

Operator Manual

YPE425A, YPE625A, YPE825A

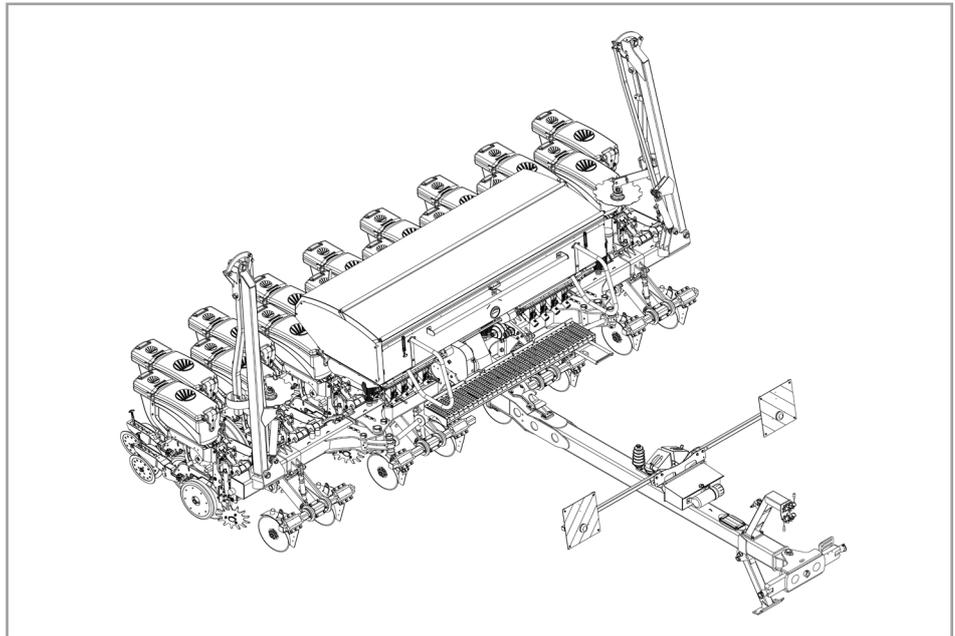
Yield-Pro® European Air Planters with Air-Pro® Seed
Meters

 **Great Plains**

Manufacturing, Inc.
www.greatplainsmfg.com



Read the operators manual entirely. When you see this symbol, the subsequent instructions and warnings are serious - follow without exception. Your life and the lives of others depend on it!



Illustrations may show optional equipment not supplied with standard unit.

ORIGINAL INSTRUCTIONS

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614-427M- ENG Rev A

EN

- ENG** If you require a copy of this document in your native language please contact your dealer or Great Plains.
- CZE** Požadujete-li kopii tohoto dokumentu ve svém rodném jazyce, obraťte se prosím na svého prodejce nebo na společnost Great Plains.
- HUN** Ha szeretné ezt a leírást magyarul is megkapni, kérjük, értesítse a forgalmazóját vagy a Great Plains-t.
- FRA** Pour obtenir un exemplaire du présent document dans la langue de votre choix, veuillez contacter votre représentant ou Great Plains.
- LIT** Jei prireiktų šio dokumento kopijos Jūsų gimtąja kalba, kreipkitės į savo platintoją arba į „Great Plains“.
- BUL** Ако ви е необходимо копие на този документ на родния ви език, моля да се обърнете към вашия дилър или към Great Plains.
- RUM** Dacă aveți nevoie de o copie a acestui document în limba dumneavoastră natală vă rugăm să vă contactați dealerul sau Great Plains.
- RUS** Чтобы получить копию данного документа на вашем родном языке, обратитесь к своему дилеру или в компанию «Great Plains»
- GER** Wenn Sie ein Exemplar dieses Dokuments in Ihrer Muttersprache brauchen, dann wenden Sie sich bitte an Ihren Händler oder an die Great Plains.

DECLARATION OF CONFORMITY

Great Plains UK Ltd. hereby declare that the Great Plains Yield-Pro® European Air Planter, as defined by the Serial Number attached to the Machine Chassis, conforms with the following Directives and Regulations, and has been certified accordingly.

EC Machinery Directive 2006/42/EC.

The Supply of Machinery (Safety) Regulations 2008.

The Provision and Use of Work Equipment Regulations 1998.
Specifically related harmonised standards are:

EN ISO 12100-1: 2003 (Safety of Machinery).

EN ISO 12100-2: 2003 (Safety of Machinery).

EN ISO 4254-1: 2009 (Agricultural machinery - Safety - General Requirements).

THE MANUFACTURER:

Great Plains UK Ltd.
Woodbridge Road
SLEAFORD
Lincolnshire
NG34 7EW
England

Telephone (+44) (0)1529 304654.

CERTIFIED ON BEHALF OF GREAT PLAINS UK LTD:



James McNair
Managing Director



WARRANTY TERMS AND CONDITIONS

In this warranty Great Plains UK Ltd., is referred to as “the Company”.

1. Subject to the provisions of this warranty the Company warrants each new machine sold by it to be sold free from any defect in material or workmanship for a period of 12 months from date of installation with the end-user.

Some specific items have additional warranty over and above the standard 12 months. Details of these can be obtained upon request directly from the distributor or Great Plains UK Ltd.
2. If the machine or part thereof supplied by the Company is not in accordance with the warranty given in clause 1 the Company will at its option:
 - (a) make good the machine or part thereof at the Company’s expense, or
 - (b) make an allowance to the purchaser against the purchase price of the machine or part thereof, or
 - (c) accept the return of the machine and at the buyers option either:
 - I) repay or allow the buyer the invoice price of the machine or part thereof, or
 - II) replace the machine or part thereof as is reasonably practical.
3. This warranty shall not oblige the Company to make any payment in respect of loss of profit or other consequential loss or contingent liability of the Purchaser alleged to arise from any defect in the machine or impose any liability on the Company other than that contained in clause 2.
4. Any claim under this warranty must be notified to the Company in writing specifying the matters complained of within 14 days from the date of repair.
5. Any claim under this warranty must be made by the original purchaser of the machine and is not assignable to any third party.
6. If the purchaser hires out the machine to any third party the warranty shall apply only to matters notified to the Company in writing within 90 days of the date of delivery and clause 1 shall be read as if the period of 90 days were substituted for the period of 12 months.
7. The warranty will cease to apply if:
 - (a) any parts not made, supplied or approved in writing by the Company are fitted to the machine or
 - (b) any repair is carried out to the machine other than by or with the express written approval of the Company or
 - (c) any alterations not expressly authorized by the Company in writing are made to the machine or
 - (d) the machine is damaged by accident or
 - (e) the machine is abused or overloaded or used for a purpose or load beyond its design capabilities, or used in conjunction with a tractor whose power output capability exceeds the stated implement power requirement by more than 40%. For the purpose of these terms and conditions, “stated implement power requirement” refers to wheeled tractors unless specifically stated. These power requirements should be reduced by 20% when used in conjunction with tracked tractors.
 - (f) the machine is operated as part of a ‘cultivation train’ where more than one implement is being towed, without the express written approval of Great Plains UK Ltd.
 - (g) any maintenance is not carried out in accordance with the service schedules in the operator’s manual.
 - (h) the Installation and Warranty Registration Certificate is not received by Great Plains UK Ltd., Service Dept., Woodbridge Road, Sleaford, Lincolnshire, England, NG34 7EW, within 7 days of installing a new machine.

Machine Identification

Enter the relevant data in the following list upon acceptance of the machine:

Serial Number	
Type of Machine	
Machine Width	
Year of Construction	
Delivery Date	
First Operation	
Accessories	

Dealer Address

Name: _____

Street: _____

Place: _____

Tel.: _____

Dealer's Customer No.: _____

Great Plains Address:

Great Plains UK LTD
Woodbridge Road Ind. Est.
Sleaford
Lincolnshire
NG34 7EW

Tel.: +44 (0) 1529 304654

Fax: +44 (0) 1529 413468

Email: simba@greatplainsmfg.com

Great Plains Customer No.: _____

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Introduction

Foreword

Make sure you have read and follow the Operating Instructions carefully before using the machine. By doing so, you will avoid accidents, reduce repair costs and downtime and increase the reliability and service life of your machine. Pay attention to the safety instructions!

Great Plains will not accept any responsibility for any damage or malfunctions resulting from failure to comply with the Operating Instructions.

These Operating Instructions will assist you in getting to know your machine and in using it correctly for its intended purposes. First, you are given general instructions in handling the machine. This is followed by sections on servicing, maintenance and the action to be taken should a malfunction occur.

These operating instructions are to be read and followed by all persons working on or with the machine, e.g:

- Operation (including preparation, remedying of faults in the operating sequence and servicing).
- Maintenance (maintenance and inspection)
- Transportation.

Together with the Operating Instructions, you will receive a Spare Parts List and a Machine Registration form. Field service technicians will instruct you in the operation and servicing of your machine.

Following this, the Machine Registration form is to be returned to your dealer.

This confirms your formal acceptance of the machine. The warranty period begins on the date of delivery.

We reserve the right to alter illustrations as well as technical data and weights contained in these Operating Instructions for the purpose of improving the machine.

Warranty Guidelines

The period of liability for material defects (warranty) relating to our products is 12 months. In the case of written deviations from the statutory provisions, these agreements shall apply.

They shall become effective upon installation of the machine with the end customer. All wear parts are excluded from the warranty.

All warranty claims must be submitted to Great Plains via your dealer.

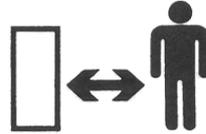
1. Safety Data

The following warnings and safety instructions apply to all sections of these Operating Instructions.



Parts may fly off during operation. Keep a safe distance away from the machine!

1.1 Safety Symbols on the machine



Read and observe the Operating Instructions before starting up the machine!



Keep clear of the working range of foldable machine components!



Watch out for escaping pressurised fluids! Follow the instructions in the Operating Instructions!



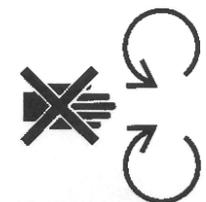
No passengers are allowed on the machine!



Never reach into areas where there is a danger of being crushed by moving parts!



Never reach into any revolving parts!



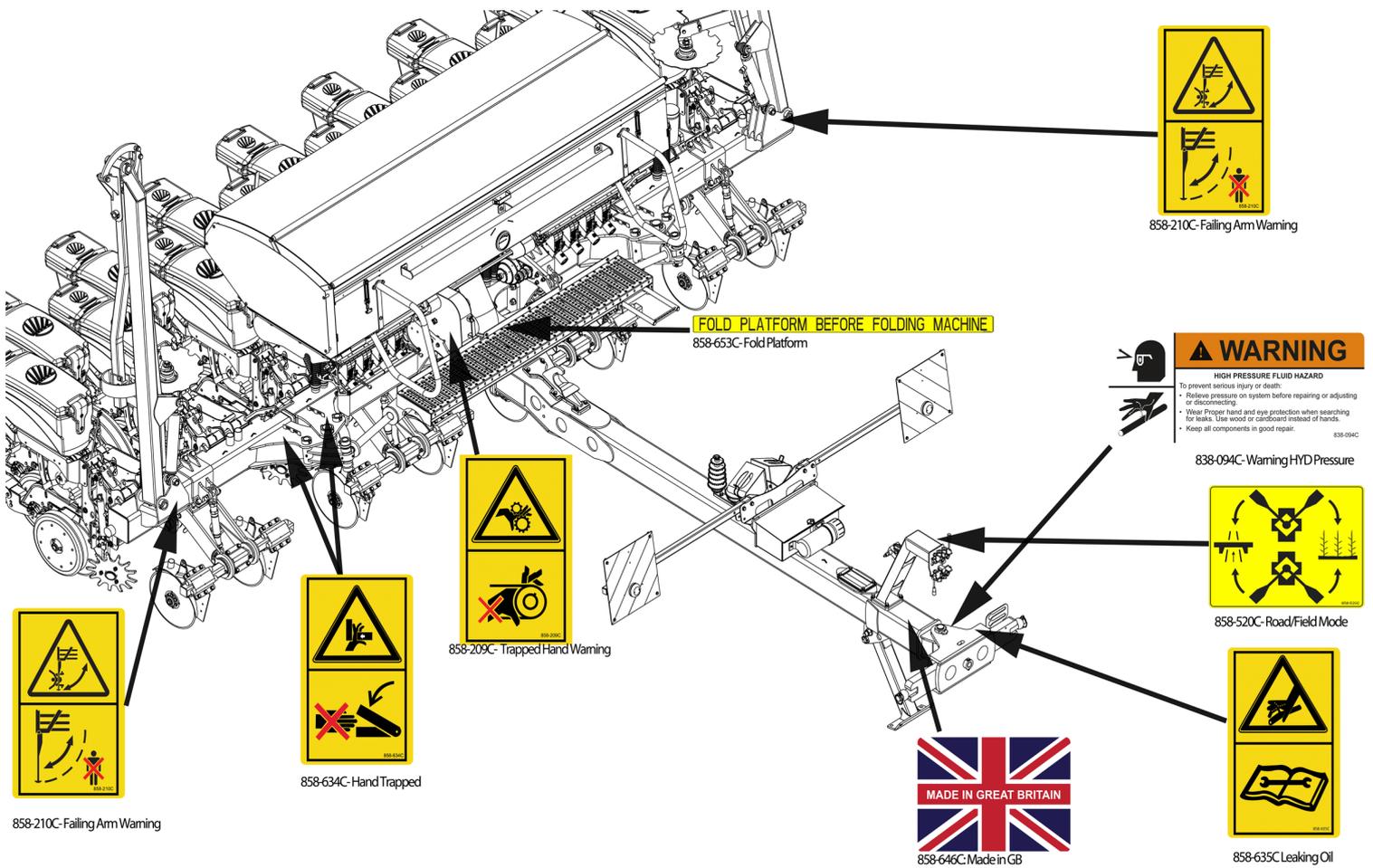


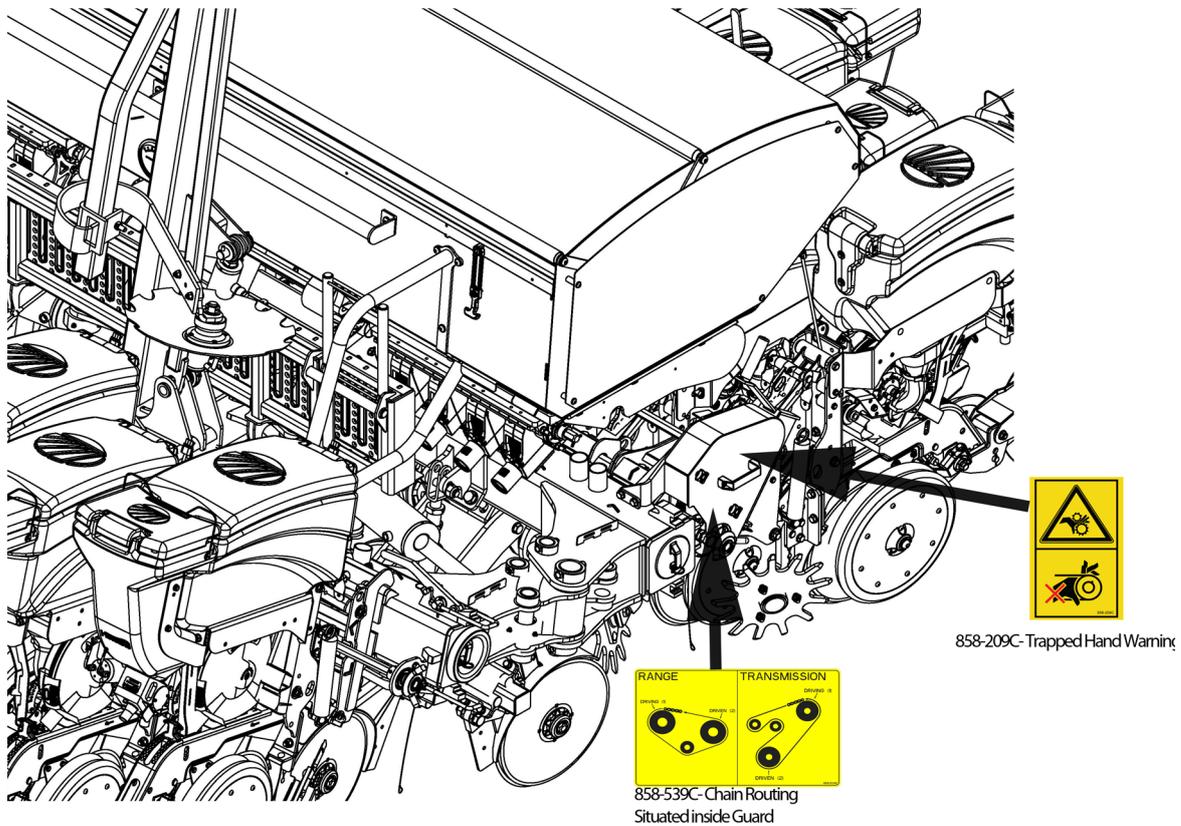
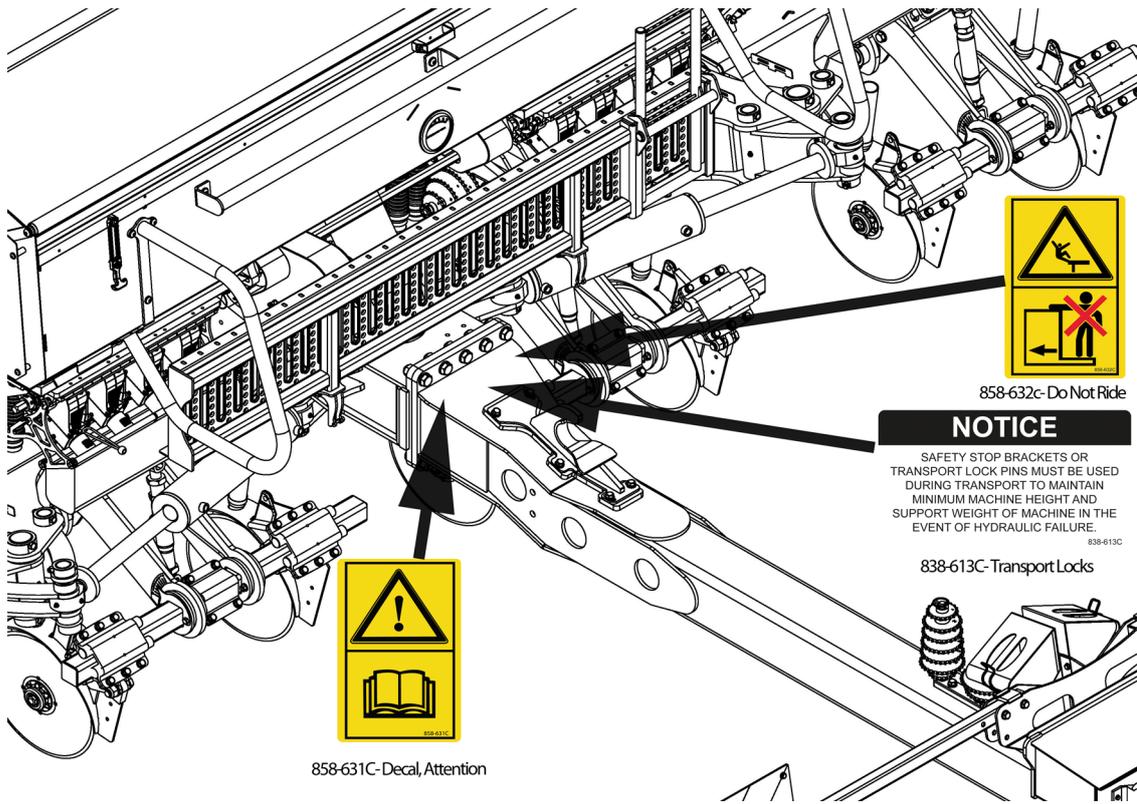
Refer to Operating Instructions before attempting maintenance.

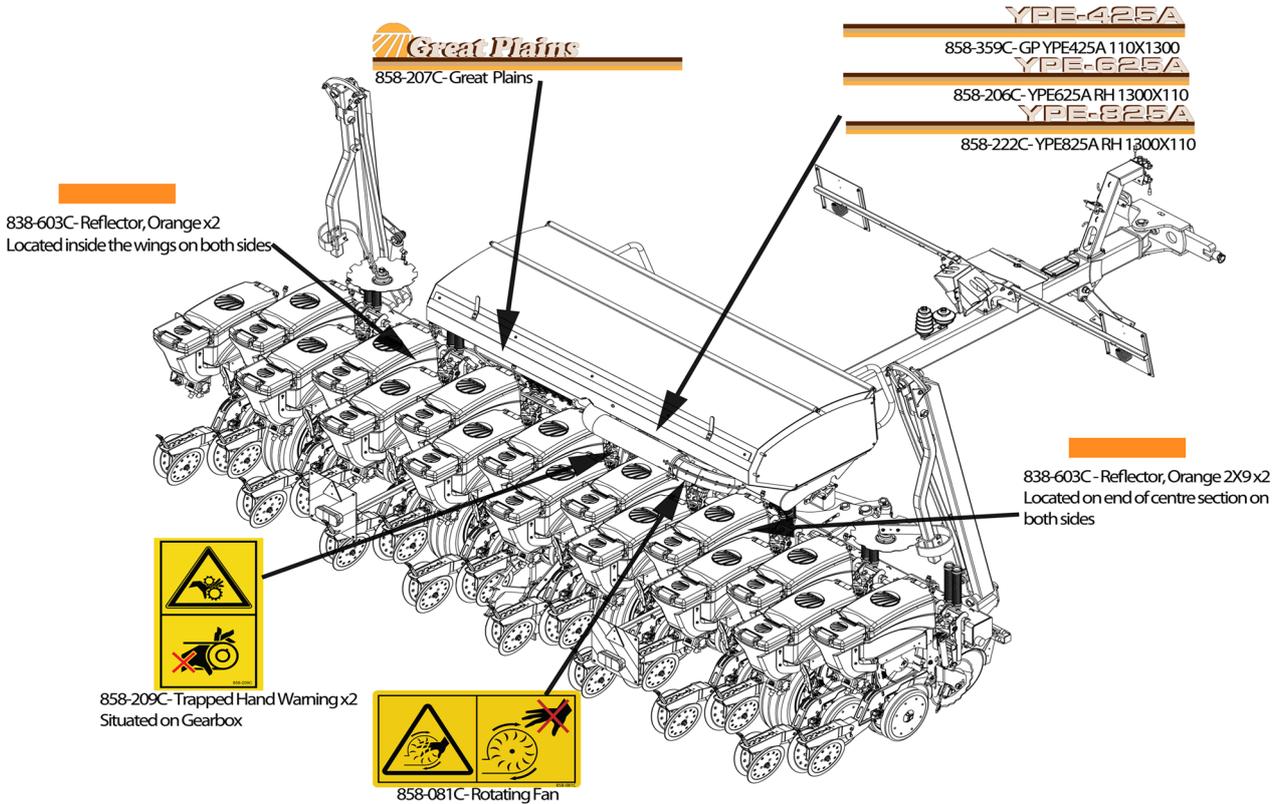


1.1.1 Decal Locations

The diagrams on pages 12-14 show the location of the decals on the machine and the part numbers should you need to order replacement stickers.







Operating Instructions:

The Operating Instructions distinguish between three different types of warning and safety instructions. The following graphic symbols are used:



Important!



Risk of injury!



Risk of fatal and serious injuries!

It is important that all the safety instructions contained in these Operating Instructions and all the warning signs on the machine are read carefully.

Ensure that the warning signs are legible. Replace any signs that are missing or damaged.

These instructions must be followed in order to prevent accidents. Inform other users of the warnings and safety instructions.

Do not carry out any operations which may affect safe use of the machine.

All references to left and right in this manual are made from the rear of the machine, facing the direction of travel (unless otherwise stated).

1.2 Use for the Intended Purpose

The Great Plains Yield-Pro® Air Planter, is built using the latest technology and in accordance with the relevant recognised safety regulations. However, risks of injury for the operator or third parties and impairment of the machine or other tangible assets can arise during use.

The machine is only to be operated when in a technically perfect condition and for the intended purpose, taking into consideration safety and risks and following the Operating Instructions. In particular, faults that can impair safety are to be remedied immediately.

Original parts and accessories from Great Plains have been specially designed for this machine. Spare parts and accessories not supplied by us have not been tested or authorised. Installation or use of non-original Great Plains products may have a detrimental effect on specific design features of the machine and affect the safety of machine operators and the machine itself. Great Plains will accept no liability for damage resulting from the use of non-original parts or accessories.

The Great Plains Planter is designed solely as a planting implement. Use for any other purpose, e.g., as a means of transport, will be deemed to be improper use. Great Plains will accept no liability for damage resulting from improper use. The risk will be borne solely by the operator.

Use of the machine behind high power tractors (in excess of 40% above the maximum recommended) can lead to high

loads and stresses which can cause long term structural damage to the chassis and key components. Such overloading can compromise safety and is to be avoided.

1.3 Operational Safety

The machine is to be put in operation only after instruction has been provided by an employee of the authorised dealer or an employee of Great Plains. The “Machine Registration” form is to be completed and returned to your dealer.

All protective and safety equipment, such as removable protective equipment, must be in place and functioning reliably before the machine is put in use.



Check screws and bolts regularly for tightness and retighten if necessary.



In the event of malfunctions, stop and secure the machine immediately.



Ensure that any faults are remedied immediately.

1.4 No Liability for Consequential Damage

The machine has been manufactured with great care. However, problems may still occur when it is used for the intended purpose. These may include:

- Worn wearing parts.
- Damage caused by external factors.
- Incorrect driving speeds.
- Incorrect setting of the unit (incorrect attachment, non-adherence to the Setting instructions).

 **Therefore, it is crucial to always check your machine before and during operation for correct operation and adequate application accuracy.**

Compensation claims for damage which has not occurred to the machine is excluded. This includes any consequential damage resulting from incorrect operation.

1.5 Road Traffic Safety

When driving on public roads, tracks and areas, it is important to observe the relevant road traffic laws as well as the specific regulations relating to this machine.

 **Pay attention to the permitted axle loads, tyre carrying capacity, and total weight in order to maintain adequate braking and steerability (these figures are shown on the serial plate).**

 **Passengers on the machine are strictly forbidden!**

 **Max. road transport speed 16mph (25km/h).**

1.6 Accident Prevention

In addition to the Operating Instructions, it is important to observe the accident prevention regulations specified by agricultural trade associations. It is the Operator's responsibility to ensure that all other persons are excluded from the danger zones surrounding or on the machine during its operation.

It is the Owner's responsibility to ensure:

- The Operator is trained and competent to use the machine & tractor,
- The tractor is suitable for the machine
- Adequate Risk and COSHH assessments have been undertaken regarding the machine's use. Specifically, these include issues concerning contact with the soil, dust, crop residues, chemicals, lubricants and other compounds during operation or maintenance, and the possibility of stones being ejected at high speed during work.



You may be severely injured or killed by being crushed between the tractor and planter. Do not stand or place any part of your body inbetween planter and moving tractor.

1.6.1 Hitching-up the machine

There is a risk of injury when hitching/unhitching the machine. Observe the following:

- Secure the machine against rolling.
- Take special care when reversing the tractor!
- There is a risk of being crushed between the machine and the tractor!
- Park the machine on firm, level ground.

1.6.2 On the Hydraulic System

Do not connect the hydraulic lines to the tractor until both hydraulic systems (machine and tractor) are depressurised.



Any hydraulic system containing an accumulator can remain under pressure permanently (even after following manual depressurisation procedures with a tractor / implement combination). It is therefore important to check all lines, pipes, and screw connections regularly for leaks and any recognisable external damage.



The hydraulic circuit contains specialised fittings which should not be tampered with under any circumstances. Do not attempt to modify hose routings or hose clamping arrangements, doing so may cause serious damage to the machine and/or injury.

Only use appropriate aids when checking for leaks. Repair any damage immediately. Spurting oil can cause injuries and fires!

In case of injury, contact a doctor immediately.

The socket and plugs for the hydraulic connections between the tractor and the machine should be colour-coded in order to avoid incorrect use.

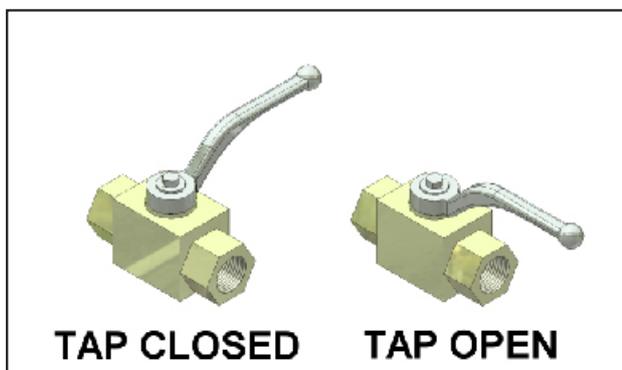


Figure. 1. Hydraulic Taps

1.6.3 Changing Equipment

- Secure the machine to prevent it from accidentally rolling away!
- Use suitable supports to secure any raised frame sections suspended above you!
- Caution! Risk of injury due to projecting parts!



Never climb on to rotating parts such as the roll unit. These parts may rotate causing you to slip and suffer serious injury!



Removing components during maintenance may affect the stability of the machine. Ensure it is fully supported in case of unexpected weight shifts.

1.6.4 During Operation

Ensure that the working range and the area around the machine are clear (children!) before operating the machine.

Always ensure adequate visibility!

Do not stand on the machine while it is in operation!

Operators must have a valid driving licence in order to drive on public roads. In the operating area, the operator is responsible for third parties.

The person in charge must:

- provide the operator with a copy of the Operating Instructions, and ensure that the operator has read and understood the instructions.

- make sure that the operator is aware of the specific regulations relating to the machine when driving on public roads.

1.7 Servicing & Maintenance

Ensure that regular checks and inspections are always carried out within the periods required by law or specified in these Operating Instructions.

When carrying out service and maintenance work always:

- Switch off the tractor engine and remove the ignition key.
- Wait until all the machine parts have stopped moving.
- Depressurise the hydraulic system.

Many hydraulic circuits contain lock or overcentre valves which can retain pressure in the lines even after depressurising the tractor side of these circuits. If in doubt, consult trained personnel (such as your local Great Plains Dealer) to ensure such valves are depressurised to the correct procedure before removing or servicing any parts connected downstream of these valves.

Check all hydraulic lines for leaks, loose connections, chafe marks and damage. Remedy any deficiencies immediately! Pay particular attention to hose renewal intervals as outlined in the specific sections which follow. ALL hydraulic hoses have a safe maximum working life of 6 (SIX) years from date of installation, provided they remain in a safe condition. Hoses which exceed 6 years of age should be replaced, or inspected and certified by a suitably qualified person to

have an extended life period which should be recorded.

Pay particular attention to those items which require specialist service tools or training to be carried out by qualified personnel. Do not attempt to service these items yourself! These include items retaining pressure (e.g. accumulator circuits), or force (e.g. spring tines), and DD Rolls of any type.

Prior to performing maintenance and servicing work, ensure that the machine is positioned on solid, level ground and is secured to prevent it rolling away. Do not use any parts to climb on to the machine unless they are specifically designed for this purpose.

Before cleaning the machine with water, steam jets (high-pressure cleaning apparatus) or other cleaning agents, cover all openings into which, for reasons of safety or operation, no water, steam or cleaning agents are to penetrate (bearings, for instance).

Lubricate all the lubricating points to force out any trapped water.

When carrying out servicing and maintenance work, retighten any loose screw connections.

When servicing the machine take precautions against soil, dust, seed coatings, oil or any other hazardous substances that you might encounter.

On a new machine tighten all nuts and bolts after 5 hours work and again after 15 hours. This also applies to parts that have been moved or replaced. After the initial 15 hours

of work a once a week check should be sufficient depending on daily work rates.

1.8 Operating Areas

The operating areas include the drawbar, hydraulic connections and depth adjustment equipment as well as all operating points requiring maintenance.

All operating areas will be specified and described in detail in the following chapters on servicing and maintenance.

Observe all safety regulations included in the section dealing with Safety, and in the subsequent sections.

1.9 Authorised Operators

Only those persons who have been authorised and instructed by the operator may operate the machine. The operator must be at least 16 years of age.

1.10 Protective Equipment

For operation and maintenance, you require:

- Tight fitting clothing.
- Strong protective gloves (to provide protection against sharp-edged machine components).
- Protective goggles (to stop dirt getting into your eyes).

1.11 Chemical Safety



Agricultural chemicals can be dangerous. Improper use can seriously injure persons, animals, plants, soil and property.

Do not use liquid seed treatments with the Machine .

Read and follow chemical manufacturer's instructions.

Wear protective clothing / gloves when handling chemicals.

2. Transportation and Installation

Transportation and initial installation of the machine are described in this chapter.

2.1 Delivery

The machine is normally delivered, fully assembled. However it is possible to request the machine is delivered on racking.

- The machine can be lifted off with a crane or other suitable lifting equipment.
- The machine should be hitched to a tractor and driven off a low-loader.

2.2 Transportation

The machine can be transported on public roads by hitching it up to a tractor or on a low-loader.

- It is important to observe the permitted dimensions and weights when transporting the machine.
- If the machine is transported on a trailer or a low-loader, it must be secured using straps or other devices.
- Before transporting the machine on public roads, it must be adjusted to its transportation position and the stipulations relating to road transportation fulfilled.



The transportation width can vary according to the machine specification. It may be necessary to adjust these elements in order to achieve the minimum transport width.



Adjustments, including the attachment of transport devices, should be made at ground level; lowering the machine may be necessary to achieve this.

- The maximum permissible speed is 25 km /h (16mph).

2.3 Installation

When carrying out installation and maintenance work there is a higher risk of injury. It is important that you familiarise yourself with the machine and read the Operating Instructions beforehand.

Operator instruction and initial installation of the machine are carried out by our service technicians or authorised distributors.

The machine must not be used in any way beforehand! The machine can only be released for operation after instructions have been provided by our service technicians or authorised distributors.

- If any modules or parts have been removed for transportation, these shall be mounted by our service technicians/ authorised dealers before the instruction takes place.
- Check all important screw connections!
- Lubricate all nipples and joints!
- Check all hydraulic connections and lines for damage.

2.4 Preparation and Setup

This section helps you prepare your tractor and machine for use. And covers seasonal tasks, and tasks when the tractor/ planter configuration changes. Before using the machine in the field, you must hitch the planter to a suitable tractor, inspect systems and level the planter. Before using the planter for the first time, and periodically thereafter, certain adjustments and calibrations are required.

2.4.1 Initial Setup

- Install the monitor console in the tractor cab.



Mount the console so that it is easy to monitor during planting, but does not interfere with safe operation of the tractor in the field or on public roads.

- Set boutmarker extension.

2.4.2 Seasonal Setup

On initial delivery use with a new tractor, and seasonally check and complete (where necessary) these items before continuing to the routine setup items:

- Wing levelling and alignment.
- Speed sensor calibration.
- Blow out entire air system to remove condensation. Check air flow at each row, for evidence of plugging.
- De-grease exposed cylinder rods if so protected at last storage.

2.4.3 Pre-Planting Setup

Complete this checklist before routine setup:

- Read and understand “Safety Information” section.
- Check that all working parts are moving freely, bolts are tight, and cotter pins are spread.
- Check that all grease fittings are in place and lubricated.
- Check that all safety decals and reflectors are correctly located and legible. Replace if damaged.
- Inflate tyres to pressure recommended and tighten wheel bolts as specified.

2.5 Hitching Tractor to Planter



You may be severely injured or killed by being crushed between the tractor and planter. Do not stand or place any part of your body in between planter and moving tractor.

1. Back up the tractor to align tractor link arms and planter linkage.
2. Engage the link arms and the planter linkage, ensuring the balls are seated correctly.
3. Raise the link arms / linkage and move the parking stand into the work position.
4. Shut down tractor and remove key.
5. Connect hydraulic hoses.
6. Connect brake hoses .
7. Connect electrical cables.

2.6 Hydraulic Hose Hookup



Escaping fluid under pressure can have sufficient pressure to penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic lines. Use a piece of paper or cardboard, **NOT BODY PARTS**, to check for leaks. Wear protective gloves and safety glasses or goggles when working with hydraulic systems. If an accident occurs, seek immediate medical assistance from a physician familiar with this type of injury.

Only trained personnel should work on system hydraulics!

Great Plains hydraulic hoses are colour coded to help you hook-up hoses to your tractor outlets. Hoses that go to the same remote valve have the same colour handles.

The fan pressure hose (black) must be connected to a circuit capable of continuous flow at high volume.

To distinguish hoses on the same hydraulic circuit, refer to labels at the hose ends. Low Pressure (Case) Drain Connection: Attach case drain hose to low pressure drain connection in order to protect fan hydraulic motor seals.

Connect low pressure motor return hose, marked "SUMP", to a high volume low pressure return port. The sump line is distinguished by a 3/4 in. BSP connector.

For the hydraulic fan, connect the hose with a retracted cylinder symbol to the pressure side of the motor.

The fan motor further requires hook-up of a (third) case drain line, which returns lubricating/cooling fluid.

2.6.1 Protect Motor Seals

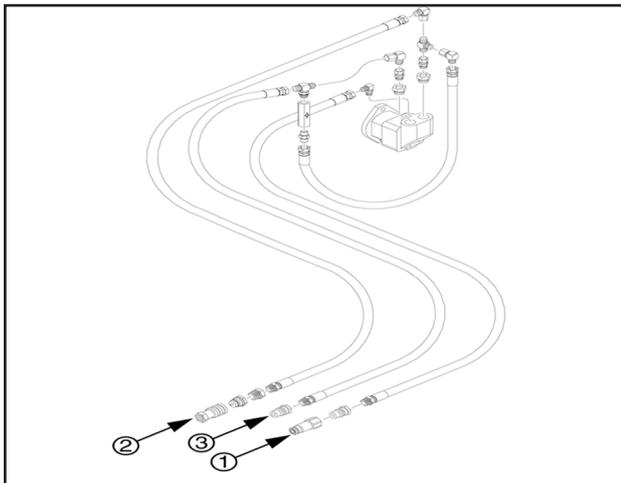


Figure 2. Fan Hoses

(Refer to figure 2)

1. Connect the fan case drain line first, before making any other connections. Connect this line to a low pressure drain port.

Note: Case drain hose has the smaller 1/4 inch I.D. hose and small, flat-face, low-seep connector.

2. Connect the fan return line second.

Note: Fan pressure return hose has a large (1.06 inch/ 2.7 cm diameter) quick coupler.

3. Connect the fan motor pressure hose third. If the tractor has a priority remote, use it for the fan connection.

4. Make marker (option) connections.

 **DO NOT connect the fan case drain line to a power-beyond-port. Case Drain Hose must be attached first, prior to inlet and return hoses being connected. Case Drain Hose must be detached last, to prevent damage to the fan motor.**

Referring to figure 3:

Applies to planters with no fertiliser application.

1. Connect the motor return line , to remote circuit return (Extend port) or to sump.

2. Connect the motor inlet line to a tractor remote capable of 20 liters per minute. If a priority remote is available, use it for the fan.

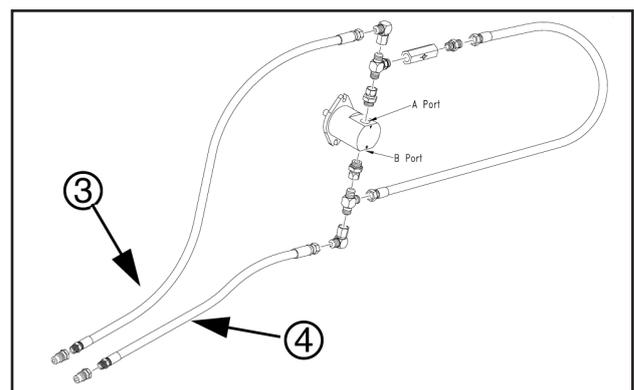


Figure 3. Fan Hoses

2.7 Brake Hook-up

Two braking (trailer braking) systems are available for the Planter; a dual-line air system, and single-line hydraulic system. In both systems, the tractor's trailer brake remote port(s) operate a hydraulic slave cylinder on the planter. Tractor trailer braking systems are normally integrated with the tractor brakes, and operate the trailer brakes when tractor brakes are used during tractor movement. The trailer braking system may or may not be integrated with the tractor parking brake system. Trailer brakes typically are not automatically engaged when the tractor transmission is in Park, and may not be engaged by any tractor Emergency Brake.



Make sure the operator understands when the planter brakes are engaged and when they are released.

Also understand and comply with tractor operational restrictions when trailer brakes are used. For example, it is generally necessary to inter-tie split brakes, and avoid differential (steering braking) if trailer brakes are used.

2.7.1 Air Brake Hook-up

Please refer to the following procedure when coupling or decoupling any item of Great Plains machinery fitted with an AIR brake or AIR and HYDRAULIC brake system. Please note that this procedure does not apply to any machines fitted with a HYDRAULIC system ONLY.

When Coupling:

1. Reverse up to the machine and connect the machine to the tractor as instructed too.
2. With the machine connected couple the air lines. When coupling ensure the yellow line is attached first followed by the red line.
3. Your brake hoses are now attached and are ready for operation.
4. Continue with the coupling process as instructed.

When De-coupling:

1. Bring the machine to the parking position as instructed too.
2. With the machine still connected to the tractor remove the red brake line followed by the yellow line.
3. Your brakes will now be ON and will hold, ensuring they have been adjusted and maintained correctly, the machine in position. (note: if the machine's tank is drained of air once all lines have been detached the brakes will come off (same situation as pushing the shunt valve).
4. Continue de-coupling the machine until it is fully disconnected.



By following these instructions you will see that at No point in the coupling or decoupling process has the red line been left in the tractor on its own. This is intentional and should be considered the ‘rule’ to coupling the hoses



Do not use the Machine with a “single-line” air brake system. This planter is designed for transport speeds that require a brake system to be “dual-line”. A single line tractor system cannot charge the tank that powers the planter brakes.

2.7.2 Hydraulic Brake Hook-up

This is a single hydraulic line, connected to the tractor “Brake” outlet. This has a female connector.



Figure 4. Brake Connection Hose

2.7.3 Hydraulic Colour Coding

The hydraulic Hoses are colour coded using cable ties to identify the different circuits.

Hoses with 1 tie indicates the cylinder side of the circuit while hoses with 2 ties indicate the rod side.

YPEM

Green= Bout Markers
Black=Fan

YPET

Red=Lift
Yellow=Fold
Green=Bout Markers
Black=Fan

2.7.4 Electrical Hook-up

Make sure the tractor is shut down with accessory power off before making connections.

1. Mate lighting connector to tractor outlet.
2. Mate monitor connector to tractor harness.
3. Mate any optional or after-market electrical connectors.

Make connections prior to planter movement. Some planter hydraulic circuits are under monitor control.

2.7.5 Beacon Operation

The flash strobe beacon should be on in all instances when the machine is being transported or used.

2.8 Stow Wheel Chocks

Verify that the tractor transmission is in Park, and that the tractor's parking brake is set.

Two wheel chocks are provided to secure the planter when parked. These provide safety when installed correctly ahead or behind the transport tyres.

If one chock is extremely difficult to remove, and/or the planter moves significantly when the chock is removed, investigate the cause before removing the chocks on the other side. If no tractor is hitched, or the tractor is not securely parked, the planter could roll away after chock removal, and cause an accident resulting in death, serious injury and substantial property damage.

2.9 Checking Planter Height

The implement frame should be level with the ground during planting, this will allow the row units to operate at their most consistent planting depth.

The ideal height for planting is 660mm from the ground to the bottom of the main beam.

2.9.1 Boutmarker Setup

Prior to first use the marker extension should be set or reviewed.

Prior to each planting session, check and adjust "Boutmarker Disc Adjustment".

2.10 Unfolding and Folding

Unfold and fold implement only if fold hydraulics are bled free of air and fully charged with hydraulic oil. Keep away and keep others away when unfolding or folding.

Keep clear of overhead power lines when unfolding, operating, folding or transporting the planter. Machine is not earthed.

At higher voltages, electrocution can occur without direct contact. Any line voltage present on implement, cart or tractor can cause severe injury or death.

Keep people away from the planter and tractor during folding. Risks include pinching or crushing at pivot points and at multiple sites in pivoting assemblies.

Ensure that wing lock is engaged correctly. If a hydraulic failure occurs, or hydraulic levers are moved, unlocked wings could fall suddenly causing a major road accident, or crushing anything near the wings, resulting in death or serious injury, and property damage.

Do not use tyres as steps or platforms. All tyres can be in light ground contact, or free to spin, when implement is lowered. Fold only on hard level ground.

2.10.1 Unfolding

These steps presume a planter folded for transport. Follow the detailed instructions below until this is a familiar operation.

1. Move the planter to level ground with adequate overhead and lateral clearances for the fold operation.
2. Ensure all wing and chassis plugs are removed. Unlock taps on fold rams.
3. Ensure that the changeover valves are set to 'road mode'.
4. Use tractor spools to unfold the wings.
5. Use manual wing locks to secure wings in unfolded state and lock the taps on fold rams.
6. Move the changeover valves to 'field mode' and operate tractor spool to raise planter.
7. Remove transport shims and stow away.

2.10.2 Folding

Fold the planter for moves between fields, transport over public roads, parking and storage.

Follow the detailed instructions below until this is a familiar operation.

1. Make sure boutmarkers are fully folded.
2. Move the planter to level ground with adequate overhead and lateral clearances for the fold operation.

3. Ensure that the machine is fully raised and insert transport shims.
4. Use tractor spools to raise wing wheels.
5. Move changeover valves to road mode.
6. Ensure that the manual wing locks are disengaged. Unlock taps on fold rams.
7. Use tractor spools to fold the wings. Ensure that both wings engage into the 'wingcatcher'.
8. Lock taps on fold rams. Install wing and chassis plugs.

2.11 Transporting the Planter



Tractor must weigh at least 67% of the planter as towed. Ensure that the towing vehicle is adequate for the task. Using an inadequate tow vehicle is extremely unsafe, and can result in loss of control, serious injury and death. Do not tow if planter exceeds the load rating of the vehicle.



Maximum transport speed is 25 kph (16 mph) at all times, and lower with a lighter tractor. Excess speed can result in loss of control or inability to stop. Reduce speeds with materials loaded, or if road conditions are less than ideal.



Ensure the wing lock is engaged when the wings are folded.



Inflate tyres to factory specifications. Tighten wheel nuts to specifications. Underinflated tyres or loose nuts can cause loss of control. Overinflated tyres or overtightened nuts can fail suddenly and cause loss of control. Loss of control can cause a major accident resulting in death, injury and equipment damage.

Check lights and reflectors regularly. Replace bulbs and faded/ worn/ missing decals as required. Use lights in transport. These features are critical to visibility, particularly with other drivers unfamiliar with farm equipment or not expecting to encounter a slow-moving vehicle. Front lights should be moved into the road transport position.

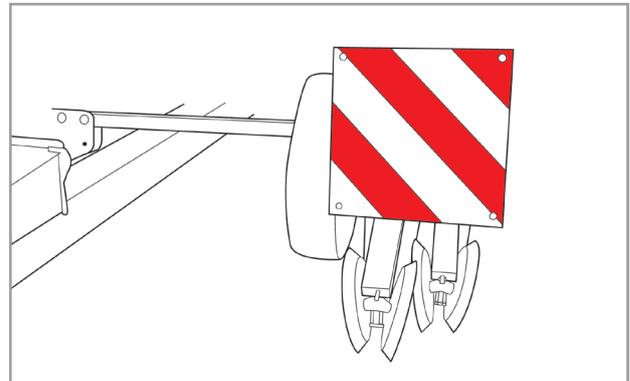


Figure 5. Front lights in road transportation position.

2.12 Parking the machine

In order to avoid damage as a result of moisture, the machine should be parked, if possible, indoors or under cover.

When manoeuvring the machine, pay attention to your surroundings. Ensure that nobody is in the manoeuvring area (watch for children!).

1. Park the machine on level and solid ground.
2. Lower the machine onto the parking stand / transport wheels ensuring that it is stable. Ensure pin is fitted correctly.
3. Place wheel chocks under wheels.
4. Uncouple the machine from the tractor link arms.
5. Switch off the tractor and remove key.
6. Uncouple the hydraulic hoses and electrical / brake connectors.

2.13 Leveling Planter

For row units to function correctly, planter must be:

- level from side to side,
- level from front to back, and;
- at correct tool bar height.

Perform this setup on level ground in representative field conditions.

1. Raise planter so that gauge wheels are just off ground.
2. Insert correct shims to ensure that the planter runs level at 66cm while resting on gauge wheels.
3. Check tyre pressures of gauge wheels. As necessary, inflate to specifications.
4. Measure height from bottom of main tool bar to ground, at each end.

Note the current height for step 7, and what lowering would be required to make that 66 cm.

5. Check front-to-back level at top of main tool bar. If unlevel, adjust to level.
6. Pull forward slowly, and lower the planter to approximately 66 cm. Stop the tractor and set the parking brake.
7. Check the tool bar height . Adjust the hitch height until it is 66cm.
8. Check that the row units are running level with the ground.

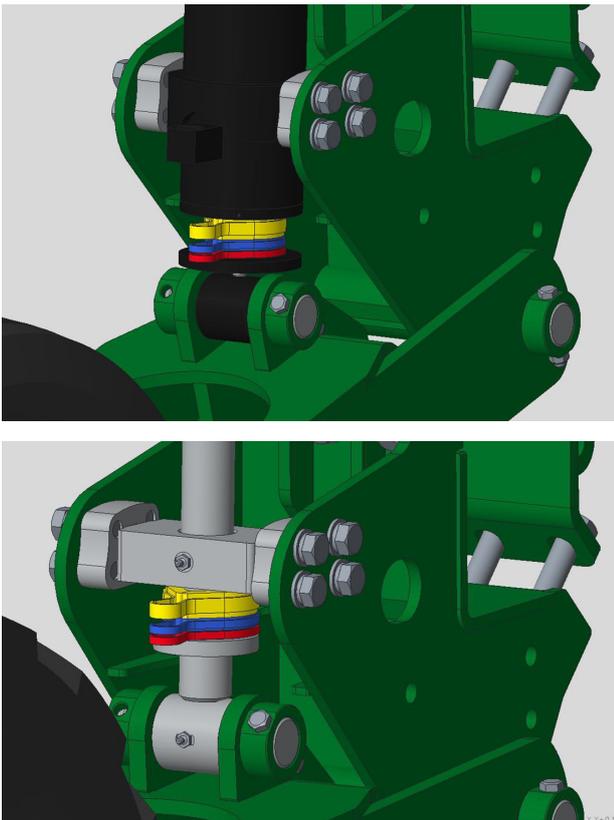


Figure 6. Image of shims

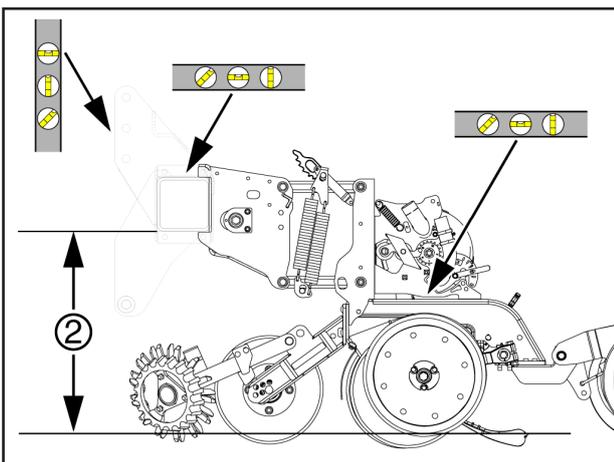


Figure 7. Tool bar height and leveling

Hitch configuration during planting can vary between tractor models, and due to field conditions. Great Plains recommends starting with the hitch set to Float or Position/Depth Control (and not Load or Draft Control).

2.14 Monitor Set up

Refer to Figure 8

The standard DICKEY-john® PM300 system monitors the following elements of a YPE planter:

- Seeds at each row unit seed tube.
- Ground speed.

Refer to the DICKEY-john® PM300/PM332/PM400 Operator's Manual for monitor operations.

After installation, and prior to first field use, the monitor must be setup with the row spacing and speed sensor constant, as well as your preferences for information display. Row count is auto-assigned, but any other factory defaults are not likely to be correct for your planter.

For speed setup, Great Plains recommends using the 400-foot calibration described in the DICKEY-john® manual, rather than using a theoretical “# of pulses”.

Perform the calibration run in representative field conditions, as soil conditions, surface looseness and other tillage practices can cause variations in the effective rolling radius of the ground drive wheel.

Prior to each planting session, set any desired limits for speed and population for the current crop.

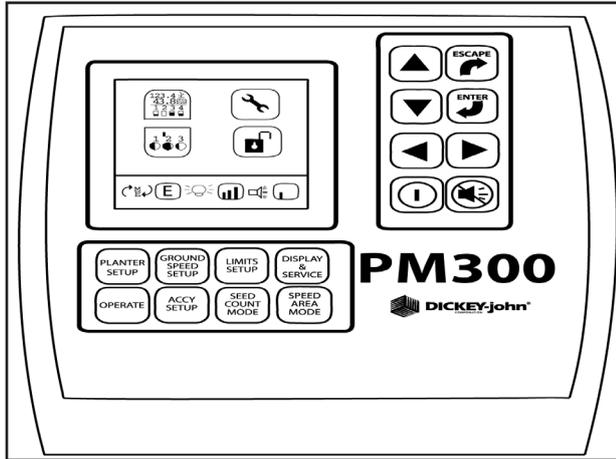


Figure 8. Monitor Primary Screen

3.0 Operations

3.1 Operating Instructions

This section covers general operating procedures. Experience, machine familiarity, and the following information will lead to efficient operation and good working habits. Always operate farm machinery with safety in mind.

To get full performance from your machine, you need an understanding of all component operations, and many provide adjustments for optimal field results.

Even if your planting conditions rarely change, some of these items need periodic adjustment due to normal wear.

3.2 Pre-Start Checklist

Perform the following steps before transporting the Machine planter to the field. Check all hydraulic lines and fittings before applying pressure.



Escaping fluid under pressure can have sufficient pressure to penetrate the skin. Fluid escaping from a very small hole can be almost invisible. Use paper or cardboard, not body parts, and wear heavy gloves to check for suspected leaks. If an accident occurs, seek immediate medical assistance from a physician familiar with this type of injury.

- Install seed discs appropriate for crop. See Air pro meter disc installation
- Review “Safety Information” section
- Lubricate as indicated at “Maintenance and Lubrication”.
- Check all tyres for proper inflation. See “Tyre Inflation Chart”.
- Check all bolts, pins, and fasteners. Torque as shown in “Torque Values Chart”.
- Check planter for worn or damaged parts. Repair or replace parts before going to the field.
- Check hydraulic hoses, fittings, and cylinders for leaks. Repair or replace before going to the field.

3.3 Loading Materials

3.3.1 Hopper Operations

Hopper lids (1):

- Hopper lids are held in place by a latch and hinge.
- Release latch and allow gas spring to open hopper up.

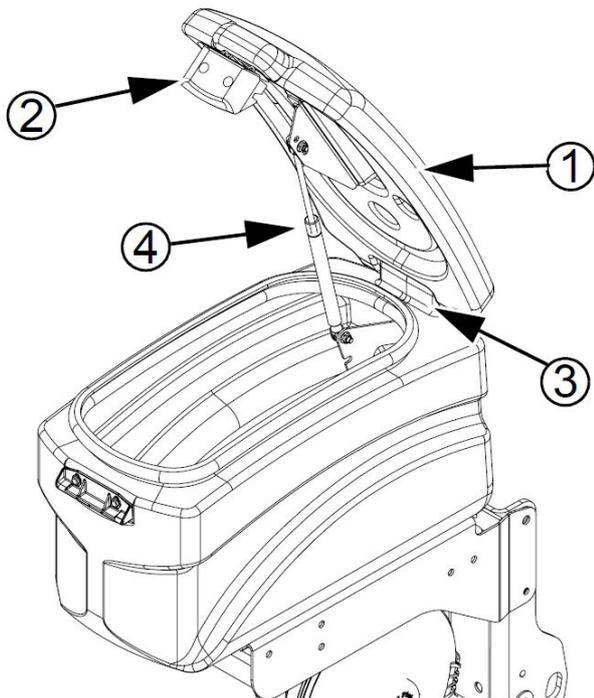


Figure 9. Hopper

3.3.2 Loading Seed

1. Install correct seed discs.
2. Check that each hopper is correctly seated and secured: front and rear mounting bolts secured hopper discharge opening lined up with seed tube
3. Open hopper lid .
4. Inspect the hopper for leftover seed and debris. Clean out anything other than the seed to be planted.



Possible Agricultural Chemical Hazards: Read and follow all supplier cautions for safe handling of treated seed.



Irritant and Chronic Exposure Hazards: Do not mix lubricants into seed with hands or any part of body. Wear protective equipment. Use tools.

5. Pre-mix seed and lubricant.
For clean seeds other than milo, cotton, and sunflowers sprinkle 1/4 cup of Ezee Glide Plus per bushel or unit (60 ml per 35 liters) of seed.

For milo, cotton, and sunflowers double the application to 1/2 cup (or more) per bushel or unit (120 ml per 35 liters) of seed.



Population Risk: The seed must be properly lubricated, starting with the first seed through the meter. If unable to pre-mix prior to loading, pre-mix at least one gallon (4 litres) per hopper, and load this seed first. Fill the hoppers to half full with fresh seed. Add half the lubricant and stir. Complete filling the hoppers and sprinkle the remaining lubricant on top.

6. Add seed and lubricant to all hoppers.

7. Close lids.

3.4 Monitor Operation

Refer to Figure 10

The standard DICKEY-john® PM300 system monitors the following elements of a YPE planter:

- Seeds at each row unit seed tube: Medium and larger seeds are individually counted with high accuracy. Small seed sensing may be limited to seed stoppage (“blockage”) detection.
- Ground speed: The standard magnetic pickup at the ground drive allows the monitor to calculate and report population.

Once setup for the planter and your display preferences, and configured for the current crop rates/limits, the monitor is typically used in the “OPERATE” mode. Refer to the DICKEY-john® PM300/PM332/PM400 Operator’s Manual for monitor operation details.

Both the DICKEY-john® manual and this manual contain trouble-shooting information for apparent monitor problems. Check both manuals, as the focus and content is not identical.

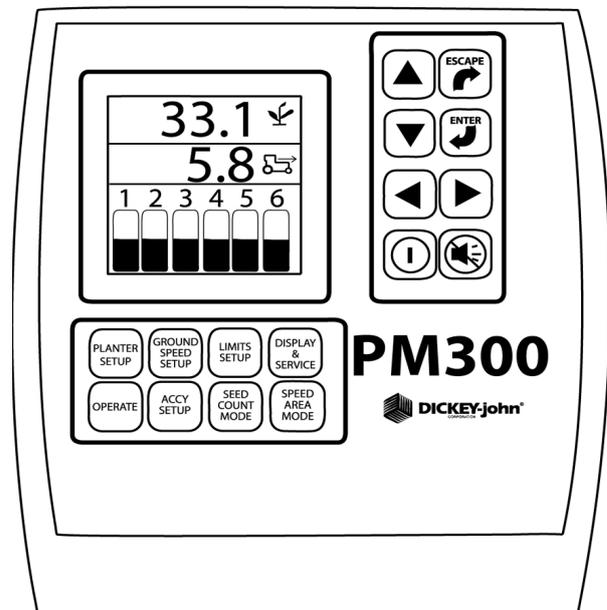


Figure 10. Monitor Typical operator screen

3.5 Air and Seeding System Overview

The hydraulic fan supplies air for meter operation. Fan rpm is operator-adjusted, normally via the tractor circuit's hydraulic flow control.

A manually-adjusted butterfly valve is provided at the fan outlet. for valve adjustment.

The manifold system delivers fan air across the planter. It includes passive internal design features to balance pressure across the planter.

Separate pressurisation tubes route manifold air to each row unit.

Seed is delivered from the seed box by gravity through the sliding seed tubes, to the inlet of the Air-Pro® seed meter .

A manually adjusted inlet shutter controls the size of the seed pool at the base of the meter. The shutter also minimizes air loss back up the seed inlet tube, and is also used during row shut off.

At the meter, pressurised air exits the meter through the seed pockets of the disc, and holds seed in the pockets until released above the seed tube.

In the seed tube, the seed sensor detects passage of seeds. Medium size and large seeds are counted individually. With smaller seeds, most are detected,

allowing the monitor to detect stoppages.

Several rows have a pressure sensor port for the meter pressurisation system. A line from each of these rows is connected to a chamber to average the pressures.

The average pressure is reported by a Magnehelic® gauge visible to the tractor operator.

A sensor in each seed tube reports seed passage to the seed monitor. Larger seeds are counted individually.

For smaller seeds, the system acts as a blockage

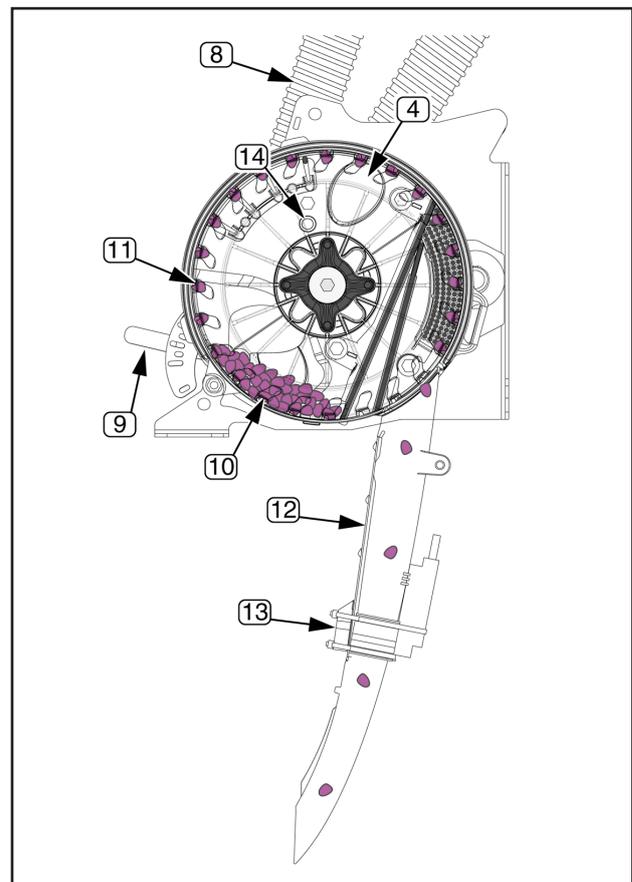


Figure 11. Air pro meter disc side view

-  Use of the special blank disc, and closing the seed inlet shutter, are particularly important when a sensor row is shut off.
-  On any row, running a normal disc with no seed, or with an open empty inlet, unbalances the air system. Doing either at a sensor row causes the gauge to mis-report as well.
-  Do not operate in the ground with the fan shut off, or with insufficient manifold pressure. The meters will completely fill with seed. Meter clean-out may be required to resume normal operation.

3.6 Fan Circuit Operation (Machines with fertiliser)

Refer to Figure 12

Three hydraulic hoses serve the fan, and must be properly connected for the fan to operate in the correct direction, at recommended speeds, and without damage.

1. Always connect the case drain line (2) first.

This line protects the outer shaft seal of the hydraulic motor. The case drain is a small line to the hitch, provisioned with a specialized low-seep flat-face case drain Quick Disconnect. Pressure spikes during motor operation, and pressure cycles due to temperature change are bled off by the case drain.

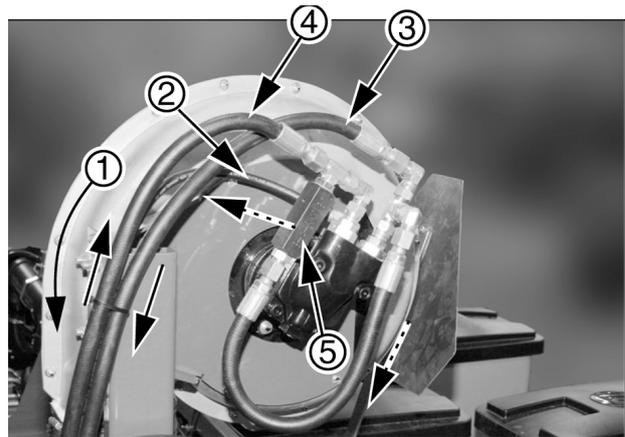


Figure 12. Hydraulics Fan

-  **Motor Seal Damage Hazard:** Do not apply pressure to the case drain line. Do not change the special QD connector. A restricted or sealed case drain line will promptly result in motor seal damage.

2. Connect the motor return line (3) second, to sump.

The planter includes a low back-pressure QD coupler set. Install the receptacle on a tractor sump port, and not at a normal remote return port. The unusual size aids in ensuring correct connection, so that the motor return line handles high volume at low back-pressure, ensuring full motor performance.

3. Connect the motor inlet line (4) to a tractor remote capable of 20 litres per minute. If a priority remote is available, use it for the fan.

4. The fan hydraulic circuit includes a check valve (5), which provides a relief path for oil at motor shutoff. If the fan is

connected in reverse, flow through this valve results in low fan rpm, providing a strong indication of a reversed connection.

Correct fan direction is shown at (1). If reversed fan is suspected, observe it during shutoff, as the direction of motion is easier to see at lower rpms as it slows to a stop (initial startup is virtually instantaneous, making observation at the start difficult).

Fan speed is controlled by the tractor circuit and butterfly valve (and not the seed monitor).

You may stop the fan by setting the circuit to neutral or float. The check valve slows the blades to a stop by locally recirculating the oil.

If the fan is connected in reverse, it may not run at all (due to no oil source at the return connection). If oil is present, oil will bypass at the check valve (5) preventing the fan from reaching high rpm. A reversed fan may send some air to the meters, but is incapable of providing reliable air flow for planting.

Fan speed can change as oil heats to operating temperature. Re-check meter pressurisation more often during early operations.

3.7 Fan Circuit Operation (Planters without Fertiliser)

Refer to Figure 13

Two hydraulic hoses serve the fan, and must be properly connected for the fan to operate in the correct direction , and at recommended speeds.

1. Connect the motor return line (3), to remote circuit return (Extend port) or to sump.

The planter includes a pressure-relief QD coupler for the return line. This prevents motor damage in the event that the return line is not connected, or is connected incorrectly; however, an oil spill results if the return line is not correctly connected.

2. Connect the motor inlet line (4) to a tractor remote capable of 20 liters per minute. If a priority remote is available, use it for the fan.

3. The fan hydraulic circuit includes a check valve (5), which provides a relief path for oil at motor shutoff. If the fan is connected in reverse, flow through this valve results in low fan rpm, providing a strong indication of a reversed connection.

Correct fan direction is shown at (1). If reversed fan is suspected, observe it during shutoff, as the direction of motion is easier to see at lower rpms as it slows to a stop (initial startup is virtually instantaneous, making observation at the start difficult).

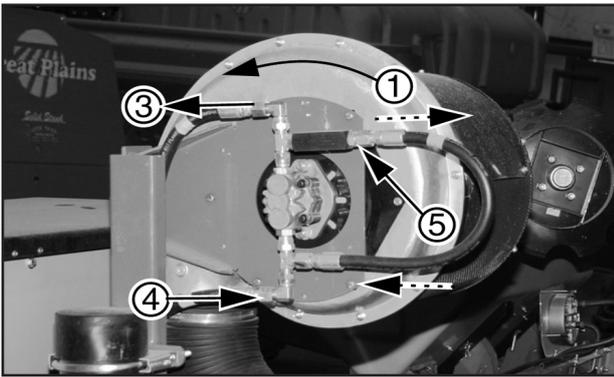


Figure 13. Hydraulics at Fan

Fan speed is controlled by the tractor circuit and butterfly valve (and not the seed monitor).

Note: Fan speed can change as oil heats to operating temperature. Re-check meter pressurisation more often during early operations.

You may stop the fan by setting the circuit to Neutral or Float. The check valve slows the blades to a stop by locally recirculating the oil.

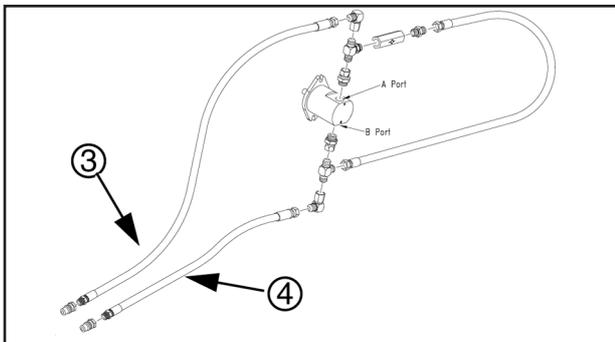


Figure 14. Fan Hoses.

If the fan is connected in reverse, it may not run at all (due to no oil source at the return connection). If oil is present, oil will bypass at the check valve preventing the fan from reaching high rpm. A reversed fan may send some air to the meters, but is incapable of providing reliable air flow for planting.

3.8 Fan General Operating Information

Adjust the fan to provide the meter pressurisation recommended for the seed disc, seed, and seed density. See the tables and charts for recommended values in the Seed Rate Manual.

Normal gauge readings are in the 0.8 inch to 4.0 inch water pressure range, and vary considerably with crop.

Use tractor remote hydraulic valve flow control to set fan speed and butterfly valve adjustment to make fine adjustments to meter pressurisation. Precise technique depends on tractor capabilities:

- The objective is to obtain recommended meter pressurisation, and maintain it during end-of pass marker fold, lift and turn.
- For any setup adjustment, operate the tractor engine at typical field rpms, and not at idle.
- Preset the butterfly valve. Use any setting that you previously developed for the crop/disc/range, otherwise:

If the tractor has fine control of remote flow rates, and consistent flow at varying tractor engine rpm, initially set the butterfly valve to 30° or less.

If the tractor has only coarse control of flow, initially set the butterfly valve to 45° .

- Set the fan circuit flow to bring the gauge reading to near the recommended value.
- Fine tune the meter pressurisation with the butterfly valve.
- If the tractor has marginal flow available, or the lift circuit has priority, you may need to experiment with combinations of fan flow and butterfly valve settings.

Always start the fan with a low flow setting. Gradually bring fan up to the recommended initial meter pressurisation.

At excessive rpm, too much air flow can cause:

- oil heating
- slow lift times

If desired pressure cannot be reached, or requires unusually high oil flow at low butterfly valve settings, chances are the fan is running backwards. Reverse the inlet/return lines at the hitch.

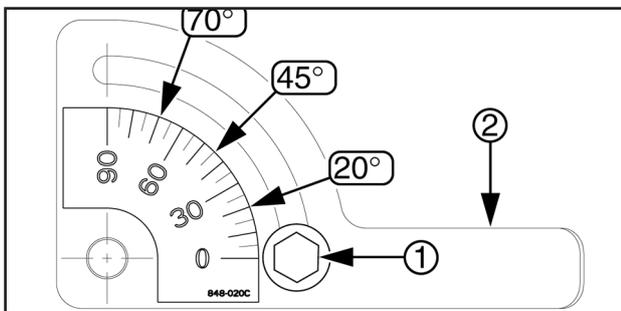


Figure 15. Fan Butterfly Valve Handle

Butterfly Valve Operation:

To adjust, loosen bolt (1) and rotate the handle (2).

Re-tighten bolt.

0° is wide open - maximum air flow.

90° is closed - minimum air flow.

The valve provides the most effect at settings between 20° and 70° .

Starting at 30° reduces the fan workload. Starting at 45° provides the most adjustment range up or down.

- Note: You may find that different crop, seed disc and rate range combinations need different valve settings. If so, make a note of the valve angle on the chart in the Seed Rate manual.
- Low Population Risk at Turns: The fan requires up to 4.5 gpm. This figure does not include oil for lift/lower or oil for marker operation. Aggressive lift/lower operations, and simultaneous lift/marker operations, can reduce fan rpm below that needed to pressurize meter discs. If seed falls out of pockets, low population bands will occur shortly after turns.
- Unless the tractor has generous oil flow capacity, raise/fold markers before lift, and lift slowly. Watch meter pressurisation and tune operations to keep it at planting levels in turns.

3.9 Air-Pro® Meter Operation

Refer to Figure 16

The meter disc is driven, top forward, by a chain drive (not shown) always connected to the section drive shaft. At non-planting rows, use a blank disc.

Seed is air-delivered to the inlet above the air release screen. Seed customarily fills to the top of the screen, blocking further air flow from the seed delivery system, until the seed level falls below the screen.

Seed enters the meter at the seed inlet shutter (2) (if open), and forms a seed pool (3) at the base of the meter. Seed pool size is controlled by the shutter handle (4) setting (which is the only user adjustment at the meter). Initial shutter settings are given in the seed rate charts.

Meter pressurisation air enters the meter at (5), and exits the meter primarily at the seed pockets in the seed disc. The pressure differential holds seed in the disc pockets (6) rising from the seed pool. Excess seed at a pocket is picked off by the tickler brushes (7).

The strip and drop brushes block meter pressurisation air. Seeds passing the drop brush (8) are free to fall into the seed tube, and are detected by the seed sensor (9).

Meter Operation

1. Install discs for your crop/population range per the Seed and Fertiliser Rate manual and the instructions of this manual.

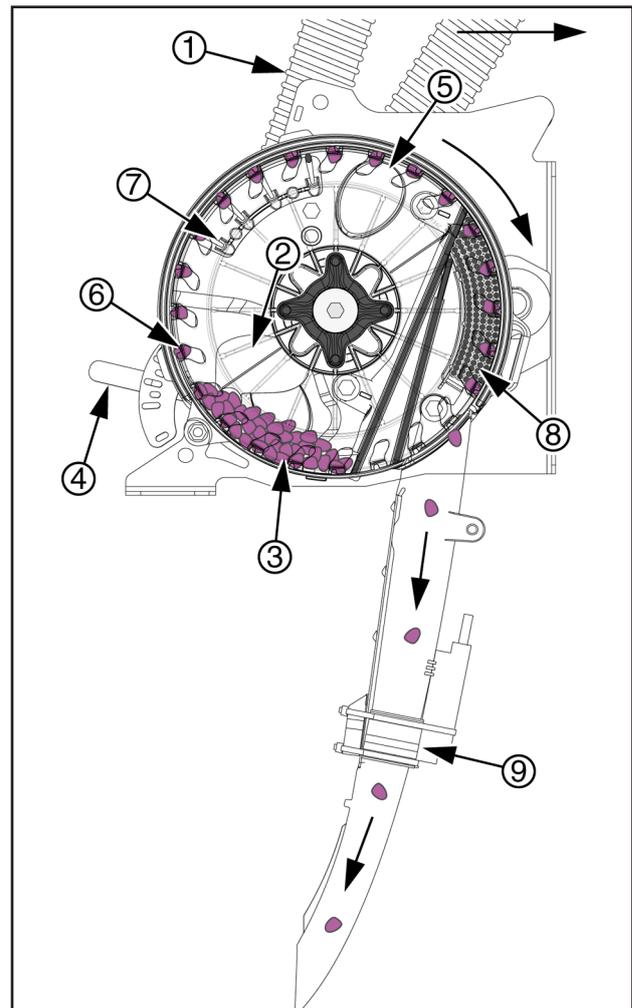


Figure 16 Air Pro Seed Meter at Row

2. Open the shutter at planting rows to the recommended initial setting (from the Seed Rate charts). At unused rows, install a blank disc and close shutter.

3. Set sprocket indexing if staggering a twin-row crop (see Seed and Fertiliser Rate manual for details).

4. Operate fan to achieve suggested manifold pressure

5. Open slide gates to fill meters.

6. With all rows primed, rotate meters one turn to fill pockets to edge of drop brush. Rotate the drive shaft (top forward) with a 7/8 inch (23 mm) wrench, or raise and rotate ground drive wheel (top forward).

7. Leave fan running (to keep seed in top pockets). Re-install rain covers. Commence planting. Meter operation is automatic from this point on.

See also:

“Seed Pool Troubleshooting”

“Meter Clean-Out”

“Meter Brush Maintenance” .

3.10 Marker Operation (Option)

Before Operating Markers

- Make sure cylinders are properly bled. See “Marker Maintenance (Option)”.
- This section presumes correct marker extension for your pass spacing. If this has not been set, or needs to be changed, see “Marker Extension” on.
- Markers are equipped with an automatic sequence valve that controls which side activates, as well as marker deployment speed. Marker folding speed is adjusted via set screws on the sequence valve body.

Excessive folding speed may damage markers. Set speed prior to first field operations. See “Marker Speed Adjustment”.

Marker Unfold (one side)

1. Move tractor hydraulic control (lever or switch) for the marker circuit (typically to Extend). Hold until marker is completely unfolded. Do not leave tractor control in detent.
2. If the marker side operating is not the desired side, let it unfold part way, and move the tractor’s circuit control to Retract. When the marker is folded, move the circuit control to Extend to activate the other side.

Both Sides Unfolded

With both markers in the upright/tilted positions:

1. Unfold either side, and when completely deployed:
2. Move lever/switch to Retract momentarily, and return to Extend to deploy other side.

Row Marker Operation

To alternate which side is marked:

1. Move the tractor’s circuit control to Retract. Hold until marker is folded.
2. Move the tractor’s circuit control to Extend. Hold until the new side’s marker is fully unfolded.
3. Return tractor control to neutral/off.

Folding The Markers

If your planter has markers, fold them before performing a lift operation.

1. Move the tractor’s circuit control to Retract. Hold until marker is folded.
2. Tilt markers down for transport or storage.

3.11 Field Set up Checklists

Use the following tables to develop a final checklist for your tractor/planter configuration.

Mechanical Checklist
<input type="checkbox"/> Planter hitched
<input type="checkbox"/> Parking stands raised
Electrical Checklist
<input type="checkbox"/> Verify electrical hook-ups solid
<input type="checkbox"/> Check seed monitor terminal and observe any diagnostic messages
<input type="checkbox"/> a. Refer to monitor manual.
Hydraulic System Checklist
<input type="checkbox"/> Check tractor hydraulic reservoir full
<input type="checkbox"/> Fan case drain Fan return Fan motor pressure side (retract)
<input type="checkbox"/> Inspect connections for leaks
<input type="checkbox"/> Check fan speed and airflow direction
a. Operate fan briefly. Observe rotor blades spinning toward exit port as fan slows to a stop.
Mechanical Checklist (post-Hitching)
<input type="checkbox"/> Planter leveled
<input type="checkbox"/> Marker extension set
<input type="checkbox"/> Marker disc angle set
<input type="checkbox"/> Markers folded (unless already at start of first planting row)
Planter Meter Drive Checklist
<input type="checkbox"/> Check chain lubrication and slack
<input type="checkbox"/> Calibrate speed sensor pulses with planter lowered.
<input type="checkbox"/> Seeding: Set/check Range and Transmission against rate chart
a. Refer to seed monitor manual.
b. Refer to Seed and Fertiliser Rate manual.

Additional or fewer steps may be necessary depending on tractor features, planter options and planting accessories.

Air System Checklist
<input type="checkbox"/> Fan butterfly valve set
<input type="checkbox"/> Seed loaded. Lids closed.
<input type="checkbox"/> Meter shutters open to chart value
<input type="checkbox"/> No air leaks (except from seed hoppers)
<input type="checkbox"/> Hoses and tubing - no sags, no pinches Check both manifold and sensor lines
<input type="checkbox"/> Hoses fully connected to meters
Row Units Checklist
<input type="checkbox"/> Preset depth handles alike.
<input type="checkbox"/> Preset down force springs alike, except in tracks.
<input type="checkbox"/> Option: Set all unit-mounted coulters to 1/4 inch shallower than opener blades.
<input type="checkbox"/> Check coulter alignment to row
<input type="checkbox"/> Check closing wheel alignment
<input type="checkbox"/> Set press wheels alike, except in tracks.
<input type="checkbox"/> Check action and contact of side depth wheels
<input type="checkbox"/> Check wheel scraper gaps (if installed)
<input type="checkbox"/> Slide gates open
Meters Checklist
<input type="checkbox"/> Corn? Check timing of meters for twin-row
<input type="checkbox"/> Check chain tension. Re-connect any loose idler tensioning springs.
<input type="checkbox"/> Correct discs for seed
<input type="checkbox"/> Start fan. Operate at field manifold pressure.
<input type="checkbox"/> Rotate meter drive shafts one turn discs with seed.
a. Refer to Seed and Fertiliser Rate manual.

Field Operation

Perform all steps in “Pre-Start Checklist” on page 31 and “Field Set-Up Checklists” on page 42.

First Pass Operation Checklist

1. Slide gates open. Shutters set.
2. Raise planter and line up at start of first planting row.
3. Prime meters with seed. Leave fan running.
4. Unfold marker on next-row side.
5. Pull forward, lower planter, and begin planting for a short distance.
6. Stop. Assess:
 - planting depth
 - seed spacing
 - press wheel operation
7. Make necessary adjustments
8. Resume planting.

Sharp Field Turns Checklist

1. Fold marker
2. Raise planter when fold is complete
3. Make turn
4. Lower planter
5. Unfold marker on next-row side.
6. Resume planting.
 - a. Monitor manifold pressure during end-of-pass operations and turns. Adjust operations as needed to maintain meter pressurisation.

Consult seed monitor for alarms during planting. Check that reported rates are consistent with your plan. When reloading seed, check consumption against anticipated use to that point.

Suspending Planting Checklist

1. Stop tractor
2. Fan hydraulic circuit to Float or Neutral
3. Hydraulic drive circuit to Float or Neutral
4. Fold Marker
5. Raise planter

Ending Planting Checklist

1. Suspend operations as above, then
2. Lights ON
3. Transport

3.12 Short Term Parking

1. Fold markers.
2. Choose a location with level firm ground. Do not unhitch on a steep slope.
3. Raise planter and insert transport shims.
4. Lower parking stands to ground and pin.
5. Lower planter.
6. Set hydraulic circuits to neutral.
7. Disconnect hydraulic lines. Secure them so that they do not touch the ground.
8. Disconnect electrical cables, capping where provisioned.
9. Unhitch. Restart tractor and pull away from planter.

3.13 Long term storage

1. Complete Parking steps.
Park the planter indoors if possible.
2. See "Material Clean-Out". Clear all seed from seed container, air box, seed delivery system and meters.
3. Close slide gates and latch hopper lids.
4. Remove seed discs from meters (this is primarily to relieve pressure on brushes). Clean discs of residue build-up (see Caution at right). Use mild soap, non-abrasive scrubbers, and hot or warm water. If using sealed storage, dry discs prior to storage.



Possible Chemical Hazard: Seed discs will have talc and graphite residue, and may have residues of hazardous seed treatments. Do not wash discs where food is prepared, or where cookware or dinnerware is washed. Wear gloves when washing discs. Avoid spray. Although the discs are dishwasher-safe, do not wash them in an appliance also used for food cookware or dinnerware.

5. Tie or tape a small plastic bag over ends of all seed delivery tubes to prevent insects from entering or nesting.
6. Close seed inlet shutters at meters (to prevent pest entry to seed hoses). Thoroughly clean seed and seed treatment residue from seed meters. See "Meter Clean-Out", for more information.
7. Clean planter of mud, dirt, excess oil and grease.
8. Lubricate all points listed in Maintenance.
9. Apply grease to exposed cylinder rods to prevent rust.
10. Inspect planter for worn or damaged parts. Make repairs and service during off season.
11. Use spray paint to cover scratches, chips, and worn areas on the planter to protect the metal.
12. Cover planter with a tarp if stored outside.

4.0 Adjustments

4.1 Setting Material Rates

Full details on rate setting sprocket selection and installation are found in the YPE Seed Rate Manual. This is a summary. Setting the seeding rate requires the following steps:

1. Monitor setup
2. Seed disc selection,
3. Drive speed Range sprockets,
4. Transmission sprockets,
5. Inlet shutters
6. Meter pressurisation,
7. Checking seeding rate.

All rate adjustments are performed at the left end of the planter. There are no adjustments at the ground drive assembly.

4.1.1 Planting Rate Details

1. Rate: Monitor configuration:

The seed monitor must be set up with the

- correct row count,
- correct row spacing,
- speed calibration and;
- expected population limits, in order to have accurately rate reports and useful alarms.

See the YPE Seed and Fertiliser Rate manual and the DICKEY-john® Planter Monitor operator (PM) manual.

If you only plant with the factory configuration of the planter, you never need to update row count and spacing. If any rows are unused, adjust the monitor setup.

Speed calibration must be done prior to first use, and re-calibration is recommended periodically, particularly if soil conditions change.

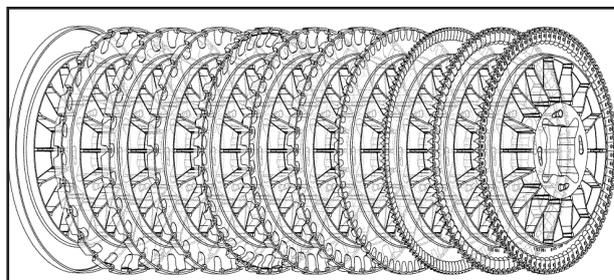


Figure 17. Air Pro Speed Discs

2. Rate: Disc Selection:

The YPE Seed and Fertiliser Rate manual has a table of recommended discs. Discs are specific to crops. Some crops have multiple discs available, to cover both seed varieties, and different populations within disc rpm limits. Discs have a high and low rpm limit, which also corresponds to a high and low field speed limit. The charts account for these limits.

If any rows are unused, install special blank discs. See “Row Unit Shut-Off”.

3. Rate: Range Sprockets

Range sprockets provide coarse control of seed rate.

Refer to Figure 18 and Figure 19
All Seed Rate charts specify a DRIVING and DRIVEN sprocket combination for the Range. Crops with more than one range are noted as “LOW RANGE” or “HIGH RANGE” at the top of the chart.

To change Range:

- a. Loosen the bolt securing the idler. Disengage the idler. Remove the chain.
- b. Remove pins from shaft ends at DRIVING and DRIVEN sprockets.
- c. Exchange sprockets so that new DRIVING and DRIVEN sprocket tooth counts (stamped on sprocket face) match chart. Re-pin all shafts.
- d. Remount chain. Re-engage idlers for 1/4 inch (6.4 mm) slack in chain span.

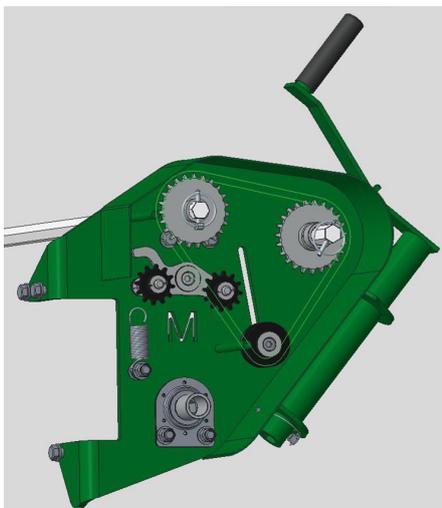


Figure 18. Range Sprockets

4. Rate: Transmission Sprockets

Transmission sprockets provide fine control of seed rate. Each chart row provides a rate adjustment of 2 to 3%.

Each Seed Rate chart row has a unique pairing of DRIVING and DRIVEN Transmission sprocket.

To change Transmission:

- a. Remove the chain.
- b. Remove pins from shaft ends at DRIVING and DRIVEN sprockets.
- c. Exchange sprockets so that new DRIVING and DRIVEN sprocket tooth counts (stamped on sprocket face) match chart. Re-pin all shafts.
- d. Remount chain. Re-engage idlers for 1/4 inch (6.4 mm) slack in chain span.

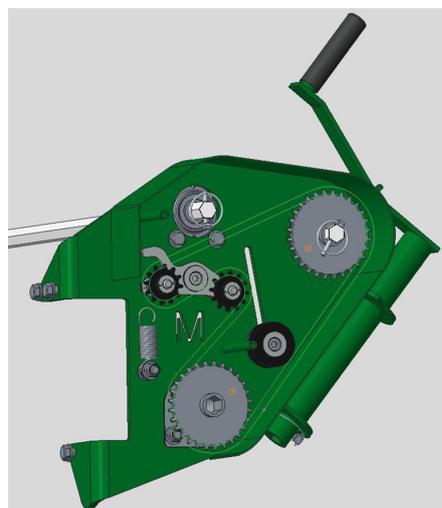


Figure 19. Transmission Sprockets

5. Rate: Seed Inlet Shutter

A consistent crop results from having a consistent number of seeds (usually one) in each pocket of the seed disc, avoiding “skips” (fewer seeds per pocket) and “doubles” (excess seed per pocket).



Figure 20. Seed Inlet Shutter: Setting II

Refer to Figure 20

One of the factors that affects seed pickup at the disc is having an optimal seed pool . The depth of the seed pool is controlled by the seed inlet shutter .

Each Seed Rate chart specifies a suggested initial shutter setting. See “Seed Inlet Shutter Adjustment” for setting details, and further adjustment.

At unused rows, set the shutter to zero/closed to prevent loss of meter pressurisation air. Install a blank disc. See “Row Unit Shut-Off”.

6. Rate: Meter Pressurisation

Refer to Figure 21 (which depicts a typical reading for some densities of corn)

A major factor that affects seed pickup at the disc is optimal meter pressurisation. Fan air holds the seed in the disc pockets until they pass the drop brush.

The Seed and Fertiliser Rate manual has a section with suggested initial meter pressures, which may be a single value, or a graph based on seed density.

Meter pressure is set by a combination of tractor circuit lever and fan butterfly valve.

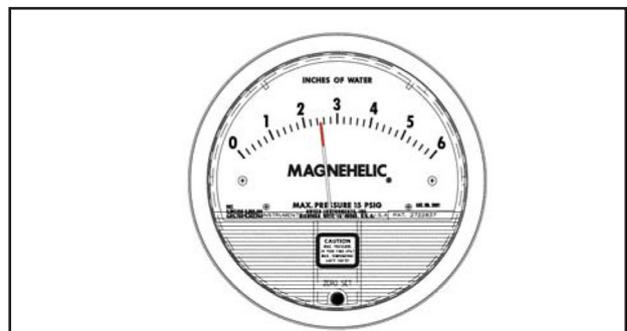


Figure 21. Meter Pressure Gauge

7. Rate: Checking

Although the seed monitor reports a computed population based on seeds sensed, only an actual furrow check provides certainty about the actual seeding rate. See the Seed and Fertiliser Rate manual.

4.2 Marker Disc Adjustment



Sharp Overhead Object and Pinch/Crush Hazards: Never allow anyone near the planter when folding or unfolding the markers. Markers may fall quickly and unexpectedly if the hydraulics fail. Anyone beneath may be injured if hit by an unfolding marker, or caught in a folding marker.

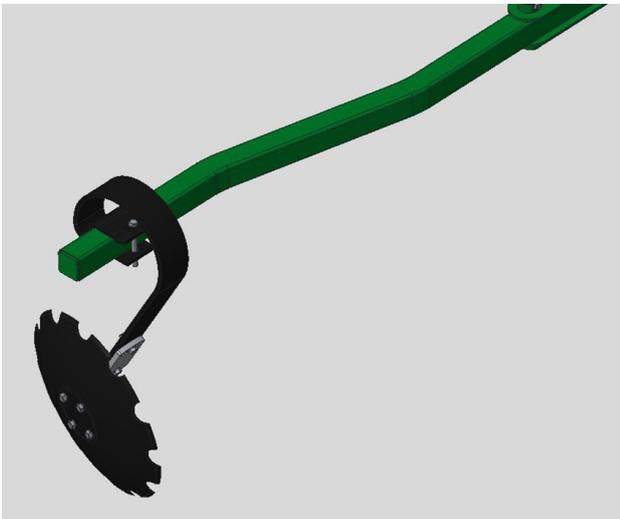


Figure 22. Marker Disc

Refer to Figure 22

1. To change angle of cut, and the width of the mark, loosen bolts holding the disc assembly.

For a wider mark, increase the angle of the marker with respect to the tube. For a narrower mark, reduce the angle.

Note: Do not set a marker angle wider than needed to make a useful mark. Excess angle increases wear on all marker components.

2. Tighten bolts.

Note: Direction of travel tends to drive the disc angle to Wide. If bolts are not tight enough, or loosen over time, disc slips into the Wide mark configuration.

4.3 Fan and Adjustment

1. These steps presume that correct seed discs are installed (per Seed Rate Manual), and the seed inlet shutters are set for the seed.

2. With fan off, check meter pressurisation reported by the Magnehelic® gauge. Re-zero as needed.

3. Determine the recommended meter pressurisation based on your own notes or the published value in the Seed Rate Manual.

4. Put tractor in Park and set brakes. Set tractor engine speed to typical field rpm. Lift planter.

5. Start the fan. Gradually increase fan speed using the tractor's hydraulic flow control for the circuit. Using hydraulic flow and/or the butterfly valve, adjust meter pressurisation to the developed or suggested value from step 3.

6. Rotate ground drive wheel to fill meters. Meters are filled when seed begins emerging below two or more openers. With fan running, put the tractor in Park and set the brakes. Walk behind the wings, remove several rain covers, and check for seed in meters by looking through the clear discs.

7. Re-check meter pressurisation. With meters and discs filled, air loss through empty disc pockets is reduced, and meter pressurisation can change.

8. Begin planting. Troubleshoot any obvious problems or optional seed monitor alarms.

9. During the first pass, take note of the average populations reported on the optional seed monitor.

If the reported seed monitor population varies from your intentions by a significant amount, it is imperative to perform a furrow check.

For serious rate variances, for which the source of the problem and the solution are not quickly determined, see "Population Troubleshooting Charts".

If the population is only slightly low, the problem can be skips (periodic empty disc pockets). If slightly high, the problem can be doubles (period pockets with double seed). An adjustment to the meter pressurisation may correct either condition (see step 12).

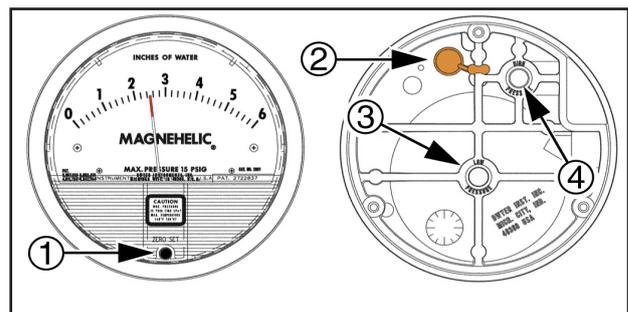


Figure 23. Magnehelic® Gauge

Re-zero the Magnehelic® gauge on level ground with the fan off, and if possible, under no-wind conditions. Turn the set screw (1) on the meter face until it reads zero from the tractor driver's viewing position.

Port ID for Troubleshooting (Figure 23):
 (2) Over-pressure relief port (with plug in place)
 (3) Low-pressure port (breather/ atmospheric pressure)
 (4) High-pressure port (from manifold chamber)

Small seeds, such as Milo, may be under-reported by the seed monitor. Use the “Alternate Skip/Double Check” below to verify seed status at the disc pockets.

4.3.1 Furrow Check:

Expose several seeds in each of several rows, being careful not to disturb their relative positions. Measure and average the distance between seeds. Compare this to the predicted seed spacing for the population in the Seed Rate Manual.

Any instances of no seed where expected may be a sign of “skips”. Finding two seeds at the same spot is clear indication of “doubles”

10. Resume planting. A small varying population deviation between rows is normal. If a row is consistently running lower or higher than the other rows, it could indicate a meter or seed sensor problem that needs attention. “Population Troubleshooting Charts”.

11. Continue to monitor meter pressurisation. When oil reaches operating temperature, fan speed can change. Expect to make periodic adjustments to fan circuit or butterfly valve to maintain ideal meter pressurisation.

12. Skips: If all else is correct, and the overall average population is running low (or there are gaps upon furrow check), the cause may be seeds falling out of disc pockets before delivery to the seed tube. Increase meter pressurisation to correct this.

Insufficient meter pressurisation, or unusually rough fields, can increase the incidence of empty pockets. Be sure to rule out other causes (such as skipping chains, meter starvation, incorrect meter discs) before adjusting meter pressurisation to reduce apparent skips.

13. Doubles: If all else is correct, and the overall average population is running high (or there are double seeds upon furrow check), the cause may be two seeds in some disc pockets at delivery to the seed tube. Decrease meter pressurisation to correct this.

Excess meter pressurisation can increase the incidence of doubles. Be sure to rule out other causes (such as incorrect meter discs) before adjusting meter pressurisation to reduce doubles.

4.3.2 Fine-Tuning Meter Pressurisation

After several passes, and you are comfortable with the planter’s operation, you can optimize meter pressurisation. Use this method during longer passes, so there are fewer distractions (and see sidebar regarding Milo).

14. Observe the current overall average population reported by the monitor.

15. Adjust the fan speed down, in small steps, waiting 5-10 seconds between adjustments, until skips occur (actual population begins falling below target). Note the pressure at which skips begin.

16. Restore pressure to the initial value at step 14.

17. Adjust the fan speed up, by periodic small increments, until doubles occur (actual population begins rising above target). Note the pressure at which doubles begin.

18. Adjust meter pressurisation to a value halfway between the limits established at step 15 and step 17. This is the ideal value for your crop, disc and population, providing equal margin against skips and doubles. Record this value for future use.

4.3.3 Alternate Skip/Double Check

Small seeds, particularly Milo, are less reliably sensed as skips or doubles by the seed tube sensors, and watching monitor population is unlikely to locate the pressure limits. This test can also be quicker for all seeds.

A. After planting a few passes with initial settings, remove the rain covers from several rows (use rows with a variety of seed hose lengths and routes).

B. Make a meter pressurisation adjustment. Resume planting for a pass or less.

C. Stop planter motion but leave engine at field rpm and fan running.

D. Inspect the seed discs closely. Look for empty seed cells (skips) and cells with multiple seeds (doubles).

E. Repeat step B-to-step D until limits are established. Record limits. Re-install rain covers. Plant with median settings.

4.4 Gauge Wheel Adjustments

The minimum tool bar height is limited by the gauge wheels. In some conditions, such as ridge planting, you may need to use a tool bar height lower than 660mm (26 inch).

There is adjustments for this at the gauge wheels.

- Gauge wheel shims :
This provides a variable height reduction.

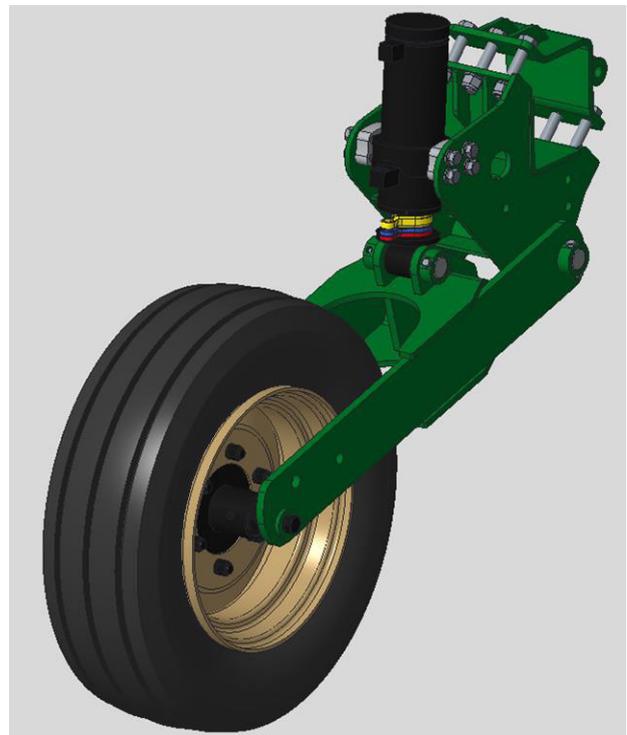


Figure 24. Gauge Wheel Height

4.4.1 Yoke Adjustment

Refer to Figure 25

To adjust the height:

1. Raise the planter until the planter is at recommended height.
2. Install correct shims to set height.



Figure 25. Gauge Wheel

4.5 25AP Series Row Unit Adjustments

(Refer to figure 26)

1. **Lock-Up Pin Storage Hole (Hole Standard)** See “Row Unit Shut-Off”.
2. **Down-Pressure Cam (Standard)** Row units are mounted on parallel arms. This parallel-action mounting allows the row unit to move up and down while staying horizontal. Springs add an adjustable force, set by the cam, to the row weight. See “Row Unit Down Pressure”.
3. **Meter Pressurisation Air Inlet (Standard)** Pressure-regulated air enters the meter here and holds seed in the disc pockets. See “Fan and Adjustment”.
4. **Seed Delivery Hose Inlet (Standard)** When the hopper slide gate (not shown) is open, gravity carries the seed into the meter at the shutter. The hose is easily removed for inspection. There are no adjustments.
5. **Air-Pro® Seed Meter (Standard, Choice of Discs)** See “Air-Pro® Meter Disc Installation”.
6. **Seed Inlet Shutter (Standard)** This controls the level of bulk seed at the disc. There are four operating settings, plus fully open (clean-out) and fully closed (shut-off or storage). See “Seed Inlet Shutter Adjustment”.

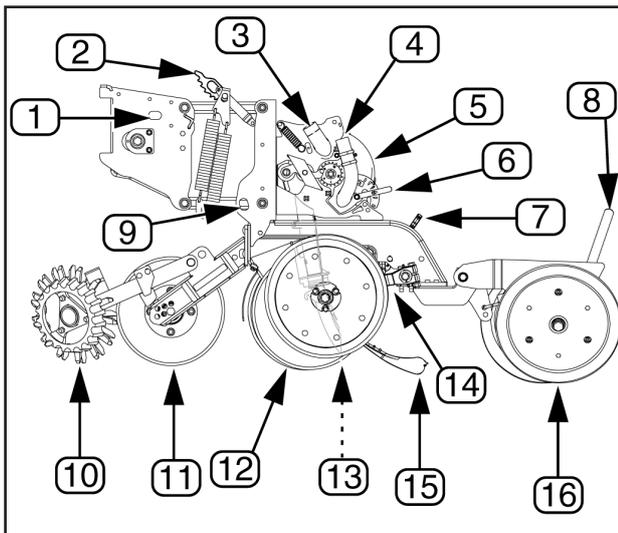


Figure 26. 25AP Series Row Unit

7. Side Gauge Wheel Depth (Standard)

The T-handle sets planting depth by controlling the height of the side gauge wheels relative to the opener discs. See “Side Gauge Wheel Adjustment”.

8. Press Wheel Force, Angle, Stagger (Standard) The press wheels close the furrow, gently pressing the soil over the seed to ensure good seed to soil contact for even emergence. See “Press Wheel Adjustment”.

9. Row Unit Lock-Up Hole (Hole Standard)

Pins are standard on some models. With the row unit raised above level, the lock-up pin is inserted here. See “Row Unit Shut-Off”.

10. Row Cleaner (Option) Row cleaners clear trash from the row, to a depth set by an adjustment on the arms. See “Unit-Mount Cleaner Adjustments”.

11. Unit-Mount Coulter (Option)

Coulters cut remaining trash and begin opening the seed furrow. Working depth is set by row depth and a mounting hole selection. See “UMC Coulter Adjustments”.

12. Opener Discs (Standard) Row-unit double disc openers create the seedbed furrow. They have adjustments for angle and spacing. See “Row-Unit Opener Disc Adjustments”.

13. Seed Tube with Sensor (Standard)

Requires no adjustment.

14. Scrapers (Optional, not shown)

Inside scrapers require no adjustment. For gauge wheel scrapers, see “Adjusting Gauge Wheel Scrapers”.

15. Seed Firmers (Seed Flap Standard, not shown) An optional seed firmer (Keeton shown) minimizes seed bounce and improves soil contact. It may also deliver fertilizer. See “Seed Firmer Adjustments”.

16. Press Wheel Type (Choice) A variety of single and dual press wheel assemblies are available, some region-specific. Consult your Great Plains dealer.

4.6 Row Unit Down Pressure

Refer to Figure 27

The ideal amount of down-force causes the side gauge wheels to compress any loose surface soil, but not press a trench into subsoil.

To assess down-force, operate the planter for a short distance on typical ground (with or without seeding), and stop. Leave the planter lowered (row units in ground).

At several row units, inspect the furrow created by the opener discs, but prior to furrow closing by the press wheels.

Note: Be sure to inspect rows both in and out of tyre tracks.

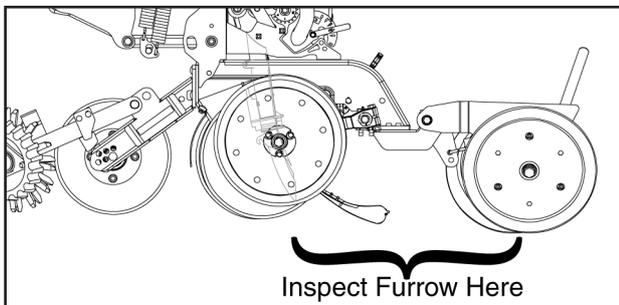


Figure 27. Checking Furrow.

Refer to Figure 28

1. If the side gauge wheels are leaving no tracks, or light tracks, increase down-force.
2. If the wheels are compressing trash and loose soil, and leaving clear tracks right at the top of the subsoil, down-force is probably correct and needs no adjustment.

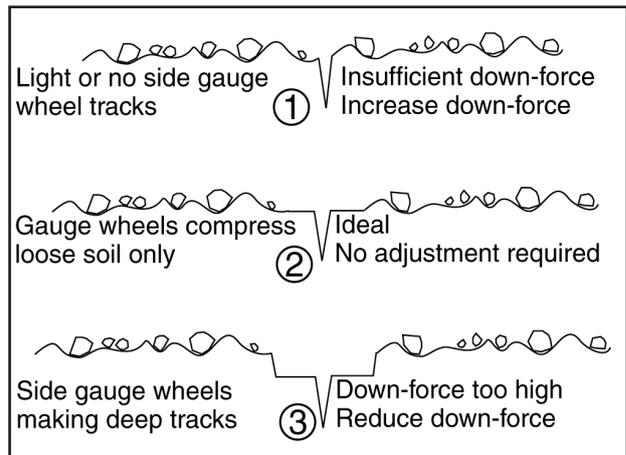


Figure 28. Assessing Down-Force

4.6.1 Adjusting Down-Force

Refer to Figure 29

Row unit springs provide the primary down pressure necessary for row unit discs to open a seed trench. The weight of the row units themselves contributes about 130 pounds (59 kg) of the total force.

The springs allow the row units to float down into depressions and up over obstructions. Springs also provide down force on coulters when using optional row mounted coulters, and provide the primary down force on row cleaners (optional), seed firmers (optional) and press wheels.

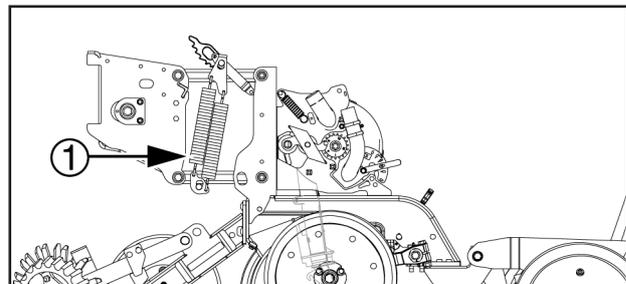


Figure 29. 25AP Series Row Unit Springs

Refer to figure 30.

An adjuster cam (2) sets down pressure individually for each row unit. This is useful for penetrating hard soil and planting in tire tracks. For best results always adjust tractor tires so they are not ahead of 30 inch rows.

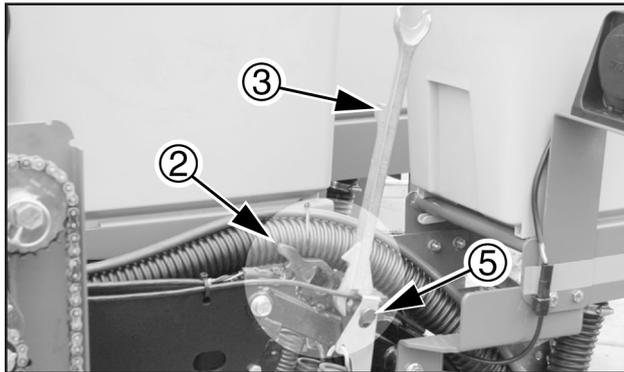


Figure 30. 25AP Series row unit spring adjustment.

Refer to figure 31 & 32.

Cam Notch	Pounds	Kilograms
zero (out of notch)	Lock-Up & Maintenance	
one	305	140
two	330	150
three	365	165
four	425	195
five	485	220
six	545	250
tip	Do Not Use	

Values are down force with hoppers empty 29958

Use only enough down pressure to cut the seed trench and maintain proper soil-firming over seed. With a full seed load, the force on each row is up to 120 pounds higher at start of planting.

Excessive row unit spring force will lead to premature wear on row unit components and uneven seed depth. If all rows are set to cam 4, some lighter planter configurations could be lifted out of ground contact.

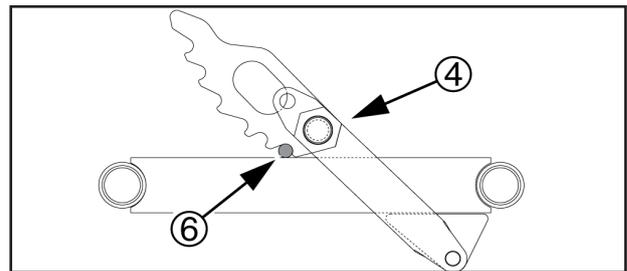


Figure 31. Row Unit Minimum Cam (at 1)

To adjust down pressure, use a 1 1/8 inch (29 mm) open end wrench or the tool (3) stored at the left end of the planter.

1. Raise the planter. Although this adjustment can be made with the planter lowered, the springs will be in tension, and will require more effort. The extra force required may also damage tools.
2. Install lift cylinder locks.
3. Put tractor in Park and shut it off.
4. Position wrench on the fixed nut (4) near or slightly forward of vertical.
5. Pull upper spring link (5) back.
6. Move the adjustment cam (2) to the new setting on the spring adjust bar (6).

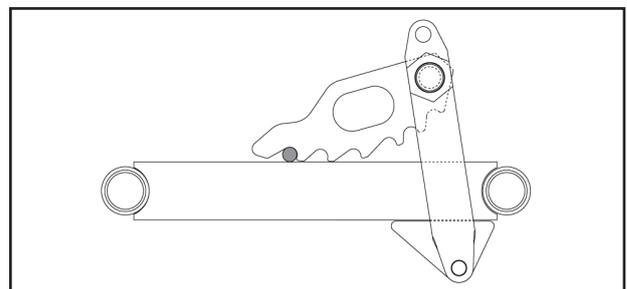


Figure 32. Row Unit Maximum Cam (at 6)

Note: Do not set all rows higher than notch four this causes uneven planting. Individual rows may be set higher if running in tyre tracks.

4.7 Unit-Mount Cleaner Adjustments

There are two adjustments:

Wheel height, adjusted by a stop. Cleaner arms float. The stop only sets the lowest position.

In UMRC mount, a pinned cross-tube on the mount adjusts the depth.

The row cleaner needs to be adjusted for your conditions, crop changes, and as coulters and openers wear. Ideally, cleaners contact only the trash, and do not disturb the soil. If allowed to “dig”, row cleaners can reduce seed coverage.

Suggested initial depth is tine tips at ground level.

Make the adjustment with the planter raised. Install cylinder locks. Also check bolt tightness prior to each planting session, to avoid down-stop slippage.

To adjust the row cleaner:

1. Determine the height adjustment required. Measure from the lowest tine to the ground. Determine the desired new measurement.
2. Support most or all of the weight of the arm to prevent injury and ease the adjustment. Loosen bolts on UMC-RC. Remove pin on UMRC.
3. Support arm at desired height.
4. UMRC: Slide adjustment tube until cross-tube contacts arm at target height. Insert pin in whichever hole pair is most in alignment.
5. Check the new height measurement.

4.8 UMC Coulter Adjustments

Note: Coulters are factory-installed. Check alignment and depth prior to first use.

4.8.1 UMC Coulter Depth Adjustment

The ideal operating depth for coulters is 1/4 inch (6 mm) above opener depth. Although they may have originally been set to this depth, coulters (and opener) blades wear with time, and may need adjusting.

Adjusting the coulters depth is accomplished by re-mounting the coulters blade in one of the six mounting holes arranged in a staggered pattern in the coulters bracket.

Refer to Figure 33

Raise planter and install cylinder locks before working on coulters. Row unit may be fully lowered or locked up. Do not attempt to move blade when the current or new position causes it to contact the ground during the adjustment. Be careful around the front end of row units. Row cleaner tines and coulters blades may be sharp.



Figure 33. 25 Series Unit-Mounted Coulter

To adjust coulters depth:

1. Determine the present opener and coulters depths.
2. Note which bracket hole the coulters is presently using.
3. Determine which new hole will position the coulters closer to the 1/4 inch-above depth. See the table below.
4. Remove the bolt, washer and nut.
5. Move the blade to the new position. Insert the bolt, and tighten on the washer and nut.
6. Re-adjust row cleaners, if installed.

If a worn coulters cannot be adjusted to satisfactory operating depth, replace coulters.

4.8.2 Coulter Row Alignment

Refer to Figure 34

For unit-mounted coulters, the ideal alignment is for the blade to open a furrow directly ahead of the opener discs.

As a check on coarse alignment, sight along the coulter blade center-line (1), the gap between the opener blades (2), and the center-line between the press wheels (3). If they are clearly out of alignment, either the coulter or the press wheels (or both) may be in need of adjustment.

The exacting test of correct alignment is field results. Operate the planter on some test ground (no seed required), and verify that the opener blades are in the groove opened by the coulter, and that the press wheels are centered over the furrow. See "Press Wheel Adjustment" for press wheel alignment.

Refer to Figure 33

To adjust coulter alignment, loosen the four bolts that attach its bracket to the row unit. The holes on the row unit are slotted, side-to-side, and allow the coulter bracket sideways and rotational adjustment.

Keep the coulter blade vertical while adjusting.

If the blade cannot be brought into alignment, check that the blade spindle itself is using the same hole location on each side of the bracket.

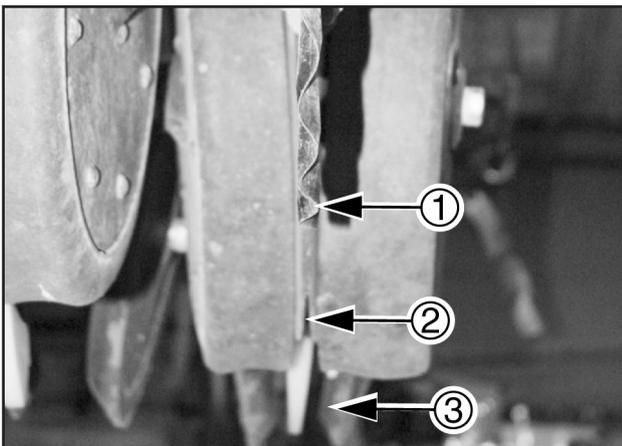


Figure 34. 25 Series Coulter Alignment

4.9 Row-Unit Opener Disc Adjustments

25 Series openers have three adjustments:

1. Planting/seed depth
2. Opener disc to disc clearance
3. Gauge wheel/opener disc clearance

4.9.1 Setting Planting Depth

Refer to Figure 35

The “T” handle (1) sets planting depth by limiting the how high the side depth gauge wheels ride relative to the opener discs. The position of the seed tube itself is fixed relative to the discs, and is not adjusted.

To adjust seed depth, pull the “T” handle (1) up and back, move it forward or aft, and set it back in a different pair of holes in the scale.

- For shallower planting, move the “T” handle (1) forward.
- For deeper planting, move the “T” handle (1) back.

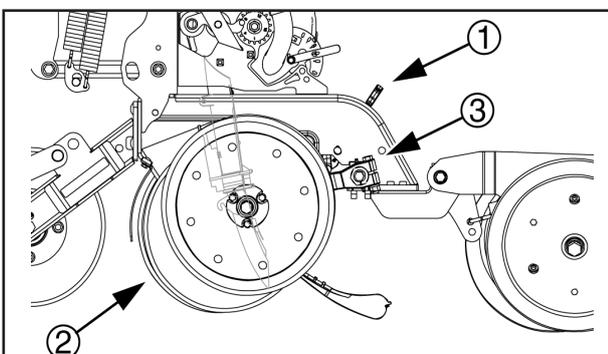


Figure 35. Opener Adjustments

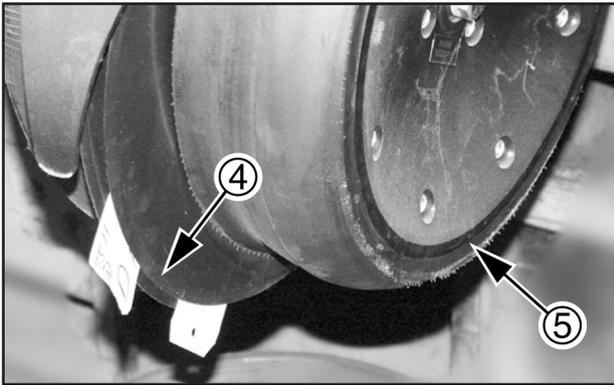


Figure 36. Opener Disc Contact Region

4.9.2 Opener Disc Contact Region

Refer to Figure 37 and Figure 38. Opener disc angle and stagger is not adjustable, but disc-to-disc spacing is, and may need attention as discs experience normal wear. Spacers will need to be reset when blades are replaced.

The ideal spacing causes the blades to be in contact for about one inch. If you insert two pieces of paper between the blades, they should slide to within zero (touching) to 1.5 inch (3.8 cm) of each other. If zero, the gap between the blades should not be significantly greater than the thickness of two sheets of paper.

If the contact region is significantly larger or there is a large gap, it needs to be adjusted by moving one or more spacer washers.

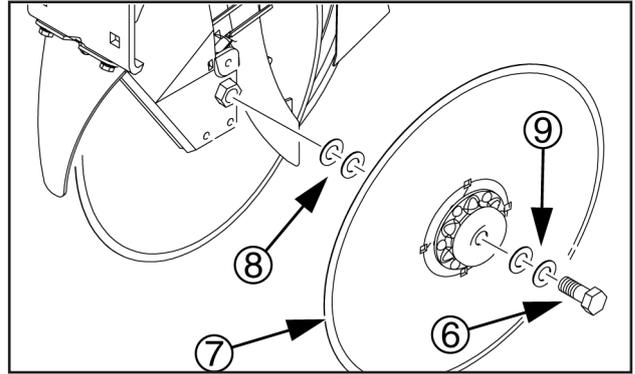


Figure 37. Opener Disc Spacers

4.9.3 Adjusting Disc Contact

1. Raise the planter and install lift cylinder locks.
2. Remove the side gauge wheels (5) on the row unit in need of adjustment.
3. Remove the bolt (6) retaining the opener disc (7) on one side. Carefully remove the disc. Do not lose the hub components and spacer washers (8), (9).
4. To reduce the spacing between the discs (the normal case), move one spacer washer from the inside (8) to the outside (9) of the disc.
5. Re-assemble and check disc contact.

4.10 Side Gauge Wheel Adjustment

Refer to Figure 38 and Figure 39
Disc-to-wheel angle and clearance ideally has the wheel just touching the disc when the wheel is raised to planting depth (is up against the stop set by the “T” handle). The goal is to have both discs and wheels turn freely, but keep soil and trash from getting between them.

These two adjustments interact with each other. Changing one requires at least checking the other.

In addition to changing the disc angle due to changing depth or new field conditions, these two settings may need attention over time as the disc and wheels wear from normal use. This adjustment will also need to be made if any opener components are replaced.

For 2 inch (5.1 cm) planting depth, adjust side gauge wheel angle so wheels contact row unit discs at the bottom of wheel. Check with row units in soil so wheels are held up.

At the same time, keep side gauge wheels close to opener discs so openers do not plug with soil or trash.

Note: Wheels should be out far enough so discs and wheels turn freely.

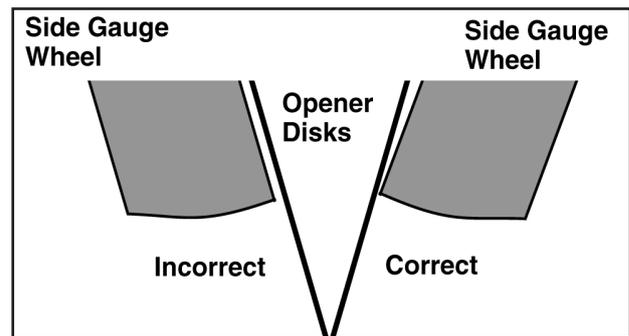


Figure 38. Disc/Gauge Wheel Alignment

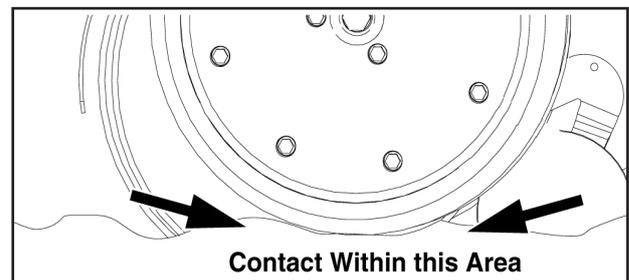


Figure 39. Opener-Gauge Wheel Contact

Refer to Figure 41

To adjust side gauge wheels:

1. Raise the planter and install lift cylinder locks.
 2. Loosen hex-head bolt (1) . Move wheel and arm out on O-ring bushing.
 3. Loosen pivot bolt (2) Turn hex adjuster (3) so indicator notch (4) is at 5 o'clock to 7 o'clock.
- Note: Use this as the starting point for adjustment.
4. Move wheel arm in so side gauge wheel contacts row unit disc. Tighten hex-head bolt (1) to clamp arm around bushing and shank.

Refer to Figure 40

5. Check wheel-to-disc contact at 2 inch (5.2 cm) planting depth. Lift wheel 2 inch, check contact and release. When let go, wheel should fall freely.

- If wheel does not contact disc at bottom to area where blade leaves contact with soil, move hex adjuster until wheel is angled for proper contact with disc.

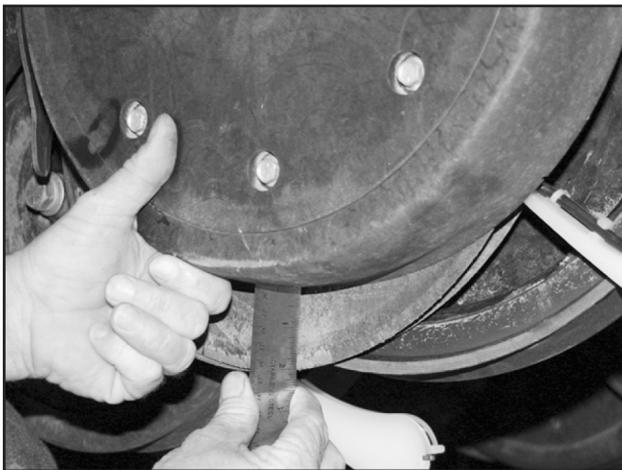


Figure 40. Checking Wheel/Disc Contact

- If wheel does not fall freely, loosen hex-head bolt and slide wheel arm out just until wheel and arm move freely. Retighten hex-head bolt according to grade:

1 2 inch Grade 5 bolt on 25 series:
75 foot-pounds (102 N-m).

1 2 inch Grade 8 bolt on 25 series:
110 foot-pounds (149 N-m).

Note: Use “Torque Values Chart”

6. Keep turning hex adjuster and moving wheel arm until the wheel is adjusted properly. When satisfied, tighten pivot bolt (2) to 110 foot-pounds (149 N-m).

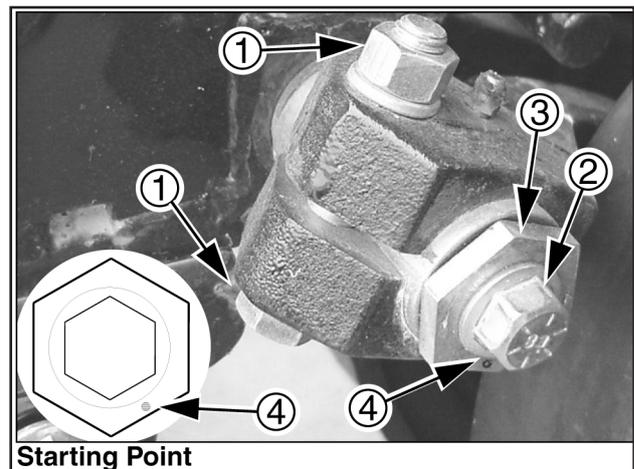


Figure 41. Disc/Gauge Wheel Adjustment

Adjusting Gauge Wheel Scrapers

Refer to Figure 42

Scrapers are optional, and may be useful in moist or sticky soils that tend to accumulate on gauge wheels and reduce intended planting depth.

To adjust scrapers:

1. Loosen nut (5) .
2. Slide scraper (6) toward gauge wheel (8) until scraper touches tire.
3. Slide scraper (6) away from wheel (8) leaving a 1/8 inch (3 mm) gap at (7) .
4. Rotate scraper left and right around bolt, making sure it cannot touch tire if bumped in field. If it can touch tire, back scraper away from wheel until it cannot.
5. Center scraper angle on bolt (5) until gap (7) is constant.
6. Tighten nut .

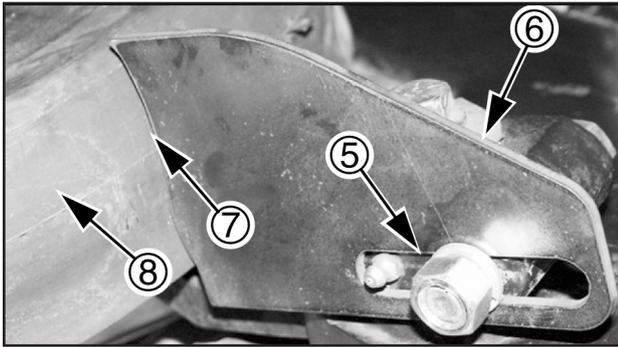


Figure 42. Gauge Wheel Scraper

4.11 Seed Meter Setup and Adjustment

There are adjustments for seed inlet, and choice of discs. There are no other adjustments, in particular no brush adjustments, at the meter.

4.11.1 Meter Rain Cover

The rain cover keeps side winds from unseating seed in disc pockets. It also keeps precipitation, sunlight and field debris out of the meters.

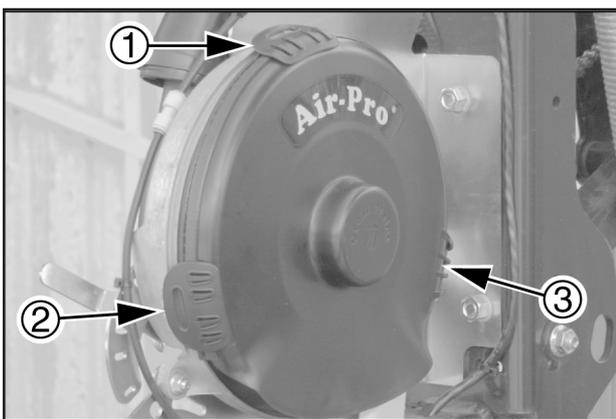


Figure 43. Rain Cover Removal

Refer to Figure 43

To remove the rain cover, peel the flexible snap latches, at top (1) and rear (2), away from the meter housing. Pivot the cover forward and down at tab (3) in slot.

When removing a cover, inspect it for damage and missing parts. If a cover does not have both latches, and an intact edge seal under the latches, the cover is apt to be lost during transport or field operations.

To replace a latch, temporarily remove the seal near the latch. Slide the replacement latch onto the cover lugs from the meter side, then snap the other end down over the lugs. Re-install the seal.

4.11.2 Seed Inlet Shutter Adjustment

Refer to Figure 44

The seed inlet shutter regulates the volume of bulk seed presented to the seed disc. The operating settings vary with crop, seed size and treatments. The shutter also has settings for row shut-off (completely closed), and clean-out (wide open).

The Seed Rate Charts include suggested initial shutter settings. Refine these settings based on experience, and on inspection of the slope of the seed pool at the bottom of the seed disc.

The shutter is operated by a handle. Lift the handle away from the meter plate. Move the handle to half a setting higher than the new setting, then back to the new setting, and lower the pawl into that slot.

The shutter is operated by a handle. Lift the handle away from the meter plate. Move the handle to half a setting higher than the new setting, then back to the new setting, and lower the pawl into that slot.

The table at right is a general summary of shutter settings.

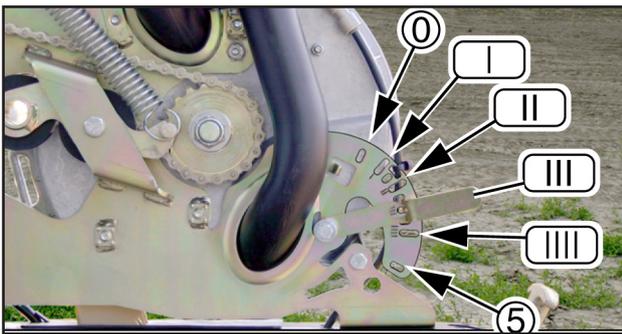


Figure 44. Seed Inlet Shutter.

Setting	Setting Typically Used For
Top (0)	Closed: Row Shut-Off, Meter Re-Fill
I (1)	Small seeds, such as Milo, with little or no treatments
II (2)	Small treated seeds and edible beans (such as Soybeans)
III (3)	Corn, round popcorn
IIII (4)	Large corn, or heavily treated corn
Bottom (5)	Wide Open: Clean-Out

4.11.3 Optimal Seed Pool Slopes

The optimal seed slope is one that results in the most consistent seeding, with minimal skips and doubles. The column at right has photographs of pool slopes found to be optimal for representative seeds.

If the suggested initial shutter settings do not seem to be working for your seed, adjust the shutter to achieve specific reserve slope targets.

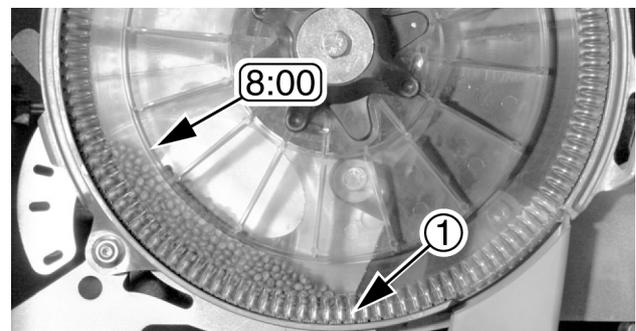


Figure 45. Milo: Seed Inlet Shutter at: 1

Refer to Figure 45

For medium size and smaller seeds that flow easily, the slope runs from just above the 8:00 (o'clock) position on the housing wall, forward and down to one or two seeds deep at the base of the rear strip brush (1).

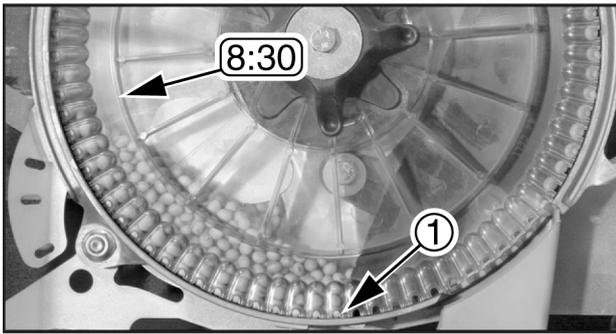


Figure 46. Milo: Seed Inlet Shutter at: 2

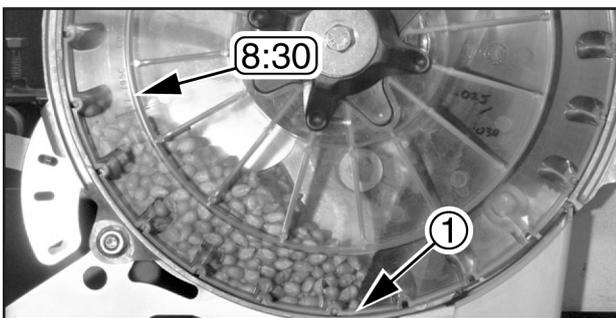


Figure 47. Milo: Seed Inlet Shutter at: 3

Refer to Figures 46, 47 and 48.

For medium size and larger, or heavily treated smaller seeds that flow less easily, the slope runs from at or slightly above the 8:30 (o'clock) position on the housing wall, forward and down to 3-to-6 seeds deep at the base of the rear strip brush .

In general, the seeds at the base of the strip brush need to be deep enough that no air escapes there, and so that just enough seeds are present to begin populating cells.

Keep the top left/rear end of the pool below the 9:00 o'clock position (meter horizontal center-line).

4.11.4 Meter Re-Fill

Once planting is underway with the seed pools set, it is infrequently possible for bridging at or above the inlet to starve the meter of seed.

An empty meter causes seed monitor "Row Failure" alarm, with a report of the row number. Row numbers are counted from the left wing (outside row is row 1).

Stop, and put the tractor in Park. Leave the fan running. Locate the failed row, remove the rain cover, and verify that the meter is empty. Note the shutter setting. Temporarily open the shutter one of two notches wider. If the problem was inlet bridging, seed should flow into the meter immediately.

If inlet bridging is not the problem, little or no seed flows into the meter with the shutter open wider. In this case, the problem is further up in the seed flow, and may be bridging where the seed hose joins the meter inlet (also check the slide gate). Close the shutter completely for about 15 seconds. This prevents meter pressurisation air from opposing seed delivery. Gently tap on the seed inlet. Re-open the shutter and see if seed now fills the meter.

If no obvious foreign object was the cause of the bridging, the shutter setting may have been too small for the seed. Verify that this and other operating rows were at the correct initial shutter setting. If so, re-set the shutters to the next higher opening.

4.12 Air-Pro® Meter Disc Installation

1. Cross-check Seed Rate Chart data against part number/description molded into discs to be used.

Note-Population Risk: Use the same disc in all active rows.

2. Inspect discs to be installed. Do not install damaged or excessively worn discs. Either can cause irregular seeding. Chips and cracks accelerate brush wear.

3. Remove meter rain cover.

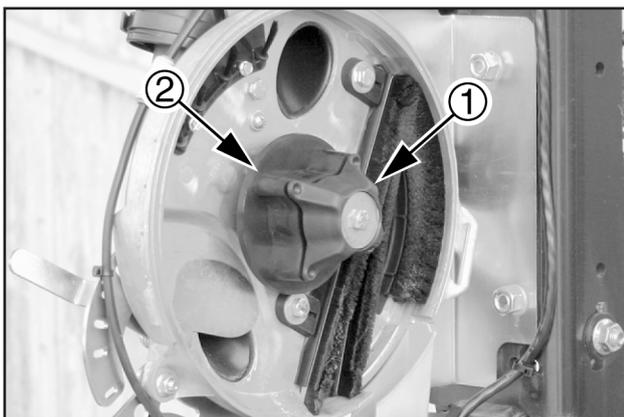


Figure 48. Disc Removed from Meter

Refer to Figure 48 (depicting an empty meter)

4. Inspect meter.

5. Make sure clamp (1) is aligned with seat (2).

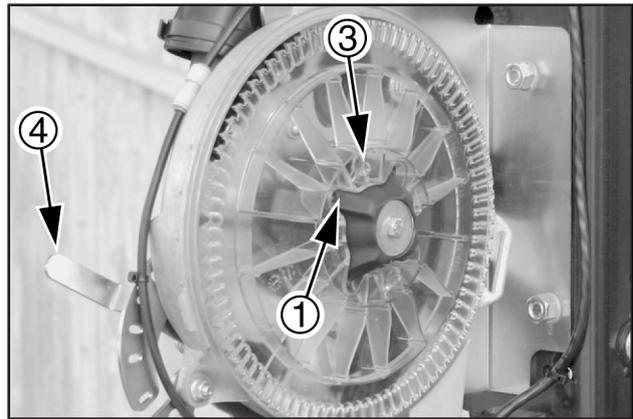


Figure 49. Disc on Clamp and Seat

Refer to Figure 49

6. With the seed pocket side facing the meter housing, place the new seed disc on the disc seat.

7. Rotate disc clamp (1) clockwise 45° to clamp disc. Clamp seats into detents (3) in disc hub.

Note: On a new meter, or with new brushes installed, force the disc into the brushes to allow the disc clamp to rotate. This condition eases as the brush fibers are trained during initial rotations.

Note: With slightly used brushes, when a disc is first clamped, it is normal for the disc hub to be flat with the face of the disc seat only on the inlet (rear) side. The disc fully seats as it first turns. This condition eases as the brush fibers receive further use.

Brush Mis-Seating Risk:

Rotate discs forward shortly after disc installation. If planting is not anticipated within an hour or two of disc installation, rotate the drive system a few turns to ensure that meter brushes lean in the correct direction. Correct lean improves meter performance and reduces air consumption. This step is particularly important for new brushes.

Brush seating may be accomplished with or without seed present. With the planter raised, rotate the ground drive wheel, or rotate the meter drive shaft, top forward, with a 7/8 inch (23 mm) open-end wrench.

8. Reset seed inlet shutter to setting recommended by Seed Rate Chart, or to your own developed value.

9. On the seed monitor console, select the new Material, seed disc Cell Count, and target population.

10. Re-install rain cover.



Figure 50. Disc Clamped

4.12.1 Removing a Seed Disc

Refer to Figure 51

1. Remove rain cover. If seed is present, close shutter (4) to prevent more seed from entering meter. Attach funnel or place a tarp under the row to collect seed.

2. Hold seed disc in meter. Rotate disc clamp (1) counterclockwise 45° to release disc.

3. Tilting top of disc toward meter, slowly remove disc, allowing seed to collect in funnel or to control flow to tarp. Open shutter to release remaining seed up to wing tube.

4. Clean seed from all brushes. Clean disc seat (2), so that new discs can seat fully. Inspect brushes for excess wear and damage. See "Meter Brush Maintenance".

5. Inspect removed discs for excess wear and damage. Set aside any discs requiring replacement. Clean other removed discs and place in storage. See "Seed Disc Maintenance".

6. Re-install the rain cover.

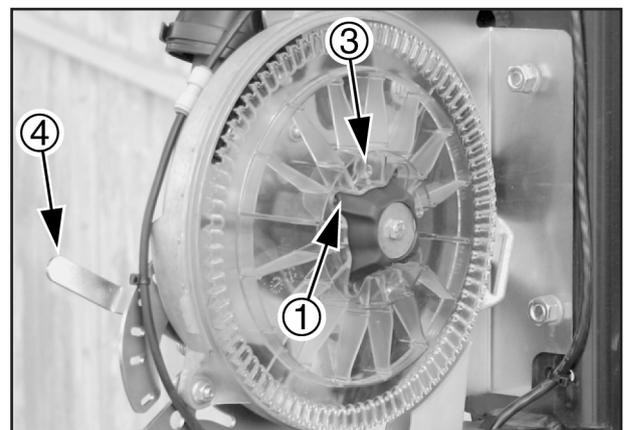


Figure 51. Remove Disc

4.12.2 Row Unit Shut-Off

Skip-row operations, such as planting from every other row when switching from 30 inch twin-row to 30 inch single-row, requires shutting down unused rows.

Shutting off seeding at a row involves 4 to 7 steps:

1. Identify the rows to shut off.
2. Fully close seed inlet shutter.
3. Replace seed disc with blank disc.
4. Lock up row unit to reduce wear.
5. Reset marker extension.
6. Reset monitor active row pattern and row spacing to avoid nuisance alarms (see Monitor manual).

Note: Meter drive is not disabled on 25AP row units during shut-off.

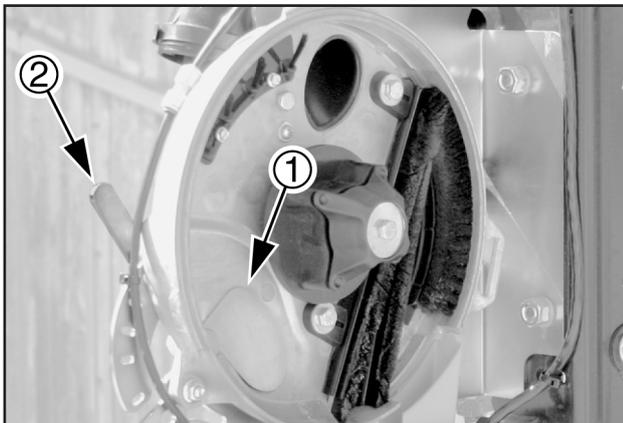


Figure 52. Seed Inlet Shutter closed.

1. Identify Rows to Shut Off

On twin-row planters, openers are installed with short and long opener mounts.

If locking up unused rows of a twin-row planter, shut off the rear (long mount) rows.

On single-row planters with mid-length mounts, any rows may be locked up.

If not locking up rows, any rows may be shut off.

2. Close Seed Shutter

Lift the handle (2) away from the plate.

Move it to the top position, and release the handle into the notch

Closing the shutter prevents meter pressurisation air from leaking into the bulk seed air system, resulting in lower pressures in adjacent rows, with risk of skips.

The shutter also stops seed flow from a row as soon as the meter is empty. Bulk seed flow to the row falls to nil as soon as the seed backs up to the air release vent at the top of the meter.

Note- Irregular Seeding Risk:

Always use a blank disc in a shut-off row.

Operating with no disc, or with a seed disc but no seed, destabilizes the regulated airflow, particularly at rows with pressure sensor lines.

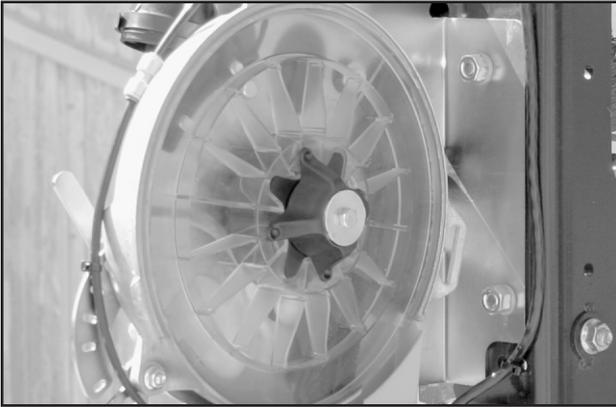


Figure 53. Shutter Closed, Blank Disc Installed

3. Install Blank Disc Refer to Figure 53.

Clean out meter. See “Meter Clean-Out”. Remove seed disc and install blank disc. See “Air-Pro® Meter Disc Installation”.

Blank discs (part number 817-841C) are essential in row shut-off, both to maintain consistent meter back-pressure to meter pressurisation and to prevent wear on seed discs and minimize wear on brushes.

Blank discs are engineered to simulate a seed disc with seed in all pockets. Blanks are particularly important on the rows with sensor lines to the pressure chamber.

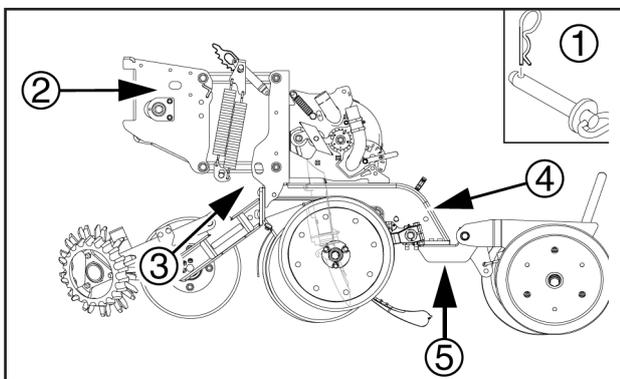


Figure 54. 25AP Row Unit Lock-up Pin

4. Lock-Up Row

Alternate twin-row units (the rear units) can be pinned in the up position to accommodate single-row spacing.

Refer to Figure 55.

The lock-up pins (1) are located in a storage hole (2) in the row unit mount. To lock up a unit, the unit must be raised, and the pin moved to the lock-up hole (3) in the row unit shank.

Note: Lock-up pins are provided for every other row of twin-row configurations. If you lose a pin, the replacement part number is 805-033C

1. Raise the planter. Although this adjustment can be made with the planter lowered, the springs will be in tension, and will require more effort. The extra force may also damage tools.

2. Install lift assist cylinder locks. Lower parking stands.

3. Set the down pressure spring cam to zero, per the instructions.

4. Raise the row unit high enough that the hole for the pin is above the lower parallel arm. This can be done in several ways, including:

- a. use a hoist at the rear of the shank
- b. use a jack under the shank extension



Use a jack or hoist. Raising a row unit on a block by lowering the planter is risky. The potential for hydraulic failure creates a safety hazard. Full lowering can damage components.

5. Remove the pin from the storage hole and insert and secure it in the lock-up hole .

6. Lower row unit until lock-up pin rests on lower parallel arm.

Note- Certain Machine Damage: Do not pin the row unit while it is in the lowered position. If the pin is inserted below the parallel arm, unit damage occurs as soon as planting begins.

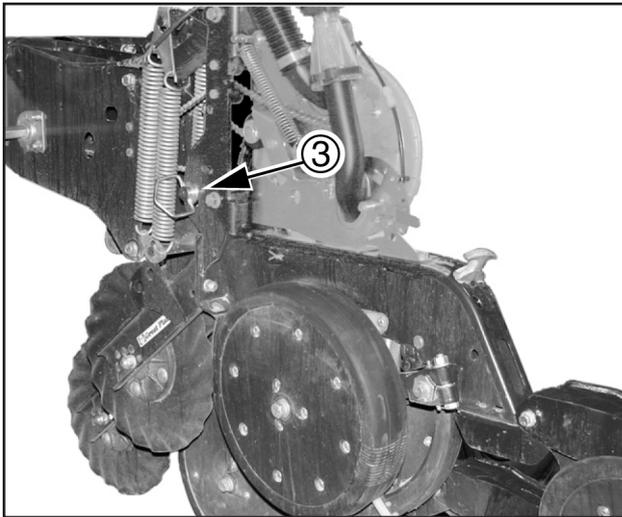
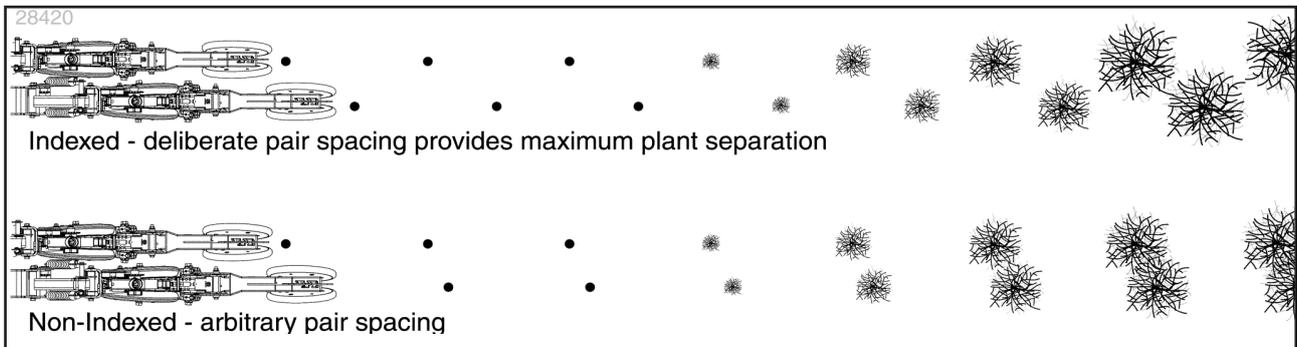


Figure 55. 25AP Row Unit Locked up.

Sprocket Indexing (Stagger)



If you are planting:

- twin-row crops,
- at seed interval spacings above 6 1/2 inches (16.5 cm), you can synchronize each pair of adjacent meters in a twin row so that you achieve the maximum seed-to-seed spacing between the units of the pair.

Refer to the Seed and Fertiliser Rate manual (401-651B) for instructions and charts.

4.13 Seed Firmer Adjustments

Series 25 row units include a standard seed flap, and accept one of two optional seed firmers (which may be included in your selected opener bundle).



Row unit disc blades may be sharp. Use caution when making adjustments in this area. To adjust the Keeton Seed Firmer, lower the planter until the discs of the row units are resting on the ground.

4.14.1 Keeton Seed Firmer Adjustment

The optional Keeton Seed Firmer is an engineered polymer shape that slides down the seed trench. It traps seeds as they exit the seed tube and firms them into the bottom of the 'V'.

Refer to Figure 56

The Firmer is provided with a preset tension which is recommended for using the first year. The tension screw (1) can be tightened in subsequent years according to your needs. Firmers should provide just enough tension to push seeds to the bottom of the trench.

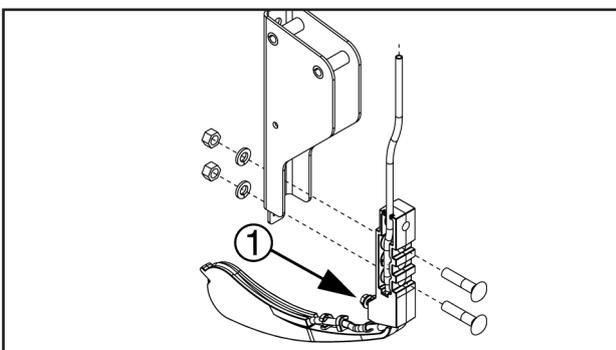


Figure 56. Keeton Seed Firmer

4.14.2 Seed-Lok® Seed Firmer Lock-Up

Optional Seed-Lok® firming wheels provide additional seed-to-soil contact. The wheels are spring loaded and do not require adjusting. In some wet and sticky conditions the wheels may accumulate soil. To avoid problems associated with this, you can lock-up the firmers.

Refer to Figure 57

To lock up a Seed-Lok® wheel:

1. Raise planter. Insert lift assist cylinder locks.
2. Push up on Seed-Lok® wheel (2) until wheel arm latches up.

To release a Seed-Lok® wheel:

1. Lift up at Seed-Lok® wheel (2) to reduce force required to release lever.
2. Flip lever (3) up slightly until Seed-Lok® wheel releases.

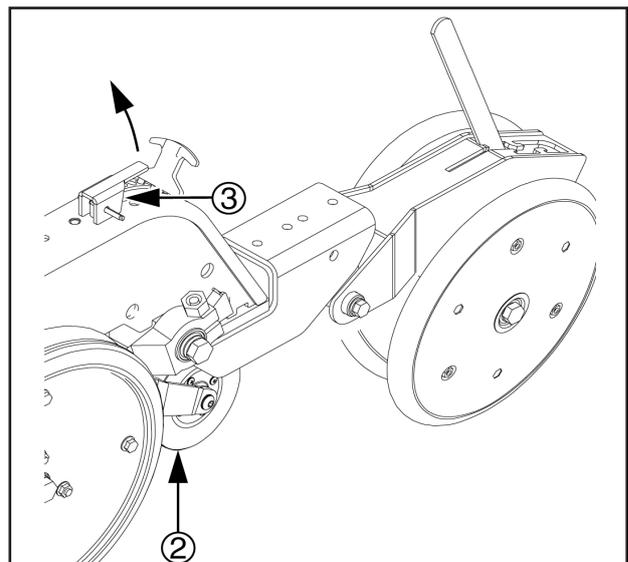


Figure 57. Seed-Lok® Lock-Up

4.15 Press Wheel Adjustment

The press wheels close the furrow which gently presses the soil over the seed to ensure good seed-to-soil contact for even emergence.

To provide consistent seed firming, the press wheels are free to move downward from their normal operating position. This system maintains closing/pressing action even if the row unit arm is lifted when the discs encounter obstructions.

There are three adjustments available on the press wheel assembly:

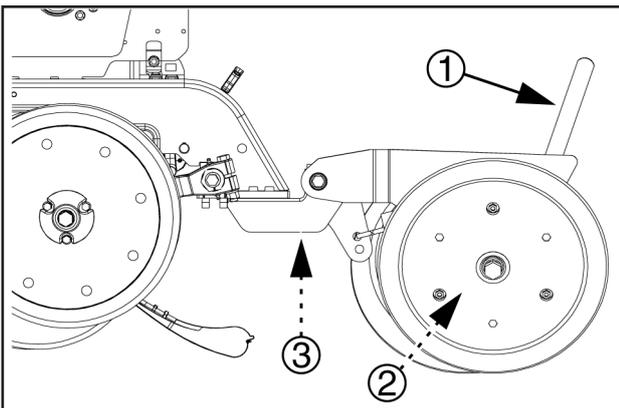


Figure 58. Press wheel adjustments.

Refer to Figure 58

- 1. Down pressure (shown at maximum)
- 2. Wheel stagger (shown staggered)
- 3. Centering (see Figure 60).



Higher press wheel down pressures reduce the down force on the main row unit shank components, such as the openers. High press wheel settings may require an increase in overall row unit down force.

Press Wheel Down Pressure

Handle (1) sets down pressure, which may need adjustment for different soil types and field conditions.

- Relax the handle forward (in the direction of travel) for decreased down pressure.
- Pull the handle (1) back for increased down pressure.

Note: Higher press wheel down pressures reduce the down force on the main row unit shank components, such as the openers. High press wheel settings may require an increase in overall row unit down force.

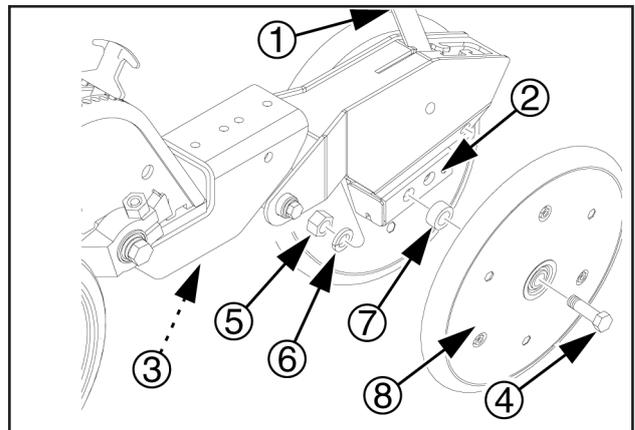


Figure 59. Press Wheel Force & Stagger

Press Wheel Stagger

The factory stagger setting has been found optimal for residue flow. If your conditions appear to require even press wheels, you might try one row before re-configuring the entire planter. To change the stagger:

Refer to Figure 59

1. Raise the planter. Secure with blocks or jack stands.
2. Remove the bolt (4), nut (5) and lock-washer (6) for the left press wheel (8) .
3. Move the spacer (7) and wheel to the forward of the two mounting holes at (2) .
4. Re-install the bolt, lock washer and nut. Tighten.

Press Wheel Centering

If one press wheel is running in the seed trench, or the wheels are not centered over the trench, the angle of the press wheel assembly can be adjusted as follows:

Refer to Figure 60

1. Determine how far, and in which direction, the press wheel assembly needs to move to center the wheels.
2. Raise planter. Secure with blocks or jack stands.
3. Loosen the ½ inch hex-head bolts (2) and (3).

Note: Do not loosen the square-head bolts forward of the hex-head bolts.

4. Turn the hex head cam (4) under the forward hex head jam bolt (3), and move the required amount.
5. Tighten both hex head bolts (2) and (3).

If press wheel adjustments do not provide satisfactory furrow closing, your conditions may require alternate press wheels. A variety of wheel assemblies are available. Consult your Great Plains dealer.

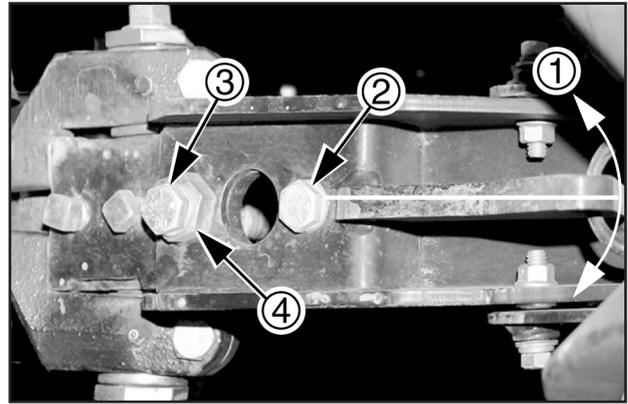


Figure 60. Press Wheel Centering (View from beneath opener)

5.0 Troubleshooting

5.1 Planting Rate Problems

When starting up with a new planter, a new crop or a new population it is important to physically double check what the monitor is reporting in the cab by digging seeds. This is to verify that you are set up correctly to plant the desired population. Do not rely solely on the population reported by the optional seed monitor.

Also during start up it is common to encounter alarms and readouts on the optional seed monitor that don't seem to make sense. It is critical to troubleshoot these alarms not only to make sure the planter drive is set properly to hit the target population, but also to fix incorrect entries in the monitor setup to eliminate nuisance alarms.

Before entering the troubleshooting charts to remedy a monitor or population problem, it is helpful to use the following flowchart to get a handle on what may be wrong. The basis for finding what is wrong comes from knowing exactly what the planter is actually doing in the soil. Always dig or observe seed on the ground when checking populations.

Suggested Furrow Check:

Plant a short distance and dig seeds, or run with the closing wheels wired up to leave an open seed trench.

Based on seeds found, determine an average distance between seeds. Compare the distance between seeds to the seed spacing listed in the charts for your population. This is listed as "inches per seed".

<p>1. Is the spacing on the ground correct?</p>	<p>No:</p>	<p>Check the ground drive transmission and range sprocket selections, or the population settings on a hydraulic drive unit. See also "Population Too Low" or "Population Too High" in the troubleshooting charts.</p>
	<p>Yes:</p>	<p>Go to step 2</p>
<p>2. Is the population reported by the optional seed monitor 1/2 the actual or is the reported population too high by a factor of 2?</p>	<p>No:</p>	<p>Go to step 3</p>
	<p>Yes:</p>	<p>An incorrect row spacing value entered in the seed monitor can cause this. Example: 15 inches instead of 30 inches. Correct the row spacing error on the optional seed monitor console. The system can be off by a large factor if incorrect range sprockets are installed. Check seed rate charts against range and transmission sprockets on the planter.</p>
<p>3. Is the population reported by the optional seed monitor close to the target population.</p>	<p>No:</p>	<p>Check seed rate charts against transmission sprockets selected. See "Population Too Low" or "Population Too High" in the troubleshooting charts.</p>
	<p>Yes:</p>	<p>If slightly under, see "Population Too Low" if slightly over, see "Population Too High".</p>

5.2 Seed Pool Troubleshooting

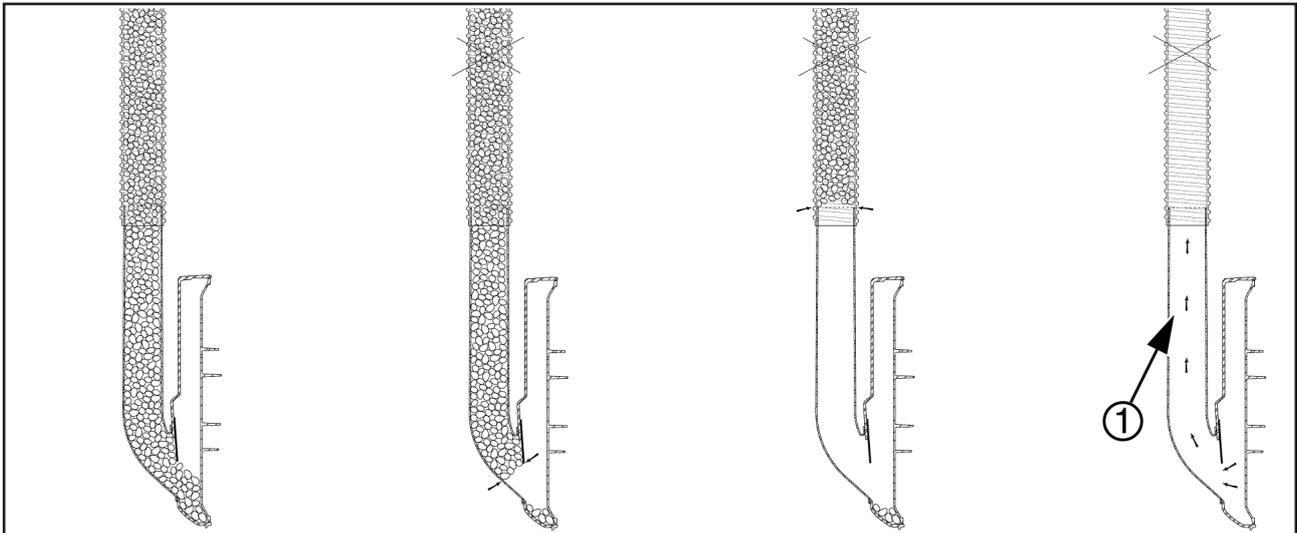


Figure 61. Rear Cross-Section of Air-Pro® Meter in Normal and Row-Failed Conditions

Normal: Filled	Bridging: Inlet Shutter	Bridging: Seed Hose	Empty Hopper
Inlet is filled to seed box. Seed move slowly down as singulated by meter.	A bridge at the shutter is blocking flow. Causes may include: <ul style="list-style-type: none"> oversized seed shutter setting too low oversize matter in seed excessive or sticky seed treatment 	Oversize matter in seed has caused a bridge at the top of the inlet. Causes may include: <ul style="list-style-type: none"> oversize seed oversize matter in seed excessive or sticky seed treatment 	No seed arriving from box. Causes may include: <ul style="list-style-type: none"> seed run-out slide gate closed If hopper is empty, air back-flow (1) is also occurring, which can reduce meter pressurisation at other rows.
Actions:	Actions:	Actions:	Actions:
No action required Continue Planting	If shutter was at suggested opening increase one notch. Check seed pool for foreign matter. Resume planting	Close Shutter Tap on hose/tube junction Check seed pool for foreign matter Resume Planting	If row is active, add seed or check slide gate. If row is inactive, close shutter. Resume planting.

5.3 Magnehelic® Gauge Troubleshooting

If the Magnehelic® gauge does not read zero with the fan off, inspect the gauge, and re-zero as needed.

Problem	Cause	Solution
Non-zero with fan off	Zero drift	Re-zero per instructions below
Gauge reading lower than sensor	Relief port plug missing/damaged	Replace plug
	Breather line blocked or kinked	Clear breather line
	Leak in sensing line	Check line to chamber
	Gauge damaged	Check for loose cover, damaged O-ring

Check for chamber and breather line problems before re-zero. Re-zero cannot accurately compensate for leaks and blockages.

Re-zero the Magnehelic® gauge on level ground with the fan off, and if possible, under no-wind conditions. Turn the set screw (1) on the meter face until it reads zero from the tractor driver’s viewing position.

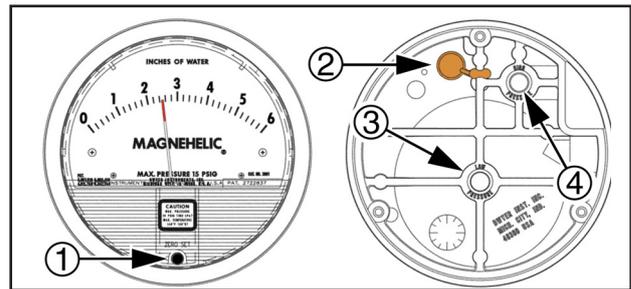


Figure 62. Magnehelic® Gauge

Port ID for Troubleshooting:

- (1) Over-pressure relief port (with plug in place)
- (2) Low-pressure port (breather/ atmospheric pressure)
- (3) High-pressure port (from manifold chamber)

Alternate high/low ports are plugged.

Winter testing/maintenance advisory:
Gauge readings may be inaccurate or sluggish below 20 F

5.4 Population

Troubleshooting Charts

Population Too Low

Fault	Possible Cause	Remedy
Overall Low Population	Incorrect seed rate	Using Seed Rate Manual, check: <ul style="list-style-type: none"> • seed disc selection, • Range/Transmission sprocket setup, and • tyre size and inflation.
	Empty pockets on disc (skips) due to insufficient air pressure.	Methodically increase the meter pressurisation. See "Fan and Adjustment".
	Empty pockets on disc (skips) due to sticky seed treatments not allowing seed to rapidly fill the pockets.	Increase seed lubricant.
	Empty pockets on disc (skips) due to rough field conditions causing seeds to fall from the discs.	Decrease field speed or increase the air pressure in the meter.
	Empty pockets on disc (skips) due to seed pool too low, and seeds are not filling every pocket on the disc.	Open shutter one notch.
	Empty pockets on disc (skips) due to disc speed too high, and pockets are not filling.	Decrease field speed or change to a higher cell count disc.
	Empty pockets on disc (skips) due to singulation (4 tufted) brush too aggressive.	Check for matted, stuck together fibres. Wash, scrape clean, or replace as needed.
	Empty pockets on disc (skips) due to seed too big for pocket.	Select the correct disc for the seed size.
	Seeds are not falling from disc, and get carried past drop zone. Static electricity can cause small, lightweight seeds to cling to the pocket and not fall out.	The graphite component of Ezee Glide Plus addresses this issue. Increase the amount of Easy Glide Plus and/or more thoroughly mix the lubricant into the seed.
	Air pressure too low, as confirmed by gauge.	Increase fan speed or reduce butterfly valve setting.
	Air pressure too low, but gauge reading is within range or reading high.	<ul style="list-style-type: none"> • Inspect the 1/4 inch sample lines from the row units up to the sensor chamber for leaks. • Make sure all non-planting rows have blank discs and shutters are closed . • Re-zero the gauge with the fan of. • Check gauge vent line for kinks, pinches or plugging
	Excess field speed	Plant within speed ranges recommended in Seed Rate Manual.
	Incorrect speed sensor constant.	Perform speed calibration per seed monitor manual.
	Incorrect magnetic speed sensor gap.	Check and adjust.
(Option) Incorrect radar speed sensor angle.	With planter lowered, check radar speed sensor angle per DICKEY-john® recommendations.	

Population Too Low

Fault	Possible Cause	Remedy
Overall Low Population, cont.	Pass gaps too large	Check marker extension. For GPS, check planter size programmed.
	Actual field size is different	Population may be correct, and calculations are not.
	Seed monitor reporting excess area	Readings can vary with conditions (wheel slippage, and effective rolling radius in soft soils) and planting patterns.
Low Population, Single Row	Shutter opening too narrow - starving meter of seed (low seed pool)	Adjust shutter to higher setting
	Meter starvation due to bridging at shutter	Re-adjust for shutter bridging. If seed is treated, increase seed lubricant.
	Meter starvation due to blockage above inlet	Clear blockage
	Meter starvation due to bridging above inlet, caused by high levels of seed treatment	Clear bridge. Increase seed lubricant
	Incorrect seed disc on one row	Install correct seed disc.
	Chain skipping at row unit.	Check chain, idler and sprocket condition.
	Skips due to low meter pressurisation at one or several rows	Check shutter setting. Check for excess wear on seed drop brush. Check for loose or leaking pressure hose.
	Skips due to skipping chain	Check for worn chain, worn idlers, low chain slack and failed meter bearing.
	Skips due to debris in disc pockets	Remove rain covers. Inspect and clean out discs.
	Row has blank disc installed	Replace with seeding disc.
Seed tube plugged	Raise planter, expose bottom of seed tube and clean out.	
Low or Erratic Seed Flow	Seed meter plugged, due to operation with fan shut off, or manifold pressure too low.	Close shutters. Clean-out meters. Set fan for correct manifold pressure. Resume planting.

Population Too High

Fault	Possible Cause	Remedy
Overall High Population	Incorrect Seed Rate	Check seed rate charts
	Two seeds per pocket on the dic (doubles), due to excess meter pressurisation.	Methodically decrease the meter pressurisation. See Fan and Adjustment.
	Two seeds per pocket on the disc (doubles), due to pockets too large for the seed.	Select a disc with smaller pockets
	The meter pressurisation is too high, as confirmed by gauge.	Reduce fan speed or increase butterfly valve setting.
	Air meter pressure too high due to pressure sensor not zeroed properly.	Re- Zero the gauge with the fan off.

Population Too High

Fault	Possible Cause	Remedy
Overall High Population. cont.	Air pressure too high, but gauge is within or reading low.	Check <ul style="list-style-type: none"> Inspect 1/4 inch sample lines from the row units up to the sensor chamber for leaks. Make sure all non-planting rows have blank discs. Check that rubber pressure relief plug is seated in gauge.
	False alarms or actual seed rate errors due to monitor setup with incorrect row count, spacing or active rows.	When troubleshooting population issues, always first rule out seed monitor setup. Review planter configuration and monitor setup.
	Incorrect cell count	Replace seed discs with correct discs, or reset rate for current discs (lit within range).
	Incorrect speed sensor constant.	Perform speed calibration per seed monitor manual.
	Incorrect magnetic speed sensor gap	Check and adjust
	(Option) Incorrect radar speed sensor angle.	With planter lowered, check radar speed sensor angle per Dickey-John® monitor recommendations.
	Doubles due to incorrect disc for crop or seed size.	Use recommended disc for crop and seed size.
	Sticky seeds: excess seed treatment.	Increase seed lubricant.
	Incorrect speed sensor constant.	Perform speed calibration per Dickey-John® monitor manual.
	Overlapping passes.	Check marker extension. For GPS, check planter size programmed.
	Actual field size is different	Population may be correct, and calculations are not.
	Seed monitor under-reporting area	Readings can vary with conditions (wheel slippage, and effective rolling radius in soft soils) and planting patterns.
High Population, Single Row	Excess meter pressurisation causing doubles.	Check shutter
	Worn seed-drop brush and/or strip brushes allowing excess seed to pass.	Replace worn brushes
	Worn meter bearing causing seed disc wobble and doubles	Replace meter bearing
	Incorrect seed disc with higher cell count	Install correct disc

Population Related

Fault	Possible Cause	Remedy
Overall Population Alarms	False alarms or actual rate errors due to monitor setup with incorrect (active) row count or spacing.	When troubleshooting population issues, always first rule out seed monitor setup. Review planter configuration and monitor set up.
	Incorrect cell count	Replace seed discs with correct discs, or reset rate for current discs (if within range).
	Improper gap on magnetic speed sensor	Check speed sensor in planter for a gap to toothed wheel or 1/32 inch (0.020-0.040inch, 0.5-1.0mm). Improper gap can cause erratic speed signal causing monitor to falsely report improper planting rate.
	Incorrect speed sensor constant	Perform seed calibration per monitor manual.
	(Option) Incorrect radar speed sensor angle	With planter lowered check radar speed sensor angle per DICKEY-John® recommendations.
	Seed run-out. Due to unequal outlets per box division, and if planting across slopes, some rows will run out before others.	Re-distribute seed to favour rows that have run out and plan to re-fill shortly.
Mismatch between reported and furrow population	Small seeds (example milo) are not reliably sensed in the seed tube	Run with rain covers in place to minimise ambient light intrusion. Use the population scaling factor in the seed monitor system to compensate for missed seeds. Remember to set this back to 100% for large seeds.
	Seed tube sensor is not counting all seeds	Clean the seed tube of graphite and dust buildup with long narrow seed tube brush. Replace sensors that malfunction.
Excessive seed cracking	Incorrect seed pocket size	Use correct disc for seed
	Damaged, old or dried-out seed	Use new seed
	Unclean Seed	Use clean seed
Skips and Bare spots after turns	Fan was turned off at turns	Leave fan running: meter pressurisation must be maintained during turns, or seed will fall out of disc pockets.
	Insufficient hydraulic flow to keep fan running at speed required to maintain meter pressurisation	Check tractor capability against requirements. If sufficient: <ul style="list-style-type: none"> • Fold markers before engaging lift • Use a less aggressive lift rate • Monitor meter pressurisations during en-of-pass operations
Seed too shallow or scattered on ground from a single row.	Bottom of seed tube damaged	Replace seed tube. Avoid setting planter straight down. Use forward motion when lowering.
	Row not penetrating in tyre tracks	Increase down force on parallel arm springs
	Opener depth too shallow	Change side depth wheel setting

Population Related

Fault	Possible Cause	Remedy
Twin Rows were timed but became out of time	Timing will change when a population change has been made	Re-time meters from the population based timing chart
	Chain has jumped	Check sprockets and chain for excessive wear or rusty stuck links

General Troubleshooting

Fault	Possible Cause	Remedy
Population Alarms	See "Population Troubleshooting Charts"	
Excess Seed Remaining	See "Population Troubleshooting Charts".	
	Field Size is different	After ruling out population problems, re-check geography.
	Excessive gaps between planter passes.	Adjust marker.
Seed consumption Too High	See "Population Troubleshooting Charts"	
	Field size different.	After ruling out population problems, re-check geography.
	Excessive overlap. Irregular shaped field	Adjust marker
Rows not planted	If not detected by optional seed monitor, check for plugged row-unit seed tube.	Lift planter, expose bottom of seed tube and clean out.
Uneven seed spacing	See "Population Troubleshooting Charts"	
	Excessive field speed	Reduce field speed
	Unclean Seed	Use clean seed
	Damaged seed tube	Inspect; repair or replace
	Seed-Lok® plugging.	Lock up Seed-Lok®
	Row unit discs not turning.	See "Row- unit discs not turning freely" in this Troubleshooting chart.
	Worn/rusted sprockets and/or chain idler or bearings.	Check and replace any worn/rusted sprockets or chain idlers.
	Partially plugged row-unit seed tube.	Lift up planter , expose bottom of seed tube and clean out.
Lack of proper seed lubrication on seed.	See "Seed Lubricant"	

General Troubleshooting

Fault	Possible Cause	Remedy
Uneven seed depth	Excessive field speed	Reduce field speed
	Planting conditions too wet	Wait until drier weather
	Incorrect coulter depth setting	See coulter manual or set unit mounted coulter
	Excessive or improper row unit down pressure spring setting	See "Row unit down pressure"
	Damaged seed tubes	Check seed tubes for damage
	Seed-Lok® building up with dirt	Lock up Seed-Lok®
	Row-unit not penetrating low spots.	Adjust row-unit
	Rough planting conditions	Rework the field
	Seed firmer not in place and set to correct tension	See "Seed firmer adjustments"
Press wheel or row-units plugging	Planting conditions too wet	Wait until drier weather
	Too much pressure on row-units	Reduce down pressure on row-units
	Coulters set too deep, bring up excess dirt and moisture	Check coulter adjustment
	Planter not set to run level from front to rear.	Check tool bar height
	Backed up with planter in the ground.	Clean out and check for damage
	Failed disc bearings	Replace disc bearings
	Disc blades worn	Replace disc blades
	Scraper worn or damaged. Side depth wheels not set correctly.	Adjust side depth wheels page
Row-unit discs not turning freely	Row-unit plugged with dirt	Clean row-unit
	Planting conditions too wet	Wait until drier weather
	Incorrect side depth wheel adjustment	See "Side gauge wheel adjustment"
	Seed-Lok® is plugging row-unit	Lock up Seed-Lok®
	Failed disc bearings	Replace disc bearings
	Bent or twisted row-unit frame	Replace row-unit frame
	Partially plugged row-unit seed tube	Lift up planter, expose bottom of seed tube and clean out

General Troubleshooting

Fault	Possible Cause	Remedy
Press wheels not compacting the soil as desired	Incorrect spring handle setting	See "Press Wheel Adjustment"
	Insufficient row unit down-force	See "Row unit down pressure"
	Use of incorrectly shaped tyre for your conditions	Wedge shaped wheels work best on narrow spacings and in wet conditions. Round edge wheels work best in wider row spacings and drier conditions
	Not level front to rear	Check tongue height and top link adjustment
	Wheel stagger needs adjustment for conditions	See "Press wheel adjustment"
	Too wet or cloddy	Wait until drier weather or rework ground
Hydraulic marker functioning improperly. or not at all	Marker/Fold switch set to fold.	CFM switch must be set to "Marker". Set tractor remote circuit to Neutral or Float before operating switch.
	Marker/Aux valve set to Aux	On a planter with optional Auxiliary Hydraulics, selector valve must be set to Marker for markers to function. Set tractor remote circuit to Neutral or Float before changing valve.
	Air or oil leaks in hose fittings or connections	Check all hose fittings and connections for air or oil leaks.
	Low tractor hydraulic oil level	Check tractor hydraulic oil level
	Loose or missing bolts or fasteners	Check all bolts and fasteners
	Needle valve(s) plugged	Open needle valves, cycle markers slowly and reset needle valves
Marker disc does not mark	Disc angle too straight for soil conditions	Reverse marker disc to pull or throw dirt.
Speed reading doesn't match tractor	Monitor speed reading, using optional radar, will only match tractor with planter lowered. (Speed reading with magnetic pickup falls to Zero when lifted).	If speeds don't agree during planting (with planter lowered) re-calibrate radar speed sensor with planter lowered.

6.0 Maintenance and Lubrication

6.1 Maintenance

Proper servicing and maintenance is the key to long implement life. With careful and systematic inspection, you can avoid costly maintenance, downtime, and repair.

Always turn off and remove the tractor key before making any adjustments or performing any maintenance.



Crushing Hazard: Always have transport locks in place when working on implement. You may be severely injured or killed by being crushed under a falling implement



High Pressure Fluid Hazard: Check all hydraulic lines and fittings before applying pressure. Fluid escaping from a very small hole can be almost invisible. Use paper or cardboard, not body parts, and wear heavy gloves to check for suspected leaks. Escaping fluid under pressure can have sufficient pressure to penetrate the skin. If an accident occurs, seek immediate medical assistance from a physician familiar with this type of injury.

1. After using your planter for several hours, check all bolts to be sure they are tight.
2. Remove excess slack from chains. Clean and use chain lube on all roller chains as needed.
3. Maintain proper air pressure in planter tires.
4. Keep disc scrapers properly adjusted.
5. Clean planter on a regular basis. Regular and thorough cleaning will lengthen equipment life and reduce maintenance and repair.
6. Lubricate areas listed under "Lubrication".
7. Replace any worn, damaged, or illegible safety labels by obtaining new labels from your Great Plains dealer.

6.2 Material Clean-Out

When planting is completed, it is commonly the case that some seed remains. There may be seed in the hoppers, hose lines, and meters.

Refer to Figure 63

The planter includes an 817-811C container for meter clean-out, stored in a spring-loaded holder at the right rear of the air manifold. The container can hold all the seed in the meter and inlet (up to a closed slide gate).

The container can be converted into a true funnel for complete system clean-out.

Note: The hoppers are connected to the rows with clamped hose, and are not intended to be routinely unlatched and tipped for clean-out.

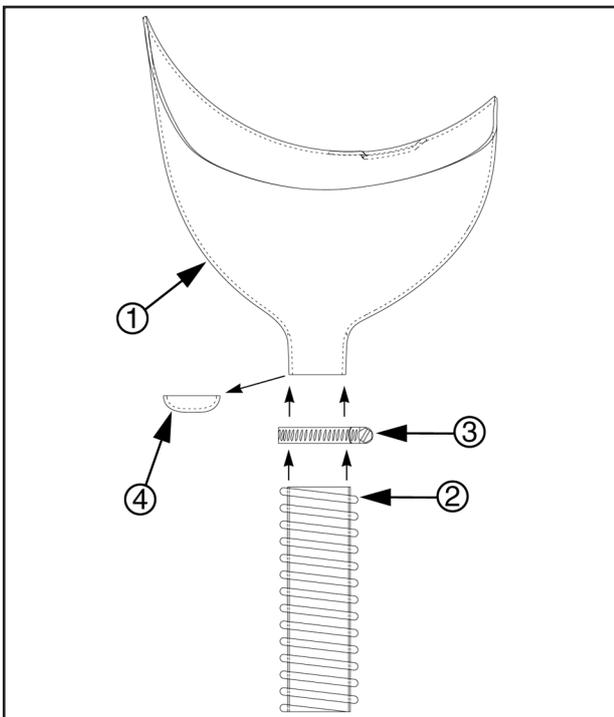


Figure 63. Convert Container to Funnel

Funnel Conversion

Materials and tools needed:

- (2) a length of 1½ inch I.D. hose
- (3) a worm drive clamp with a working diameter of approximately 1½ to 2 ¼inch
- a hacksaw with fine-toothed blade

Trim the sump (4) from the funnel. Slide the hose (2) fully onto the funnel tip. Secure with clamp (3) (do not over-tighten clamp, the funnel wall will be crushed).

The choice of complete system clean-out process depends on whether you are using the 817-811C as a container or funnel.

Seed Clean-Out (Container)

1. Scoop or vacuum as much seed as possible from the top of the hoppers.

2. Perform a meter clean-out.

Seed Clean-Out (Funnel)

1. Close slide gate at hopper.

2. Attach funnel as for meter clean-out, with hose routed to bucket or other larger container.

3. Use slide gate to control seed flow until meter, inlet and hopper are empty.

6.3 Meter Clean-Out

Refer to Figure 64 and 65

The 817-811C seed collection accessory (funnel (1)) may be attached to the housing of the seed meter, freeing your hands for other tasks during clean-out.

Note: The funnel does not fit rows to the left of gauge wheels on twin-row planters. Use vacuum or tarp collection on those rows.

Note: It may be necessary to raise a twin-row planter to obtain clearance for the funnel. Secure with blocks or jack stands if the planter is raised.

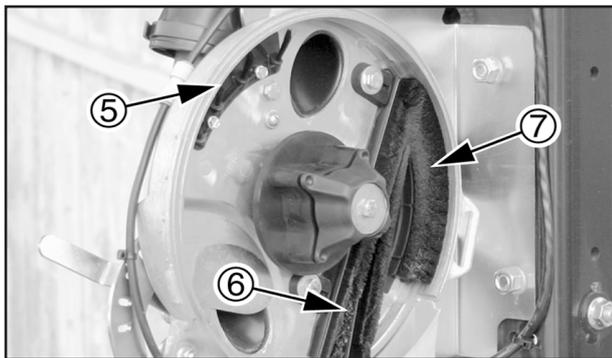


Figure 64. Brush Inspection

1. Close the seed inlet shutter on the meter. This minimizes the seed volume at disc removal.

2. Remove the rain cover. The funnel cannot be snapped in place with the cover installed.

3. Align the left (rear) end of the funnel lip (3) with the top of the lower (rear) cover latch ear. Place the right (front) end of the funnel lip (4) between the meter housing and the seed tube.

4. Rotate the funnel forward until the slot at lip center engages a tab on the bottom center of the meter housing.

5. Remove the seed.

6. Slowly open the seed shutter to empty the seed up to the slide gate.

7. If seed remains in the hopper, use the slide gate to control the volume of flow.

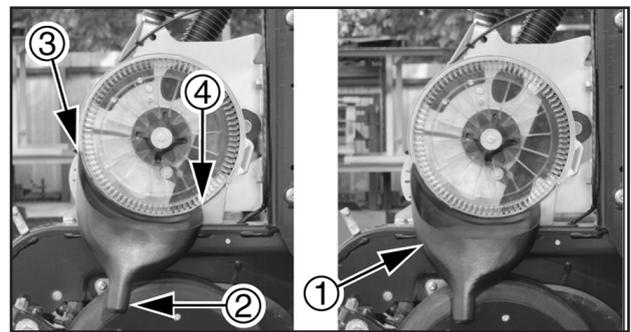


Figure 65. Funnel Positioned and Engaged

Refer to Figure 65.

8. Clean seed from all brushes (shop vac recommended).

9. Inspect brushes.

10. Rotate funnel clockwise, remove and empty.

11. For imminent operations: Install next seed wheel or blank disc for operations. Set inlet shutter for next seed.

12. For storage: Close seed inlet shutter. Leave disc out. Close Y-tube (if any).

13. Re-install rain cover.

At end-of-season clean-out, inspect a few seed meter air release screens. If they require cleaning, consider cleaning all rows.

Alternate Meter Clean-Out

To use a shop vacuum cleaner, with narrow hose nozzle, to clean out a meter:

- Close the seed shutter.
- Release the meter clamp, hold the disc against the meter.
- Tip the top of the disc away from the meter.
- Insert hose nozzle and remove seed.
- Open shutter to allow seeds in inlet and drop hose to flow to vac nozzle.

6.4 Meter Brush Maintenance



Wear a respirator for brush cleaning. Brushes will have talc and graphite residue, and may have residues of hazardous seed treatments.

Refer to Figure 66

A HEPA vacuum cleaner is recommended for brush cleaning. Washing brushes is not recommended and may cause matting. Do not scrape them with sharp instruments.

The first indications of excess brush or damage wear are normally observed on the seed monitor or in air system operation.

- If the tufted brushes are worn/damaged, the seed “double” rate rises, increasing population.

Finding an occasional cracked seed “hung up” on a tuft fiber is not uncommon, and is not an indicator that brush maintenance is required. Merely remove the seed.

- If the strip brushes are worn/damaged, air pressure regulation may become unstable, or require increasing fan speed over time.

If you find you need to exceed recommended fan rpm ranges, the regulated air system may be taking too much air due to meter leakage.

In severe cases, seed may leak past the strip brushes, causing spikes in population. If you frequently observe seed in between the strip brushes, one or both may need replacement.

- If the seed drop brush is worn/damaged, its anti-static effect may fade, which can result in “skips” due to smaller seeds failing to release, and lower populations.

If an obvious groove is worn in the drop brush, replace it.

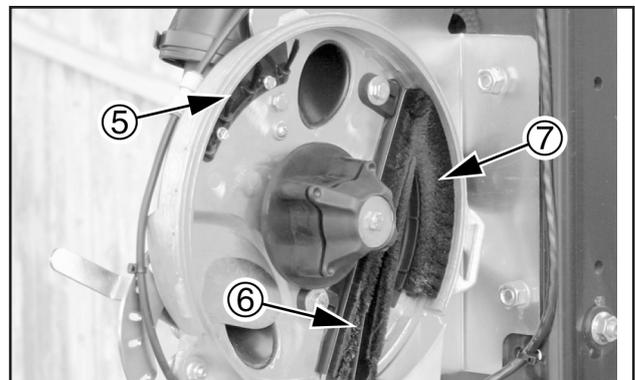


Figure 66. Brushes

Meter Brush Replacement

Consult the Parts manual for current replacement part numbers.

Refer to Figure 67

Tufted Brush Replacement

1. Remove and save both 10-24 hex head cap screws (11) and nylock nuts (not shown).
2. Remove the tufted brush assembly (12), and replace with new assembly.
3. Re-insert the 10-24 screws, and re-start the nylock nuts. Carefully tighten each nut just until plate has no play under the screw heads.
4. Add a half turn to the nuts. Do not tighten fasteners to normal 10-24 torque, or the plate may fracture.

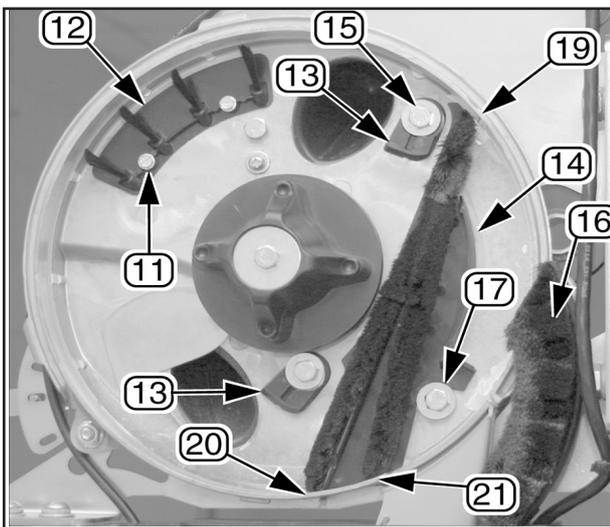


Figure 67. Brush Replacement

Strip Brush Replacement

Note: Do not loosen or remove any of the three 5/16-18 cap screws (15) retaining the brush holder.

1. Insert the flat blade of a large screwdriver into the slots of the brush holder snaps (13). Turn each snap clockwise to release brush holder (14).

2. Prepare to catch drop brush (16) (which will fall lose). Slide brush holder left and up to free front edge from under washer (17) . Remove brush holder.

3. Remove used strip brushes from the holder by sliding them downward out of the grooves.



Figure 68. Strip Brush Notches

Refer to Figure 68

4. Insert replacement strip brushes into grooves at holder bottom so that notched ends (18) are at the bottom.

Refer to Figure 67

5. Check strip brush positioning with a trial re-insertion of the brush holder. The ends of the long brush must fit snugly into meter housing grooves at top (19) and lower rear (20). The bottom end of the short brush must fit snugly in the lower front housing groove (20). If any significant force is require to re-seat the brush holder, a strip brush is likely too high or too low.

6. Relax the position of the brush holder, re-position the drop brush (see below), and re-seat the brush holder.

7. Starting with the bottom snap, swing snaps back into engagement.

6.5 Seed Disc Maintenance

Refer to Figure 69

When removing seed discs, inspect them for wear and damage. If there is any seed dust or treatment build-up in the cell pockets (1), or along the raised wiper ridges (2), clean the discs and re-inspect.

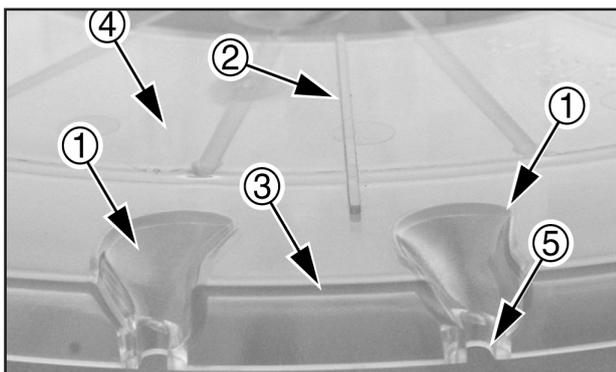


Figure 69. Disc Seed Cells and Wiper

Replace discs for conditions including:

- Chips at circumference (3). These will leak air.
- Chips at edges or in sculpted surfaces of cell pockets (1). These can leak air and/or adversely affect singulation.
- Cracks over 2 inch (5 cm) long in the working face (4) of the disc, or any cracks in support webs or to an edge.
- Warping - if any part of the disc does not press firmly on the seed drop brushes in operation, replace the disc.

- Wear - if a wiper ridge is worn away, replace the disc. If the seed pockets are worn through, or the air ports (5) have enlarged, replace the disc.

Cleaning and Storing Seed Discs

Use warm or hot water, mild soap, and a sponge or soft brush to remove build-up.

If discs are washed, allow them to dry completely prior to storage.

Retain original shipping cartons for disc storage. Otherwise, store them on edge (and not leaning), or stacked horizontally on a spindle, to eliminate any risk of warps. Any seed residue on discs may attract pests. Fully enclose dry discs to prevent rodent damage.



Wear gloves when washing discs. Avoid spray. Do not wash discs where food is prepared, or where cookware or dinnerware is washed. Seed discs will have talc and graphite residue, and may have residues of hazardous seed treatments. Although the discs are dishwasher-safe, do not wash them in an appliance also used for food preparation or food serving items.

Speed Sensor Gap

Refer to Figure 70

1. Raise planter. Rotate ground drive wheel until a disc tooth is directly at sensor center-line.
2. Check that wheel teeth are on sensor center-line side-to-side. As needed, loosen collars on either side of disc and adjust.
3. Check that center-line of sensor is pointed at center-line of transfer shaft. As needed, loosen mounting bolts and adjust.
4. Check gap between top of sensor and toothed wheel for a dimension of: 1/16 inch (1.6 mm)

To adjust, loosen jam nut . Adjust base nut to set gap. Re-tighten jam nut.

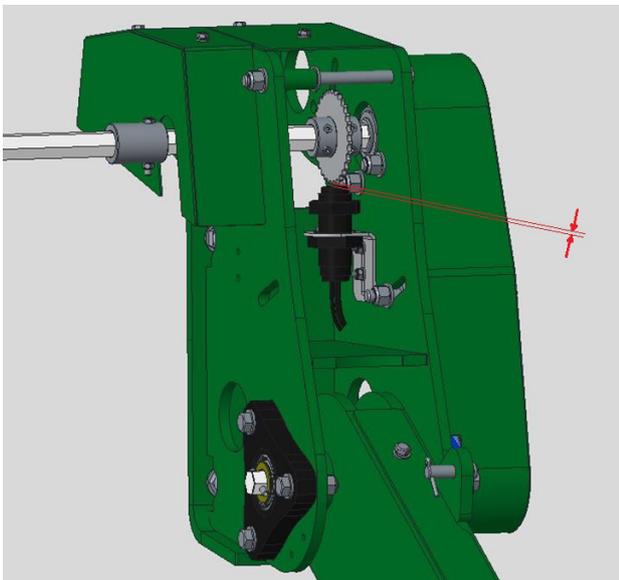


Figure 70. Speed Sensor Gap

6.6 Hydraulic Maintenance

As with any hydraulic system, contamination is the most common cause of performance problems and pre-mature wear. Make a special effort to properly clean quick couplers prior to attaching the hoses to tractor, and never let them fall to the ground.

Bleeding Marker Hydraulics

To fold properly, the marker hydraulics must be free of air. If the markers fold in jerky, uneven motions.

As the marker cylinders are encased within the main tool bar, it is not practical to bleed them at cylinder fittings. Remove air from the system by slowly cycling fold and unfold several times.

6.7 Marker Maintenance (Option)

See also:

“Initial Marker Setup (Option)” on, “Marker Operation (Option) S/N-”, and “Marker Disc Adjustment” Marker Shear Bolt Replacement.

Marker Grease Seal Cap

If grease seal cap for marker-disc hub bearings is damaged or missing, disassemble and clean hub. Repack with grease and install new seal or grease cap.

6.8 Chain Maintenance

Inspect and lubricate chains regularly. The slack of new chains tends to increase during the first few hours of operation due to seating.

Chain Slack

Check slack at fixed idlers within the first 8 hours of operation and tighten idlers as necessary. Check slack at spring-operated idlers seasonally.

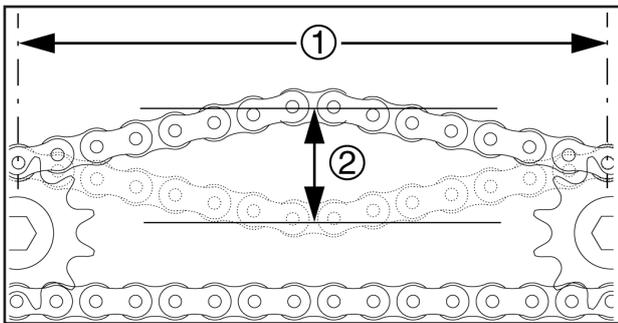


Figure 71. Measuring Chain Slack

Refer to Figure 71, which, for clarity, greatly exaggerates slack, and omits the idlers.

1. Measure the span (1) for allowable slack: Locate the longest span of each chain (usually the span which does not run through the idlers).

2. Determine the ideal slack:
 Long chains (over 36 inch/91 cm): $\frac{1}{4}$ inch per foot
 Vertical short chains: $\frac{1}{4}$ inch per foot (2.1 cm/m)
 Horizontal short chains: $\frac{1}{2}$ inch per foot (4.2 cm/m).

3. Measure the current slack :
 Acting at a right angle to the chain span at the center of the span, deflect the chain in both directions. The slack is the distance of the movement.

4. Adjust the idlers for ideal slack.

Chain Clips

Whenever mounting a chain, make sure the clip at the removable link is oriented to minimize snags.

Refer to Figure 71 (arrow shows chain direction) Install clip with open end facing away from direction of chain travel (shown by gray or striped arrows in chain routing diagrams).

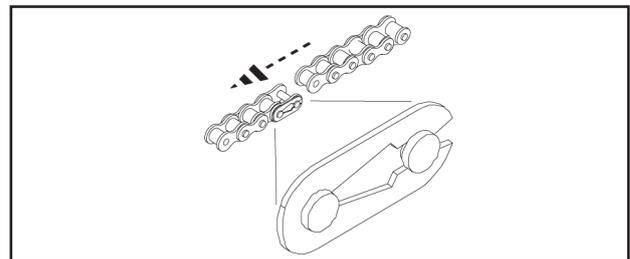


Figure 72. Chain Clip Orientation

Meter Drive Chain

When performing periodic lubrication, check chain condition. Replace chain if any frozen kinks are not corrected by lubrication.

When performing seasonal checks, lower planter to put chain at minimum idler spring tension.

Check that idler spring length (3) , measured from outside of pin to outside of pin, is not shorter than: 7.0 inch (17.8 cm)

Lift spring off idler assembly (4) . Check that idler assembly pivots freely. Re-attach spring.

Check chain clip orientation. Check chain routing at shank idler(s) (5) .

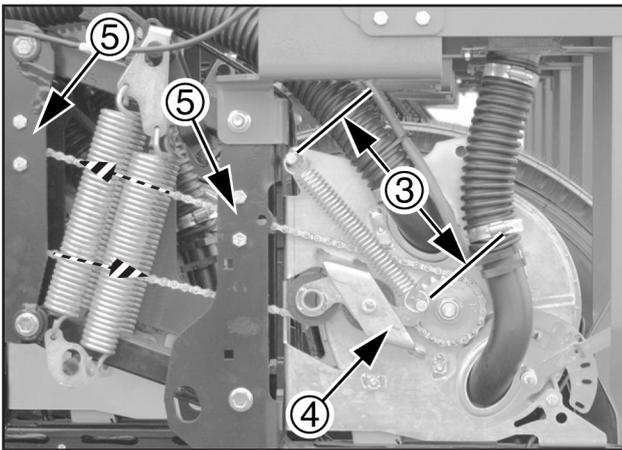


Figure 73. 25AP Meter Drive Chain

6.9 Spreaders and Scrapers

Note: Applies to all row unit Series. Refer to Figure 74.

1. Remove side gauge wheels from arms to access row-unit discs and scrapers.

Note: It is normal for the blade spreader to have some looseness in the holder and between the blades. Some looseness is required for proper operation.

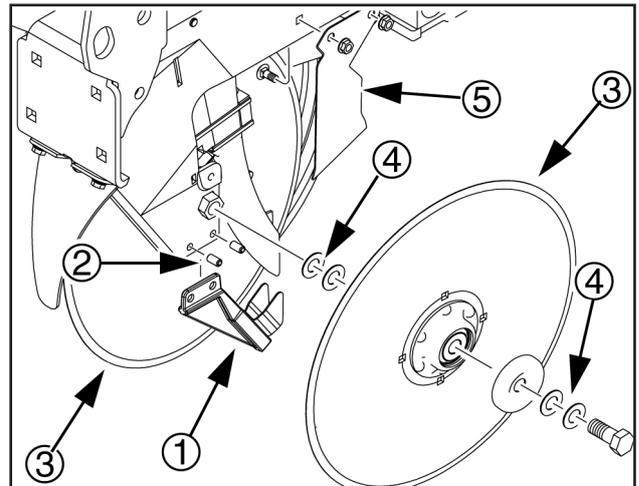


Figure 74. Spreaders and Scrapers

1. Remove side gauge wheels from arms to access row-unit discs and scrapers.

2. With the unit raised, check blade spreader (1) for wear. Replace spreader if it is ½ inch (13 mm) wide or narrower. To replace, remove disc blades (3) , drive out roll pins (2), and install new spreader.

3. When reinstalling disc blades, put two shims (4) between bearing and shank on each blade. Tighten bolts.

4. Check amount of contact between blades, and adjust number of shims as needed. Store extra shims on outside of blade. See “Opener Disc Contact Region”.

5. Check that outside disc scrapers (5) are formed to disc blades to help remove any mud. Bend/twist scrapers to fit blades as needed. Every 200 acres of operation, check outside scrapers for adjustment and wear. Replace outside scrapers as necessary.

6.10 Row-Unit Side Wheels

Refer to Figure 75

1. Lift opener side wheel off the ground. Move tyre in and out to check for end play. Check for roughness in bearing by rotating wheel. If bearings are rough, inspect and replace if necessary.

2. Side wheels are preset at the factory. Due to normal wear it may become necessary to make adjustments so the wheel remains close to the disc. To prevent plugging, loosen clamp bolt (1) and slide arm inward to take up gap between side wheel and disc blade. If more adjustment is needed, go to step 3.

3. Remove bolt (2) and wheel (3). Remove shims (4) from the inside of wheel (3) and place them on the outside of wheel. Always place removed shims from the inside to the outside. When installed, wheel should turn freely and not hit the arm at the curve. Do not add any more shims than necessary.

4. Disassemble side gauge wheel arm (5) from unit. Remove bushing (6) from sleeve (7) and check for wear. If necessary, replace bushing.

5. When reinstalling side gauge wheels, align tab on hex adjustment (8) with notch in bushing. Replace bolt and tighten.

6. Adjust side gauge wheels.

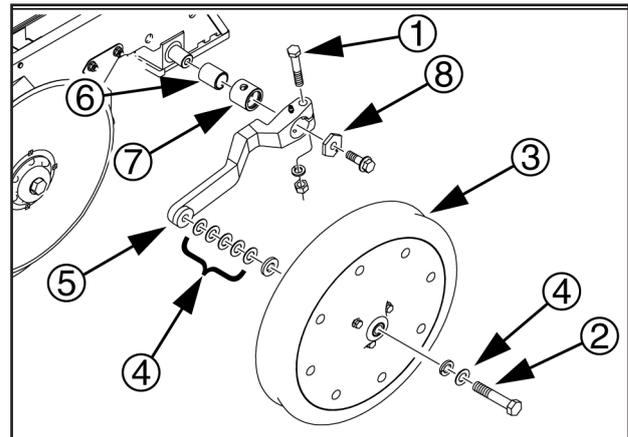


Figure 75. Side Gauge Wheel Shims

6.11 Seed Flap Replacement

Refer to Figure 76

To replace a seed flap (1), use a needle nose pliers or similar tool to grasp "T" top of flap. Pull upward to pull flap up out of metal bracket (2).

Push new seed flap (1) down through metal bracket (2) until flap snaps into place with "T" top resting on top of bracket.

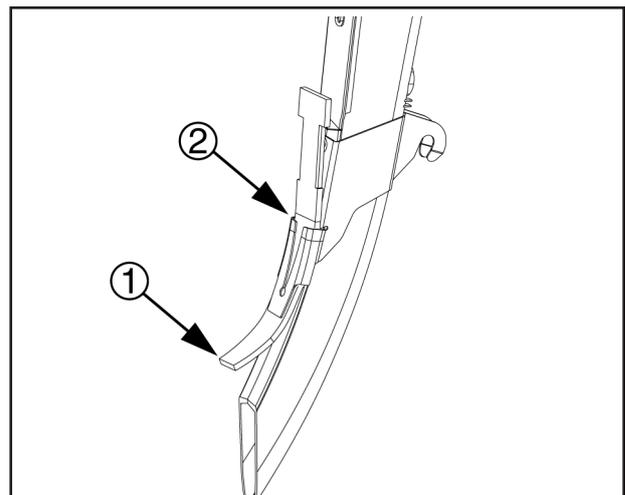


Figure 76. Seed Tube Flap

6.12 Lubrication

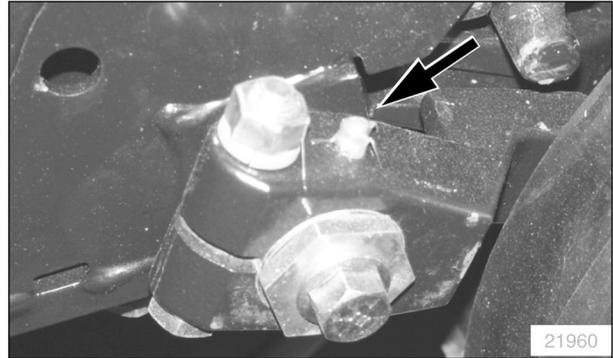
 Multi-purpose spray lubricant	 Multi-purpose grease lubricant	 Multi-purpose oil lubricant	 Inspection 34208	 50 Intervals (operating hours) at which service is required
---	--	---	---	---

Opener Side Wheel Bushing

	 8
---	---

On both sides of each row-unit (2 per row)

Type of Lubrication: Grease
Quantity: Until grease emerges



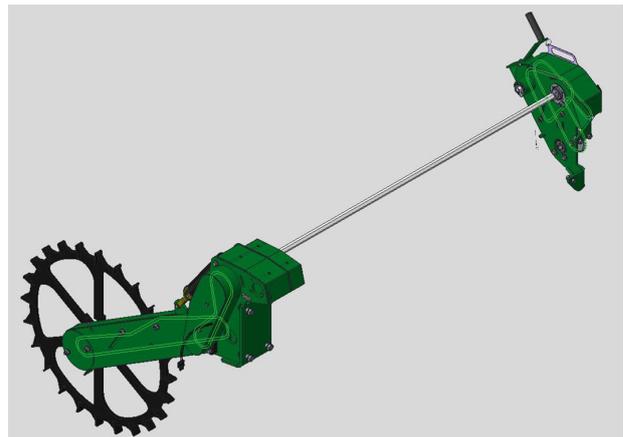
Chain: Contact Drive

	 As Required
--	--

1 chain

Type of Lubrication: Chain Lube
Quantity = Coat thoroughly

Note: Lubricate chains any time there is a chance of moisture, and when being stored at the end of the planting season.



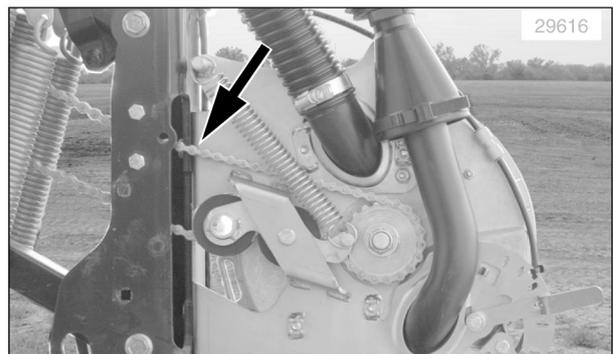
Chains: Meter Drive

	 As Required
---	---

1 chain each meter

Type of Lubrication: Chain Lube
Quantity = Coat thoroughly

Note: Lubricate chains any time there is a chance of moisture, and when being stored at the end of the planting season.

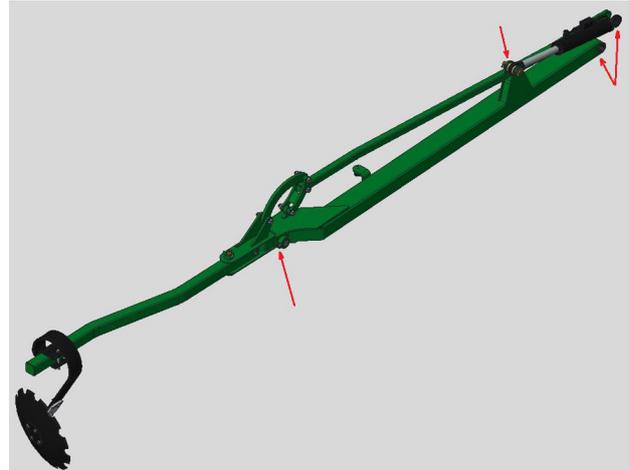


Markers (Option)

	 10
---	--

4 zerks per marker,
two markers;
8 total

Type of Lubrication: Grease
Quantity: Until grease emerges



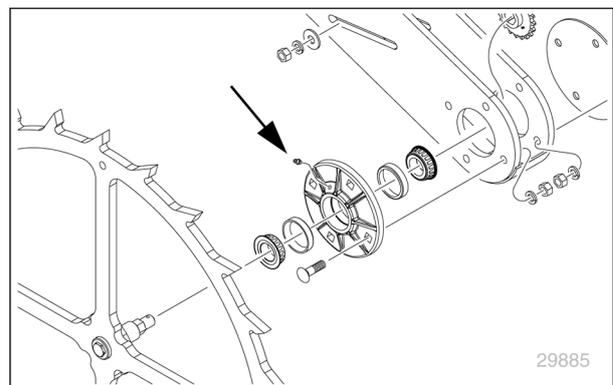
Ground Drive Wheel Hub

	 50
---	--

1 zerk at each bearing casting;
4 total

Type of Lubrication: Grease
Quantity: Until grease resistance felt

Re-pack seasonally.



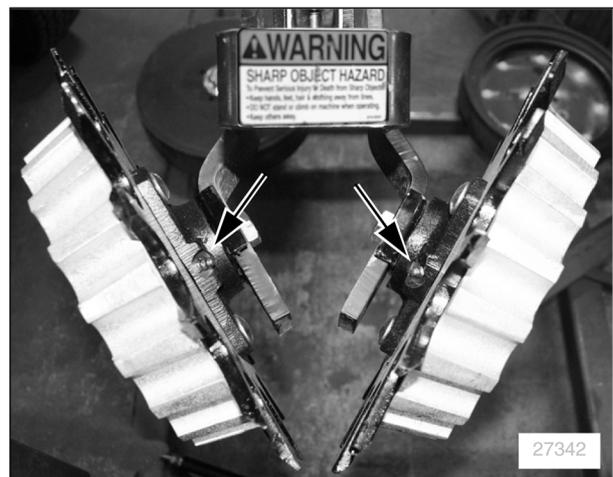
Row Cleaner Bearings (Option)

	 50
---	--

1 zerk each wheel, 1 or 2 wheels per row

Type of lubrication: Grease
Quantity = Until resistance is felt

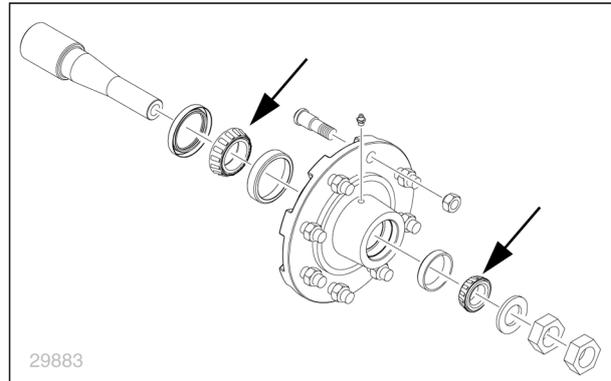
To avoid damaging the seal, do not add grease at high pressure.



Gauge Wheel Hubs

1 zerk each spindle;
4 total

Type of Lubrication: Grease
Quantity: Until resistance is felt



29883

6.13 End of Season Service/Storage

The machine should be left parked in the unfolded position

Wheel bearings should be inspected and re-packed with grease if required

All greased pins/pivots should be lubricated.

Check for worn or damaged components and hardware, replace where required.

If fitted, check and where required adjust DD roller tension

Where hydraulic cylinder rods are exposed, re-coat chrome with oil/grease.

If the machine has been washed before storage it is good practice to function all hydraulic cylinders and services before storage.

Remove all fertiliser and seed from all metering units and hoppers.

Remove all metering cassette elements.

6.12 Seed Lubricants

Air-Pro® Meters (all seeds)
Ezee Glide Plus Talc + Graphite Mix
821-069C bucket, 5 gallon (19 litre)

Ezee Glide Plus Lubricant

To maximize performance of Great Plains metering systems, it is imperative to use only “Ezee Glide Plus” lubricant. “Ezee Glide Plus” Talc + Graphite lubricant is mandatory for all seeds, especially treated or inoculated seed. Thorough mixing of seed and added lubricant is required.

Recommended Usage:

For clean seeds other than milo, cotton, and sunflowers sprinkle $\frac{1}{4}$ cup of Ezee Glide Plus per bushel or unit (60 ml per 35 liters) of seed.

For milo, cotton, and sunflowers double the application to $\frac{1}{2}$ cup (or more) per bu. or unit (120 ml per 35 liters) of seed.

Adjust this rate as necessary so all seeds become coated while avoiding an accumulation of lubricant in the bottom of the hopper.

For seed with excessive treatment, or for humid planting environments, increase the rate as needed for smooth meter operation.



Irritation and Chronic Exposure Hazard: Wear gloves. DO NOT use hands or any part of your body to mix seed lubricant. Wear a respirator when transferring and mixing. Avoid breathing lubricant dust. Not an acute hazard. May cause mechanical eye or skin irritation in high concentrations. As with all mineral spills, minimize dusting during clean-up. Prolonged inhalation may cause lung injury. Product can become slippery when wet.

Options 7.0

7.1 Seed Lubricant

Description	Order Number
Ezee Glide Plus Talc + Graphite Mix (5 gallon / 18.9 liter container)	821-069C

7.2 Clean-Out Container

One container is provided with the planter. Order the following part for additional or replacement containers.

Description	Order Number
AIR METER CLEAN OUT FUNNEL	817-811C

7.3 Row-Mounted Accessories

Lock-Up Pins

If rows are shut off, you can reduce unnecessary wear on the unused row units by locking them up. Twin-row planters include, as standard, one lock-pin per rear row. For replacement pins, or for other planter models, order one per row unit locked-up.

Description	Part Number
PIN HITCH 1 X 6 W/HAIRPIN	805-033C

See “Row Unit Shut-Off”.

Rigid Row Cleaners

Optional Martin row cleaners are unit-mounted, either:

- “stand-alone”, using a unit-mount assembly or;
- added to a UMC coulters disc mounting bracket (with or without a disc).

Twin-Row planters and narrow row spacings support only single-wheel unit-mounted row cleaners, in alternating left/right cleaner hub orientations.

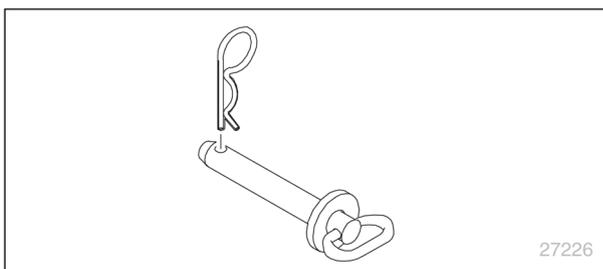


Figure 77.

7.4 Unit-Mounted Disc Coulters

Optional unit-mount disc coulters are available with 15 inch fluted or 15 inch turbo blades. For complete coulters, with unit mount and blade the selection includes:

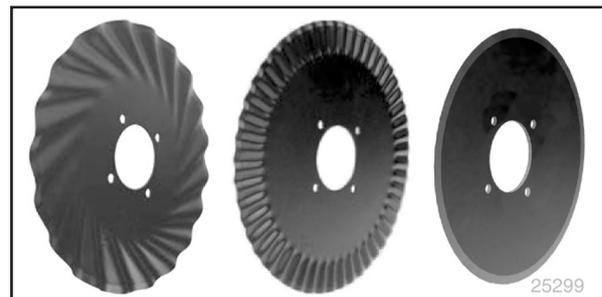
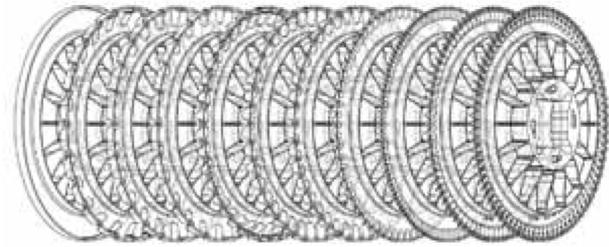


Figure 78.

7.5 Seed Meter Discs

Air-Pro® meters accept a variety of seed discs, plus a special blank disc for row shut-off. Choices include:

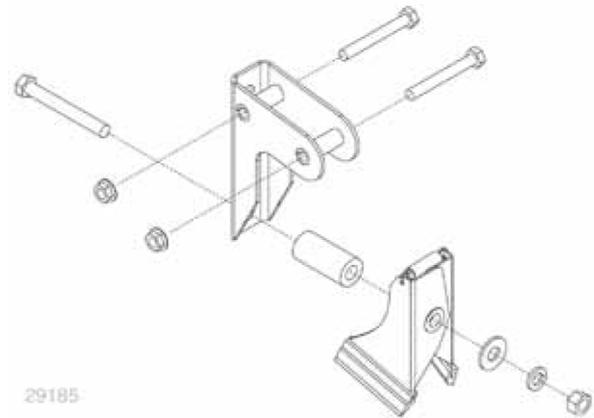
Meter Discs	Part No.
Corn, 024 Cell (Large, Flat)	817-836C
Corn, 024 Cell (Large, Round)	817-794C
Corn, 024 Cell (Small, Round or Flat)	817-795C
Corn, 040 Cell (Large, Flat)	817-838C
Corn, 040 Cell (Large, Round)	817-796C
Corn, 040 Cell (Small, Round or Flat)	817-797C
Cotton, 060 Cell	817-857C
Milo, 065 Cell	817-849C
Milo, 130 Cell	817-800C
Soybeans, 084 Cell	817-798C
Soybeans, 168 Cell	403-551D
Sunflower, 024 Cell	817-851C
Volumetric No. 1, 84 Cell	817-867C



29594

Figure 79.

Meter Disk	Part Number
Blank, 000 Cell	817-841C



29185

Figure 80.

7.6 Inside Disc Scrapers

When planting in moist or sticky soils, these scrapers are useful in preventing build-up that might otherwise impair opener disc performance.

Description	Part Number
Inside Scraper	122-278S

This scraper cannot be used with Seed-Lok® seed firmers installed. It is compatible with seed flaps and optional Keeton seed firmers.

The spring-loaded carbide scraper requires no adjustment.

7.7 Gauge Wheel Scrapers

When planting in moist or sticky soils, these scrapers are useful in preventing build-up that might otherwise result in shallow planting.

The scrapers mount on the bottom rear of the depth wheel arm, using existing hardware. The slot in the scraper is long enough to clear the lower grease zerk, and allow adjustment as wheel and scraper wear.

For operations, see: “Adjusting Gauge Wheel Scrapers”.

7.8 Seed Firmers

The base planter requires a choice of row unit bundles which include one of three firmers: seed flap, Keeton®, or Seed-Lok®. Only one type of seed firmer may be installed at the same time. Order one per row.

Keeton® Seed Firmer

The Keeton® seed firmer supports low-rate fertiliser delivery. For this use, a user-provisioned liquid fertiliser system must be installed.

Description	Part Number
Keeton seed firmer (per opener)	890-840C

For operations, see:
“Seed Firmer Adjustments”



Figure 81.

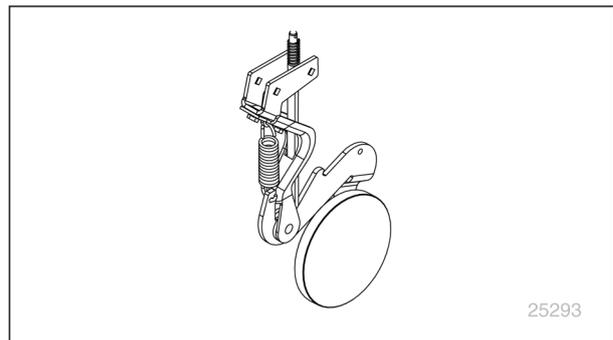


Figure 82.

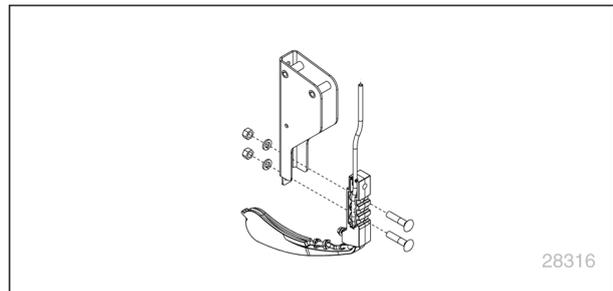


Figure 83.

7.9 Row Unit Press Wheels

The base Yield Pro planter includes a choice of press wheels. Additional wheels are available, and all may be field-installed.

This manual does not list kit part numbers as the available wheels are often region-specific. Consult your Great Plains dealer. For operations, see: “Press Wheel Adjustment”.

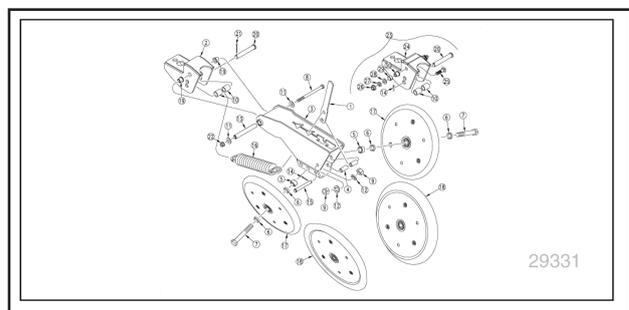


Figure 84.

7.10 Torque Value Chart

Bolt Size in-tpi ^a	Bolt Head Identification					
	 Grade 2		 Grade 5		 Grade 8	
	N-m ^b	ft-lb ^d	N-m	ft-lb	N-m	ft-lb
1/4-20	7.4	5.6	11	8	16	12
1/4-28	8.5	6	13	10	18	14
5/16-18	15	11	24	17	33	25
5/16-24	17	13	26	19	37	27
3/8-16	27	20	42	31	59	44
3/8-24	31	22	47	35	67	49
7/16-14	43	32	67	49	95	70
7/16-20	49	36	75	55	105	78
1/2-13	66	49	105	76	145	105
1/2-20	75	55	115	85	165	120
9/16-12	95	70	150	110	210	155
9/16-18	105	79	165	120	235	170
5/8-11	130	97	205	150	285	210
5/8-18	150	110	230	170	325	240
3/4-10	235	170	360	265	510	375
3/4-16	260	190	405	295	570	420
7/8-9	225	165	585	430	820	605
7/8-14	250	185	640	475	905	670
1-8	340	250	875	645	1230	910
1-12	370	275	955	705	1350	995
1 1/8-7	480	355	1080	795	1750	1290
1 1/8-12	540	395	1210	890	1960	1440
1 1/4-7	680	500	1520	1120	2460	1820
1 1/4-12	750	555	1680	1240	2730	2010
1 3/8-6	890	655	1990	1470	3230	2380
1 3/8-12	1010	745	2270	1670	3680	2710
1 1/2-6	1180	870	2640	1950	4290	3160
1 1/2-12	1330	980	2970	2190	4820	3560

Bolt Size mm x pitch ^c	Bolt Head Identification					
	 Class 5.8		 Class 8.8		 Class 10.9	
	N-m	ft-lb	N-m	ft-lb	N-m	ft-lb
M 5 X 0.8	4	3	6	5	9	7
M 6 X 1	7	5	11	8	15	11
M 8 X 1.25	17	12	26	19	36	27
M 8 X 1	18	13	28	21	39	29
M10 X 1.5	33	24	52	39	72	53
M10 X 0.75	39	29	61	45	85	62
M12 X 1.75	58	42	91	67	125	93
M12 X 1.5	60	44	95	70	130	97
M12 X 1	90	66	105	77	145	105
M14 X 2	92	68	145	105	200	150
M14 X 1.5	99	73	155	115	215	160
M16 X 2	145	105	225	165	315	230
M16 X 1.5	155	115	240	180	335	245
M18 X 2.5	195	145	310	230	405	300
M18 X 1.5	220	165	350	260	485	355
M20 X 2.5	280	205	440	325	610	450
M20 X 1.5	310	230	650	480	900	665
M24 X 3	480	355	760	560	1050	780
M24 X 2	525	390	830	610	1150	845
M30 X 3.5	960	705	1510	1120	2100	1550
M30 X 2	1060	785	1680	1240	2320	1710
M36 X 3.5	1730	1270	2650	1950	3660	2700
M36 X 2	1880	1380	2960	2190	4100	3220

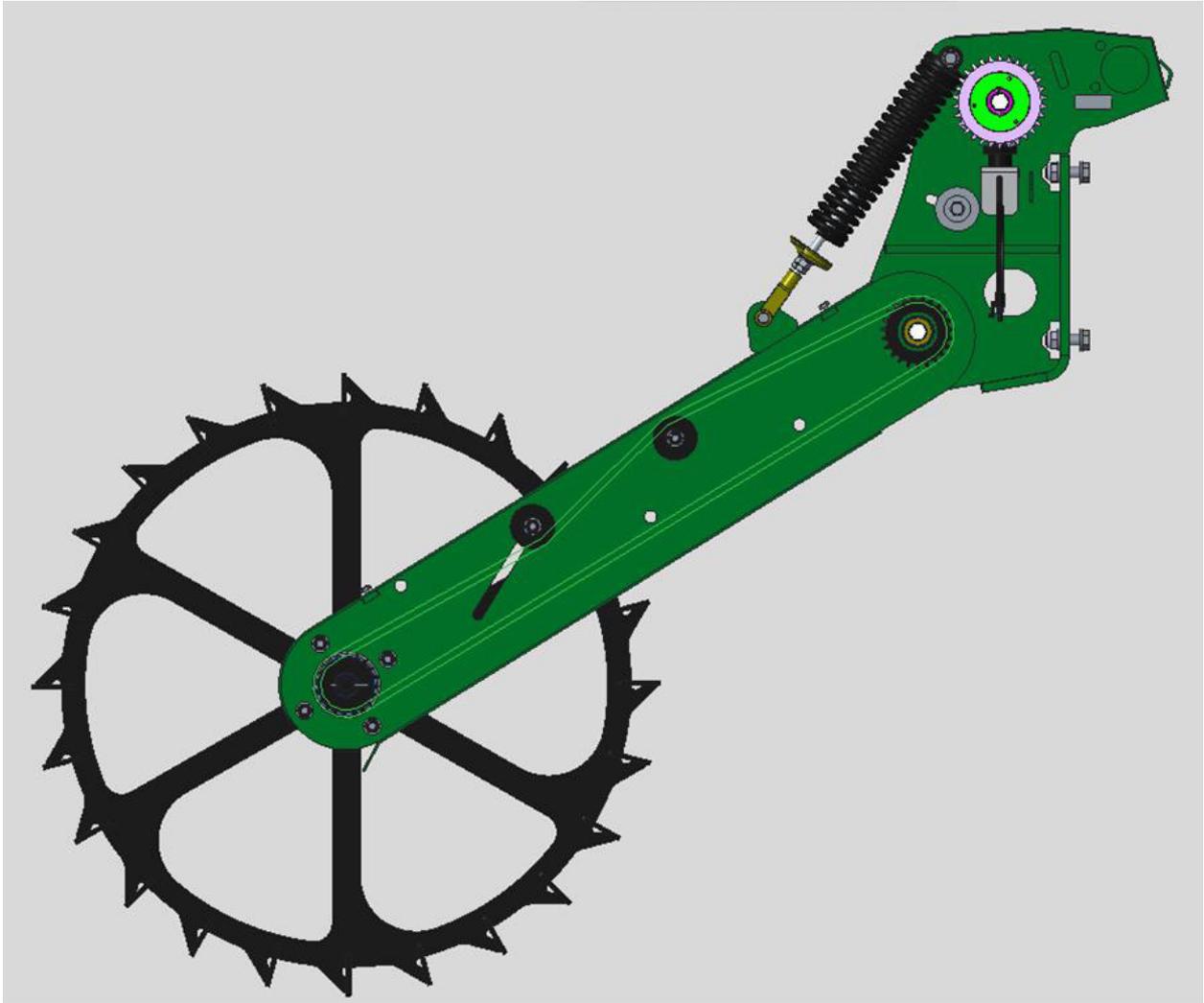
- a. in-tpi = nominal thread diameter in inches-threads per inch
- b. N·m = newton-meters
- c. mm x pitch = nominal thread diameter in mm x thread pitch
- d. ft-lb = foot pounds

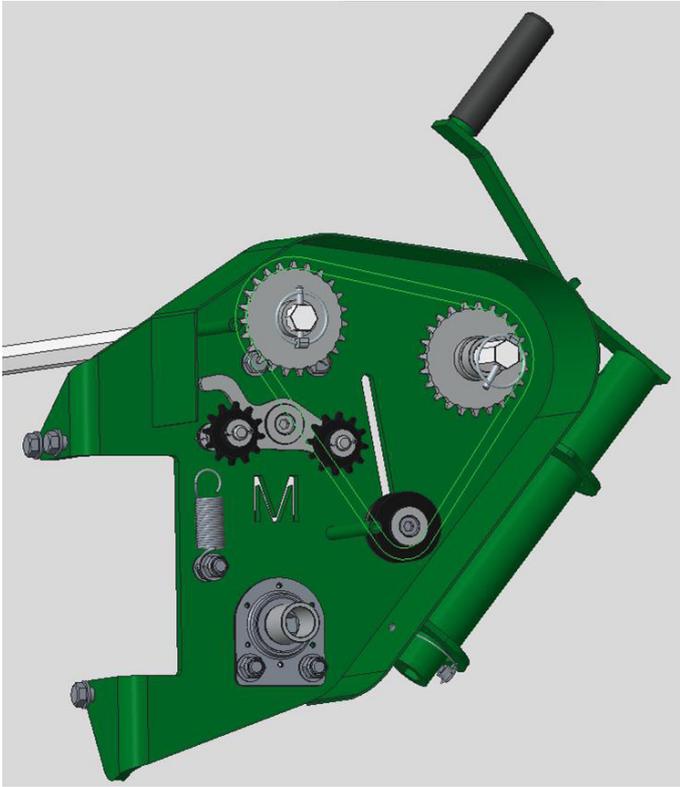
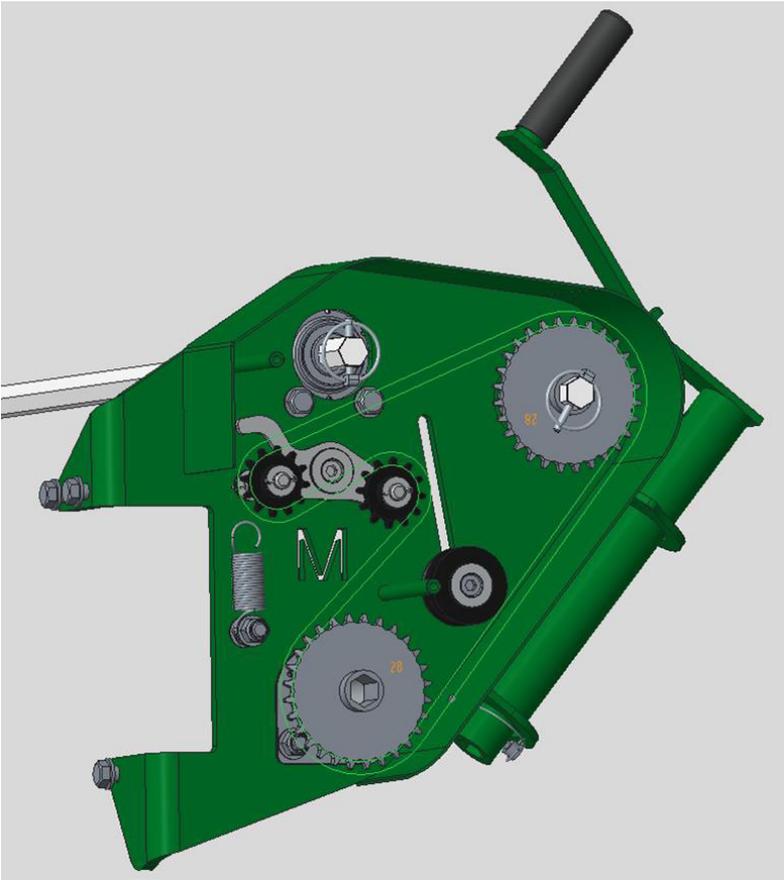
Torque tolerance + 0%, -15% of torquing values. Unless otherwise specified use torque values listed above.

25199

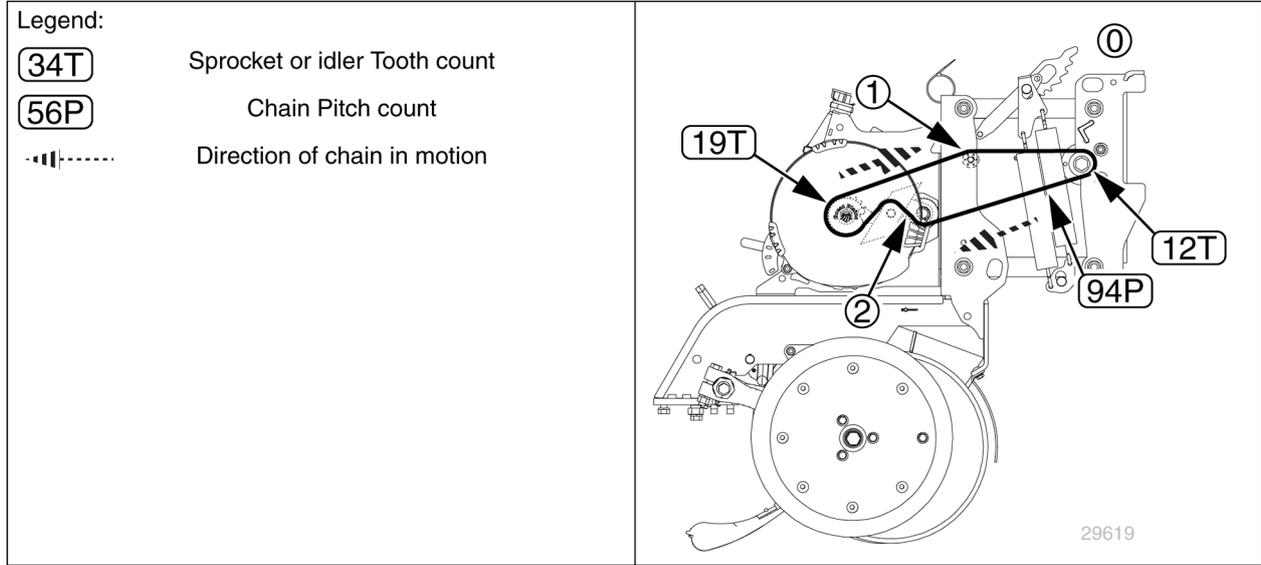
Chain Routing

Ground Drive Arm Chain



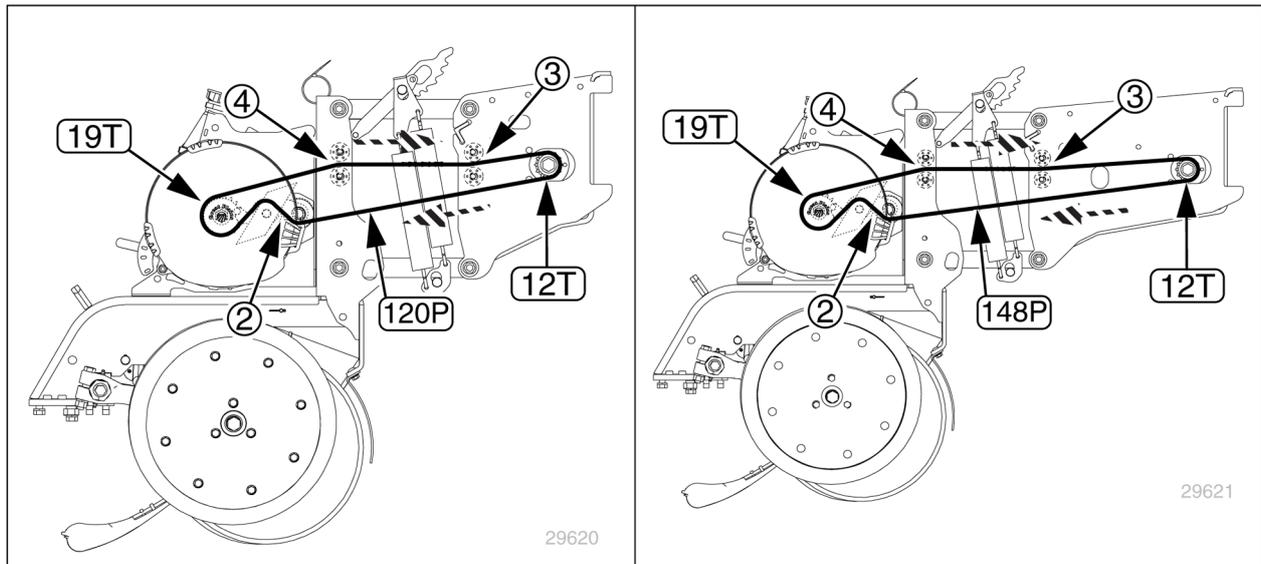


25AP Final Meter Drive



25P: Meter Drive (Front type)

- Note:
- ① No idlers on mount.
 - ① top chain passes over single idler on shank
 - ② be sure to reconnect idler spring



25P: Meter Drive (Mid type)

- Note:
- ② be sure to reconnect idler spring
 - ③ top chain passes between 2 idlers at mount
 - ④ top chain passes between 2 idlers at shank

25P: Meter Drive (Rear type)

- Note:
- ② be sure to reconnect idler spring
 - ③ top chain passes between 2 idlers at mount
 - ④ top chain passes between 2 idlers at shank

8.0 Appendix A-Pre Delivery

This Appendix covers setup tasks performed by the dealer prior to delivery. These items need to be completed prior to any items in Appendix B (some of which may also be performed by the Great Plains dealer).

- a. Partially deploy ground drive.
- b. Install press wheel assemblies.
- c. Engage ground drive spring.

The planter mainframe includes shipping stands which are returned to Great Plains after the tongue is attached.

Mount Ground Drive Wheel

The ground drive wheel is shipped loose. It must be bolted to the hub.



Sharp Object Hazard: Use a hoist or two people. Wear gloves. The wheel is heavy and the tines are sharp.

1. At the ground drive hub , orientate the wheel so that at the top, the vertical face of the top tooth is to the rear, and the longer angled face is to the front.
3. Secure the wheel to the hub with bolts , lock washers and nuts .



Install Ground Drive Wheel

Install Press Wheel Assemblies

To meet highway clearance requirements, press wheel arms and wheels may not be factory-installed.

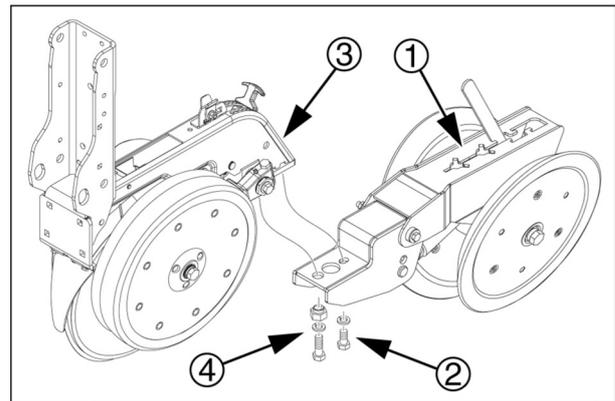
4. Remove and save the $\frac{1}{2}$ -13x1 inch hex head bolt and washer (2) at the back of an incomplete row unit (3).

There are four bolts at this location. Remove only the hex head bolts. Do not loosen or remove the square head bolts forward.

5. Remove and save the $\frac{1}{2}$ -13 11/2 inch hex head bolt (4), washer, and eccentric adjuster nut.

6. Align the $\frac{1}{2}$ inch holes in the press wheel assembly with the $\frac{1}{2}$ -13 tapped holes in the row unit, loosely assemble with the $\frac{1}{2}$ -13 1 inch hex head bolt and washer (2).

7. Loosely screw in the $\frac{1}{2}$ -13 11/2 inch hex head bolt, washer, and eccentric adjuster nut. Rotate the adjuster to visually align the press wheel assembly with the row unit, and tight the adjust and both bolts.



25AP Press Wheel Assembly

9.0 Appendix B

This Appendix covers setup tasks performed only once, or at infrequent intervals. Routine setup tasks are covered in “Preparation and Setup”. Perform Appendix A tasks first. Some of these items may already have been done by your Great Plains dealer:

- a. Seed monitor console installation (below)
- b. Marker setup
- c. Scrapers

Seed Monitor Console Installation

The planter’s standard PM300 seed monitor system includes a console (1) that needs to be mounted in the cab of the tractor to be used with the planter.

Transport and Field Safety Risk:
Mount the module so it is easy to monitor during planting, but does not interfere with safe operation of the tractor in the field or on public roads.

The monitor includes cables for power (2), speed sensor (3) and sensor harness (4). Installation instructions are found in the included DICKEY-john® manual.

Power color code is:
+ positive: red
- negative: black

The included bracket requires customer-supplied fasteners.

Post-Delivery Checklist

1. Read and understand “Important Safety Information”.
2. Check that all working parts are moving freely, bolts are tight, and cotter pins are spread.
3. Check that all grease fittings are in place and lubricated. See “Lubrication”.
4. Check that all safety decals and reflectors are correctly located and legible. Replace if damaged. See “Safety Decals”.
5. Inflate tires to pressure recommended and tighten wheel bolts as specified. See “Torque Values Chart”.



PM300 Tractor Components

Marker Extension

Marker extension needs to be adjusted once for the initial planter setup, and later only if changing row spacing (including row shut-off for single-row operation on a twin-capable planter).

1. Move the planter to a location where both markers may be safely unfolded. Lower the planter. Pull forward and lower the row units into the ground.

Note: Due to the relatively steep arm angles on short markers, extension measurements are likely to be incorrect if the main tool bar is not at normal operating height (26 inch).

2. Tilt up and unfold one marker.

3. Find the suggested initial marker Extension in the table on this page.

Note: When using altered twin-row spacings, marker extensions are different for each side.

4. Measure out the Extension distance from each outside end row unit (whether in use or not). Do not measure to center of row pair.

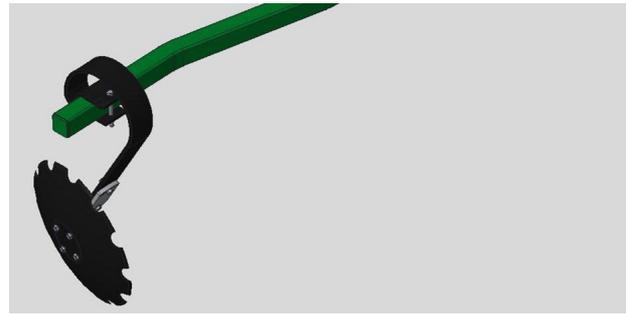
5. Mark the ground at this point.

6. To adjust marker width, loosen nuts on U-bolts . Move marker disc tube in or out to get the proper adjustment. Tighten nuts .

7. Repeat steps 4 and 6 for the other side.

8. With the planter still lowered, drive forward a few feet for each side.

9. Check the mark locations. Adjust as necessary.



Marker Extension



Marker Extension Adjustment

122-278S Scraper Installation

Optional carbide disc scrapers are not factory installed. Start with row 1 (left-most row unit).

Note: If a Keeton seed firmer is also installed, see the Parts Manual for assembly details. This scraper is not compatible with Seed-Lok®.

1. Remove one or both opener disc blades to gain safe access to the mount (1). Note the position of bushings and spacers for correct re-assembly.

2. Select one each:

- (85) 802-024C HHCS 3/8-16X3 GR5
- (84) 129BXT824 BRACKET FOR 890-929C FIRMER
- (83) 122-177D 10HD25 INSIDE SCRAPER MNT TUBE

Insert the bolt (85), from the rear, through the lowest hole of the bracket (84) . Place the tube (83) over the bolt.

3. Select one scraper set:

- (91) 890-928C 25 SER AIR DESIGN IN SCRAPER
- Place the shoulder washer (2) on bolt (85) with the larger diameter to the rear (toward bolt head). Place the left scraper blade (3) on the washer, followed by the right scraper blade (4).

4. Select one each:

- (89) 804-011C WASHER FLAT 3/8 USS PLT
- (90) 804-013C WASHER LOCK SPRING 3/8 PLT
- (87) 803-014C NUT HEX 3/8-16 PLT

Place the flat washer (89) on the bolt (85) , followed by the lock washer (90) and nut (87) . Tighten bolt and nut to 3/8-16GR5 torque spec. Make sure blades pivot freely.

5. Select the scraper spring (5). Connect the spring between the blades, using the small top holes.

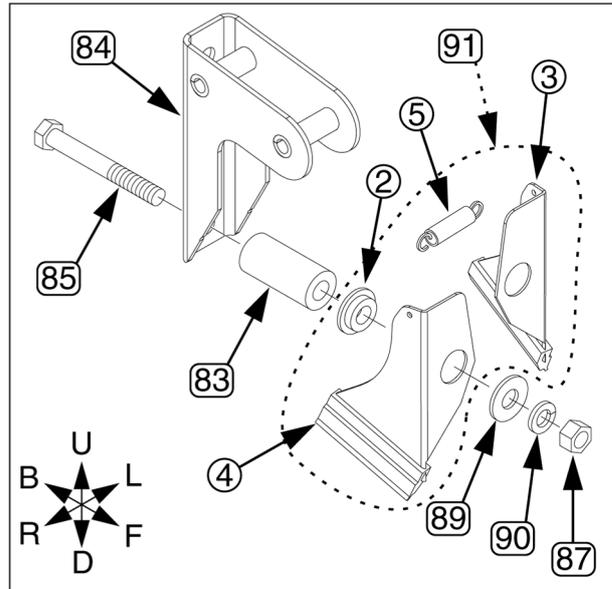
6. Select two sets:

- (86) 802-172C HHCS 5/16-18X2 1/2 GR5
- (88) 803-043C NUT HEX WHIZ 5/16-18 PLT

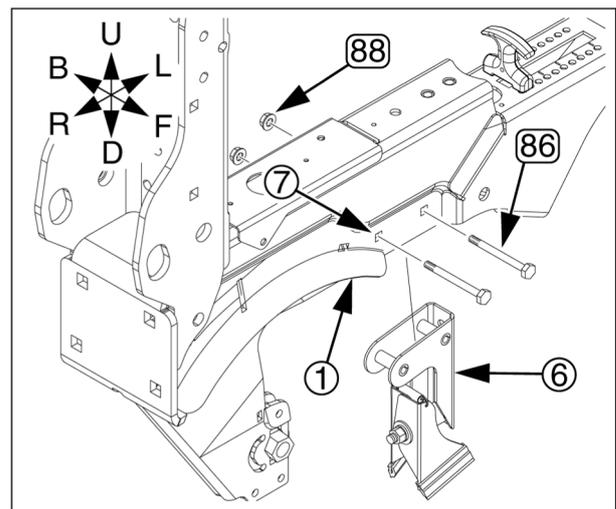
Insert the scraper assembly (6) between the middle four lower square holes (7) of the opener frame.

Secure with bolts (86) and whiz nuts (88) .

7. Re-mount the removed disc blade. Callout, Part & Description cross references are drawn from a Reference Page.



Scraper Pre-Assembly



Scraper Installation

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