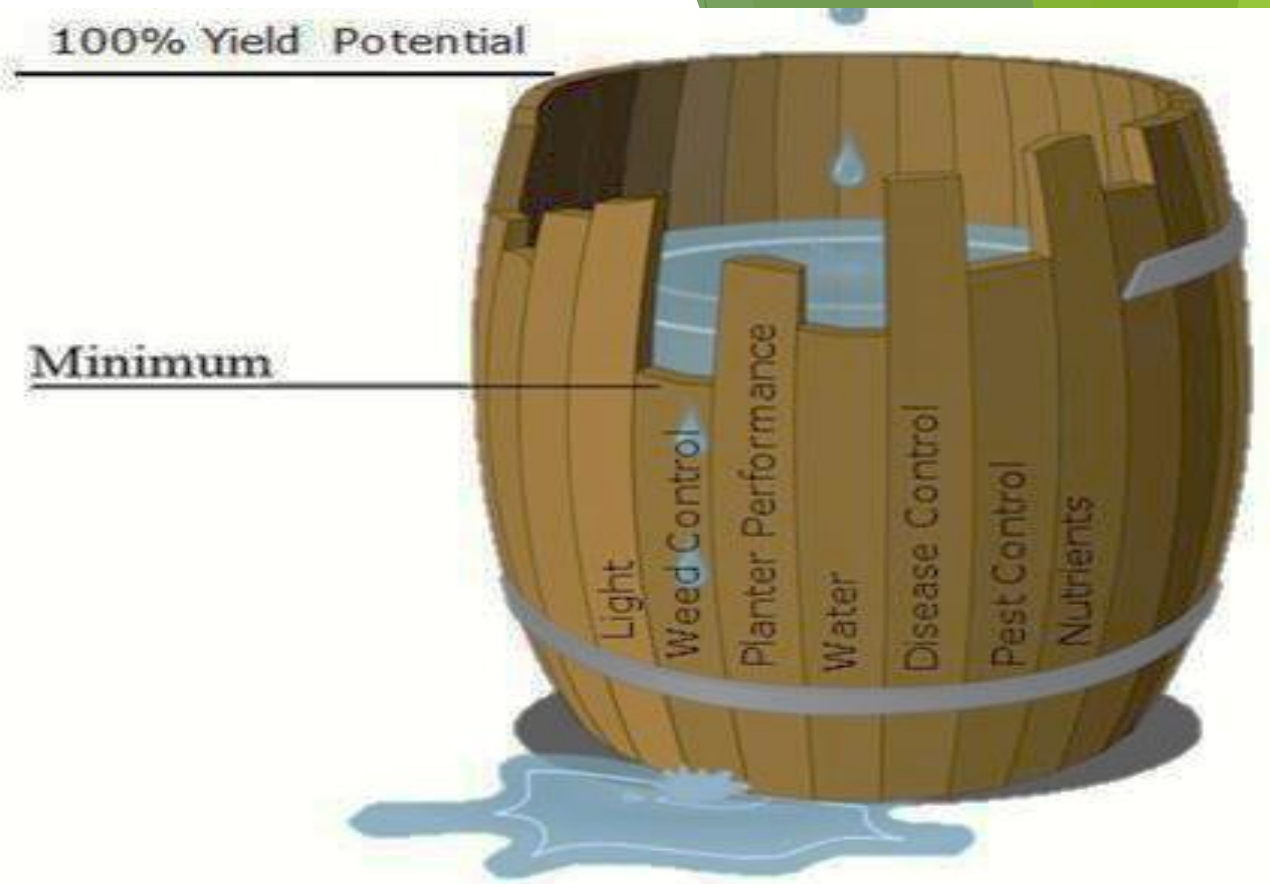

JOHN DEERE
GREENMARK™
EQUIPMENT
INTEGRITY
EXCELLENCE
COLLABORATION
SUSTAINABIITY

Liebig's Law of the Minimum

"Growth is controlled not by the total amount of resources available, but by the scarcest resource which becomes the limiting factor."



Don't let planter performance be a limiting factor.

Best Case: 0 Bu. Lost Yield Potential from planter

Worst Case: 36 Bu./Acre Lost Yield Potential*

$5/bushel*36 bushels/acre * 1000 acres = $180,000 loss

*Based on 200 Bu/Acre Yield

Planter Affects: Focus on Corn

Correct Population

2-4 bu/acre

Uniform Spacing

2-4 bu/acre

Uniform Emergence

10-18 bu/acre

Planting Window

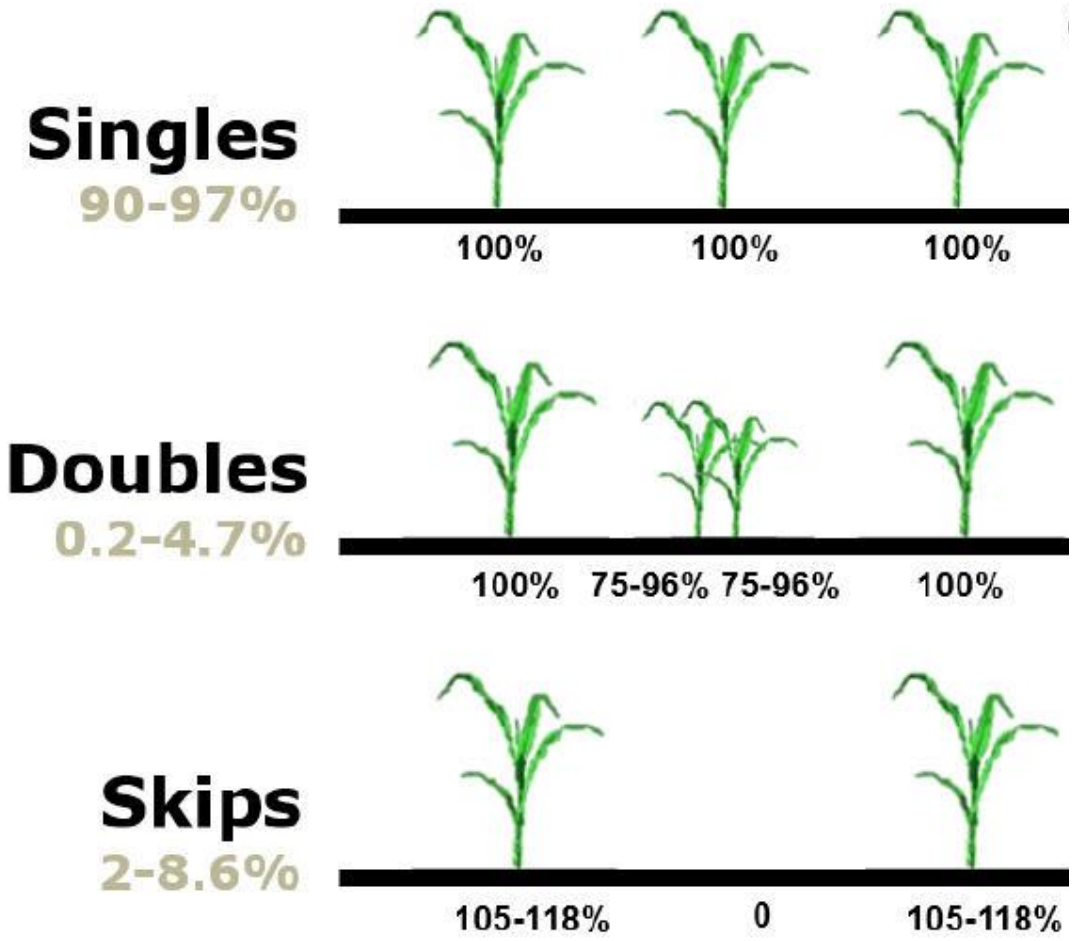
4-10 bu/acre

Source: University of Minnesota

Based on 200 bu/acre

Correct Population – Doubles and Skips

Why corn growers accept a few doubles but not skips.



Settings that affect Population and Singulation

Ground Drive

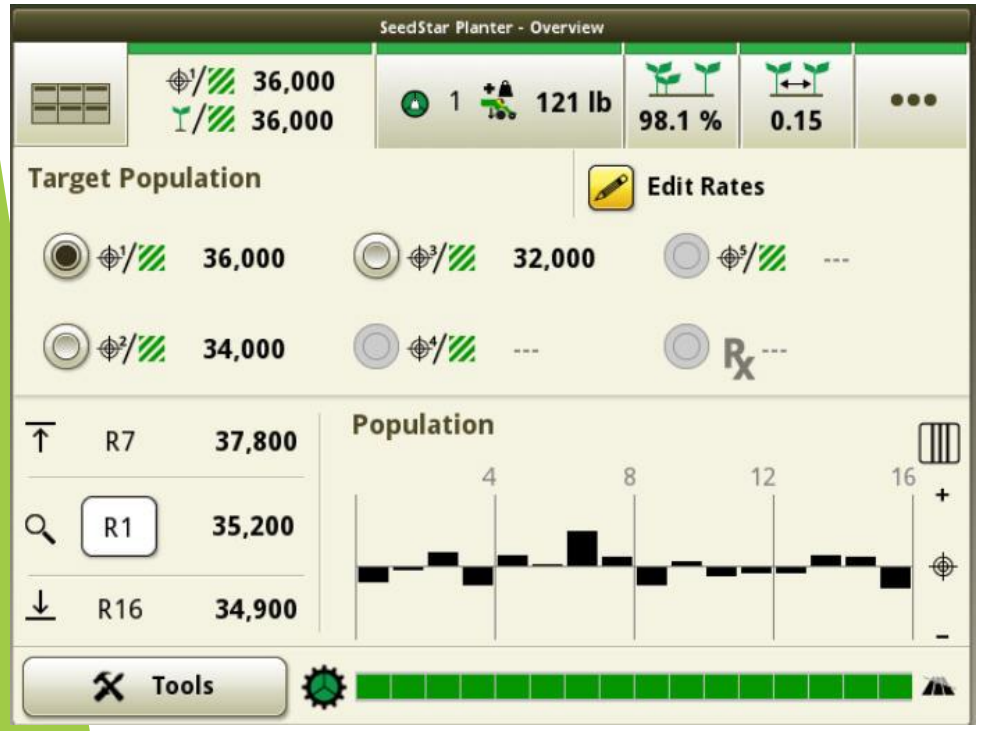
- Vacuum Setting
- Meter Settings
- Overlap

Hydraulic Drive

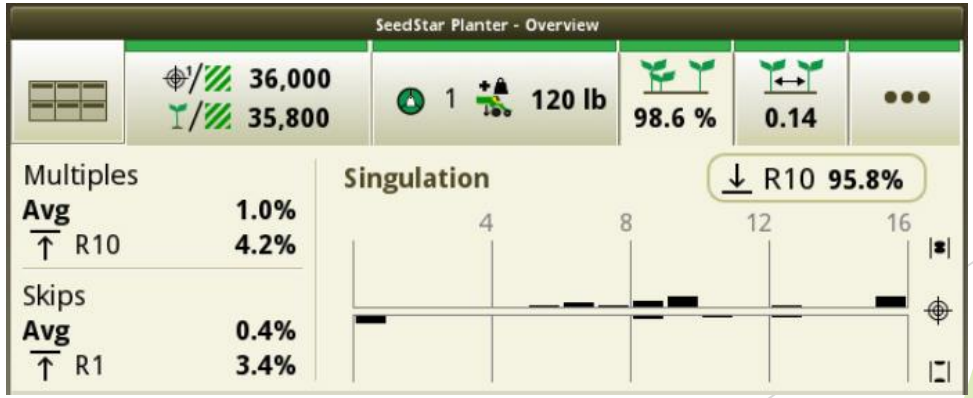
- Vacuum Setting
- Meter Settings
- Overlap

Electric Drive

- Vacuum Setting
- Meter Settings
- Overlap



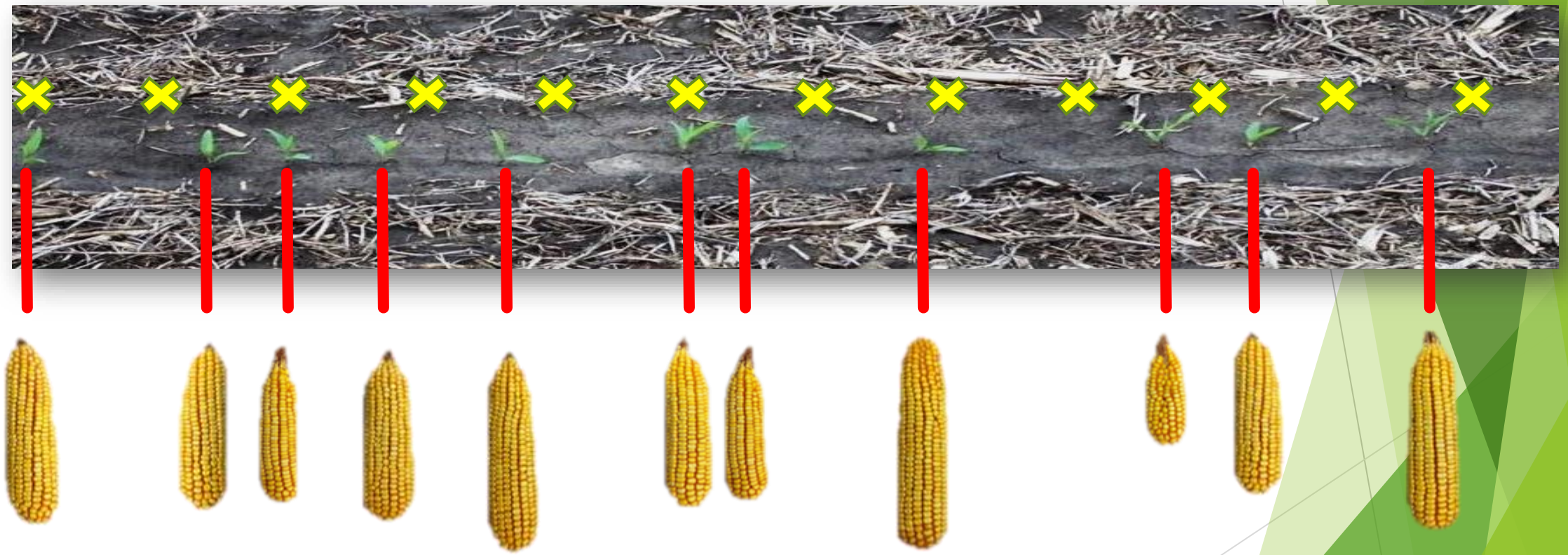
Goals:
Population for Corn = +/- 1000 seeds/acre
Singulation for Corn = 97% or above



Results of Seed Spacing

CoV = 0

CoV = .44



7 Factors that affect productivity

- Planter Size
- Ground Speed
- Seed Capacity
- Fertilizer, Chemical Capacity
- Filling Time
- Time to change settings
- Equipment Reliability

Tractor Ground Speed Signal

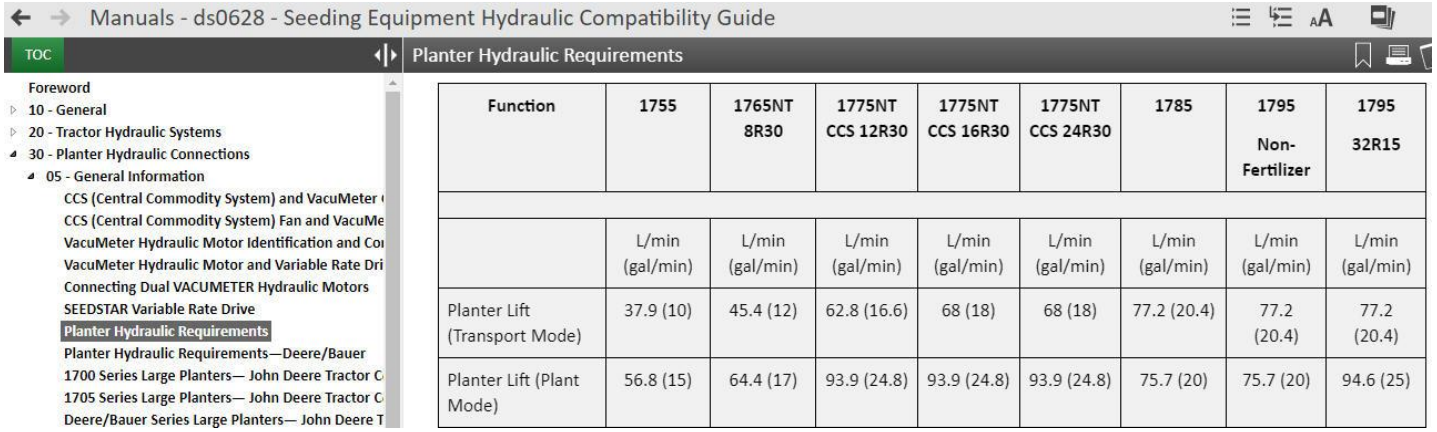
GPS Connector

- Contains plug from factory
- Connect speed source harness here to use GPS speed

Radar Connector

- Connected to speed source harness from factory
- Move plug here to use GPS as speed source

Hydraulic Requirements and SCV Flow



Function	1755	1765NT 8R30	1775NT CCS 12R30	1775NT CCS 16R30	1775NT CCS 24R30	1785	1795 Non-Fertilizer	1795 32R15
	L/min (gal/min)	L/min (gal/min)	L/min (gal/min)	L/min (gal/min)	L/min (gal/min)	L/min (gal/min)	L/min (gal/min)	L/min (gal/min)
Planter Lift (Transport Mode)	37.9 (10)	45.4 (12)	62.8 (16.6)	68 (18)	68 (18)	77.2 (20.4)	77.2 (20.4)	77.2 (20.4)
Planter Lift (Plant Mode)	56.8 (15)	64.4 (17)	93.9 (24.8)	93.9 (24.8)	93.9 (24.8)	75.7 (20)	75.7 (20)	94.6 (25)

DS0628: Seeding Equipment Hydraulic Compatibility Guide
30 – Planter Hydraulic Connections >> 05 General Information

1. There is a significant difference in the flow requirements between planting and headland turns.
2. The planter electronics deactivate as many hydraulic functions as possible when the planter is raised.
3. Run Frame Weight Distribution, IRHD, and Planter Power Generation on Power Beyond.
4. Planter power generation adds significant hydraulic demand.

Flow Requirements - 1775NT 24r30 Electric Drive		
Units: GPM	Planting	Turning
CCS Blower, Compressor	10	
Raise/Lower		25
Markers		5
Vacuum 1	5	5
Vacuum 2	5	5
Frame Weight Distribution	1.5	
Hydraulic Down Force	8	
Planter Power Generation	11	11
Total Planter GPM:	40.5	51

Electric Drive – Power Generation Systems

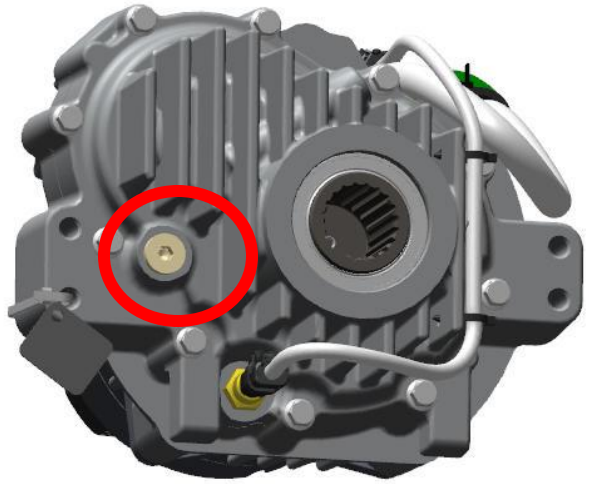
Implement Power Generation

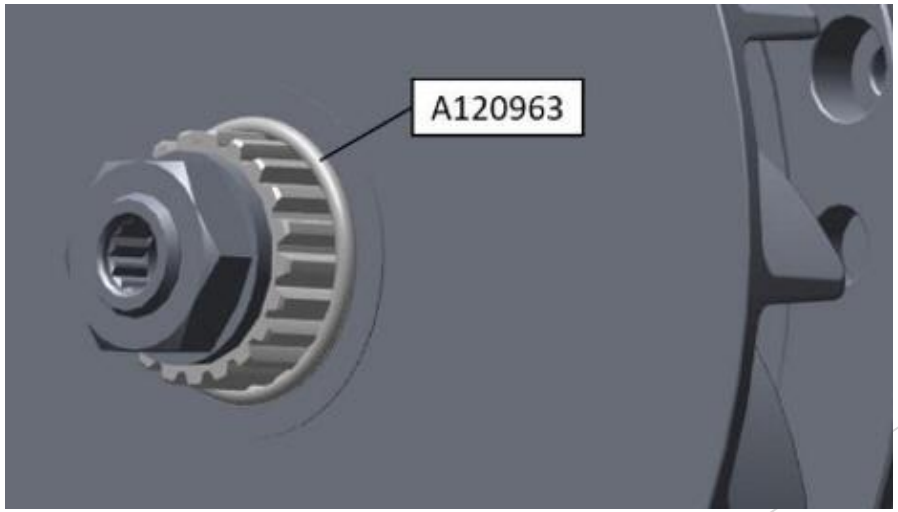
Tractor Power Generation

Note: There are a few electric drive planters with Planter Power Gen 2.0. This is the system used on N500C air seeders with a coupler instead of a belt.

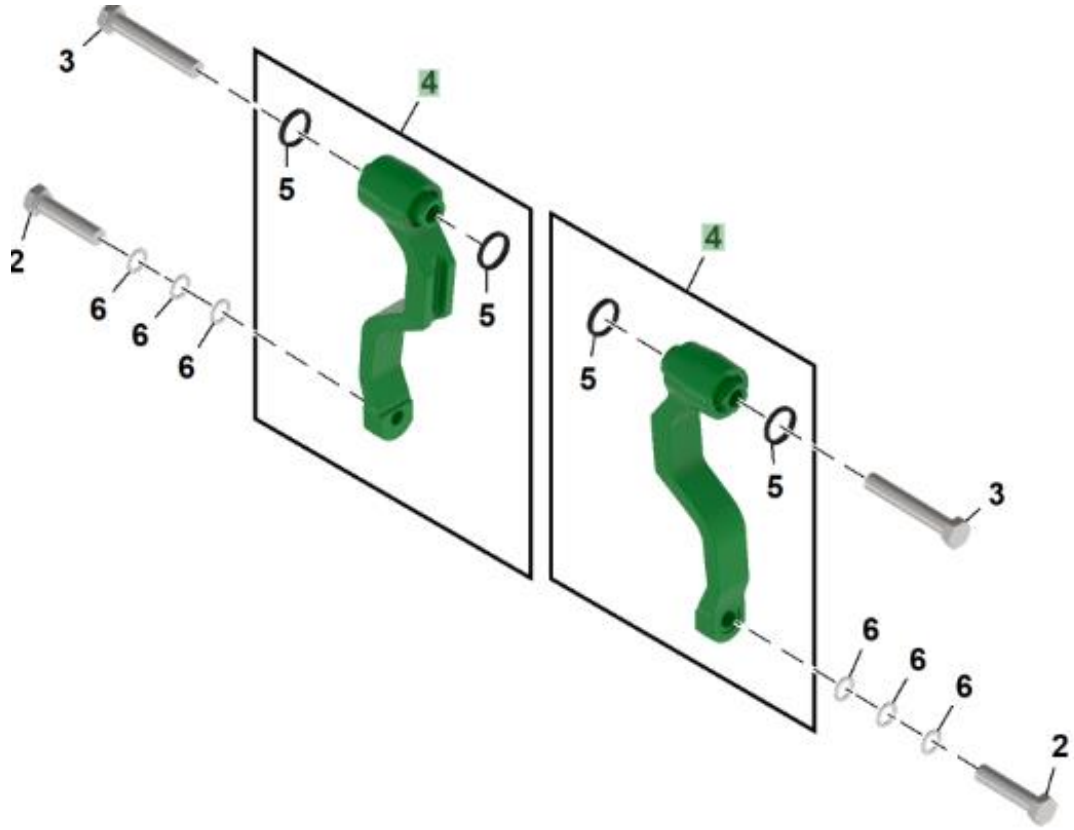
Tractor Power Generation

- Grease the splines on the alternator gear before mounting each season
  - Keeps coupling from overheating
  - Reduces wear on coupling
  - John Deere HD Moly Grease is preferred
  - O-ring (A120963) can be added to older systems
- Change gear case oil at end of season
  - John Deere Hy-Gard™ or Low Viscosity Hy-Gard™ are preferred





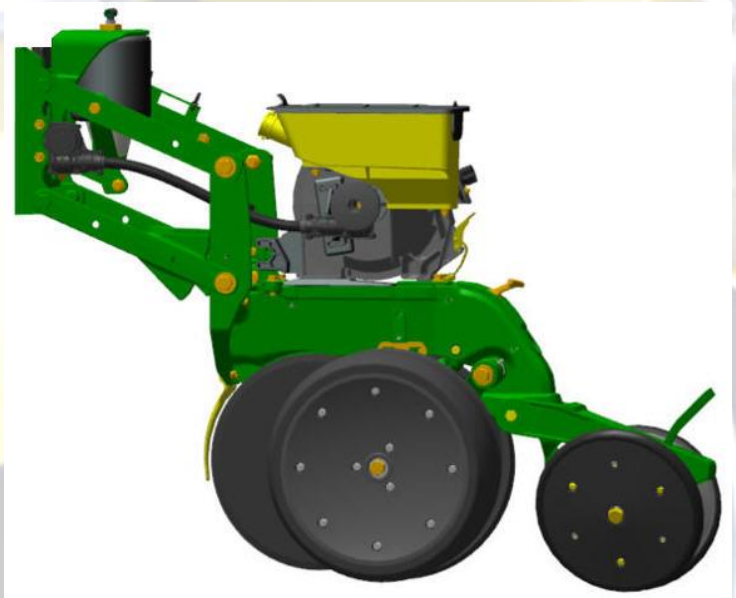
Maintenance FREE Gauge wheel arms AA114871



Current Production Row Units

MaxEmerge™ 5

Introduced: 2015



ExactEmerge™

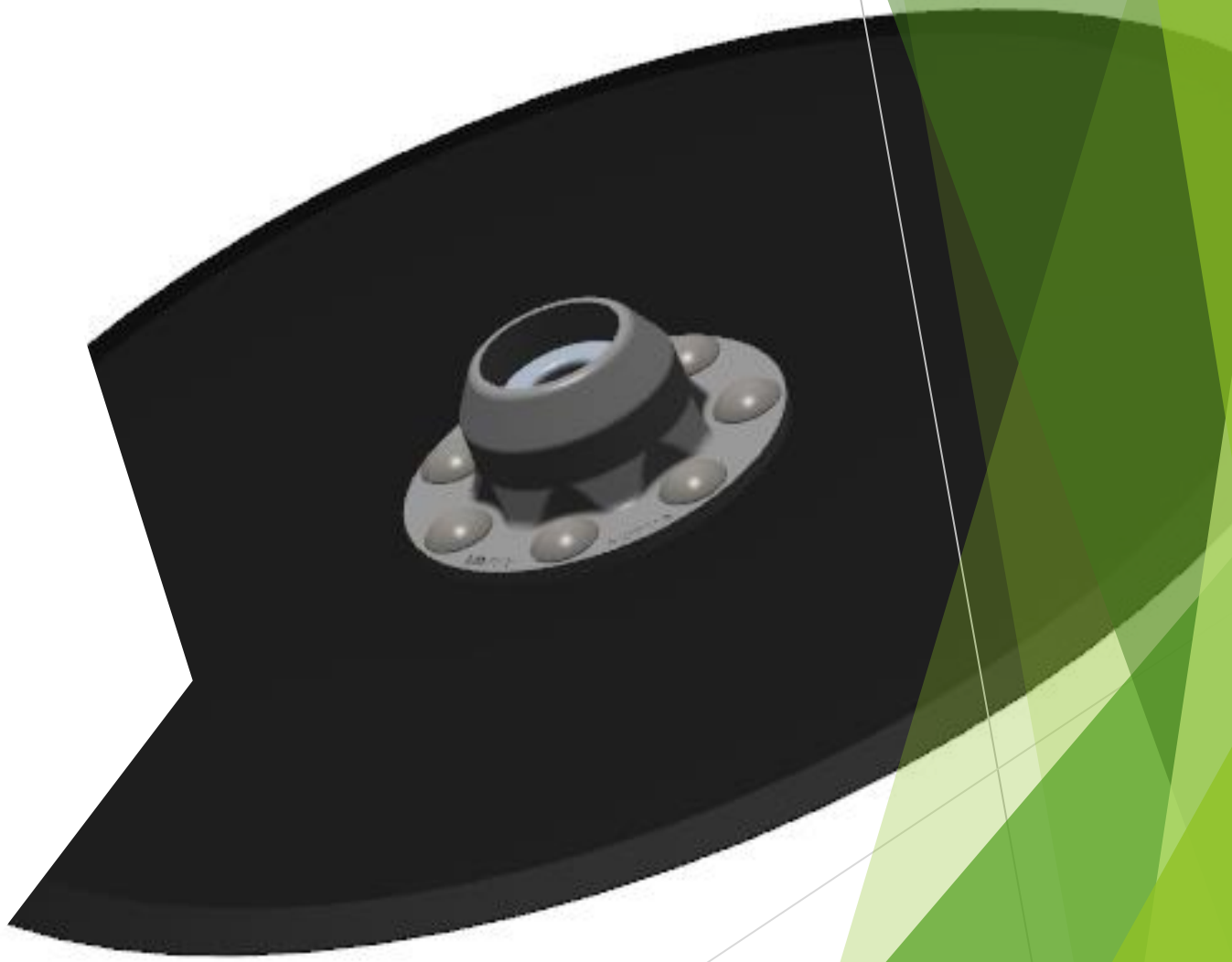
Introduced: 2015

MaxEmerge™ 5e

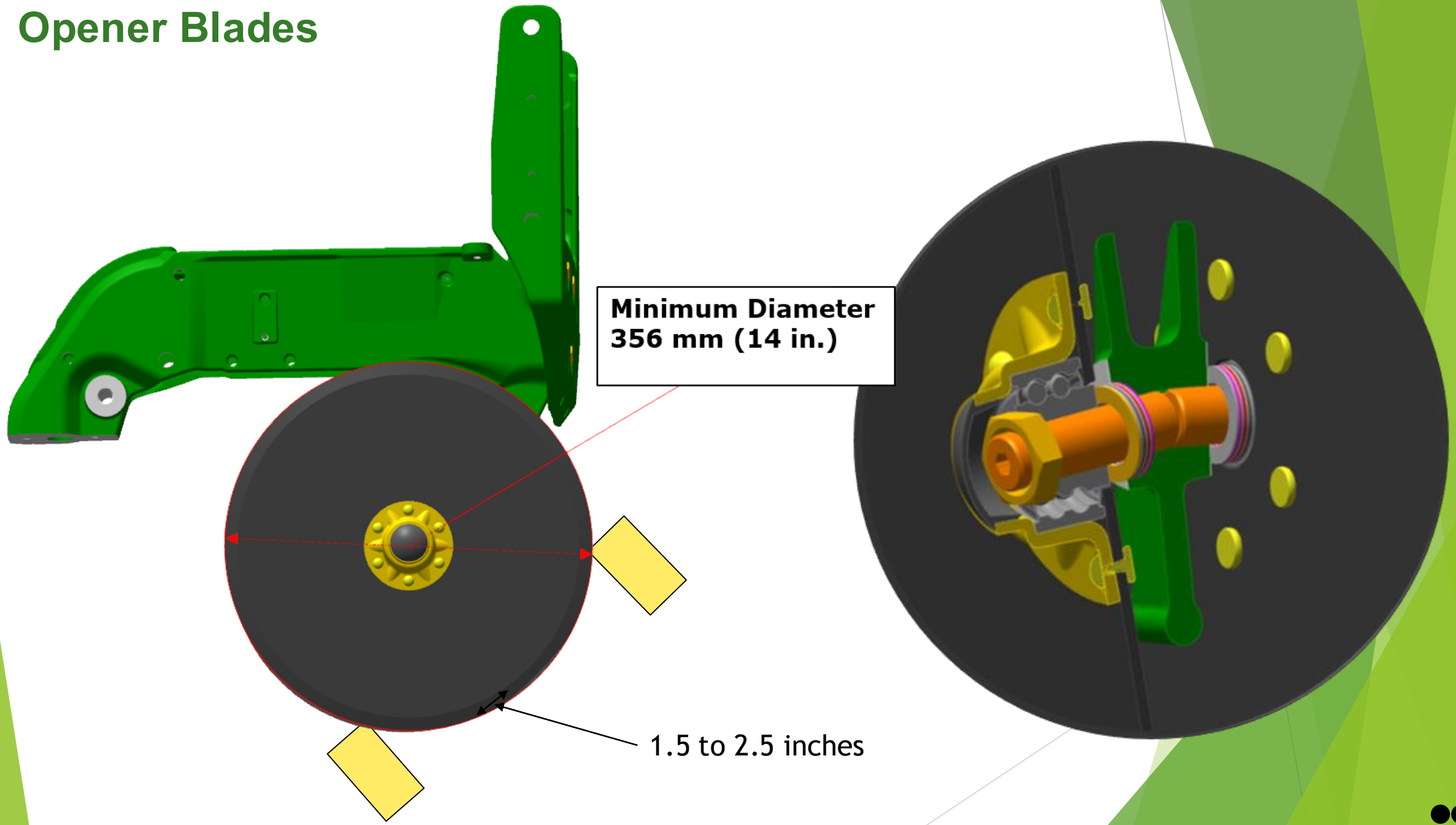
Introduced: 2017

Opener Blades Updates

- Challenge: Blades wearing out, hubs failing, runout and pinch point issues
- New Production Blades Updates - AA105795:
  - Increased rivet count (5 to 6)
  - Increased rivet diameter (6.5mm to 8mm)
  - Edge control improvements from the supplier
  - Triple Lip Seal on the bearing
- Compatibility: MaxEmerge Plus, XP, ME5, ME5e, EE row units



Opener Blades

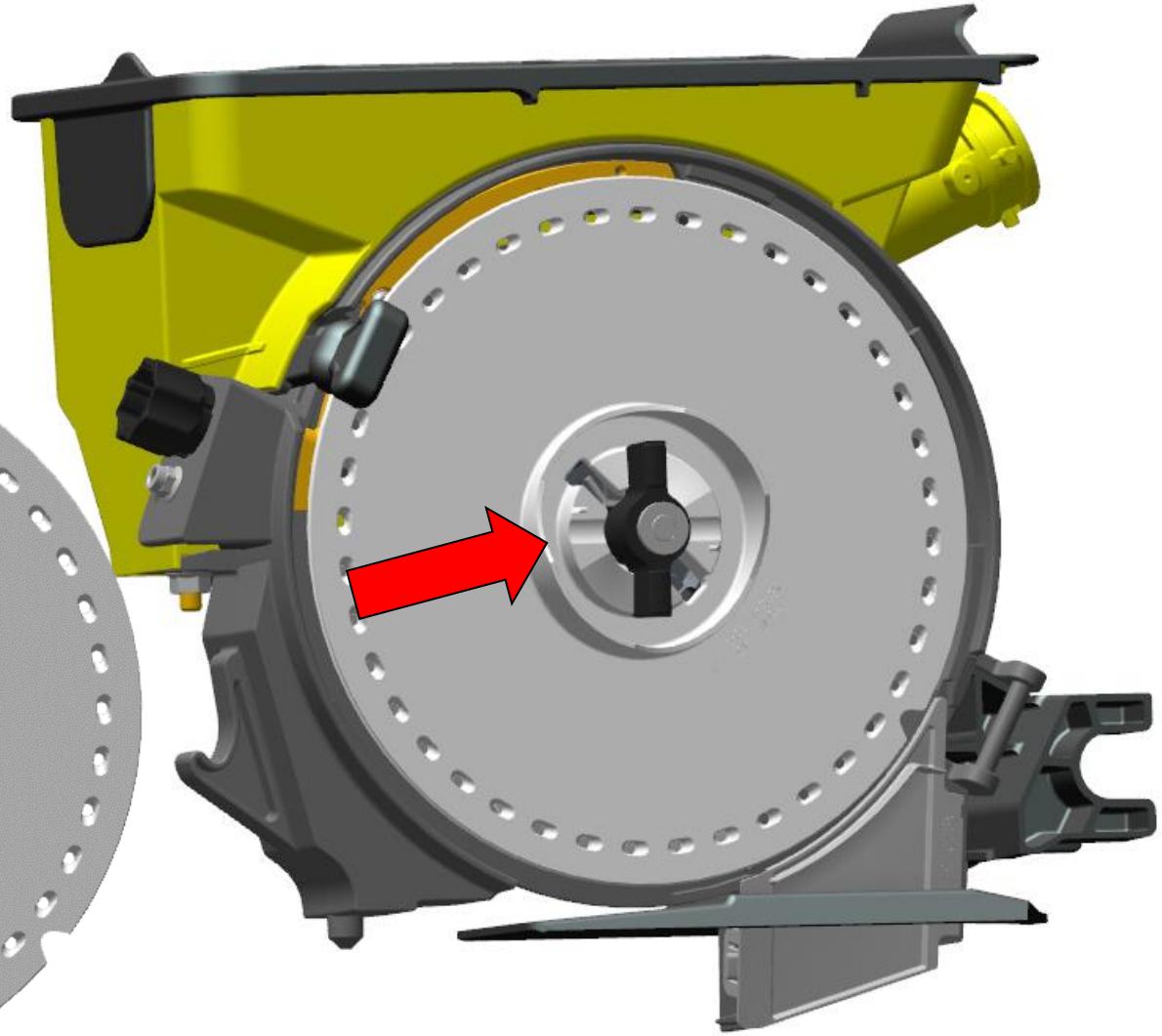


Exactemerge

NEW EE Cartridge Guard

Meter Inspection – MaxEmerge™ 5 and 5e

Remove Clip to adjust Hub Height



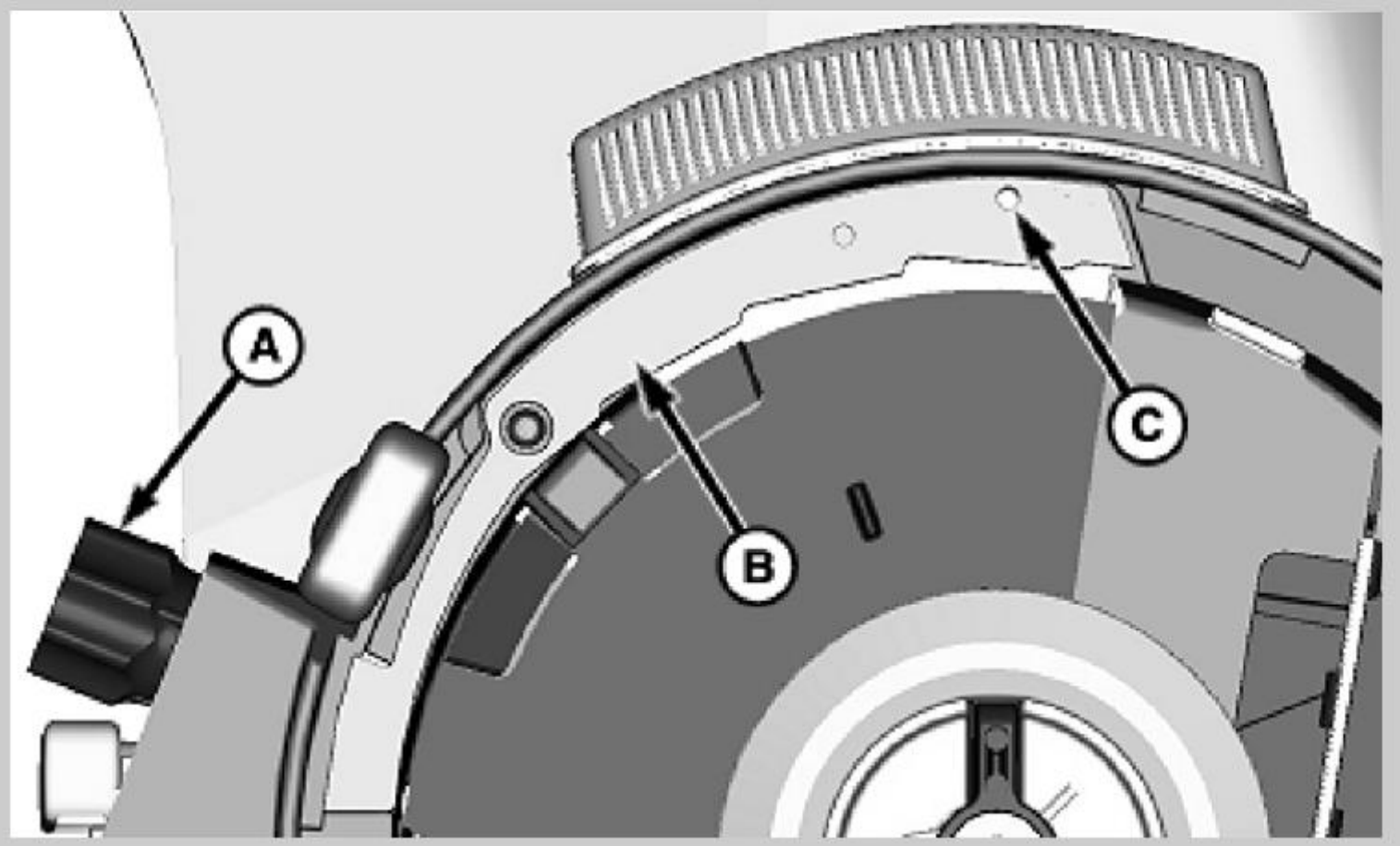
Hub Height Adjustment

Apply TY25797 spray graphite lubricant on seed disk in area where it contacts rubber seals on inside and outside of disk prior to hub height adjustment.

Adjusting the MaxEmerge™ 5 Doubles Eliminator

Establishing a Zero Position (Seed Disk not Installed)

- Zero doubles eliminator with Seed Disk out using hole “C”.
- Set Dial “A” to zero.

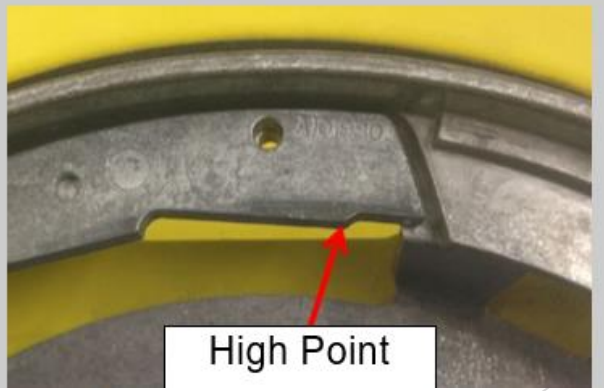


3/32 drill bit

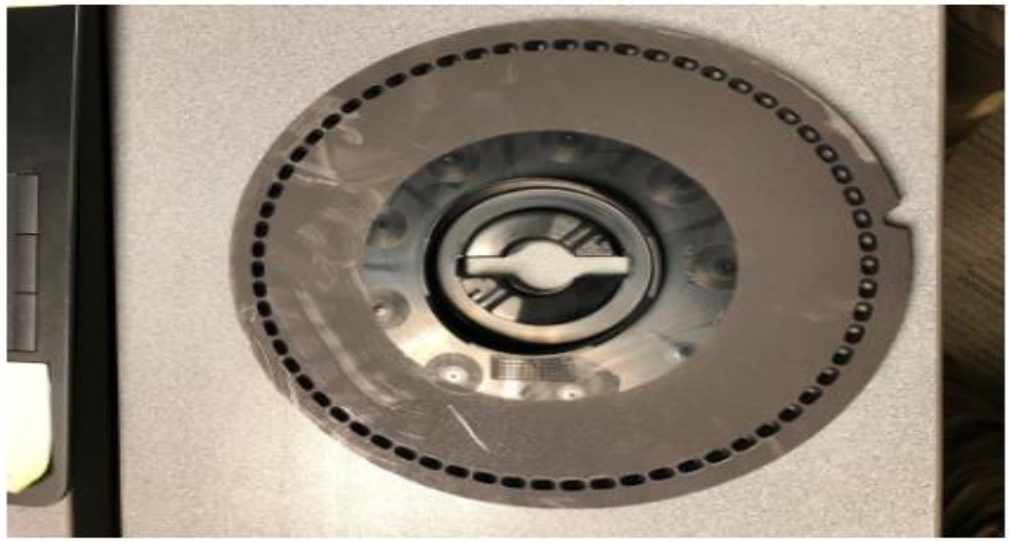
Adjusting the MaxEmerge™ 5 Doubles Eliminator

with Seed Disk Installed

- When the seed disk is installed utilize the JDG10965 Service Tool.
- Set knob to 5 as the Tool comes in contact with the “high point” of the doubles eliminator notch



- Soybean singulation disk for MaxEmerge 5 and MaxEmerge 5e



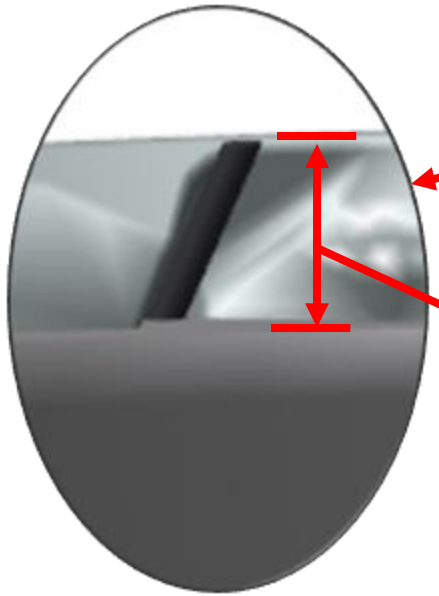
64-hole soybean disk

Knockout wheel

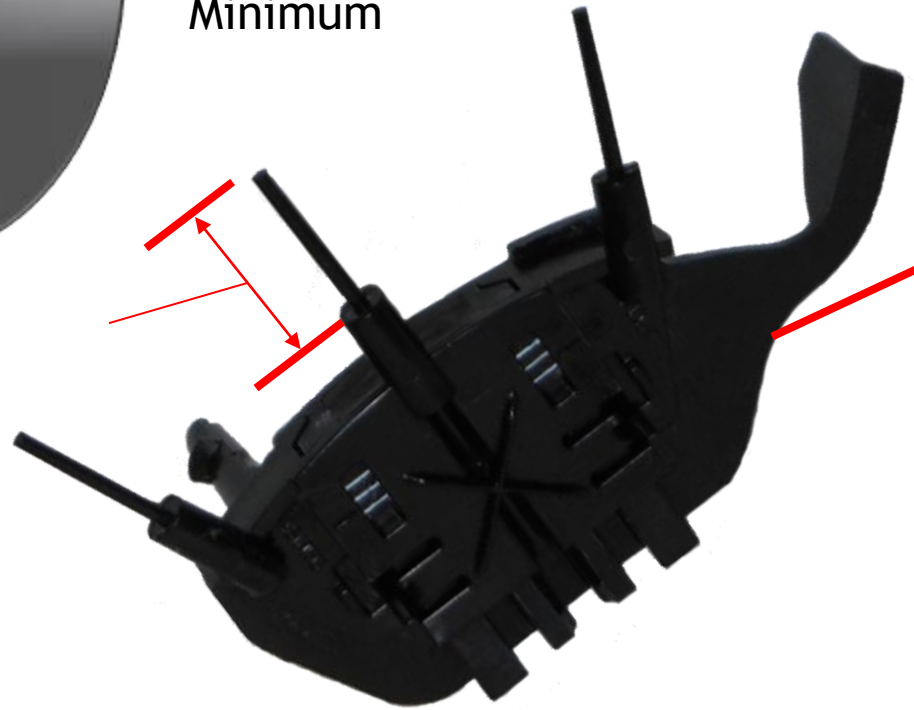
- Part number: A105848
- Knockout wheel: A106147
- Knockout wheel assembly: AA89145

Disk A124486 has proven to singulate wheat. It has rows of holes 70x3 for total of 210 cell holes. Each row of holes has independent Knockout Wheel (AA103597).

Meter Inspection – ExactEmerge™

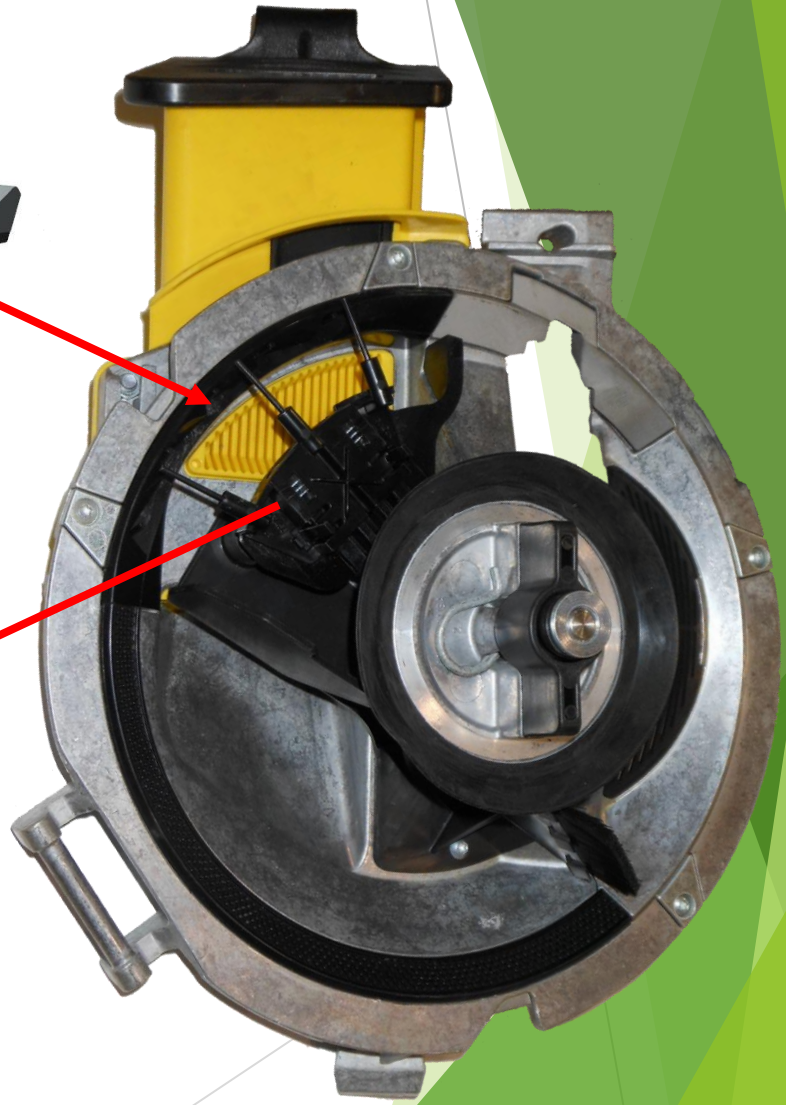


8 mm (0.315 in.)
Minimum



17.5 mm (0.688 in.)
Minimum

Inner Double Eliminator



New Double Eliminators

- EE adjustable outer DE (AA112311) and Inner DE (4 tine-AA118630)
  - Service only in Fall 2025
  - New Double Eliminator Kit: AA118722 (available Spring ’26)

4 Tine Non-Deforming Inner DE

JOHN DEERE

Adjustable Outer DE Setting

Typical Corn Setting:

- Position #3 (~25 degree from vertical)
- Align the two tick mark lines

ExactEmerge™ -2 New Seed Bowls

32 Hole Cell Type Sorghum/Sugar beet bowl:

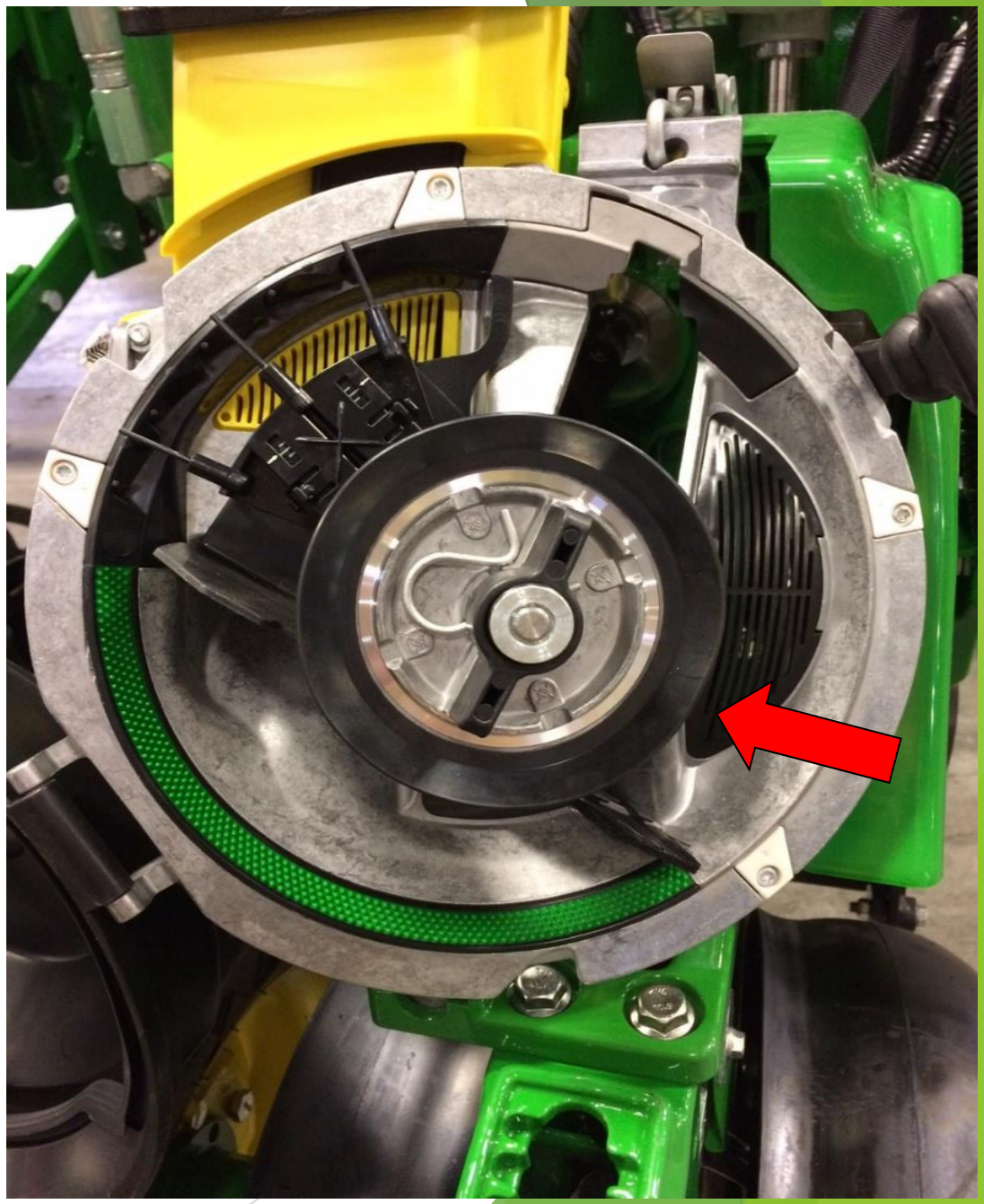
- Available through service parts only
- Part Number: A145730 (Replaces A104014)
  - Available Spring 2026
- Has a larger vac range & plants all sizes of sugar beets.

32 Hole Cell Type Singulating EE Corn Bowl

- Factory delivery.
- Part Number: A135462
- Small/med flat corn seed
  - Population 25-40K at 30”spacing
- Uses AA85925 Knock out wheel asm.
- DTAC solution 224016

ExactEmerge small flat corn bowl

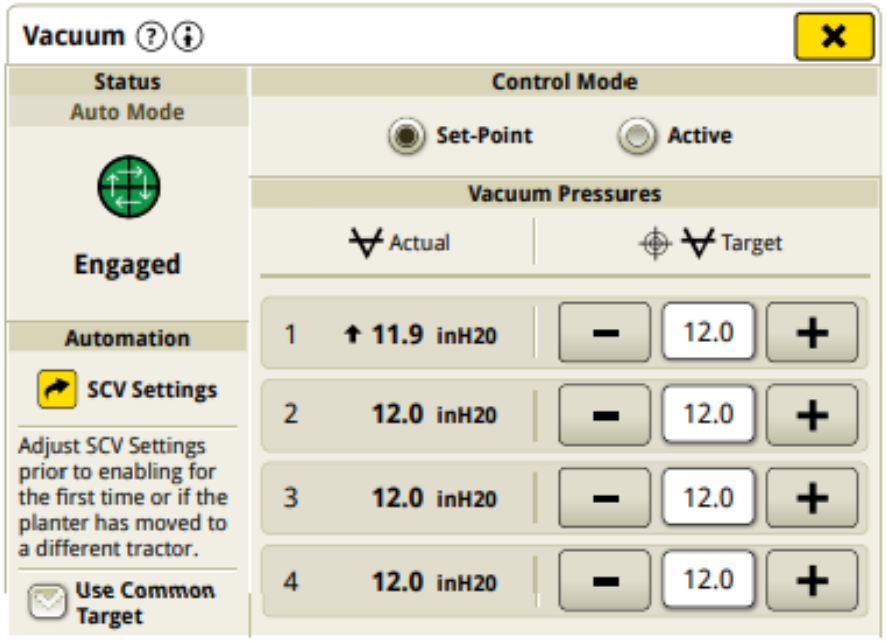
Meter Inspection – ExactEmerge™

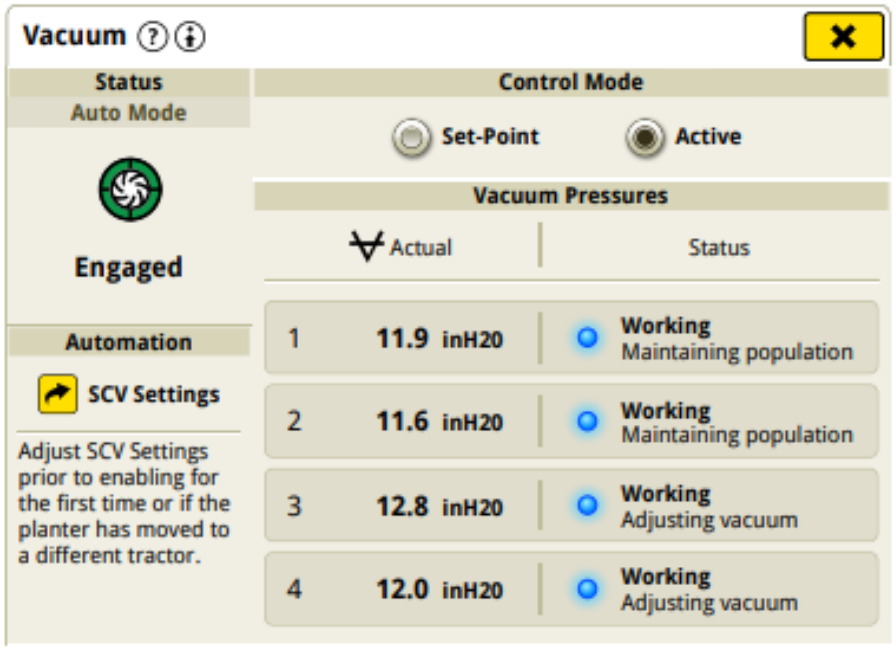


BrushBelt™ Inspection

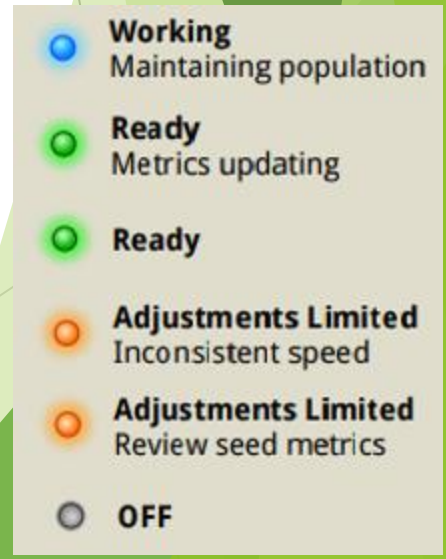
Vacuum Automation – Active Vacuum

- Vacuum Automation Control: Setpoint and **Active**
- Active: Vacuum level will automatically adjust off population feedback
- Maintains 100% population
- SeedStar™ 5 planters
- ExactEmerge – Corn and Soybeans
- MaxEmerge 5e – Corn

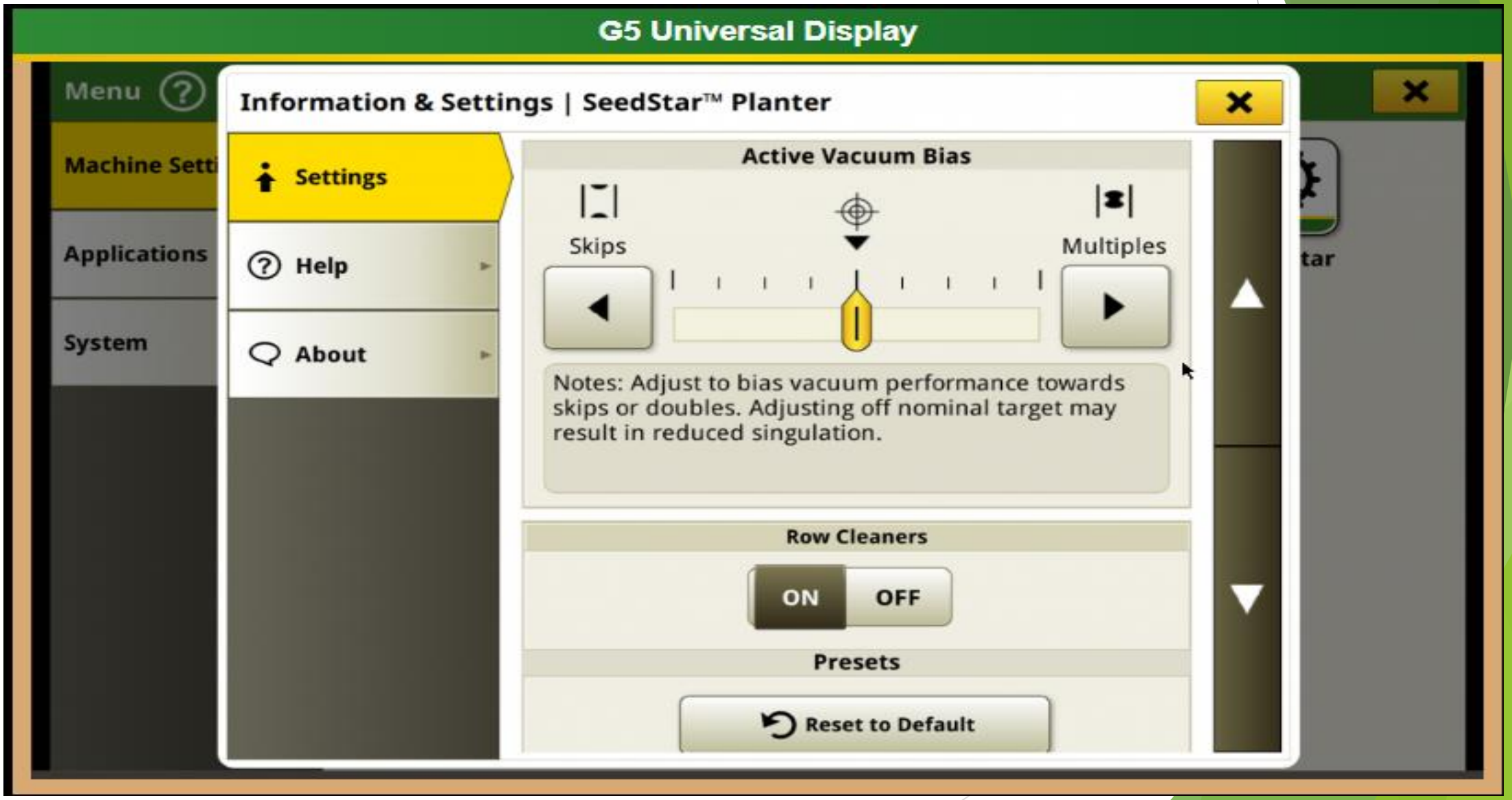




LED Statuses



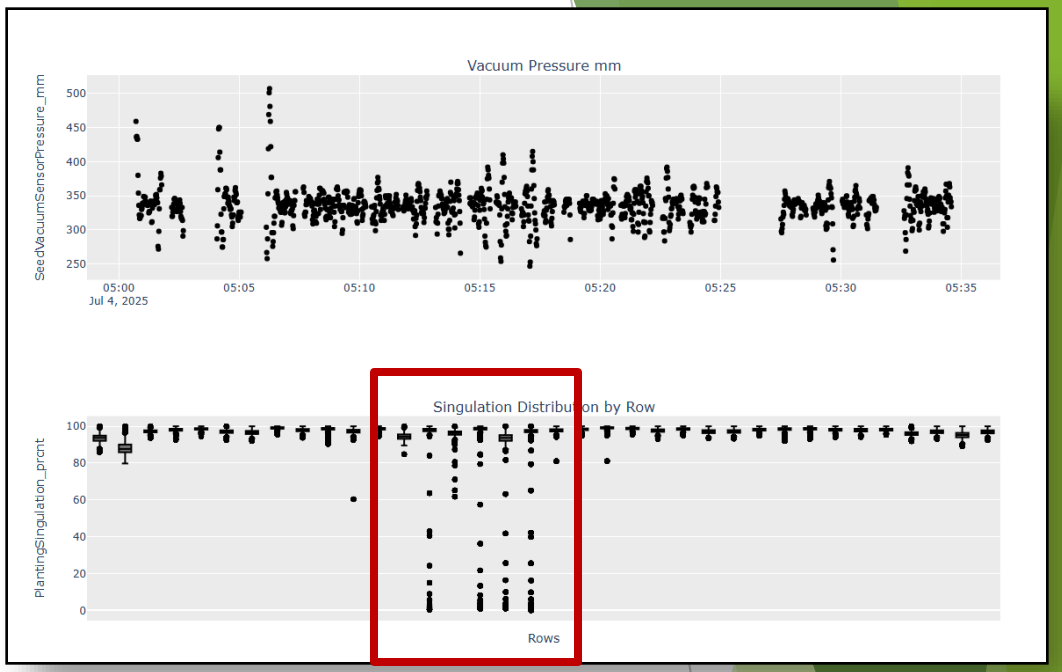
Advanced tunning for active vacuum



Vacuum automation surging

- **Problem:** while using vacuum automation, vacuum will not hold set pressure
- **Machine Impact:** Singulation is impacted
- **Alert Logic:** Vacuum Pressure showing inconsistency for continuous amount of time, singulation impacted
- **Solution:**

- Atmospheric return plugged with dirt, needs cleaned
- Vacuum sensor



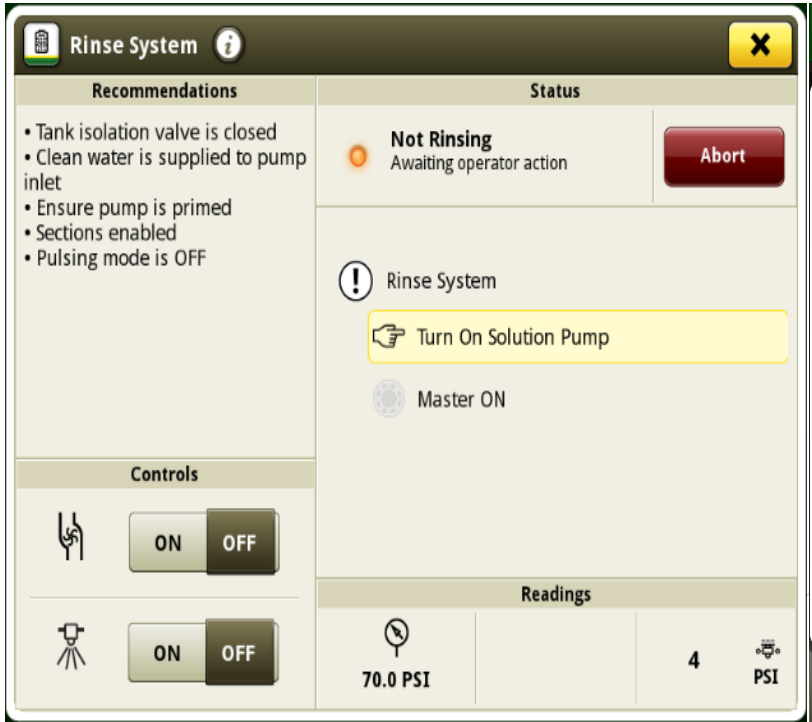
ExactRate™ Liquid Fertilizer - Features

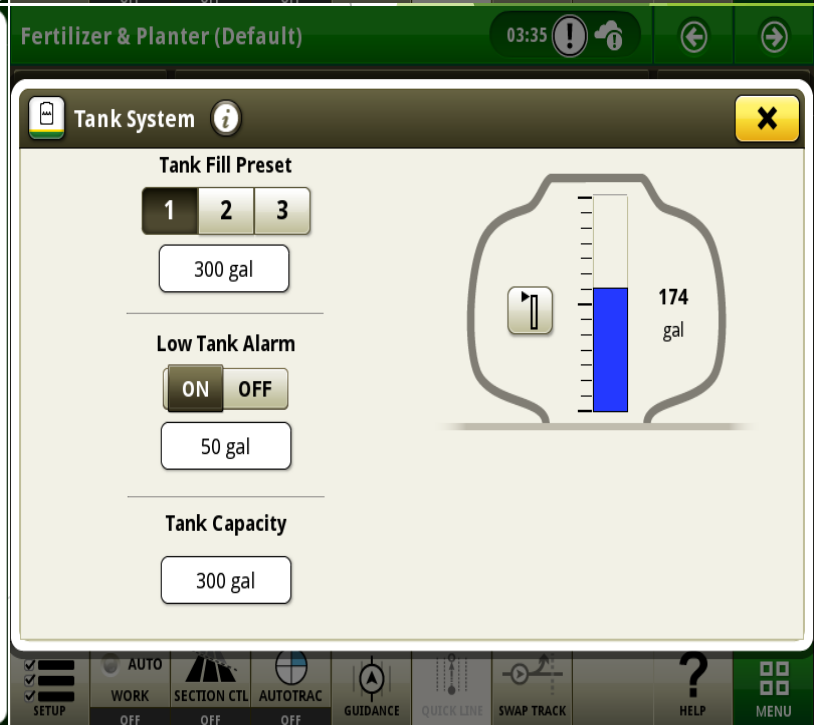
- Requires Electric Drive
- Row-by-row liquid fertilizer control
- In-furrow application: 3-10 GPA at 3-13 MPH
- Fertilizer Opener application: 7-30 GPA at 3-10 MPH (not available on DB frame)
- Variable Rate
- Turn Compensation
- 3 rate presets
- Prescriptions
- Individual row Section Control shutoff
- On-board keypad
- Row-by-row flow detection

ExactRate Setup

4 Apps

- ExactRate
- Liquid System
- Rinse System
- Tank System

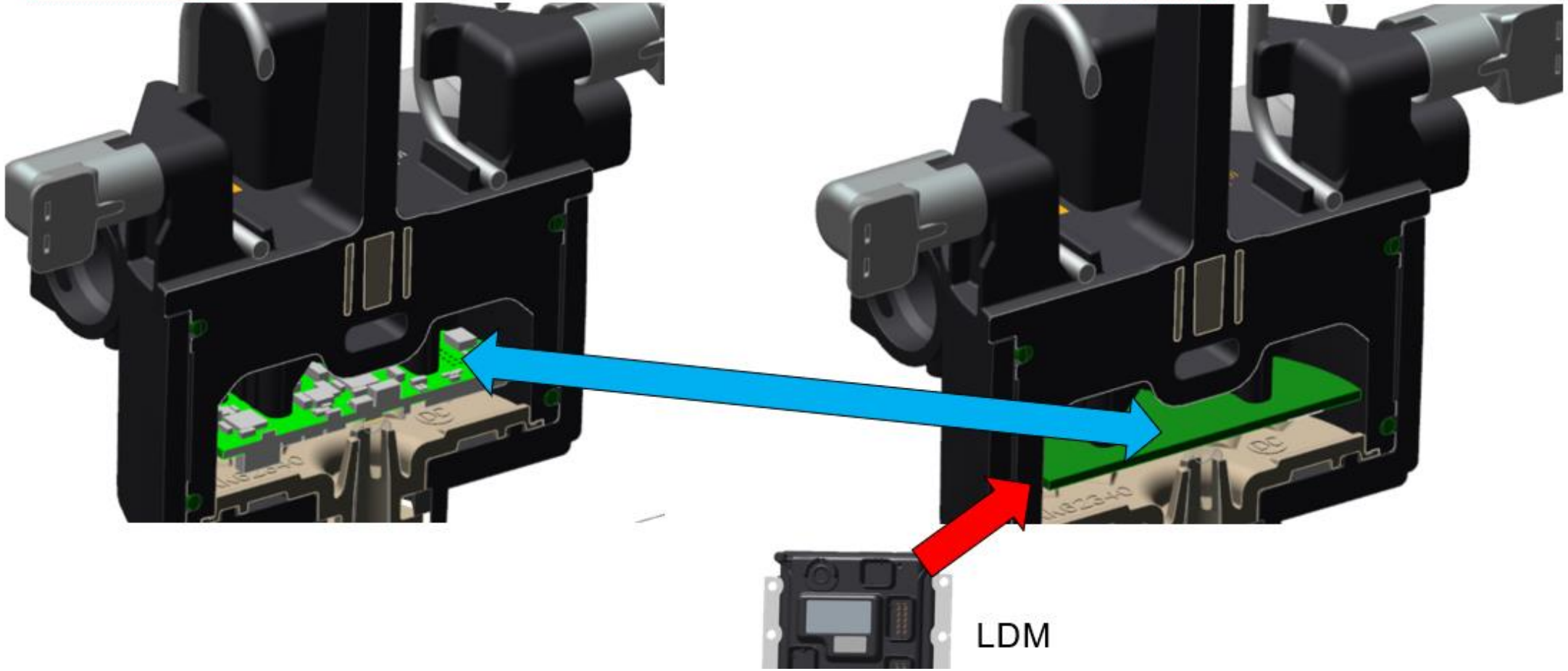




ExactRate Changes

ExactRate MY24

ExactRate MY25+



Turret Identification

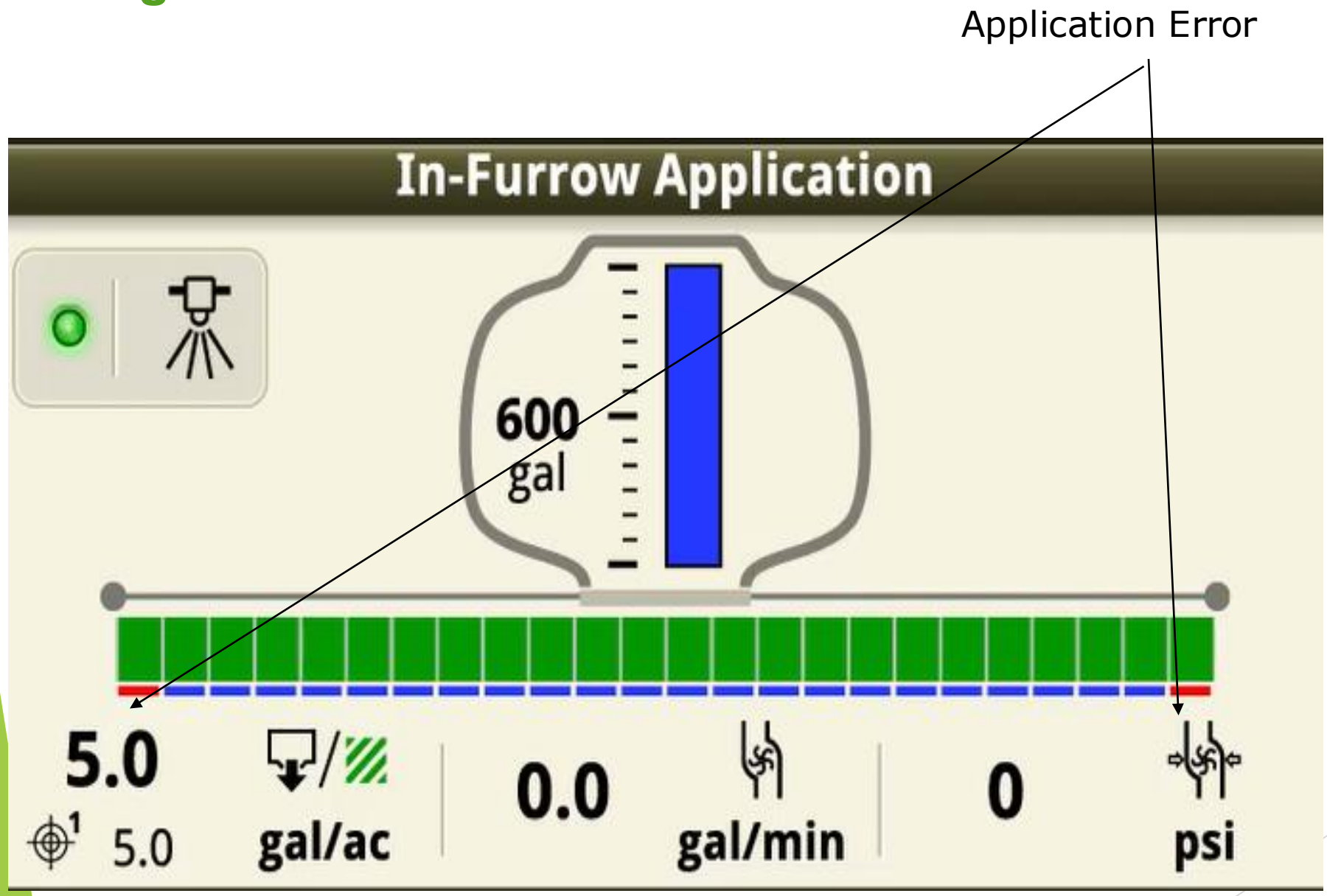
In-furrow

- Turret has grey ribbon
- Cartridge is yellow

Frame Mounted Fertilizer Openers

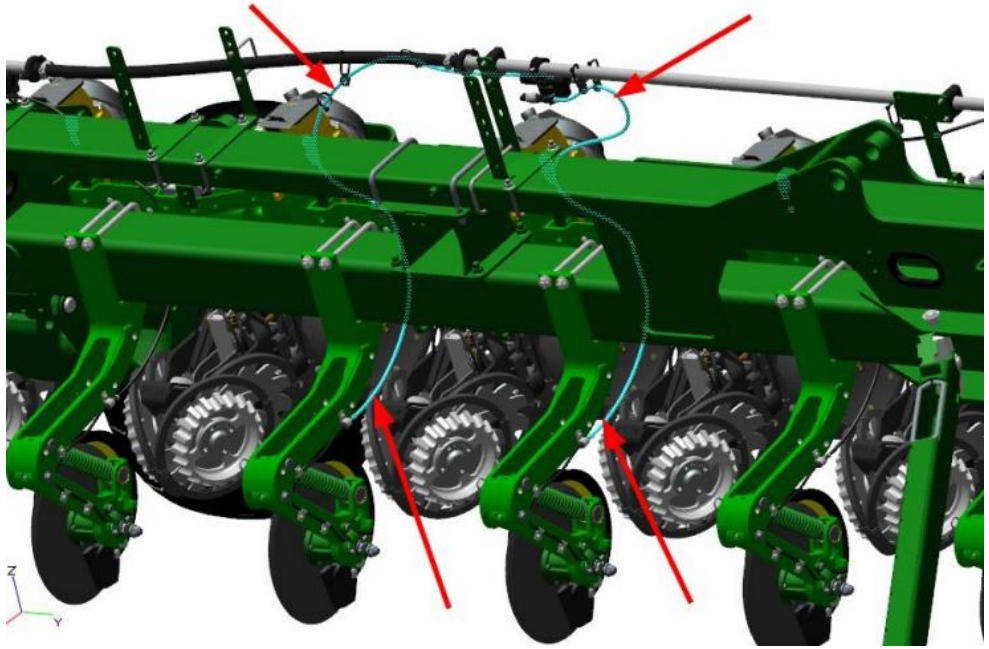
- Turret has no grey ribbon
- Cartridge is black

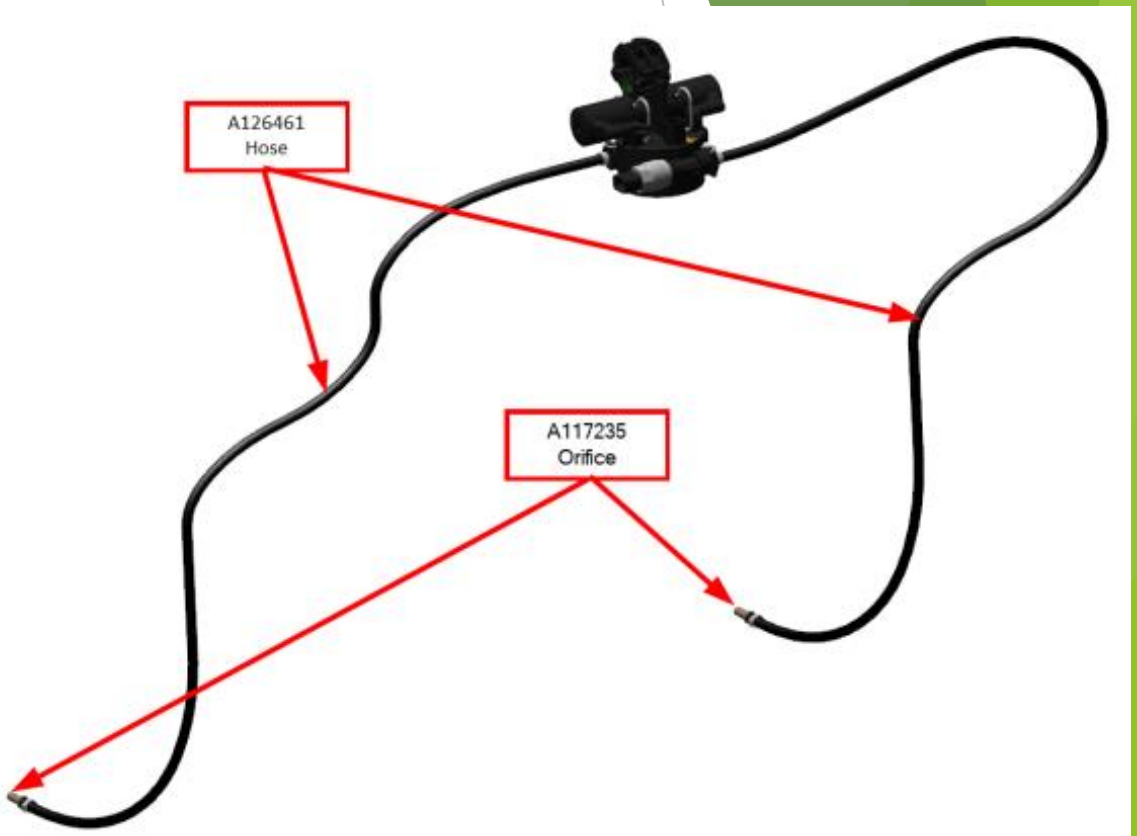
Integrated Flow Detection



- Flow detection alerts operators if an individual row detects a variation from the prescribed rate
- This helps prevent rows from missing out on nutrients due to blocked rows, or receiving too much fertilizer due to a row over applying

Example of factory routing for frame mount fertilizer or similar application





ExactShot


G5 Universal Display
Planter &
Dosing Calculator
Continuous Rate Equivalent
5.0 gal/ac
Dose Length
2 in
Dose per Seed
0.18 mL/seed
Field Application Rate
1.7 gal/ac
Avg. Seed Spacing
5.8 in
Product Savings
66 %
Tip Size
Speed Range
025
03
035
Cancel
Save
Corn
Cleaners
Wheels
SETUP
MENU

ExactRate/Shot Tank Agitation - AA115912 Service Only

- Function
  - Agitation while stationary or planting
- Integration
  - Use flow from solution pump
  - 2 nozzles in tank (swirl arrangement)
  - Manual 2-way valve
- Configurations- 1795,1775NT, DB44,60,66,80,90
- Compatible with all ExactRate and ExactShot configurations with a tank-back to MY22

Notched Fertilizer Blade

Part# A123932

Complaint or Symptom:

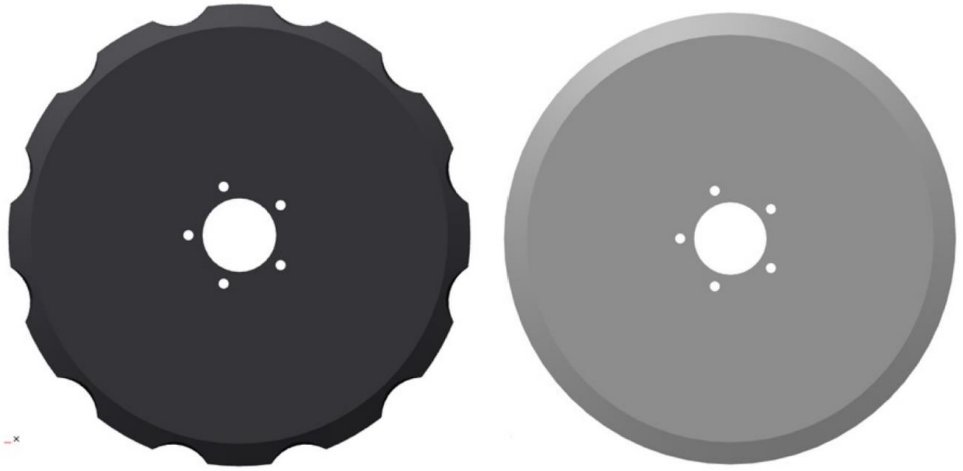
- Frame mounted fertilizer openers (FMFO) stop turning in certain soil conditions
- FMFO's plug with crop reside between the scraper and blade

Problem or Situation:

- The above symptoms lead to poor fertilizer delivery.

Solution:

- Notched blade A123932 can be installed in place the of the original smooth blade A72358.
- This blade will keep spinning in adverse conditions but will not have the same trench profile as the smooth blade.



A123932 A72358

Sequence for Setting Down Force

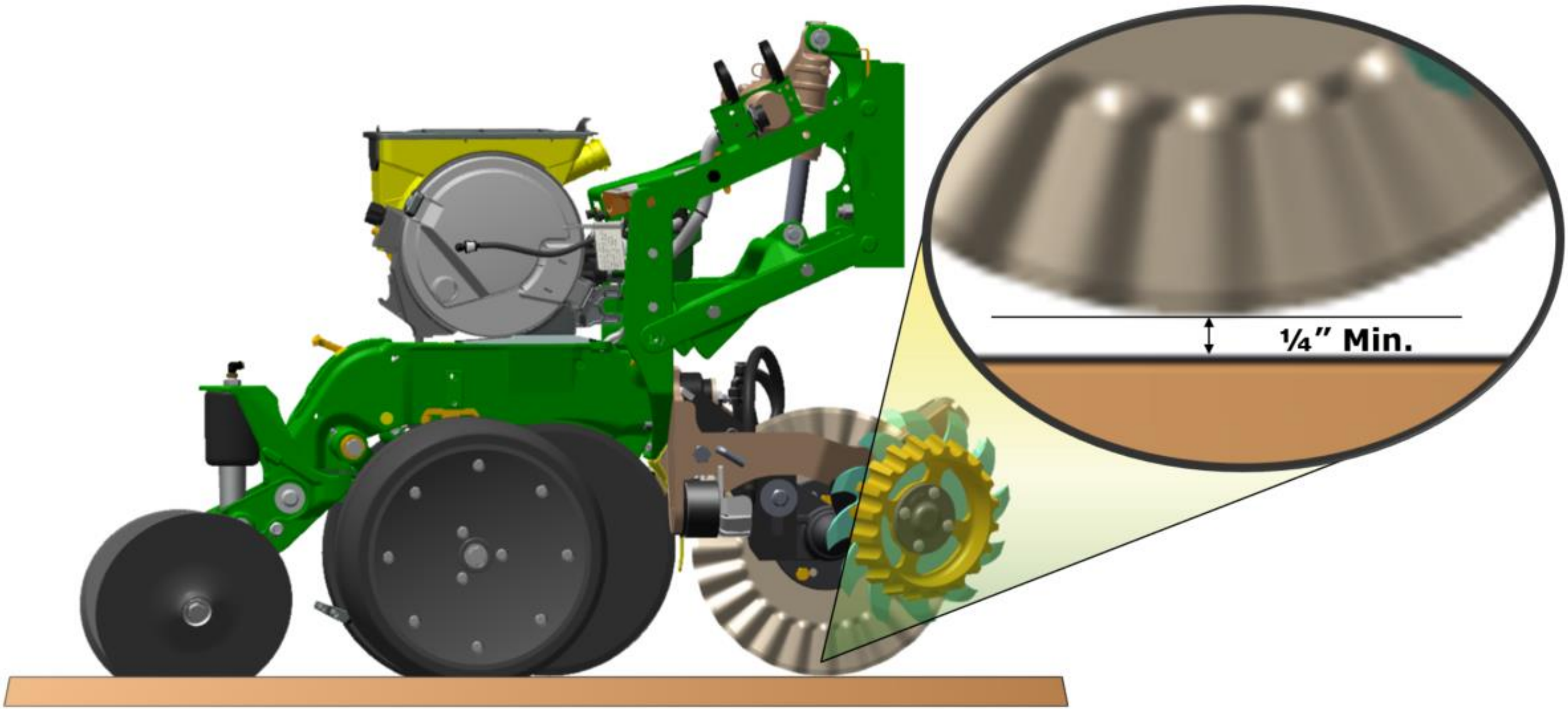
1. Frame Weight Distribution

2. Row Cleaners

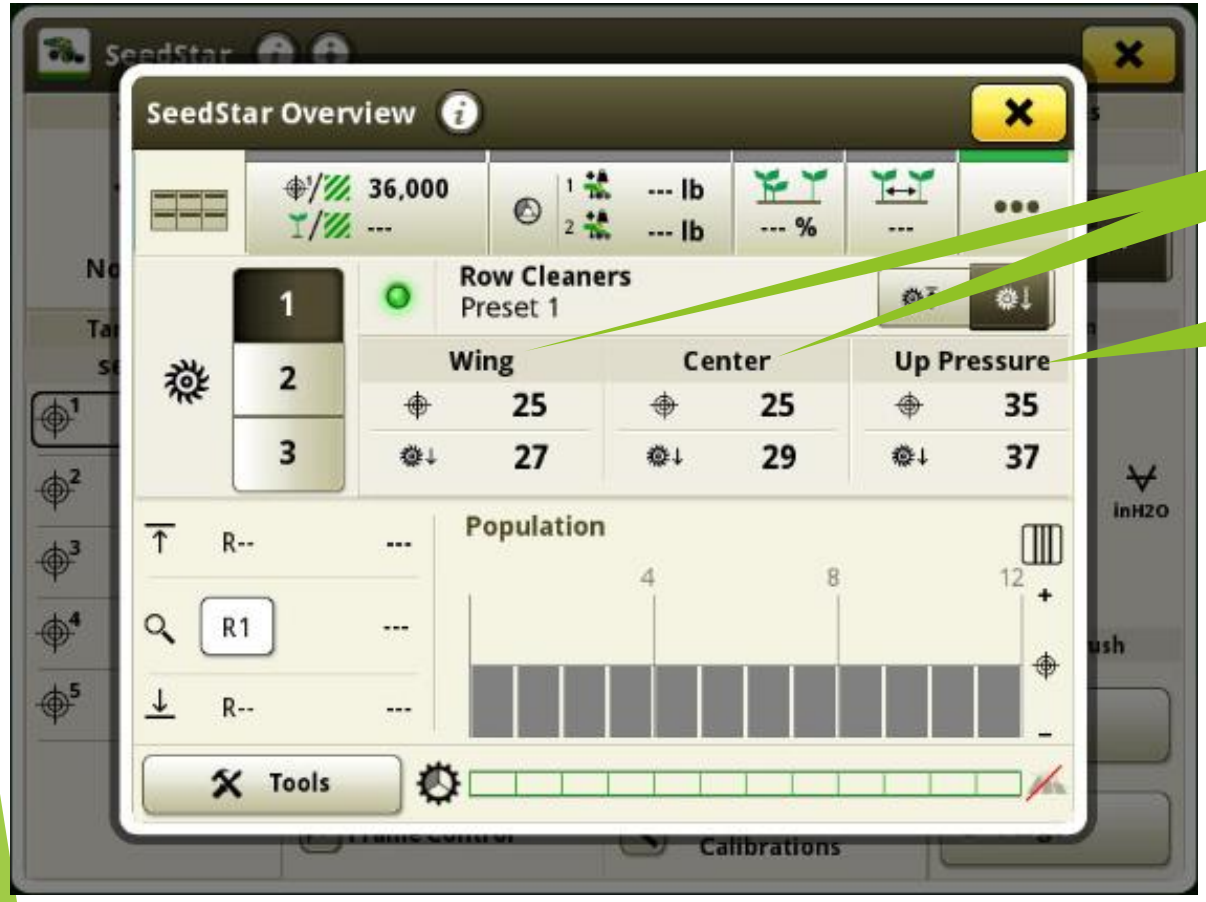
3. Closing

4. Down Force

Row Cleaners and Coulter Blades

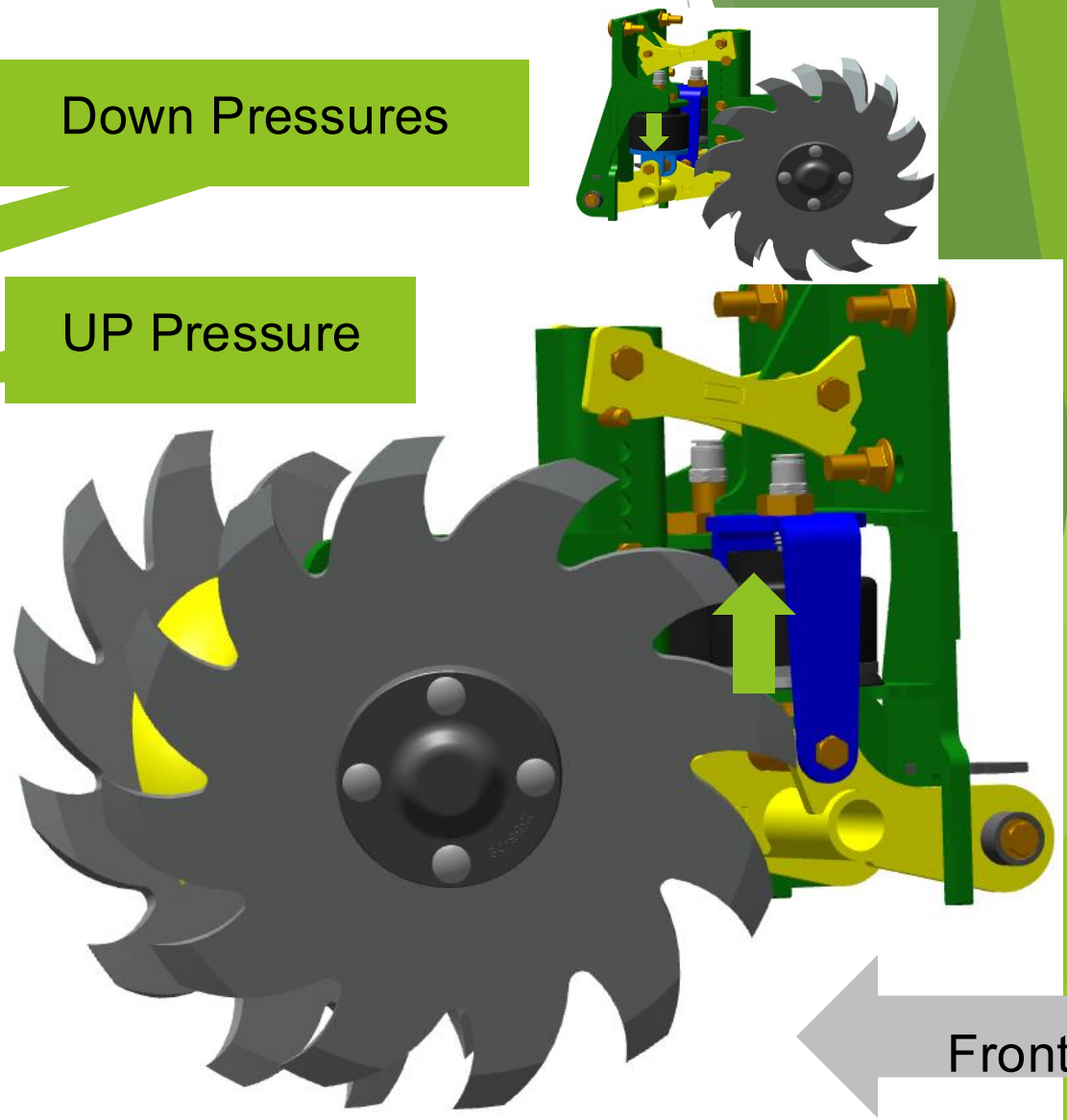


Pneumatic Row Cleaners

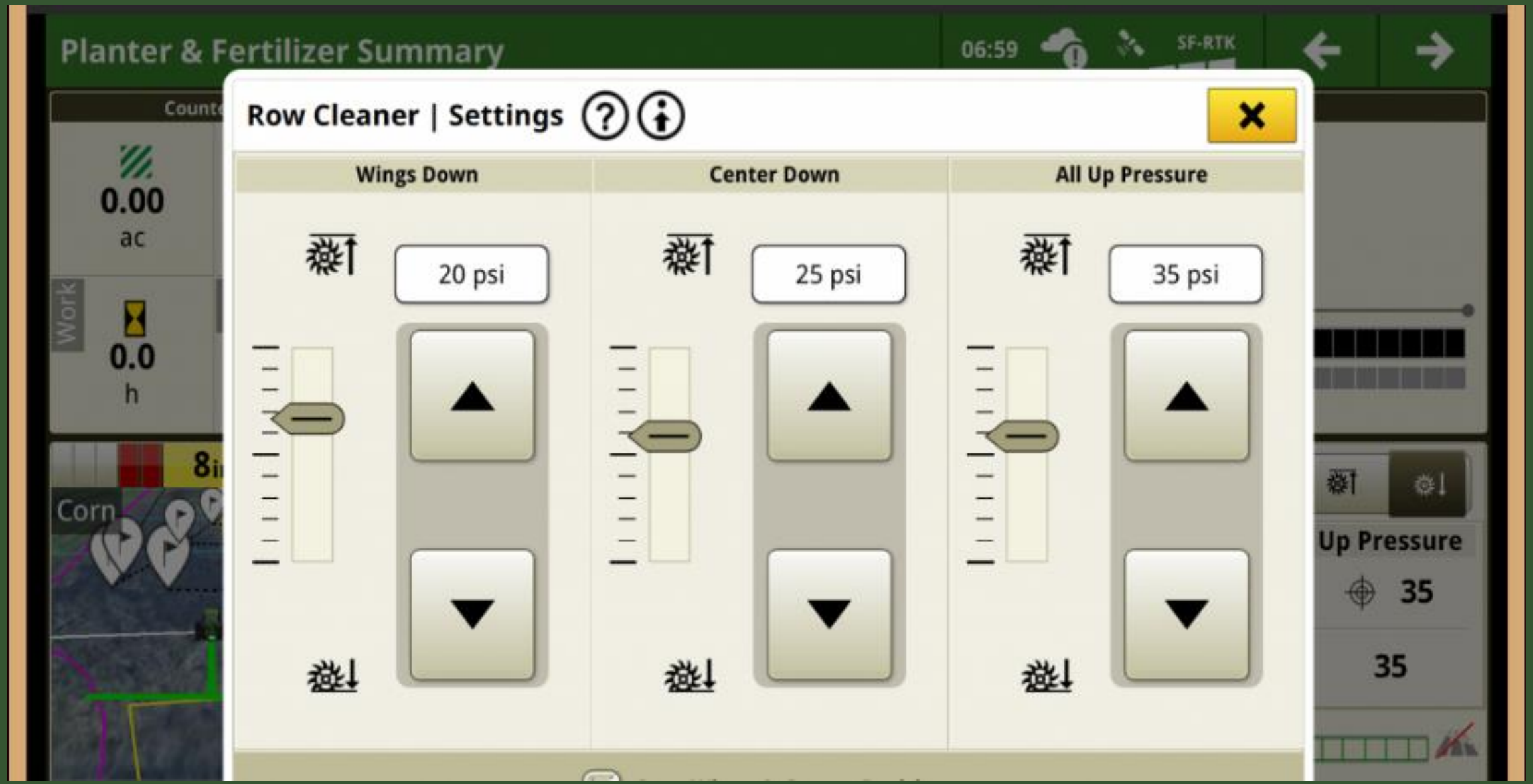


Down Pressures

UP Pressure



Front


Planter & Fertilizer Summary
06:59
SF-RTK
0.00
ac
0.0
h
Corn
Row Cleaner | Settings
Wings Down
20 psi
Center Down
25 psi
All Up Pressure
35 psi
Up Pressure
35
35

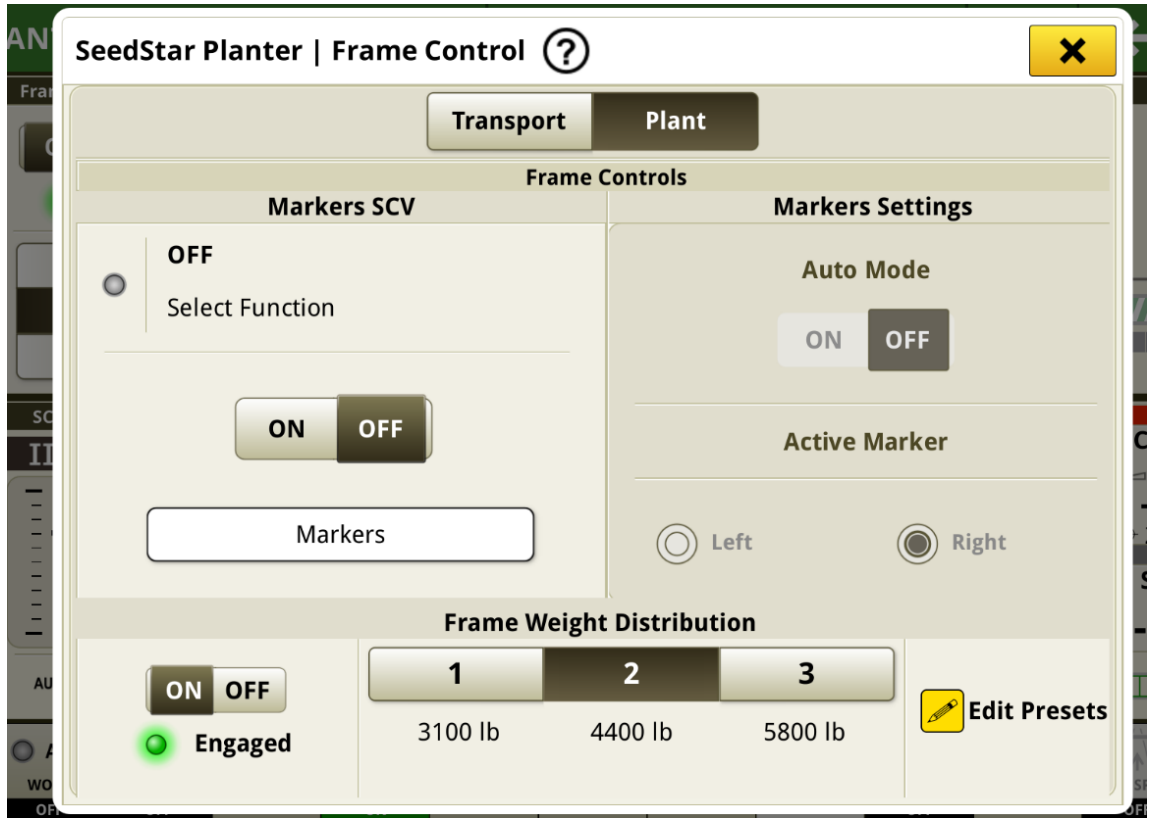
Frame Weight Distribution (FWD)

- Makes weight from the center section available to the wing rows to use for downforce.

Frame Weight Distribution – Prior to MY25

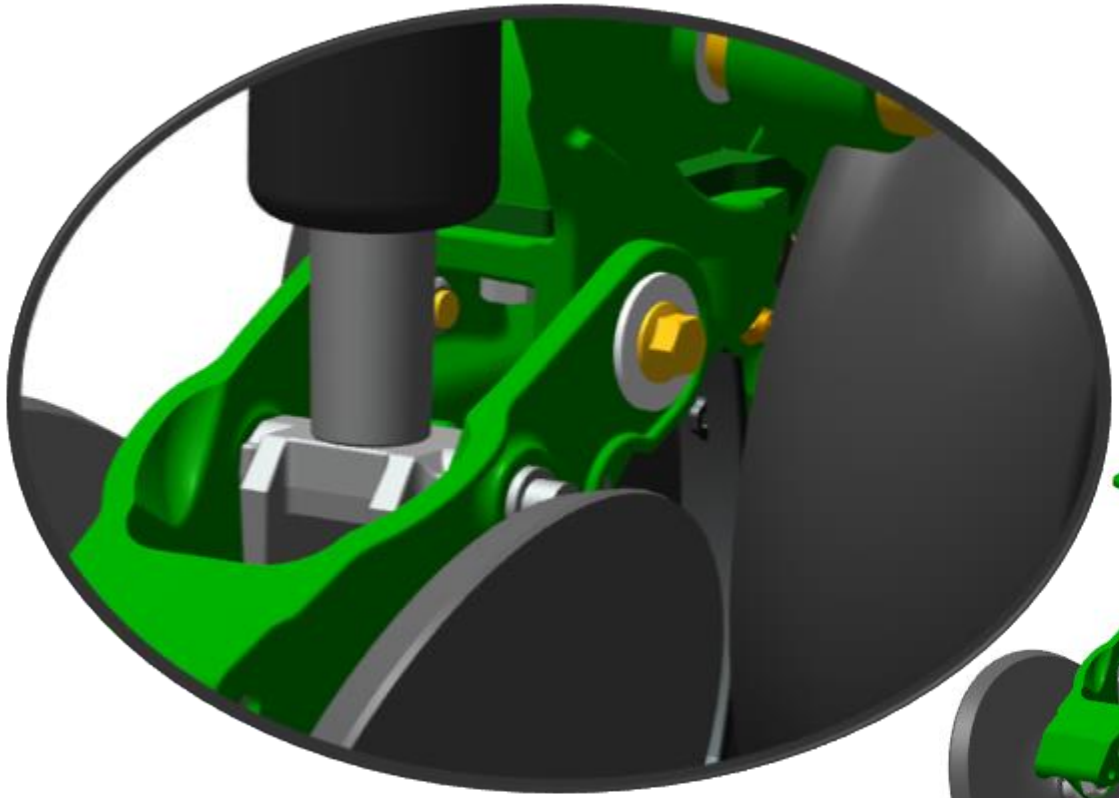
- With tanks full, set gauge to 1000 – 1100 psi.
- Compare wing wheel tracks to center wheel tracks, adjust as necessary.
- Plant until tanks are half full, compare tracks, adjust as necessary.

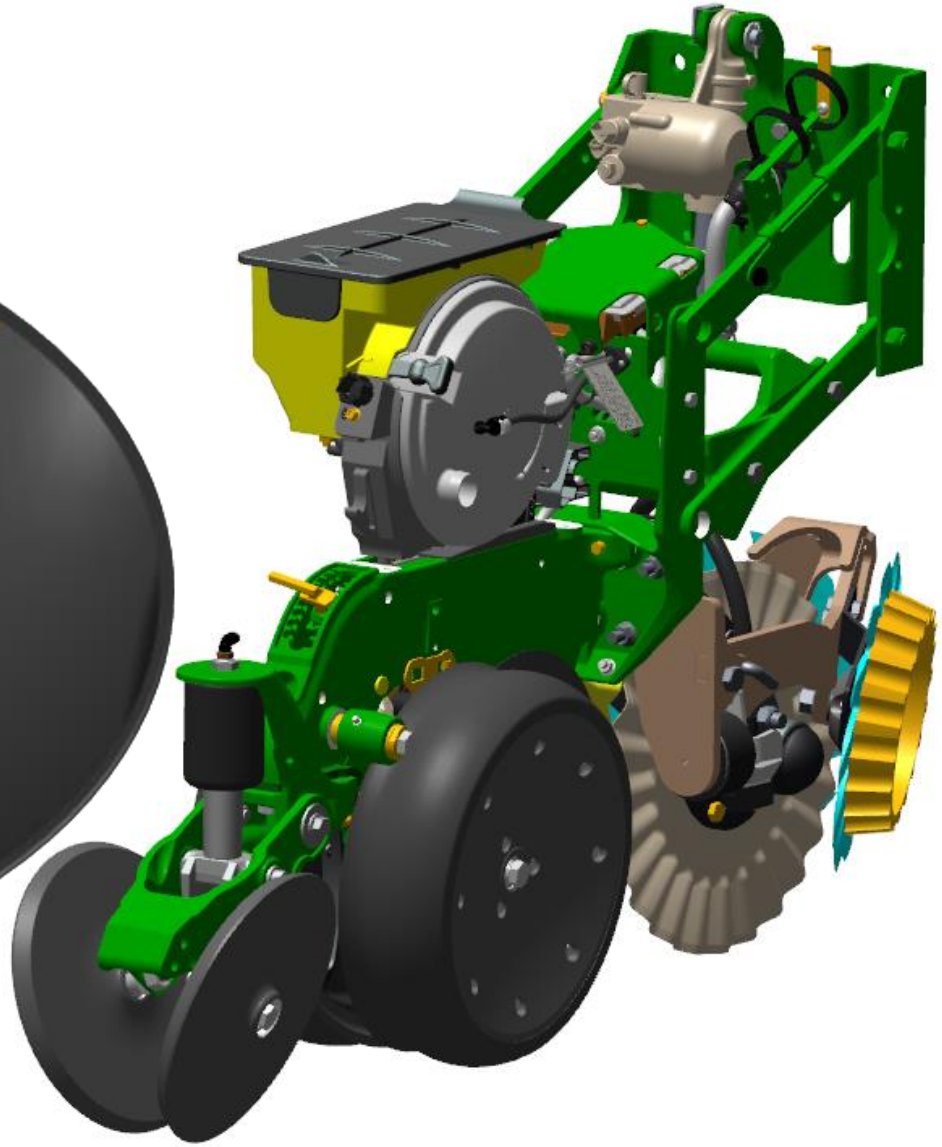
Frame Weight Distribution - MY25 and newer



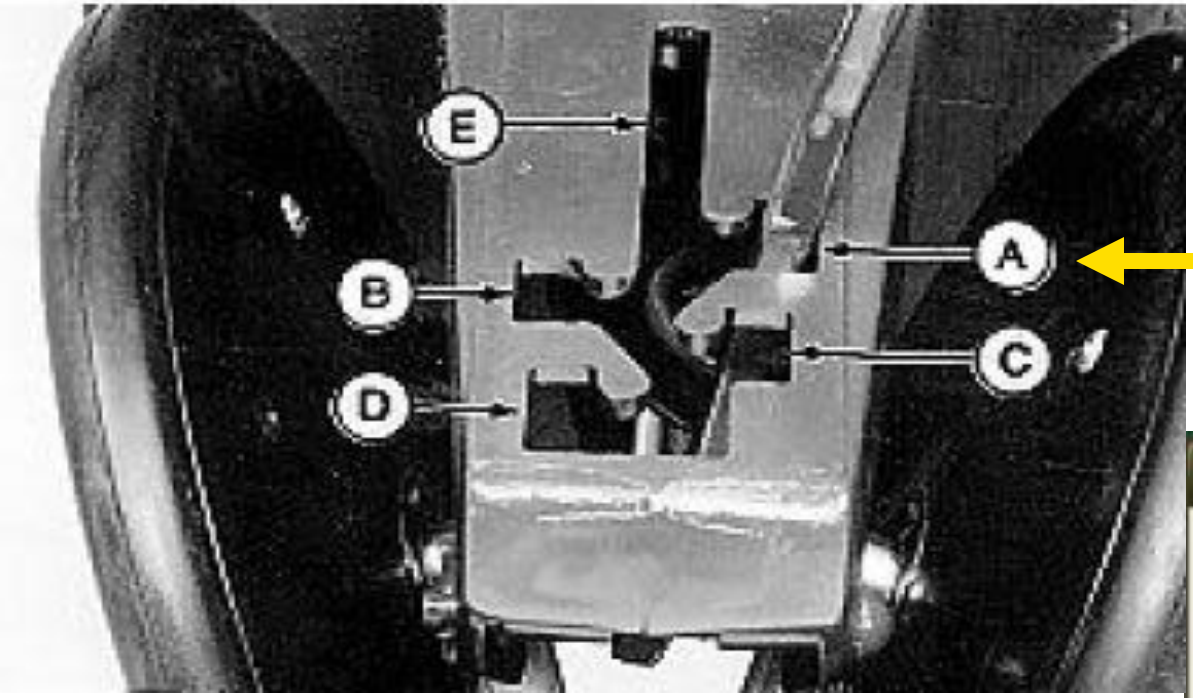
- Control is on Frame Control page of display.
- Three presets available.
- Not automated - operator must make adjustments.

Closing Wheels

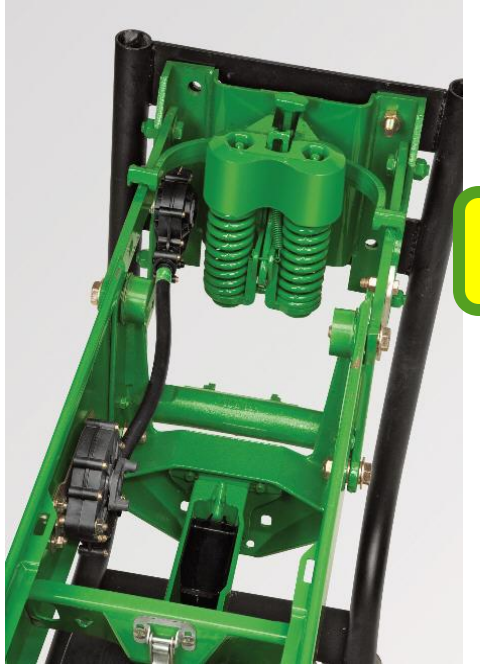




Pneumatic Closing Wheels

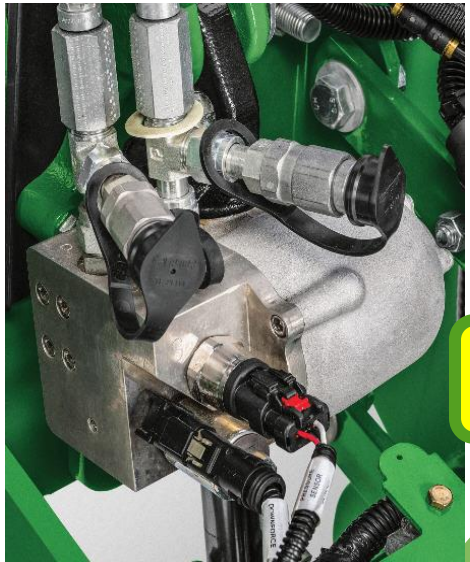


Down Force Actuators



Spring

Pneumatic



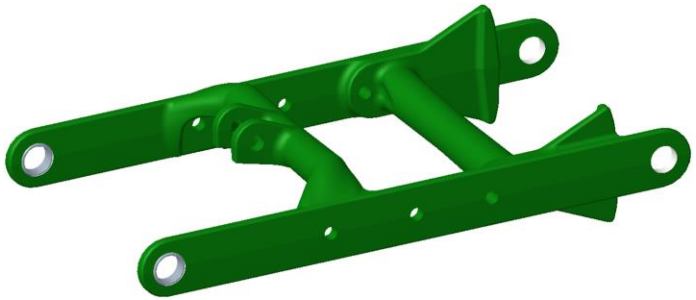
Hydraulic

Pneumatic Down Force

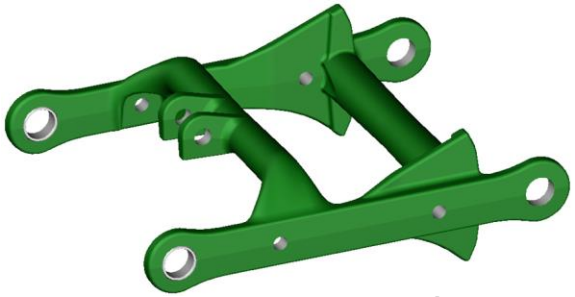
- Pneumatic Down Force
- Air spring on each row
- Infinite settings between 0 – 400 lbs (0 – 181.8 kg)
- Available on all models
- Standard or Integrated with the display

IRHD Lower Parallel Arm (AA104689 regular & AA104690 long)

- **Challenge** – Excessive wear on lower parallel arms on planters with IRHD
- **IRHD Lower Parallel Arm**
  - One piece design for added durability and strength and low-pressure accumulator fitting clearance
  - New, stronger material used in the cross member for added strength
  - New split-ring bushing on the two front holes ensures that the wear occurs on the bushing and not the arm.
  - Factory installed on new machines with IRHD since 2022
- **Compatibility**: Model Year 2017+ planters equipped with IRHD



AA104690 Heavy Duty Long Parallel Arm for IRHD



AA104689 Heavy Duty Regular Parallel Arm for IRHD

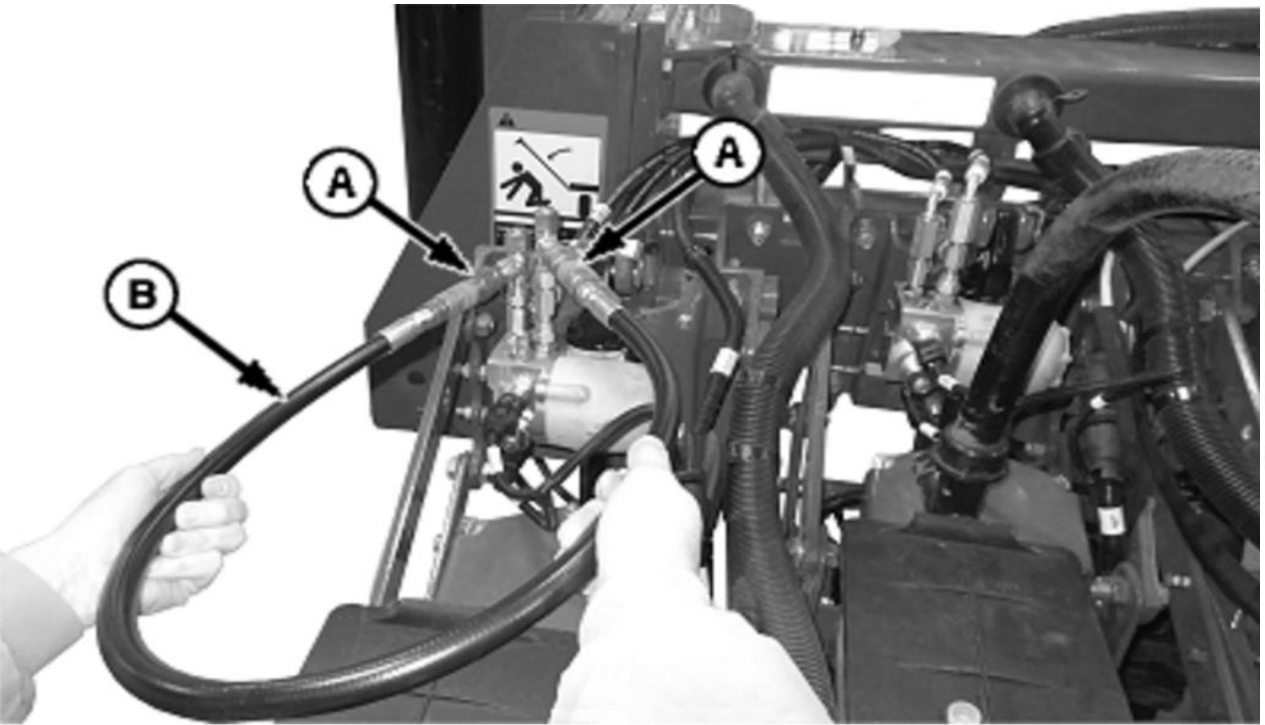
Hydraulic Down Force

- Independent Row Hydraulic Down Force (IRHD)
  - Hydraulic cylinder and accumulator on each row
  - Infinite settings between 50 – 450 lbs (22 – 204.1 kg)
  - Only available with electric drive
  - Integrated with the display
  - Quick reaction time

Down Force – Hydraulic

1. Run flush loop hose procedure on all sections.
2. Run air purge test on all rows.

Flush Loop Hose



Gen 2 IRHD Precision Upgrade Kit

IRHD Precision Upgrade Kit available

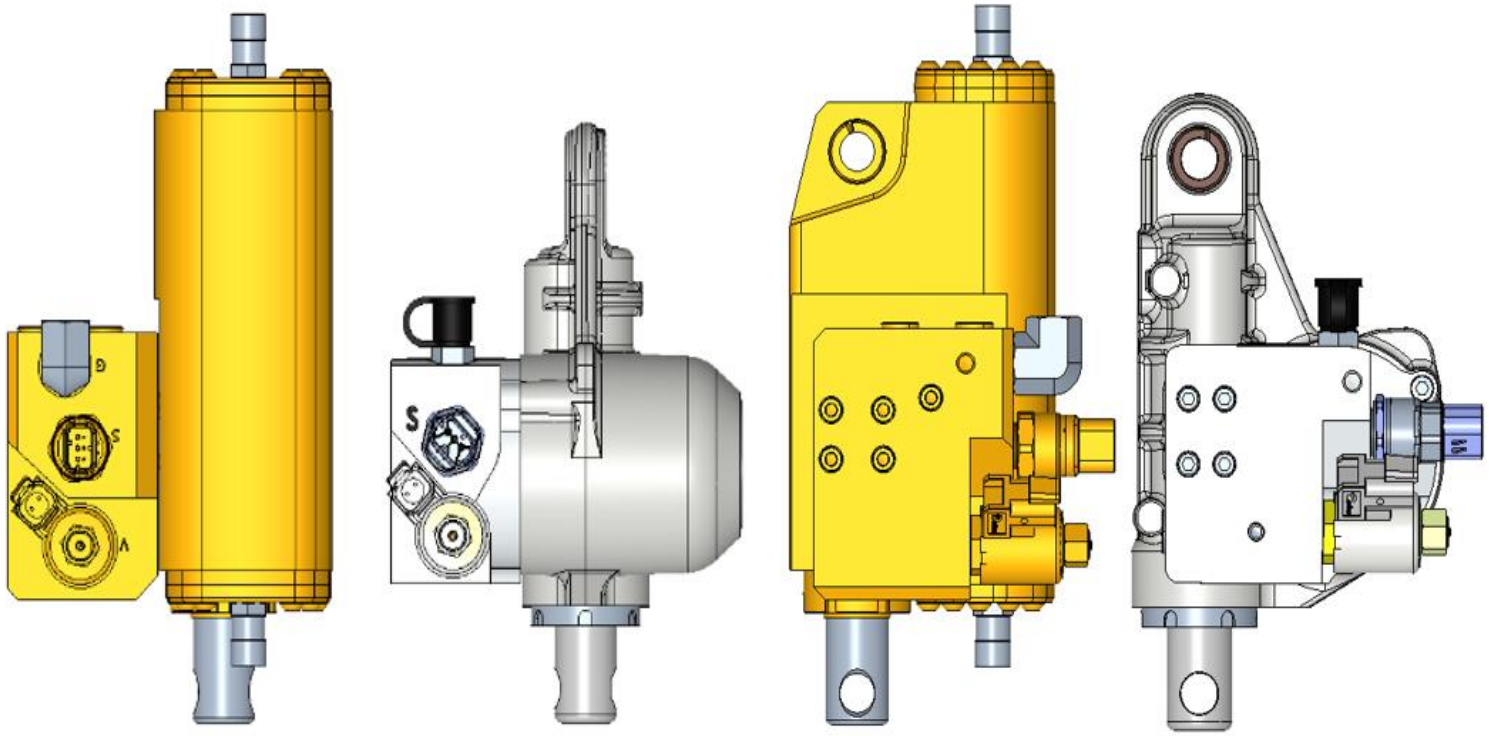
-Compatibility

- 1700/05
- 1720/05 (CCS/non-CCS)
- 1750/55
- 1770/75NT (Flex, non-CCS, CCS)
- 1790/95 MY2018+
- DB44-DB90 MY2018+

-Requires Gen 4/5 display

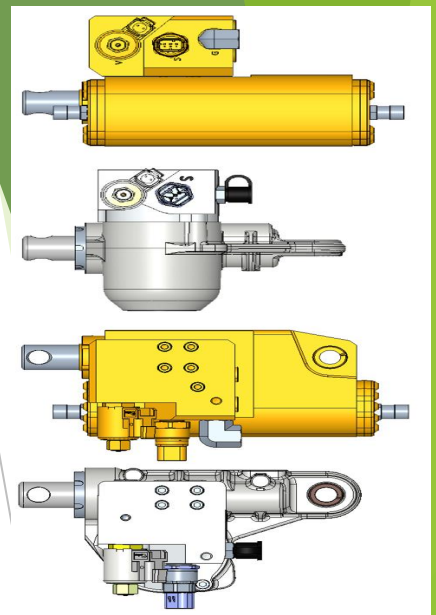
Gen 2 IRHD

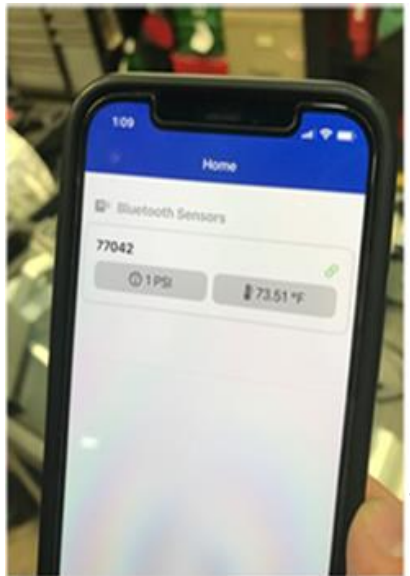
- Compatible with SeedStar™ 4HP
- Mix & match with Gen 1 actuators
- Included in IRHD upgrade

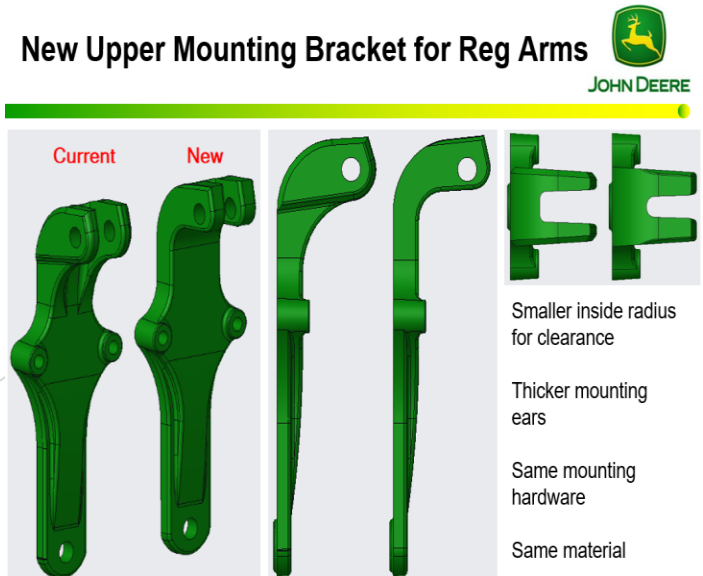


Gen 2 IRHD

- Piston style accumulators vs. bladder style
  - High side 1000 psi top, low side 175 psi bottom; snap ring secondary retention on rod
- Uses same pressure sensor & solenoid valve as Gen 1
- Each planter gets a manual blue tooth pressure transducer
  - Download Pressure Pro/CirrusSense App







Gen 2 IRHD

- Piston Accumulator (No Bladder)
- Nitrogen Charged – Top and Bottom
- Requires new lower mount
- Long parallel arms: requires new lower arm

Setting DF Margin

- Verify in ground performance at planter row units.
- Leave planter in the ground >> Get out of cab >> Examine furrow depth and furrow sidewalls

Too Little Down Force

- Inconsistent Depth
- Furrow side walls cave in

Optimum Down Force

- Consistent Depth
- No side wall caving
- Side walls firm, but not severely compacted

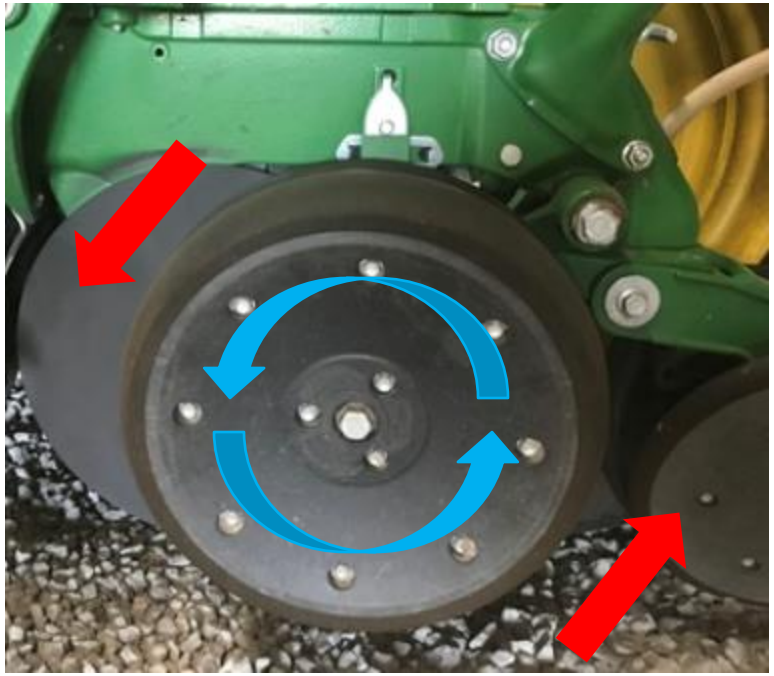
Too Much Down Force

- Compacted Side Walls
- Peeling from Gauge Wheels

Setting Down Force in the Field – determine initial target

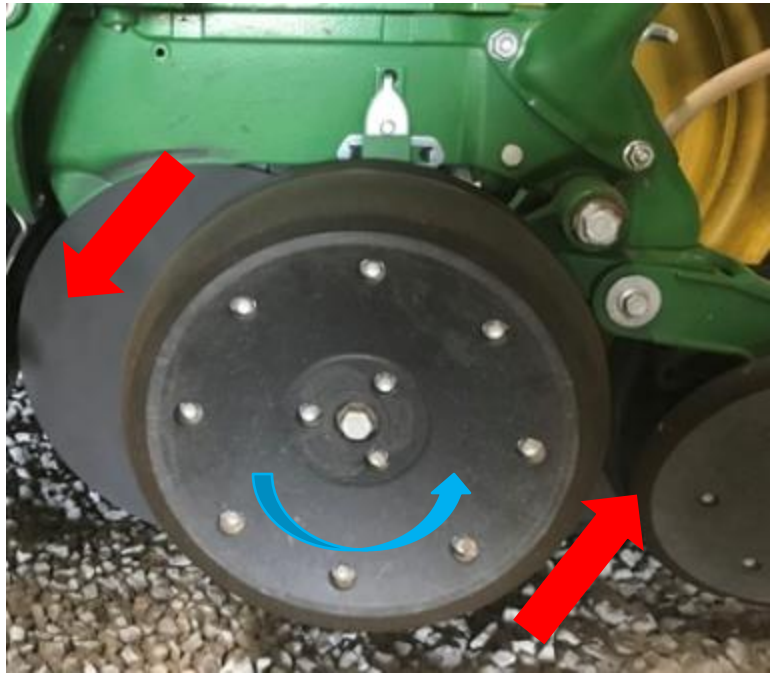
Gauge wheel spin test.

Leave planter in the ground >> Get out of cab >> Examine force required to spin gauge wheel



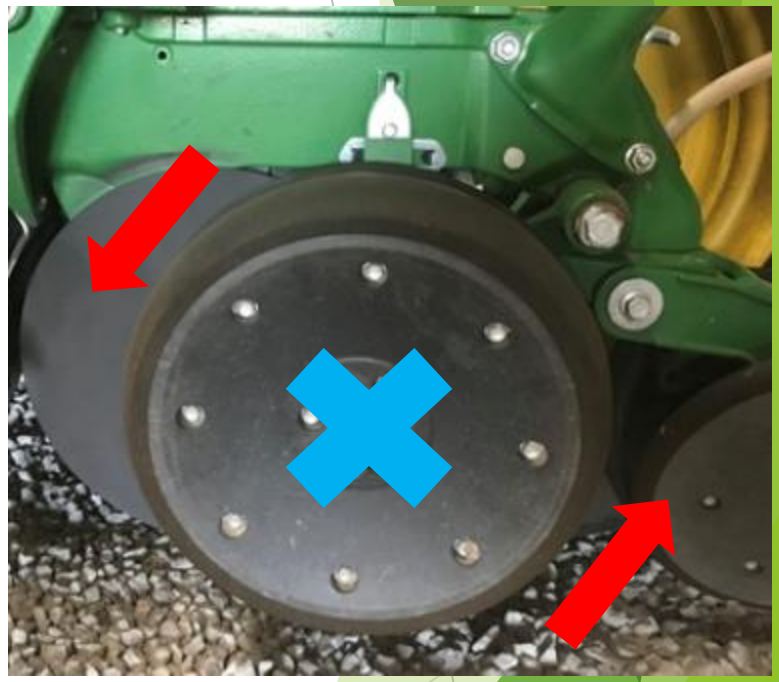
Too Little Down Force

Gauge wheel spins with ease when force is manually applied



Optimum Down Force

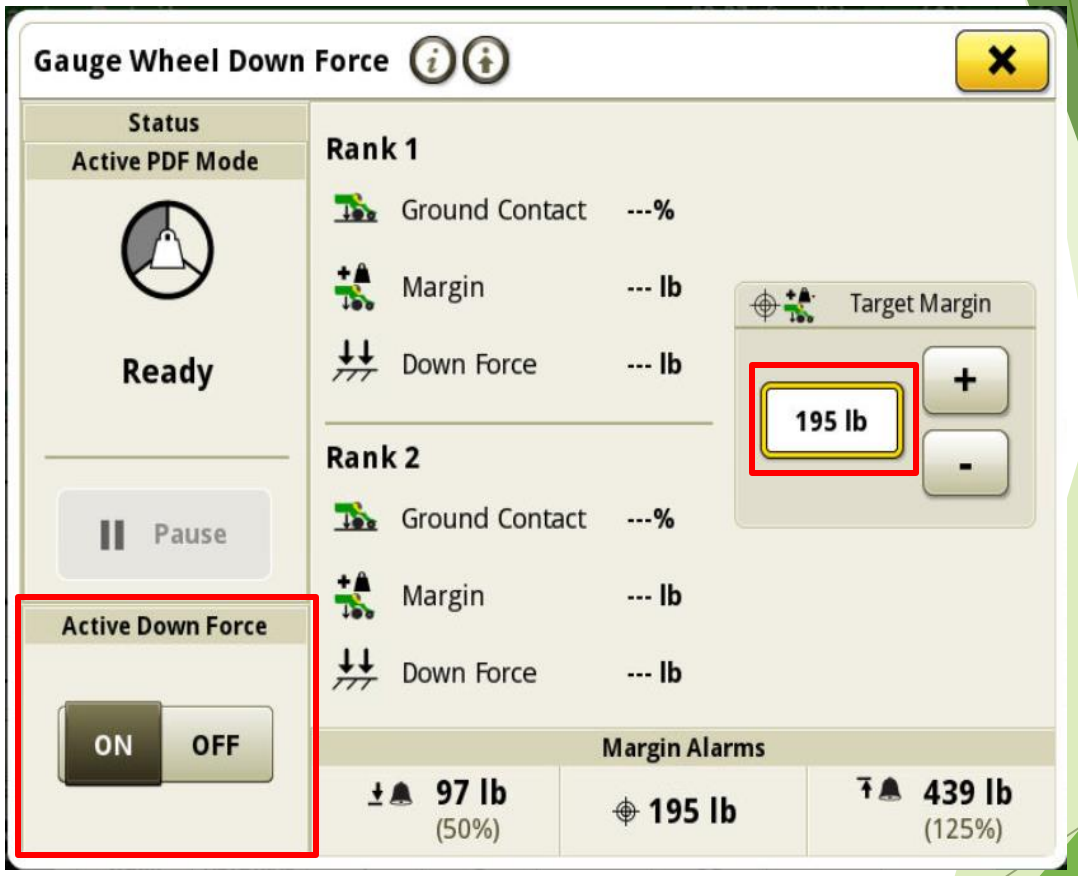
Gauge wheel can be moved, but difficult to spin



Too Much Down Force

Gauge wheel does not spin when force is manually applied

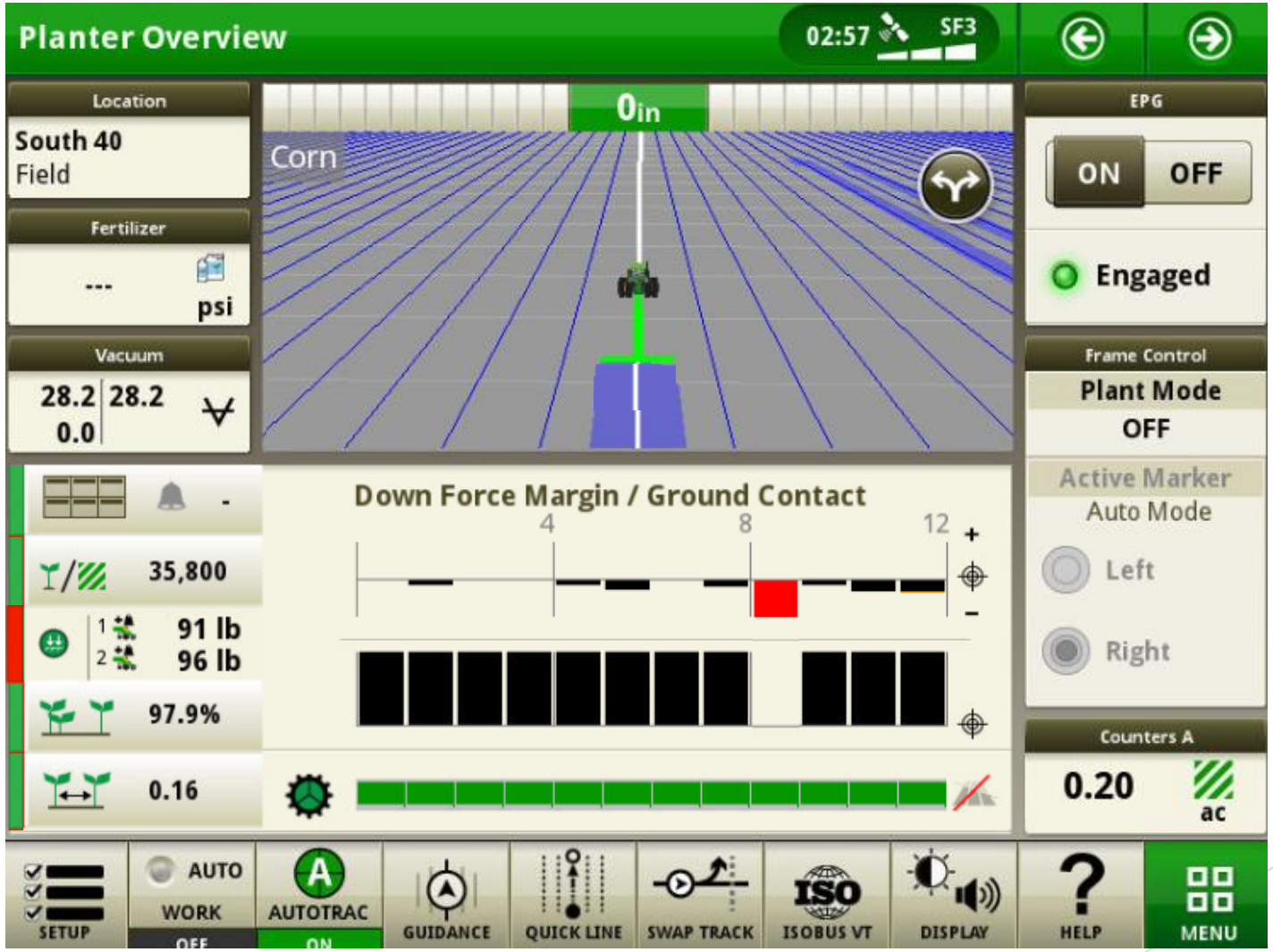
Setting Down Force in the Field



- Turn Active Down Force on and enter the average margin observed in for the target value.
- Default Run Page “Planter Details” >> Gauge Wheels Widget >> Turn Active DF ON >> enter average margin for target value

Margin Low on One Row

- Symptom: Low margin (red bar) on one row while planting



Up-lift Springs

One set of upforce springs on long parallel arms with IRHD

Upforce springs on a standard row-unit

KEY TO SUCCESS

GREENMARK EQUIPMENT