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[Threshing Speed](#)
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## Large Grain Concave Configurations

### Three Round Bar:

- Most universal coarse grains configuration
- Best configuration for most conditions

### Tough Threshing Soybeans:

- Round bar inserts can be installed in the first concave
- The round bar concave in the front position can be replaced with a large wire concave to provide more aggressive threshing in green stem/podded soybeans
  - Can run in corn, but shucks may matt over the threshing bars in wet conditions

### Peas and other Pulses:

- 3 round bars are the best for large peas and pulses sensitive to damage (Chickpeas)
- Small, Small, Large and Small, Large, Large can also work well in pulses, but may need more open concave and slower rotor speed than round bars
  - A good option to minimize concave changes



Side Panel Brackets Easily removable for service

[Concave types](#)
[Small Grains  
Concaves](#)
[Coarse Grains  
Concaves](#)
[Concave Adjust](#)
[Threshing Speed](#)
[Threshing Attachments](#)

## Concave adjustment

### Active Concave Isolation (ACI)

- The concaves are suspended by hydraulic cylinders, keeping consistent concave clearance in tough conditions forcing the crop mat to always be threshed, and reduces the amount of rotor noise that is heard by the operator.
- Ensure concaves are Zeroed, leveled and calibrated properly

### • Tighter Concave

- + Increased threshing
- Increased Power and fuel consumption
- Increased chaff load/straw damage
- Increased grain damage

### • Open Concave

- Reduced threshing
- + Reduced Power
- + Longer straw
- + Reduced grain damage

1300rpm and 0 concave with no covers can thresh as good as 1000rpm 12 concave and 3 covers but will have higher capacity, less fuel and more throughput in wheat due to less power and less straw damage.



[Concave types](#)
[Small Grains  
Concaves](#)
[Coarse Grains  
Concaves](#)
[Concave Adjust](#)
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## Threshing Speed

- **Faster Rotor Speed**
  - + Increased separation
  - Increased Power and fuel consumption
  - Increased chaff load/straw damage
  - Increased grain damage
  
- **Slower Rotor Speed**
  - Reduced Separation
  - + Reduced Power
  - + Longer straw
  - + Reduced grain damage
  - Slower material flow in tough conditions
    - Need rotor speed to convey crop into top cover vanes

Rotor speed range: 300-1300 rpm

- 1<sup>st</sup> gear = 300-520 rpm  
Corn, Edible Beans, Pulses
- 2<sup>nd</sup> gear = 420-800 rpm  
Soybeans, Canola, Pulses
- 3<sup>rd</sup> gear = 720-1300 rpm  
Small Grains



## Threshing Attachments

- **Roundbar Inserts**

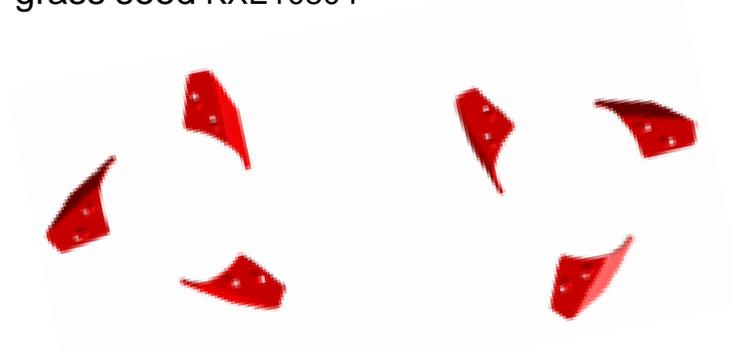
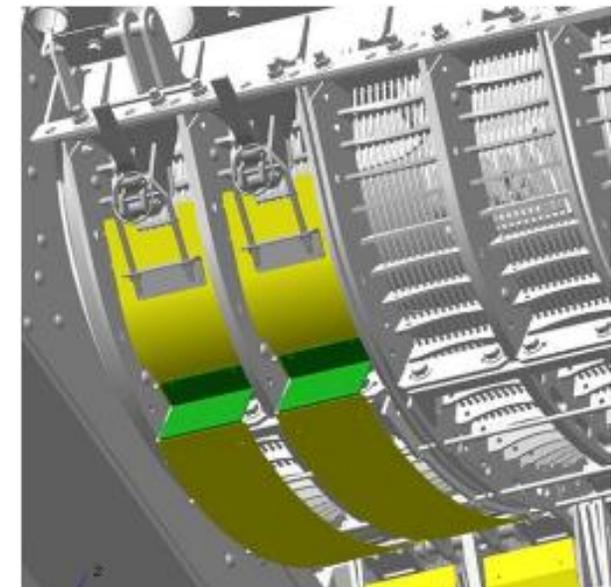
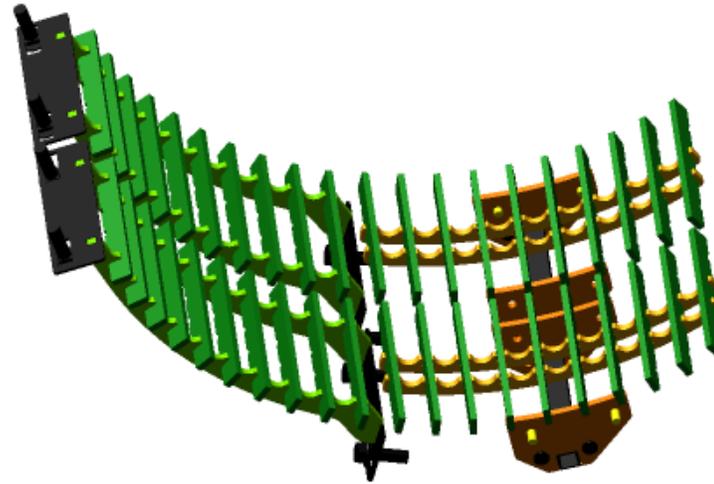
- Can increase threshing ability in tough soybeans or other crops with round bars installed.

- **Concave covers**

- Option Code: 9434 or BXE11382

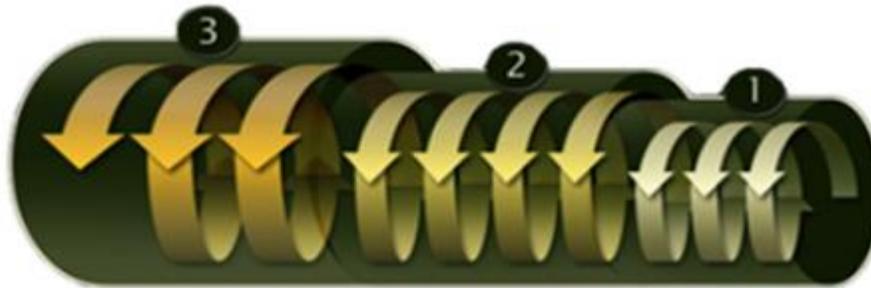
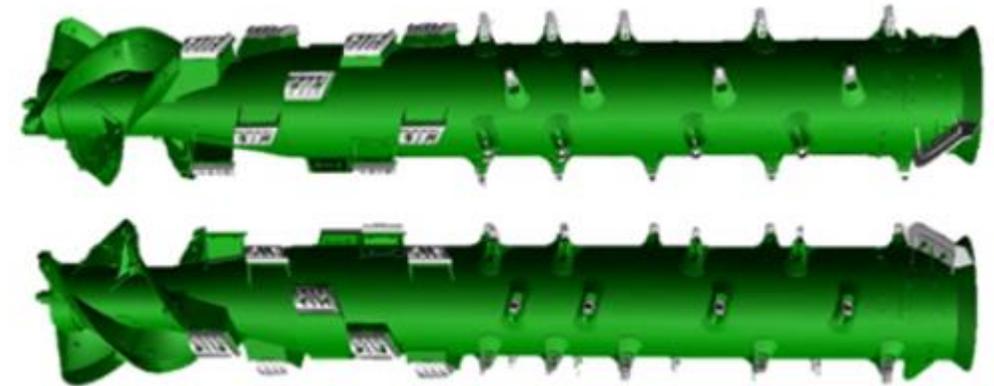
- **Grass knives**

- Attach to front of rotor for extra wrap protection in grass seed KXE10804

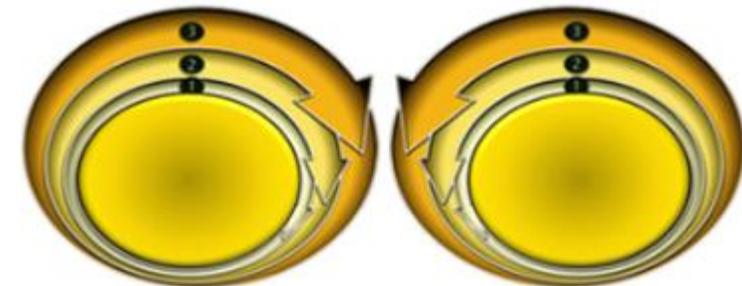


## Tine Separation

- John Deere Rotary combines use tine separation to separate material after it has been threshing
- Tines comb through material to release entrapped grain
- The separation tines are the largest diameter of the separator cage and crop speed is the fastest
- The expanded separator volume allows for the crop mat to de-compress and release entrapped grain



Three-stage rotor chamber expansion



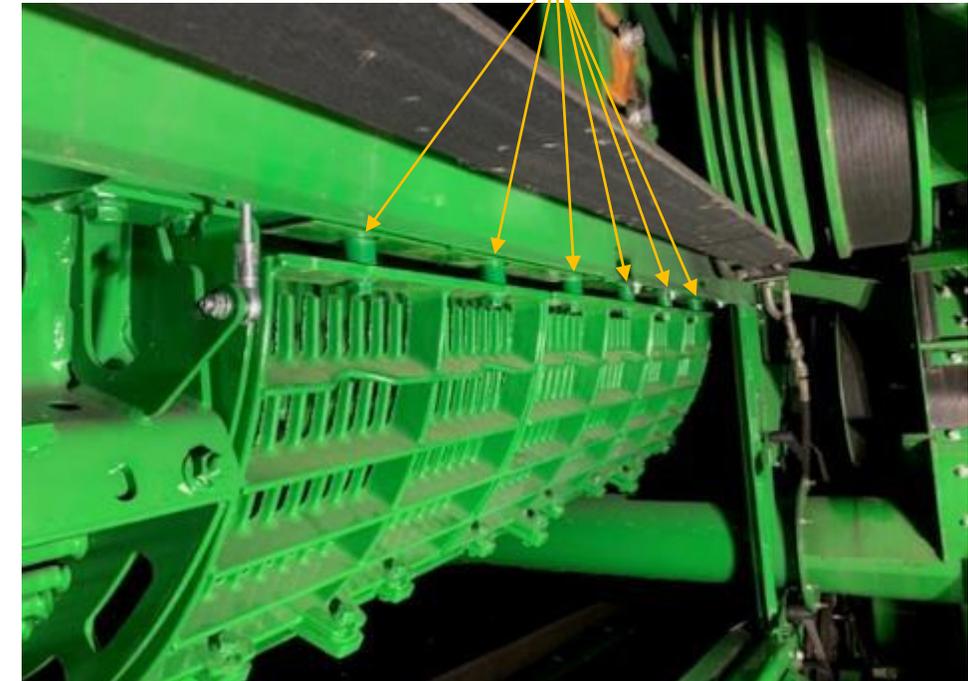
Crop rotation

[Tine Separation](#)
[Separator Grates](#)
[Chaff Distribution](#)
[Chaff Reduction](#)
[Separator Attachments](#)
[X](#)

## Separator Grates

- X Series has four separator grates accounting for 3.6m<sup>2</sup> (38.75ft<sup>2</sup>) of separating area
  - Finger bar separation grates comb material to release grain and minimize plugging and straw damage
  - Only one type of separator grate for all conditions
- In corn, insert the separator grate spacers to space down the first 3 separator grates to minimize cob breakage
  - Spacers can be left in for soybeans

Separator Grate Spacers



## Separator Grate Blanks

- Separator grate blanks come installed on machines from factory to manage chaff distribution to the cleaning system
- In dryer conditions, higher chaff loading can be seen on the outside of the cleaning system.
- Center Dividers are available to be installed on the middle of the grates if struggling with shoe distribution in corner conditions

### Removal:

- Corn – Remove when spacing down grates
- Tough to separate straw
- Heavy oats and green barley are common conditions that require blanks to be removed

### Install:

- Dry small grains/cereals if cleaning system limited
- Struggling with cleaning system losses or grain quality
- Power shutdown shows high outside loading



[Tine Separation](#)
[Separator Grates](#)
[Chaff Distribution](#)
[Chaff Reduction](#)
[Separator Attachments](#)
X

## Separator Grate Covers

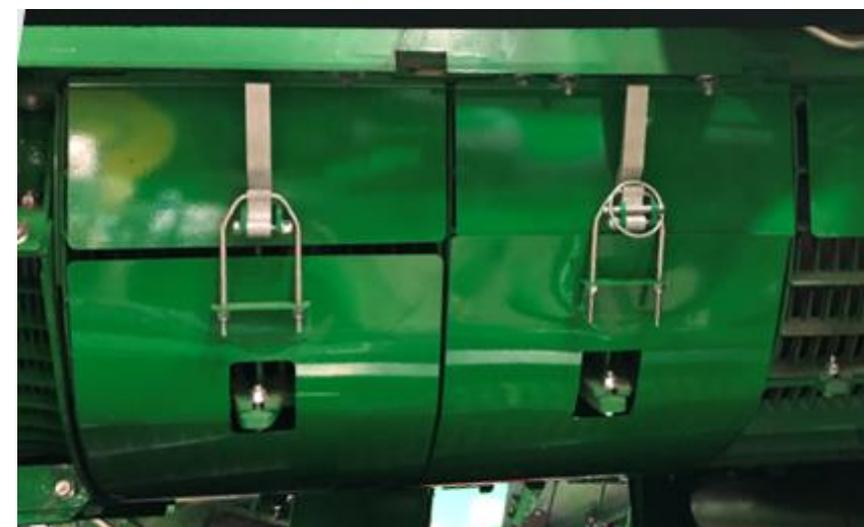
- Separator grate covers are available to installed over the 1<sup>st</sup> and/or 2nd separator grates to reduce shoe loading and better balance the machine performance in dry conditions.
- Recommended in canola, sunflowers or other very brittle straw where shoe load is limiting factor
- In these crops, 1 cover helps in most conditions. In very dry conditions 2 covers maybe needed.
- One cover can be left installed for dry cereals if not rotor loss limited
  - May need to remove if conditions change to wet/tough or high yielding
- If in wet, green canola/rapeseed and limited by rotor loss, do not install the grate covers



Notice chaff level is at top of dividers, in this condition, attempt to reduce chaff with less aggressive settings and/or separator grate covers



Same field, same condition with grate covers and optimized settings, notice reduced chaff on chaffer and more exposed dividers



[Tine Separation](#)
[Separator Grates](#)
[Chaff Distribution](#)
[Chaff Reduction](#)
[Separator Attachments](#)
[X](#)

## Separator Attachments

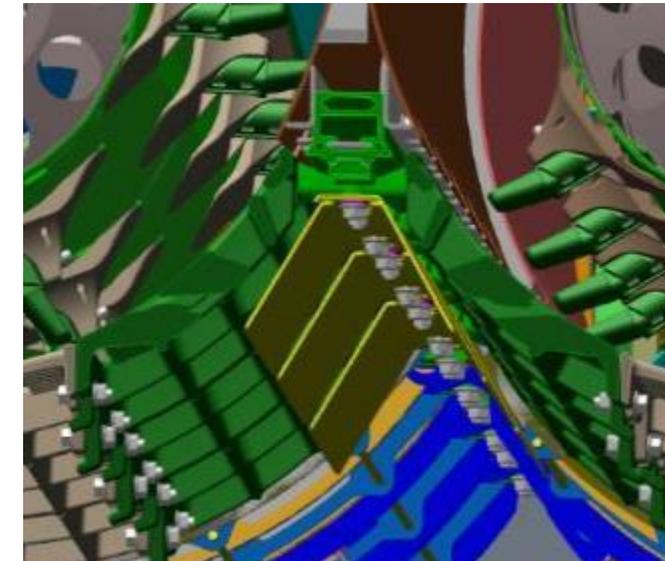
- **Separator Grate Covers**

- Option Code: 9485 or BXE11383
- Improves capacity in very dry small grains conditions by reducing the chaff load to the cleaning shoe
  - 1 bundle covers 1 grate on each rotor



- **Separator Grate Center Deflectors**

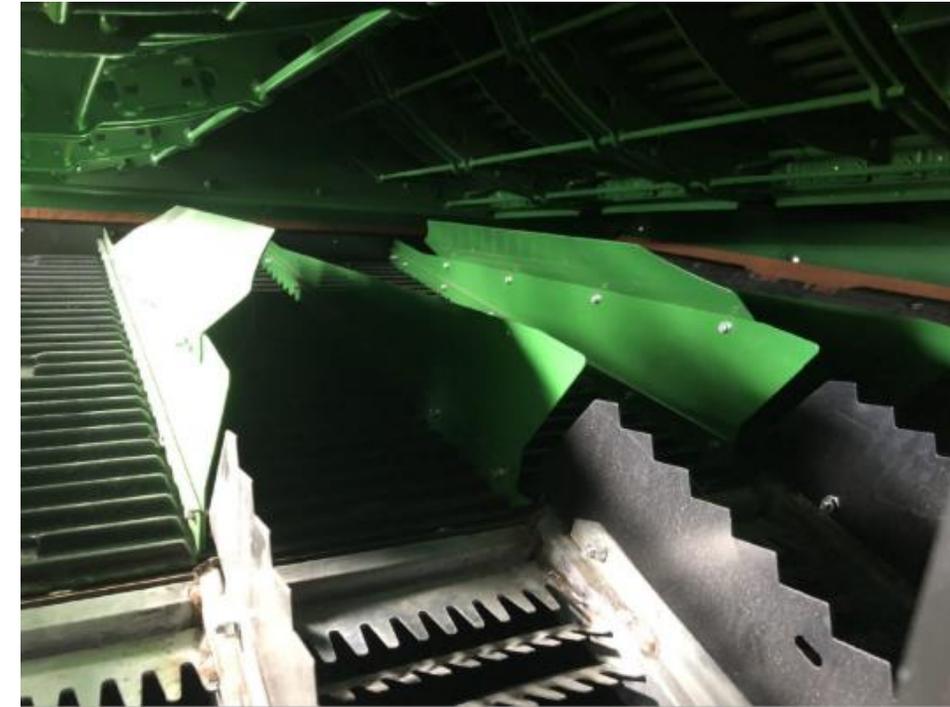
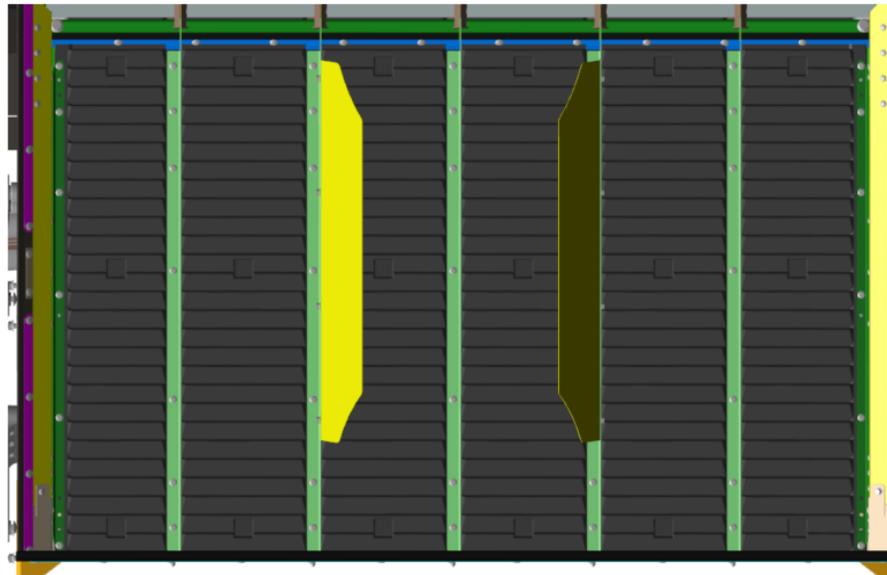
- Reduces material on the cleaning system in bays 3/4
- HXE129682 – up to 4 can be installed



## Front Step Pan Dividers

Dividers on the front step pan can be re-configured to improve cleaning system distribution.

- In corn, the front step pan can be heavy in the center and the factory mounting (right) of the deflectors distribute the grain for increased cleaning system capacity.
- Movement of these deflectors from the factory position is possible to fine tune distribution if desired but usually not needed.



Front Step pan

Cleaning Fan

Front Chaffer

Chaffer

Sieve

Tailings

## Cleaning Fan

Setting the cleaning fan is essential for machine optimization. The blast of air from the fan is designed to clean the debris from the grain and use the turbulence of the air to stratify and separate the material on the cleaning system.

X Series utilizes four turbine fans to ensure even air flow across the width of the machine.

### Fan Speed too high:

- Increased Losses
- Increased tailings
- Very clean grain tank sample

### Fan Speed to low:

- Increased light chaff in sample
- Decreased separation of grain from chaff mat

### Fan Speed Range:

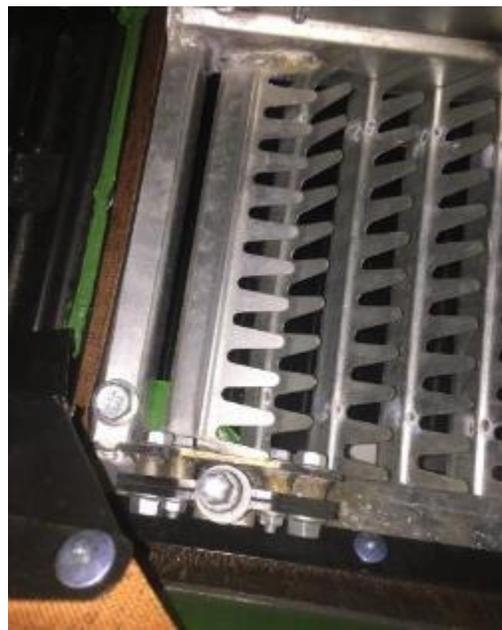
- 570-1430rpm Fan Speed
- Cleaning fan slow-down kit for grass seed and other micro seed crops is available
  - BXE11130



[Front Step pan](#)
[Cleaning Fan](#)
[Front Chaffer](#)
[Chaffer](#)
[Sieve](#)
[Tailings](#)

## Front Chaffer

- X Series combines feature a front chaffer to pre-clean grain as it enters the cleaning system.
- A portion of the air flow from the fan goes through these louvers to initiate separation of material. The Inclined design moves material downwards rapidly to thin out of the chaff mat.
- The front chaffer is adjustable for conditions where straw can stab in the louvers. It is recommended to close 6mm (1/4") at a time until stabbing stops.
  - When closed all the way, the front chaffer can create a nozzle at the rear increasing grain loss.



[Front Step pan](#)
[Cleaning Fan](#)
[Front Chaffer](#)
[Chaffer](#)
[Sieve](#)
[Tailings](#)

## Chaffer Selection

### General Purpose ~30mm (1-1/8") wire spacing:

- Most robust for wide range of conditions in small and coarse grains
- Can limit cleaning capacity in high yielding corn

### Deep Tooth ~41mm (1-5/8") wire spacing:

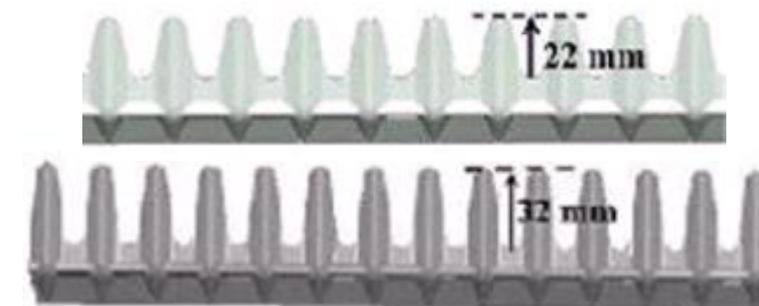
- Ideal for high yielding corn and soybeans
- Not recommended for small grains

### FTC (Flat Tooth Comb) ~30mm (1-1/8") wire spacing:

- Used in small grains to improve grain cleanliness in challenging conditions
  - Will need to run more open than GP chaffer
- Not recommended for use in corn, due to risk of silks/husks plugging louvers
- Can reduce tailings in weedy conditions
- AXE88342

### CZ4

- Rounded louver tip to reduce plugging of the louvers in 35%+ moisture corn
- AXE88343



[Front Step pan](#)
[Cleaning Fan](#)
[Front Chaffer](#)
[Chaffer](#)
[Sieve](#)
[Tailings](#)

## Sieve Selection

### General Purpose:

- Used in Small grains with GP and FTC chaffers
- For full capacity in large grains, may need to open all the way.

### Deep Tooth:

- Used for high yielding corn and soybeans
- Can run in small grains but may have difficulty getting clean sample

### Sieve Settings

#### Too far Open:

- Decreased separation of grain and debris
- Dirtier grain tank
- Lower Tailings
- Corn Cobs plug between louvers

#### Too far Closed:

- Higher Tailings
  - More grain in tailings = higher losses and damage
- Clean sample
- Closed sieve can restrict air to the chaffer resulting in a dirtier grain tank and/or higher losses



[Front Step pan](#)
[Cleaning Fan](#)
[Front Chaffer](#)
[Chaffer](#)
[Sieve](#)
[Tailings](#)

## Active Tailings

- The active tailings return system increases harvesting capacity by re-threshing the tailings taking additional load off the rotors, increasing rotor capacity and optimally delivering it back onto the cleaning shoe return pan for cleaning.

### Corn Position:

- Large grains that need gentle material handling (pulses, corn, etc). Also, dry/brittle canola to avoid grain damage and/or over processing of dry pods.

### Small grains Positions:

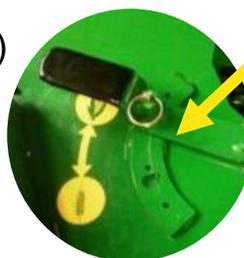
- Crops that need to be re-threshed (wheat, shatter resistant Canola)
- Ensure concave is “zeroed” to beater

### High Tailings (5+bars):

- Decreased cleaning capacity (more grain in circulation)
  - Right side shoe loss may increase
- Higher damage in large grains

### Low Tailings (<3 Bars):

- Could close sieve, or open chaffer for more capacity and/or improved grain quality.



## Spreading

- X Series Combines have a Deluxe and a Premium residue package options.
  - Both residue packages have the same spreaders with shroud adjustment and Auto Swap
- Counter knife adjustment is recommended to start at 50% engagement and adjust as needed.
  - More engaged counter knife can improve spreading in tough conditions.
  - 10% increments of adjustment available
- The Adjustable Shroud Kit can be installed to address uneven spreading in tough small grains conditions. This kit helps ensure a more uniform spread across the width of the cut.



Deluxe Residue Shown

Spreading

Premium Windrowing

Deluxe Windrowing

Chopper Selection

Attachments

## Premium residue (Chop to Drop)

- With Premium residue, the ability to windrow straw and spread chaff is enabled, this can be done from the cab.
- In very dry straw conditions, the air flow from the spreader straw paddles can fluff the windrow distorting the shape. In this condition the chopper can be put into low when windrowing to get optimal windrow shape. **\*\*Chopper needs to be in high when returning to chop.**



Windrow curtains can be adjusted  
in/out to shape windrow

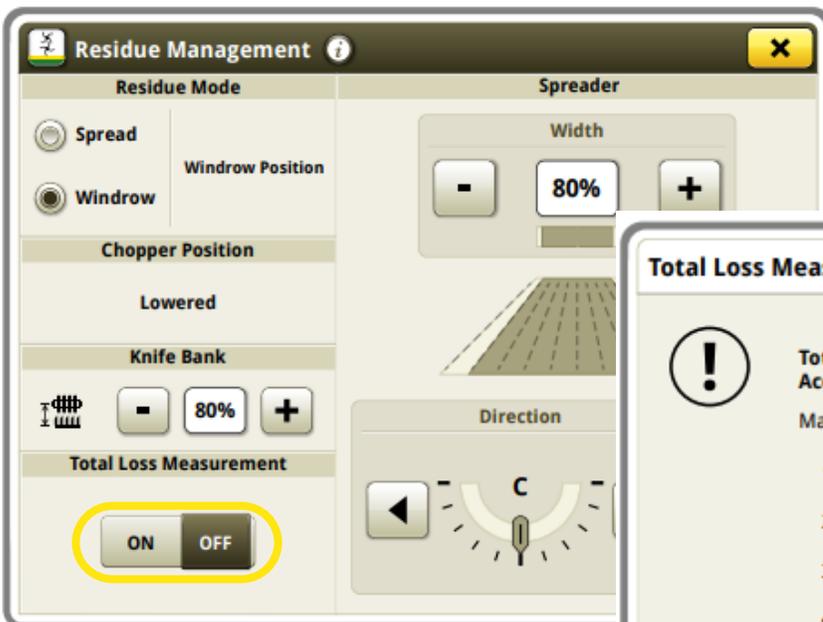


Spread Chaff/Drop Straw

Windrow Chaff+Straw (Total Loss Mode)

## Premium residue – Windrowing Chaff + Straw for loss checking

- For checking losses from the machine or windrowing the chaff+straw, the X9 requires the chopper to be raised, chopper in neutral, and straw curtain installed.



**Total Loss Measurement**

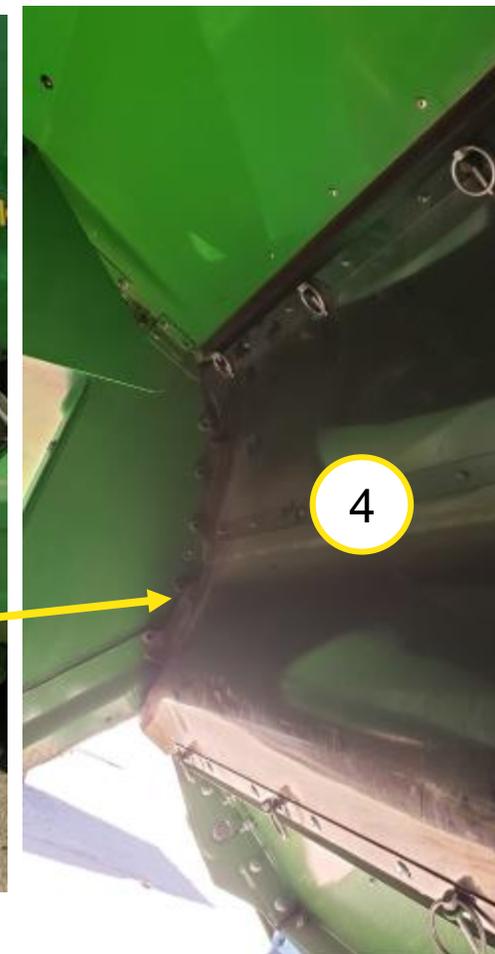
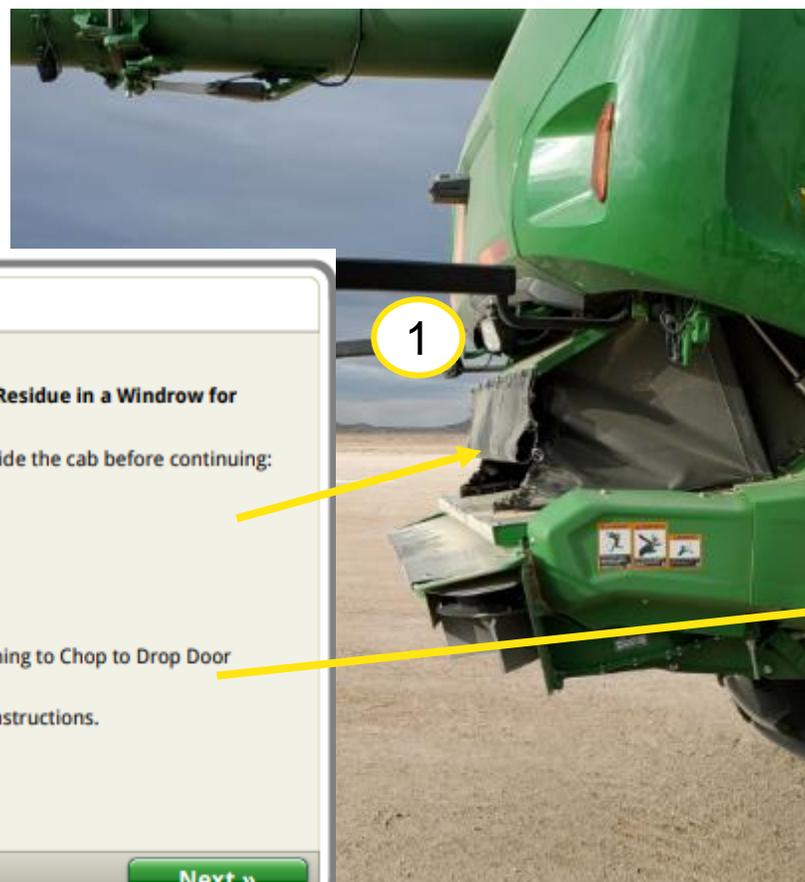
**Total Loss Measurement Drops All Residue in a Windrow for Accurate Loss Measurement**

Make the following adjustments outside the cab before continuing:

1. Disassemble Rear Curtain
2. Raise Chopper fully
3. Put Chopper Gearbox in neutral
4. Assemble Rear Curtain by fastening to Chop to Drop Door and Chopper inlet

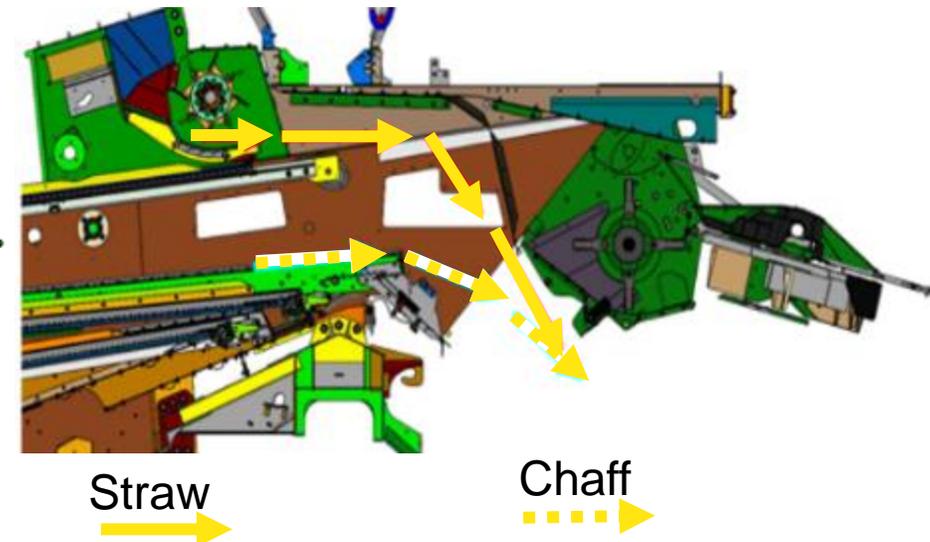
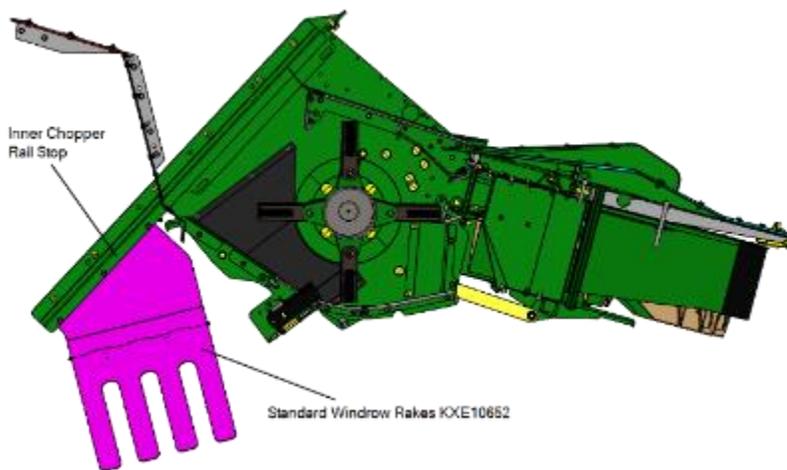
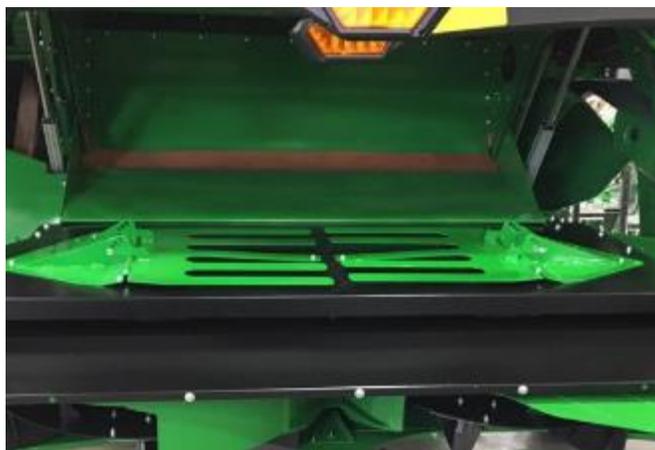
See Operator's Manual for detailed instructions.

**Cancel** **Next »**



## Deluxe Windrowing

- With Deluxe residue, the straw and chaff are dropped together when the chopper is raised.
- With the X9 being 67 inches the windrow maybe ~85" wide with the straw stream visible from each rotor making a "M" shaped windrow
- Installing Straw Rakes KXE10652 is an option to get optimal windrow shape for baling with deluxe residue
  - Multiple adjustments allow windrow to get down to 30" in some conditions



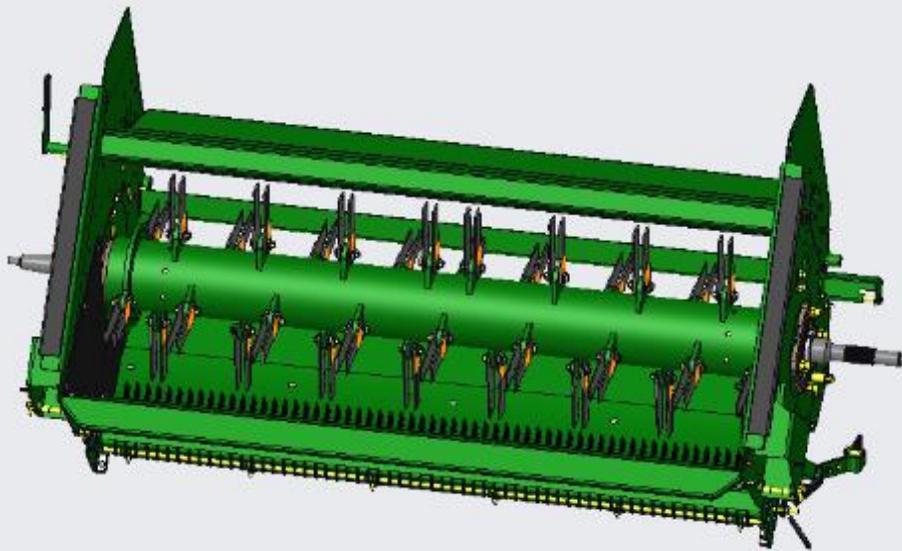
## Chopper Selection

### Fine Cut:

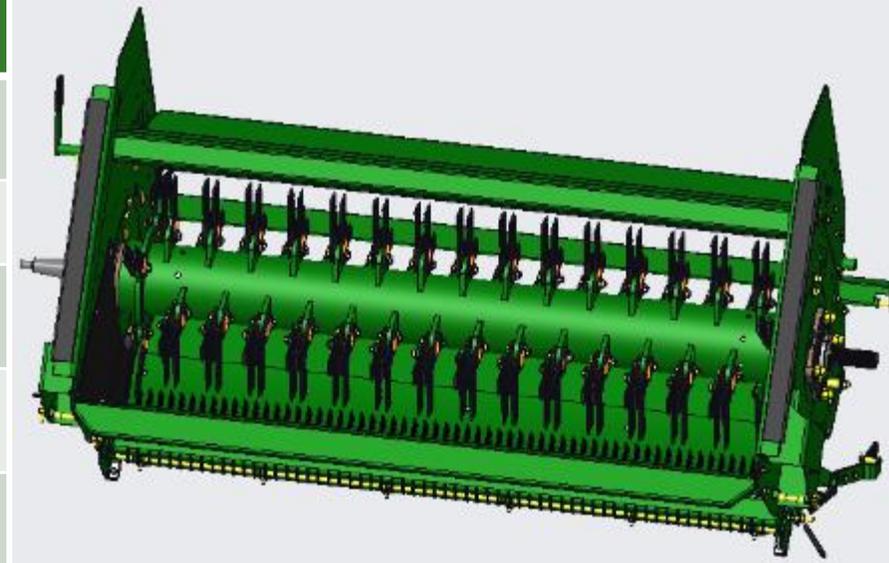
- Dry straw
- Corn/Soybeans

### Xtra Fine Cut:

- Tough straw requiring finely chopped residue for no-till operations
- Chopping straw finer does take more power



	Fine Cut	Xtra FC
Channel Width	1700 mm	1700 mm
Rotary Knives	68	124
Counter Knives	61	61
High Speed	2400 rpm	3000 rpm
Low Speed	1600 rpm	1600 rpm



Spreading

Premium Windrowing

Deluxe Windrowing

Chopper Selection

**Attachments****Deluxe Residue Straw rakes - KXE10674****Discharge Grate vanes KXE10868**

Centers material out of discharge beater  
Prevents “Hourglass” shaped windrows

**Shoe Tailboard sawtooth kit KXE10871**

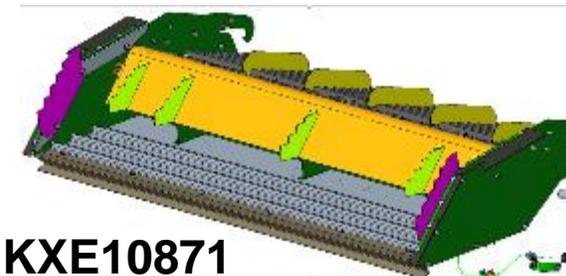
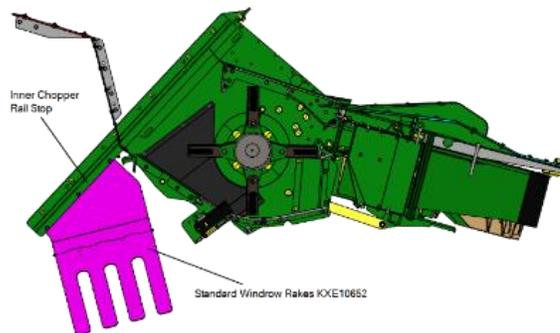
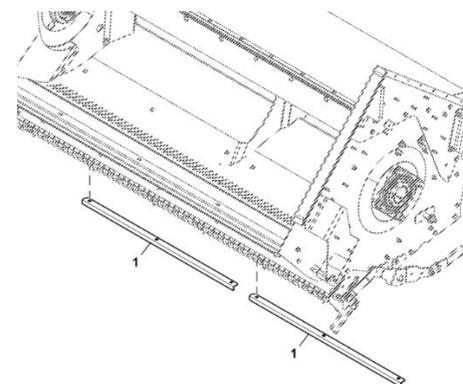
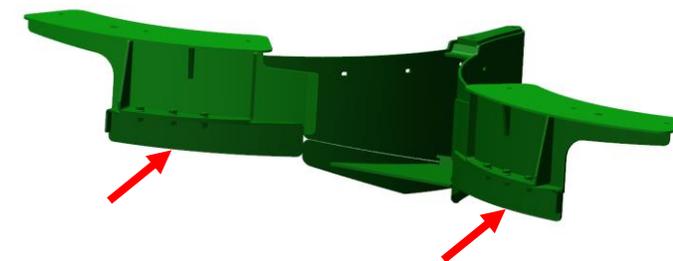
If chopper inlet plugging occurs kit adds additional conveyance into the chopper  
While plugging is rare, but has happened in wet/sticky Millet, Mustard, Rapeseed,  
Green Stem soybeans

**Residue shroud - KXE10923**

Shroud parts can be removed to address uneven spreading in tough small grains conditions. This will help ensure a more uniform spread width across the width of the cut

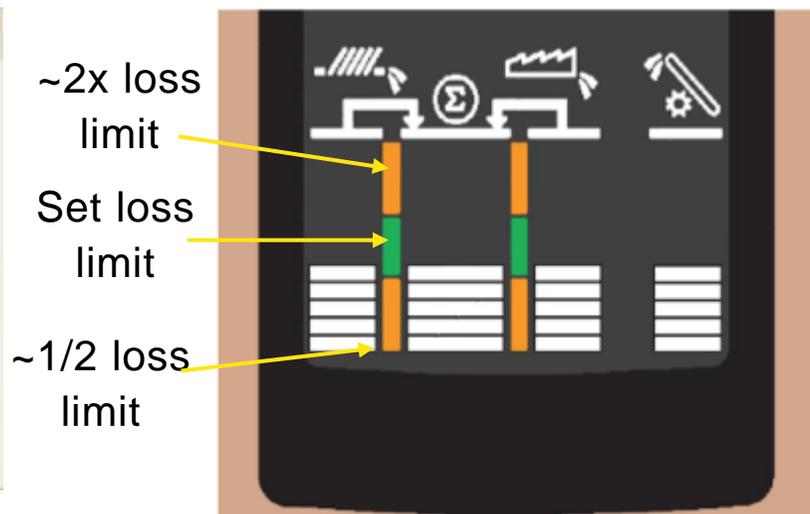
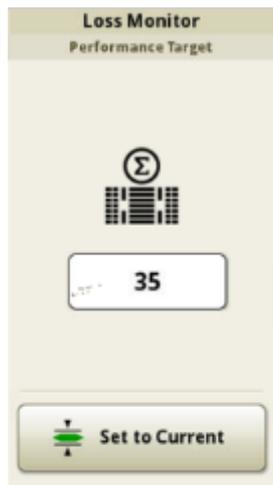
**Grouser Bar – HXE152555**

Bars are added to the inside of the chopper housing in place of the crop ramp. The bars hold back material for enhanced residue sizing

**KXE10871**

## Setting VisonTrak

- When harvesting, once the machine is optimized, push “Set to current” when at an acceptable loss level.
- What ever the loss rate is set to, it will be displayed as 2 times that when the display is full.
- If the condition you are currently in cannot get to your acceptable loss, the number will need to be adjusted to reflect what is coming out the back.
  - **Example:** If knowing the limit is 1bu/ac but combine is only throwing over 0.5bu/ac, the number will need to be changed to show 1-2bars loss



**ONLY** the center bar responds to relative loss on the ground

The Shoe/Sep bars provide guidance on where that loss is coming from

If “Set to current” was pushed at 0.5bu/ac loss on the ground, there would be ~1bu/ac loss displayed



Grain Loss

Yield/Moisture

Optimize Performance

Auto Maintain

Harvest Smart

Active Terrain

Machine Sync

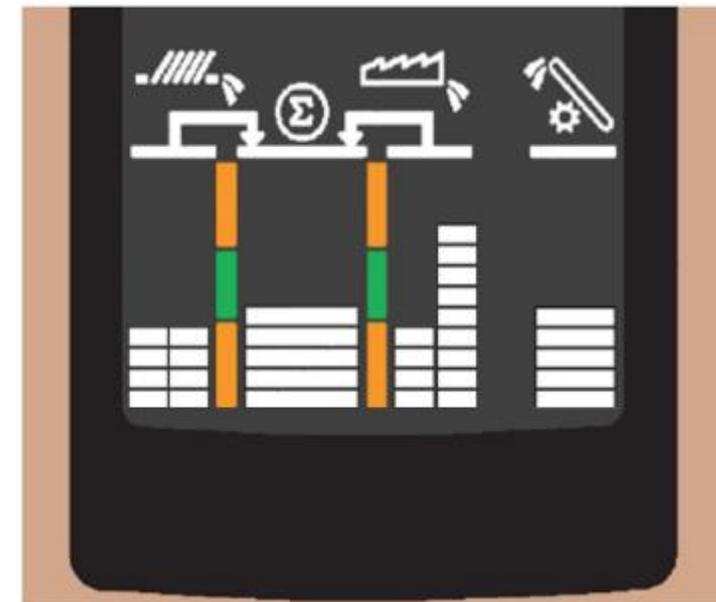
## Reading VisonTrak



- Assuming loss target was set with 1bu/ac loss, of that 1bu/ac ~25% of that is coming from the shoe and ~75% from the rotor



- Right 3 sensors of shoe have ~50% higher loss than left 3. with high tailings, this is most likely the cause. Reduce tailings would reduce shoe losses
- Total losses are still acceptable



- Right side separator sensor is reading ~50% more loss than right side
- Total losses are still acceptable

Setting VisonTrak

Reading VisonTrak

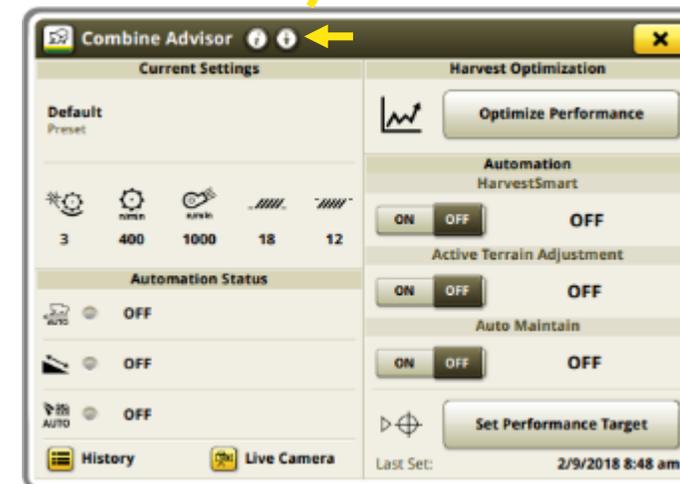
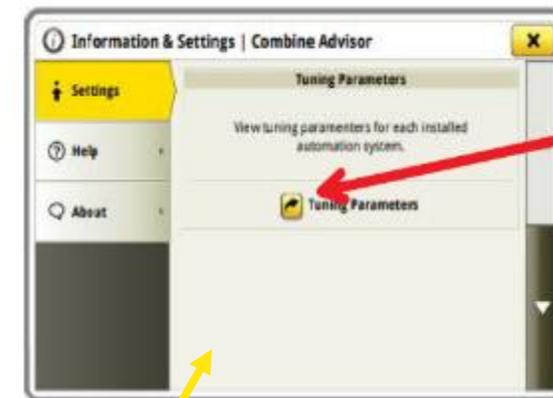
Grain Loss display

Relative Grain Loss Mapping

## Grain Loss Display Algorithm

3 different modes of grain loss display are available from the monitor

- Area-based grain loss **\*Recommended setting\* (Default on X9)**
  - Displays Strikes per area
  - Grain loss is calculated using header width and ground speed as inputs.
  - Correlates well with customers who measure loss as “Bu/Ac”
- Other Modes (Area based is still recommended)
  - Time-based grain loss
    - Displays strikes per unit of time (Seed strikes per second)
  - Mass Flow
    - Displays strikes relative to mass flow
      - Can be erratic due to changes in mass flow at headlands and low yielding



[Grain Loss](#)
[Yield/Moisture](#)
[Optimize Performance](#)
[Auto Maintain](#)
[Harvest Smart](#)
[Active Terrain](#)
[Machine Sync](#)

## Relative Grain Loss Mapping

Through the Connect Mobile Ipad app, relative grain loss mapping -Beta is available to view

- Other items shown:
  - Ground speed
  - Moisture
  - Dry yield
  - Wet yield
  - Relative grain loss - Beta



Show relative grain loss map - beta with trend graph

[Grain Loss](#)
[Yield/Moisture](#)
[Optimize Performance](#)
[Auto Maintain](#)
[Harvest Smart](#)
[Active Terrain](#)
[Machine Sync](#)

## Yield Monitoring

On X Series combines the user has the choice to use Active Yield or Manual yield calibrations depending on their preference.

For All yield monitoring, it is important to do the following prior to calibration:

### Mass flow vibration calibration:

- Grain tank empty
- Machine at settings near operating speed.
- **Every** header type
  - If harvesting windrow and straight cut canola, for the best accuracy it will need a mass flow calibration for both headers.

### Moisture correction and calibration:

- With the bypass empty, ensure the calibration for the moisture sensor is done.
- If needed, an offset can be applied in the grain handling pages.



[Grain Loss](#)
[Yield/Moisture](#)
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[Auto Maintain](#)
[Harvest Smart](#)
[Active Terrain](#)
[Machine Sync](#)

## Yield Monitoring Choices

Active yield delivers automatic yield calibrations to every time the grain tank begins to fill to save time when performing yield calibrations.

### When Should Active Yield be Used:

- Active yield is a **field totals solution**, and recommended for customers looking for field totals without minimum time spent calibrating
- Customers who do not have the ability/time to calibrate yield monitor manually, but want improved field total accuracy

### When should Manual Calibration be used:

- Seeking Pass-to-Pass yield accuracy
- Have the ability to manually calibrate or
- Crops where moisture is changing a lot
  - Wet to dry corn where pile shape changes
- Terrain where AY cannot collect loads.



*ActiveYield force sensors within the grain tank.*

[Yield Harvest Guide Link](#)
[Yield Video](#)
[Yield Accuracy Guide](#)
[Yield Accuracy Video](#)

Grain Loss

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## Active Yield Tips

Reduced accuracy is caused by the grain pile shifting in the grain tank when collecting a sample. Drive consistently when collecting sample (ground speed and terrain). After load is accepted, end rows, crop flow variability, and terrain slope will not affect ActiveYield™ performance.

The system will reject the load if the machine pitch/roll is more than 4 degrees, a grain tank pile shift occurs, harvesting with inconsistent crop flow (washouts, waterways, stop/go), or turning on end rows at any point in time during load collection. Stored calibration loads are replaced by new loads as the system continues to collect data.

For optimal performance when harvesting a new field, reset to the default calibration. This will promote higher yield accuracy and retain the yield calibration curve but will clear all previously accepted loads from ActiveYield. All new loads will be based on the % moisture in the field being harvested, not as an average based on loads previous harvested in previous fields.

Performing manual yield calibrations prior to turning on ActiveYield will not improve initial ActiveYield performance as calibration loads are saved as separate calibration curves.

Grain Loss

Yield/Moisture

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## Active Yield Tips 2

### What can operators do if no loads are accepted?

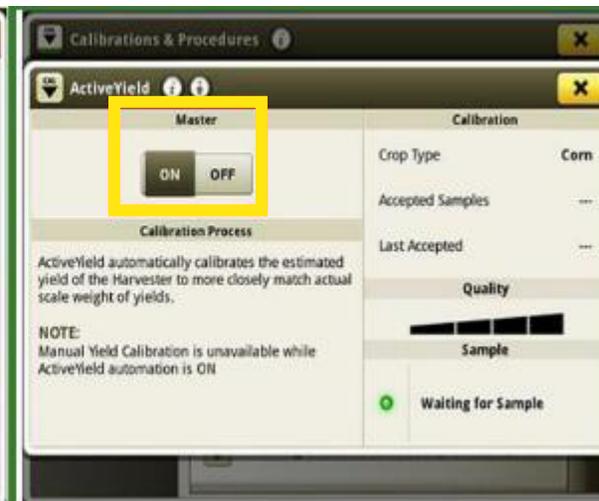
- *Avoid flow interruptions when collecting load.* Start a long harvest run with an empty grain tank. Do not unload on the go during sample collection.
- *Reduce flow variation when collecting load.* Target constant flow rate areas first. Maximize ground speed & cut width.
- *Avoid load collection calibration time out.* There is built in logic that will reject a load that takes 400 total seconds to collect. Increase ground speed and maximize cut width to decrease time to collect load.
- *Increase opportunities to get sample accepted.* Unload grain tank soon after sample has completed to start another load collection.
- *Target harvesting any flat or near flat terrain available.* Unload the grain tank just before harvesting flatter terrain.

### Can ActiveYield be used when harvesting high moisture and variable crop?

When harvesting in adverse crop conditions, more variation can occur on the force sensors as the grain piles differently across the 3 force sensors and could have an affect on the yield calculation. For customers that experience variations in yield accuracy with Active Yield, specifically harvesting High Moisture corn (22% or above), they have the option to perform a 2-point manual calibration.

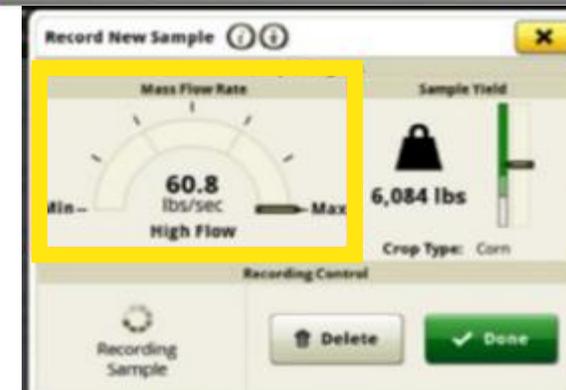
## Manual Yield Calibration

Before performing a manual yield calibration, ensure Active Yield is turned off and ensure Moisture sensor, Temp and Mass Flow vibration (with header attached) is done



### 2+ Point Calibration:

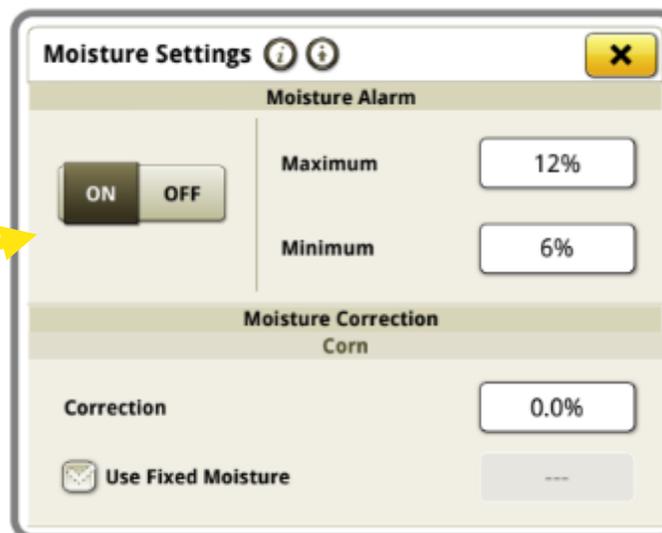
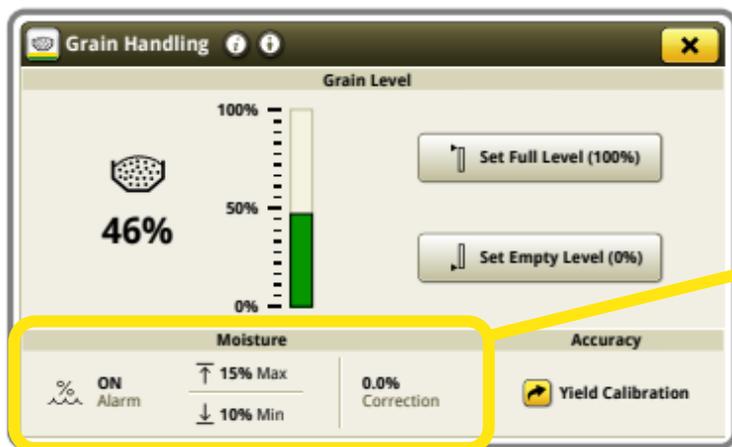
- For best pass to pass accuracy, at least two points are recommended. This is a sample size of at least 5000lbs and a **consistent flow** rate for the calibration (NO headlands).
- The 2 calibration points should be at DIFFERENT flow rates
  - Point 1 at your normal productivity ie. 2000bu/hr
  - Point 2 at 50% of that ~1000bu/hr
- These 2 points create a curve accounting for yield and productivity changes throughout the field.
- If more accuracy is desired can do more calibrations at different feedrate



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## Moisture Sensor

- The Moisture sensor is mounted on the clean grain elevator.
- If Calibration is needed, that is in the calibration menu. Ensure the sensor is clean and bypass is empty before calibrating
- For Correction, offset and alarms, this all can be found in the Grain Handling App on the display



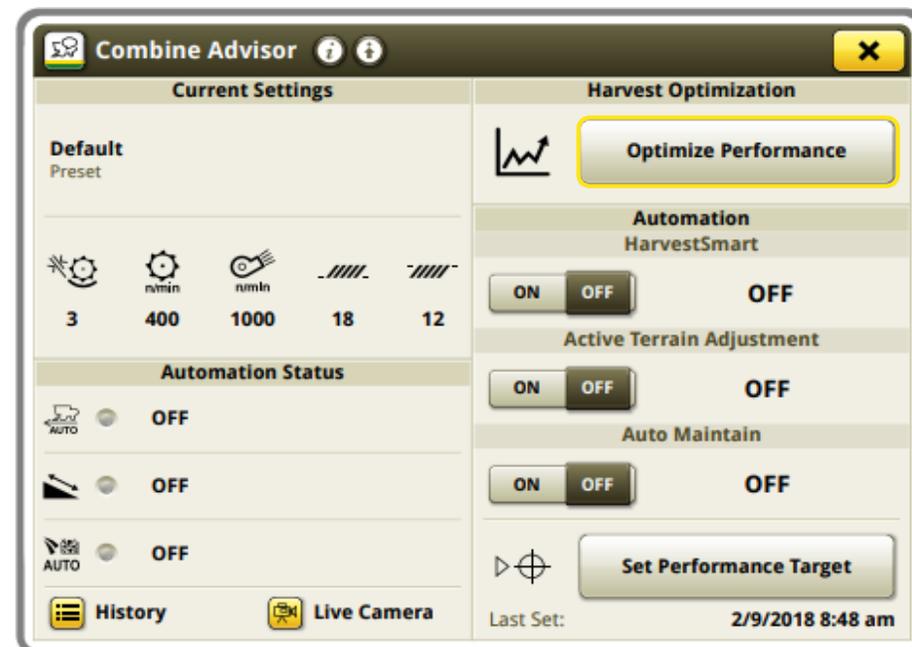
[Grain Loss](#)
[Yield/Moisture](#)
[Optimize Performance](#)
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[Active Terrain](#)
[Machine Sync](#)

## Optimize Performance

- Optimize Performance helps the user optimize the machine by providing recommendations for settings adjustments based on the user reported issues
- Optimize Performance works in all crop types
- To use, press “Optimize Performance” on the Combine Advisor Page and follow the prompts



Combine  
Advisor

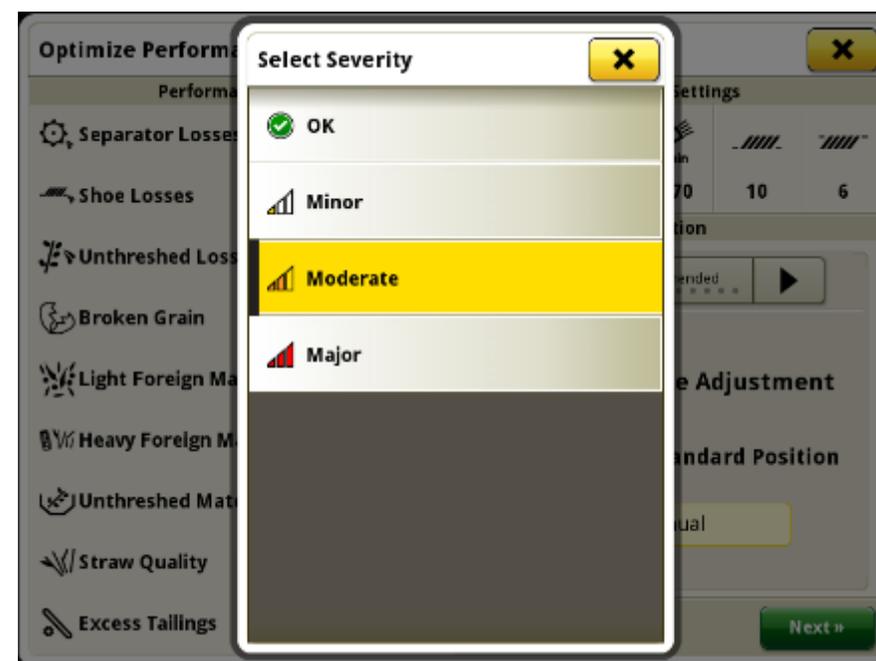
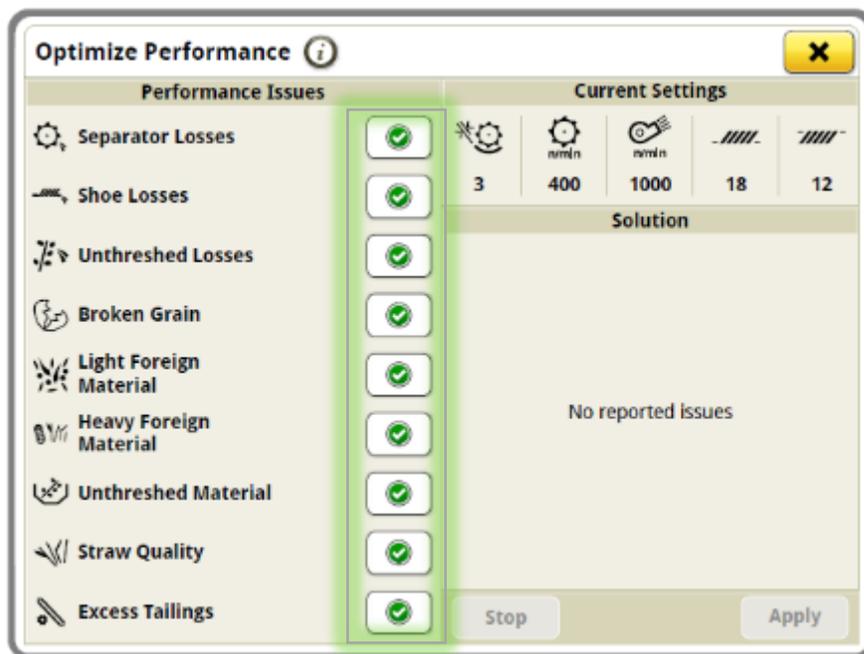


Reporting Issue

Solving an Issue

## Reporting an issue

- To begin, select any of the to report the issue severity
- Multiple issues can be reported at once
- Once the issue(s) have been reported, Optimize Performance will generate recommendations based on the current settings and the crop being harvested



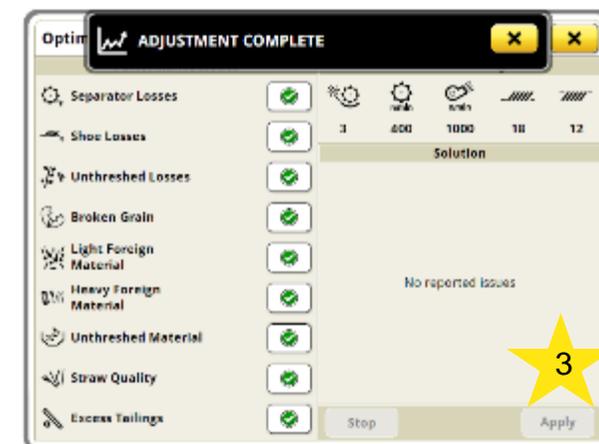
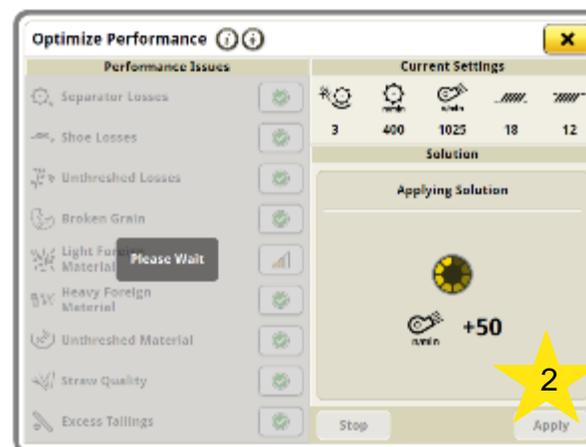
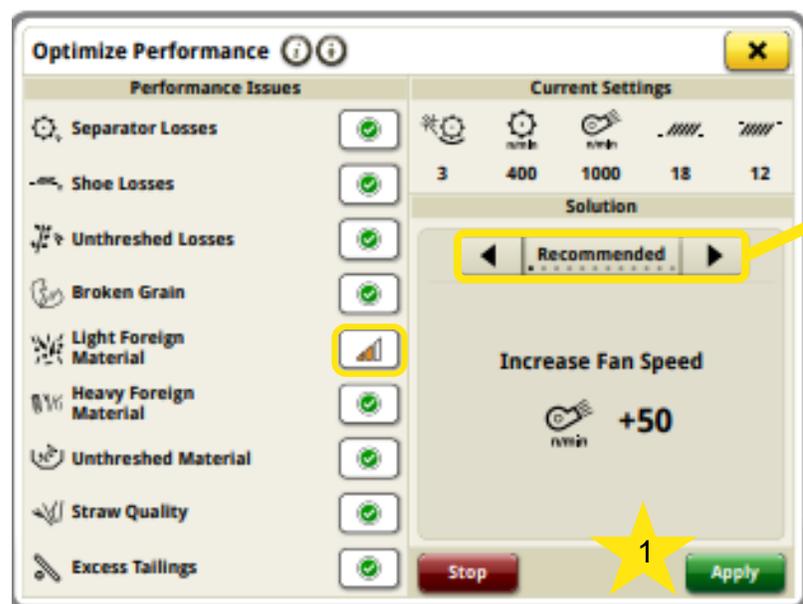
Reporting Issue

Solving an Issue

[Grain Loss](#)
[Yield/Moisture](#)
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[Active Terrain](#)
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## Solving an issue

- Once an issue is selected, Optimize Performance will develop a list of recommendations to solve them
- Use the arrows to cycle through suggested recommendations, or press recommended to see all
- Press “Apply” to 1 or all suggestions until issue is resolved
- If another issue arises, Optimize Performance can be used at any time



## Auto Maintain

- Auto Maintain is a system use to maintain combine performance across the day through changing conditions, where in the past these settings would need to be changed manually
- Auto Maintain is designed to function in Corn, Soybeans, Wheat, Barley, and Canola
- The Crop modifiers matter for Auto Maintain
- Canola and Corn have Wet/Dry presets
- Threshing and straw conditions modify the algorithm for their conditions



Combine Advisor

**Combine Advisor**

Current Settings

**Dry Preset**

8	880	1170	10	6
---	-----	------	----	---

Automation Status

- Ready
- Monitoring
- Monitoring

Harvest Optimization

Optimize Performance

Automation HarvestSmart

4.0 mph

Active Terrain Adjustment

0.4°

Auto Maintain

Set Performance Target

Last Set: 3/21/2019 5:10 pm

Load Harvest Settings

Preset: Wet

Threshing Conditions: Difficult

Straw Conditions: Brittle

Settings Preview		
	Current	New
Threshing	14	---
n/min	750	---
n/min	750	---
Straw	12	---
Straw	4	---

Save Preset Cancel OK

## Setting Performance Target

### What is a Performance Target?

- A Performance Target tells the system what the user defines as acceptable grain loss and grain quality

### A Performance Target will set or save:

- HarvestSmart™ targets and calibration
- Auto Maintain Grain Loss and Grain Quality targets

### When Should You Set Performance Targets?

- Changing to a new field that has different conditions
  - I.e. change in Yield, Moisture, Variety, Crop Type
- Once optimized, press “Set Performance Target”
- This will take 5-15min depending on productivity, to speed up process harvest on level ground and minimize starting/stopping
- One target saved/crop

### Bad Target = Bad Performance

- Setting a poor performance target on a non-optimized machine will result in poor system performance.



[Grain Loss](#)
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## Acquiring Performance Target

### How Long does it take?

Dependent on Mass flow rate and how many images the camera sees - -the higher bu/hr the faster it will acquire

### The combine must be in “Steady State” to acquire targets:

- High Idle
- >0.25km/h or >0.15mph
- Header below recording height
- A settings change is not being commanded
- Ground speed, Rotor Pressure and Mass flow not erratic
  - Acquiring a target in lodged crop may take a while

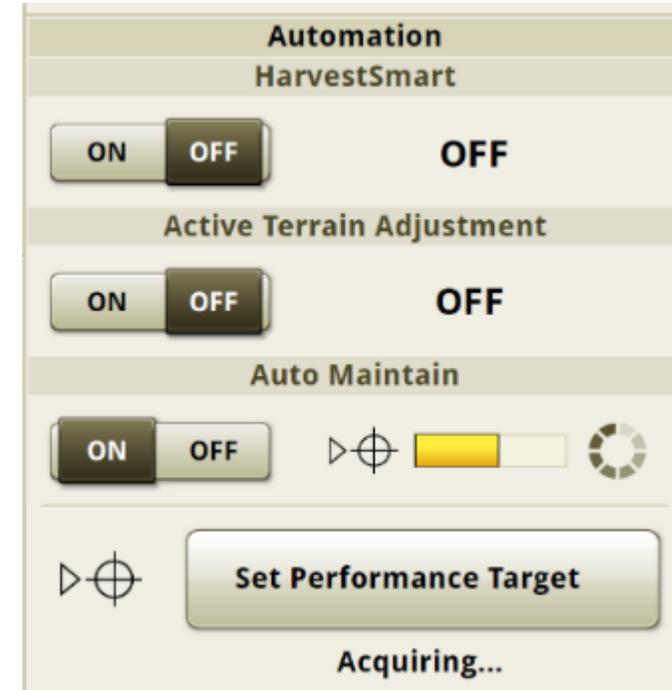
### Time Harvesting in “Steady State” is important

More time in “Steady State” = Faster Target Acquisition

Frequenting stopping or adjusting ground speed slows down acquisition time

If ATA is on and commanding settings changes it can slow down acquisition time

Temporarily turn off until target is acquired



## Automated Adjustments

When Auto Maintain makes settings changes, there are 2 types of issues it identifies in the background:

### Long Term Issues:

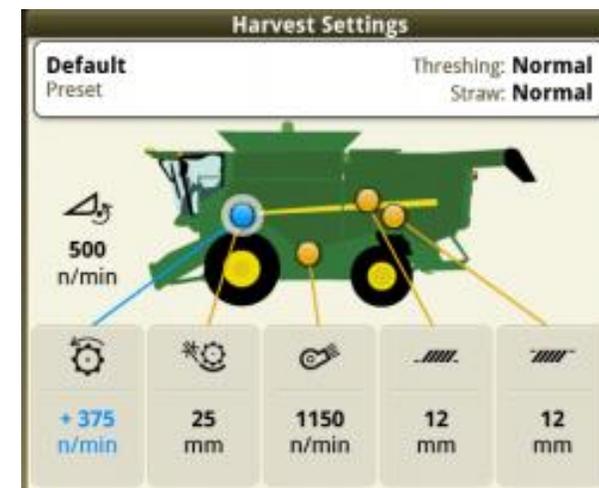
- Permanent changes accounting for large condition shifts
- Less frequent
- Ex. Afternoon to evening

### Short Term Issues – Auto Maintain Offset

- Temporary adjustments to account for short term condition changes
  - Ex. Spot on field was tougher threshing and needed to close concaves
- These are more frequent, and settings changes may revert as conditions change across the field
- If the system finds itself repeating many of the same settings changes, it will make the change permanent

- Settings in **Blue** indicate an offset is being applied

Feature	Reason	Completed
AUTO Auto Maintain	Foreign Material Light	10 mins ago
AUTO Auto Maintain Offset	Grain Loss	11 mins ago
Active Terrain Adjustment Offset	4.2°	26 mins ago
AUTO Auto Maintain Offset	Grain Quality	3 hrs ago
AUTO Auto Maintain Offset	Grain Loss	3 hrs ago
Active Terrain Adjustment Offset	2.3°	3 hrs ago



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## Sensitivities

**Response Aggressiveness:** Based on Bu/Hr – controls the time between adjustments

**When to Lower:** High Bu/Hr crops like corn if making too many adjustments

**When to Raise:** Low Bu/Hr crops like Canola, to speed up adjustments

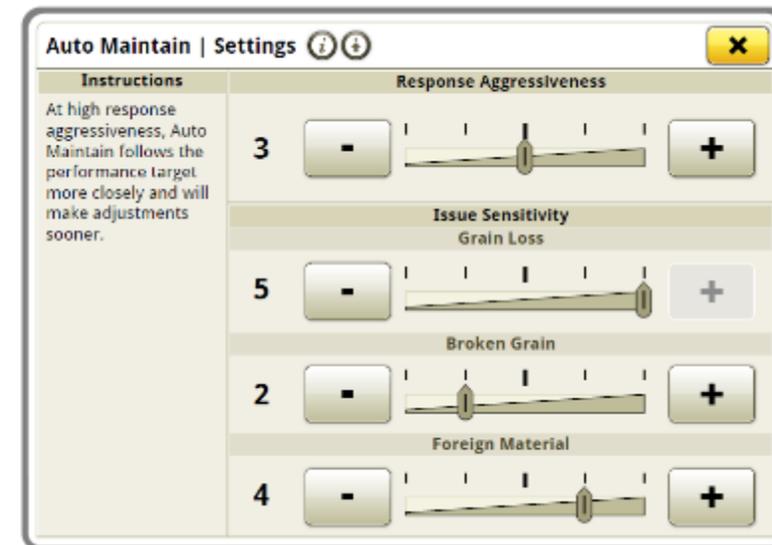
**Issue Sensitivity:** Sliders change the threshold of when a settings change will be made to resolve an issue “How severe should the issue be before it needs to be fixed”

**When to Lower:** User wants system to react slower to issues

Makes deadband wider – A larger change is needed before a setting is changed

**When to Raise:** User wants system to react sooner to issues

Makes deadband tighter – A smaller change is needed before a setting is changed



As a rule of thumb, increase sensitivities for issues that matter most to user and decrease less important issues.

If in Canola and only care about grain loss, increase grain loss and lower broken/FM

If user is questioning system changes like opening concave due to broken grain, and sample is fine, decrease sensitivity

Grain Loss

Yield/Moisture

Optimize Performance

Auto Maintain

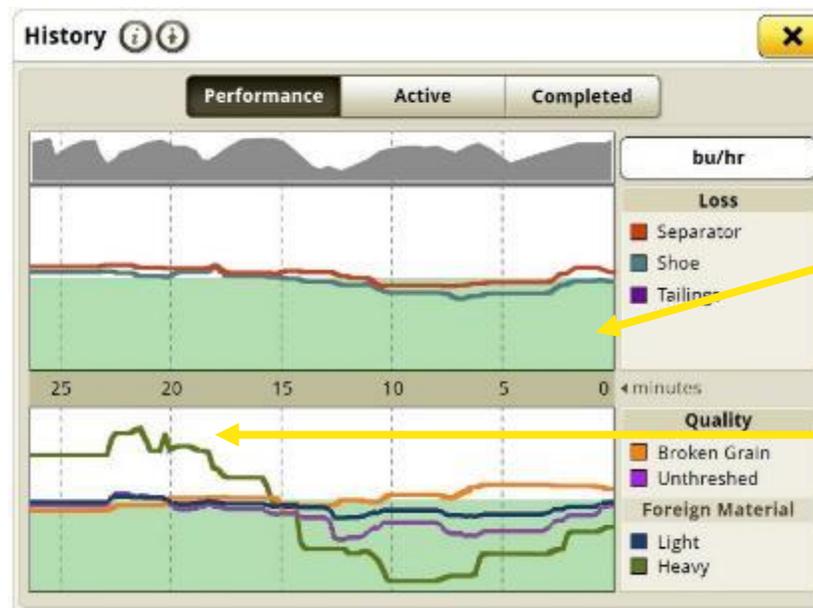
Harvest Smart

Active Terrain

Machine Sync

## Performance History

- The Performance History provides a graphical view of three performance metrics over the last half hour
  - Throughput/Productivity/Yield (user can choose one of these three options)
  - Grain Loss
  - Grain Quality (not all grain quality metrics recorded in every crop)



Green is good- machine is at or below performance target

If sensitivity is set to 1, line will need to be high for system to begin solving issue

Setting Target

Acquiring Target

Automated Adjustments

Sensitivities

Performance History

ActiveVision

[Grain Loss](#)
[Yield/Moisture](#)
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## ActiveVision Cameras

- The clean grain and tailings cameras can be accessed to show live images of material flowing through the elevators
- For the 5 supported crop types, grain analysis may be turned on to identify the grain quality parameters
- Lens debris has 3 stages; OK, Moderate, or Severe



[Setting Target](#)
[Acquiring Target](#)
[Automated Adjustments](#)
[Sensitivities](#)
[Performance History](#)
[ActiveVision](#)

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## HarvestSmart™

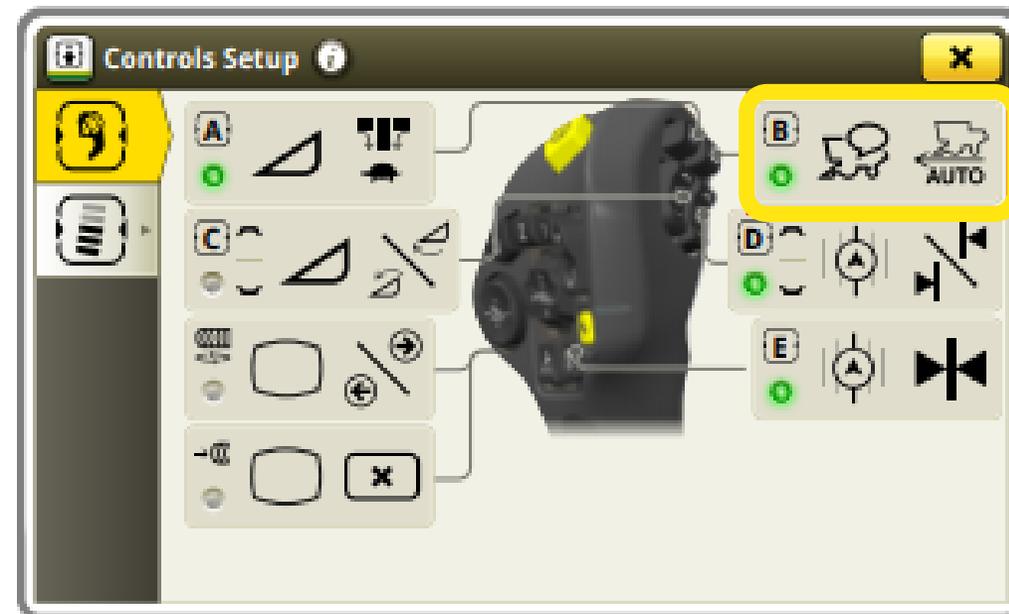
- HarvestSmart™ is a “cruise control” system for the combine
  - Helps keep combine full and operating at loss or engine power limit.
  - When used, it can increase productivity and reduce operator stress over a long harvest.
- HarvestSmart™ uses a combination of engine power, rotor load, and loss sensors for its speed control inputs.



[Grain Loss](#)
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## HarvestSmart Engage

- HarvestSmart™ is engaged using the re-configurable buttons on the Multifunction Lever
- The reconfigurable comes pre-associated to the Multifunction Lever Button B, or can be configured to your liking on another button
- To Engage the system, pull into crop and when the combine gets up to speed and the rotor loaded, engage the system (~100ft).
  - Similar to engaging cruise control on your car when you get up to speed on the highway



\* If an operator prefers the legacy mode of engagement of using the 2/3 buttons, there is an option to enable that in the Combine Advisor tuning parameters screen but erratic behavior during entering crop can occur.

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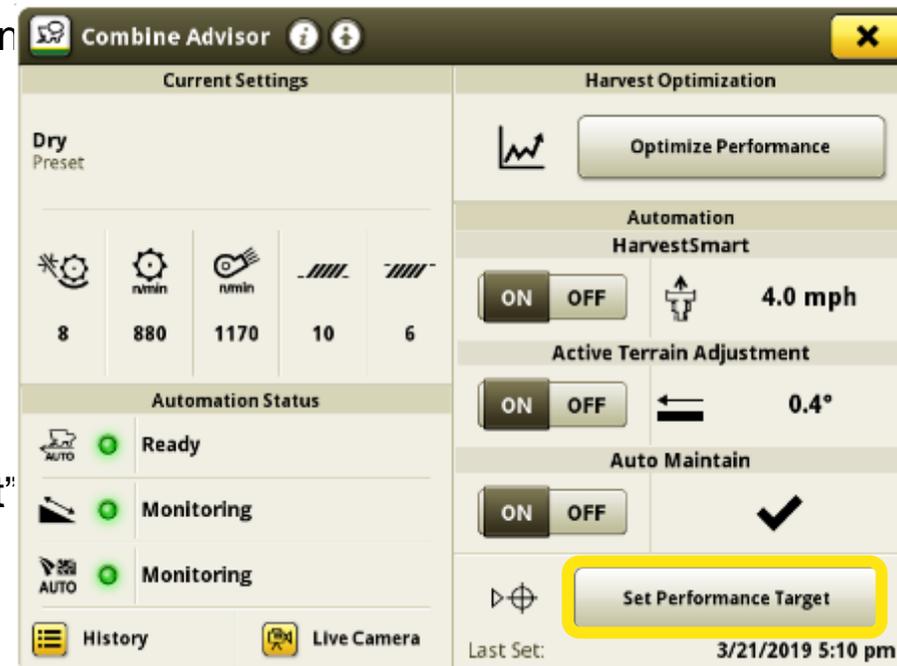
## Setting Target

HarvestSmart™ requires the user to set a performance target

- This lets the system learn the crop conditions to understand the balance between rotor and engine power.
- While harvesting, if the load at the rotor or engine become excessive, the machine will slow down
- The target for HarvestSmart™ is acquired relatively quickly and the target for Auto Maintain will continue to acquire
- For *Smart Mode*, the grain loss targets are acquired here as they are the same targets Auto Maintain uses for grain loss

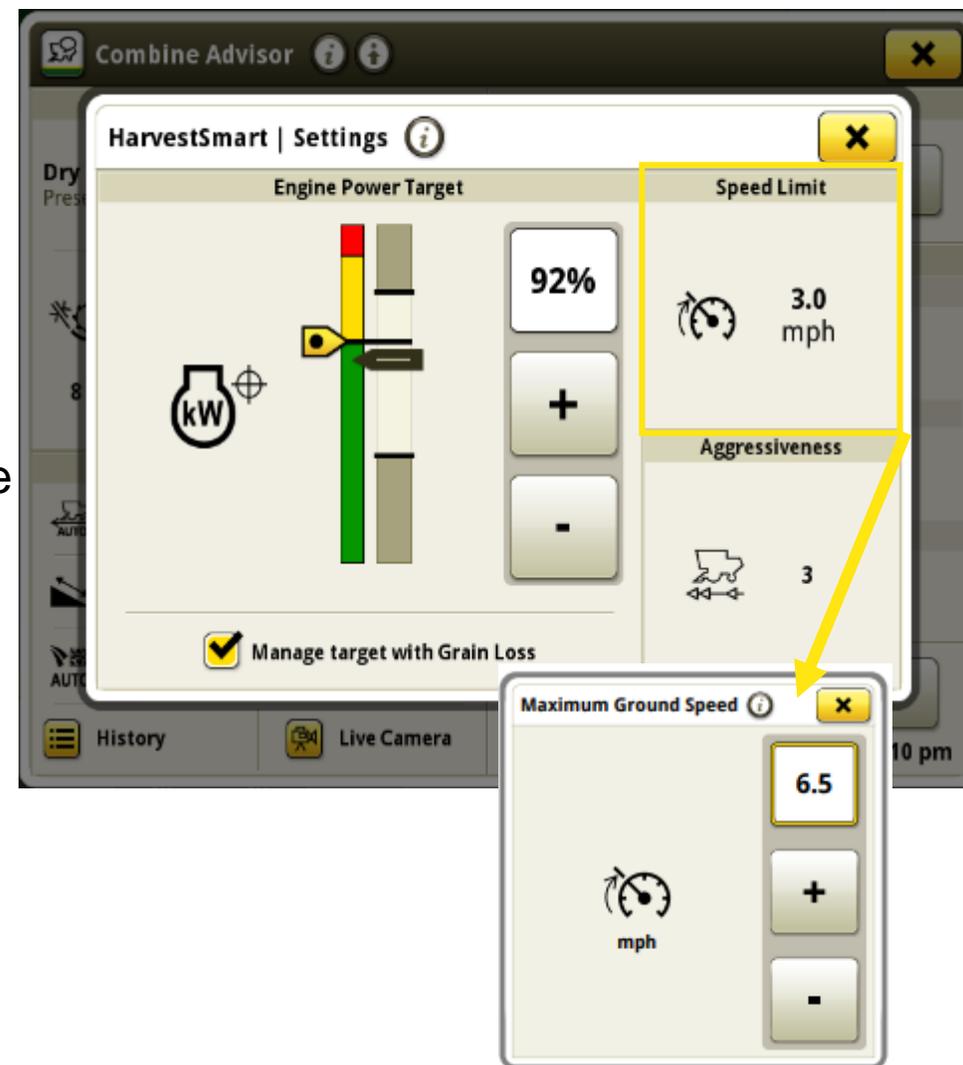
To set target, get combine up to harvesting speed and push “Set Performance Target”

- If running at the top end of each rotor gear range (1<sup>st</sup> -520, 2<sup>nd</sup> - 800, 3<sup>rd</sup> 1300rpm) and experiencing issues with HarvestSmart Control, the rotor sheave gap may need to be re-set to 10mm
  - If running near 520 or 800 Rpm on rotor, it is best to be in the next highest gear to allow more movement in the rotor drive variable.



## Ground Speed Settings

- The Ground speed limit of the system can be adjusted from 1.2mph and 8.7mph
- It is recommended to keep this 0.5-1.5mph above your average harvesting speed
- This value should always be above average harvesting speed to improve operator comfort as machine transitions from heavy to light crop.
- If running at speed limit continually, increase your speed limit and lower power target to achieve desired speed
  - HarvestSmart is designed to maintain the engine power target and system will perform better that way.
  - Speed Limit is designed for when machine temporarily encounters low yielding conditions or crop gaps
  - Lower engine % power to run at desired ground speed



## Engine Power Settings

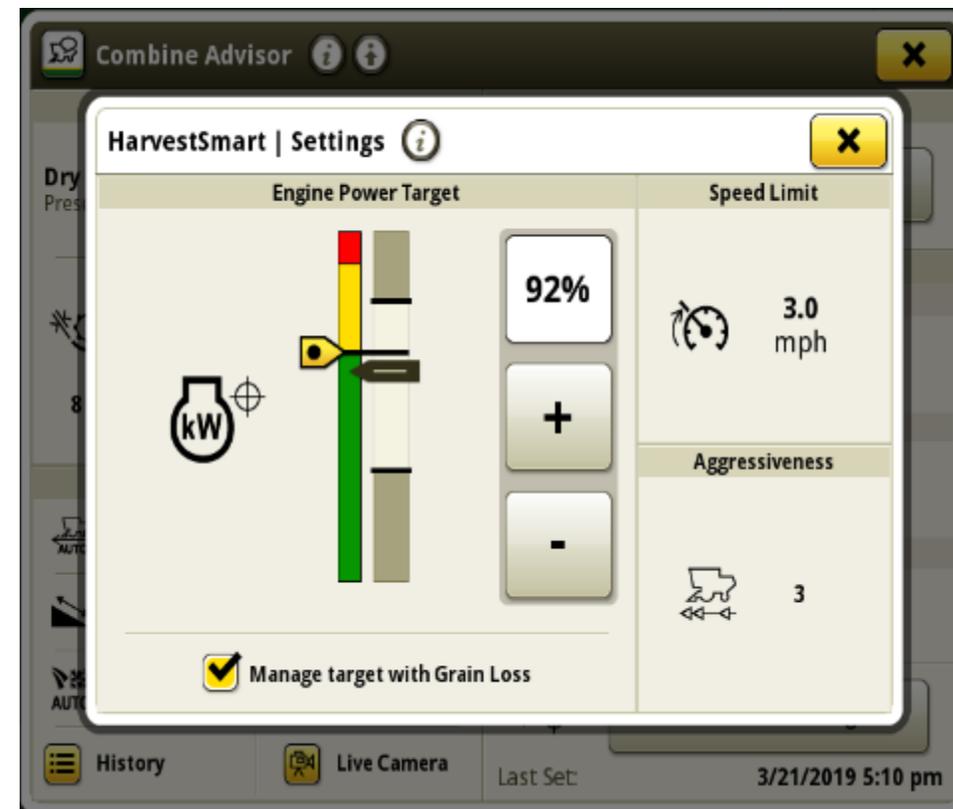
For best performance set Engine Power target to: (assuming not loss limited)

- 90% - 100% in consistent conditions
- 85% - 95% in variable, high straw yield conditions
- 75% - 85% in tough feeding conditions / down crop

With changing straw conditions, down crop or rolling terrain, HarvestSmart™ can find itself going over 100% power. If this occurs, lower 1% at a time until a point is found where the system is stable and performs as desired.

Like cruise control on a car has limitation in the city/traffic, HarvestSmart™ has limitations in:

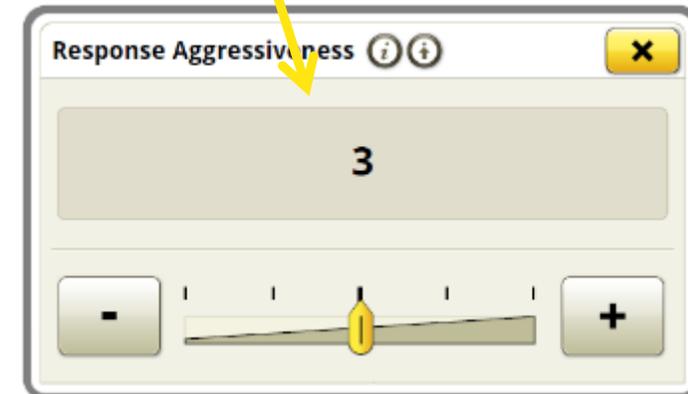
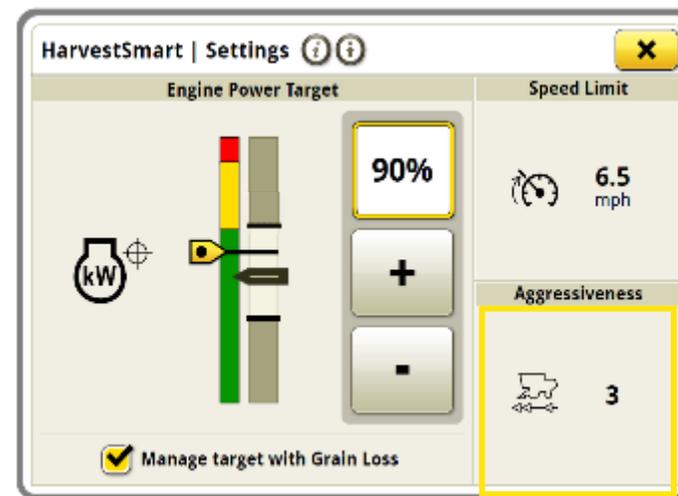
- Steep Slopes
- Wet/Muddy ground
- In tough, down crop and erratic conditions
- While there are some limitations, in many conditions HarvestSmart works well and can provide less fatigue and higher productivity over long harvest days



## Aggressiveness Settings

HarvestSmart™ system aggressiveness can be used to adjust how aggressive it changes speed when holding power targets.

- Aggressiveness can be set from 1 to 5 and is defaulted to 3
- **Higher aggressiveness (5)** - The system will maintain the Engine Power Target better but could be less comfortable to the operator.
- **Lower aggressiveness (1)** – The system will provide a smoother ride but have worse target tracking. Not recommended to decrease aggressiveness with a high Engine Power target.



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## Manage with Grain Loss “Smart Mode”

This feature can be used with or without Auto Maintain.

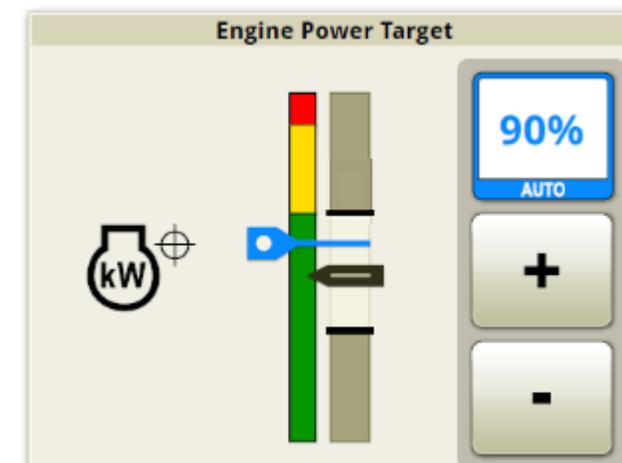
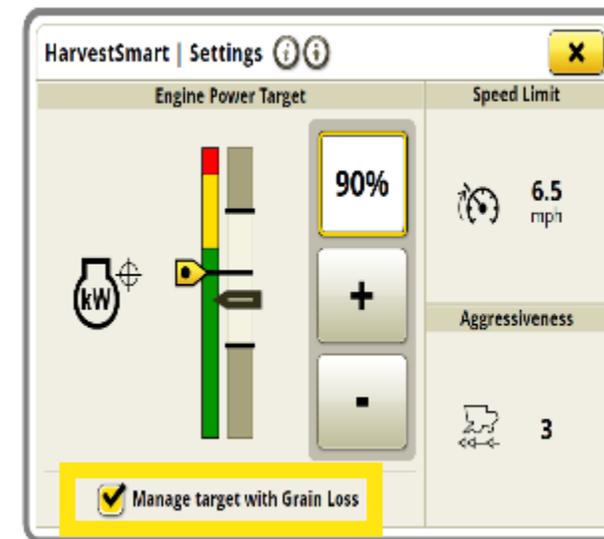
- When paired with Auto Maintain, the system will adjust combine settings first to not decrease ground speed and reduce productivity. In some severe cases when settings adjustments are not be enough to address rising losses, the engine power target may start to decrease sooner than machine settings.
- When managed without Auto Maintain, the Engine Power will be adjusted for all grain loss issues.
- The engine percentage will turn **Blue** indicating that the machine is automatically adjusting the engine power target to maintain loss levels
- If losses are high, the %Power target will lower, slowing the machine down. If losses are reduced, the %Power target will increase, speeding the machine up.

Manually adjusting the Engine Power Target will automatically disable “Manage target with Grain Loss” as the operator is manually overriding the automatic management. The option can be re-selected after adjustment

### All MY18+ machines no longer use grain loss targets from the VisonTrak

These targets are obtained from the Auto Maintain Performance Target, which is a more filtered/stable representation of grain loss.

Smart Mode will work in crops not supported by Auto Maintain (peas/lentils/etc.)



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## Unloading with HarvestSmart

- When unloading with HarvestSmart engaged, the system will pause and maintain its current ground speed.
  - If the engine load becomes too excessive the system will slow the machine down at that point.
  - Once the unloading auger is shut off, the system will resume control.
- 
- If the Multifunction control lever position is moved, the system will dis-engage and once done unloading, the system will need to be re-engaged.
    - Due to being focused unloading the operator may not notice this or may have accidentally moved the control lever
    - Pushing the button again after the unloader is shut off ensures the system is re-engaged.



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## Active Terrain Adjustment

- Active Terrain Adjustment (ATA) is a system to automatically control the chaffer, sieve and cleaning fan as the combine harvests up and down hills.
- Active Terrain is available to use in all crops
- Automatic adjustment of these settings allows for the combine to maintain shoe losses, grain quality, and tailings as it traverses hills.



[Grain Loss](#)
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[Optimize Performance](#)
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## Sensitivities

Active Terrain allows the operator to customize how the system responds to terrain

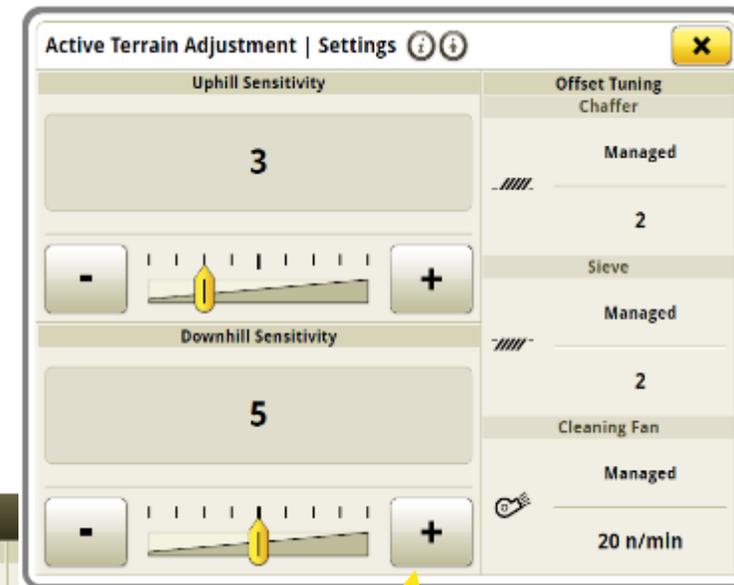
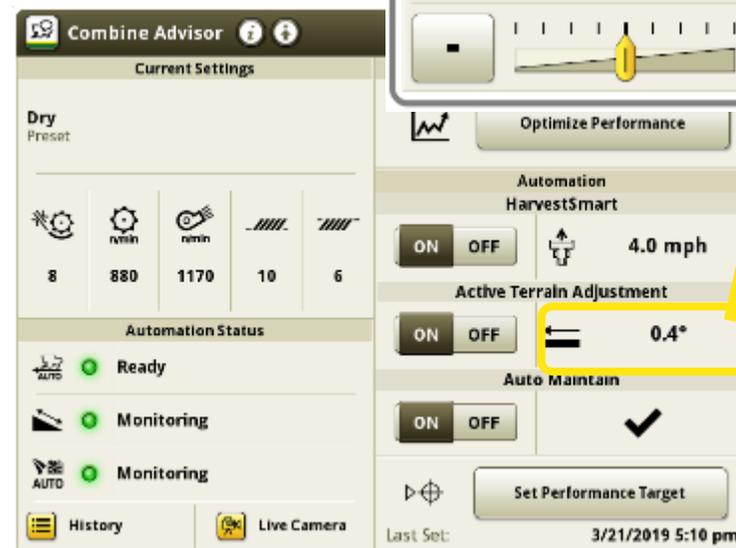
- In the Active Terrain settings menu is where the adjustments can be found
- If not satisfied with the changes Active Terrain is making at slopes 8° and lower, adjusting sensitivities can usually solve these issues

### Increase Sensitivity:

- Operator feels the system should begin making settings changes at 2° instead of 4°
- Going downhill, user wants fan speed to be higher at 8° would increase downhill sensitivity to get fan at desired level

### Decrease Sensitivity:

- Operator feels the system should begin making settings changes at 6° instead of 4°,
  - In Canola, going uphill, the tank gets too dirty, can decrease sensitivity to not slow fan down as fast


[Sensitivities](#)
[Tuning](#)

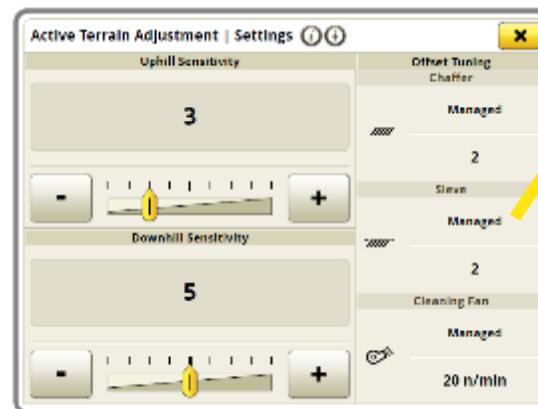
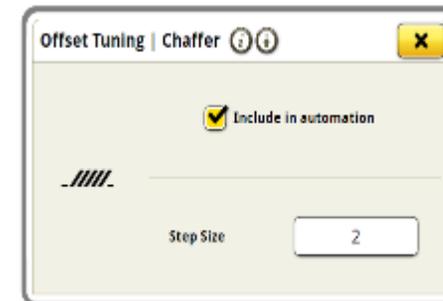
[Grain Loss](#)
[Yield/Moisture](#)
[Optimize Performance](#)
[Auto Maintain](#)
[HarvestSmart™](#)
[Active Terrain](#)

## Tuning

- Chaffer, Sieve, Fan can all be tuned to the customer liking.
- Chaffer and Sieve can be turned off and have Fan only adjustment
  - In Small grains, the chaffer can be turned off if the user finds that there are too many stems getting in the tank when going down hill

## Step Size

- If finding the offset of a setting is too high/low this can be adjusted
  - I.e. If going down hill and fan not going fast enough
- If the setting offset is too high or low above 8° changing the step size is usually the way to solve it.
  - $50\text{rpm} * 4 \text{ offsets} = 200\text{rpm}$
  - $20\text{rpm} * 4 \text{ offsets} = 80\text{rpm}$
  - For these large changes in speed, the sensitivities cannot be changed to accomplish this (if needed)



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## Machine Sync Best Practices

### Attachment – BPF12005

Additionally, H119187 x2 (foam seal) and HXE157904 (bracket)

**Adjust AutoTrac Line sensitivity** – On Tractor, Set Heading on to 50 to reduce “s-ing”

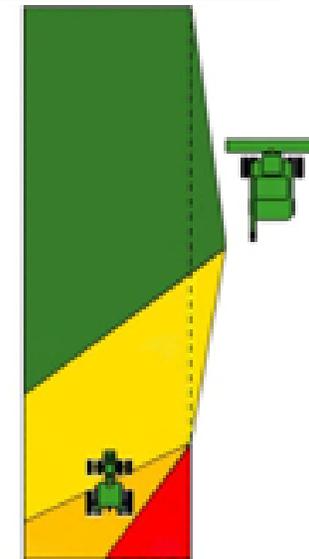
**IVT Transmission** -- Set maximum speed to ~2x harvesting speed

### Engagement:

When approaching the combine, enter the operational zone from behind the Leader, at a higher rate of speed than the combine. Make sure the tractor’s set speed is set higher than then combines travel speed (1+mph), and throttle is in the full throttle position. This ensures that the tractor can effectively acquire the combine.

- The tractor coming in faster reduces need for tractor to shift up during unloading
- To avoid an “Increase set speed” message, it is recommended to have Follower machines running full throttle and set the maximum speed to approximately double the expected harvest speed

**Home Point Suggestions-** On 1000bu carts and smaller setting the home point to dump in the front first  
On 1500-2500bu carts, set the home point to the center and nudge front or back depending on how full the cart is



Grain Loss

Yield/Moisture

Optimize Performance

Auto Maintain

HarvestSmart™

Active Terrain

Machine Sync

## Machine Sync Best Practices – PowerShift

Machine Sync on PowerShift transmission will not perform like an IVT transmission. This is due to the transmission shifting gears in order to acquire the home point while maintaining low engine RPMs

**6-8 Series** – Machine Sync Speed sensitivity adjusted to 1 to reduce speed surging

**9 Series** – Machine Sync Speed sensitivity for steering and speed set to 50% to reduce acquisition time

Machine Sync Speed Sensitivity settings may need to be adjusted to account for tractors that experience transmission surging while trying to maintain the home point. Adjust Speed Sensitivity value higher until machine surging occurs, then reduce by values of 10 until ride quality is acceptable. Lowering the speed sensitivity value too low will cause the machine to be less responsive to nudge and Leader speed changes.

### Transmission settings

Transmission Set to full AUTO

In the tractor Transmission Settings, make sure there are no maximum RPMs restrictions set.

ECO mode off

Hand Throttle at 100%

***Minimum speed requirement for 9xxx series articulated tractors is 2 km/h (1.2 mph) in acquiring, tracking, and setting Home Point.***

Grain Loss

Yield/Moisture

Optimize Performance

Auto Maintain

HarvestSmart™

Active Terrain

Machine Sync

## Machine Sync Best Practices – Dis-Engagement

When disengaging Machine Sync after actively tracking, the tractor will override the set speed to the last known speed of the combine when disengaged by manually turning the steering wheel. This requires the operator to manually adjust the set speed for transport across the field. Instead of frequent adjustments to set speed, Machine Sync can also be disengaged through the following methods:

**In a PowerShift transmission** equipped tractor, bump the shift lever up or down, or select Set Speed 1 or Set Speed 2 buttons to disengage Machine Sync.

When disengaging Machine Sync from Leader, it is recommended for the tractor to speed up or shift, out and away from the combine. Otherwise, the set speed will automatically change to the speed of the combine when the disengagement occurs

**In an IVT equipped tractor**, manually move the speed control lever from the F1 position to F2 or use set speed adjuster to increase the set speed.

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## Nudging

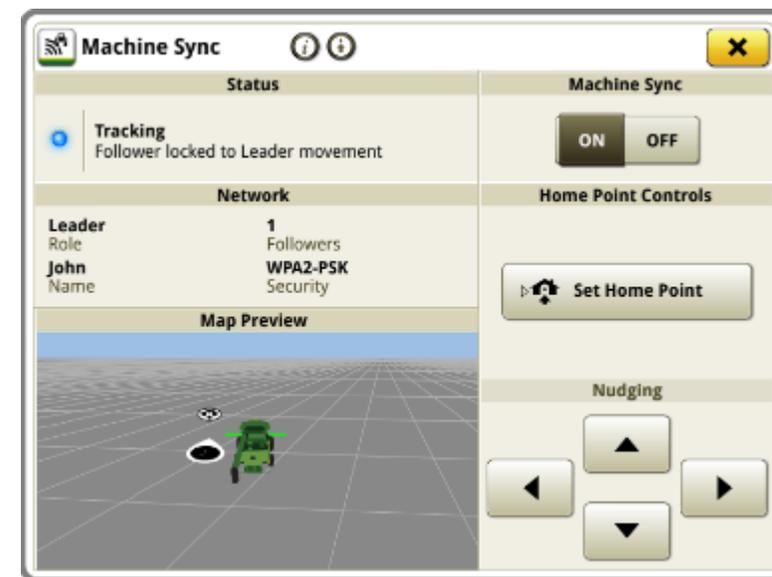
Nudging is a feature to move the tractor left/right forward back relative to the combine.

Set the home point with the pivoting spout in its middle position to ensure grain falls where desired

If Home point is set to the middle of the cart, when the cart approaches, it can be nudged quickly before unloading forward or backwards for proper cart fill

While nudging left/right can be done, it is best to let the pivoting spout move the pile and limit left/right nudging, especially on articulated tractors

3ft is a good starting number for front/back nudging distance



## Select the crop type you are harvesting



**Canola**



**Wheat**



**Corn**



**Oats**



**Rye**



**Soybeans**



**Barley**



**Lentils**



**Peas**



**Rice**



**Flax**

# Corn

	Setting
Feeder House Sprocket	18t
Feed Accelerator gear	1st
Concaves	Round bar
Active Tailings	Corn
Separator Grates	Spaced down
Shoe Elements	Deep Tooth
Front Chaffer	25mm
Feeder House Chain	6 pitch

- When checking losses in corn, ensure looking at losses from header as they can be overlooked and assumed to be from the combine.
- Minimize grain in tailings, the more grain in tailings from sieve being closed too much can reduce capacity and increase grain damage.
- Front chaffer can be opened to its maximum opening to separate grain sooner
- General Purpose elements can work in corn, but in dry corn would not expect higher than 6000bu/hr with them installed.
  - Deep Tooth elements will maximize X9 capacity in corn.
- Ensure separator grates are spaced down to prevent cob breakage and grate covers removed
- Ensure loss level is set to accurate, if “Set to Current” is pushed with 0.25bu/ac of loss on the ground, when the monitor begins to max out it means roughly that the loss has doubled



**Wet Corn**

**Dry Corn**

## Wet Corn

	22%	25%	30%	35%
<b>Rotor (RPM)</b>	400-450	450	450	450+
<b>Concave (mm)</b>	30 (cob diameter +2mm)	30	30	30
<b>Fan (RPM)</b>	1350-1430	1400+(Max)	1400+(Max)	1400+(Max)
<b>Chaffer (mm)</b>	16-20	16-20	18-22	22+
<b>Sieve (mm)</b>	13-16	13-16	13-16	15-18

- Settings are for Deep Tooth, if General Purpose, increase chaffer/sieve ~3mm
- Increased rotor speed might be needed in high moisture conditions to separate kernels from shucks
- If increased rotor speed to +100rpm and still having rotor loss, return to original speed and close concaves by 8-10mm
- Try to avoid running the chaffer and sieve wide open, the more vertical the louver, the easier leaves can hairpin on the louvers and plug in green conditions
- If the sieve is set greater than 20, parts of cob can get stuck between the sieve louvers and prevent the sieve from closing resulting in manual cob removal
- If stalk is dry/brown and still high moisture grain, slower rotor speeds can be used
- 1 separator grate cover installed over the first grate can increase shoe capacity in very green conditions



**Wet Corn**

**Dry Corn**

## Dry Corn



	<15%	18%	22%
<b>Rotor (RPM)</b>	350	400	400-450
<b>Concave (mm)</b>	30 (cob diameter +2mm)	30	30
<b>Fan (RPM)</b>	1300-1430	1300-1430	1430
<b>Chaffer (mm)</b>	15-18	15-18	16-20
<b>Sieve (mm)</b>	13-16	13-16	13-16

- Settings are for Deep Tooth, if General Purpose, increase chaffer/sieve ~3mm
- As corn dries down or with lower test weight, max fan speed may result in shoe loss. Reduce fan 100rpm if cleaning shoe loss is too high in these conditions.
- If increased rotor speed to +100rpm and still having rotor loss, return to original speed and close concaves 8-10mm
  - In some varieties it has been found the X9 needs a slightly tighter concave than S-Series with the larger rotor
- If harvesting 6000bu/hr+ in slightly rolling terrain, having Automatic Terrain Adjust (ATA) turned on at max sensitivity prevents shoe loss from the large pile of corn inside the machine shifting



Wet Corn

Dry Corn

Planning Timeline

Know Your Customers

Logistics

Timing

Equipment Prep

Crops &amp; Conditions

## Cornhead

### Deckplates:

- Set to no more than 3mm (1/8") larger than cob diameter
- Set to no less than 3mm (1/8") smaller than stalk diameter
  - In dry corn, tight deckplates can take in more material to “cushion” the ears and reduce header loss
    - May need more rotor speed for the extra trash intake
- If auto deckplates enabled, ensure when pressing “2/3” on Multifunction Handle, deckplates move to intended position
- Starting deckplate angle: 20°

### Backshaft Speed:

- Starting speed 620rpm and adjust with ground speed
- The stalks should be pulled straight down

### Auger position:

- Down ~12mm or 1/2" from floor
- If stalks are breaking and plugging row units, remove one or both of ear savers

**Stalk  
Rolls**

### Down Corn:

- Heel header rearwards to flatten deckplates
  - Snouts may need adjusting to lower points.
- Stalk deflectors may need to be removed to get header low enough and not plug row units

**Wet Corn****Dry Corn**

## Corn Performance Parts

### Engine Brush Kit - BXE11395

In wet corn, hot temperatures, with chopping corn heads, rotary screen can mat over causing overheating  
Brush kit keeps rotary screen clear of the wet, sticky debris. (Similar to S series Kit)

### Separator grate covers - BXE11383

1 separator grate cover installed in over the first grate can limit green material from separating to the cleaning shoe and can increase shoe capacity

### FAST slow down kit - BXE11414

Be aware when pushing machine to maximum capacity (7000+bu/hr) that the ears of corn going through the combine is significant and 320rpm may not convey fast enough and may cause more damage due to not pulling away from the feeder house fast enough



Wet Corn

Dry Corn

# Soybeans

	Setting
Feeder House Sprocket	18t
Feed Accelerator gear	1 <sup>st</sup> (may need 2 <sup>nd</sup> in green stem)
Concaves	Round bar
Separator Grates	Can leave spaced down from corn
Shoe Elements	Deep Tooth
Front Chaffer	25mm
Active Tailings	Corn

- When Checking losses in soybeans, ensure you know what your header loss is, especially in dry conditions
- In green stem soybeans, round bar concave inserts or replacing the first concave with a large wire can help threshing tough pods and get them out of the grain tank.
  - Large wire in 1<sup>st</sup> concave position can be left in for dry corn, however it is possible it can plug over with husks.
  - Without more aggressive threshing in the front, higher rotor speed and tighter clearance is needed and could result in grain damage
- If setting grain loss target during the day and losses are low (ex. 0.2bu/ac) when losses double, the grain loss bars will be full range.
- When soybeans are below 10% moisture, consider harvesting in the evening or morning when dew sets in to minimize possibility of splits
- If in tough beans and pods need re-threshing, can set to “wheat” position, and adjust concave clearance wider on the beater head



## Soybeans



	<8%	12%	14%
<b>Rotor (RPM)</b>	450-550	650	750+
<b>Concave (mm)</b>	25+	15-20	12-15
<b>Fan (RPM)</b>	1000*	1000*	1000*
<b>Chaffer (mm)</b>	15*	15*	15*
<b>Sieve (mm)</b>	10-13	6-10	6-10

*\*Suggested starting setting*

- Settings are for Deep Tooth, if General Purpose or FTC, increase chaffer/sieve ~3mm
- If finding you need to run 700rpm+ and tighter than 10mm concave to thresh pods, consider installing round bar inserts or large wire concave in the first position.
  - This will allow the machine to run less aggressive settings and clean up the sample for higher machine performance.
- Try to keep sieve settings more open to minimize grain in tailings and possibly grain damage
- As conditions get tougher in the evening, the chopper counter knife may need to be engaged further to chop and spread with similar performance as drier conditions.



**Soybean Settings**

## Draper

- **Guards:**

- Stub nose guards provide the best performance
- Pointed Guards can stab into stalks or debris and cause pushing
- Non-clog guards can reduce plugging/pushing on outside of head

**Cutterbar**

- **Sections:**

- Coarse or Long/Short for no-till in corn/milo/cotton stalks
- Knife angle should start at 11°
- Consider harvesting 10°-15° to the rows at an angle if pushing
- If harvesting with many rocks and debris, consider raised height/high wear skid shoes to raise cutterbar 25mm and reduce potential for damage

- **Reel**

- Set reel fingers to be vertical when right above the cutterbar.
- When dew sets in, a lower, more aggressive reel position and higher speed maybe needed to clear the cutterbar of wet leaves

- **Center Feed Section**

- Low Speed
- Crop divider installed if underfeeding on point rows



**Soybean  
Settings**

## Soybean Performance Parts

**Raised height skidshoes** - Raises 25mm cutterbar out of debris on the ground

**Long/short sickle sections** - Better cutterbar performance in no till conditions

**Header Crop flow divider** – Reduces underfeeding in point rows/half head feeding

**Large Wire concave** – Improves threshing in tough, green stem beans, removing pods from sample

**RB inserts** - Improves threshing in tough, green stem beans, removing pods from sample

**Separator grate blanks** – Reduces chaff load in bays 1 and 6

**Separator Grate covers** – Covers 1 grate entirely and reduces chaff load on cleaning system and can reduce stalk stabbing in front chaffer.

**Residue shrouds** -Can help uniformly spread 50ft in challenging conditions

**Grouser Bar** - Bars hold back material for enhanced residue sizing



**Soybean  
Settings**

## Wheat

	Setting
Feeder House Sprocket	18t
Feed Accelerator gear	2nd
Concaves	Small Wire, or Large wire in 3 <sup>rd</sup> position
Separator Grates	No-spacer Remove blanks if tough conditions and have rotor loss
Shoe Elements	General Purpose or FTC chaffer
Front Chaffer	25mm
Active Tailings	Small Grains

- As conditions get tougher in the evening, counter knife may need to be engaged more to maintain chop and spread quality
- In hard threshing wheat, ensure Active Tailings concave is zeroed properly
- In hard to thresh conditions, 4 concave covers at 10-15mm concave can net better performance than 0-2 covers with a tight concave and high rotor speed.
  - Closing the concave with high rotor speeds increases rotor power significantly and can reduce throughput
- If setting grain loss target during the day and losses are low (ex. 0.2bu/ac) when losses double, the grain loss bars will be full range.



## Wheat - NA



	<10%	15%	20%
<b>Rotor (RPM)</b>	1100-1200	1000-1200	1000-1100
<b>Concave (mm)</b>	10-15	10-15	15-25
<b>Fan (RPM)</b>	950*	950*	1050*
<b>Chaffer (mm)</b>	15*	15	18
<b>Sieve (mm)</b>	6*	7*	7-12

*\*Suggested starting setting*

- With FTC Chaffer, Settings should be 18-20 (as much open as possible)
- In hard to thresh wheat, if needing to run 1300rpm and <5 concave to thresh, consider adding more concave covers to for threshing to allow more open concave and lower rotor speeds. Fast Rotor + Tight concave = More power. Especially as straw gets tough in evening
  - Longer/less processed straw is easier to separate grain than highly processed straw
- If cleaning shoe limited in dry conditions, consider adding 1 separator grate cover
- Running a tight sieve to clean white caps can limit chaffer air flow and increase grain in tailings (lowering capacity)
- **If wheat hulls are experienced in the grain tank, and increased fan speed does not remove them, decrease threshing clearance to increase threshing as they are most likely unthreshed white caps.**



## Header

### Cutterbar:

Fine tooth sections are best

Coarse tooth sections can cut wheat but may notice flagging at higher ground speeds in dry conditions not leaving as clean of a cut as the fines.

Ensure hold downs are adjusted properly

If top augers are installed, ensure spinning faster than belts to prevent slug feeding

### Reel:

With flip over kit installed, may see some crop carry over at higher ground speeds in dry wheat

Adjust reel pitch to less aggressive setting to prevent carry over

For down/lodged crop set “3” on the multifunction lever to position head to easily get down crop



## Wheat Performance parts

### Concave covers

Improve threshing in hard to thresh conditions with “white caps” in the sample  
Recommend 2 straps

### FTC chaffer

Improve grain tank sample if stems are present in with general purpose

### Residue shroud

Shroud parts can be removed to address heavy outside spreading in tough small grains conditions. This will help ensure a more uniform spread width across the width of the cut

### Grouser Bar

Bars are added to the inside of the chopper housing in place of the crop ramp. The bars hold back material for enhanced residue sizing



## Canola

	Setting
Feeder House Sprocket	18t
Feed Accelerator	2 <sup>nd</sup> (1 <sup>st</sup> if dry stem)
Concaves	Small Wire
Separator Grates	No spacer 1 cover
Sieves	General Purpose/ FTC chaffer
Front Chaffer	25mm
Active Tailings	Small Grains (Closed)

- **MAKE SURE CANOLA IS READY TO BE HARVESTED**
  - Seeds should pop and fall out of the pod
  - In each field, evaluate how hard the pods are to thresh by squeezing in hand to see how easy the pod is open. Expect this to change field to field or day to day
- Loss sensors may not pickup unthreshed losses, the chopper knives will thresh all pods when checking losses in spread
  - Raise chopper and ensure threshing fully
- Canola can be very difficult to harvest due to how different the plant can be across varieties and timing during the harvest season
  - Expect settings changes with variety and maturity changes
- It is recommended to start out with 1 separator grate cover installed for all conditions and add a seconded as needed, especially if dryer conditions.
  - Can leave 1 in for wheat, Many times separator performance in wheat won't be limited by 1 separator cover unless 100+bu or green straw.
- With the high speed of the loading auger in the grain tank, chaff will be concentrated to the edge of the graintank/glass
- All chaffer cettings are for GP If running FTC Chaffer, fan may need 50rpm more and open chaffer ~3mm



**Straight cut/  
Conventional  
Settings**

**Pod Shatter  
resistant  
Settings**

**Windrow  
Settings**

## Conventional

	<6%	8%	12%
<b>Rotor (RPM)</b>	500+*	500+*	550*
<b>Concave (mm)</b>	25-35	20-25	20-25
<b>Fan (RPM)</b>	650-750	650-750	650-750
<b>Chaffer (mm)</b>	14*	14*	14*
<b>Sieve (mm)</b>	5*	5*	5*

*\*Suggested starting setting*

- Settings are for GP Chaffer If running FTC Chaffer, fan may need 50rpm more and open chaffer ~3mm
- If stalks are very green, may need to run slow/open settings to prevent breakage and release moisture in the stalk which causes the seed to stick to the stalks in the separator
- Grab pods to determine how difficult they are to thresh, if very easy to open and can shatter in wind 30+ is correct concave if need to squeeze in hand to thresh 20 is a good starting point



**Straight cut/  
Conventional  
Settings**

**Pod Shatter  
resistant  
Settings**

**Windrow  
Settings**

## Pod Shatter Resistant

<6%

8%

12%

**Rotor (RPM)**

650\*

750\*

750\*

**Concave (mm)**

10-20

10-20

10-20

**Fan (RPM)**

650-750

650-750

650-750

**Chaffer (mm)**

14\*

14\*

14\*

**Sieve (mm)**

5\*

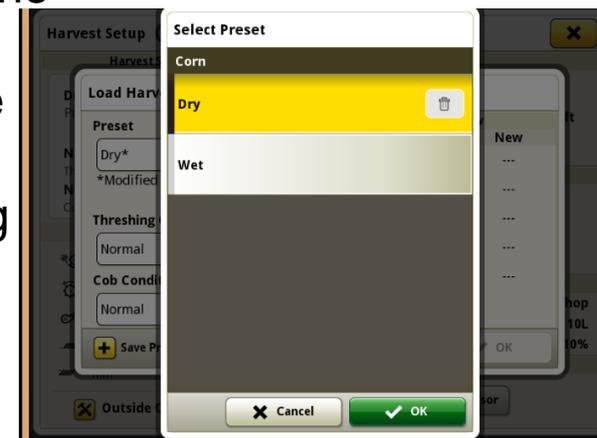
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5\*

*\*Suggested starting setting*



- If stalks are very green and wet on the inside, may need to run slow/open settings to prevent breakage and release moisture in the stalk which causes the seed to stick to the stalks in the separator
- In general, the higher the grain moisture and greener the stalk the harder to thresh the pods will be, this is especially the case with “rubbery” canola stalks later in October
  - Fungicide application holds the plant alive longer and can lead to harder threshing as the plan dries down
- For AutoMaintain, set crop type to “Wet” canola in pod shatter to thresh more aggressively



**Straight cut/  
Conventional  
Settings**

**Pod Shatter  
resistant  
Settings**

**Windrow  
Settings**

## Windrow

<6%

8%

15%

**Rotor (RPM)**

550-600

600-700

700

**Concave (mm)**

25-30

15-25

15-25

**Fan (RPM)**

650-750

650-750

650-750

**Chaffer (mm)**

14\*

14\*

14\*

**Sieve (mm)**

5\*

5\*

5\*

*\*Suggested starting setting*

- Settings are for GP If running FTC Chaffer, fan may need 50rpm more and open chaffer ~3mm
- If no rain between swathing and harvest, evaluate the pods at bottom of windrow, they may be harder to thresh and break open requiring more aggressive settings
  - Rain and snow cures the windrow, after each event, would expect the pods to become easier to thresh/more brittle
- Run as centered on windrow as possible for even splitting
- In difficult/wet conditions, may need faster rotor speed for material processing
- Run BP15 Auger sprocket in high speed if needing more throughput



**Straight cut/  
Conventional  
Settings**

**Pod Shatter  
resistant  
Settings**

**Windrow  
Settings**

## Draper Header

### Cutterbar:

Fine tooth sections are best

Ensure hold downs are adjusted properly, especially in green stalk conditions

Coarse sections can help in green stalks, but may cause more flagging in cereals

### Center feed Drum

High speed (if very dry and throughput not a concern, put in low to reduce possible shatter in the header)

### Top Auger

Ensure the speed of the flighting is slightly faster than the belt speed to have the augers pull the canola headfirst into center feed drum

### Reel

Depending on the Canola the way you run the reel might be vastly different. If canola is a taller hybrid, very dry and/or not shatter resistant Canola the reel needs to be up and back, so the reel fingers just very light brush Canola onto belts. Also, you will want to run reel at a slower speed, so you don't pre thrash the pods. If Canola is shatter resistant and wet, you may need to run the reel a lot more aggressive. Very similar to how you should run your reel in wheat. A higher reel speed would be needed to keep even feeding with the heavier cop mat.



**Straight cut/  
Conventional  
Settings**

**Pod Shatter  
resistant  
Settings**

**Windrow  
Settings**

## Canola Performance parts

**Large Wire concave** – Separates material early to get it out of rotor, may need to use 2 separator covers to limit longer chaff from grates. Also may overload shoe and not thresh as well in other crops.

### FTC chaffer

Improve grain tank sample if stems are present in with general purpose AXE88342

**Separator Grate covers** – Covers 1 grate entirely and reduces chaff load on cleaning system and can reduce stalk stabbing in front chaffer.

**Residue shrouds** - Can help uniformly spread 50ft in challenging conditions

### Grouser Bar

Bars are added to the inside of the chopper housing in place of the crop ramp. The bars hold back material for enhanced residue sizing



Straight cut/  
Conventional  
Settings

Pod Shatter  
resistant  
Settings

Windrow  
Settings

## Barley

	Setting
Feeder House Sprocket	18t (may need 22T in dry conditions)
Feed Accelerator gear	2nd
Concaves	Small Wire or Small, Small Large
Separator Grates	No-spacer
Shoe Elements	General Purpose or FTC chaffer
Front Chaffer	25mm
Active Tailings	Small Grains

Dry barley straw can be very slick and feeder house conveyor chain may need to be in high speed to pull crop away from header

Ensure awns are properly threshed, if seeing partial awns in tank it could be breaking off in elevator

Remove separator grate blanks in tough conditions to separate more material if needed

Open active tailings if needed for grain quality



## Barley

	<10%	15%	20%+
<b>Rotor (RPM)</b>	900*	1000-1200	1100-1200
<b>Concave (mm)</b>	12-16	12-16	15-25
<b>Fan (RPM)</b>	850*	850*	850*
<b>Chaffer (mm)</b>	15*	15*	18*
<b>Sieve (mm)</b>	9*	9*	10-15

*\*Suggested starting setting*

- With FTC Chaffer, Settings should be 18-20 (as much open as possible)
- If cleaning shoe limited in dry conditions, consider adding separator grate cover
  - Maybe more cleaning limited if running large wire concaves
  - Barley awns can create “Carpet” over the chaffer when separator is creating too much chaff resulting in shoe loss.
- For Straw quality, Mini-Round bars or round bars could be added starting in 3<sup>rd</sup> position



## Header

### Cutterbar:

Fine tooth sections are best

Ensure hold downs are adjusted properly

### Feed Drum:

Ensure in high speed,

In dry conditions, ensure drum is in lower position, cone flighting strippers set and timing correct for proper feeding

## BP15

Ensure feeding windrows evenly to combine

Consider double windrows if operation allows

Spreading full 70ft can be a challenge, but recommend installing wide shrouds for best opportunity



## Barley Performance parts

**Separator Grate covers** – Covers 1 grate entirely and reduces chaff load on cleaning system and can reduce stalk stabbing in front chaffer.

### FTC chaffer

Improve grain tank sample if beards and stems are present in with general purpose

### Residue shrouds

The Wide Shroud Kit can be installed to address heavy outside spreading in tough small grains conditions. This kit helps ensure a more uniform spread width across the width of the cut.

### Grouser Bar

Bars are added to the inside of the chopper housing in place of the crop ramp. The bars hold back material for enhanced residue sizing



# Peas

	Setting
Feeder House Sprocket	18t
Feed Accelerator gear	2 <sup>nd</sup> (1 <sup>st</sup> for dry/low yielding)
Concaves	Roundbar/Large wire
Separator Grates	No-spacer
Shoe Elements	General Purpose or FTC chaffer
Front Chaffer	25mm
Active Tailings	Corn (open) position

For larger peas, Roundbar or Large wires maybe needed to separate without damage

Many times, small wire with a large wire concave in the 3<sup>rd</sup> position is sufficient for separation and grain quality

If not, suggest putting Large Wire/Round bar in middle as well to minimize concave.

Minimize grain in tailings with a more open sieve to reduce grain recirculation and possible damage.

If green straw recommend Feed Accelerator to be in high speed

Check hold downs and knife daily in tough cutting conditions



## Peas

	<8%	11%	13+%
<b>Rotor (RPM)</b>	450*	450*	500+
<b>Concave (mm)</b>	30*	30*	25*
<b>Fan (RPM)</b>	950-1050	950-1050	950-1050
<b>Chaffer (mm)</b>	15*	15	18
<b>Sieve (mm)</b>	12*	12*	12*

*\*Suggested starting setting*

- With FTC Chaffer, Settings should be 18-20 (as much open as possible)
  - Pea vines may hairpin on louver tails in greener conditions
- If cleaning shoe limited in dry conditions, consider adding separator grate cover



## Header

### Cutterbar:

Fine tooth sections are best

Ensure hold downs are adjusted properly daily– Especially important in green straw

If desire is to leave some stubble can run with HDR on the gauge wheels with header tilted forwards

Raised skid shoes an option as well to leave longer stubble and keep knife out of rocks/debris

### Top Augers:

Ensure the speed of the flighting is slightly faster than the belt speed to have the augers pull the peas headfirst into center feed drum

### Center feed Drum:

High Speed in tough conditions,

Consider low speed in most conditions to limit pod shatter and header loss

### Reel

Start with reel fingers vertical over the cutterbar

Ensure reel-to-cutterbar position is set correctly



## Peas Performance parts

**Residue shrouds** - Can help uniformly spread 50ft in challenging conditions

**Chopper Ramp** - Can help spread 50ft in challenging conditions

**Grouser Bar** - Bars hold back material for enhanced residue sizing

**Raised height skidshoes** - Raises 25mm cutterbar out of debris on the ground

**Header Crop flow divider** – Reduces underfeeding in point rows/half head feeding

**Large Wire concave** – In 3<sup>rd</sup> and/or 2<sup>nd</sup> position can allow for single concave config from cereals/pulses

**Separator grate blanks** – Reduces chaff load in bays 1 and 6

**Separator Grate covers** – Covers 1 grate entirely and reduces chaff load on cleaning system and can reduce stalk stabbing in front chaffer.



## Lentils

	Setting
Feeder House Sprocket	18t
Feed Accelerator gear	2 <sup>nd</sup> (1 <sup>st</sup> for dry/low yielding)
Concaves	Small wire/Large wire
Separator Grates	No-spacer
Shoe Elements	General Purpose or FTC chaffer
Front Chaffer	25mm
Active Tailings	Corn (open) position

Many times, small wire with a large wire concave in the 3<sup>rd</sup> position is sufficient for separation and grain quality

If not, suggest putting Large Wire/Round bar in middle as well to minimize concave.

Minimize grain in tailings with a more open sieve to reduce grain recirculation and possible damage.

If green straw recommend Feed Accelerator to be in high speed



# Lentils



<b>Rotor (RPM)</b>	400	500	600
<b>Concave (mm)</b>	20	15	12
<b>Fan (RPM)</b>	900	900	900
<b>Chaffer (mm)</b>	15	15	15
<b>Sieve (mm)</b>	5	5	5

*\*Suggested starting settings*

- With FTC Chaffer, Settings may need to be 3-5mm more open and 50rpm more fan speed
  - Lentil vines may hairpin on louver tails in greener conditions
- If shoe limited in very dry conditions consider adding a separator grate cover
- Keep X9 full with HD50R/F in Lentils



**Lentil Settings**

## Header

### Cutterbar:

Fine tooth sections are best

**\*Ensure hold downs are adjusted properly\***– Especially important in green straw

In Lentils, it is important to check these **each morning** before harvest

Raised skid shoes an option as well to leave longer stubble and keep knife out of rocks/debris

### Top Augers:

Ensure the speed of the flighting is slightly faster than the belt speed to have the augers pull the peas headfirst into center feed drum

### Center feed Drum:

Low Speed

### Reel

Start with reel fingers vertical over the cutterbar

Ensure reel is spinning faster than ground speed to “Pull” on lentils before they are cut, this is especially important in green straw

Check reel to cutterbar clearance prior to harvest



## Lentils Performance parts

**Raised height skid shoes** - Raises 25mm cutterbar out of debris on the ground

**Header Crop flow divider** – Reduces underfeeding in point rows/half head feeding

**Separator grate blanks** – Reduces chaff load in bays 1 and 6

**Separator Grate covers** – Covers 1 grate entirely and reduces chaff load on cleaning system and can reduce stalk stabbing in front chaffer.

**Residue shrouds** - Can help uniformly spread 50ft in challenging conditions

**Grouser Bar** - Bars hold back material for enhanced residue sizing



# Oats

	Setting
Feeder House Sprocket	18t (22t for tough conditions)
Feed Accelerator gear	2nd
Concaves	Small Wire, Small/Small/Large
Separator Grates	No-spacer
Shoe Elements	General Purpose or FTC chaffer
Front Chaffer	25mm
Active Tailings	Small Grains

Remove all separator covers for improved separation.



## Oats



	900	1000	1100
<b>Rotor (RPM)</b>	900	1000	1100
<b>Concave (mm)</b>	20	20	20
<b>Fan (RPM)</b>	750	750	750
<b>Chaffer (mm)</b>	15	15	18
<b>Sieve (mm)</b>	8	9	10

- With FTC Chaffer, Settings should be 18-20 (as much open as possible)
- With the lighter test weight of Oats, minimize shoe loading in dry conditions.



## Header

### Cutterbar:

Fine tooth sections are best

Ensure hold downs are adjusted properly

### Center feed Drum

High Speed



**Oats  
Settings**

## Oats Performance parts

### Residue shrouds

The Wide Shroud Kit can be installed to address heavy outside spreading in tough small grains conditions. This kit helps ensure a more uniform spread width across the width of the cut.

### Concave covers

Improve threshing in hard to thresh conditions with “white caps” in the sample  
Recommend 2 straps

### FTC chaffer

Improve grain tank sample if stems are present in with general purpose

**Residue shrouds** - Can help uniformly spread 50ft in challenging conditions

**Grouser Bar** - Bars hold back material for enhanced residue sizing



## Rye

	Setting
Feeder House Sprocket	18t
Feed Accelerator gear	2nd
Concaves	Small Wire
Separator Grates	No-spacer
Shoe Elements	General Purpose or FTC chaffer
Front Chaffer	25mm
Active Tailings	Small Grains

Remove all separator covers for improved separation.



# Rye



	1000	1000-1200	1100-1200
<b>Rotor (RPM)</b>	1000	1000-1200	1100-1200
<b>Concave (mm)</b>	12-16	12-16	15-25
<b>Fan (RPM)</b>	950	950	950
<b>Chaffer (mm)</b>	15	15	18
<b>Sieve (mm)</b>	8	9	10-15

- With FTC Chaffer, Settings should be 18-20mm (as much open as possible)



## Header

### Cutterbar:

Fine tooth sections are best

Ensure hold downs are adjusted properly

### Center feed Drum

High Speed

### Top Augers

If crop is contacting top augers, ensure speed is faster than the belts



## Rye Performance parts

### Concave covers

Improve threshing in hard to thresh conditions with “white caps” in the sample  
Recommend 2 straps

### FTC chaffer

Improve grain tank sample if stems are present in with general purpose

### Residue shrouds

The Wide Shroud Kit can be installed to address heavy outside spreading in tough small grains conditions.  
This kit helps ensure a more uniform spread width across the width of the cut.



# Flax

	Setting
Feeder House Sprocket	18t
Feed Accelerator gear	2 <sup>nd</sup> (1 <sup>st</sup> for dry/low yielding)
Concaves	Small wire
Separator Grates	No-spacer If down for corn, ok to leave down
Shoe Elements	General Purpose or FTC chaffer
Front Chaffer	25mm
Active Tailings	Small grains (Closed) position

Ensure concaves are zero and leveled before start  
 Ensure re-thresher concave is zeroed to beater head

Minimize grain in tailings with a more open sieve to reduce grain recirculation

If green straw recommend Feed Accelerator to be in high speed

Up to 4 concave covers maybe needed

Inspect chopper knives before flax harvest, if wore, may need be flipped or replaced



# Flax



<b>Rotor (RPM)</b>	1100+	1100+	1100+
<b>Concave (mm)</b>	0-10	0-10	0-10
<b>Fan (RPM)</b>	1050	1050	1050
<b>Chaffer (mm)</b>	15	15	15
<b>Sieve (mm)</b>	5	5	5

- With FTC Chaffer, Settings may need to be 3-5mm more open and 50rpm more fan speed
- Up to 4 concave covers maybe needed to get all the bolls threshed.
- With the aggressive rotor speed/concave 1 separator cover maybe needed to limit shoe loading



**Flax  
Settings**

## Header

### Cutterbar:

Fine tooth sections are best

**Ensure hold downs are adjusted properly**– Especially important in green straw

These need to be checked each day to ensure no cutting issues happen

Raised/highwear skid shoes an option as well to leave longer stubble and keep knife out of rocks/debris

### Top Augers:

Ensure the speed of the flighting is slightly faster than the belt speed to have the augers pull the crop headfirst into center feed drum

### Center feed Drum:

High Speed

### Reel

Start with reel fingers vertical over the cutterbar

Ensure reel is spinning faster than ground speed to “Pull” on Flax before they are cut, this is especially important in green straw

Ensure reel to cutterbar clearance is set correctly



## Flax Performance parts

**Raised height skid shoes-** Raises 25mm cutterbar out of debris on the ground

**Header Crop flow divider** – Reduces underfeeding in point rows/half head feeding

**Separator grate blanks** – Reduces chaff load in bays 1 and 6

**Separator Grate covers** – Covers 1 grate entirely and reduces chaff load on cleaning system and can reduce stalk stabbing in front chaffer.

**Residue shrouds** --Can help uniformly spread 50ft in challenging conditions

**Chopper Ramp** -- Can help spread 50ft in challenging conditions with low straw volume



## Additional Resources\*

### Compatibility Information

2021 Sales Handbook

2022 Sales Handbook

S-Series Tire Compatibility and Spacing Chart

Header Compatibility Chart

### Training

John Deere HIGHSPOT

Combine Sales Clinic Materials

X-Series Sales & Demonstration Material

Ready to Harvest Guides

Checking Losses

### Additional Videos

John Deere GoHarvest™ Videos

John Deere YouTube Channel

John Deere Combine Advisor™ Video

### John Deere Apps

John Deere App Center Android

John Deere App Center iOS

### Miscellaneous Information

Register Your John Deere Demo

John Deere Connected Support™

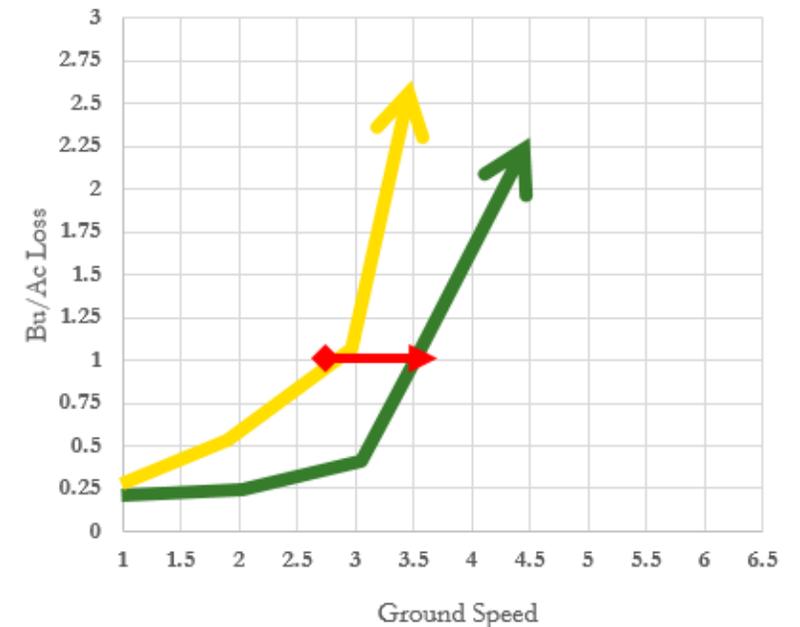
Optimizing Harvest Equipment

## Losses:

- Checking losses in Canola/OSR can be a challenge due to the small seeds. It is important losses are checked often as conditions change throughout harvest.
- Unless you know the source of grain loss, you will be unable to reduce it. There are pre-harvest losses, header loss, rotor loss, and shoe loss.
- Perform loss checks in areas representative to the rest of the field.
- The preferred and most accurate way of checking losses is to raise chopper and drop pans in the windrow with a full width loss pan.
  - After dropping a pan, clean the larger material away by hand and use a grading screen to sieve off the final amount of chaff.
  - If throwing pans in the windrow is not available to do, the next best method is to throw a 1-3sq ft pan into the spread of the combine. Loss distribution may change across the width so trials should be made with the screen thrown in the center and outside of the residue spread.
  - It is recommended to check losses at 2-3 different speeds to get an understanding of the speed where losses begin to increase significantly.
  - If checking in the spread, most loss is concentrated behind chopper and not evenly distributed across the width.
- Reference the **Equipment Plus** app for loss calculator tool which makes it easy to determine bu/ac or % loss.

To help visualize loss, use the printable worksheets to mark losses. In a consistent part of the field, collect loss at 3-4 increasing speeds with same settings, make a mark on the sheet at the loss level for that speed use to compare machines performance at a loss level.

In the example below, at 1bu/ac loss there is a ~16% difference in speed (3.0mph vs 3.5mph)



Printable Graphs

