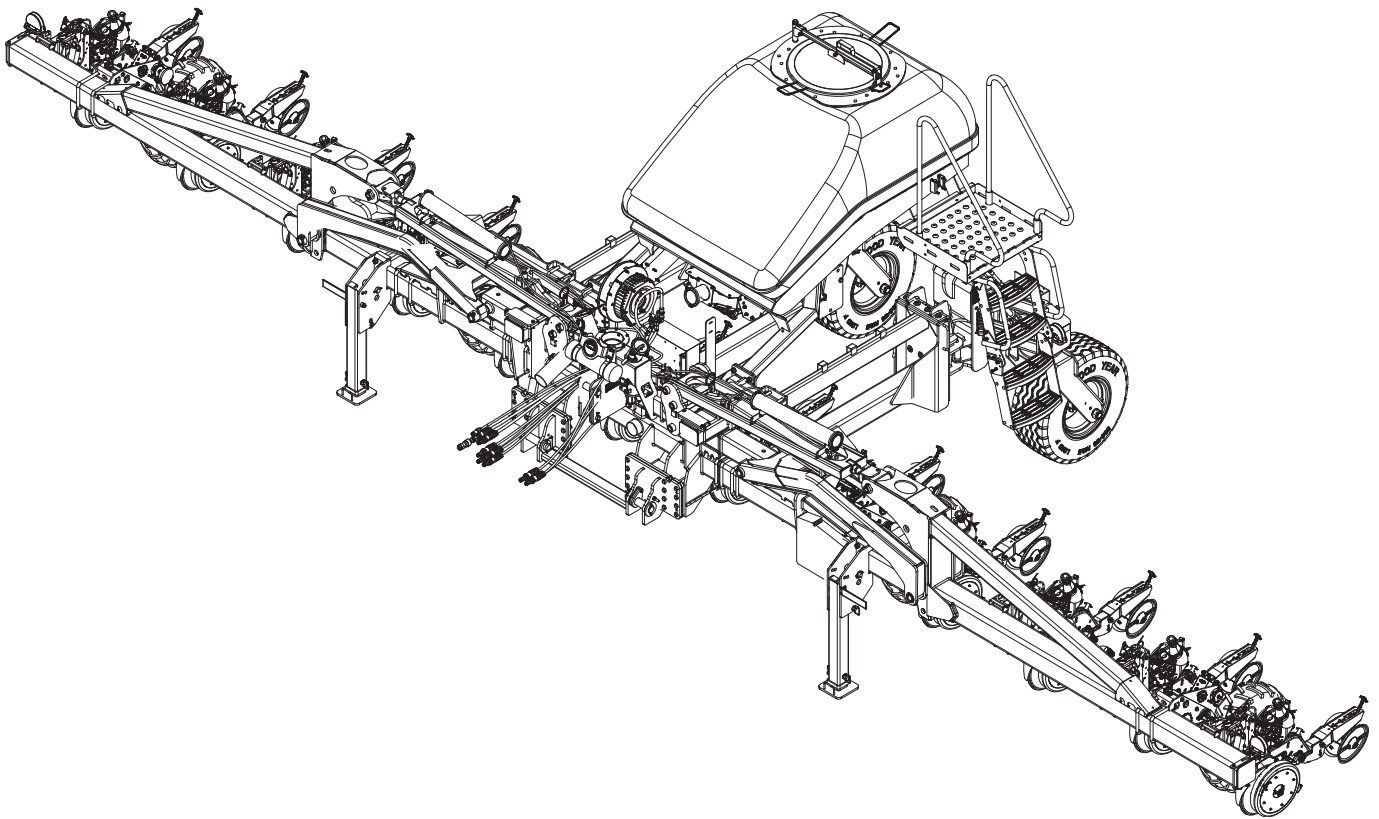


Great Plains

PLANTER

OPERATOR MANUAL

MODEL PL5200 40' Stack-Fold Planter



Original Instructions 411-825M



Read the operator 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.

Machine Identification

Record your machine details in the log below. If you replace this manual, be sure to transfer this information to the new manual.

If you or the dealer have added options not originally ordered with the machine, or removed options that were originally ordered, the weights and measurements are no longer accurate for your machine. Update the record by adding the machine weight and measurements with the option(s) weight and measurements.

Model Number	
Serial Number	
Machine Height	
Machine Length	
Machine Width	
Machine Weight	
Year of Construction	
Delivery Date	
First Operation	
Accessories	

Dealer Contact Information

Name: _____

Street: _____

City/State: _____

Telephone: _____

Email: _____

Dealer's Customer No.: _____

California Proposition 65
 WARNING: Handling passenger or off-highway motor vehicle parts can expose you to chemicals such as phthalates and lead, which can cause cancer and reproductive harm. To minimize exposure, service the vehicle in a well-ventilated area, wear gloves, and wash your hands. For more information see www.P65Warnings.ca.gov/motor-vehicle-parts .

To our customer:

Congratulations on the purchase of your Name of Company product. Name of Company welcomes you to its growing family of new product owners. Your product has been designed and built by skilled workers using quality materials.

Your dealer has performed the necessary pre-delivery service to your machine, and will advise you of the proper maintenance and operating practices that will give you long, satisfactory use of your machine. Do not hesitate to contact your dealer when you have a question related to your machine.

Your machine has been designed to run efficiently in most operating conditions, and will perform relative to the service it receives. If you need customer service or repair parts, contact your dealer who has trained personnel, repair parts, and equipment specially designed for Name of Company products.

Read this manual carefully before using the machine. It will familiarize you with safety, operation, adjustments, and maintenance of your new equipment. This manual must always be kept with your machine.

Name of Company wants you to be satisfied with your product. If for any reason you do not understand any part of this manual or are otherwise dissatisfied, please take the following actions first:

1. Discuss the matter with your dealership service manager. Make sure he is aware of any problems so he can assist you.
2. If you are still unsatisfied, seek out the owner or general manager of the dealership.

If your dealer is unable to resolve the problem or the issue is parts related, please contact:

Great Plains Service Department
1525 E. North St.
P.O. Box 5060
Salina, KS, USA 67402-5060

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Table of Contents

Introduction	1	Center Frame Leveling Front-to-Back	19
Intended Usage Statement	1	Wing Leveling	19
Prohibited Use	1	Gauge Wheel Stop	19
Machine Identification	1	Gauge Wheel Spring Linkage	20
Target Group for Operator Manual	1	Walkboard	20
Training and Instruction	1	Loading Material	21
Safety Information	3	Bulk Seed Hopper	21
Safety Symbols and Signal Words	3	Row Hoppers	21
Observe Safety and Informational Symbols	3	Seed Lubricants	22
Be Aware of Signal Words	3	Ezee Glide Plus	22
Before Getting Started	3	Bayer Fluency Agent Advanced	22
Read Machine Information	3	Speed Calibration	22
Wear Appropriate Clothing and Equipment	3	Speed Radar Sensor	23
Inspect Machine Before Use	3	Parking Stands	23
Machine Use	4	Rear Parking Stand	23
Operate Responsibly	4	Transport	23
Handle Hydraulics with Care	4	Parking	24
Avoid Potential Collision Damage	4	Storage	24
Chemicals and Waste	4	Operation	26
Dispose of Waste Properly	4	Pre-Start Checklist	26
Machine Maintenance	5	Field Operation	26
Follow Tire Recommendations	5	Before Planting Checklist	26
Prepare for Performing Maintenance	5	Begin Planting	26
PTO	5	End Planting	26
Machine Transport	5	Planter Locks	27
Use Safety Lights and Devices	5	Raising and Lowering	28
Shutdown and Storage	5	Lift-Assist Hydraulics (Option)	28
Safety Decals	6	Raising Planter with Lift-Assist	28
Preparation and Setup	14	Lowering Planter with Lift-Assist	28
Preparation Checklist	14	Folding and Unfolding	28
Hydraulic Connections	14	Unfolding with 3-Point Hitch	28
Hydraulic Hose Connections	14	Unfolding with 2-Point Hitch	28
Fan Hydraulic Connections	14	Folding with 3-Point Hitch	28
Electrical Connections	15	Folding with 2-Point Hitch	29
Hitch	15	Air System	29
Hitching (3-Point Hitch)	15	Dual-Fan Air System Hydraulics	30
Hitching (2-Point Hitch)	15	Fan Operation	30
Hitching (3-Point Side-Shift Hitch)	16	Fan and Meter Pressurization	31
Lower Link	16	Skips	32
Side-Shift Hitch Lower Link	16	Doubles	32
3-Point Hitch Top Link	17	Fine Tuning Meter Pressurization	32
3-Point Side-Shift Hitch Top Link	17	Alternate Skips/Double Check	32
Hitch Tracking Alignment	17	Seed Meter Operation	33
Height Switch (S/N E1193K-)	17	Meter Operation	33
Leveling Planter	18	Planting Rate	33
Center Frame Leveling Left-to-Right	18	Singulated Rate	34
		Twin-Row to Single-Row Conversion	35

Side-Shift Hitch Offset	35	Coulter Blades	53
3-Point Side-Shift Hitch Offset	35	Inside Disk Scrapers	53
2-Point Side-Shift Hitch Offset	36	Side Gauge Wheel Scrapers	54
Row Unit Lock-Up	37	Press Wheels	54
Row Unit Lock-Up (3-Point Hitch)	37	Seed Tube Brush	54
Row Unit Lock-Up (2-Point Hitch)	37	Timing Tool Hat	54
Disable Seed Meters	38	Seed Firmers	55
Gauge Wheel Offset	38	Keeton Seed Firmers	55
Lift-Assist Wheel Offset (Option)	39	Seed-Lok Firming Wheel	55
Adjustments	40	Seed Meter Clean-Out Container	55
Planting Rate for Ground Drive	40	Seed Meter Disks	55
Range Sprockets	40	Topcon Console System	56
Transmission Sprockets	40	SureForce Hydraulic Option	56
Planting Rate for Hydraulic Drive	41	Maintenance	57
Planting Rate with IRC	41	Maintenance Schedule	57
Verify Seed Delivery	41	Regular Maintenance	57
Seed Meter Setup and Adjustments	42	Hydraulic System	58
Seed Meter Rain Cover	42	Hydraulic System Inspection	58
Seed Disk Installation	42	Hydraulic Drive Filter	58
Seed Disk Removal	43	Material Clean-Out	58
Seed Inlet Gate Adjustment	43	Airbox Clean-Out	59
Disable Seeding	43	Air System Clean-Out	59
Seed Pool Slopes	44	Airbox Residue Clean-Out	59
Seed Meter Operation	44	Seed Meter Clean-Out	60
Seed Meter Hydraulic Drive	44	Alternate Meter Clean-Out	61
5000 Series Row Unit	45	Seed Tube Clean-Out	61
Row Unit Down Pressure	45	Seed Meter Brushes Maintenance	61
Down-Pressure Adjustment	46	Seed Meter Brush Replacement	62
Row Unit Opener Disks	47	Tufted Brush Replacement	62
Setting Planting Depth	47	Strip Brush Replacement	62
Disk-to-Disk Spacing	47	Seed Drop Brush Replacement	63
Side Gauge Wheel Angle and Clearance	47	Knockout Brush Replacement	63
Side Gauge Wheel Scraper (Option)	48	Seed Disk Maintenance	63
Press Wheel Adjustments	48	Cleaning and Storing Seed Disks	63
Press Wheel Down Pressure	49	Side Depth Wheels	64
Press Wheel Stagger	49	Disk Spreaders and Scrapers	64
Press Wheel Centering	49	Seed Flap Replacement	65
Unit Mounted Coulters	49	Chains	65
Coulter Row Adjustment	50	Chain Lubrication	65
Row Unit Shut-Off	50	Chain Slack	65
Seed Firmers	51	Chain Clips	65
Keeton Seed Firmers (Option)	51	Seed Meter Drive Chain	65
Seed-Lok Firming Wheels (Option)	51	Lubrication	65
Seed-Lok Wheels Lock-up (Option)	52	Grease Fittings	65
Height Switch (S/N E1193K-)	52	Bearings	67
Height Switch (S/N E1194K+)	52	Troubleshooting	68
Options	53	Seed Pool	69
Seed Lubricant	53	Seed Pool Recovery	69
Unit Mounted Disk Coulters	53	Planter Troubleshooting	70

Population and Airbox Troubleshooting	71
Seed Blockage Removal	73
Fuse Block Decals	74
Specifications	78
Torque Value Chart	80
Tire Chart	80
Hydraulic Diagrams	81
Chain Routings.	86
Pre-Delivery Instructions	87
Requirement Checklist	87
Tools Required	87
Location Selection	87
Unloading	88
Loose Components	88
Hitching to Planter	88
List-Assist Installation (Option).	89
Lift-Assist Wheel Assembly	89
Hydraulic Cylinders	90
Shipping Top Link Removal	91
Height Switch	91
Install Height Switch Kit (413-063S) (S/N	
E1193K-)	91
Height Switch Electrical Connections.	92
Height / Lift Switch (413-121S) (S/N E1194K+) .	
92	
Option Installation	93
Inside Disk Scraper Installation	93
Warranty	94

Introduction

The PL5200 Planter is a stack-fold, semi-mounted implement for use in conventional till, minimum-till, or light no-till conditions. Flex and rigid wings configurations are available.

The PL5200 Planter has 5000 Series, side-depth-control row-units, and Air-Pro Seed Metering System. Optional unit-mounted coulters are for light to moderate no-till conditions only. Twin-row configurations in 38" and 40" row spacing offer an industry exclusive side-shift quick conversion from twin-row to single-row planting operations within an hour. The planter stack-folds for transport.

■ Intended Usage Statement

The PL5200 Stack-Fold Planter with standard equipment and/or authorized attachments and options is intended to be used as a seeding machine when operated according to instructions and safety precautions in this manual, machine decals, or other information provided with the machine.

Use this planter to seed production-agriculture crops only. Do not modify the planter for use with attachments other than Great Plains options and accessories specified for use with the planter.

Any other use, for example, using the machine as a grader or cultivator tool, is not permitted. The manufacturer and dealers are not liable for damage caused by improper use.

Prohibited Use

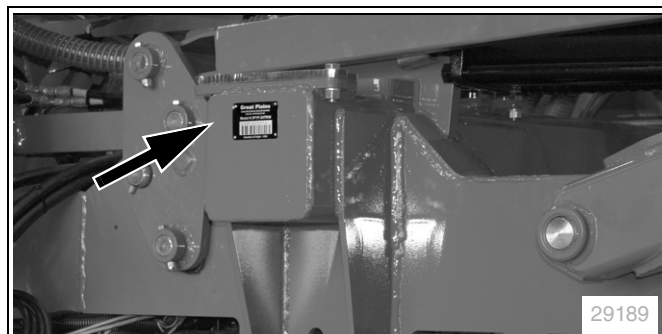
Do not use this machine for any purpose or in any way other than what is described in this manual, machine decals, or any other information provided with the machine by the manufacturer. These materials define the intended use of the machine.

Unauthorized modifications to the machine will relieve the manufacturer of all liability for any resulting injury or damage.

■ Machine Identification

Your machine's parts were specially designed and should only be replaced with Great Plains parts. Always use the serial and model number when ordering parts from your dealer. Record your planter model and serial number on the inside cover of this manual for quick reference. The serial number plate is

located on the front face of the left wing rest near machine center.



■ Target Group for Operator Manual



Simplified Illustrations

This operator manual is aimed at trained agriculturists and persons who are otherwise qualified for agricultural activities and have received instruction in working with this machine.

For your safety - You must familiarize yourself with the contents of this operator manual before assembly or initial operation of the machine. In this way, you will achieve optimum work results and operational safety. The operator manual forms an integral part of the machine and must always be kept at hand. This will ensure that you:

- avoid accidents,
- comply with warranty conditions, and
- have a fully functional machine in good working order at all times.

Training and Instruction

Your dealer will provide instruction on operation and care of the machine.

Information for the employer - All personnel are to be regularly, at least once a year, instructed on the use of the machine, in accordance with the regulations of the national organization for Health and Safety at Work. Untrained or unauthorized persons are not permitted to use the machine.

You are responsible for ensuring that the machine is operated and maintained safely. Make sure that you and all other persons that operate, maintain, or work in close proximity with the machine are familiar with the operating and maintenance regulations, as well as the corresponding safety instructions in this operator manual.

**Parts Manual QRC**

The QR Code to the left will take you to this machine's parts manual. Use your smart phone or tablet to scan and start viewing.

**Product Manuals QRC**

The QR Code to the left will take you to Great Plains' catalog of product manuals. Use your smart phone or tablet to scan and start viewing.

Safety Information

■ Safety Symbols and Signal Words

Observe Safety and Informational Symbols

Throughout this manual you will see the following safety and informational symbols. They indicate safety hazards, machine hazards, or information to improve operation. Read the instructions carefully whenever you see any of these symbols:



The safety symbol indicates a potential safety hazard to persons operating or near the machine and advises on how to avoid it.



The notice symbol indicates a potential for machine or property damage from operator error and advises on how to avoid misuse.



The information symbol indicates useful - but not crucial - information for machine operation, assembly, or adjustment.

Be Aware of Signal Words

Some decals are accompanied by a signal word. Signal words indicate the seriousness of a potential hazard. These signal words are:



DANGER indicates an imminent hazard which, if not avoided, will result in death or serious injury. This signal word is limited to the most serious situations, typically for unguarded machine components.



WARNING indicates a potential hazard which, if not avoided, could result in death or serious injury including hazards that are exposed when guards are removed. It also alerts against unsafe practices.



CAUTION indicates a potential hazard, which if not avoided, may result in minor or moderate injury. It also alerts against unsafe practices.

■ Before Getting Started



Read Machine Information

- Read this manual in its entirety before attempting to start and operate the machine. Do not let anyone operate machine without proper instruction.
- Non-Great Plains components on this machine may contain additional safety information not found in this manual. Consult the manufacturer's safety information and product decals to safely use products from third-parties.

Wear Appropriate Clothing and Equipment

- Never wear loose clothing around machine. Always wear appropriate clothing and equipment such as hard hats, gloves, face masks, eye protection, and work or steel-toed boots as needed.
- Prolonged exposure to machine noise during operation can cause hearing impairment or loss. Use proper hearing protection like earmuffs or earplugs while working.

Inspect Machine Before Use

- Inspect brakes, link pins, and other mechanical parts for wear and dirt buildup, and check that all guards and shields are undamaged, installed, and secure before operating machine.
- Check that hydraulic fittings are tight and all hydraulic hoses and lines are in good working condition before applying pressure to the system.
- Do not modify the machine. Unauthorized modification can result in unsafe conditions that lead to machine damage or personal injury.

■ Machine Use



Operate Responsibly

- Maintain attention on operation at all times to avoid injury to yourself or others.
- Do not operate machine while distracted by a smart phone, tablet, or similar electronic device, or while impaired by alcohol, medication, any controlled substance, or while fatigued.
- Do not ever allow passengers to ride on any part of the machine at any time, for any reason.

Handle Hydraulics with Care

- Keep clear of machine while hydraulics are in use. Any failure in the hydraulic system can cause machine parts to move or fall rapidly with a great deal of force. Anyone struck, caught between, or crushed beneath these parts can suffer serious injury or even death.
- A raised planter without cylinder locks installed or without active hydraulic pressure will slowly lower over time. Use tractor hydraulics to raise planter only for brief periods, such as field turns and cylinder lock installation.
- Relieve hydraulic pressure and wait for all parts to come to a complete stop before disconnecting any hydraulic lines or performing any work on the hydraulic system.
- Do not have skin exposed when searching for leaks in hydraulic lines. Use a piece of cardboard or wood to locate leaks. If injured by escaping hydraulic fluid, seek immediate medical attention.
- Wear protective gloves and eye protection when working on the machine's hydraulic system.

Avoid Potential Collision Damage

- Watch your surroundings at all times. Do not operate with nearby bystanders or while anyone makes adjustments or fills the machine.
- Avoid contacting overhead obstructions such as low bridges, overpasses, and power lines.
- Do not operate near ditches, holes, steep slopes, embankments, or other surfaces which may collapse under the machine's weight or tip the machine over.

■ Chemicals and Waste



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

- Read chemical manufacturer's instructions carefully, and then take appropriate precautions before use. In the absence of manufacturer instructions, chemical labels will inform you of any potential hazards and their severity.
- Wear protective clothing and as well as any other personal protective equipment.
- Wash hands and face before eating after working with chemicals. Shower as soon as application is completed for the day.
- Apply only with acceptable wind conditions. Make sure wind drift of chemicals will not affect any surrounding land, people or animals.
- Dispose of unused chemicals and chemical waste as specified by the manufacturer. Observe all the local ordinances and regulations in your area.

Dispose of Waste Properly

- Dispose of waste properly to avoid threatening the environment and ecology. Potential harmful waste includes oil, fuel, filters, and batteries.
- Use a leak-proof container for draining fluids. Do not use a food or beverage container that may be mistaken for a consumable product.
- Do not drain or pour waste onto the ground, down a drain, or into any water source.
- Contact your local environmental or recycling center for the proper way to recycle or dispose of waste.

■ Machine Maintenance



Follow Tire Recommendations

- Consult the tire manufacturer's recommendations for maintenance and replacement of your machine's tires. Only use prescribed tire sizes with correct ratings and tire pressure.
- Replacing tires is potentially hazardous. Have a trained professional change the machine's tires with the proper tools and equipment.
- Avoid over inflation of tires and over torquing wheel bolts. Review the machine specifications and tire information in this manual first before doing any work on the tires of your machine.

Prepare for Performing Maintenance

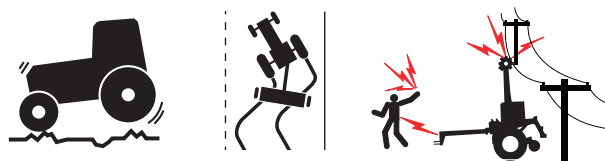
- Understand procedure before performing any work. Always use proper tools and equipment.
- Only work on or around the machine if frame is lowered, or raised with the cylinder locks in place.
- Lower the implement. Put tractor in Park, turn off engine. To prevent unauthorized starting, remove key before performing maintenance or service work.
- If work must be performed with wings raised, set the wing tilt locks to the road position.
- Disconnect electronic monitor and lighting harness from the tractor before servicing or adjusting electrical systems.
- Check and replace worn brake lines as needed.
- Remove all tools and unused parts from implement before operation.

PTO



- Wait until all moving components have completely stopped before adjusting, cleaning, or servicing any PTO driven equipment.
- When operating stationary PTO driven equipment, always apply the parking brake and place chocks behind wheels.
- Stay clear of and never step over any rotating parts.

■ Machine Transport



- This machine does not meet all local, regional, or national regulations for transport on a public road. Know and comply with your local laws and regulations before transporting your machine.
- Transport only at recommended transport speed. Further reduce speed when turning.
- Before towing implement on roads, empty out all material from hoppers or boxes. Implement should never weigh more than 1.5 times the weight of towing vehicle.
- Know transport height and width of implement to avoid collision.
- Do not engage any hydraulic functions while machine is in transport.

■ Use Safety Lights and Devices



- Inspect safety chain and chain load rating before use with machine. Never use the safety chain for towing. Replace chain if any links or end fittings are broken, stretched, or otherwise damaged.
- Always use safety lights and devices when transporting and operating the machine. If equipped, use flashing warning lights and turn signals whenever driving on public roads.
- Regularly inspect safety lights, signs, and devices to ensure that they are clean and visible from either end of the machine.

■ Shutdown and Storage

- Park the tractor and implement on a solid, level surface devoid of bystanders.
- Fold and tilt wings up.
- Put tractor in park or set the parking brake. Turn off engine and remove key from ignition.
- Turn lockout valve and wing lock levers to locked position to prevent the wings from lowering.
- Detach the tractor. Secure the implement using blocks.

Safety Decals

Your planter comes equipped with safety reflectors and decals in place.

Read and follow decal directions. Keep all safety decals clean and legible. Replace all damaged, faded, or missing decals.

Order new decals from your Great Plains dealer. Refer to this section for proper decal placement.

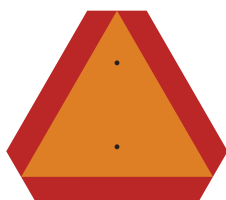
When ordering new parts or components, also request corresponding safety decals and reflectors.

To install new decals:

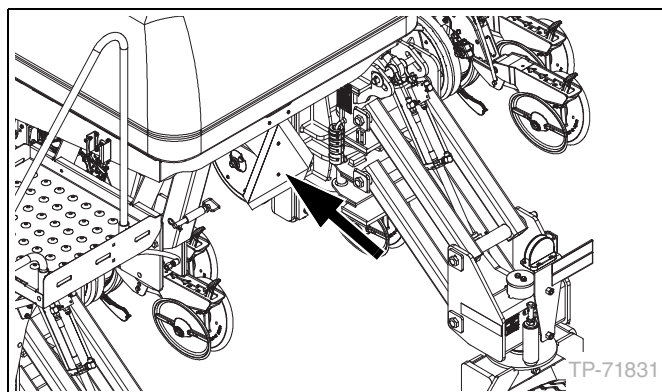
- Clean the area on which the decal is to be placed.
- Peel backing from decal. Press firmly on surface, being careful not to cause air bubbles under decal.

Slow Moving Vehicle Reflector (with Bulk Hopper)

818-055C

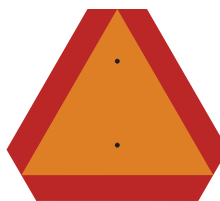


One reflector - Rear, center of planter.

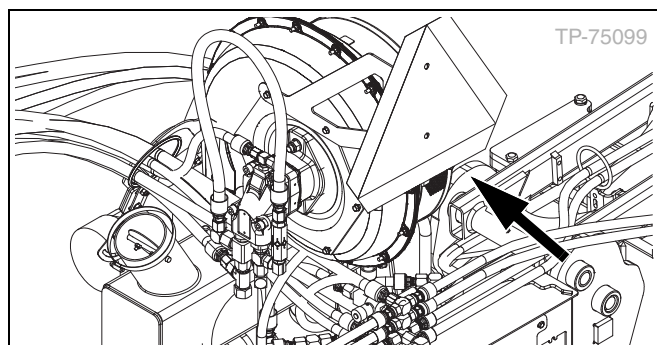


Slow Moving Vehicle Reflector (with Row Hoppers)

818-055C



One reflector - Rear mount on fan.

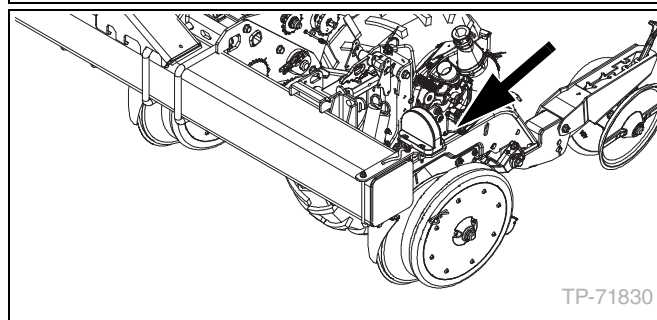
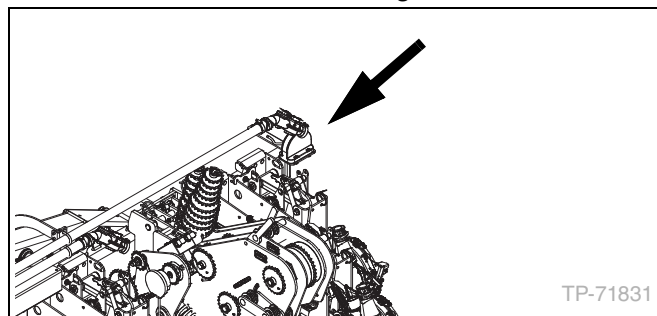


Red Reflector (with Bulk Hopper)

838-266C

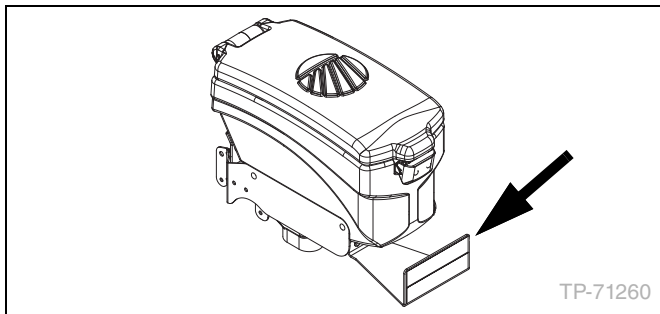


Four reflectors - One reflector above daytime reflector, on the face of each toolbar end. One reflector on the rear face of wing toolbars.

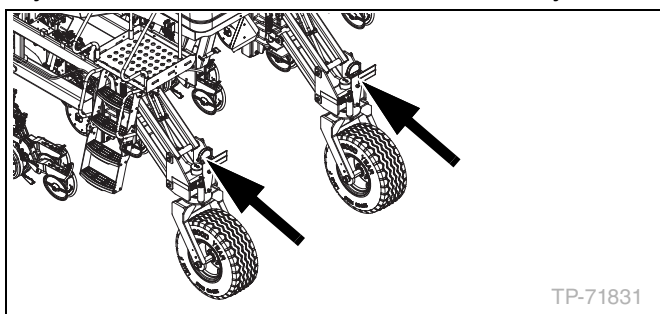


Red Reflector (with Row Hoppers)**838-266C**

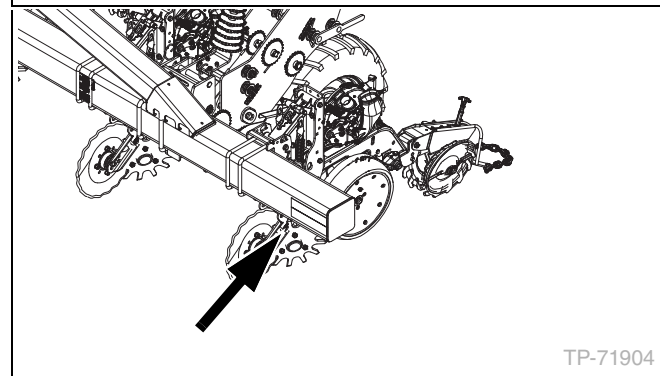
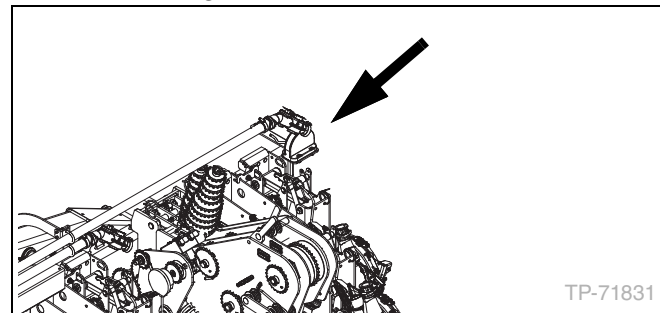
Four reflectors - One reflector above daytime reflector, on row units 1, 4, 9, and 12.

**Red Reflector (with Lift-Assist)****838-266C**

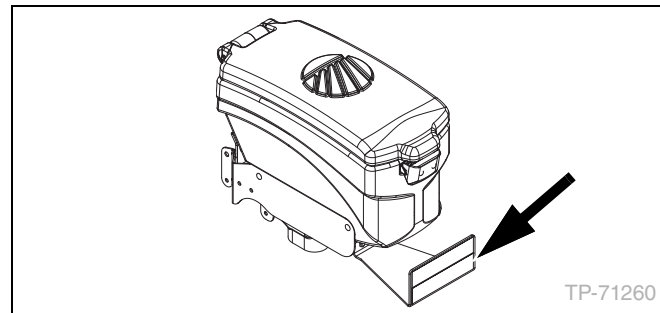
Two additional reflectors - One reflector above daytime reflector on each lift-assist assembly.

**Daytime Reflector (with Bulk Hopper)****838-267C**

Four reflectors - One reflector below Amber Reflector, on the face of each toolbar end. One reflector on the rear face of wing toolbars.

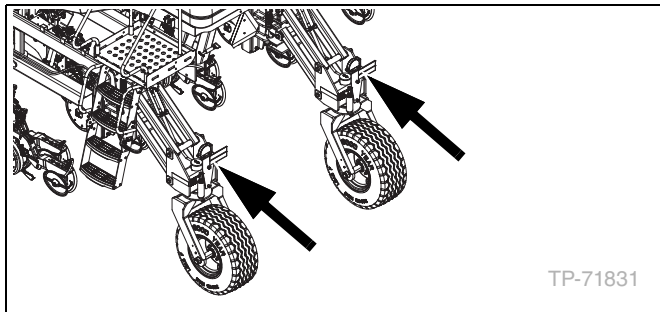
**Daytime Reflector (with Row Hoppers)****838-267C**

Four reflectors - One reflector below red reflector, on row units 1, 4, 9, and 12.

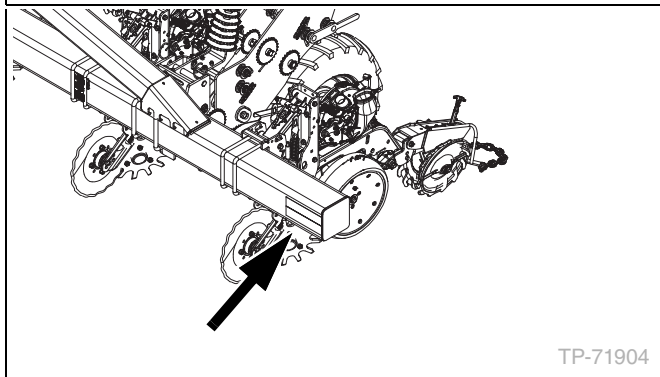
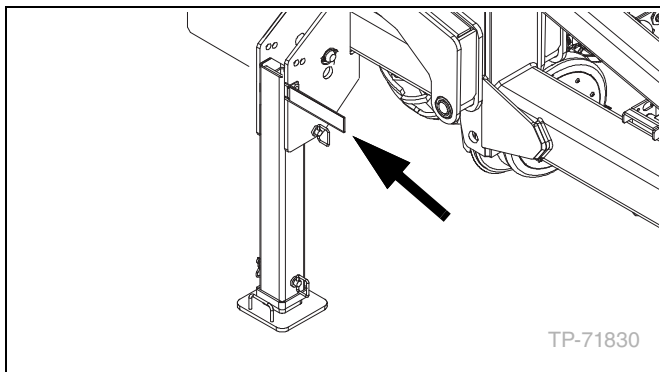


Daytime Reflector (with Lift-Assist)**838-267C**

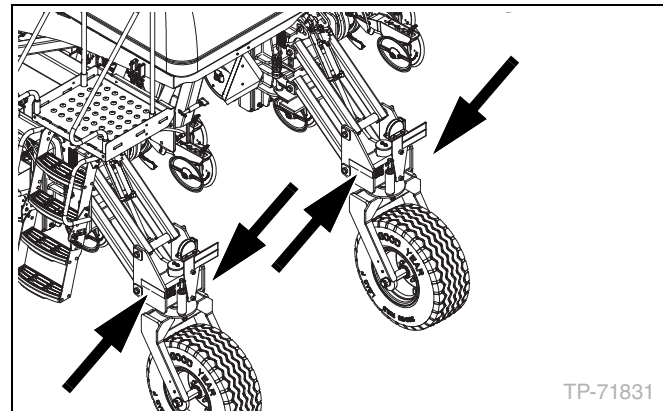
Two additional reflectors - One reflector below red reflector, on each rear wheel caster.

**Amber Reflector****838-265C**

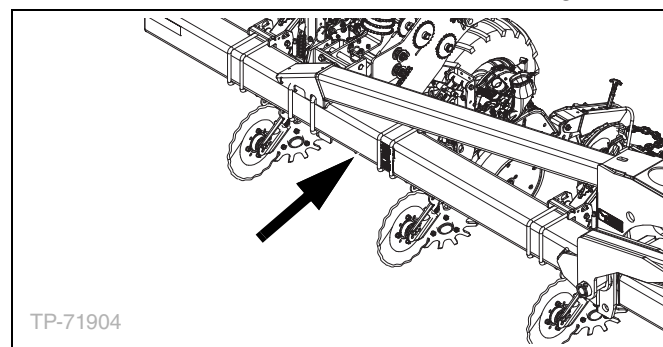
Four reflectors - One reflector on each parking stand on front toolbar. One reflector below Amber Reflector, on the face of each toolbar end.

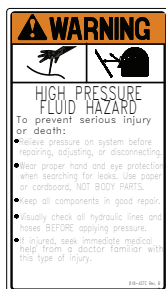
**Amber Reflector (with Lift-Assist)****838-265C**

Four additional reflectors - One on each side of rear wheel casters.

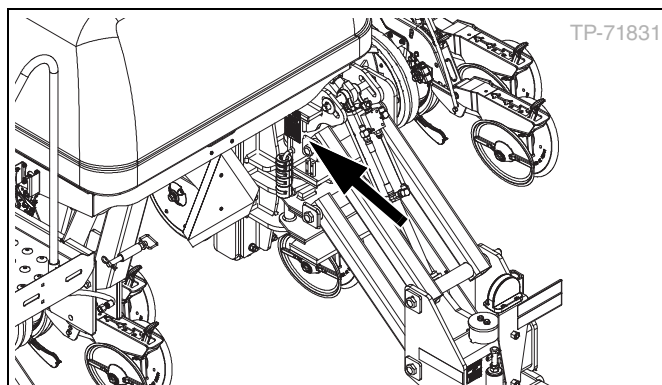
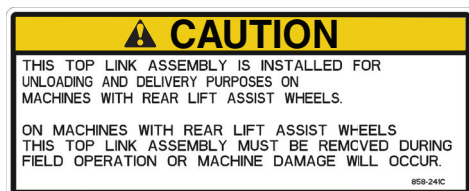
**Moving Chains Hazard****818-860C**

Two decals - One decal on face of each wing.

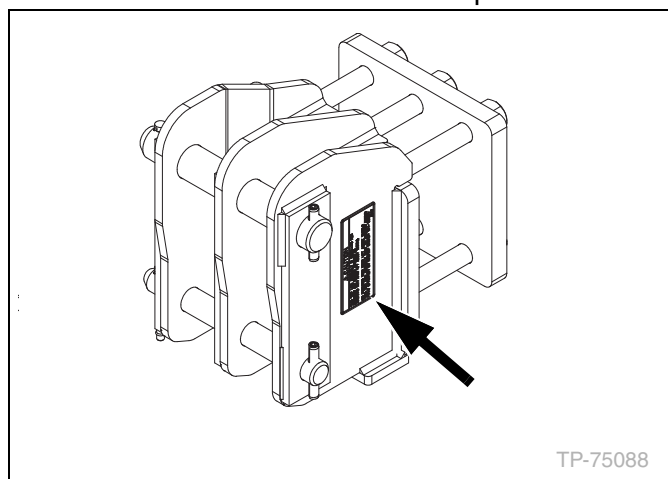


High Pressure Fluid Hazard (with Lift-Assist)**818-437C**

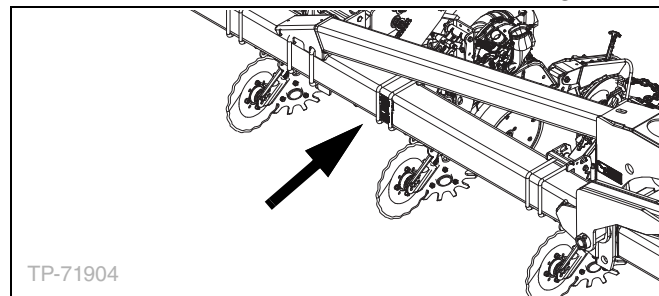
Two decals - One decal on the right-side of each lift-assist mount.

**Top Link (some models with Lift-Assist)****858-241C**

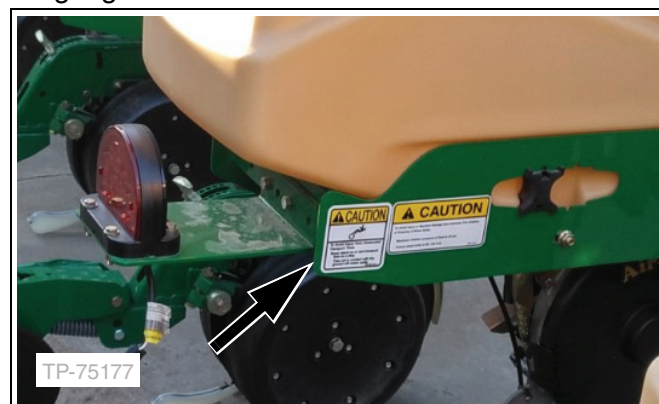
One decal - One decal on side of top link.

**Tires Not a Step****818-398C**

Two decals - One decal on face of each wing.

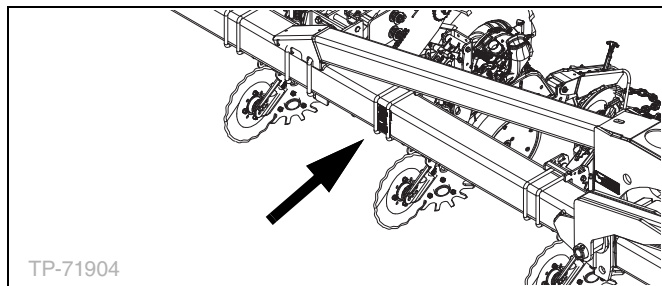
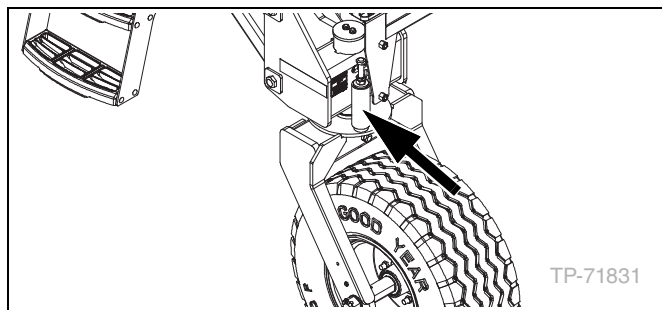
**Tires Not a Step (with Row Hoppers)****818-398C**

Four decals - One decal on side of the hopper row at the gauge wheel.

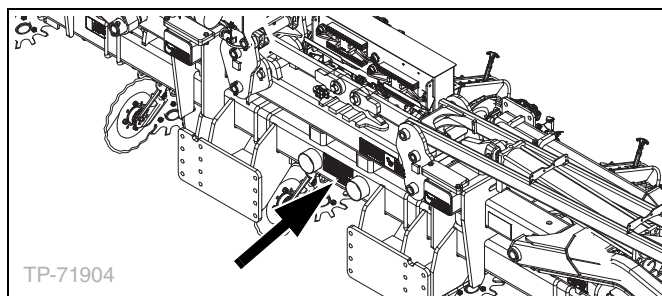


Tires Not a Step (with Lift-Assist)**818-398C**

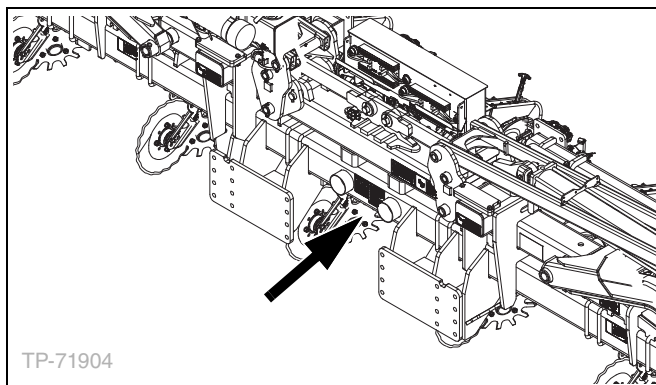
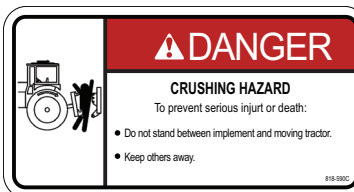
Four decals - One decal on each rear wheel caster and one decal on face of each wing.

**Read Owner's Manual****818-587C**

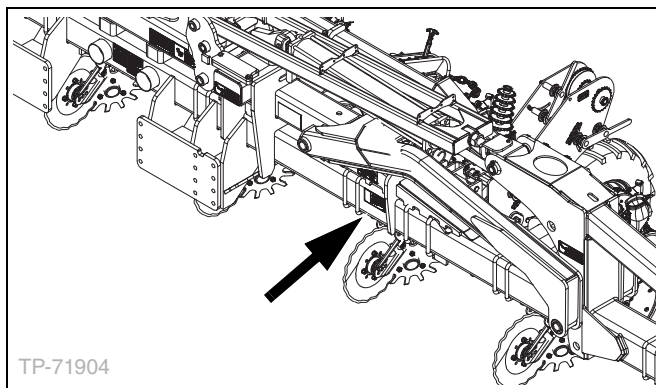
One decal - One decal on the center-face of frame.

**High Pressure Fluid Hazard****818-339C**

One decal - One decal on the center-face of frame.

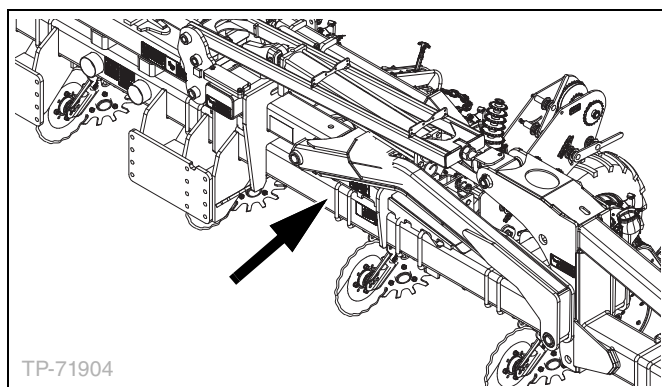
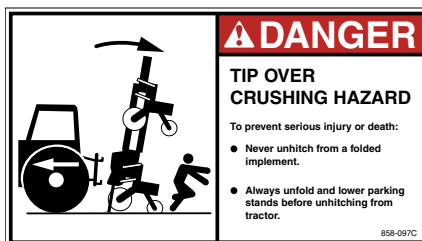
**Crushing Hazard****818-590C**

Two decals - One decal on each side of face of toolbar.

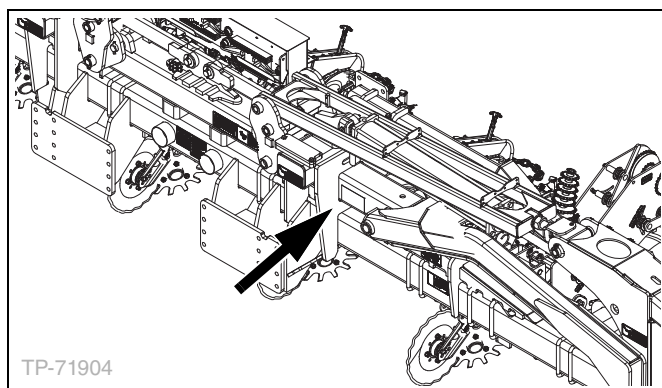


Pinch Point and Crushing Hazards**818-045C**

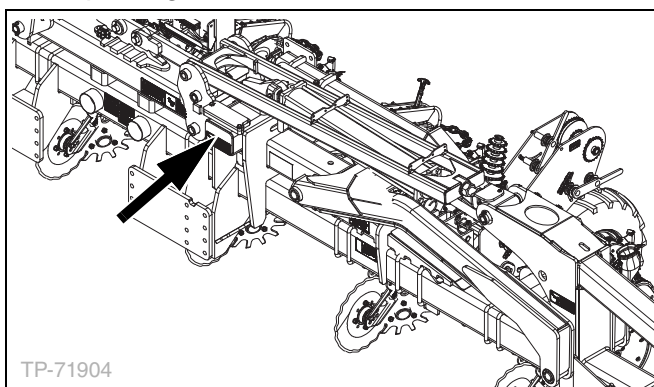
Two decals - One decal on each side of face of toolbar.

**Tip Over Crushing Hazard****858-097C**

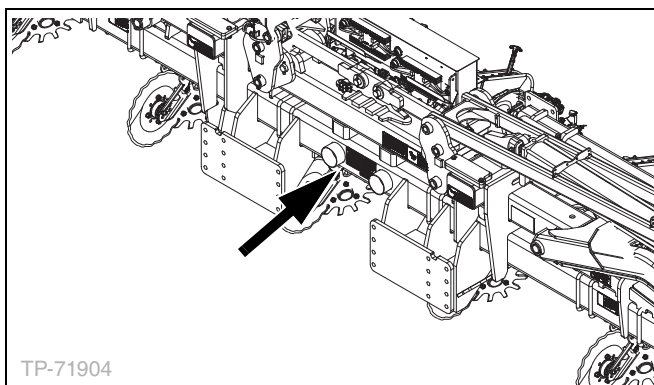
Two decals - One decal on face of each end of upper frame.

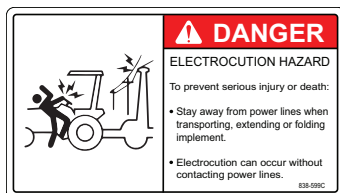
**Pinch Point Hazard****818-579C**

Four decals - One decal offset from each side of center of hitch and one decal on each side of toolbar above parking stand.

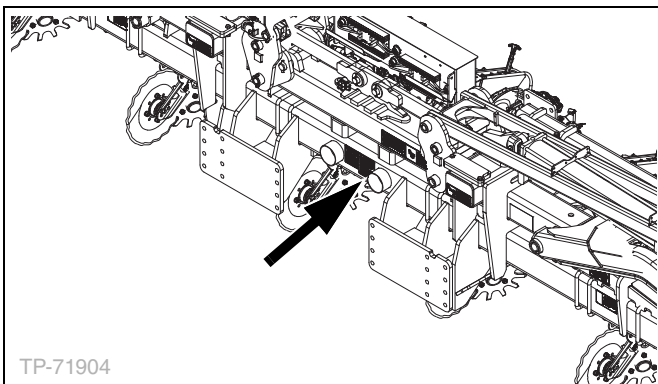
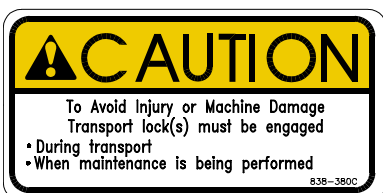
**Excessive Speed Hazard****818-188C**

One decal - One decal on face of upper frame, beside electrocution hazard decal.

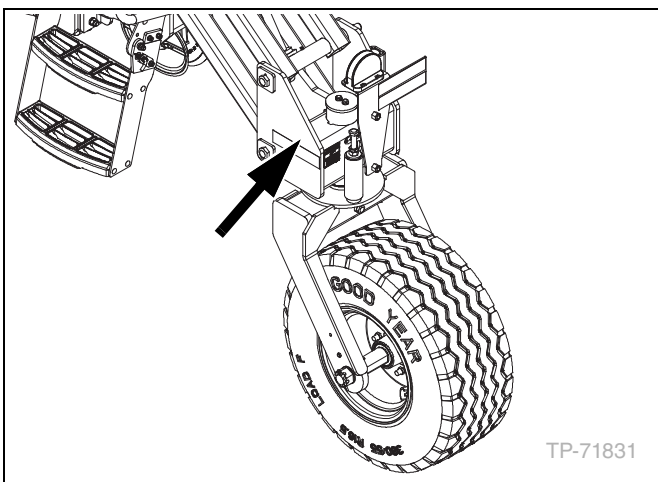
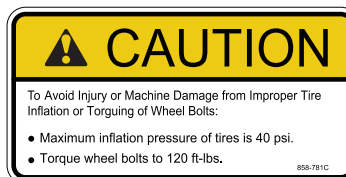


Electrocution Hazard**838-599C**

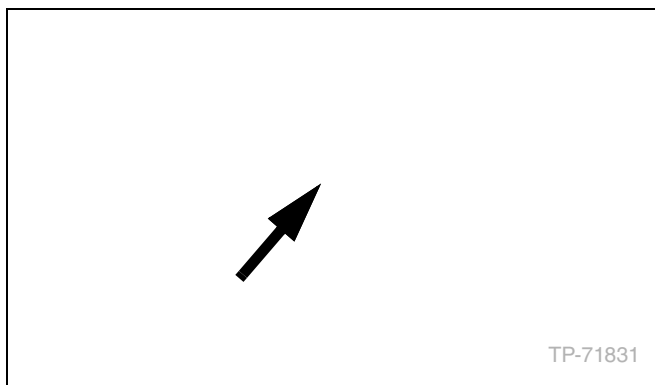
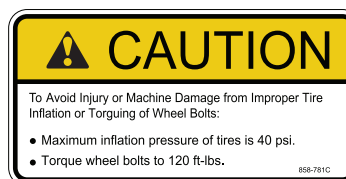
One decal - One decal on face of upper frame, beside excessive speed hazard decal.

**Transport Locks (with Lift-Assist)****838-380C**

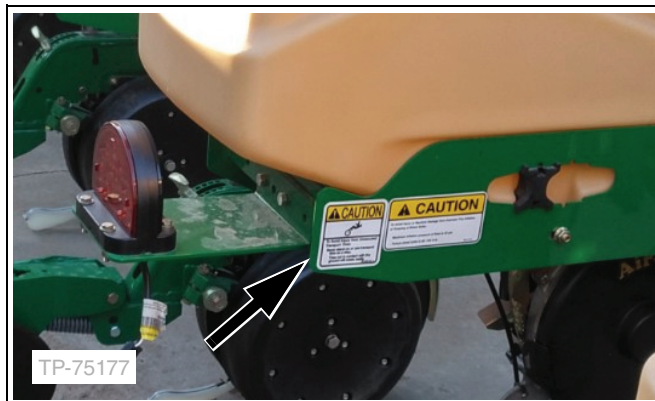
Two decals - One decal on the side of lift-assist wheel.

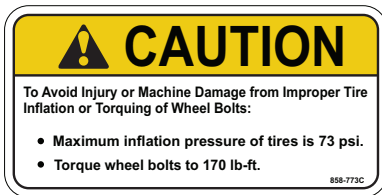
**Max Tire Pressure and Torque (with Bulk Fill)**
(40 psi/120 lb-ft)**858-781C**

Four decals - One decal on the inside of gauge wheel rims.

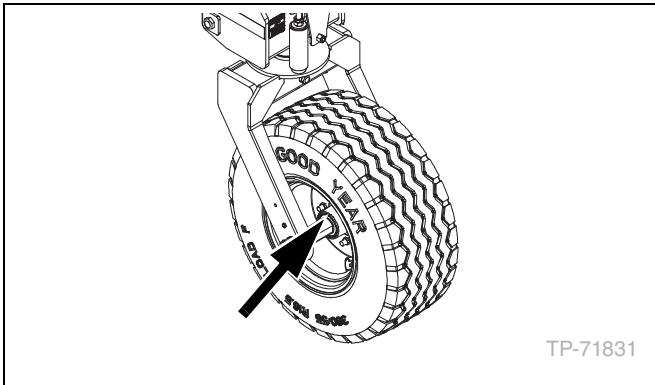
**Max Tire Pressure and Torque (with Row Hoppers)**
(40 psi/120 lb-ft)**858-781C**

Four decals - One decal on side of the hopper row at the gauge wheel.



Max Tire Pressure and Torque (73 psi/170 lb-ft)**(with Lift Assist)****858-773C**

Two decals - One decal on the inside of lift-assist wheel rims.



Preparation and Setup

This section helps to prepare your tractor and planter for use. Before using the planter in the field, you must hitch the planter to a suitable tractor, inspect systems, level planter, and load materials after transporting the planter to your field.

■ Preparation Checklist

Complete the following checklist prior to beginning preparation and setup.

- ☑ Read and understand “**Safety Information**” beginning on page 3.
- ☑ Check that all working parts are moving freely, bolts are tight, and cotter pins are spread apart.
- ☑ Check that all grease fittings are in place and lubricated. “**Lubrication**” beginning on page 65.
- ☑ Check that all safety decals and reflectors are correctly placed and legible. If damaged, replace with new, legible decal or reflector. See “**Safety Decals**” beginning on page 6.
- ☑ Inflate tires to pressure recommended and tighten wheel bolts as specified. See “**Tire Chart**” and “**Torque Value Chart**” on page 80.
- ☑ Check the planter for worn or damaged parts. Repair or replace parts before going to the field.
- ☑ If returning the planter to use from storage, remove any grease used to protect the cylinder rods.

■ Hydraulic Connections



Crushing Hazard

Do not stand or place any part or your body between planter and moving tractor. Keep others away. Failure to avoid may result in severe injury or death by being crushed between tractor and planter. Stop tractor engine and set park brake before attaching harnesses or hoses.



High Pressure Fluid Hazard

Escaping fluid under pressure can have sufficient pressure to penetrate the skin. Check all hydraulic lines and fittings before applying pressure. Use paper or cardboard, not body parts, and wear heavy gloves to check for suspected leaks. If injured, seek immediate medical attention from a physician familiar with this type of injury.

Hydraulic Hose Connections

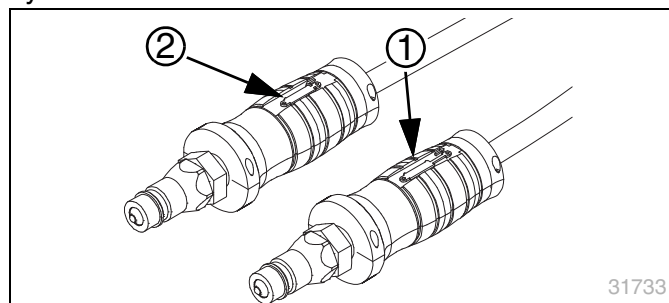
Great Plains hydraulic hoses have color coded handle grips to help hook up hoses to tractor outlets.

Hoses that go to the same remote valve are marked with the same color.

Green - Left Wing Fold
Gray - Right Wing Fold
Blue - Wing Flex/Lift-Assist
Black - Meter Pressure
Yellow - Hydraulic Drive
Red - Seed Delivery

Color	Hydraulic Function
Green	Left Wing Fold
Gray	Right Wing Fold
Blue	Wing Flex (Option)
Blue	Lift-Assist (Option)
Black	Meter Pressure
Yellow	Hydraulic Drive (Option)
Red	Seed Delivery

To distinguish hoses on the same hydraulic circuit, refer to the symbol on the handle grip. Hoses with an extended cylinder symbol (1) feed cylinder base ends. Hoses with a retracted cylinder symbol (2) feed cylinder rod ends.



Fan Hydraulic Connections



Motor Seal Damage Risk

The case drain hose must be attached before the inlet and return hoses are connected.



Hydraulic Motor Performance Risk

Do not attach the motor return/low pressure case drain line to a power-beyond port.



Fan Motor Damage Risk

When disconnecting the hydraulic hoses, always detach the case drain hose last to prevent damage to the fan motor.

For hydraulic fan and drive motors, connect the hose with the retracted cylinder symbol to the pressure side of the motor. All motor returns combined in motor return hose.

The fan motor requires further hook up of a third line which returns hydraulic fluid from the fan motor case.

1. Connect the case drain hose to the low pressure drain connection.
2. Connect low pressure return hose to low pressure connector.
3. If the tractor has a limited number of remotes capable of continuous flow, use those remotes for the hydraulic fan, optional hydraulic drive, and delivery.

For more information about the fan hydraulics, see “**Dual-Fan Air System Hydraulics**” on page 30.

■ Electrical Connections

Connect the planter electrical lead to the tractor seven-pin connector. If your tractor is not equipped with an ASAE J560b seven-pin connector, contact your dealer for installation.

For ground drive planters, connect the frame fold connector. For hydraulic drive planters, connect the IBBC connector. For IRC planters, connect the IBBC and auxiliary power.

Make sure the tractor is shut down with accessory power off before making the following connections. These connections can be made in any order, and must be made before moving the planter.

- Lighting connector
- Planter console harness connector
- Speed radar connector
- Any optional or after-market electrical connectors

■ Hitch



Crushing Hazard

Do not stand or place any body part between planter and moving tractor. You may be severely injured or killed by being crushed between the tractor and planter. Stop tractor engine and set parking brake before attaching cables and hoses.



Hitch Failure Hazard

Securely lock the tractor arms to the planter hitch. Hitching to the planter incorrectly may lead to hitch failure which could result in a serious highway accident or severe machine damage or even death.

All PL5200 Planters require a tractor with a quick attach hitch.

All PL5200 Planters with the optional Lift-Assist configuration will require a 2-point hitch.

Planter Configuration	Hitch Description	Hitch Kit
Standard Model	Category 4N Short 3-Point Hitch	411-870A
	Category 4W Short 3-Point Hitch	411-871A
with Lift-Assist	Category 3W-4N Short 2-Point Hitch	411-867A
	Category 4W Short 2-Point Hitch	411-868A
Side-Shift	Category 3W-4N Short 3-Point Side-Shift Hitch	411-869A
	Category 4N 3-Point Side-Shift Hitch	411-830A
	Category 4W Short 3-Point Side-Shift Hitch	411-866A
Side-Shift with Lift-Assist	Category 3N 2-Point Side-Shift Hitch	411-864A
	Category 3W-4N 2-Point Side-Shift Hitch	411-862A
	Category 4W 2-Point Side-Shift Hitch	411-863A

Some PL5200 Planters with Lift-Assist will include a top link for shipping purposes only. This top link assembly will need to be removed from the planter by the dealer. It should be discarded prior to first use.

Hitching (3-Point Hitch)

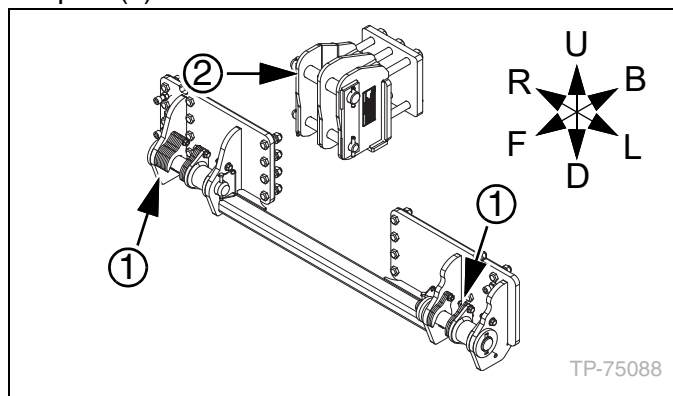
1. Connect the tractor lift arms to the lower hitch pins.
2. Securely lock tractor lower hitch points arms onto the planter hitch.
3. Adjust tractor upper link arm, as needed to connect to planter top link.
4. Securely lock tractor upper hitch point on the top link planter hitch.

Hitching (2-Point Hitch)

1. Connect the tractor arms to the lower hitch pins.
2. Securely lock tractor lower hitch points arms onto the planter hitch.

Hitching (3-Point Side-Shift Hitch)

1. Connect the tractor lift arms to the lower hitch pins (1).



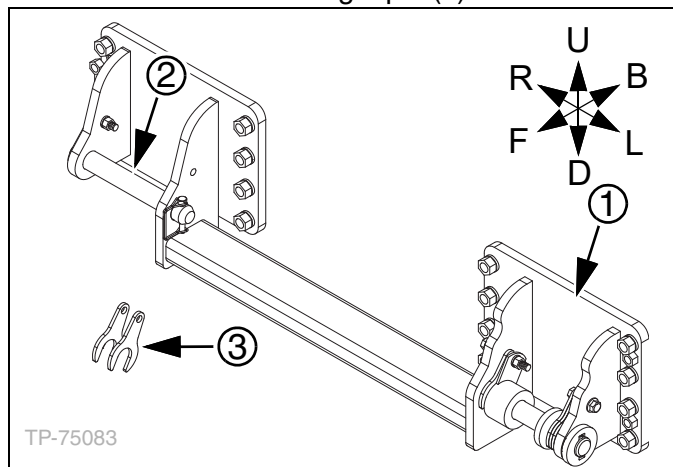
2. Securely lock tractor lower hitch points arms onto the planter hitch.
3. Adjust tractor upper link arm, as needed to connect to planter top link.
4. Securely lock tractor upper hitch point on the top link planter hitch pin (2).

Lower Link

A lower link adjustment is necessary to:

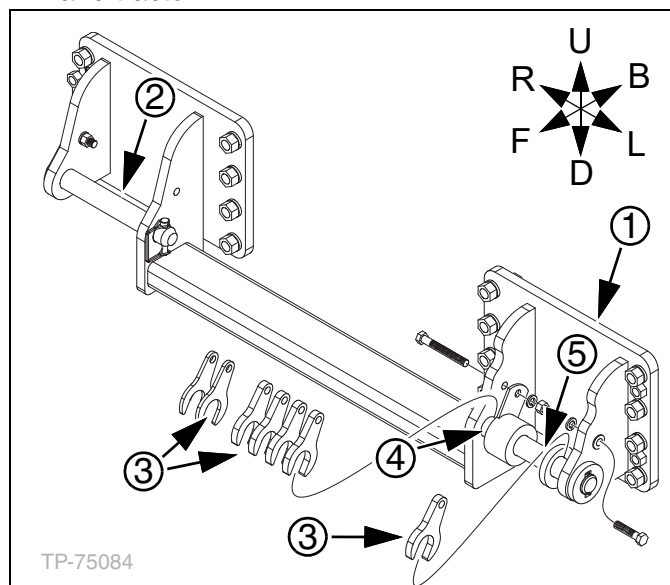
- Align center-lines of planter and tractor.
- To shift alignment up to 1" (2.54 cm) to set slight offset to plant on beds.
- Offset hitch when converting from twin-row to single-row planting operations.

To properly hitch the planter to the tractor, the planter center-line and the tractor center-line must be aligned with each other. The planter includes several types of spacers (3) to position and secure the left arm of the hitch. The left arm (1) of the 2-point or 3-point hitch is secured to prevent lateral shifting. The right arm is allowed with float on the right pin (2).



To adjust lower link:

1. Insert the necessary amount of open-end spacers (3) to the left of the smaller tube spacer (4) until you have aligned center-lines of the planter and tractor.



2. Add a combination of the remaining spacers to eliminate any slack space on the left pin (5), and minimize side-to-side play during operations.
3. Secure both sets of spacers with the provided bolts, lock washers, and nuts.
4. Connect your lower tractor arms to the planter hitch. Ensure planter locks onto hitch securely.



To shift alignment up to 1" (2.54 cm) for slight offset to plant on beds, offset the alignment no more than 1" (2.54 cm) when making lowering link adjustment.

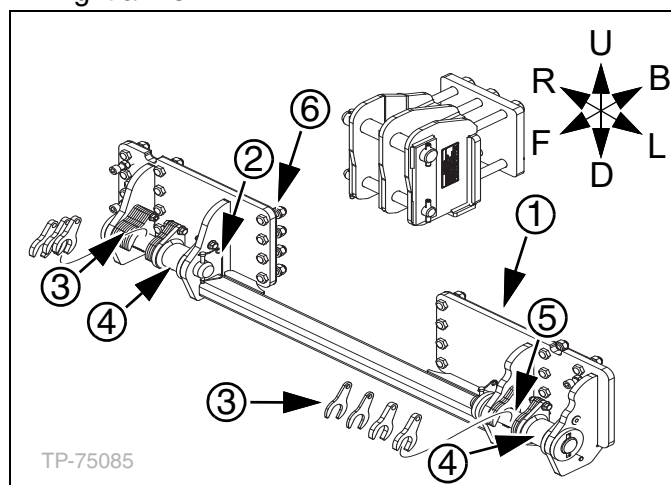
Side-Shift Hitch Lower Link

On PL5200 Planters configured with the Side-Shift Hitch option, lower link adjustments will need to be made on both the left arm (1) and right arm (6) in order to align center-lines of planter and tractor.

To adjust lower link for twin-row planting:

1. On the left arm (1), insert the necessary amount of open-end spacers (3) to the left of the smaller tube spacer (4) until you have aligned center-lines of the planter and tractor. The amount of

spacers should be equal on both the left arm and right arms.



2. Add a combination of the remaining spacers to eliminate any slack space on the left pin (5), and minimize side-to-side play during operations.
3. Secure left arm (1) with both sets of spacers with the provided bolts and nuts.
4. On the right arm (6), insert the necessary amount of open-end spacers (3) to the left of the smaller tube spacer (4) until you have aligned center-lines of the planter and tractor. The amount of spacers should be equal on both the left arm and the right arm.
5. Add a combination of the remaining spacers to eliminate any slack space on the right pin (2), and minimize side-to-side play during operations.
6. Secure right arm (6) with both sets of spacers with the provided bolts and nuts.

See **“Twin-Row to Single-Row Conversion”** on page 35 for lower link adjustment for single-row planting operations on a twin-row planter.

3-Point Hitch Top Link

On 3-point hitches, the top link controls the angle at which the planter is relative to the ground.

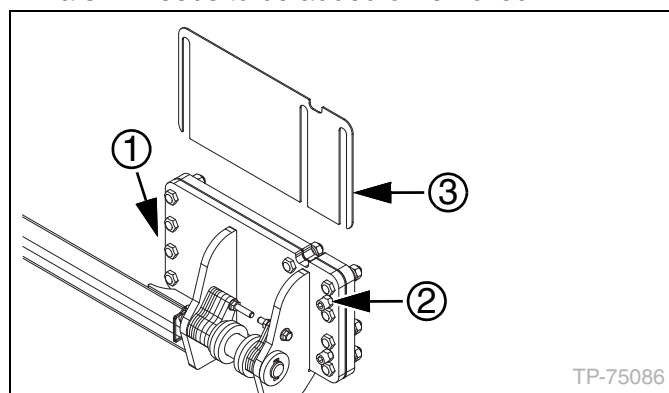
3-Point Side-Shift Hitch Top Link

On side-shift 3-point hitches, the top link controls the angle at which the planter is relative to the ground. It will be necessary to side-shift the tractor upper arm to on the planter top link hitch pin for single-row planting. See **“Twin-Row to Single-Row Conversion”** on page 35 for 3-point side-shift hitch top link adjustment for single-row planting operations on a twin-row planter.

Hitch Tracking Alignment

For proper row unit tracking in the field, the planter frame must be set correctly to the tractor line of pull. Occasionally a one-time alignment adjustment may be needed on the hitch if tracking alignment is a problem. Two hitch shim plates are provided for each planter hitch for this alignment adjustment. Shim plates may be added, or removed, to the left arm, as needed.

1. Loosen all 8 or 12 bolts (1) on the left arm where a shim needs to be added or removed.



2. Loosen jam nuts and the two set screws (2).
3. Add or remove hitch shim plates (3), as needed.
4. Back out set screws (2) in until the hitch can be tightened. Secure the jam nuts.
5. Tighten all 8 or 12 bolts (1) to torque. See **“Torque Value Chart”** on page 80.

Height Switch (S/N E1193K-)



Crushing Hazard

Exercise extreme caution when adjusting the height switch. You may be severely injured or killed by being crushed by the planter and its components.



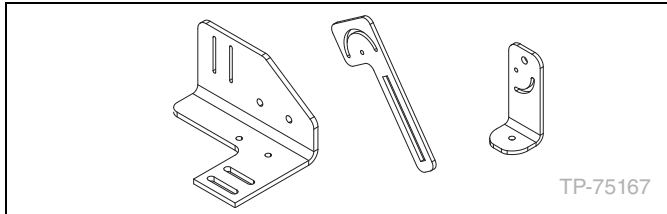
When the hydraulic drive planter is raised, the switch state is ignored during FILL DISK and 5 REV TEST operations. See your console manual for more information.

On planters with a 3-point hitch, it is necessary to install the height switch on the tractor in a location where the whisker will make contact with the tractor lift arms.

The height switch informs the seed monitoring system if the planter is raised or lowered on planters configured with ground drive. On all planters, the seed monitoring system only counts seed when the planter is lowered and the drive is activated. On

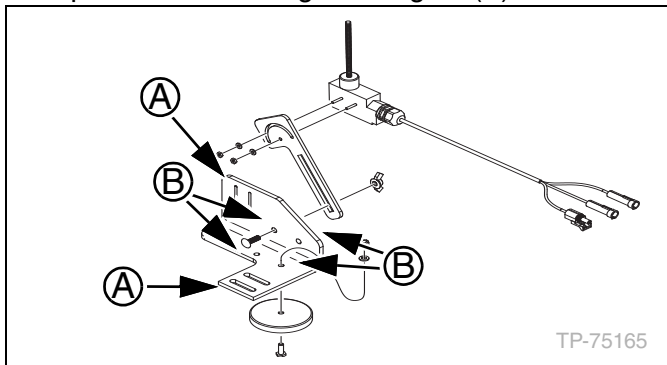
hydraulic and electric drive planters, the height switch also enables or disables the drive.

Three brackets are included in the kit, any one bracket or combination of brackets may be used to mount the height switch sensor. Do not discard any unused brackets. Any unused brackets need to be stored with the planter for future use.

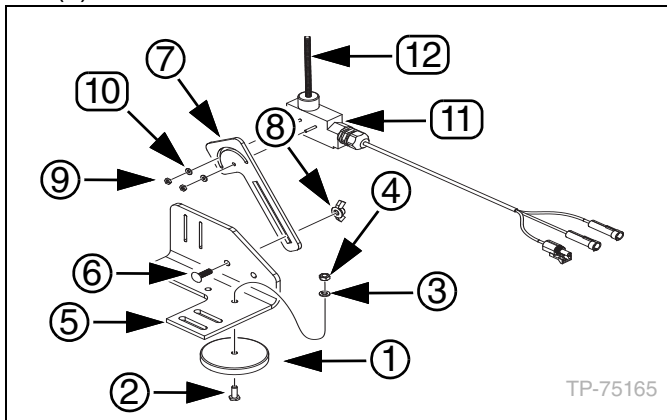


To install the height switch:

1. Lower the planter to the height at which seed delivery should begin.
2. The brackets have several options for mounting for the height switch sensor (A) and multiple options for mounting the magnet (B).

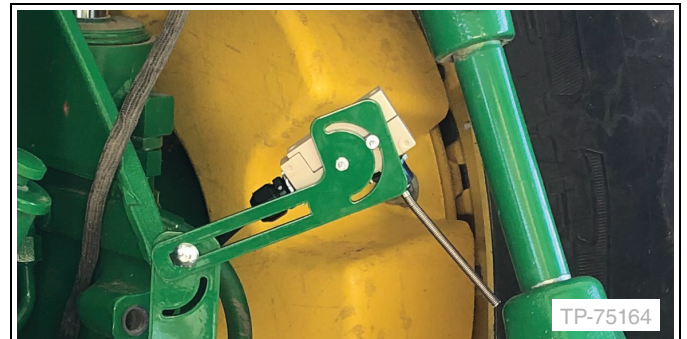


3. Secure the magnet (1) with one bolt (2), one washer (3), and one nut (4) on mounting bracket (5).



4. Loosely secure bracket (7) with the one bolt (6) and one wing nut (8) to bracket (5).

5. Loosely secure the height switch sensor (11) with two nuts (9) and two washers (10) on mounting bracket (7).
6. Using the magnet, position the kit on the tractor. Move the brackets until the whisker will make contact with a point which will adjust in relation to the height of the planter. This location will vary from tractor model to tractor model. Below is a single example.



■ Leveling Planter



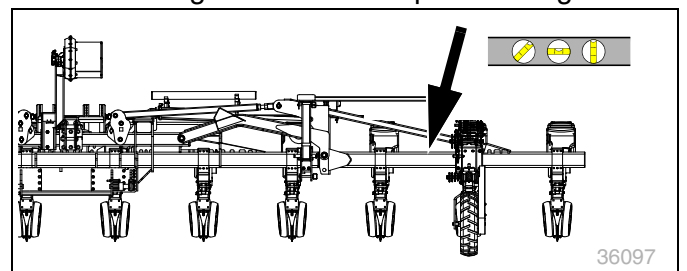
Planter Damage Risk

Set the tractor 3-point hitch control for depth control operation. If the 3-point hitch control is set for load control, the auto load control response may automatically adjust too high in some circumstances, causing the wings or other major planter components to become damaged.

Check, and adjust, all planter levels in field conditions on level, even ground. The wing lock pins should be installed on the toolbar coupling before leveling the planter.

Center Frame Leveling Left-to-Right

1. Hitch the planter to a suitable tractor.
2. Activate the fold hydraulics. Fully unfold the planter.
3. Set the tractor hydraulic fold circuit to "Neutral".
4. Insert the wing lock pins on the toolbar coupling.
5. Adjust the tractor hitch so that the center section toolbar is level. Use a level to check.
6. Check wing for level at the top of the wing toolbar.



Center Frame Leveling Front-to-Back

The planter is designed to operate with the main tool bar at 26 inches (66 cm) above the planting surface.

1. Remove cylinder locks from lift-assist and stow locks, if equipped.
2. Completely lower the hitch to planting position, or if configured with lift-assist, fully lower the rear of the planter using hydraulics.
3. Raise the hitch until the toolbar is 26 inches (66 cm) above the planting surface or peaks of planting bed.
4. Set the tractor 3-point lever stop to set the planter height at 26 inches (66 cm).



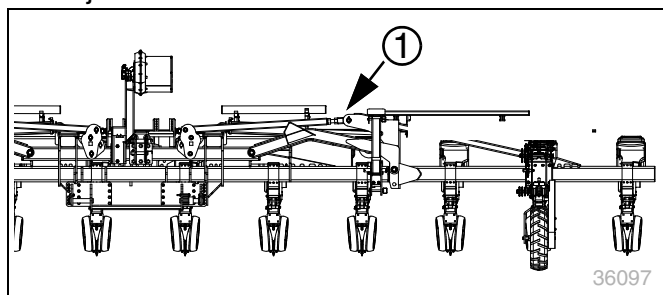
If leveling from peaks of planting bed, it will be necessary to use customer provisioned blocks to raise the down-stop position of the lift-assist cylinders.

5. Place a carpenter's level on a side tube of the center frame. Have an assistant stand a safe distance away and observe the carpenter's level.
6. With the hitch lowered to the 26 inches (66 cm) stop, incrementally raise the lift-assist until the frame is level.
7. Ensure the front tool bar is at 26 inches (66 cm) above planting surface. If not, adjust stop and repeat until the frame is level.
8. Measure the length of exposed rod on the lift-assist cylinder. Customer must provision two sets of blocks in the measured length.
9. Fully raise the lift-assist and insert the two sets of customer provisioned blocks.

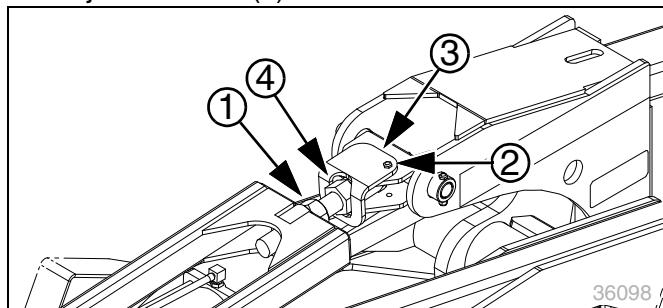
Wing Leveling

1. Ensure the wing lock pins are installed on the toolbar coupling, and center frame leveling left-to-right and front-to-back have been completed.

2. Loosen the jam nut (1) at the upper link arm adjuster.



3. Remove bolt (2) and rotate lock plate (3) clear of adjustment nut (4).



4. Rotate the adjustment nut (4) until the wing is level. Check with level.
5. Secure the jam nut (1).
6. Install the lock plate (3) with bolt (2).
7. Repeat steps for other wing.



When making an wing level adjustment, it may be necessary to adjust the side gauge wheel. See **"Side Gauge Wheel Angle and Clearance"** on page 47.

Gauge Wheel Stop



Pinch Point, Crushing, and Moving Hazards

Moving parts can pinch or crush causing serious injuries. Use care and caution when making adjustments in this area.

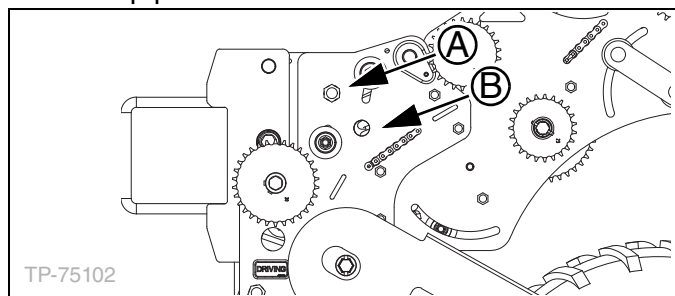


Planter Damage Risk

All four gauge wheels must be set in the same gauge wheel stop position, either all upper or all lower, or machine damage can occur.

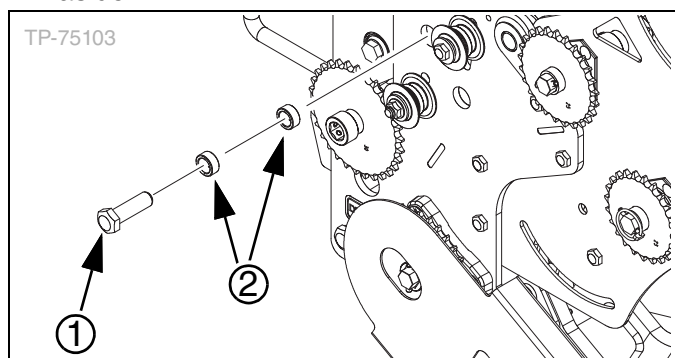
The gauge wheels will come preset from the factory in the upper gauge wheel stop position (A). Adjusting the gauge wheel stop will allow for up to an additional 100 lbs (45 kg) of down pressure to be added to the gauge wheel assembly. Making the adjustment can help improve traction in the field, removing tire slippage, and allowing for improved seeding precision some soil conditions. If it is your preference

you may add additional down force to your gauge wheels by adjusting the gauge wheels to the lower gauge wheel stop position (B). It is necessary to have all four gauge wheels set at the same gauge wheel stop position.



To adjust gauge wheel stop position:

1. Begin from left side of the planter, loosen the bolt (1) and 2 sleeve mounts (2) and remove. Set aside.



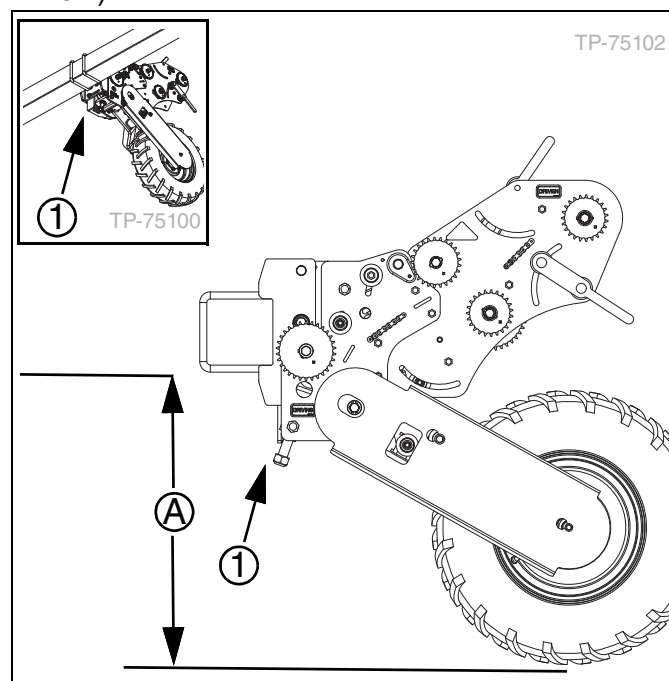
2. On the opposite side of the gauge wheel, loosen the bolt and 2 sleeve mounts and remove.
3. Slide the 2 sleeve mounts into the upper or lower position on each side.
4. From the inside of the gauge wheel stop, shift the spring pivot weldment to the upper or lower position.
5. Secure the bolts into the upper or lower position on each side. Tighten to torque.
6. Repeat for each gauge wheel assembly.

Gauge Wheel Spring Linkage

Adjusting the gauge wheel spring linkage on each gauge wheel will help fine tune planter leveling for seeding accuracy. This adjustment needs to be made only after the wing lock pins are installed on the toolbar coupling, and center frame leveling left-to-right, center frame leveling front-to-back, and wing leveling have been completed. Ensure that each gauge wheel block mount is set for the same hole,

upper or lower. It is important to ensure tires are properly inflated before making any adjustments.

1. Pull the planter forward slowly, and lower the planter to 26 in (66 cm).
2. Beginning on the left side of the planter, from the underside of the gauge wheel measure from the toolbar to the ground (A). It should be 26 in (66 cm).



3. Turn the nut (1) for a fine-tune adjustment for the gauge wheel to help achieve the 26 in (66 cm) for the working height.
 - Lengthening spring linkage will raise the planter.
 - Shortening spring linkage will lower the planter.
4. Level the drill, if necessary.

Walkboard



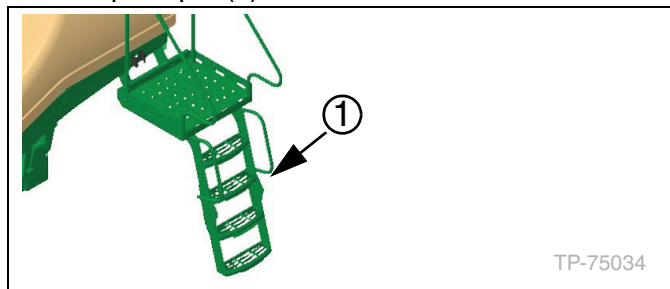
Pinch Point and Crushing Hazards

Keep body parts clear from moving parts. Your fingers, hands, and arms could be injured or severed if caught in the folding ladder section or is in the pathway of a falling ladder section. Firmly support the lower ladder section as you make adjustments until you confirm the pivot pin has secured the lower ladder in the desired position.

On PL5200 Planters configured with bulk seed hoppers, there is a walkboard to allow for access to the bulk hopper to load materials and complete maintenance. On the rearward side of the walkboard ladder is a pivot pin (1) which allows for the lower two

steps to be unfolded and folded, as needed. The ladder should be folded for field use, parking, and storage.

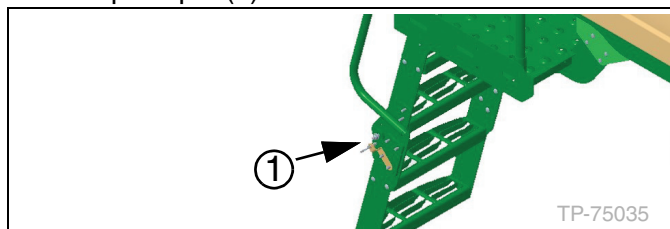
1. Pull pivot pin (1) outwards.



2. Fold lower ladder upwards, and insert the pivot pin until locked in place for field use, transport, parking, and storage.

To unfold walkboard ladder:

1. Pull pivot pin (1) outwards.



2. Unfold lower ladder downwards and insert the pivot pin to lock in place for access to walkboard.

■ Loading Material



Agricultural Chemical Hazard

Read and follow all supplier cautions for safe handling of treated seed.



Irritant Exposure Hazard

Do not mix lubricants into seed with hands or any part of body. Wear protective equipment. Use tools.

The PL5200 Planters may be configured with either a bulk seed hopper or a row hopper. Great Plains does not recommend loading material before transporting the planter. The PL5200 Planter should be empty during transport.

Bulk Seed Hopper

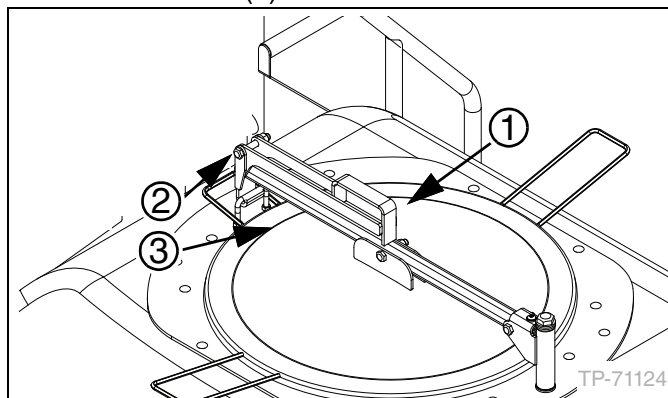


Entrapment and Rapid Suffocation Hazards

A hopper that is full, or appears full, can be an entrapment hazard. You can sink all the way into the grain and suffocate in a matter of seconds. Never enter a hopper for loading, unloading, or routine maintenance. Leave strainer in place except when instructed to remove it. Keep lid tightly closed during operation.

Seed is loaded into the bulk seed hopper from above.

1. Lift the handle (1).



2. Swing the handle out until the hook (2) releases from the u-bolt latch (3).
3. Move the hook clear of the latch.
4. Lift lid slightly at the pivot end to clear the strainer (4).
5. Swing lid away from the opening.
6. Inspect the hopper to make sure it contains only the expected material.
7. Load the seed.
8. If equipped, make sure the bulk hopper level sensor is connected to the console harness.
9. Close and latch lid.
 - a. Swing lid over opening until the hook is centered on the u-bolt latch.
 - b. Open the handle and engage the hook on the latch.
 - c. Close the handle.

Row Hoppers

Two different sizes of row hoppers are available - 3.0 bushel and 1.6 bushel on the single-row planters. Twin-row planters are limited to the 1.6 bushel hopper. The process for loading both hoppers are the same.

1. Ensure each hopper is correctly seated and mounting bolts are secured. Ensure the hopper discharge opening is aligned with the seed inlet tube.
2. Clean out any leftover seed and debris in the hopper.
3. Install the correct seed disks. See Material Rate manual for seed disk selection.
4. Premix seed and Ezee Glide Plus lubricant. See **"Seed Lubricants"** on page 22.

5. Add seed and lubricant to hoppers.
6. Close lids and secure latches.

■ Seed Lubricants



Irritation and Chronic Exposure Hazards

Seed lubricants may cause eye or skin irritation in high concentrations. Prolonged inhalation may cause lung injury. Product can become slippery when wet. Wear gloves and a respirator when transferring and mixing seed lubricant. Do not use bare hands or any part of your body to mix. Avoid breathing lubricant dust. Follow chemical manufacturer's precautions when handling items that may be coated with treatment. Use proper skin, eye, and respiratory protection.



Dust and Explosion Hazards

Avoid creating dust in any confined space with ignition sources present in specific concentration can be explosive. Avoid exposure to dust when missing this powder into seed. Consult the instruction booklet and Safety Data Sheet (SDS) for more information.

To maximize the performance of the metering systems, it is imperative to use Ezee Glide Plus or Bayer Fluency Agent Advanced. Proper use of seed lubricants will decrease wear in the seed meters and helps to prevent clumping, bridging, and clinging of seed. It is key to premix the seed lubricant into the seed so that each seed is evenly coated. Only mixing seed into the top layer of the bulk seed hopper will not be effective.

Ezee Glide Plus Talc-Graphite Mix

Ezee Glide Plus seed lubricant is suitable for all seeds, especially treated or inoculated seed, except where talc and graphite mixes are prohibited or not advantageous. Thorough mixing of seed and added seed lubricant is required.



Recommended usage:

Clean Seed Type	Ezee Glide Plus
Milo	1 cup per 2 bushels 335 ml per 100 liters
Cotton	1 cup per 2 bushels 335 ml per 100 liters
Sunflowers	1 cup per 2 bushels 335 ml per 100 liters
Mustard	1 cup per 30 pounds 240 ml per 13.6 kg
Canola	1 cup per 30 pounds 240 ml per 100 liters
All other seed	1 cup per 4 bushels 170 ml per 100 liters

Adjust this rate as necessary so all seeds become evenly 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 seed meter operation.

Bayer Fluency Agent Advanced

This agent is required by regulation for certain crops in certain regions; such as corn and soybeans in Canada. It is an alternative to Ezee Glide Plus in other locales, for large seeds. It is not recommended for small seeds such as canola and milo.

Refer to the booklet attached to the bucket for recommended usage. Do not exceed recommendations, as excess amounts adversely affect accurate seed metering.



■ Speed Calibration

Calibrate the speed radar sensor the first time the planter is operated in the field - with or without planting. See the accompanying console manual for this procedure.

Cross-check the console speed reading with the tractor speedometer.

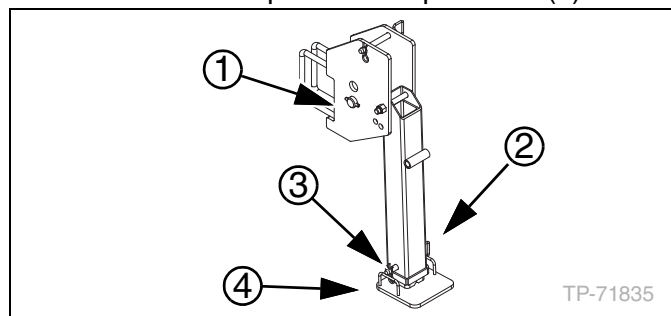
Speed Radar Sensor

When the planter lowered, it will be necessary to ensure that the radar speed sensor is pointed at the ground, at an angle approximately 35° below horizontal. Refer to the speed radar sensor manual for more information.

■ Parking Stands

The parking stands will provide some stability to the planter when engaged however there is not enough weight on parking stands to anchor the planter on a slope. Always engage parking stands on even, level ground. If the ground is soft, place a customer provisioned thin piece of wood or plate on the ground under each stand to increase contact area. Parking stands should be engaged during parking, storage, and while completing maintenance.

1. Remove the hairpin cotter at pin stand (1).



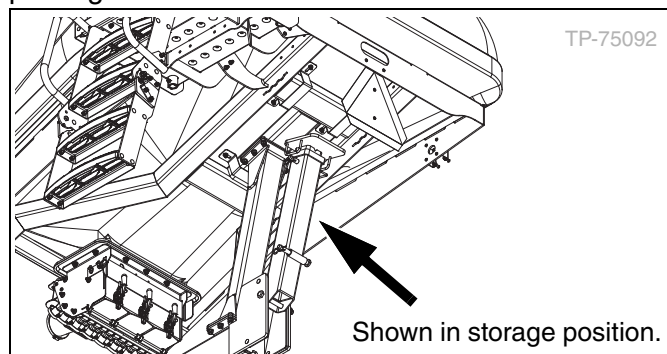
2. Support the stand at its grip handle (2).
3. Remove the pin (3).
4. Lower the stand until the rear pin tube (4) is aligned with the lower holes of the stand weldment.
5. Re-insert pin and secure with cotter pin (1).
6. Repeat for other parking stand.

Complete the steps in reverse order to pin up the parking stands for field use or transportation.

Rear Parking Stand

PL5200 Planters configured with the bulk seed hopper have a rear parking stand located underneath the bulk seed hopper. The rear parking

stand operates in the same manner as the other parking stands mounted on the toolbar.



■ Transport



Electrocution Hazard

Avoid overhead lines transporting. When folded and lifted, the planter requires clearance of at 15 feet (4.5 m), which is high enough to contact low-hanging lines. Touching the planter or tractor completes a circuit to ground, and can result in serious injury or death. At higher voltage, shock can occur without direct contact.



Loss of Control Hazard

Do not exceed 20 mph (32 km/h) when transporting. Use a tractor rated for the load. Towing the planter at high speeds or with a vehicle that is not heavy enough can lead to loss of vehicle control resulting in serious injury or death.

The tractor must weigh at least 2/3 (67%) of the planter plus any materials loaded. See “**Specifications**” on page 78.

Before transporting, follow and check these items:

- Set the tractor 3-point hitch control for depth control operation. If the 3-point hitch control is set for load control, the auto load control response may automatically adjust too high in some circumstances, causing the wing locks to disengage on the road.
- Empty seed before transporting if at all possible. The planter cannot be transported full of grain.
- Transport the planter only while in the folded position.
- Ensure all cylinder locks are in place.
- Ensure the wing flex pins are installed on the wing pivots.
- Always use warning lights when transporting the planter.
- Comply with all national, regional, and local safety laws when traveling on public roads.
- Remember that the planter is wider than the tractor. Allow safe clearance.

■ Parking



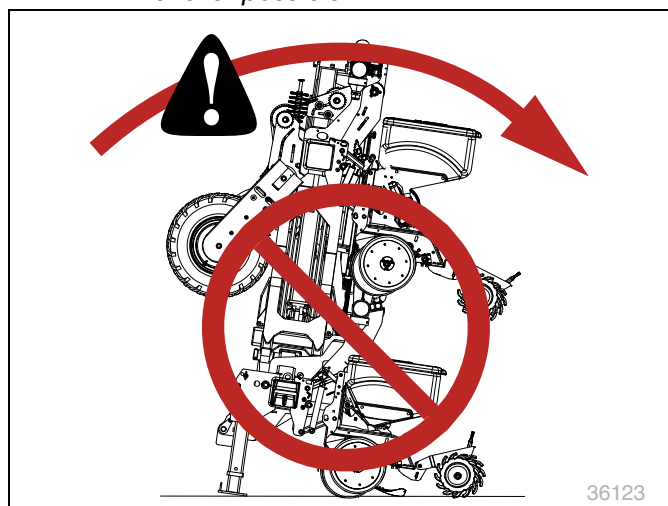
Roll-Away Hazard

There is not enough weight on parking stands to anchor planter on a slope. Do not unhitch planter while on a steep slope. Always block tires when unhitching from tractor and follow the instructions found under “Storage” on page 24. Never park the planter, even for brief periods of time, with the planter unhitched from a suitable tractor.



Crushing and Overturn Hazards

Never unhitch, park, or store a folded PL5200 Stack-Fold Planter. An unhitched folded stack-fold planter could topple backward or forward immediately, or at some later time, causing serious injury or death, and certain severe equipment damage. When unhitched, the PL5200 Stack-Fold Planter is supported in front only by the parking stands, and at the rear only by press wheels and spring tension. Slopes, soft soils, and soils later softened by rain are particularly dangerous. Great Plains strongly recommended the planter is parked on a level, debris-free, concrete surface whenever possible.



Follow these steps when parking the drill for periods of less than 36 hours. For longer periods, or whenever the planter is unhitched from a suitable tractor for any length of time, follow storage instructions, “Storage” in the following section.

1. Position the planter on firm, level ground.
2. Unfold the planter.
3. Set the fold circuit to “Neutral” to prevent wing droop.
4. Install the wing locks pins on the toolbar coupling.

5. Lower the planter to just above ground level at the rear of row units.
6. Shutoff tractor, set parking brake, and remove key.
7. If the ground is soft, place a board or plate under each stand to increase contact area.
8. Engage parking stands.
9. Lower the tractor 3-point until the planter is resting on parking stands.
10. Unplug light harness and console harness. Protect connections with any plugs or caps provided.
11. To prevent rolling, block the tires securely.
12. Relieve hydraulic pressure, shut down hydraulics, and unplug hydraulic lines from the tractor. Do not allow hose ends to rest on the ground.

■ Storage



Possible Chemical Hazard

Seed disks will have talc and graphite residue, and may have residue of hazardous seed treatments. Do not wash disks where food is prepared or where cookware and dinnerware is washed. Wear gloves when washing disks. Avoid spray.



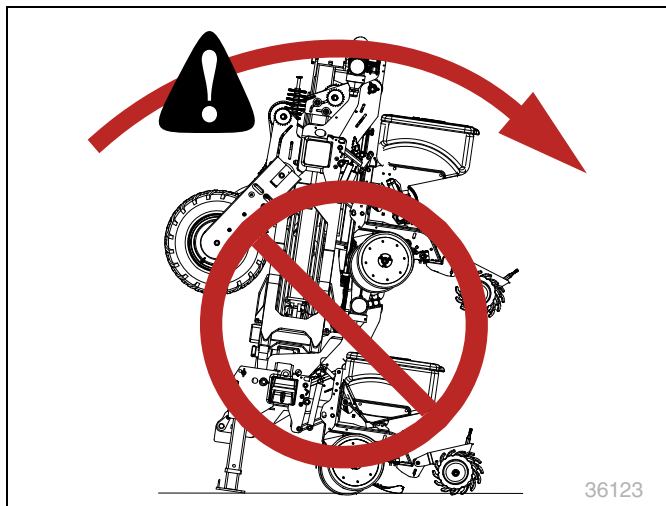
Roll-Away Hazard

There is not enough weight on parking stands to anchor planter on a slope. Do not unhitch planter while on a steep slope. Always block tires when unhitching from tractor and follow the storage instructions. Never park the planter, even for brief periods of time, with the planter unhitched from a suitable tractor.



Crushing and Overturn Hazards

Never unhitch, park, or store a folded PL5200 Stack-Fold Planter. An unhitched folded stack-fold planter could topple backward or forward immediately, or at some later time, causing serious injury or death, and certain severe equipment damage. When unhitched, the PL5200 Stack-Fold Planter is supported in front only by the parking stands, and at the rear only by press wheels and spring tension. Slopes, soft soils, and soils later softened by rain are particularly dangerous. Great Plains strongly recommended the planter is parked on a level, debris-free, concrete surface whenever possible.



Store the planter where children do not play. If possible store inside for longer life of the planter. Great Plains strongly recommends the planter is parked on a level, debris-free, concrete surface.

1. Unfold the planter, if necessary. The planter should always be stored unfolded.
2. Set the fold circuit to "Neutral" to prevent wing droop.
3. Install the wing locks pins on the toolbar coupling.
4. Lower the implement to just above ground level at the rear of row units.
5. If the ground is soft, place a board or plate under each stand to increase contact area.
6. Engage parking stands.
7. Lower the tractor 3-point until the planter is resting on parking stands.
8. Empty the hopper(s), if material is present.
9. Clean-out the air system.
10. Remove in-cab console and store away from the elements, shifting temperatures, and pests.
11. Remove seed disks from seed meters to relieve pressure on the brushes. Clean the disks of residue buildup.
12. Unlatch the hopper lid(s) so that the seals are not in compression during storage. Route a chain or security cable through the hold-down U-bolt and the latch handle to prevent unauthorized entry, and prevent high winds from opening the lid(s).
13. Clean planter of mud, dirt, excess oil, and grease.

14. Lubricate all points according to "**Lubrication**" beginning on page 65.
15. Apply grease to exposed cylinder rods to prevent rust.
16. Inspect the planter for worn or damaged parts. Make repairs and service during off season.
17. Use spray paint to cover scratches, chips, and worn areas on the planter to protect the metal.
18. If stored outside, cover the planter with a tarp.

Operation

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

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

■ Pre-Start Checklist

Complete the following checklist prior to operation.

- ✓ Read and understand “**Safety Information**” beginning on page 3.
- ✓ Check that all working parts are moving freely, bolts are tight, and cotter pins are spread apart.
- ✓ Check that all grease fittings are in place and lubricated. “**Lubrication**” beginning on page 65.
- ✓ Check that all safety decals and reflectors are correctly placed and legible. If damaged, replace with new, legible decal or reflector. See “**Safety Decals**” beginning on page 6.
- ✓ Inflate tires to pressure recommended and tighten wheel bolts as specified. See “**Tire Chart**” and “**Torque Value Chart**” on page 80.
- ✓ Check the planter for worn or damaged parts. Repair or replace parts before going to the field.
- ✓ If returning the planter to use from storage, remove any grease used to protect the cylinder rods.

■ Field Operation



Electrocution Hazard

Keep clear of overhead power lines when unfolding, folding, operating, or transporting the planter. The machine is not grounded. At higher voltages, electrocution can occur without direct contact. Any line voltage present on planter or tractor can cause severe injury or death.

Before Planting Checklist

- ✓ Check electrical and hydraulic connections.
- ✓ Make sure planter is leveled (page 18).
- ✓ Set up the seed meters for correct seed (page 42).
- ✓ Set planting rate. See the Material Rate manual.
- ✓ Check the console and observe any diagnostic messages.
- ✓ Check chain tension (page 65).
- ✓ Make sure meter inlet gates are open to chart value. See Material Rate manual.
- ✓ Make sure hoses are fully connected to meters.
- ✓ Close and latch all tank/hopper lids.
- ✓ Set planting depth handles the same (page 47).
- ✓ Set down pressure springs the same except in tracks (page 47).
- ✓ Check coulter alignment to the row (page 50).
- ✓ Set press wheels the same except in tracks (page 48).
- ✓ Check fan operation (page 30).

Begin Planting

- Remove wing lock pins, and install pins in the wing flex lock pin position (page 27).
- Unfold and line up the planter at the start of the first row.
- Prime the meters with seed. Leave the fan running.
- Pull forward, lower the planter, and begin planting for a short distance.
- Stop and check the planting depth, seed spacing, and press wheel operation.
- Make the necessary adjustments and resume planting.
- For turns:
 - Raise the wings, ensure row units are not in contact with the ground, and make the turn.
- After turning:
 - Lower the wings into field position and resume planting.

End Planting

- Stop the tractor.
- Set the fan hydraulic circuit to float or neutral.
- Raise the planter and install cylinder locks (page 27).
- Remove wing flex lock pins, and install pins in the wing lock pin location (page 27).
- Fold the wings (page 28).
- Turn on lights for transport.

■ Planter Locks



Machine Damage Risk

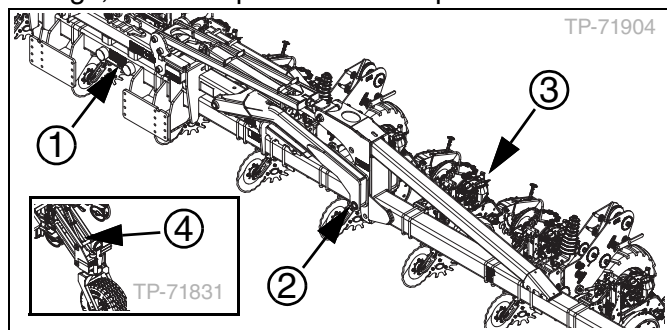
Improper use of locks will cause machine damage. Read and understand the following information about the locks before operating your planter.



Machine Damage Risk

The wing flex lock pins (1) must be installed and the wing lock pins (2) must be removed during folding and unfolding, or machine damage will occur.

The planter may be configured with up to four sets of locks that may require attention during the operation, storage, and transportation of the planter.



Wing Flex Lock Pins (Option) - Wing flex lock pins (1) stabilize pivot during folding and unfolding, and prevents wing flex during transport. Used when planter is configured with Flex Wing. Same pin used on the toolbar coupling for the wing lock.

Wing Lock Pins - Wing lock pins (2) secure the wing toolbar and the mainframe toolbar at the same height with a coupling. When wing lock pin is installed at the coupling, the outer wing is either rigid, or can flex, dependent on the flex configuration.

Row Lock-Up Pins - Row lock-up pins (3) are used when converting twin-row to single-row spacing. Used when planter is configured with twin-row spacing but will be used for single-row planting operations. Additionally, can be used to lock up individual row units, as needed.

Lift-Assist Cylinder Locks (Option) - Lift-Assist cylinder locks (4) are installed to hold the rear of the planter at raised. Cylinder locks are stored on the lift-assist weldments. Used when planter is configured with lift-assist.

The following tables will summarize lock usage by task:

Planting		
Lock	Location	Comments
Wing Flex Lock Pins	Installed as Wing Lock Pin.	Allows for wings to flex with the land.
Wing Lock Pins	Installed on toolbar coupling.	Allows for wings to remain stable.
Lift-Assist Lock Cylinders	Stowed.	Must be removed for field operations to prevent machine damages.
Row Lock-Up Pins	Stowed.	When planting in twin-rows.
	Installed on short (front) row units.	Only when planting single-row on a twin-row planter.*

*Row Lock-Up Pins are only used with twin-row spacing during single-row planting operations. The short row units on the front should be locked up. Row Lock-Up Pins are stowed at all other times.

Unfolding/Folding		
Lock	Location	Comments
Wing Flex Lock Pins	Wing Arm Pivot.	Stabilizes the wing for unfolding/folding to prevent damages.
Wing Lock Pins	Installed as Wing Flex Lock pin.	-
Lift-Assist Lock Cylinders	Stowed.	Allows for lift-assist to operate when necessary.

Transport		
Lock	Location	Comments
Wing Flex Lock Pins	Installed as Wing Lock pin.	-
Wing Lock Pins	Installed as Wing Flex Lock Pins.	Or stored.
Lift -Assist Lock Cylinders	Installed.	Locks cylinders for transport.

Storage/Maintenance		
Lock	Location	Comments
Wing Flex Lock Pins	Installed as Wing Lock Pin.	-
Wing Lock Pins	Installed as Wing Flex Lock Pins.	Or stored.
Lift-Assist Lock Cylinders	Stowed.	Proper storage position for planter.

■ Raising and Lowering



Crushing Hazard

Keep all persons away from wings and openers during raising and lowering. Openers and wings will cut or crush anything beneath them, and can result in serious injury or death.



Falling Hazard

Do not stand on tires when implement is raised or lowered. Wheels may have little or no weight on them, and may turn suddenly and without warning if used as a step, resulting in serious injury.

The standard 3-point hitch will raise and lower the planter.

Lift-Assist Hydraulics (Option)



Planter Damage Risk

Great Plains strongly recommends following the sequential order of raising and lowering the planter to prevent lateral dragging of wing components which will cause planter damage if not operated properly.

PL5200 Planters configured with the optional lift-assist, raising and lowering the planter relies on the lower link arms of the tractor in the front, and the lift-assist hydraulic cylinders in the rear. To raise or lower the planter, you will need to use a combination of the in-cab hydraulic tractor circuit for the rear and the 2-point hitch for the front.

Raising Planter with Lift-Assist

1. Use the tractor hydraulic lift-assist lever to raise the planter.
1. Set the tractor hydraulic lift-assist lever to "Neutral".
2. If necessary, install the lift-assist lock cylinders.
3. Raise the front of the planter using the 2-point hitch.

Lowering Planter with Lift-Assist

1. Remove the lift-assist lock cylinders, if necessary.
2. Lower the front of the planter using the 2-point hitch.
3. Use the tractor hydraulic lift-assist lever to lower the planter. Keep the tractor lever retracted until the rear of the planter is fully lower.
4. Set the tractor hydraulic lift-assist lever to "Neutral".

■ Folding and Unfolding



Pinch Point, Crushing, and Moving Hazards

Moving parts can pinch or crush causing serious injury or death. Keep all persons away when folding or unfolding the planter.



Planter Damage Risk

Do not fold or unfold without first raising planter completely or damage will occur.

Unfolding with 3-Point Hitch

1. Using the 3-Point hitch, fully raise the planter.
2. Use the tractor hydraulic fold lever to unfold the machine.
3. Set the tractor hydraulic fold lever to "Neutral".
4. Remove the wing flex lock pins located on at wing pivots.
5. Install wing lock pins on each end of toolbar coupling.
6. Lower the planter into field position for planting.

Unfolding with 2-Point Hitch

1. Remove the lift-assist lock cylinders, if necessary.
2. Use the tractor hydraulic lift-*assist lever to raise the rear of the planter to ensure the rear of the planter is fully raised.
3. Set the tractor hydraulic lift-assist lever to "Neutral".
4. Using the 2-point hitch, raise the front of the planter.
5. Use the tractor hydraulic fold lever to unfold the machine.
6. Set the tractor hydraulic fold lever to "Neutral".
7. Remove the wing flex lock pins located on at wing pivots.
8. Install wing lock pins on each end of toolbar coupling.
9. Lower the planter for field operations. Lower the 2-point hitch first, followed by using tractor hydraulic lift-assist lever to lower the rear of the planter.

Folding with 3-Point Hitch

1. Raise the planter using the 3-point hitch.
2. Remove the both wing lock pins on toolbar coupling.
3. Install wing flex lock pins at wing pivots.
4. Use the tractor hydraulic fold lever to fold the machine. Keep lever retracted until wings are fully folded.

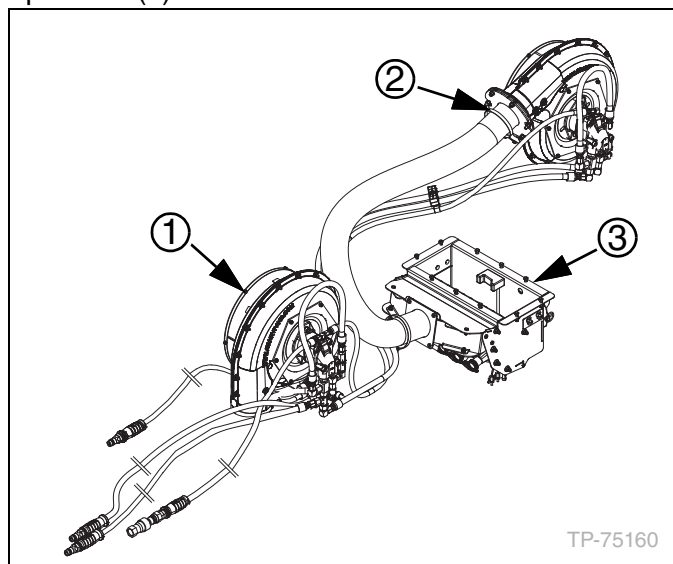
5. Set the tractor hydraulic fold lever to "Neutral".

Folding with 2-Point Hitch

1. Use the tractor hydraulic lift-assist lever to raise the planter.
2. Set the tractor hydraulic lift-assist lever to "Neutral".
3. If necessary, install the lift-assist lock cylinders.
4. Raise the front of the planter using the 2-point hitch.
5. Remove the both wing lock pins on toolbar coupling.
6. Install wing flex lock pins at wing pivots.
7. Use the tractor hydraulic fold lever to fold the machine.
8. Set the tractor hydraulic fold lever to "Neutral".

■ Air System

The air system consists of two hydraulic fans on bulk seed hopper configured PL5200 Planters. One hydraulic fan supplies air for the seed delivery (1) and the other hydraulic fan supplies air for the meter operation (2).



Fan rpm is adjusted using the tractor remote hydraulic flow control.

A sensor from the seed monitoring system measures and reports the air to the in-cab console.



In case of insufficient fan air or significant seed delivery air leaks, seed flow may be irregular or stop.

Some rows have lines to sample metering air pressure which is measured in a sensor chamber.

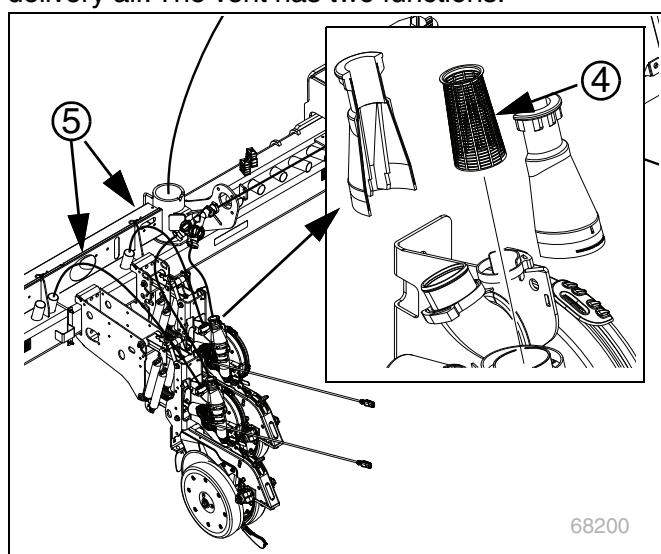
The sensor reading is fed back to the console for pressure control. Air pressure is adjusted to preset target in the console.

At the airbox (3), air is mixed with seed from the hopper and flows out the airbox manifold ports into seed hoses to the rows.



If seed delivery air flow is insufficient, the indication will be low seed rate alarms. If fan speed and direction are as recommended, check for air leaks in the seed delivery system.

A screen (4) above each seed meter vents the delivery air. The vent has two functions:



1. Releases delivery air while retaining the delivered seed.
2. Controls bulk seed delivery.

When the meter inlet is filled and seed fills the tube above the inlet, the screen becomes blocked by seed, shutting off the air flow to that meter. As the meter uses seed, the screen is exposed and air resumes flowing, carrying more seed to the meter.



It takes about a minute to initially fill the seed meters.

Separate pressurization tubes (5) provide air to the meters that holds the seed in disk cells until released to the seed tubes.

A sensor in each seed tube reports seed passage to the seed monitoring system which reports counts and rates on the console.

Dual-Fan Air System Hydraulics



Motor Seal Damage Risk

Do not apply pressure to the case drain line. Do not change the special quick connector. A restricted or sealed case drain line will promptly result in motor seal damage.



Fan Motor Damage Risk

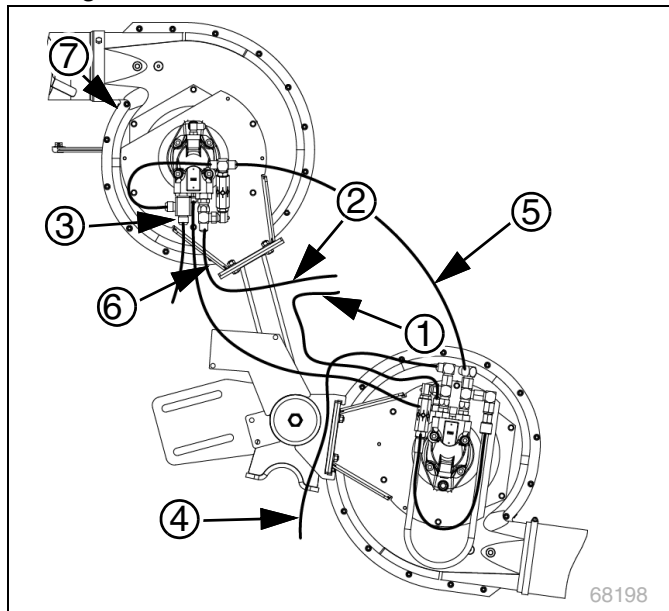
When disconnecting the hydraulic hoses, always detach the case drain hose last to prevent damage to the fan motor.



Hydraulic Motor Performance Risk

Do not attach the motor return/low pressure case drain line to a power-beyond port.

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



(1) Always connect the case drain hose first.

The case drain hose protects the outer seal of the hydraulic motor. It is small line to the hitch, supplied 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.

(2) Pressure line from tractor retract.

(3) Return to tractor along right tool-bar.

(4) Pressure line from tractor retract fold/bulk valve.

(5) Return from delivery fan to meter pressure fan.

(6) Case drain from meter pressure fan to delivery fan motor.

(7) Return bypass to motor tank port.

The fan hydraulic circuits include a check valve which provides a relief path for oil at motor shutoff. The resulting low fan rpm provides indication of reverse connection.

If a reversed fan is suspected, observe during shutoff since the direction of motor is easier to see at lower rpm rates.



Initial startup is nearly instantaneous, making observing at startup difficult.

If a 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 bypass at the check valve prevents the fan from reaching operating rpm. A reversed fan is incapable of providing sufficient air flow for planting.

Fan Operation

Use the tractor remote hydraulic valve flow control to set fan speed. Always start the fans with a low flow setting. Monitor fan rpm with the seed monitor.

Gradually bring fans up to the recommended initial rpm. The recommended initial fan speed is 2800 rpm.

The monitor console can report meter pressurization. There is also a Magnehelic air pressure gauge. These two readings should not disagree by more than a few tenths of an inch.



The Seed Rate manual provides initial values for meter pressurization. Normal readings are in the 4/5 to 4 inches (2 to 10 cm) H₂O and vary considerably with crop.

If the fans are running at suggested rpm or the meters are not getting seed, the fans may be running backward. Reverse the inlet/return lines at the hitch.

■ Fan and Meter Pressurization

Make sure the correct seed disks are installed, and the seed inlet gates are set for the seed. Refer to Material Rate manual.

1. With the fan off, check the meter pressurization on the console. Re-zero as needed, see seed monitoring system console manual.
2. Determine the recommended fan rpm.
3. Determine the recommended meter pressurization. Refer to Material Rate manual.
4. Start the fan. Gradually increase fan rpm using the tractor hydraulic flow control for the circuit.
5. Check that at least a small amount of pressure is being sensed at the meters and meter pressurization is near the suggested value.
6. Start delivery fan.
7. Fill the meters:
 - a. With the fan running, put the tractor in park and set the park brake.
 - b. Walk behind the wings, remove several rain covers from the seed meters, and check for seed in the meters by looking through the clear disks. Rows to check are those with longer hoses and sharper hose bends.

If a meter runs completely out of seed, back-pressure to the airbox manifold may prevent prompt refill. To fill a starved meter, close the seed inlet gate for about 15 seconds, then restore it to the original setting.
8. Fill the disk pockets with seed:
 - a. For electric drive and hydraulic drive, run a FILL DISK operation.
 - b. For ground drive, use one of these options:
 - With RSM clutch switches off, use a 7/8 inch wrench to rotate the wing meter system drive shaft 1 1/2 turns (top forward).
 - Lower the planter and plant for a short distance. It takes a few feet before seed begins to drop from the meters.
9. Check control air system pressure. With meters and disks filled, meter pressurization should be at target value.
10. Begin planting. Troubleshoot any obvious problems or alarms.
11. During the first pass, take note of the average populations reported on the seed monitoring system console:

- Screen 1 (first row above graphs), Average Overall Population

If the population is only slightly low, the problem can be skips (periodic empty disk pockets). If slightly high, the problem can be doubles (periodic pockets with double seed). A meter pressurization adjustment may correct either condition.

If the reported population varies from the desired population by a significant amount, perform the following check:

- a. Expose several seeds in each of several rows, being careful not to disturb their relative positions.
- b. Measure and average the distance between seeds.
- c. Compare the average to the predicted seed spacing for the population in the Material Rate manual.

Any instances of no seed where expected may be sign of skips. Two seeds at the same place indicates doubles.

12. Resume planting. During the next pass, note the following on the console:

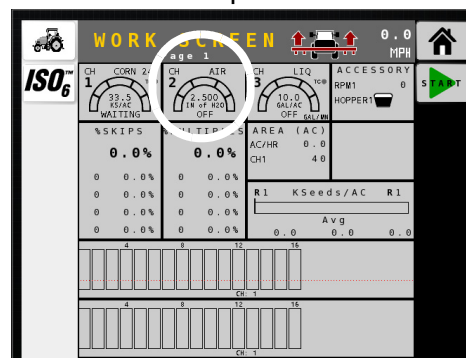
- Screen 1 (second row above graphs), Minimum Row Population
- Screen 1 (third row above graphs), Maximum Row Population

A small variation of population between rows is normal. However, a row consistently running lower or higher than the other rows, could indicate a meter or seed sensor problem that needs attention. See **“Population and Airbox Troubleshooting”** on page 71.



Meter pressurization can be adjusted with the planter in motion.

To increase meter pressurization:



1. Adjust hydraulic flow to meter pressure change.
2. Wait 5 to 10 seconds for the system to update while you continue planting.
3. Continue making small decrease adjustments until the reported population levels out at the target value.

Skips

If everything else is correct, and the overall average population is running low, or there are gaps when doing a furrow check, the cause may be seeds falling out of disk pockets before delivery to the seed tube. Increase meter pressurization to correct this.

Insufficient meter pressurization, or unusually rough fields can increase the incidence of empty pockets. Be sure to rule out other causes, such as skipping chains, meter starvation, or incorrect meter disks, before adjusting meter pressurization to reduce skips. Excess meter pressurization can increase the chance of doubles.

Doubles

If everything else is correct, and the overall average population is running high, or there are double seeds when doing a furrow check, the cause may be two seeds in some disk pockets at delivery to the seed tube. Decrease meter pressurization to correct this.

To decrease meter pressurizations:

1. Adjust tractor hydraulic flow.
2. Wait 5 to 10 seconds for the system to update while you continue planting.
3. Continue making small decrease adjustments until the reported population levels out at the target value.

Fine Tuning Meter Pressurization

After several passes, if you are comfortable with the planter operation, optimize the meter pressurization. Do this during longer passes, so there are fewer distractions.

1. Observe the current overall average population reported by the console.
2. Adjust the meter pressurization down in small increments, waiting 5 to 10 seconds between adjustments, until skips occur. Note the pressure where skips begin.
3. Restore the pressure to the initial value at step 1.

4. Adjust the meter pressurization up by small increments until doubles occur. Note the pressure at the which doubles begins.

If unable to adjust up to doubles, or if skips happen instead, seed delivery is probably being starved of air.

Increase fan rpm and repeat limit search.

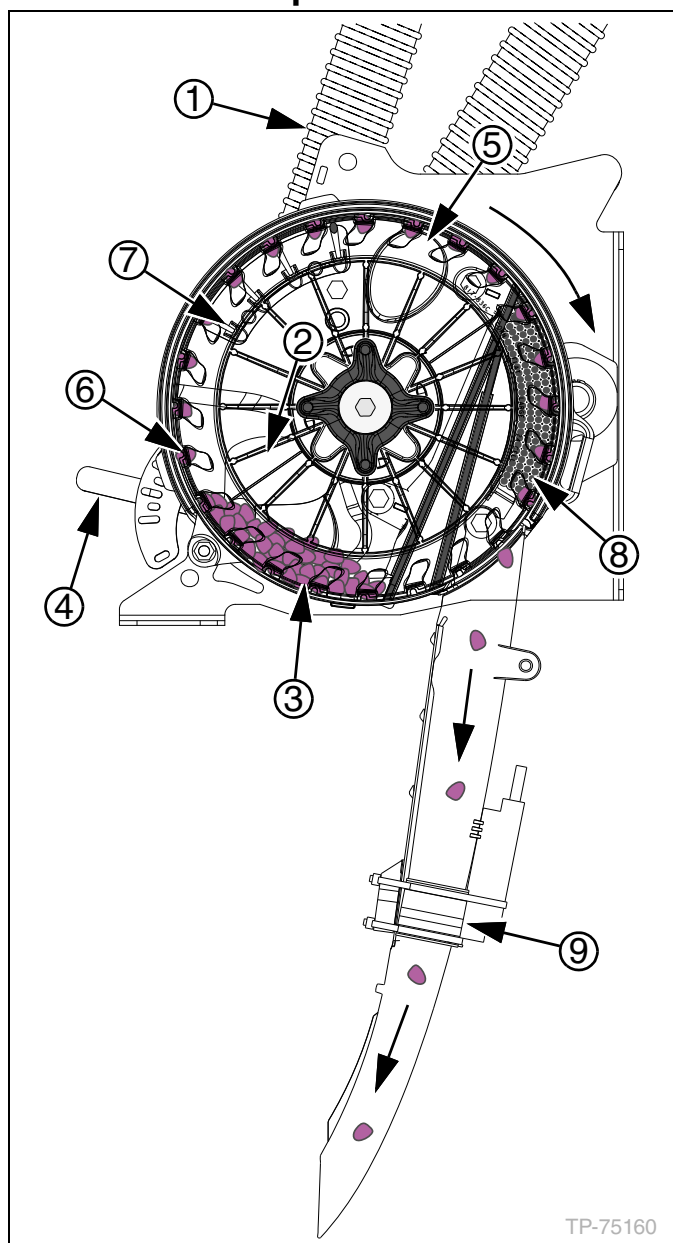
5. Adjust meter pressurization to a value halfway between the limits established at step 2 and step 4. This is the ideal value for your crop, disk, and population, providing equal margin against skips and doubles. Record this value for future use.

Alternate Skips/Double Check

Small seeds -particularly milo- and high populations - particularly soybeans- may not be sensed as skips or doubles by the seed tube sensors, and watching seed monitoring system population is unlikely to locate the pressure limits. The following test can also be quicker for all seeds:

1. After planting a few passes with initial settings, remove the rain covers from several seed meters. Use rows with a variety of seed hose lengths and routes.
2. Make a meter pressurization adjustment, and resume planting for pass or less.
3. Stop the planter motion but leave the fan running.
4. Inspect the seed disks closely. Look for empty seed cells, skips, and cells with multiple seeds (doubles).
5. Repeat steps 2 through 4 until limits are established. Record the limits and calculate an average.
6. Install the rain covers and plant with the calculated average.

■ Seed Meter Operation



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

Seed is gravity-delivered to the inlet from the hopper. Seed enters the meter at the seed inlet shutter (2) unless closed, and forms a seed pool (3) at the base of the meter. Seed pool size is controlled by the shutter handle (4) setting. The shutter handle setting is the only user adjustment at the meter. Initial shutter settings are provided in the seed rate charts. See the Material Rate manual for more information.

Meter pressurization air enters the meter at (5), and exits the meter primarily at the seed pockets in the seed disk. The pressure differential holds seed in the disk 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 pressurization 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

Install disks for your crop/population range per the Material Rate Manual. See **"Seed Disk Installation"** on page 42.

Open the shutter at planting rows to the recommended initial setting information from the Material Rate manual. At unused rows, install a blank disk and close shutter. See **“Seed Inlet Gate Adjustment”** on page 43.

Set sprocket indexing if staggering a twin-row crop.
See Material Rate manual for procedure.

Operate fan to achieve suggested manifold pressure.
See **"Fan Operation"** on page 30.

With all rows primed, rotate meters one turn to fill pockets to edge of drop brush. Rotate the drive shaft (top forward) with a $\frac{7}{8}$ inch open end wrench, or raise and rotate ground drive wheel (top forward).

Leave fan running to keep seed in top pockets. Re-install rain covers. See “**Seed Meter Rain Cover**” on page 42. Commence planting. Meter operation is automatic from this point on.

■ Planting Rate

Always check seed delivery rate before planting.

The seed monitoring system can count most singulated seeds, but may not reliably the smallest seeds, such as milo. It does not count individual volumetric seeds, and several factors can cause large seed singulated reports to be inaccurate, such as incorrect speed calibration, Sensor Constant, or Gear Ratio setup.

Methods of rate checking are described in detail in the Material Rate manual. This is an overview of the general process, which varies with the seed type and planter meter drive type.

Methods of rate checking are described in detail in the Seed Rate manual. This is an overview of the

general process, which varies with the seed type and planter meter drive type.

Before checking the rate, make sure the seed monitoring system console is configured with an accurate Ground Speed Constant. The console may have an incorrect default value preloaded.

The seed monitoring system Quick Start Guide for your planter includes an initial value for this constant, but the value may not be the best one for your planter, and does not include any adjustment for tire wear over time.

For reliable console reports, at the start of each season, perform a GROUND SPEED CALIBRATION over a 400 ft (100 m) course, as described in the seed monitoring system console manual. When completed and entered in the console, cross-check the reported implement speed against the tractor speedometer or other reference.

Singulated Rate

A furrow check is the most accurate way to verify the seeding is at the desired population value. This is done by planting for a short distance with one or two rows set to shallow depth and with press wheels tied up for no furrow closure. Seeds are counted in the furrow over a specific distance and the area rate is computed. Refer to the Seed Rate manual for details.

The seed monitoring system will also be counting the test. Compare the results.

If the checked rate varies from the chart rate, or for hydraulic drive from the programmed rate, it is likely there is a seed flow problem or planter malfunction, such as contact drive tire slippage or a configuration error that requires correction. Do not calibrate to correct expected variations in singulated rates.

Twin-Row to Single-Row Conversion



Crushing Hazard

Make sure machine is secure before working on the planter or making any adjustments. A falling machine or flailing parts can cause severe injury or even death.

This section covers adjustments necessary to convert your twin-row planter with the optional side-shift system to single-row planting operations within an hour. This option is only available on twin-row planters with 38 inch and 40 inch row spacing. Always make adjustments with safety in mind.

There are five necessary adjustments to achieve single-row planting operations on your twin-row planter:

- Side-Shift Hitch Offset
- Row Unit Lock-Up
- Disable Seed Meters
- Gauge Wheel Offset
- Lift-Assist Wheel Offset (Option)

Side-Shift Hitch Offset



Crushing Hazard

Do not make any adjustments in the hitch area including connecting and disconnecting hydraulic lines without first ensuring the tractor engine is stopped, the parking brake is set, and the key is removed. You may be severely injured or killed by being crushed between the tractor and planter.



Pinch Point, Crushing, and Moving Hazards

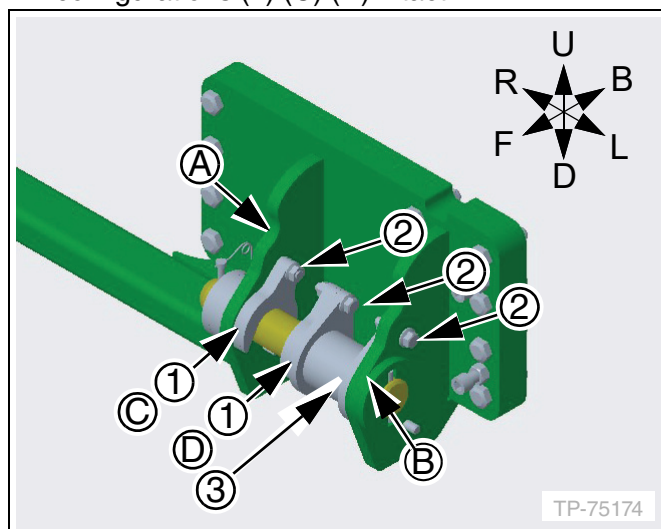
Moving parts can pinch or crush causing serious injury or death. Keep all persons away when making adjustments to the planter.

Whenever converting a twin-row spacing planter to single-row spacing planting operations, it will be necessary to offset the hitch by four inches (10.2 cm) to maintain center-of-bed alignment.

3-Point Side-Shift Hitch Offset

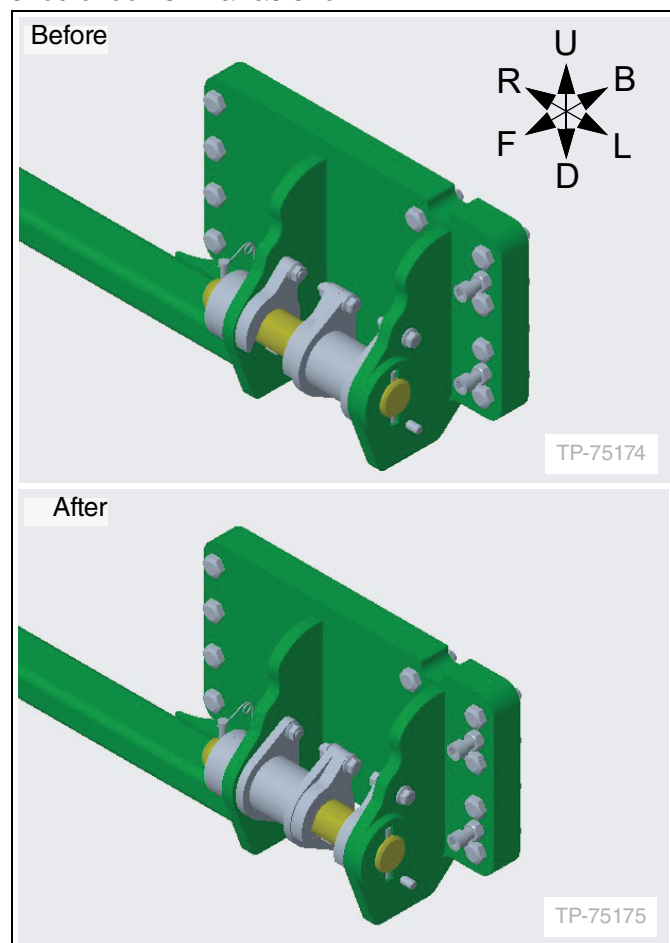
1. Move the planter to level ground with adequate overhead and side-to-side clearance for unfolding the planter.
2. Using the 3-point hitch, fully raise the planter.
3. Use the tractor hydraulic fold lever to fully unfold the planter.

4. Set the fold circuit to “Neutral” to prevent wing droop.
5. Install the wing locks pins on the toolbar coupling.
6. Lower the implement to just above ground level at the rear of row units.
7. If the ground is soft, place a board or plate under each parking stand to increase contact area.
8. Set parking stands.
9. Unhitch planter from tractor.
10. Keeping each of the two sets of the shim configurations (1) (C) (D) intact:

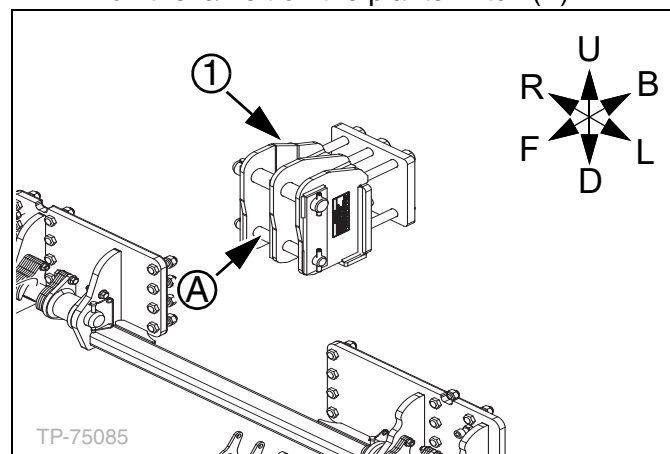


- a. Loosen the three bolts (2) and nuts, and remove the two sets of the shim configurations (1). Set aside, keeping the shim configurations intact, and in order.
- b. Slide the spacer weldment (3) to the far left until flush with the lower pin weldment (A).
- c. Secure with a bolt and nut (2).
- d. Retrieve shim configuration (1) (D) and place flush with the right side of the spacer weldment (3). Secure with a bolt and nut (2).
- e. Retrieve shims configuration (1) (C) and place on the far right lower pin weldment (B) and secure with bolt and nut (2).
11. Repeat steps a through e to shift the shims on other lower pin on hitch.
12. Connect the tractor lift arms to the lower hitch pins.

When all steps have been completed your lower pin should look similar as shown:

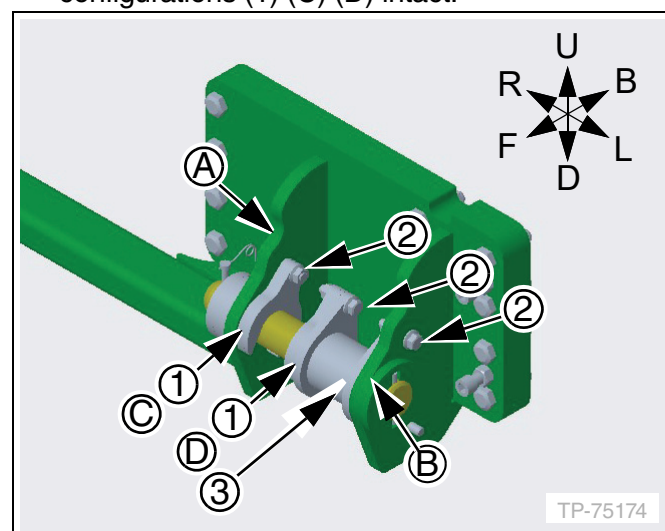


13. Securely lock tractor lower hitch points arms onto the planter hitch.
14. Adjust tractor upper link arm, as needed to connect to planter top link (1).
15. Securely lock tractor upper hitch point on the top link on the far left on the planter hitch (A).



2-Point Side-Shift Hitch Offset

1. Move the planter to level ground with adequate overhead and side-to-side clearance for unfolding the planter.
2. If necessary, fully unfold the planter.
3. Set the fold circuit to "Neutral" to prevent wing droop.
4. Install the wing locks pins on the toolbar coupling.
5. Drive the planter forward, and turn the wheel to the left. This will create adequate space for necessary lift-assist adjustments.
6. Remove all lock cylinders.
7. Lower the front of the planter using the 2-point hitch.
8. Use the tractor hydraulic lift-assist lever to lower the planter. Keep the tractor lever retracted until the rear of the planter is just above ground level at the rear of row units.
9. Set the tractor hydraulic lift-assist lever to "Neutral".
10. If the ground is soft, place a board or plate under each stand to increase contact area.
11. Set parking stands.
12. Keeping each of the two sets of the shim configurations (1) (C) (D) intact:



- a. Loosen the three bolts (2) and nuts, and remove the two sets of the shim configurations (1). Set aside, keeping the shim configurations intact, and in order.
- b. Slide the spacer weldment (3) to the far left until flush with the lower pin weldment (A).
- c. Secure with a bolt and nut (2).

- d. Retrieve shim configuration (1) (D) and place flush with the right side of the spacer weldment (3). Secure with a bolt and nut (2).
- e. Retrieve shims configuration (1) (C) and place on the far right lower pin weldment (B) and secure with bolt and nut (2).
13. Repeat steps a through e to shift the shims on other lower pin on hitch.
14. Connect the tractor lift arms to the lower hitch pins.

■ Row Unit Lock-Up



Crushing and Sharp Object Hazards

Use extreme caution when raising and locking up a row unit. Do not raise the row unit using a block or with your hands. Do not attempt to raise the row unit by hand with several people. Opener disks may be sharp. The row unit can snap down sharply causing severe injury or even death.



Crushing and Sharp Object Hazards

Fully raise the planter before locking up the row unit. Although the adjustment can be made with the planter lowered, the springs will be in tension, presenting dangerous conditions which could cause machine damage, or severe injury or even death.



Planter Damage Warning

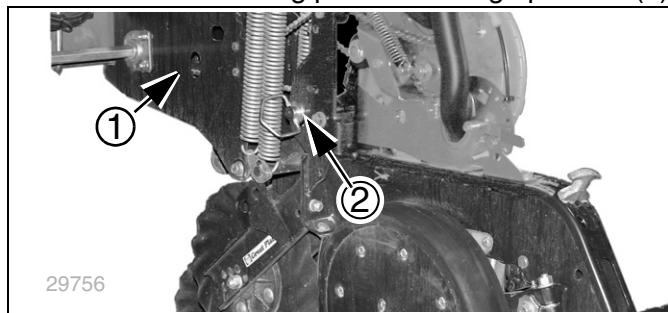
Do not pin the row unit while in a lower position. If the locking pin is inserted below the parallel arm, unit damage will occur as soon as planting begins.

On the twin-row planters, row units have been configured with one short opener mount and one long opener mount. The row units with the short opener mounts will be locked-up to convert a twin-row planter to single-row planting operations.

Row Unit Lock-Up (3-Point Hitch)

1. Using the 3-point hitch, fully raise the planter.
2. Use the tractor hydraulic fold lever to fully unfold the planter.
3. Set the fold circuit to “Neutral” to prevent wing droop.
4. Install the wing locks pins on the toolbar coupling.
5. Set the down pressure spring to cam notch to zero. See “**Row Unit Down Pressure**” on page 45.

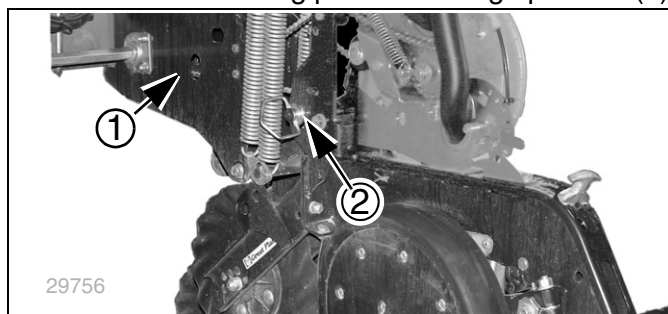
6. Remove the locking pin from storage position (1).



7. Raise the row unit high enough to align the lock-up hole (2) in the row unit shank and secure with locking pin. It may be necessary to use a hoist or jack under the shank extension to support the row unit.

Row Unit Lock-Up (2-Point Hitch)

1. Use the tractor hydraulic lift-assist lever to raise the planter.
2. Set the tractor hydraulic lift-assist lever to “Neutral”.
3. If necessary, install the lift-assist lock cylinders.
4. Raise the front of the planter using the 2-point hitch.
5. Use the tractor hydraulic fold lever to fully unfold the planter.
6. Set the fold circuit to “Neutral” to prevent wing droop.
7. Install the wing locks pins on the toolbar coupling.
8. Set the down pressure spring to cam notch to zero. See “**Row Unit Down Pressure**” on page 45.
9. Remove the locking pin from storage position (1).



10. Raise the row unit high enough to align the lock-up hole (2) in the row unit shank and secure with locking pin. It may be necessary to use a hoist or jack under the shank extension to support the row unit.

■ Disable Seed Meters



Pinch Point, Crushing, and Moving Hazards

Moving parts can pinch or crush causing serious injury or death. Keep all persons away when making adjustments to the planter.



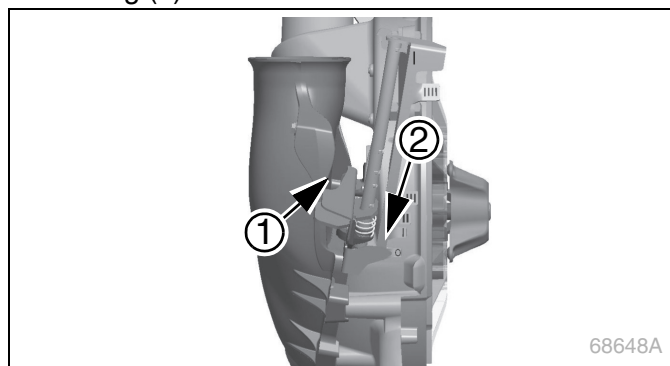
Irregular Seeding Risk

Do not operate the planter without disabling the seed meters on the locked-up row units. If all necessary steps are not followed to disable the seed meters, there will be difficulties maintaining consistent meter pressurization for precision planting including skips and material loss.

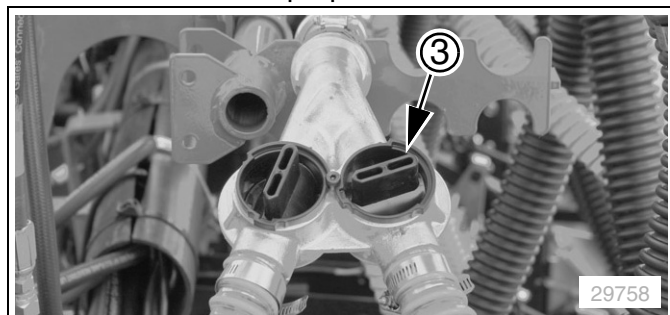
Converting twin-row planters to single-row planting operations requires the seed meters to be disabled on the row units which have been locked up.

Begin on the left-side of the planter, and repeat steps on each locked-up row unit:

1. Close the seed inlet gate on the seed meter, by squeezing the tabs (1) and set the gate to the "X" setting (2).



2. Clean out the seed meter. See **"Seed Meter Clean-Out"** on page 60.
3. Install a blank seed disk. See **"Seed Disk Installation"** on page 42.
4. Close the valve (3) on the Y-tube for the branch to the locked-up row unit by rotating the valve cap until the handle is perpendicular to the tube.



5. Reset your seed monitoring system console to reflect new active row pattern to avoid nuisance alarms. See console operator manual for more information.

■ Gauge Wheel Offset



Crushing Hazard

Do not stand or place any body part under any part of the planter. You may be severely injured or killed by being crushed.



To aide in future twin-to-single row conversions, you may consider marking the frame as you work with a marker for future reference.

To offset the frame to maintain center-of-bed alignment will be achieved by shifting the gauge wheels by 3 to 4 inches (7.6 to 10.2 cm) on the frame. The gauge wheel offset distance is determined by your planter configuration. See table below.

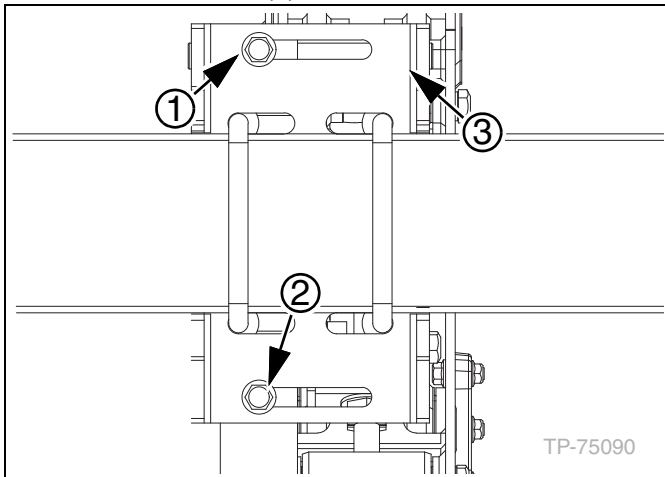
Model	Gauge Wheel Offset Distance
Any 36" Row Spacing Configuration	Not available
Any Single-Row Configuration	Not available
PL5200-CH-TR38	4 inches (10.2 cm)
PL5200-CB-TR38	4 inches (10.2 cm)
PL5200-HH-TR38	3 inches (7.6 cm)
PL5200-HB-TR38	4 inches (10.2 cm)
PL5200-IH-TR38	3 inches (7.6 cm)
PL5200-IB-TR38	4 inches (10.2 cm)
PL5200-CH-TR40	4 inches (10.2 cm)
PL5200-CB-TR40	4 inches (10.2 cm)
PL5200-HH-TR40	4 inches (10.2 cm)
PL5200-HB-TR40	4 inches (10.2 cm)
PL5200-IH-TR40	4 inches (10.2 cm)
PL5200-IB-TR40	4 inches (10.2 cm)



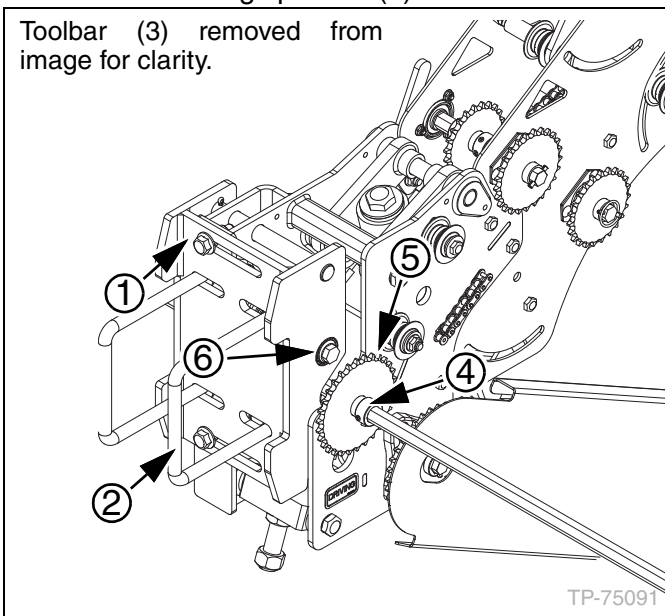
To successfully complete the gauge wheel offset it will be necessary to carefully guide the main driving sprocket assembly on the drive shaft as you shift the gauge wheel into place on the toolbar.

1. Lower the planter but do not allow the wheels to make contact with the ground.
2. Stop tractor engine, set parking brake, and remove key.

- Beginning on the left side of the planter, on the gauge wheel assembly(3), loosen the upper bolt (1) and the lower bolt (2).



- Loosen the two lock collars (4) on both sides of the main driving sprocket (5).



- Tighten the adjuster nut (6) to move the gauge wheel weldment to the right until the gauge wheel offset distance has been achieved. Carefully support and guide the main driving sprocket assembly along the shaft as the gauge wheel mount is shifted. Use the gauge wheel offset distance based on your planter configuration. See previous table.
- Once the gauge wheel mount is in the correct offset location, tighten the two lock collars (4) to secure the main driving sprocket (5).

- Tighten the upper bolt (1) and the lower bolt (2) to secure the gauge wheel assembly (3).
- Repeat steps 3 through 7 for the other gauge wheels.

■ Lift-Assist Wheel Offset (Option)



Pinch Point, Crushing, and Moving Hazards

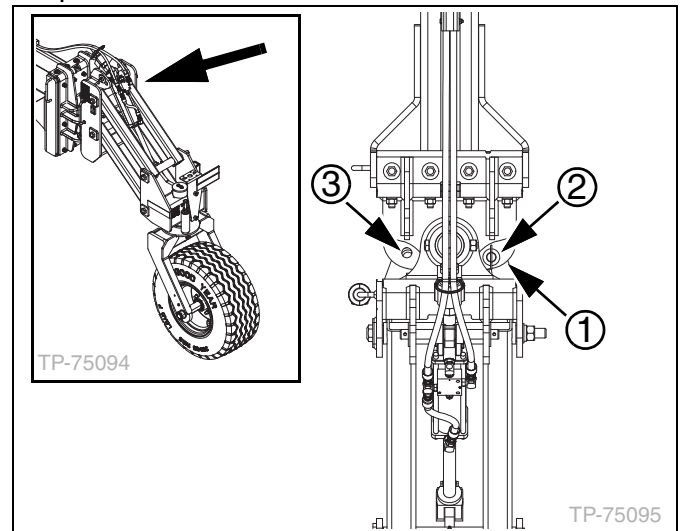
Moving parts can pinch or crush causing serious injury or death. Keep all persons away when making adjustments to the planter and when the planter is moving and/or in operation.

If your PL5200 Planter is configured with lift-assist, it will be necessary to offset the lift-assist pivot mount on the rear of the planter.



To successfully complete the lift-assist wheel offset, it will be necessary to move the planter forward while turning to shift rear lift-assist pivot mount, to achieve single-row planting mount hole alignment.

- On the left and right rear lift-assist pivot mounts (1), remove pin (2) from twin-row planting position.



- By pulling the planter forward and turning, shift rear lift-assist pivot mount (1) to the left until the single-row planting mount hole (3) is aligned to allow for the pin (2) to be secured into the single-row planting position.
- Stop tractor engine, set parking brake, and remove key.
- Insert pin (2) into the single-row planting position.

Adjustments

This section covers adjustments and settings necessary for the best field performance and results. Even if planting conditions rarely change, some items need periodic adjustment due to normal wear. Always make adjustments with safety in mind.

■ Planting Rate for Ground Drive

Always check recommended planting rate in the Material Rate manual before beginning planting operation. The seed rate charts will include the suggested starting sprocket settings. There are four ground drive systems on the planter and each drive needs to be set identically.

There are three adjustments necessary to set the planting rate for ground drive planters:

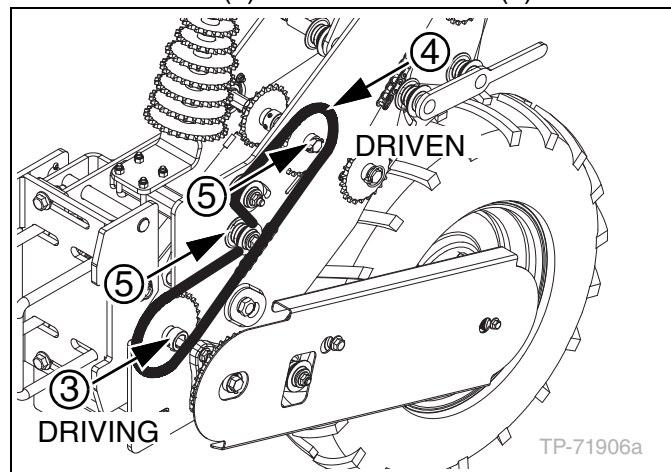
- Range sprockets
- Transmission sprockets
- Upper drive sprockets

Range Sprockets

Select the correct range sprockets for your seed by referring to the Material Rate manual.

To change range sprockets:

1. Loosen idler (3) and remove chain (4).



2. Remove retaining pins (5) from shafts and install range sprockets as necessary.
3. Reroute chain over sprockets and idlers as shown.
4. Move idler into chain so chain has 1/4 inch (6 mm) slack in its longest span. Tighten idler and install lynch pins.

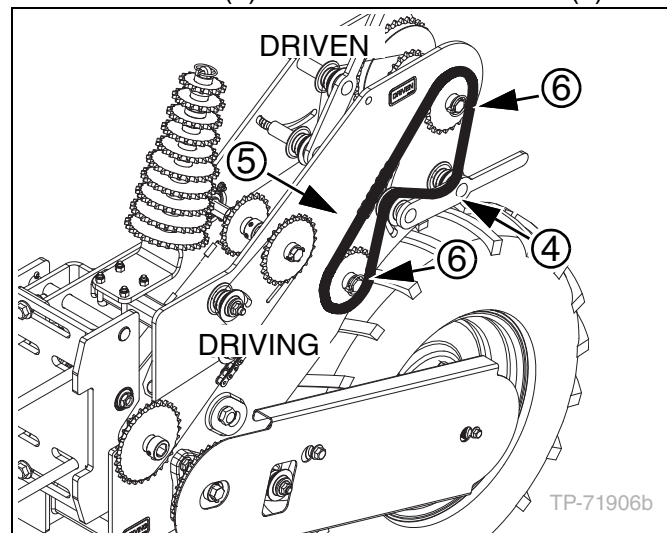


Ensure the correct sprockets have been installed in the DRIVING and DRIVEN locations.

Transmission Sprockets

Select the correct transmission sprockets combination for your seed by referring to “Seed Rate Charts” in the Material Rate manual.

1. Loosen idler (4) and remove drive chain (5).



2. Remove retaining pins (6) from shafts and rearrange driving and driven sprockets as necessary.
3. Reroute drive chain over sprockets and idlers as shown.
4. Move idler into chain so chain has 1/4 inch slack in its longest span. Tighten idler and install lynch pins.

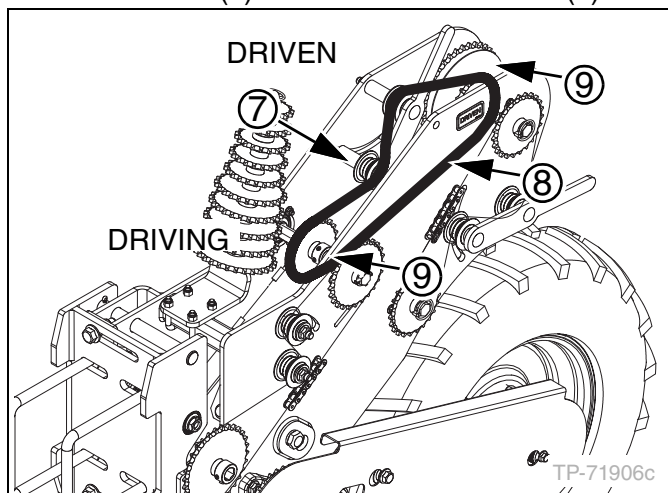


Ensure the correct sprockets have been installed in the DRIVING and DRIVEN locations.

Upper Drive Sprockets

Select the correct upper drive sprockets combination for your seed by referring to “Seed Rate Charts” in the Material Rate manual.

1. Loosen idler (7) and remove drive chain (8).



2. Remove retaining pins (9) from shafts and rearrange driving and driven sprockets as necessary.
3. Reroute drive chain over sprockets and idlers as shown.
4. Move idler into chain so chain has 1/4 inch slack in its longest span. Tighten idler and install lynch pins.

■ Planting Rate for Hydraulic Drive

Set the planting rate in the console. See console manual for details.

Manually verify seed delivery rate accuracy before planting.

■ Planting Rate with IRC

Set planting rate in the console and drive control channel. See console manual for details.

Manually verify seed delivery rate accuracy before planting.

■ Verify Seed Delivery

Although your seed monitoring system console will report useful full pass results, cautious practice includes manually checking the seed rate early in the first pass before beginning planting operations.

The console can count most singulated seeds, but may not accurately count the smallest seeds, such as canola. It does not count individual volumetric seeds.

The following is described in detail in the Material Rate manual. The following is an overview of the general process, which varies with the seed type and planter meter drive configuration.

Before checking the rate, make sure the console is configured with an accurate Ground Speed Constant.

At the start of each season, perform a *GROUND SPEED CALIBRATION* over 400 ft (100 m), as described in the console manual. When completed and entered in the console, check the reported implement speed against the tractor speedometer or other reference.

The seed charts provided in the Material Rate manual are based on cleaned and sized seed. Extreme seed variations, foreign material, and tire pressure can materially affect planting rate.

Checking the rate also provides a double-check on your population calculations and drive configuration.

1. Adjust the planting depth to shallow on 3 rows units. Using center and wing-end row units for measurement provides a more accurate assessment of overall planter performance. Pick center units outside wheel tracks.
2. Use bungees or wire to tie-up the press wheel assembly on the tested row units, so that the seed is not covered.
3. Operate the planter for 17 feet 5 inches, plus several feet for the press wheels to clear the end of the sample distance.
4. Count the number of seeds in the test rows.
5. Multiply the total by 1000 to obtain an acre value.
6. If the populated is substantially different than expected, check tire inflation and double-check the sprocket configuration.

Seed Rate Check Example

Seed: soybeans
Seed Wheel: 100 cell
Target population: 140,000 seeds/acre

Sample: 3 rows

Operate for 25 feet.

Count seeds in 17-feet 5-inch section of the test run.
A total of 141 seeds is counted in all 3 rows.

$141 \times 1000 = 141,000$ seed per acre

The result is only 0.1 percent higher than the target population. This is within expected sampling error, and requires no adjustment.

■ Seed Meter Setup and Adjustments

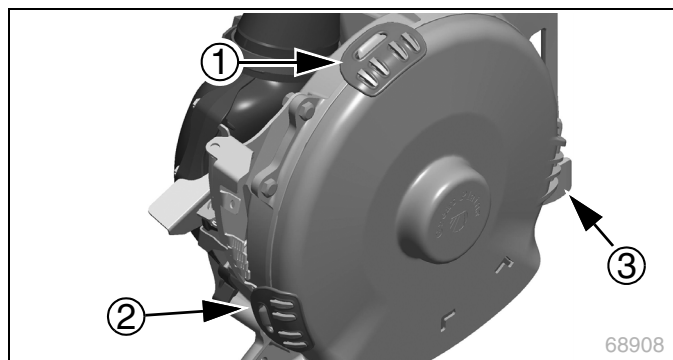
The only seed meter adjustments are for the seed inlet gate, a choice of disks, and meter pressure.

Seed Meter Rain Cover

The rain cover keeps side winds from pushing seed out of the disk cells. It also keeps precipitation, sunlight, and field debris out of the meters. It acts to direct any dust or debris coming from the seed downward toward the soil. A knockout brush on the inside of the cover brushes loose seeds off the seed disk.

To remove the rain cover:

1. Unclasp the latches (1 and 2).
2. Pivot the cover forward and down at the tab (3) and remove.



When removing a cover, inspect it for damage and missing parts. If a cover does not have both latches it can be lost during transport or field operations. Also, inspect the knockout brush for wear.

To replace a latch, slide the replacement latch onto the cover lugs from the meter side, then snap the other end down over the lugs.

To replace the knockout brush, see “**Knockout Brush Replacement**” on page 63.

Seed Disk Installation

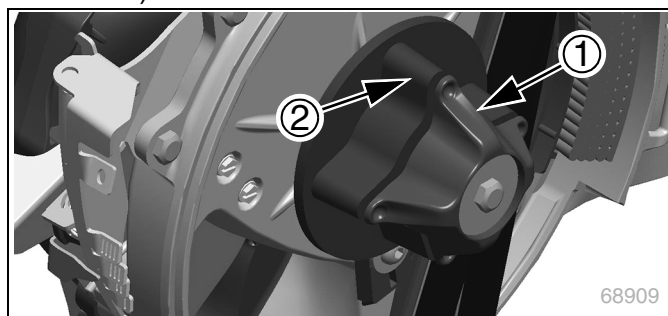


Population Risk

Make sure to use the same disk in all active rows.

1. Check the part number and description on the seed meter disks against the seed rate chart data.
2. Before installing, inspect the disks. Do not install damaged or worn disks which can cause irregular seeding. Chips and cracks can increase brush wear.
3. Remove the meter rain cover.

4. Inspect the meter and brushes (see page 61 for details).

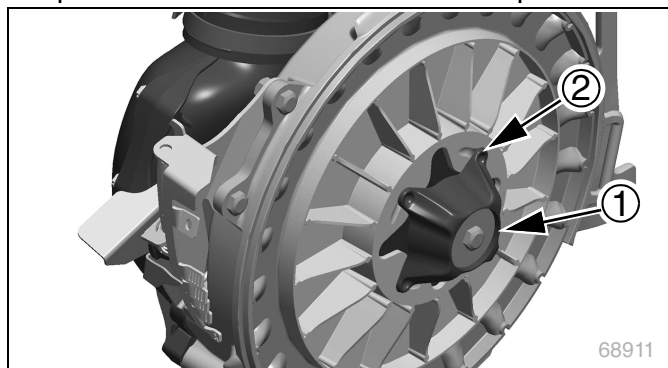


5. Make sure the seed meter clamp (1) is aligned with the disk seat (2).
6. With the seed cells side facing the meter housing, place the new seed disk on the disk seat.
7. Rotate the seed meter clamp (1) clockwise 45° to clamp the disk. The clamp will seat into the seed disk hub (2).

With a new meter or new brushes, force the disk into the brushes to position the seed meter clamp. The brushes will be trained during initial rotations.

With slightly used brushes, when a disk is first clamped, the disk hub may be flat with the disk seat only on the gate side. The disk should seat as it first turns. This condition will ease as the brushes are used.

8. Rotate disks forward a few turns after disk installation to make sure the meter brushes lean in the correct direction. This is particularly important for new brushes. It will improve meter performance and reduce air consumption.

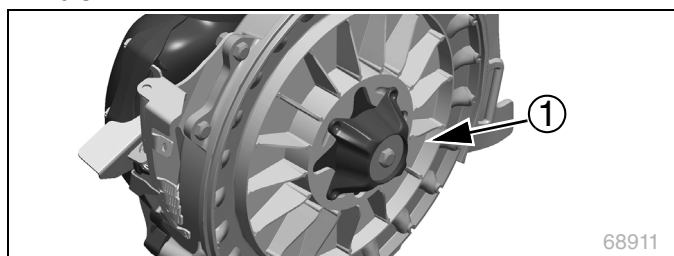


9. Set the seed inlet gate to the setting on the seed rate chart.
10. On the console, select the new Material, seed disk Cell Count, and target population.

11. Reinstall the rain cover.

Seed Disk Removal

1. Remove the rain cover. If seed is present, close the seed inlet gate to prevent more seed from entering the meter.
2. Attach the seed container, stored at the left end of the planter, to the seed meter or place a tarp under the row unit to collect the seed.
3. Hold the seed disk and rotate the seed meter clamp (1) counterclockwise 45° to release the disk.



4. Tilt the top of the seed disk toward the meter and slowly remove the disk, allowing seed to collect in the container or on the tarp.
5. Open the seed inlet gate to release the remaining seed.
6. Clean the seed from all brushes. Inspect brushes for excess wear and damage, see “**Seed Meter Brush Replacement**” on page 61.
7. Clean disk seat so new disks can fully seat.
8. Inspect removed disks for excess wear and damage, see “**Seed Disk Maintenance**” on page 63. Set aside any disks requiring replacement.
9. Clean seed disks and place in storage.
10. Install the rain covers.

Seed Inlet Gate Adjustment

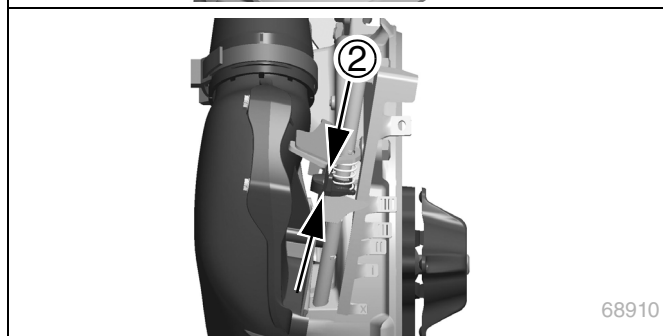
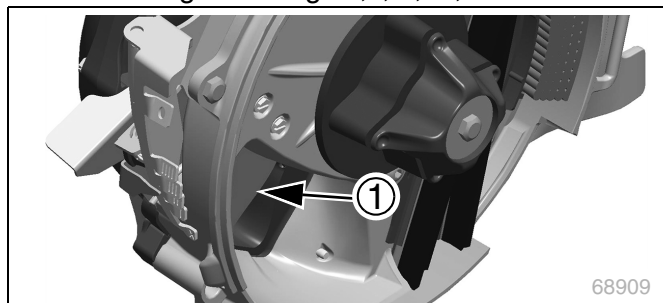
The seed inlet gate (1) controls the volume of bulk seed at the seed disk. The settings vary with crop, seed size, and seed treatment. The gate has settings for row shut-off for completely closed, and clean-out for wide open.

The seed rate charts include suggested initial gate settings. Refine these settings based on the slope of the seed pool at the bottom of the seed disk and flow of seed.

Coarse seed treatments may require a larger opening.

Do not adjust more than two positions different than the seed rate chart.

To adjust the seed inlet gate, squeeze the tabs (2) and move the gate up or down as necessary. There are four settings for the gate; I, II, III, IIII.



The table below is a general summary of gate settings.

Setting	Setting Typically Used For
X	Closed - row shut-off, meter refill
I	Small seeds, such as milo, with little or no treatments
II	Small treated seeds and edible beans such as soybeans
III	Corn, round popcorn
IIII	Large corn, heavily treated corn
O	Wide open - clean-out

Disable Seeding



Population Risk

Make sure to use a blank disk in all rows that are shut-off or operation without a disk or with a seed disk but no seed will destabilize the regulated air flow, and cause population issues.

It is possible to disable seeding on individual rows.

1. Set seed inlet gate to “X” or fully closed.
2. Replace seed disk with blank seed disk. See “**Seed Disk Installation**” on page 42.
3. Lock-up row unit to reduce wear. See “**Seed Pool Slopes**” on page 44.

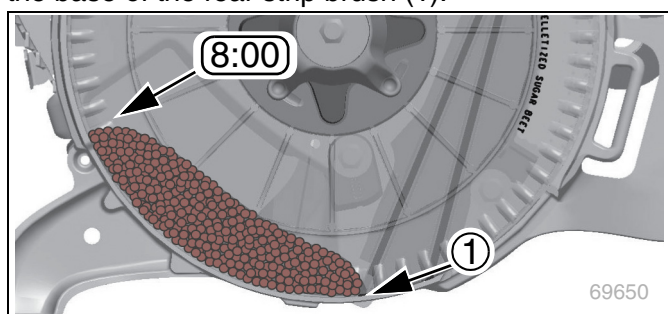
- Reset console to reflect new active row pattern.
See console operator manual for more information.

Seed Pool Slopes

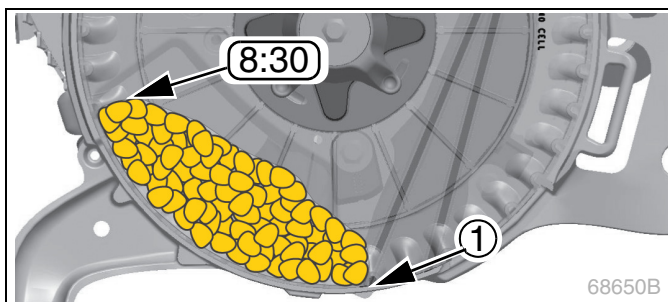
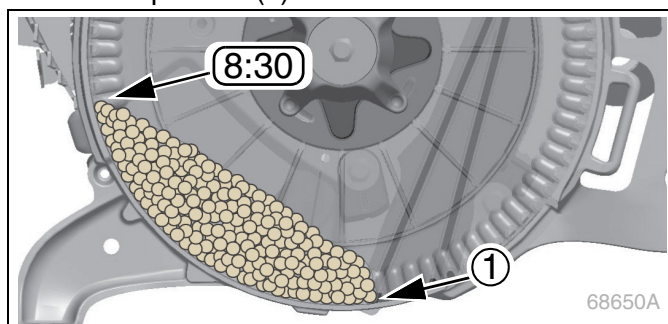
The best seed pool slope results in the most consistent seeding with minimal skips and doubles. The illustrations below are found to be the best seed pool slopes for sample seeds.

Adjust the seed inlet gate if the suggested setting does not work for your seed.

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



For medium size and larger, or heavily treated smaller seeds that flow less easily, the slope runs at or slightly above the 8:30 position on the housing wall, down to three to six seeds deep at the base of the rear strip brush (1).



Keep the top left/rear end of the pool below the 9:00 position; meter horizontal center-line.

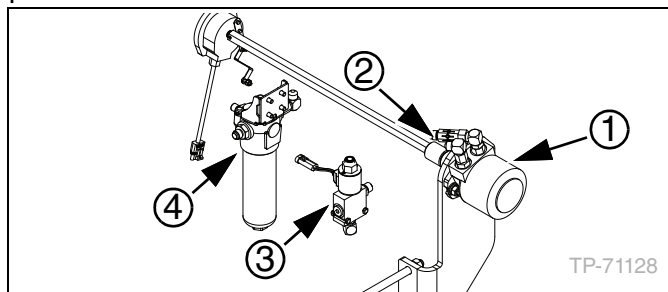
In general, the seeds at the base of the strip brush need to be deep enough that no air escapes, and that just enough seeds are present to begin populating the cells.

Seed Meter Operation

- Install disks for your crop/population range according to the Material Rate manual and the instructions beginning on page 33 of this manual.
- Open the gate at the planting rows to the recommended initial setting from the seed rate charts.
- Operate the fan to achieve the suggested air pressure.
- With all rows primed, rotate meters one turn to fill the cells to the edge of the drop brush. Rotate the drive shaft (top forward) with a 7/8 inch open end wrench, or raise and rotate the ground drive wheel (top forward).
- Leave the fan running to keep seed in top cells.
- Install rain covers.
- Begin planting. Meter operation is automatic from this point on.

Seed Meter Hydraulic Drive

The hydraulic drive uses a hydraulic motor (1) as the power source for meter rotation.



The drive requires a separate closed center hydraulic circuit capable of 4.5 gal/min (17 liters/min). A check valve (2) at the motor prevents reverse operation in case the connections are reversed at the tractor or the circuit lever reversed.

A solenoid valve (3) controls flow to the motor.

A filter (4) in the system requires periodic maintenance.

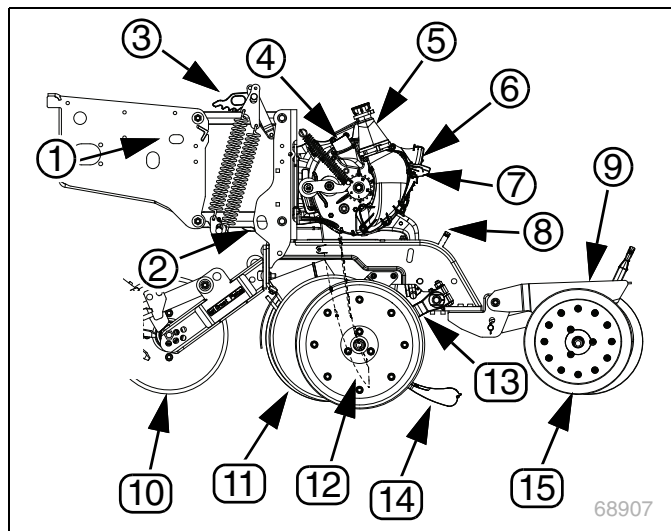
Refer to the console manual for more information.

When the planter is raised in normal field operation, the lift switch causes the console to shut off hydraulic flow to the motor. Override this shut off and operate

the drive while raised using special console modes as follows:

- In User Level 1, the FILL DISK operation runs the motor for one meter disk revolution.
- In User Level 2, the 5 REV TEST operation runs the motor for five meter disk revolutions.

■ 5000 Series Row Unit



(1) **Lock-up Pin Storage Hole** (twin-row spacing configuration). See “**Row Shut-Off**” on page 46.

(2) **Row Unit Lock-up Hole** (twin-row spacing configuration). With the row unit raised above level, the lock-up pin is inserted here. See “**Row Shut-Off**” on page 46.

(3) **Down-pressure Cam** (standard). Row units are mounted on parallel arms; allowing the row unit to move up and down while staying horizontal. Springs set by a cam add an adjustable force to the row weight. See “**Row Unit Down Pressure**” on page 36.

(4) **Pressurization Air Inlet** (standard). Pressure-regulated air enters the meter here and holds seed in the disk pockets. See “**Fan and Meter Pressurization**” on page 23.

(5) **Seed Inlet** (standard). Air carrying the bulk seed is vented at the bottom of the air release cone. Gravity then carries the seed into the meter at the seed inlet gate. Remove the hose for inspection. There are no adjustments.

(6) **Seed Meter** (standard with choice of disks). See “**Tighten both bolts.**” on page 41.

(7) **Seed Inlet Gate** (standard). This controls the level of bulk seed at the disk. There are four

operating settings, plus fully closed for shut-off or storage. See “**Seed Inlet Gate Adjustment**” on page 34.

(8) **Side Gauge Wheel Depth** (standard). The T-handle sets the planting depth by controlling the height of the side gauge wheels relative to the opener disks. See “**Setting Planting Depth**” on page 38.

(9) **Press Wheels** (standard with choice of wheels). The press wheels close the furrow, pressing the soil over the seed to provide good seed to soil contact.

(10) **Unit Mount Coulter** (option). Coulters cut remaining trash and begin opening the seed furrow. Working depth is set by row depth and a mounting hold selection. See “**Unit Mounted Coulters**” on page 41.

(11) **Opener Disks** (standard). Row unit double disk openers create the seedbed furrow with adjustments for angle and spacing. See “**Row Unit Opener Disks**” on page 38.

(12) **Seed Tube with Sensor** (standard). Requires no adjustment.

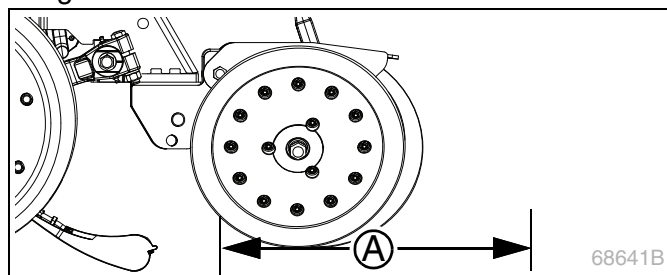
(13) **Scrapers** (optional). Inside scrapers require no adjustment. For side gauge wheel scrapers, see “**Side Gauge Wheel Scraper (Option)**” on page 39.

(14) **Seed Firmers** (seed flap, standard, not shown; Keeton, optional, shown). The seed firmer minimizes seed bounce and improves soil contact. See “**Coulter Row Adjustment**” on page 41.

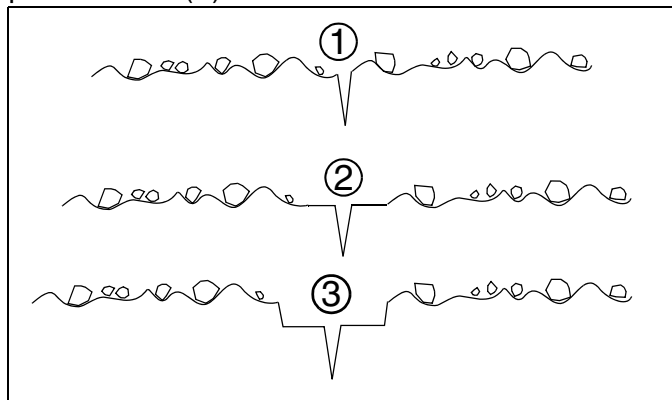
■ Row Unit Down Pressure

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

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



At several row units, inspect the furrow created by the opener disks, but before the furrow closing by the press wheels (A).



Be sure to inspect rows in and out of tire tracks.

(1) If the side gauge wheels are leaving no tracks, or light tracks, increase down force.

(2) If the side gauge wheels are compressing trash and loose soil, and leaving clear tracks at the top of the subsoil, down force is correct and needs no adjustment.

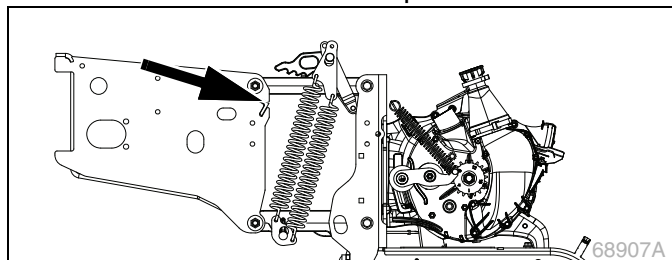
(3) If the side gauge wheels are creating a trench into the subsoil, down force is too high and needs to be reduced.

Down-Pressure Adjustment

Row unit springs provide the down pressure necessary for row unit disks to open a seed trench. The springs allow the row units to float down into depressions and up over obstructions.

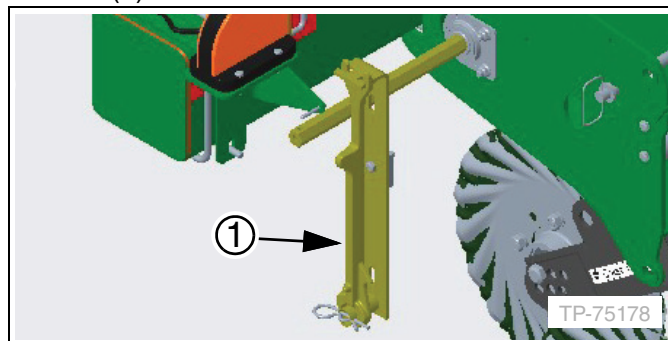
You can adjust down pressure individually for each row unit. This is useful for penetrating hard soil and planting in tire tracks. For best results, always adjust tractor tires so the tires are not ahead of rows.

Use only enough down pressure to cut the seed trench and maintain proper soil-firming over seed. Excessive row unit down force will lead to premature wear on row unit components. Excessive down force will also cause uneven seed depth.

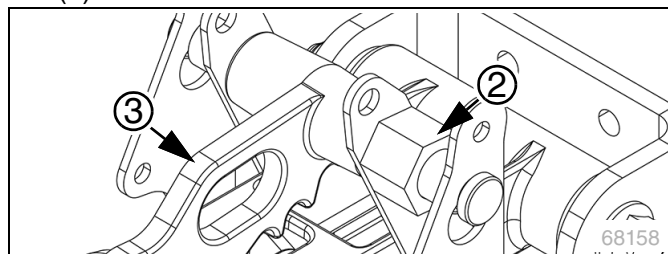


To adjust down pressure:

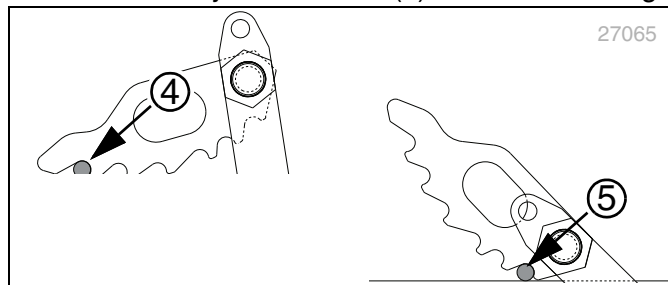
1. Use 1 1/8 inch (29 mm) open end wrench or the tool (1) stored on the end of the toolbar.



2. Position the wrench or supplied tool on the nut (2). Pull back and down.



3. Move the adjustment cam (3) to the new setting.



Minimum setting (5) and maximum setting (4) are indicated by the position of the adjustment cam.

Each notch on the adjustment cam will increase the down pressure on the row unit springs. Use the table as a setting reference.

Cam Notch	Pounds	Kilograms
out of notch	Lock-up and maintenance	
1	320	145
2	355	160
3	385	175
4	435	200
5	485	220
6	535	245
tip of cam	Do not use	

Do not set all rows any higher than notch 4. Using settings above this on all rows will create uneven depth control and improper function.

Individual rows may be set higher if running in heavy tires tracks.

■ Row Unit Opener Disks



Crushing Hazard

Install cylinder locks when working or making adjustments on the machine. A falling machine can cause severe injury or death.



Sharp Object Hazard

Opener disks are sharp and may result in injury. Wear hand protection when working in this area.



Crushing Hazard

Make sure machine is secure before working on the machine. A falling machine can cause severe injury or death.

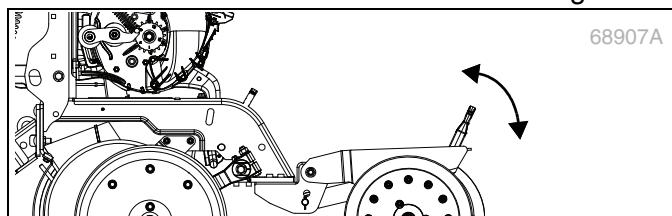
The 5000 series openers have three adjustments:

- planting seed depth,
- openers disk-to-disk clearance, and
- side gauge wheel/opener disk clearance.

Setting Planting Depth

The T-handle sets planting depth by limiting how high the side depth gauge wheels ride relative to the opener disks. The position of the seed tube is fixed relative to the disks and is not adjusted.

To adjust seed depth, pull the T-handle up and back and move it forward or back to another setting.

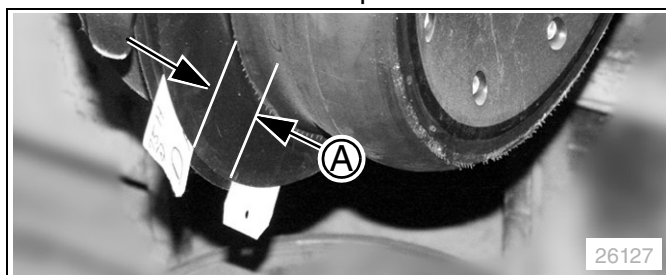


- For shallower planting, move the T-handle forward.
- For deeper planting, move the T-handle back.

Disk-to-Disk Spacing

Opener disk angle and stagger is not adjustable, but disk-to-disk spacing is, and may need attention as

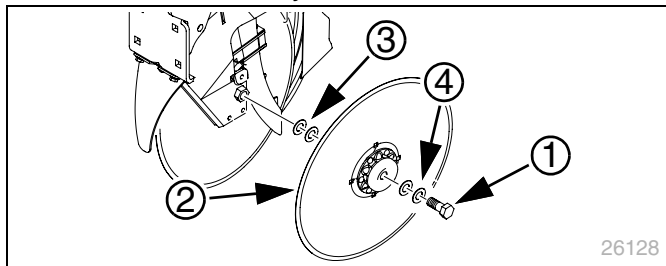
disks experience normal wear. Spacers will need to be reset when blades are replaced.



The ideal spacing causes the blades to be in contact for about 1 inch (2.5 cm) (A). If you insert two pieces of paper between the blades, the paper should slide from touching to 1 1/2 inch (3.8 cm) from each other.

If the contact area is significantly larger or there is a large gap, adjust by moving one or more spacer washers.

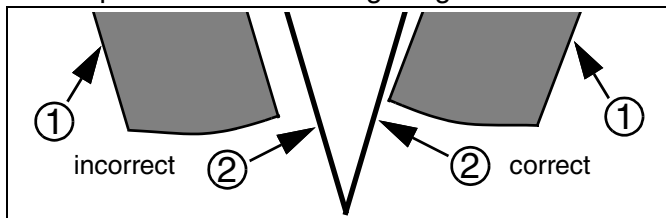
1. Raise the planter and install lift cylinder locks.
2. Remove the side gauge wheels on the row unit which needs an adjustment.



3. Remove the bolt (1) retaining the opener disk (2) on one side.
4. Carefully remove the disk. Do not lose the hub components and spacer washers (3 and 4).
5. To reduce the spacing between disks, move one spacer washer from the inside (3) to the outside (4) of the disk.
6. Reassemble and check the disk contact.

Side Gauge Wheel Angle and Clearance

For disk-to-wheel angle and clearance the side gauge wheel (1) should just be touching the opener disk (2) when the wheel is raised to planting depth. The goal is to have both disks and wheels turn freely, but keep soil and trash from getting between them.



The side gauge wheel have two related adjustments. Changing one requires at least checking the other. The two adjustments are:

- angle of side gauge wheel, and
- distance between side gauge wheels and disks.

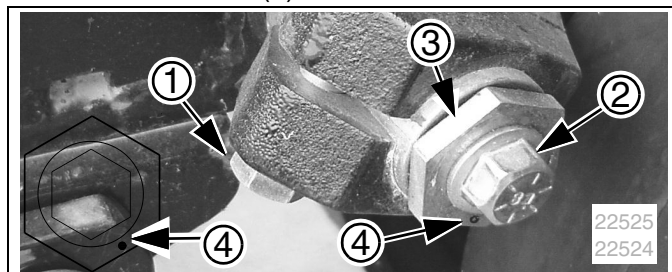
In addition to changing the disk angle due to changing depth or new field conditions, the two interrelated adjustments may need attention over time as the disk and wheels wear from normal use. This adjustment will also need to be made when any opener components are replaced.

For 2 inch (5 cm) planting depth, adjust the side gauge wheel angle so the wheels contact the row unit disks at the bottom of the wheel and the gap is 3/8 to 5/8 inch (9.5 mm to 16 mm) at the top. Check with row units in the soil so wheels are held up.

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

To adjust the side gauge wheels:

1. Raise the planter slightly, removing the weight from the side gauge wheels.
2. Loosen the bolt (1).



3. Move the wheel and arm out on O-ring bushing.
4. Loosen the pivot bolt (2).
5. Turn hex adjuster (3) so the indicator notch (4) is at 5 o'clock to 7 o'clock. Use this as the starting point for adjustment.
6. Move wheel arm in so the side gauge wheel contacts the row unit disk.
7. Tighten the bolt (1) to clamp the arm around the bushing and shank.
8. Check wheel-to disk contact at 2 inch (5 cm) planting depth. Lift wheel 2 inch (5 cm), check the contact, and release. When let go, the wheel should fall freely.
- If the wheel does not contact the disk at the bottom to the area where the blade leaves contact with the solid,

move the hex adjuster until the wheel is angled for proper contact with the disk.

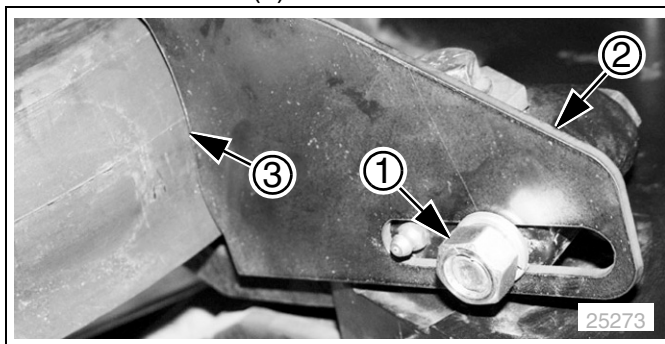
- If the wheel does not fall freely, loosen the bolt (1) and slide the wheel arm out just until the wheel and arm move freely.
 - Tighten the bolts follows:
Grade 5 bolt - 76 ft-lb (105 Nm)
Grade 8 bolt - 110 ft-lb (150 Nm)
9. Keep turning the hex adjuster and moving the wheel arm until the wheel is adjusted properly.
 10. When properly adjusted, tighten the pivot bolt (2) to 110 ft-lb (150 Nm).

■ Side Gauge Wheel Scraper (Option)

Side gauge wheel scrapers may be useful in moist or sticky soils that tend to accumulate on gauge wheels reducing the intended planting depth.

To adjust gauge wheel scraper:

1. Loosen the nut (1).



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

■ Press Wheel Adjustments

Press wheels are attached to each row unit body. The press wheels close the seed trench and press soil over the seed.

To provide consistent seed firming, the press wheels are free to move downward from the normal

operating position. This system maintains closing/pressing action even if the row unit arm is lifted when the disks encounter obstructions.

There are three adjustments on the press wheel assembly:

- **Down Pressure.** An adjustable spring in the press wheel mechanism creates the down pressure needed to close the seed trench. The amount of force needed will vary with field conditions.
- **Wheel Stagger.** The factory setting is staggered to achieve the best residue flow.
- **Centering.** Press wheels should be centered over the seed trench.

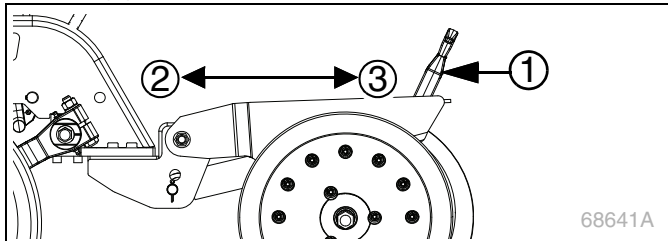


Increased press wheel spring force may require increased row unit down force to maintain depth.

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

Press Wheel Down Pressure

To adjust the press wheels, move the adjustment T-handle (1).

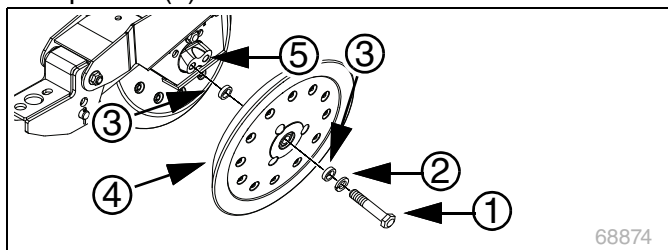


- For less down pressure, move the T-handle forward (2) toward the planter.
- For more down pressure, move the T-handle back away (3) from the planter.

Press Wheel Stagger

To change the stagger:

1. Raise the planter.
2. Remove the bolt (1), lock washer (2), and spacers (3).

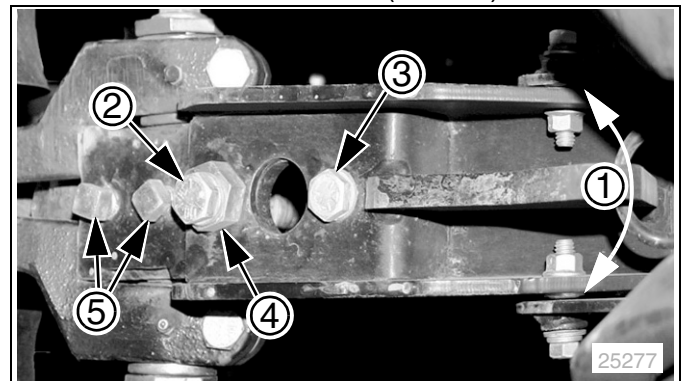


3. Reinstall the spacers, press wheel (4), and hardware to the other hole location (5).

Press Wheel Centering

If one press wheel is running in the seed trench, or the press wheels are not centered over the trench, the angle (1) of the press wheel assembly can be adjusted as follows:

1. Determine how far, and in which direction, the press wheels are not centered over the trench, the angle (1) of the press wheel assembly can be adjusted as follows:
2. Raise the planter.
3. Loosen the 1/2 inch bolts (2 and 3).



Do not loosen the two front bolts (5).

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

Unit Mounted Coulters



Crushing Hazard

Make sure machine is secure before working on the machine. A falling machine can cause severe injury or death.



Sharp Objects Hazard

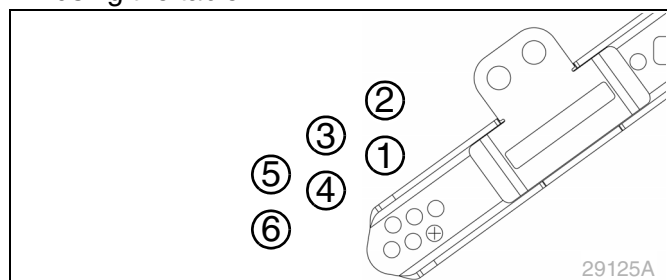
Casting edges and coulters blades are sharp and may result in injury. Wear hand protection when working in the area.

The best operating depth for coulters is 1/4 inch (6 mm) above the opener depth. The coulters may have originally been set to this depth, but coulters and opener blades wear with time, and may need adjustments for continued optimal performance.

Adjust the coulters depth by mounting the coulters blade in one of the six mounting holes on the coulters bracket.

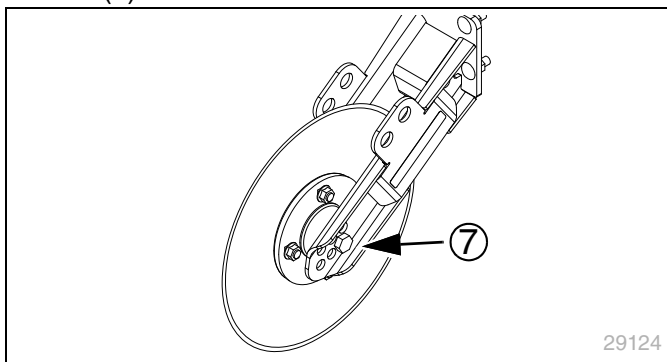
1. Raise the planter.

2. Dismount the row cleaner, if installed, to reduce risk of injury.
3. Determine the current opener and coulters depths.
4. Determine which new hole will position the coulters closer to the 1/4 inch (6 mm) depth by using the table.



Hole Number	Depth of coulters blade relative to opener blade
1	0
2	1 inch (25 mm) above
3	5/8 inch (16 mm) above
4	3/8 inch (9.5 mm) below
5	1/4 inch (6 mm) above
6	3/4 inch (19 mm) below

5. Remove the 5/8 x 4 inch bolt, lock washer, and nut (7).



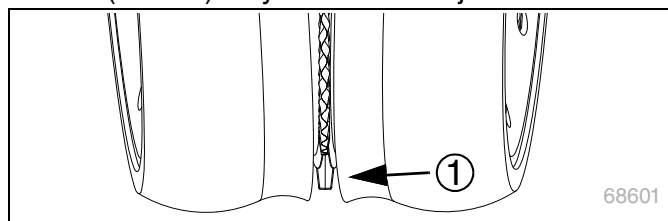
6. Move the coulters blade to the new position.
 7. Install the bolt and washer locker with the nut.
 8. Readjust row cleaners, if installed.
- If a worn coulters cannot be adjusted to the proper operation depth, replace the coulters blade.

Coulters Row Adjustment

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

To check alignment, sight along the coulters blade centerline (1), the gap between the opener blades, and the centerline between the press wheels. If they

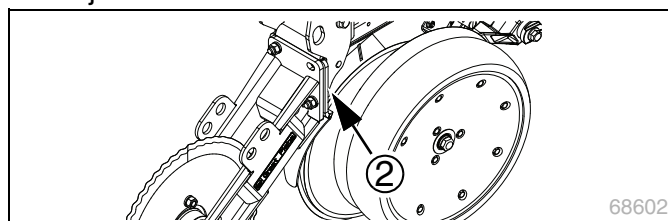
are out of alignment, either the coulters or the press wheels (or both) may need to be adjusted.



Operate the planter on test ground (no seed required), and verify that the opener blades are in the groove opened by the coulters, and that the press wheels are centered over the furrow. See **“Press Wheel Adjustments”** on page 40.

To adjust coulters alignment:

1. Loosen the four bolts that attach the coulters bracket to the row unit.
2. The holes on the row unit are slotted (2) for adjustment.



Keep the coulters blade vertical while adjusting.

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

Row Unit Shut-Off



Crushing and Sharp Object Hazards

Use extreme caution when raising and locking up a row unit. Do not raise the row unit using a block or with your hands. Row unit disks may be sharp. The row unit can snap down sharply causing severe injury or death.

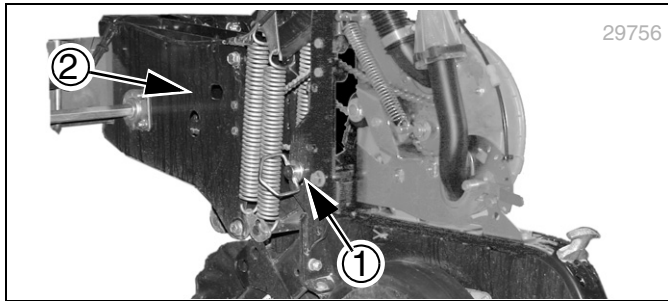


Planter Damage Warning

Do not pin the row unit while in a lower position. If the locking pin is inserted below the parallel arm, unit damage will occur as soon as planting begins.

1. Raise the planter.
2. If configured with Lift Assist, install cylinder locks.
3. Set the down pressure spring to cam notch to zero. See **“Down-Pressure Adjustment”** on page 46.

- Remove the locking pin (1) from storage position (2).



- Raise the row unit high enough to align the lock-up hole in the row unit shank and secure with locking pin. It may be necessary to use a hoist or jack under the shank extension.

■ Seed Firmers



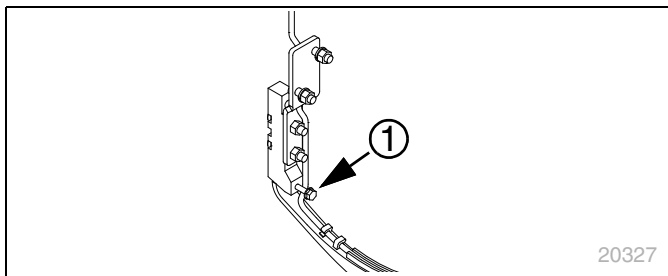
Sharp Objects Hazard

Disk blades are sharp and may result in injury. Wear hand protection when working in the area.

Use an optional seed firmer to ensure each seed is placed firmly in the bottom of the seed trench. Only one type of seed firmer may be installed at a time.

Keeton Seed Firmers (Option)

A Keeton seed firmer has a polymer shape that slides down the seed trench. It traps the seeds as they exit the seed tube and firms them into the bottom of the seed trench.



The Keeton seed firmer is provided with a preset tension which is recommended for the first year of planting. The tension screw (1) can be tightened after the first, according to your needs. The seed firmers should provide just enough tension to push seeds to the bottom of the trench.

Measure the distance from the ground to the head of the tension screw. The distance should be 4 to 4 1/2 inches (10.2 to 11.4 cm).

If an adjustment is necessary, loosen the bolts in the mounting bracket and select different holes until the proper measurement is reached.

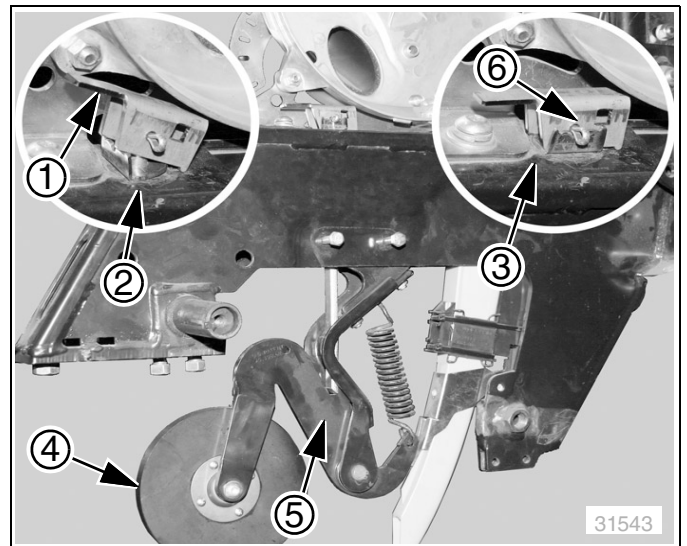
Seed-Lok Firming Wheels (Option)

The 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 this problem, you can lock up the firming wheels.

To lock up the firming wheels:

- Raise the planter.
- Install lift-assist cylinder locks.
- Light the handle (1) until the lever stop (2) is free to rotate.



The illustration shows a row unit with disks, side depth wheels/arm, and press wheels removed. This is not necessary to lock or unlock the firming wheels.

- Rotate the lever stop to the side/idle position (3).
- Release the lockup handle.
- Push up on the firming wheel (4) until the wheel arm latches up (5).

To release a locked up firming wheel:

- Insert a 1/4 inch tool drive tip in the tool hole (6) of the handle (1). Alternatively, lift up on the wheel (4).
- Rotate the handle clockwise, with the handle arm up, until the firming wheel releases at the latch point (5) and falls free.
- While holding the handle up, rotate the raised portion of the lever stop (2) under both sides of the handle at the arm end.
- Remove the drive tool.

Engage the lever stop under the handle when the Seed-Lok is in use. If left disengaged (3), a furrow obstruction could cause unintended lockup.

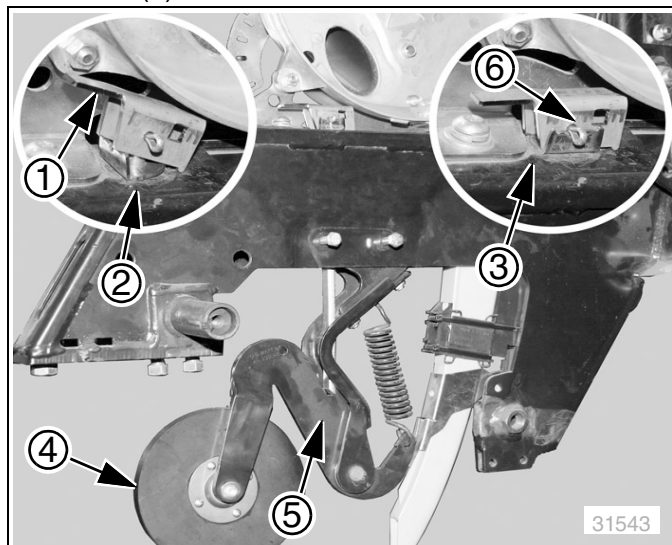
Seed-Lok Wheels Lock-up (Option)

To lock-up Seed-Lok wheels:

1. Move the planter to level ground with adequate overhead and side-to-side clearances for the unfolding operation.
2. Raise the planter for ease.
3. Set tractor circuit lever to Neutral.
4. Install cylinder locks. See **"Planter Locks"** on page 21.
5. Put the tractor gear in park, set the park brake, turn off the engine, and remove the key.
6. Lift Seed-Lok lock-up handle (1) until lever stop (2) is free to rotate.
7. Rotate lever stop to side/idle position (3).
8. Release lock-up handle (1).
9. Push up on Seed-Lok wheel (4) until wheel arm latches upward (5).

To release Seed-Lok wheels:

1. Insert a 1/4 inch tool drive tip in the tool hole (6) of the handle (1). Alternatively, lift up on the wheel (4).

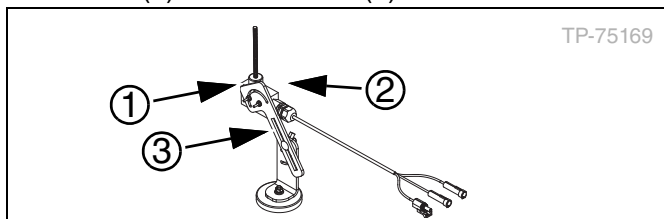


2. Rotate the handle clockwise (handle arm up) until the Seed-Lok wheel releases at the latch point (5) and falls free.

■ Height Switch (S/N E1193K-)

To adjust the height switch:

1. Lower the planter to the height at which seed delivery should begin.
2. Slightly loosen the nut (1) holding the height switch (2) to the bracket (3).



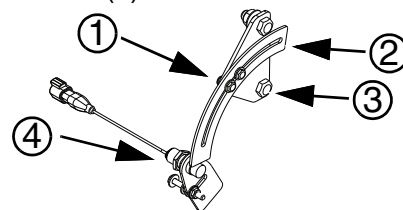
3. Slowly rotate the height switch (2) on the bracket (3).
4. Tighten the nut (1) to secure to the bracket (2) at the height at which the whisker will make contact with the tractor lift arms on planters configured with 3-point hitches, or with the lift assist gauge wheel assembly parallel arms near the hydraulic cylinder on planters configured with 2-point hitches.
5. Ensure the height switch and the electrical harnesses will not be pinched, crushed, or otherwise damaged during operation.

■ Height Switch (S/N E1194K+)

To install this height switch, reference the installation manual 421-034M. It is referred to as a Lift Switch in the installation manual.

To adjust the height switch:

1. Lower the planter to the height at which seed delivery should begin.
2. Slightly loosen the nuts (1) holding the sensor position bracket (2) to the lift sensor bracket (3).



3. Slowly rotate the sensor position bracket (2) until the LED lights up on the proximity sensor (4).
4. Tighten the nuts (1) to secure the sensor position bracket (2).

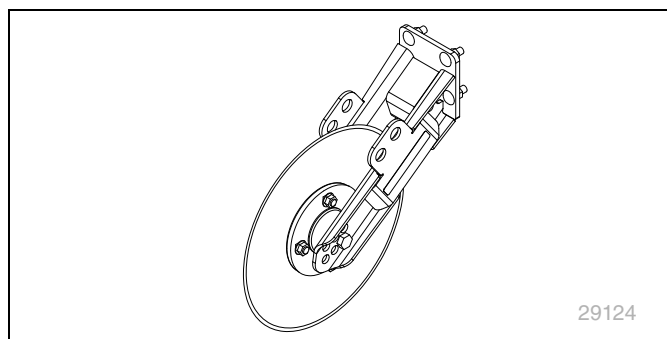
Options

■ Seed Lubricant



Description	Part Number
Ezee Glide Plus Talc and Graphite Mix 5 gal (18.9 liter) container	821-069C
Bayer Fluency Powder case quantity	821-074C
Bayer Fluency Powder single 4.4 pound bucket	821-075C

■ Unit Mounted Disk Coulters



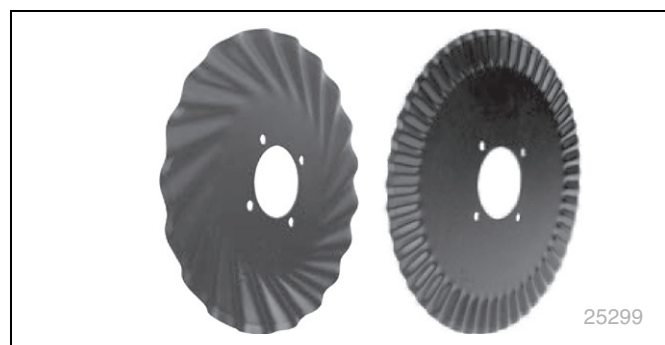
Optional unit mount disk coulters are available with 15 inch (38.1 cm) fluted blades or 15 inch (38.1 cm) turbo blades.

Kits includes coulters with unit mount and blade:

15 Inch Fluted Blade Packages	Part Number
-1236	204-552A
-1238	
-1240	
-TR36	204-528A
-TR38	
-TR40	

15 Inch Turbo Blade Packages	Part Number
-1236	204-553A
-1238	
-1240	
-TR36	204-530A
-TR38	
-TR40	

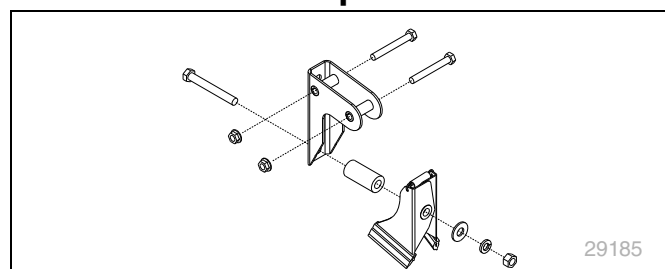
Coulter Blades



Replacement and alternate coulter blades. Order one blade per row.

Description	Part Number
Turbo, 15 inch (20 flutes)	820-327C
Fluted, 15 inch (50 flutes)	820-331C

■ Inside Disk Scrapers



When planting in moist or sticky soils, the inside disk scraper is useful in preventing buildup that might impair opener disk performance.

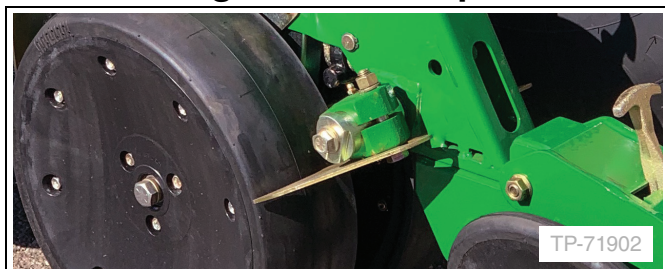
The carbide scraper is spring loaded and requires no adjustment.

Description	Part Number
Inside Disk Scraper	122-278S



The inside scraper cannot be used with Seed-Lok seed firmers, but are compatible with seed flaps and Keeton seed firmers.

■ Side Gauge Wheel Scrapers



When planting in moist or sticky soils, the side gauge wheel scrapers are useful in preventing buildup that might result in shallow planting.

Order one part per wheel; two per opener.

Description	Part Number
2 $\frac{3}{8}$ inch Gauge Wheel Scraper	404-194D
3 inch Gauge Wheel Scraper	404-195D
4 inch Gauge Wheel Scraper	404-196D

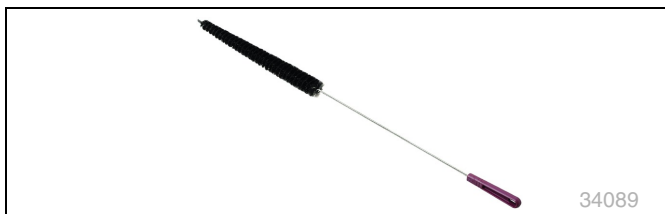
The scrapers mount on the bottom rear of the depth wheel arm, using the existing bolt and lock washer. The slot in the scraper is long enough to clear the lower grease fitting and allow adjustment as the wheel and scraper wear.

■ Press Wheels



The planter includes a choice of press wheels. Additional wheels are available, and may be ordered at anytime. This manual does not list part numbers as the available wheels are often region-specific. Consult your Great Plains dealer.

■ Seed Tube Brush



One brush is provided with the planter. Use the following to order an additional or a replacement brush.

Description	Part Number
Seed Tube Brush	891-259C

■ Timing Tool Hat



A timing tool comes standard on twin-row planters. It is used to shift the chain position by one tooth per tool rotation. For further information and directions on how to use the timing tool, see the Material Rate manual.

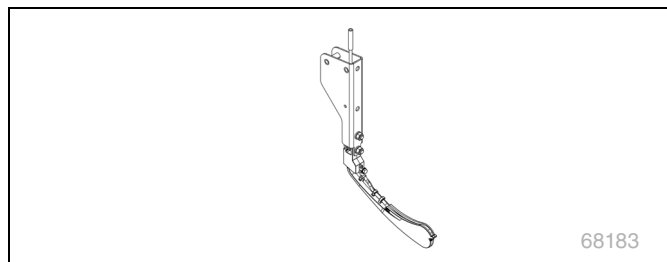
For easy access, the timing tool can be ordered with hardware for mounting it under the walkboard.

Description	Part Number
Timing Tool Assembly (contains one each of the following)	403-557S
Timing Tool Holder	403-556H
$\frac{3}{16}$ x 1 $\frac{9}{16}$ Long Lynch Pin	805-240C
Timing Tool, 19 Tooth	812-391C

■ Seed Firmers

The base planter does not include seed firmers. A choice of seed firmers is an option in the product bundles, or may be field installed. Only one type of seed firmer may be installed at the same time.

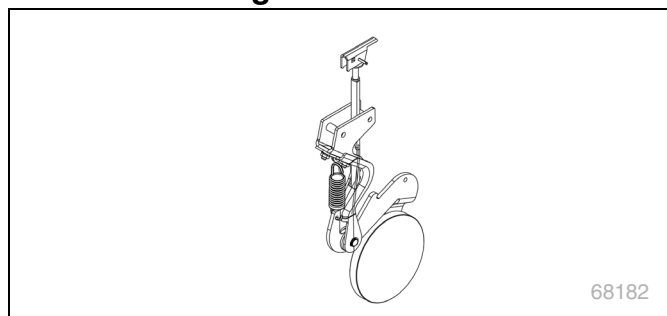
Keeton Seed Firmers



Order one Keeton Seed Firmer per opener.

Description	Part Number
Keeton® Seed Firmer	890-840C

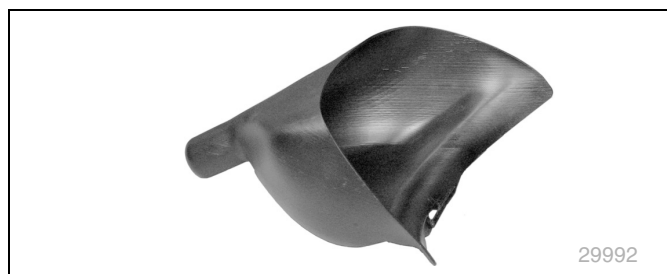
Seed-Lok Firming Wheel



Order one Seed-Lok kit per opener.

Description	Part Number
Seed-Lok® Kit	404-093K

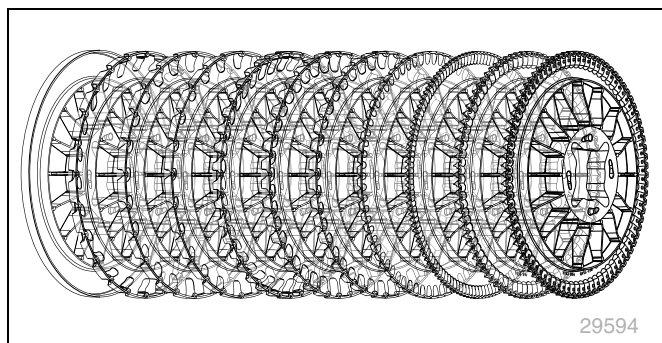
■ Seed Meter Clean-Out Container



One seed meter clean-out container is provided with the planter and located under the walkboard. Use the following to order an additional or a replacement container.

Description	Part Number
Air Meter Clean Out Funnel	817-811C

■ Seed Meter Disks



The Air-Pro Seed Meters accept a variety of seed disks, each one for a specific seed, plus a blank disk for row shut off.

Description	Part Number
Blank, 0 Cell	817-841C
Canola, 250 Cell	817-991C
Canola, 150 Cell	837-148C
Corn, 24 Cell (Large; Flat)	817-836C
Corn, 24 Cell (Large; Round)	837-602C
Corn, 24 Cell (Medium)	837-126C
Corn, 24 Cell (Small; Round or Flat)	817-795C
Corn, 40 Cell (Large; Flat)	817-838C
Corn, 40 Cell (Large; Round)	837-603C
Corn, 40 Cell (Medium)	837-127C
Corn, 40 Cell (Small; Round or Flat)	817-797C
Cotton, 60 Cell	817-857C
Edible Bean, 56 Cell (Large)	817-967C
Edible Bean, 60 Cell (Medium)	837-065C
Industrial Hemp, 5 Cell	837-364C
Industrial Hemp, 30 Hemp	837-386C
Hill Drop Cotton, 12 Cell	837-186C
Milo, Pelletized Sugar Beet, 30 Cell	837-057C
Milo, Pelletized Sugar Beet, 65 Cell	817-849C
Milo, Pelletized Sugar Beet, 130 Cell	817-800C
Soybeans, 84 Cell (Medium)	817-798C
Soybeans, 168 Cell (Large)	403-551D
Sunflower Oil, 60 Cell (Small)	837-234C
Sunflower Oil, 60 Cell (Medium)	837-235C
Sunflower Oil, 24 Cell (Large)	817-851C
Wheat/Rice, 84 Cell (Volumetric)	817-867C

■ Topcon Console System

Topcon console systems provides powerful functionality for precision machine control. Your console will come configured with software for machine control. Refer to the Topcon console operator manual for installation instructions.



Description	Part Number
XD-Plus Console Kit	194-468A
XD Console Kit	194-467A
GPS Receiver and Mount*	194-472S
ISOBUS Analog Camera**	411-861A
Adapter Harness for XD-Plus/XD***	843-411C

* GPS is customer-provisioned.

** Up to three cameras may be used with XD-Plus console. One camera may be used with XD console.

*** One adapter harness is required for each Camera.

For online resources and manuals, create an account at <https://mytopconnow.topconpositioning.com> and search for XD/XD+ in the search bar.

■ SureForce Hydraulic Option

Ag Leader[®]

SureForce[™]

With SureForce installed on a machine, row depth is monitored and adjusted through hydraulic pressure and a gauge wheel sensor system. The system can apply up to 250 pounds of uplift and 650 pounds of down force.

The system allows for Individual Row Control (IRC). For more information on SureForce, write or e-mail Ag Leader at:

**2202 South Riverside Drive
Ames, Iowa 50010
info@agleader.com**

For immediate customer assistance with a SureForce system, call **515-735-7000**.

Maintenance

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

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



Crushing Hazard

A falling implement can cause severe injury or death by crushing. Always have cylinder locks in place and the frame blocked up when working on the implement.



High Pressure Fluid Hazard

Escaping fluid under pressure can have sufficient pressure to penetrate the skin. Check all hydraulic lines and fittings before applying pressure. Use paper or cardboard, not body parts, and wear heavy gloves to check for suspected leaks. If injured, seek immediate medical attention from a physician familiar with this type of injury.



Component Damage Risk

When cleaning the planter, to avoid damage to IRC components, do not power wash on or around these electrical components.

Maintenance Schedule

Maintenance Point	Type of Maintenance	Frequency
Wheel hardware (page 80)	Check torque	Daily
Wheel bearings (page 65)	Clean and pack	Seasonally
Chains (page 65)	Inspect and lubricate	Periodically
Chain slack (page 65)	Tighten as needed	Within first 8 hours, then seasonally
Seed meter disks (page 42)	Inspect for damage or wear	Each time seed disks are removed
Seed meter brushes (page 42)	Clean and inspect for wear	Each time seed disks are removed
Hydraulic drive filter (page 58)	Replace element	When indicated by pop-out indicator

Regular Maintenance

- ✓ After using the planter for several hours, check all bolts to be sure they are tight. See “**Torque Value Chart**” on page 80.
- ✓ Remove excess slack from chains. Clean and use chain lube on all roller chains as needed. See “**Chain Slack**” on page 65.
- ✓ Maintain proper air pressure in the tires. See “**Tire Chart**” on page 80.
- ✓ Keep disk scrapers properly adjusted. See “**Side Gauge Wheel Scraper (Option)**” on page 48.
- ✓ Clean the planter on a regular basis. Regular and thorough cleaning will lengthen equipment life and reduce maintenance and repair needs.
- ✓ Lubricate areas listed under “**Lubrication**” beginning on page 65.
- ✓ Replace any worn, damaged, or illegible safety decals by obtaining new decals from your Great Plains dealer. See “**Safety Decals**” on page 6.

■ Hydraulic System



High Pressure Fluid Hazard

Escaping fluid under pressure can have sufficient pressure to penetrate the skin. Check all hydraulic lines and fittings before applying pressure. Use paper or cardboard, not body parts, and wear heavy gloves to check for suspected leaks. If injured, seek immediate medical attention from a physician familiar with this type of injury.



High Pressure Fluid Hazard

Do not attempt to make hydraulic system repairs. Great Plains strongly recommends that all hydraulic system repairs to be completed by a trained professional who is knowledgeable about how to safely complete hydraulic system work. You should only maintain or adjust your hydraulic system as described within this manual. Compromising a closed hydraulic system can cause serious injury or death.

The hydraulic system is fully charged and bled at the factory prior to shipping. It is necessary to ensure the tractor hydraulic oil reservoir is filled and fluid levels are maintained.

Contamination is the most common cause of performance problems and premature wear in the hydraulic system. Before each connection is made, properly clean quick-connect couplers before you attach the hydraulic hoses to the tractor.

If you notice jerky hydraulic movements, you may try to remove air from the hydraulic system by carefully by raising and lowering, or folding and unfolding, the planter several times. When the movements are smooth and even, the air has been removed from the hydraulic system. This method will only remove small amounts of air through the system, and it may be necessary to contract your Great Plains dealer for hydraulic service when larger amounts of air are present within the hydraulic system.

Hydraulic System Inspection

Routine hydraulic maintenance will require inspection of hydraulic lines, valves, fittings, and cylinders for any signs of damaged or worn parts, and the presence of hydraulic fluid. If you discover or suspect a leak, or damaged or worn parts, contact your Great Plains dealer for service on your hydraulic system by a trained professional.

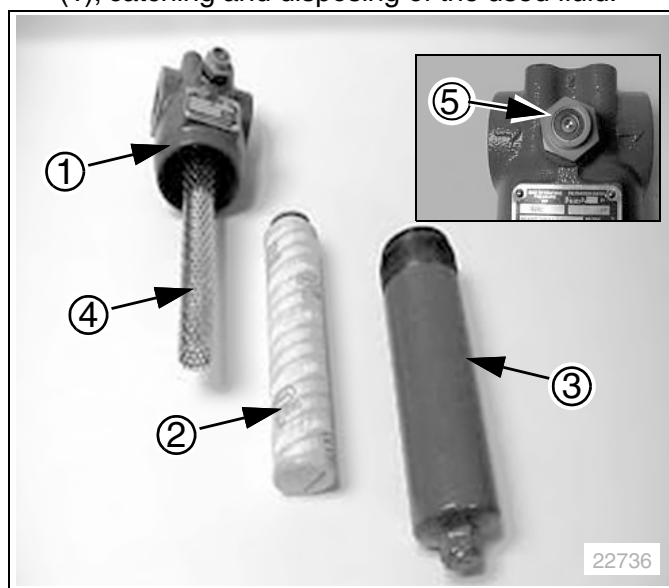
Hydraulic Drive Filter

All hydraulic fluid in the hydraulic drive is filtered through the high pressure filter (1) which contains a replaceable filter element (2), and it provides protection to the hydraulic components of the drive if properly maintained.

The high pressure filter (1) is equipped with a pop-out indicator (5) when the replaceable element (2) is clogged, and should be changed immediately. Normal service life of the replaceable element will vary based on the precautions taken to minimize contamination at the couplers and route service of the tractor filtration.

To replace the element:

1. Unscrew the lower filter canister (3) from the filter (1); catching and disposing of the used fluid.



2. Remove and discard the filter element (2).
3. Install a new filter element (2).
4. Clean the canister threads (4) and lube the O-ring with hydraulics fluid, then reinstall.
5. Reset the pop-out indicator (5) if necessary.

Keep a filter element (2) on hand. Great Plains recommends changing the filter element at least seasonally, or when alerted by the pop-out indicator.

■ Material Clean-Out



Possible Dust and Chemical Fume Hazard

Clean-out can create dust and fumes from seed residue and seed treatment. Wear a respirator and any other protective equipment specified by the seed and/or seed treatment supplier.



Entrapment and Suffocation Hazard

A seed hopper that is full, or appears full, can be an entrapment hazard. You can sink all the way into the grain and suffocate in a matter of seconds. Never enter a seed tank for loading, unloading, or routine maintenance. Keep lid tightly closed during operation.



Clean-Out Door Damage Risk

Make sure clean-out doors are closed before folding or unfolding the planter to avoid damage to the doors.



Planter Damage Risk

Do not remove the strainer from the hopper as it prevents larger foreign matter from clogging the air system.

When planting is completed, it is common that some seed remains in the bulk seed hopper, airbox, hose lines, and/or meters.

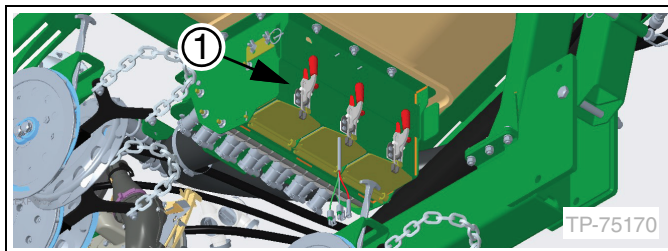
Airbox Clean-Out



Perform hopper clean-out with the fan off.

To clean-out airbox:

1. Place a tarp or large container under the airbox clean-out to catch seed.
2. Open the clean-out door (1) on the bottom of the airbox. Seed in the airbox will immediately fall out of the airbox.



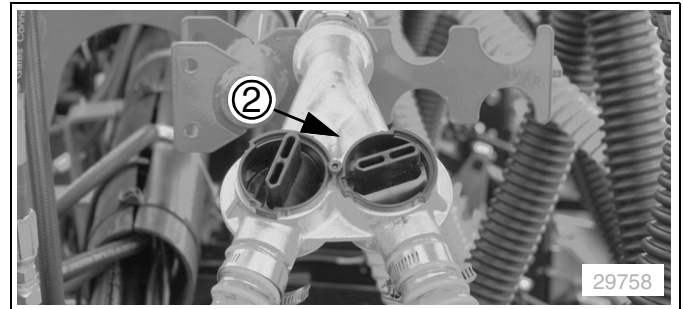
3. Tap on the sides of the hopper to dislodge any residual seed.
4. Close the airbox clean-out door.
5. Perform an air system clean-out to remove final amounts of residual seed from the airbox and all seed in the meters.

Air System Clean-Out

To clean-out air system:

1. Place a tarp or large container under the airbox clean-out to catch seed.

2. Shut off all Y-tubes (2).

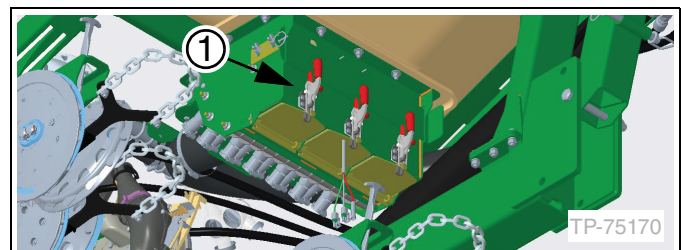


3. Open the airbox clean-out door to empty seed from the manifold.
4. Close the airbox clean-out door.
5. Turn on the delivery air fan and let it run.
6. Start at one end of the planter; clean out the meters. Use a bucket or the funnel to catch the seed. See **"Seed Meter Clean-Out"** on page 60.
 - a. Open the Y-tube gate feeding the meter and let the air blow seed out of the meter. Use the meter gate to start and stop seed flow if using a small container.
 - b. Close the Y-tube gate and meter gate.
 - c. Repeat the procedure for all meters.
7. During air system clean-out, it is common for a few seeds to dislodge and make their way to meters already cleaned. To avoid seed size causing problems for the next disk to be used, and to avoid crop mixing, open and close all meter gates to remove any stray seed.

Airbox Residue Clean-Out

Planting is extremely dusty conditions, particularly dusty and humid conditions, or otherwise sticky soils, can lead to air residue buildup the airbox. This residue can cause seed delivery blockages.

When opening the airbox clean-out door (1), inspect the inside of the airbox.



If any areas inside the airbox are partially or completely blocked, follow the clean-out instructions below.

1. Park the planter at a suitable location for clean-out.
2. Set out a tarp to recover any seed still in the airbox.
3. Open the airbox clean-out door.
4. Use a marker to identify the hoses on the seed hose ports.
5. Disconnect the clamps and remove the hoses.



Further disassembly of the airbox is not recommended. Joints are sealed with silicone adhesive, and would need to be cleaned and resealed.

6. Break up any buildup. Use a hooked tool or wire to clean out smaller fragments. Use a vacuum to clean out the rest.
7. Inspect the seed hose ports. Break up any deposits and vacuum out from the clean-out door.
8. With all ports and doors open, operate the planter fan to blow up any remaining loose residue.
9. Reconnect the seed hoses.
10. Close the clean-out door.



Flushing the airbox with water is not recommended. If this is done, make sure to operate the fan for an extended period to completely remove any moisture before storing or before field operations.

Seed Meter Clean-Out

The planter container for meter clean-out is stored at the right rear under the walkboard. This container can hold all the seed in a meter and inlet.

The container can also be converted to a funnel for complete system clean-out.

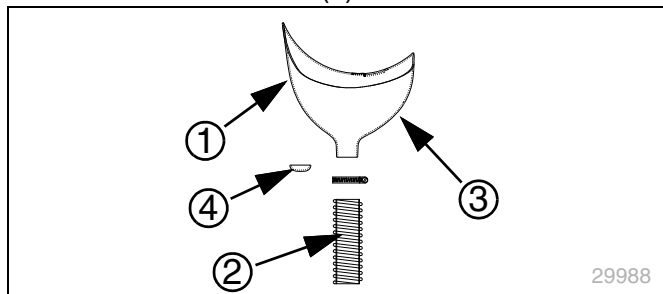
Material and tools needed for the conversion are:

- A length of 1 3/8 inch (3.5 cm) ID hose (2),
- a worm drive clamp (3) with a working diameter of 1 3/8 to 2 1/4 inch (3.5 to 5.7 cm), and
- a hacksaw with a fine-toothed blade.



The funnel wall is thin ABS. Scissor-type pipe-cutting tools may fracture it. Rotary-type pipe cutting tools may slip off.

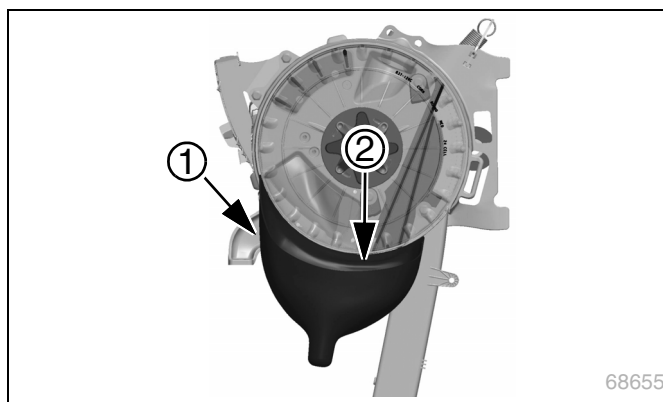
To convert the container (1):



1. Trim the sump (4) with the hacksaw.
2. Slide the hose (2) sully onto the funnel tip.
3. Secure with the clamp (3). Do not over-tighten the clamp or the funnel wall will be crushed.

Attach the container/funnel to the housing of the seed meter to free your hands for other tasks during clean-out.

1. Close the seed inlet gate on the meter to minimize the seed volume when the disk is removed.
2. Remove the rain cover. The container/funnel cannot be snapped in place with the rain cover installed.
3. Align the left (rear) end of the container/funnel lip (1) with the top of the lower (rear) rain cover latch ear.



4. Place the right (front) end of the container/funnel lip (2) between the meter housing and the seed tube.
5. Rotate the container/funnel forward until the slot engages a tab on the bottom center of the meter housing (2).
6. Remove the seed disk.
7. Slowly open the seed inlet gate to empty the seed up to the Y-tube or wing tube.

8. If the air system is running (with Y-tube open), there may be more seed than the container can hold. Use the seed inlet gate to turn off seed flow to empty the container.
9. Clean seed from all brushes. A shop vacuum is recommended to clean the brushes.
10. Inspect the brushes.
11. Rotate the container/funnel clockwise to remove and empty.
12. If the planter will be used again.
 - a. Install the next seed disk or blank disk for the operation.
 - b. Set the inlet gate for the seed.
13. If the planter will be stored:
 - a. Close the seed inlet gate.
 - b. Do not put a seed disk back in the meter.
 - c. Reinstall the rain cover.

Alternate Meter Clean-Out

Use a shop vacuum cleaner with a narrow hose nozzle to clean out a meter.

1. Close the seed inlet gate.
2. Release the disk clamp while holding the seed disk against the meter.
3. Tip the top of the disk away from the meter.
4. Insert the shop vacuum hose nozzle and remove the seed.
5. Open the gate to allow seeds in the inlet and the drop hose to flow to the shop vacuum hose nozzle.

Seed Tube Clean-Out

The seed sensor in the seed tube can have a buildup of dust, dirt, and seed treatment which can cause false low population alarms.

If the seed meter is empty, remove the seed disk and insert seed tube brush (part number 891-259C) into the seed tube from above. With the planter raised, you can insert the brush from below, whether the meter is empty or not.



Seed Meter Brushes Maintenance



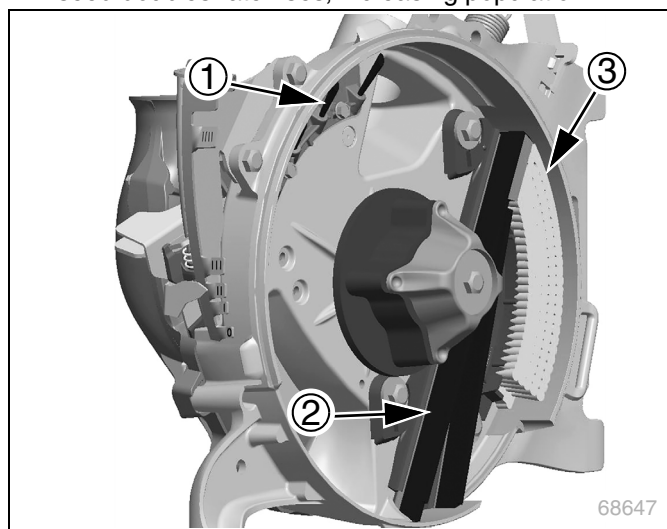
Possible Chemical Hazard

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

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

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

- If the tufted brushes (1) are worn or damaged, the seed doubles 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. Remove the seed and continue with operations.

- If the strip brushes (2) are worn or damaged, air pressure regulation may become unstable or required increasing fan speed over time.

If recommended fan rpm ranges need to be exceeded, 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 seed is frequently seen between the strip brushes, one or both may need replacement.

- If the seed drop brush (3) is worn or damaged, its anti-static effect may fade, which can result in skips due to smaller seeds failing to release, and lower population.

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

Seed Meter Brush Replacement

See the parts manual for current brush replacement part numbers.

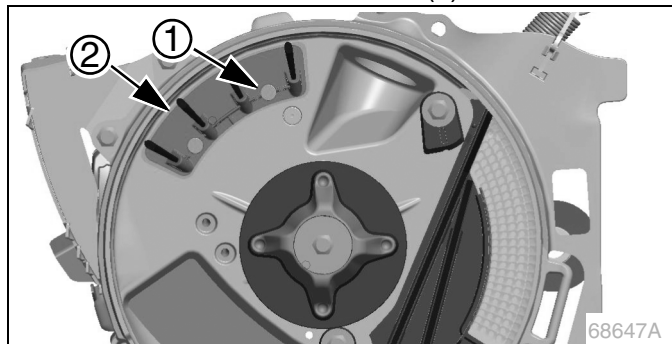
Tufted Brush Replacement



Fracture Risk

Do not tighten the fasteners to normal torque or the plate may fracture.

1. Remove and save both bolts (1) and nuts.



2. Remove the tufted brush assembly (2), and replace with a new assembly.
3. Insert the bolts and start the nuts. Carefully tighten each nut just until there is no play under the screw heads.
4. Add a half turn to the nuts.

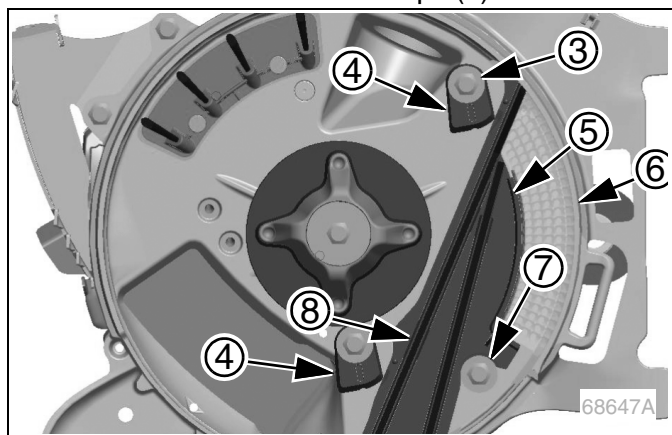
Strip Brush Replacement



Equipment Damage Risk

Do not loosen or remove any of the bolts retaining the brush holder.

1. Insert the flat blade of a large screwdriver into the slots of the brush holder snaps (4).

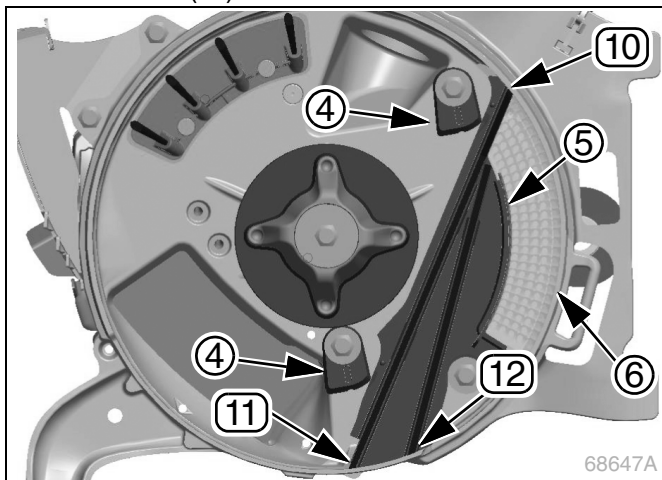


2. Turn each snap clockwise to release the brush holder (5).

3. Be prepared to catch the drop brush (6) which will fall loose.
4. Slide the brush holder left and up to free the front edge from under the washer (7).
5. Remove the brush holder.
6. Remove used strip brushes (8) from the holder by sliding them down out of the grooves.
7. Insert replacement strip brushes in the grooves at the holder bottom so the notched ends (9) are at the bottom.



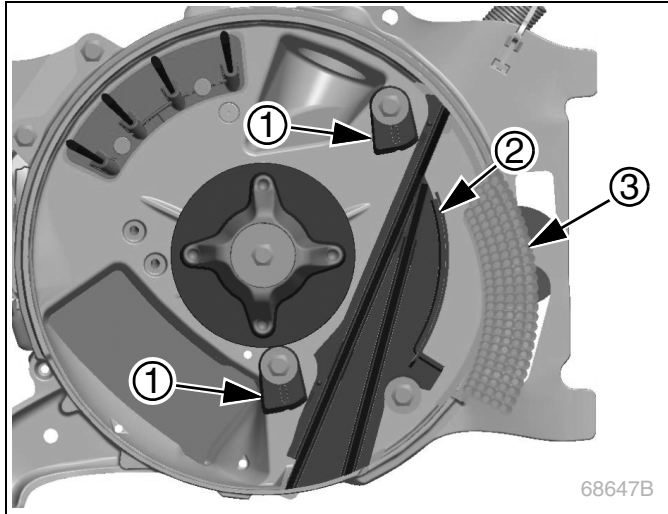
8. Insert the brush holder and check the strip brush positioning.
 - a. The ends of the long brush must fit snugly into the meter housing grooves at the top (10) and lower rear (11).



- b. The bottom end of the short brush must fit snugly in the lower front housing groove (12).
 - c. If any significant force is required to seat the brush holder, a strip brush is likely too high or too low.
9. When the strip brushes fit correctly, position the drop brush (6) and seat the brush holder (5).
 10. Starting with the bottom snap, swing the snaps (4) back into place.

Seed Drop Brush Replacement

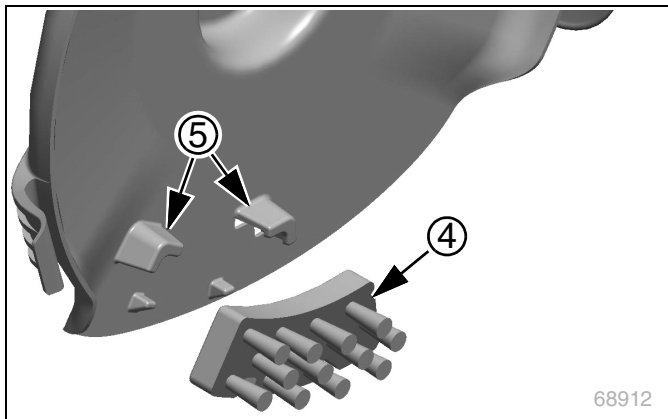
1. Insert the flat blade of a large screwdriver into the slots of the brush holder snaps (1).



2. Turn each snap clockwise to release the brush holder (2).
3. Prepare to catch the drop brush (3) which will fall loose.
4. Slide the brush holder left and up.
5. Remove the drop brush.
6. Position a new drop brush so the brush is flat against the back of the meter housing and under ridges on the leading edge of the brush holder.
7. Slide the brush holder forward and down to engage the drop brush.
8. Starting with the bottom snap, swing the snaps (1) back in place.

Knockout Brush Replacement

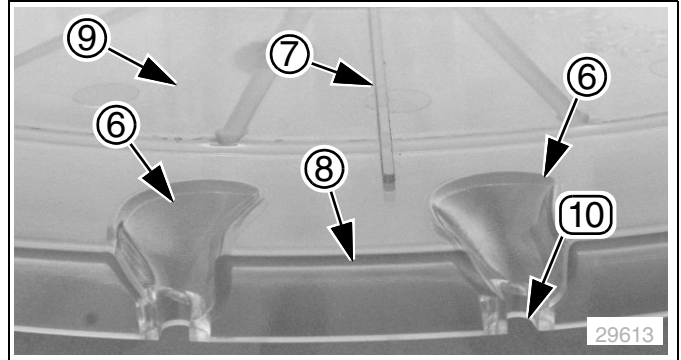
1. Remove the knockout brush (4) from the seed meter rain cover.



2. Position the new knockout brush under tabs (5) and snap in place.

Seed Disk Maintenance

When removing seed disks, inspect for wear and damage. If there is any seed dust or treatment buildup in the cells (6), or along the raised wiper ridges (7), clean the disks and reinspect.



Disk replacement is necessary if:

- Chips at the outer edge (8). These chips will leak air.
- Chips at the edges or in surfaces of the cell pockets (6). These chips can leak air and/or adversely affect singulation.
- Cracks over 2 inch (5 cm) long in the working face (9) of the disk, or any cracks in the ridges or grooves on the face.
- Warping which occurs when any part of the disk does not press firmly on the seed drop brushes in operation, replace the disk.
- Wearing along a wiper ridge (7).
- Any wearing on the cells.
- If the air ports (10) have enlarged.

Cleaning and Storing Seed Disks



Possible Chemical Hazard

Seed disks will have talc and graphite residue, and may have residue of hazardous seed treatments. Do not wash disks where food is prepared or where cookware or dinnerware is washed. Wear gloves when washing disks. Avoid spray.

Use warm or hot water, mild soap, and a sponge or soft brush to remove buildup on seed disks.

If disks are washed, allow to dry completely before storage.

Keep original shipping cartons for disk storage. Otherwise, store on edge (not leaning), or stacked horizontally on a spindle, to eliminate any warping risks.



Any seed residue on disks may attract pests. Fully enclose dry disks to prevent rodent damage.

■ Side Depth Wheels

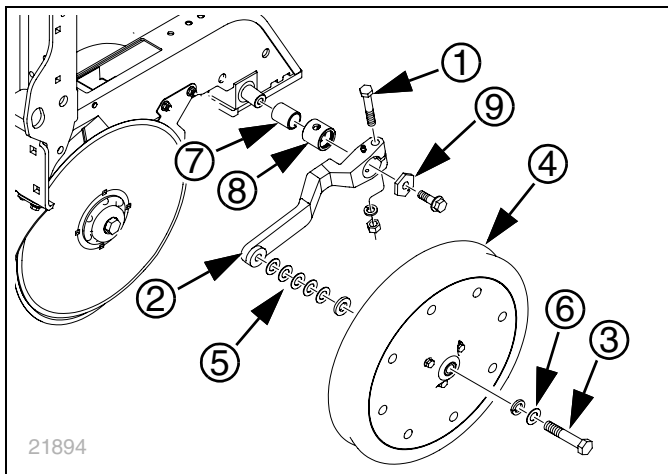


Sharp Object Hazard

Disk blades are sharp. To avoid serious injury, wear gloves when working in this area.

The side depth wheels are preset at the factory. With normal wear, it may become necessary to make adjustments so the wheel remains close to the disk.

1. Lift the side depth wheel off the ground. Move the tire in and out to check for end play. Check for roughness in the bearing by rotating the wheel. If the bearings are rough, inspect and replace, if necessary.
2. Loosen the clamp bolt (1) and slide the depth wheel arm (2) in to take up the gap between the wheel and disk blade. If more adjustment is needed:



- a. Remove the bolt (3) and wheel (4).
- b. Remove the shims (5) from the inside of the wheel and place them on the outside of the wheel (6).

Always place removed shims from the inside to the outside. When installed, the wheel should turn freely and not hit the arm at the curve. Do not add any more shims than necessary.

- c. Remove the depth wheel arm (2) from the row unit.
- d. Remove the bushing (7) from the sleeve (8) and check for wear. If necessary, replace the bushing.

- e. When reinstalling the depth wheels, align the tab on the hex adjustment (9) with the notch in the bushing. Install the bolt and tighten.
- f. Adjust side depth wheels.

■ Disk Spreaders and Scrapers



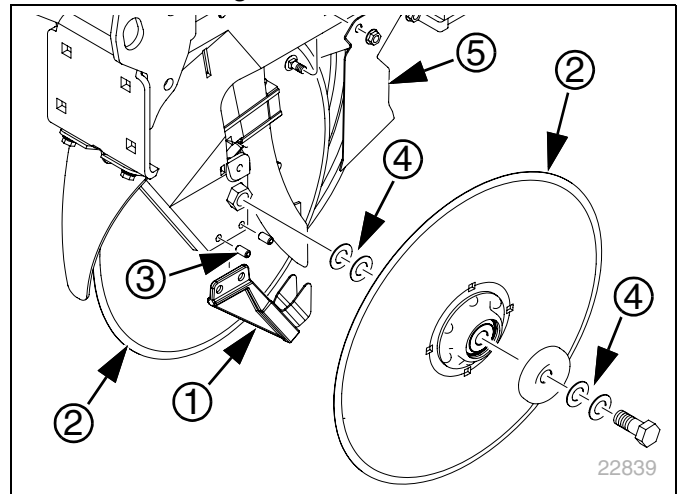
Sharp Object Hazard

Disk blades are sharp. To avoid serious injury, wear gloves when working in this area.

1. Remove the side depth wheels from the arms to access row unit disks and scrapers.
2. With the unit raised, check the blade spreader (1) for wear. Replace the spreader if it is 1/2 in. (13mm) wide or narrower. To replace:
 - a. Remove the disk blade (2).
 - b. Drive out the roll pins (3).
 - c. Install the new spreader.

For proper operation, the scraper separator must be a little loose in the holder and between the blades.

3. When reinstalling disk blades, put two shim washers (4) between the bearing and shank on each blade. Tighten the bolts.

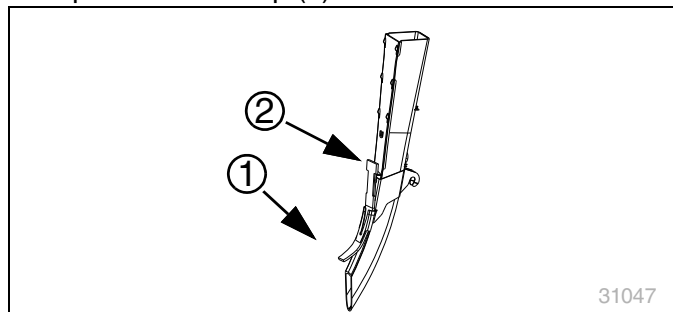


You may need fewer inside shim washers on worn disks.

4. Check that outside disk scrapers (5) are formed to the disk blades to help remove any mud. Bend or twist the scrapers to fit the blades as necessary. After every 200 acres (80 hectares) of operation, check outside scrapers for proper adjustment and wear. Replace the outside scrapers, as necessary.

■ Seed Flap Replacement

To replace a seed flap (1):



1. Use a needle nose pliers or similar tool to grasp the **T** at the top of the flap.
2. Pull up to pull the flap up out of the metal bracket (2).
3. Push the new seed flap down through the metal bracket until the flap snaps into place with the **T** top resting on top of the bracket.

■ Chains

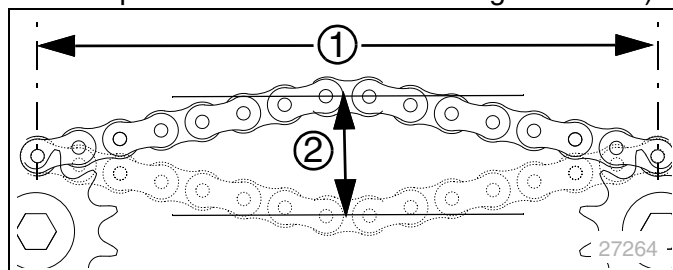
Chain Lubrication

Lubricate chains any time there is a chance of moisture, and when being stored at the end of the planting season. Use a multi-purpose spray lubricant.

Chain Slack

Initially check the drive chains after the first 8 hours of drill use. The new chain slack tends to increase during the first few hours of operation due to seating. After the first 8 hours, check the chains seasonally.

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:

Chain Type	Chain Slack
Long chains over 36 inch (91 cm)	1/4 in/ft (2.1 cm/m)
Vertical short chains	1/4 in/ft (2.1 cm/m)
Horizontal short chains	1/2 in/ft (4.2 cm/m)

3. Measure the current slack (2):

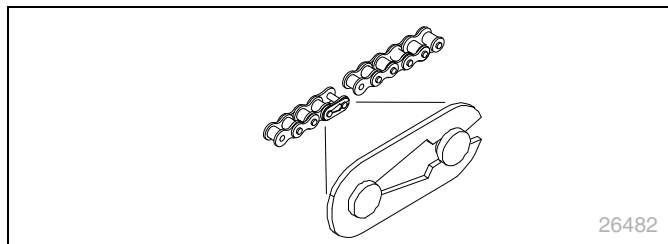
At a right angle to the chain span at the center of the span, deflect the chain in both directions. The slack is the distance of the movement.

4. Adjust the idlers for ideal slack.

Chain Clips

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

Install the clip with the open end facing away from the direction of chain travel.



Seed Meter Drive Chain

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

Lift the spring off the idler assembly. Check that the idler pivots freely. Re-attach the spring.

■ Lubrication

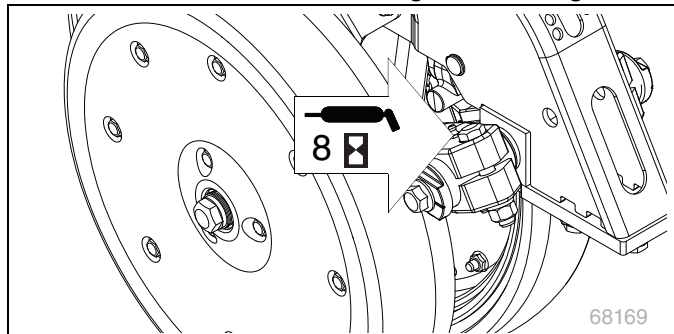
If any movable parts such as levers, pivots, and clamps are not moving smoothly due to rust or hindering material, do not attempt to force parts into motion. Instead, remove the rust or unwanted material and apply oil or grease on the relevant spot. Otherwise, machine may become damaged through impaired usage.

Grease Fittings

Lubricate with grease at the hourly interval indicated in the arrow. If you operate the machine in extremely wet and/or muddy conditions, lubricate grease fittings more frequently.

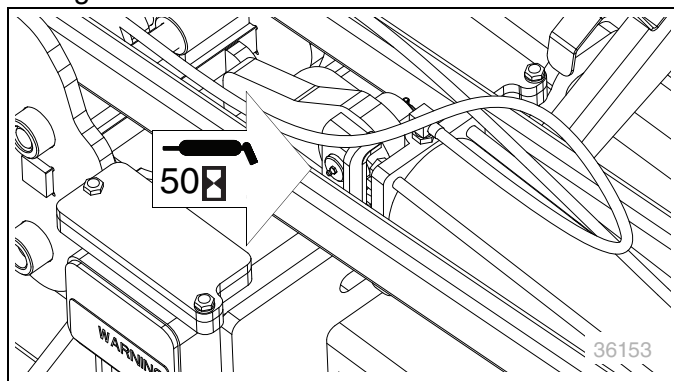
Side Depth Wheel Bushing

Apply grease only to the top two grease fittings on each side of each row unit until grease emerges.



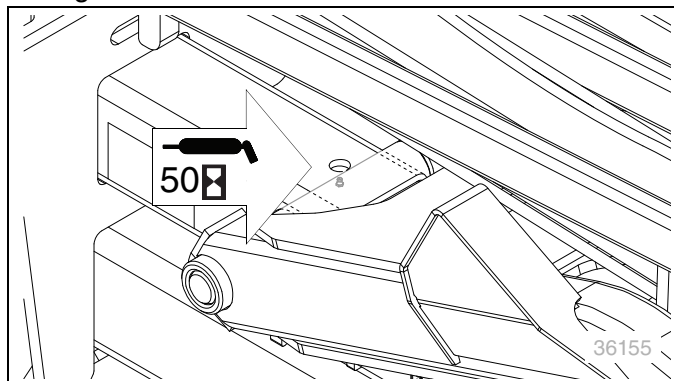
Wing Fold Cylinder Base Pins

Apply grease on each wing unit until grease emerges.



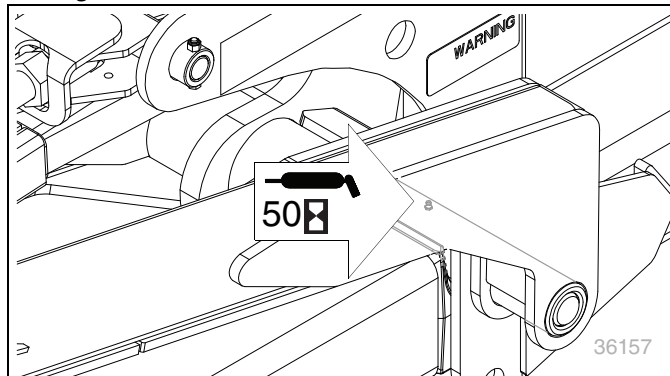
Wing Lower Link Arm Inner Pivots

Apply grease on each wing unit until grease emerges.



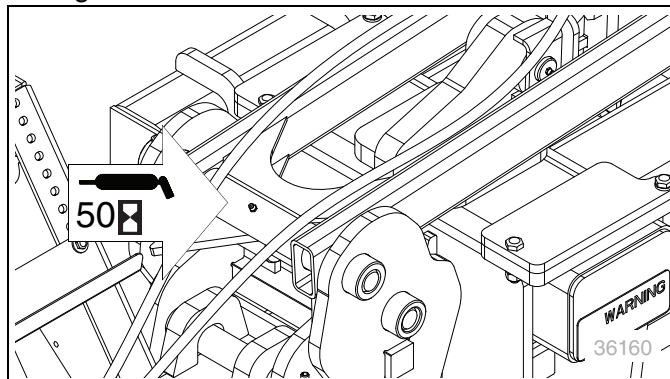
Wing Lower Link Arm Outer Pivots

Apply grease on each wing unit until grease emerges.



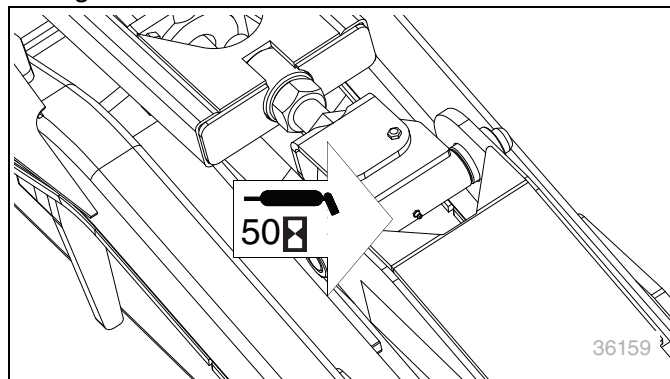
Wing Upper Link Arm Inner Pivots

Apply grease on each wing unit until grease emerges.



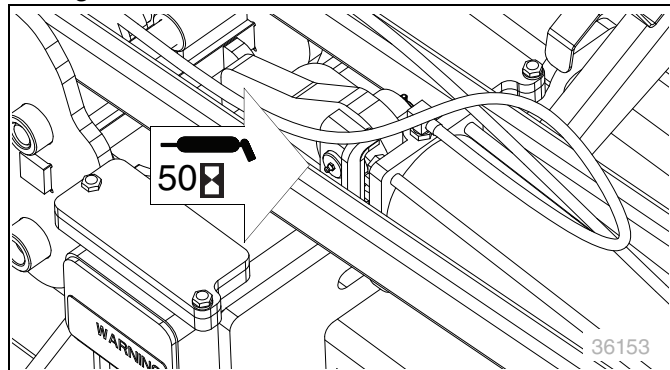
Wing Upper Link Arm Outer Pivots

Apply grease on each wing unit until grease emerges.

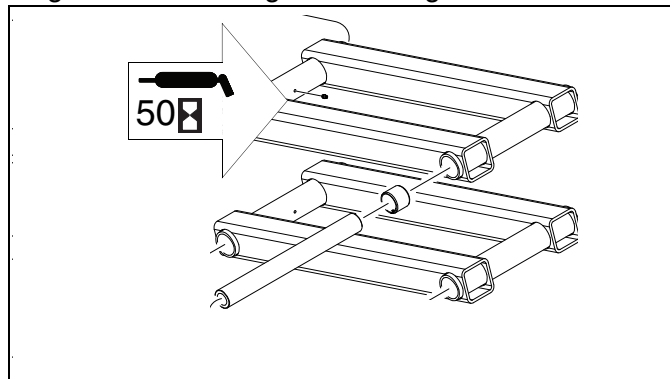


Wing Flex Link Bottom Pivots (Option)

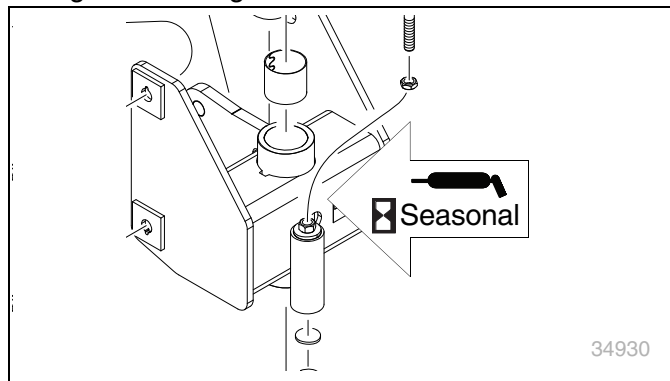
Apply grease on each wing unit until grease emerges.

**Lift Assist Parallel Arms (Option)**

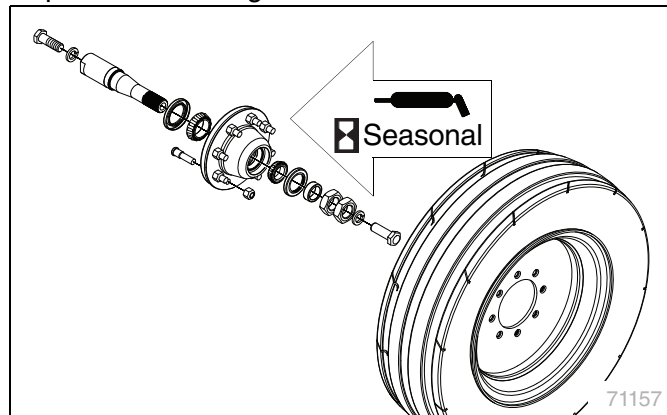
Apply grease to each zerk on each side of each hinge tube unit until grease emerges.

**Caster Pivots**

Apply grease on each zerk on caster pivot spindle until grease emerges.

**Bearings****Wheel Bearings**

Repack two bearings on each wheel.



Troubleshooting

When starting with a new planter, a new crop, or a new population, it is important to physically check what the seed monitoring system console is reporting by digging and observing seeds. This is to verify that the planter is set up correctly to plant the desired population. Do not rely solely on the population reported by the console.

Plant a short distance and dig the 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 listed as “inches per seed.”

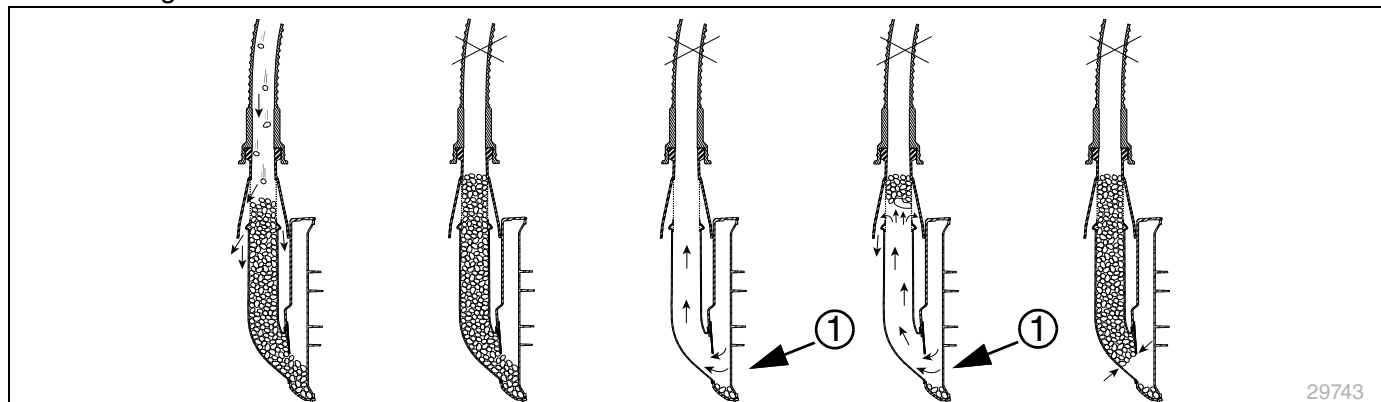
Also, during start up you may encounter alarms and readouts on the console that do not seem to make sense. It is critical to troubleshoot these alarms, not only to make sure the planter drive is set properly to hit the target population, but also to fix incorrect entries in the console to eliminate nuisance alarms. For console issues, see console operator manual.

Before going to the troubleshooting charts to remedy seed monitoring system console or population problem, use the following chart. Finding what is wrong comes from knowing what the planter is actually doing in the soil. Always dig and observe seed on the ground when checking populations.

1. Is the spacing on the ground correct?	No	Check the ground drive transmission and range sprocket selections, or the population settings on a hydraulic drive unit.
	Yes	Go to step 2.
2. Is the reported population $\frac{3}{8}$ the actual population, or is the reported population too high by a factor of 2?	No	Go to step 3.
	Yes	An incorrect row spacing value entered in the console can cause this. Example: If 15 inches has been entered instead of 30 inches, correct the row spacing error on the console. The system can also be off by a large factor if incorrect range sprockets are installed. Check seed rate charts against range and transmission sprockets on the planter.
3. Is the population on the console close to the target population?	No	Check seed rate charts against transmission sprockets selected.
	Yes	If slightly under or over see “ Population and Airbox Troubleshooting ” on page 71.

■ Seed Pool

The following illustration shows rear cross sections of the seed meter in normal and row-failed conditions.

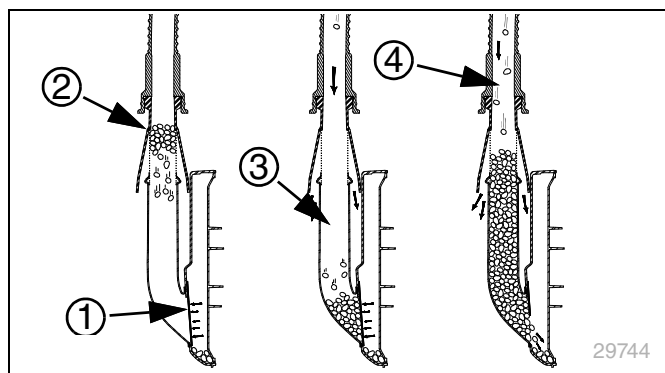


29743

Normal: Filling	Normal: Filled	Delivery Blockage or Back-flow Starvation	Bridging: Screen	Bridging: Gate
Seed pool at the gate prevents back-flow of meter pressurization air, allowing seed to flow from the delivery system, filling the inlet to the top of the air release screen.	Once the inlet is filled to the top of the air release screen, the air flow from the delivery system is blocked. No further seed arrives until planting reduces the backlog at the inlet.	No seed is arriving from the manifold. Air back-flow (1) is occurring. Causes may include: • low fan speed • seed hose blockage • no seed available • Y-tube closed • meter never primed	Oversize matter in the seed has caused a bridge at the top of the inlet. Air back-flow (1) is occurring. When the bridge is released, the seed pool will be insufficient to prevent back-flow.	A bridge at the gate is blocking flow. Causes may include: • oversize seed • gate setting too low • oversize matter in seed
Actions	Actions	Actions	Actions	Actions
No action required. Continue planting.	No action required. Continue planting.	1. Correct the cause of the blockage. 2. Perform a one-row seed pool recovery. 3. Resume planting.	1. Close gate. 2. Disconnect hose at the meter. 3. Tap on air release screen and inspect. 4. Check seed pool for foreign matter. 5. Perform a one-row seed pool recovery. 6. Resume planting.	1. If the gate is at suggested opening, increase one notch. 2. Check the seed pool for foreign matter. 3. Resume planting.

Seed Pool Recovery

When a seed meter has been starved of seed, the back-flow of air through the open gate reduces delivery air flow. This causes seed delivery to be slow. If you start or resume planting with an empty seed pool, the delivery flow may be too low to keep the meter supplied. The steps below quickly prime the meter by rebuilding the seed pool.



29744

■ Planter Troubleshooting

Problem	Cause	Solution
Planter does not fully unfold or fold	Fold cylinders out of phase	Slowly operate the fold hydraulics for several cycles until smooth hydraulic movements are achieved. If a large quantity of air is present in the hydraulic system contact your Great Plains dealer for service.
Hydraulic movement is jerky	Low tractor hydraulic oil level	Add fluid to hydraulic oil reservoir, if necessary.
	Air in the hydraulic system	Slowly operate the hydraulics for several cycles until smooth hydraulic movements are achieved. If rephasing does not create smooth hydraulic movement, and the tractor hydraulic oil reservoir is full, contact your Great Plains dealer to service the hydraulic system.
	Tangled hydraulic hoses near the hitch	In a safe manner, inspect hitch area for tangled hydraulic hoses.
	Seeping or leaking hydraulic oil	Relieve pressure in hydraulic system. Tighten hydraulic connections to tractor. Do not over tighten or make repairs on the hydraulic system. If necessary, contact your Great Plains dealer to service the hydraulic system.
Drag marks in field	Opener disks are not freely turning	Remove trash and/or mud from row unit.
		Failing parts within row unit. Inspect all parts on row unit for damage, rust, wear, and maintenance needs; replace, adjust, or service, as needed.
		Field conditions may be too wet; wait for improved field conditions.
		Adjust side depth wheel. See “Side Gauge Wheel Scraper (Option)” on page 48.
		Coulter depth is set too deep and brings up excess soil and debris. Adjust as needed. See “Setting Planting Depth” on page 47.
		Seed-Lok is plugging the row unit. See “Seed-Lok Wheels Lock-up (Option)” on page 52.
		Too much down pressure. Reduce down pressure, See “Side Gauge Wheel Scraper (Option)” on page 48.
		Inspect row unit frame for damage; replace if necessary.
	Tires may be slipping	Place the gauge wheel block mount in the lower position. See “Gauge Wheel Stop” on page 19.
Seed-Lok wheels packed with soil	Planter may not be fully unfolded	Fully unfold planter.
	Planter may not be level	Level the planter from front-to-back. Adjust the tongue height. See “Leveling Planter” on page 18.
	Field conditions too wet	Lock-up Seed-Lok. See “Seed-Lok Wheels Lock-up (Option)” on page 52.

Problem	Cause	Solution
Soil not compacting as desired	Incorrect spring handle setting on press wheels	Adjust spring handle. See “Setting Planting Depth” on page 47.
	Insufficient row unit down-force	Adjust row unit down force. See “Down-Pressure Adjustment” on page 46.
	Using wrong tire shape for conditions	Lock-up press wheels. See “Press Wheel Adjustments” on page 48.
		Swap out tires to match conditions. Wedge-shaped tires work best on narrow spacings and/or wet conditions. Round-edged tires work best in wider row spacings and drier conditions.

■ Population and Airbox Troubleshooting

Problem	Cause	Solution
Many consecutive population alarms on seed monitoring console	Seed tube damaged or plugged	Inspect seed tube for damage and/or plugging. Remove all obstructions, and replace if necessary.
Off population - Too high Too low No seed	Incorrect seed rate	Check seed rate charts in Material Rate manual.
	Excessive field speed	Reduce field speed to recommended values. See “Operate Responsibly” on page 2.
	Incorrect tire sizes	Ensure correct tire sizes are installed. See “Tire Chart” on page 80.
	Incorrect tire pressures	Inflate tires to the correct psi. See “Tire Chart” on page 80.
	Incorrect fan airflow	Adjust fan speed to recommended rpm. See “Fan Operation” on page 30.
	Incorrect range and/or transmission sprockets	Compare range and transmission sprockets tooth counts and driving/driven locations to recommendations found in the Material Rate manual.
	Improper main shaft sprockets	Inspect sprockets. The hydraulic drive is assembled with 23-tooth sprockets and the ground drive is assembled with 25-tooth sprockets.
	Incorrect seed disk	Refer to seed rate charts in Material Rate manual to determine correct seed disk.
		Seed size may be too small or too large for the recommended configuration or seed disk cell size, make other selections as needed.
	Sticky or tacky seed treatment	Add seed lubricant to help dry out seed. See “Seed Lubricants” on page 22.
	Incorrect speed sensor constant	Perform a speed calibration. See console manual.
Low population bands or skips after turns	Insufficient oil to the fan, meter pressure too low, seed falling in wrong location	Lift planter more gradually.

Problem	Cause	Solution
Uneven seed spacing	Hydraulic drive meter motor rpm too low for reliable control by proportional valve	Increase field speed. See “Operate Responsibly” on page 2.
		Ensure correct seed disk is installed. Refer to Material Rate manual.
	Excessive field speed	Reduce field speed to recommended values. See “Operate Responsibly” on page 2.
	Partially plugged row unit seed tube	Remove any obstruction.
Uneven seed depth	Excessive field speed	Reduce field speed to recommended values. See “Operate Responsibly” on page 2.
	Field conditions too wet	Wait for improved field conditions.
	Seed firmer not in correct position and/or incorrect tension setting	Ensure correct positioning and adjust tension as needed. See “Seed Firmers” on page 51.
	Incorrect row unit down pressure	Adjust row unit down pressure. See “Down-Pressure Adjustment” on page 46.
	Excessive debris and/or uneven field conditions	Rework field.
Seed depth too shallow and/or scattered seed	Damaged seed tube	Replace seed tube.
	Opener depth too shallow	Adjust side depth wheels. See “Side Gauge Wheel Scraper (Option)” on page 48.
Excessive seed cracking	Incorrect disk cell size for seed	Use correct seed disks for seed type and size. Refer to Material Rate manual.
		Seed size may be too small or too large, refer to Material Rate manual.
	Damaged, old, or dry seed.	Replace with clean seed.
Seed blowing	Fan rpm too high	Slow down the fan to 2800 rpm. See “Fan Operation” on page 30.
	Seal to airbox not positioned properly	Inspect and adjust seal. Seal should be intact, and compress to about 1/2 inch (13 mm) under seed container. Replace, if necessary.
Seed hoses plugging or partially plugging	Fan too slow/high	Inspect seed hoses, and remove obstructions, in these areas: between airbox and y-tubes, between y-tubes and meter, and meter and seed tube. Adjust fan speed. See “Fan Operation” on page 30.
	Sag or kink in seed hoses	Inspect seed hoses, and remove obstructions, in these areas: between airbox and y-tubes, between y-tubes and meter, and meter and seed tube. Ensure proper air hose placement at mount weldment. If correct, shorten the length of air hoses as necessary.
	Meter and/or y-tubes are closed	Open meter door and/or y-tubes.
	Incorrect seed hose assembly placement	Properly attach y-tube to intended meter.
	Possible air leak	Inspect for air leaks from fan to top of meter. Repair or replace, as necessary.

Problem	Cause	Solution
One or more rows with little or no seed	Set population value too high for field speed	Particularly high seed populations may require a reduced field speed to achieve.
	Foreign matter in seed chamber	Clean out seed chamber located at the bottom of the airbox.
	Drop seed hose is too long	Shorten seed hose between airbox to y-tubes. Adjustment should be made with the planter fully raised, but row units lower, to ensure adjustment doesn't shorten the drop seed hose too short.
All rows fail	Lack of seed	Improper fan speed, see " Fan Operation " on page 30.
		Check material levels, add more seed, and verify correct settings in seed monitoring system console if depletion of seed was unexpected.

■ Seed Blockage Removal

Planting in extremely dusty conditions, particularly dusty and humid conditions, can lead to dust and residue buildup inside the airbox. This residue can cause seed delivery blockages. You should inspect the airbox any time there is a blockage, issues with and off seed population, and seasonally.

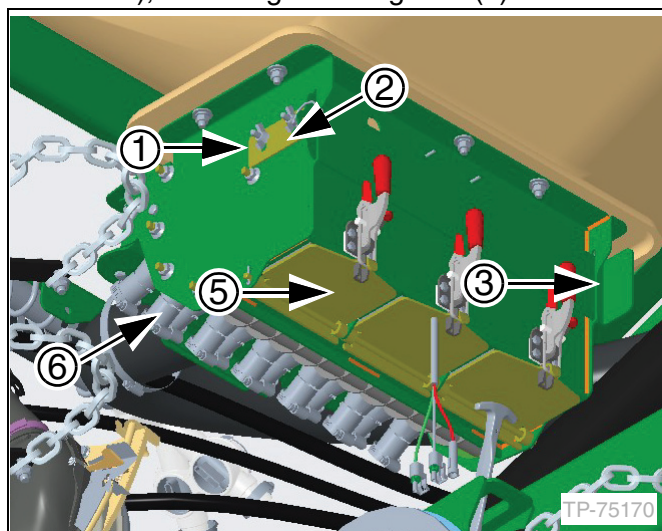
If any areas inside the airbox are partially or completely blocked, follow the instructions below.



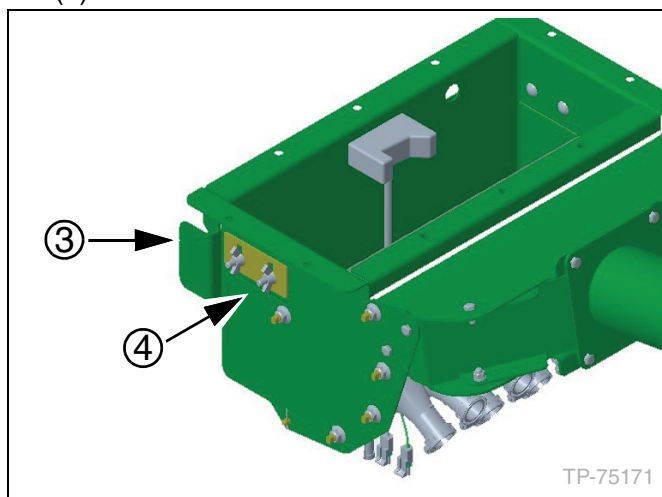
Flushing the airbox with water is not recommended. If done, operate the fan for an extended period to completely remove any moisture prior to field operations or storage.

1. Move the planter to even, level ground suitable for clean-out.
2. Raise the planter.
3. Set tractor circuit lever to Neutral.
4. Install cylinder locks. See "**Planter Locks**" on page 27.
5. if necessary, turn off fan.
6. Put the tractor in park, set the park brake, and remove the key.
7. Set out a tarp to recover any seed still in the airbox.
8. Loosen the wing nuts (1) on both sides of the airbox, slide the airbox cover (2) upwards to allow

access for the airbox shut-off gate slot (not shown), and re-tighten wing nuts (1).



9. Remove the airbox shut-off gate (3) from storage position and slide into airbox shut-off gate slot (4).



10. Use an indelible marker to identify the hoses on the seed hose ports (6) 1 through 12. (Hoses not shown.)

11. Disconnect the clamps and remove the hoses.



Further disassembly of the airbox is not recommended as joints are sealed with silicon adhesive, and would need to be cleaned and resealed before use.

12. Inspect the airbox. Break up any build-up. Use a hooked tool or wire to pull small fragments through the clean-out doors.
13. Break up any buildup. Use a seed tube brush, hooked tool, or wire to clean out smaller fragments. Use a vacuum to clean out the rest.
14. With all three doors open, operate the planter fan to blow any remaining loose debris.
15. Reconnect the seed hoses and secure with clamps.
16. Close airbox clean-out doors.
17. Remove the airbox shut-off gate (3) and return to storage position.
18. Loosen wing nuts and slide the airbox cover (2) downwards to cover the airbox shut-off gate slot (4) and re-secure wing nuts.

■ Fuse Block Decals

844-347C

F1 5 AMP PWR ECU WSMT	F2 5 AMP PWR ECU 18R	F3 5 AMP PWR ECU ACC
F1 15 AMP PWR	F1 5 AMP PWR SENSOR	
F7 10 AMP BRAKE LIGHTS	F8 10 AMP LEFT TURN	F9 10 AMP RIGHT TURN
F10 10 AMP WORK LIGHTS	F11 10 AMP TAIL LIGHTS	
F13 10 AMP SPARE	F14 15 AMP SPARE	F15 5 AMP SPARE
HARNESS P/N: 843-315C		

TP-75973

844-348C

F1 5 AMP PWR ECU WSMT		F3 5 AMP PWR ECU ACC
F1 15 AMP PWR	F1 5 AMP PWR SENSOR	
F7 10 AMP BRAKE LIGHTS	F8 10 AMP LEFT TURN	F9 10 AMP RIGHT TURN
F10 10 AMP WORK LIGHTS	F11 10 AMP TAIL LIGHTS	
F13 10 AMP SPARE	F14 15 AMP SPARE	F15 5 AMP SPARE
HARNESS P/N: 843-313C		

TP-75974

844-349C

F1 5 AMP PWR ECU WSMT	F2 5 AMP PWR ECU 18R	F3 5 AMP PWR ECU ACC
F1 15 AMP PWR SOL		F1 5 AMP PWR SENSOR
F7 10 AMP BRAKE LIGHTS	F8 10 AMP LEFT TURN	F9 10 AMP RIGHT TURN
F10 10 AMP WORK LIGHTS	F11 10 AMP TAIL LIGHTS	
F13 10 AMP SPARE	F14 15 AMP SPARE	F15 5 AMP SPARE
HARNESS P/N: 843-338C		

TP-75975

844-399C

F1 5 AMP PWR ECU WSMT	F2 5 AMP SPARE	F3 5 AMP PWR ECU ACC
F4 15 AMP PWR SOL		F6 5 AMP PWR SENSOR
F7 10 AMP BRAKE LIGHTS	F8 10 AMP LEFT TURN	F9 10 AMP RIGHT TURN
F10 10 AMP WORK LIGHTS	F11 10 AMP TAIL LIGHTS	
F13 10 AMP SPARE	F14 15 AMP SPARE	F15 5 AMP SPARE
HARNESS P/N: 843-399C		

TP-75976

844-400C

60 AMP 12V AUX PWR	AUX PWR RELAY	60 AMP 12V AUX PWR
D1 —→ SOFT START		
D2 —→ SOFT START		
		F3 15 AMP WSMT PWR SOL
F4 5 AMP ACC ECU PWR		F6 5 AMP WSMT ECU PWR
F7 25 AMP LH 24V PWR	F8 25 AMP CNTR 24V PWR	F9 25 AMP RH 24V PWR
F10 5 AMP LH ECU PWR	F11 5 AMP CNTR ECU PWR	F12 5 AMP RH ECU PWR
F13 10 AMP WORK LIGHTS	F14 10 AMP TAIL LIGHTS	F15 10 AMP SPARE
F16 10 AMP BRAKE LIGHTS	F17 10 AMP LEFT TURN LIGHT	F18 10 AMP RIGHT TURN LIGHT
25 AMP SPARE	15 AMP SPARE	5 AMP SPARE
HARNESS P/N: 843-320C		

TP-75977

844-401C

60 AMP 12V AUX PWR	AUX PWR RELAY	60 AMP 12V AUX PWR
D1 —→ SOFT START		F3 15 AMP WSMT PWR SOL
D2 —→ SOFT START		F6 5 AMP WSMT ECU PWR
F7 5 AMP ACC ECU PWR		
F10 25 AMP LH 24V PWR	F11 25 AMP CNTR 24V PWR	F12 25 AMP RH 24V PWR
F13 5 AMP LH ECU PWR	F14 5 AMP CNTR ECU PWR	F15 5 AMP RH ECU PWR
F16 10 AMP WORK LIGHTS	F17 10 AMP TAIL LIGHTS	F18 10 AMP SPARE
F19 10 AMP BRAKE LIGHTS	F20 10 AMP LEFT TURN LIGHT	F21 10 AMP RIGHT TURN LIGHT
25 AMP SPARE	15 AMP SPARE	5 AMP SPARE
HARNESS P/N: 843-319C		

TP-75978

Specifications

PL5200 Model	-1236	-1238	-1240
Row Count	12 Rows		
Row Spacing	36 in (91.4 cm)	38 in (96.5 cm)	40 in (101.6 cm)
Swath (Channel Width)	432 inches (1097.3 cm)	456 inches (1158.2 cm)	480 inches (1219.2 cm)
Hitch	Category 4N Short 3-Point Hitch Category 4W Short 3-Point Hitch Category 3W-4N Short 2-Point Hitch (with Lift Assist) Category 4W Short 2-Point Hitch (with Lift Assist)		
Seed Capacity	50.0 bu Bulk Hopper: 50.0 bu (1760 liters) 3.0 bu Row Hoppers: 3.0 bu (105 liters) each row, 36.0 bu (1260 liters) total 1.6 bu Row Hopper: 1.6 bu (56 liters) each row, 19.2 bu (672 liters) total		
Gauge Wheel Tire	7.60-15 6-Ply Lug		
Lift Assist Tire (Option)	380/55R-16.5		
Wing Flex (Option)	Up to 15° Downward and Upward		
Length, transport	155.0 in (393.7 cm)		
Width, transport	291.0 in (739.1 cm)		
Height, transport	156.0 in (396.3 cm)		
Length, working (maximum)	155.0 in (393.7 cm)		
Width, working	465 in (1181.1 cm)		
Height, working	85.0 in (215.9 cm)		
Weight, base configuration	Bulk Hopper: 13,900 lbs (6300 kg) Row Hopper: 12,500 lbs (5600 kg)		
Weight, loaded	18,200 lbs (8300 kg)		
Opener, Travel	10 inch (25.4 cm)		
Opener, Depth Range	0 to 3.5 inches (0-9 cm)		
Opener, Down Pressure	350 to 540 lbs (159 to 245 kg) per row		
Minimum Tractor Requirements	220 hp (165 kW) Open-Center or Closed-Center, 3 or 4 remotes 2250 psi (155 bar), 25 gal/min (98 liters/min) for fan circuit Quick Attach Hitch		

PL5200 Model	-12TR36	-12TR38	-12TR40
Row Count	24 Rows, Twin-Rows		
Row Spacing	36 in (91.4 cm)	38 in (96.5 cm)	40 in (101.6 cm)
Swath (Channel Width)	432 inches (1097.3 cm)	456 inches (1158.2 cm)	480 inches (1219.2 cm)
Hitch	Category 4N Short 3-Point Hitch Category 4W Short 3-Point Hitch Category 3W-4N Short 2-Point Hitch (with Lift Assist) Category 4W Short 2-Point Hitch (with Lift Assist) Category 3W-4N Short 3-Point Side-Shift Hitch Category 4N 3-Point Side-Shift Hitch Category 4W Short 3-Point Side-Shift Hitch Category 3N 2-Point Side-Shift Hitch (with Lift Assist) Category 3W-4N 2-Point Side-Shift Hitch (with Lift Assist) Category 4W 2-Point Side-Shift Hitch (with Lift Assist)		
Seed Capacity	50.0 bu Bulk Hopper: 50.0 bu (1760 liters) 1.6 bu Row Hopper: 1.6 bu (56 liters) each row, 38.4 bu (1344 liters) total		
Gauge Wheel Tire	7.60-15 6-Ply Lug		
Lift Assist Tire (Option)	380/55R-16.5		
Wing Flex (Option)	Up to 15° Downward and Upward		
Length, transport	155.0 in (393.7 cm)		
Width, transport	291.0 in (739.1 cm)		
Height, transport	156.0 in (396.3 cm)		
Length, working (maximum)	155.0 in (393.7 cm)		
Width, working	465 in (1181.1 cm)		
Height, working	85.0 in (215.9 cm)		
Weight, base configuration	Bulk Hopper: 19,100 lbs (6300 kg) Row Hopper: 13,900 lbs (6300 kg)		
Weight, loaded	18,200 lbs (8600 kg)		
Opener, Travel	10.0 in (25.4 cm)		
Opener, Depth Range	0 to 3.5 in (0-9.0 cm)		
Opener, Down Pressure	350 to 540 lbs (159 to 245 kg) per row		
Minimum Tractor Requirements	260 hp (195 kW) Open-Center or Closed-Center, 3 or 4 remotes 2250 psi (155 bar), 25 gal/min (98 liters/min) for fan circuit Quick Attach Hitch		

■ Torque Value Chart

Bolt Size in-tpi ^a	Bolt Head Identification					
						
	Grade 2	Grade 5	Grade 8	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	
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

■ Tire Chart

Location	Tire Size	Pressure	Torque
Gauge Wheel	7.60-15 6-Ply Lug	40 psi (276 kPa)	120 ft-lb (162 N-m)
Lift Assist	380/55R-16.5	73 psi (503 kPa)	170 ft-lb (231 N-m)

Tire Warranty Information

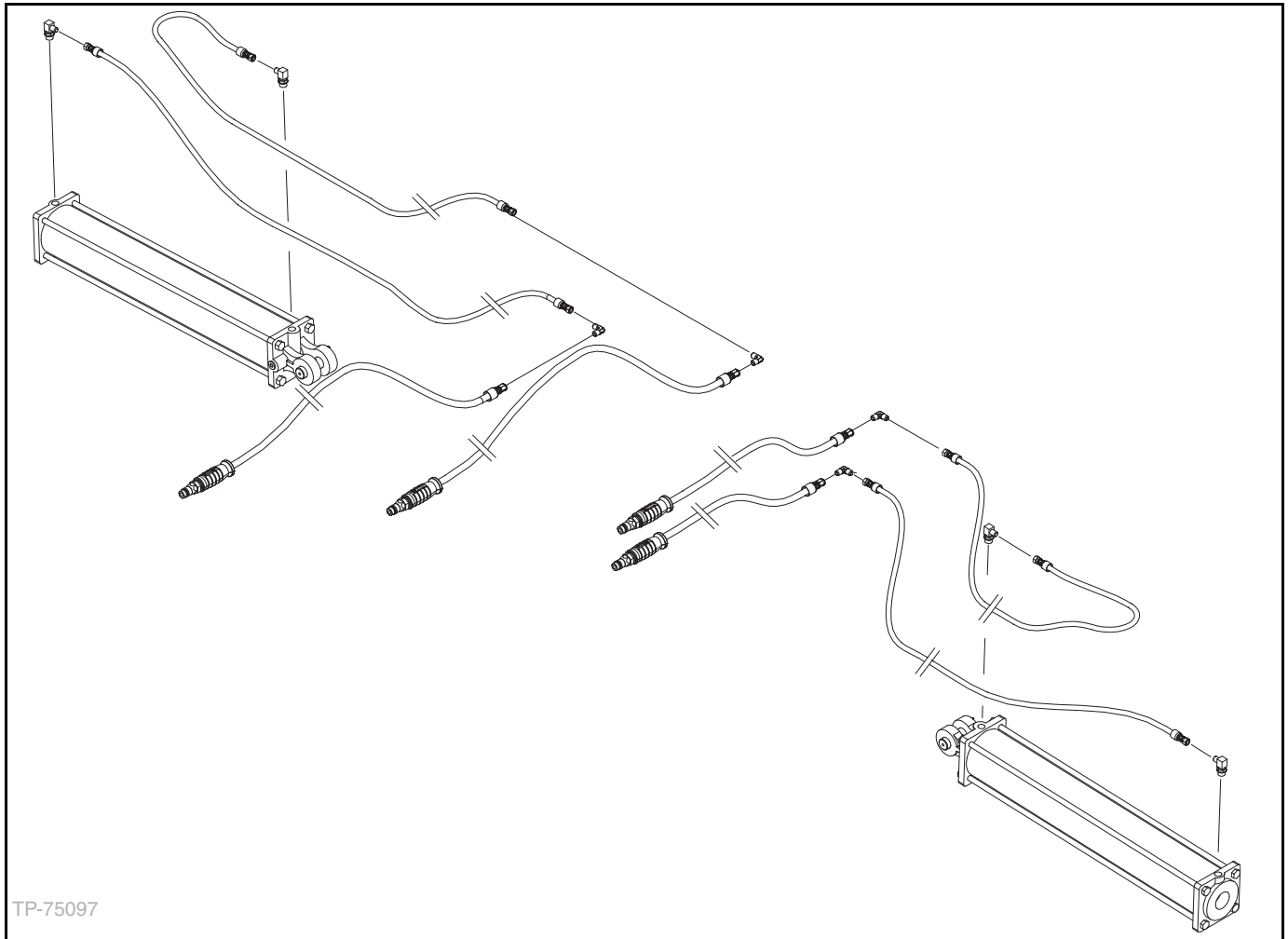
All tires are warranted by the original manufacturer of the tire. Tire warranty information is found in the

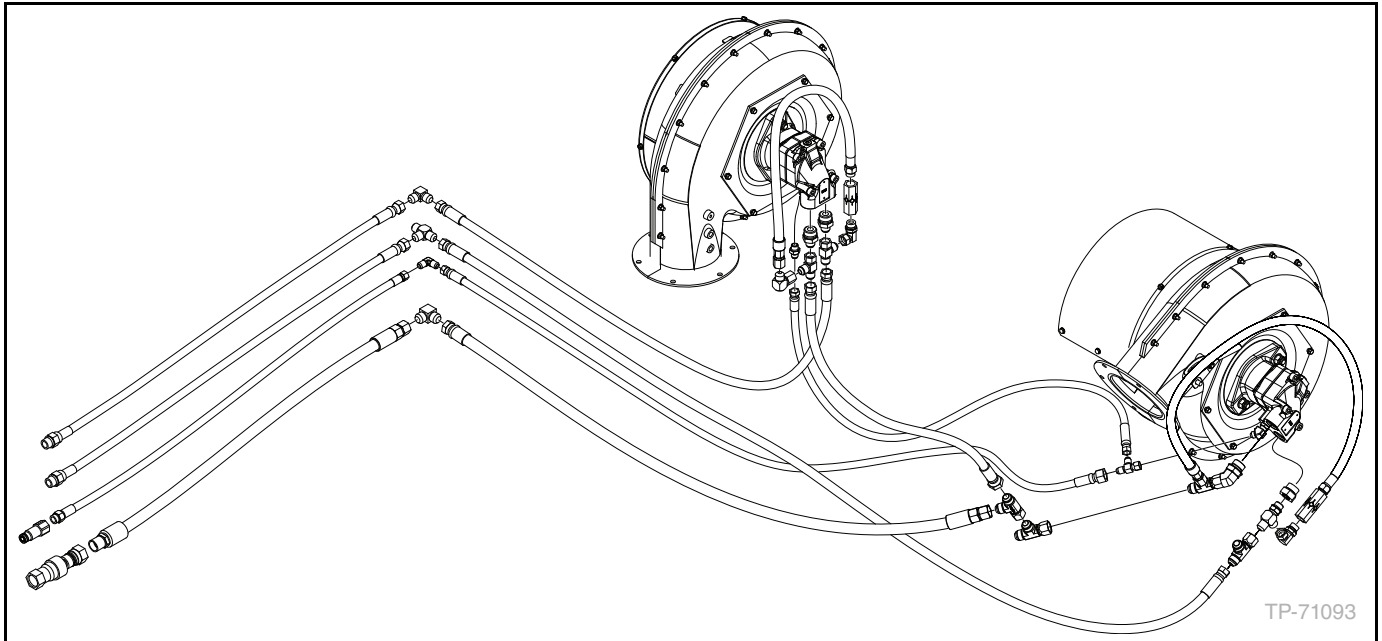
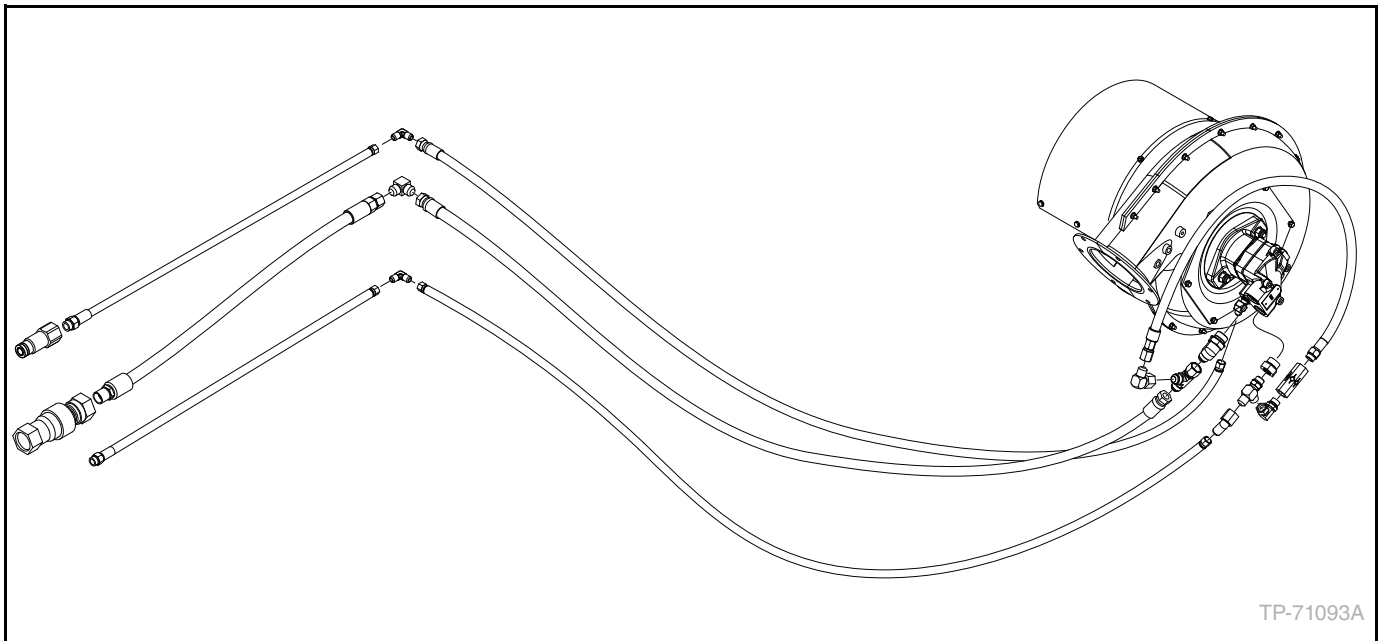
brochures included with your Operator and Parts Manuals or online at the manufacturer's websites listed below. For assistance or information, contact your nearest Authorized Farm Tire Retailer.

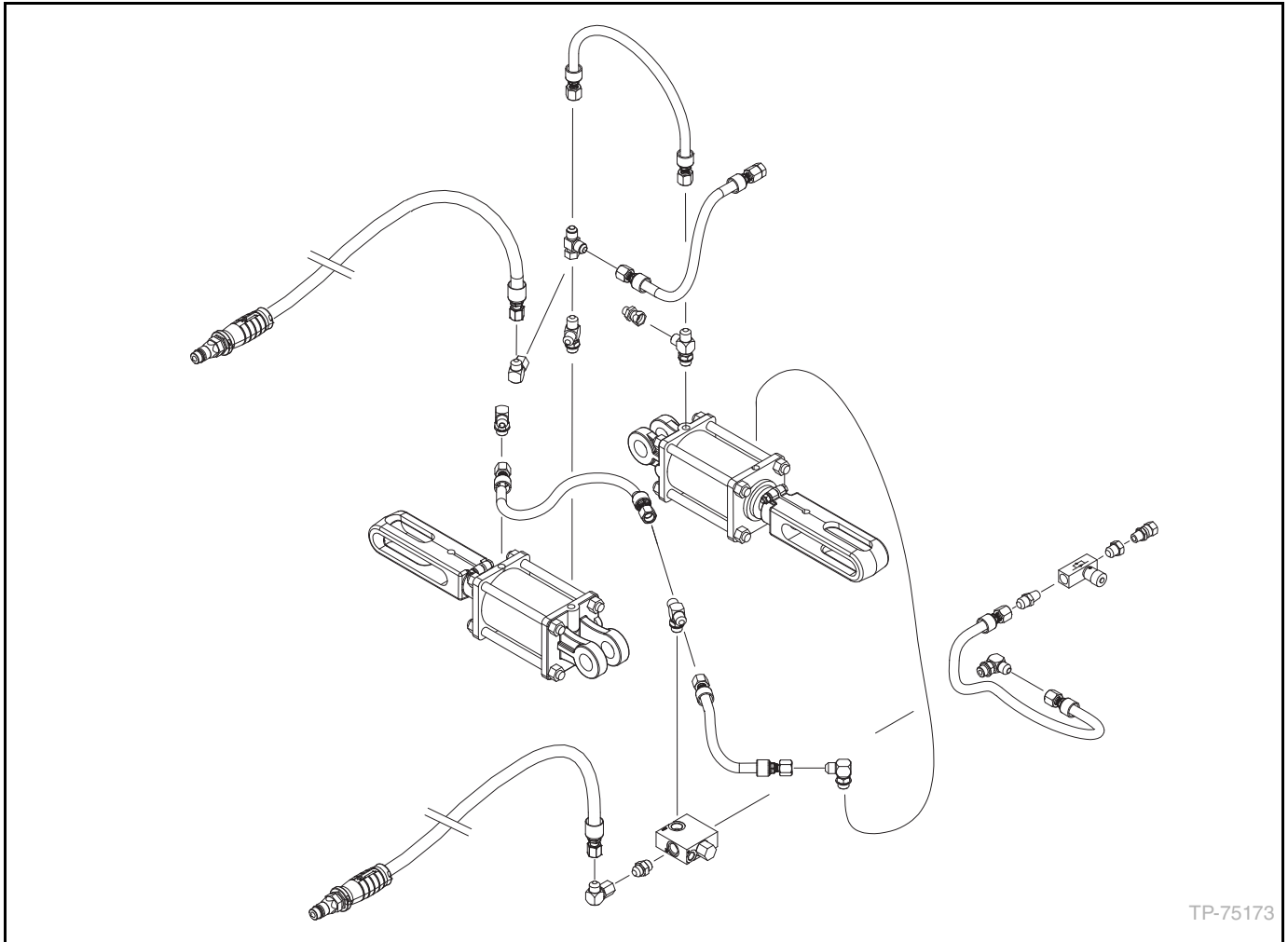
Manufacturer	Web Site
Titan	www.titan-intl.com
Goodyear	www.titan-intl.com
Firestone	www.firestoneag.com
BKT	www.bkt-tires.com/en

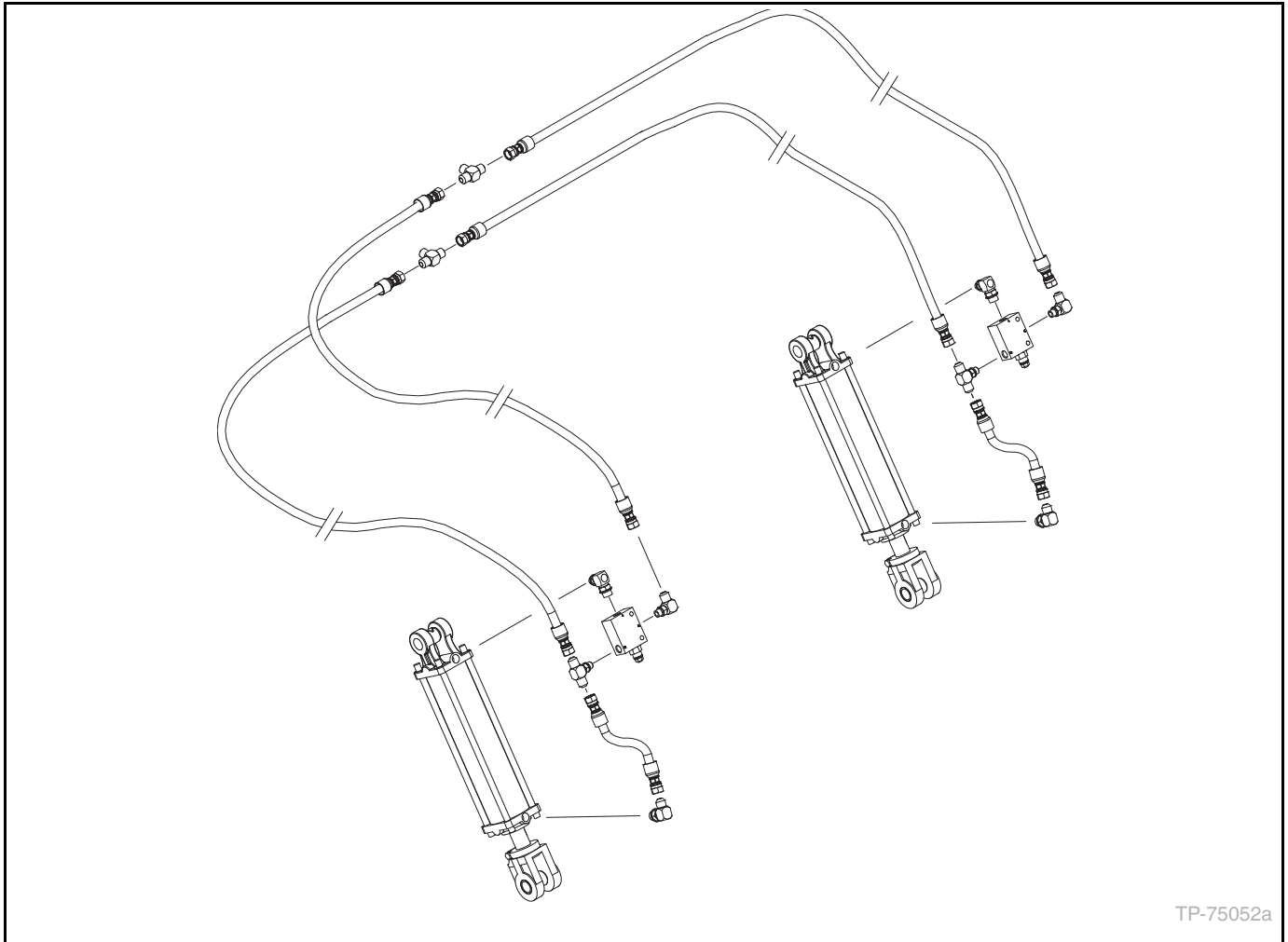
■ Hydraulic Diagrams

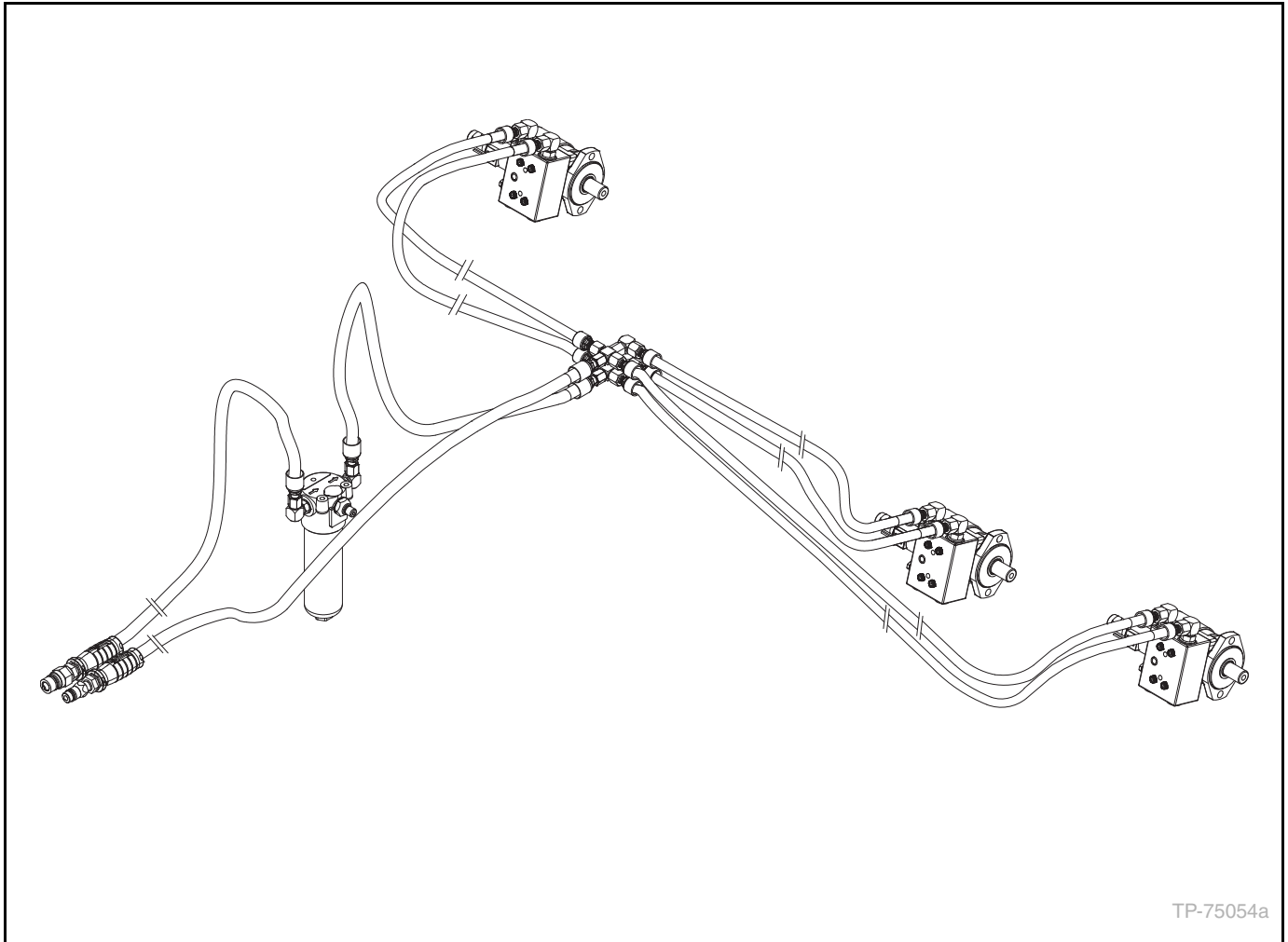
Fold Hydraulics - Right/Left Wings



Fan Hydraulics - Bulk Hopper Configuration**Fan Hydraulics - Row Hopper Configuration**

Wing Flex Hydraulics (Optional Configuration)

Lift Assist Hydraulics (Optional Configuration)

Hydraulic Drive Hydraulics (Optional Configuration)

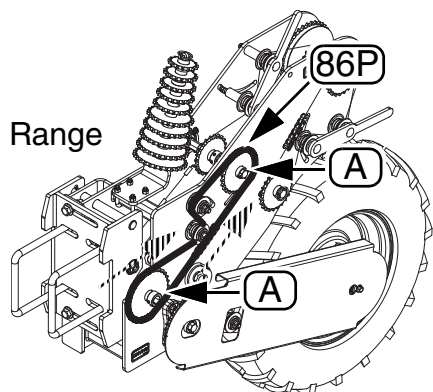
■ Chain Routings

(36T) Sprocket or idler tooth count

(74P) Chain pitch count

..... Direction of chain in motion

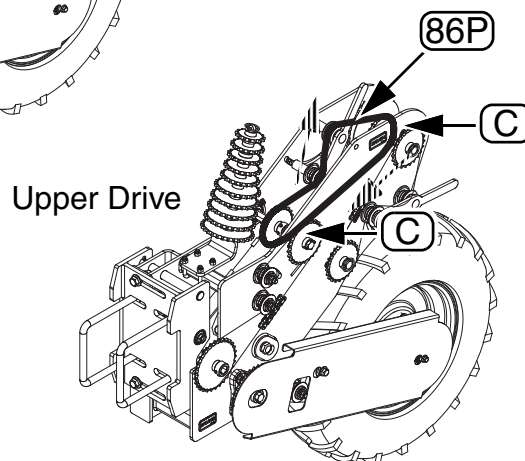
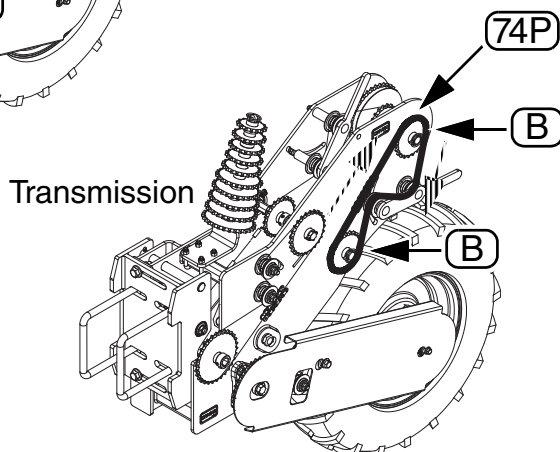
Ground Drive



(A) Range Sprockets: 18T, 19T, 20T, 30T, and 38T

(B) Transmission Sprockets: 17T, 19T, 23T, 24T, 25T, 26T, 27T, and 28T

(C) Upper Drive Sprockets: 18T, 36T, and FIXED



TP-71906

Pre-Delivery Instructions

This section covers instructions exclusively for the dealer to assemble and produce a properly working machine for the customer. All workers must read and understand this entire manual before beginning assembly and setup.

Illustrations in this section were not done during an actual assembly. For clarity, some illustrations may or may not include parts, assemblies, and other components at the same point in an actual assembly.

Ensure you have all the necessary tools and equipment before beginning assembly. Ensure the heavy machinery has the proper ratings for tasks.

As the assembly steps are completed, ensure removed items or items set aside a safe distance away from and will continue to allow for adequate space to safely complete assembly.

It is the dealer's responsibility to unload the PL5200 planter. Unload all equipment before beginning assembly. Do not attempt any work with the PL5200 while on the truck. It is the dealer's responsibility to ensure any workers or others in close proximity of the planter are familiar and understand the contents of this manual, and are properly trained to work, assembly, operate, and perform maintenance on the planter and the other machinery used to assemble the PL5200 planter.



Crushing and Pinching Hazards

A falling section or part can cause severe injury or death by crushing. Always keep body and body parts out from under any parts or components of the planter. Ensure all equipment is properly rated for the load before attempting to unload or move parts, or assembly the planter. Ensure all equipment operates with smooth movements.



Secure Load

Obey all safety instructions from hoist and/or lifting equipment manufacturer. Be sure hoist chains and lift straps are properly rated for load and securely attached to planter part before moving or unloading parts.



Lift Failure Hazard

Do not lift on the wings. There is a significant risk of hinge failure and lift collapse; either will result in major planter and lift equipment damage, serious injury, and even death.

■ Requirement Checklist

- ☑ Read and understand “**Safety Information**” on page 3 before beginning to assemble the planter.
- ☑ Have at least three people on hand while assembling.
- ☑ Appoint a designated observer and have a plan to safely complete assembly
- ☑ Ensure the assembly location is level and free of obstructions and debris. Great Plains recommends an open, concrete area.
- ☑ Have all major components and required tools. Test to ensure they are properly working.
- ☑ Account for all loose components, fasteners, and pins shipped with the PL5200 planter.
- ☑ Use a tractor of sufficient size and horsepower with at least three hydraulic circuits. Refer to “**Specifications**” on page 78 for tractor requirements.
- ☑ Ensure safety decals and reflectors are located correctly and legible. Replace if improperly located or damaged. Refer to “**Safety Decals**” on page 6.
- ☑ Have a copy of the parts manual on hand for reference. If unsure of proper placement or use of any part or fastener, refer to the parts manual.
- ☑ Ensure all moving parts are moving freely, bolts are tighten to torque, and cotter pins are spread.
- ☑ Check for proper tension and alignment on all drive chains.
- ☑ Inflate tires to recommended pressure as listed on “**Tire Chart**” on page 80.
- ☑ Tighten wheel bolts to torque as specified on “**Torque Value Chart**” on page 80.

Tools Required

- Industrial lift rated for 30,000 lbs (14,000 kg) or greater with a 3-point hitch attachment.
- Industrial lift or hoist system rated for 1,000 lbs (XX kg) or greater
- PL5200 Planter parts manual (411-825P.)
- General hand tools.
- Ladder.
- Jack stands or blocks.
- Hoist straps with proper load rating.
- Suitable tractor with a 3-point hitch. See “**Specifications**” on page 78.
- At least three workers or more to assist.

Location Selection

The planter will need to be unloaded at the spot where the final assembly will take place.

This location needs to be:

- ✓ level and free of obstructions and debris.
- ✓ adequate overhead space to lift the planter off of the trailer with an industrial lift or hoist.
- ✓ adequate space to pull the tractor forward from underneath the planter, without turns
- ✓ adequate space all around to easily maneuver heavy machinery on all sides of the planter and/or truck.
- ✓ adequate space to attach a tractor to the front of the planter.
- ✓ adequate space to stage equipment and tools for assembly and setup.
- ✓ adequate space to stage components after unloading from truck.

■ Unloading

Do not begin assembly without all workers and those in close proximity understanding the plan for assembling the planter. Each worker should understand their role and responsibilities prior to beginning to work.

Loose Components

Ensure as the work is completed, unloaded components are set aside far enough away for continued clearance for unloading remaining components, assembling the planter, and moving or maneuvering the truck, planter, and heavy equipment.

1. Remove any loose components from the truck.
2. Remove any crated items that may be on the truck.

Hitching to Planter



Load Rating

The industrial lift must have a rating for 30,000 lbs (14,000 kg) or higher or significant damages to the planter and lifting equipment, and serious injury and even death can occur to any workers or others in close proximity of the area can occur due to lift failure, tipping, or rollover. Great Plains recommends using a single industrial lift, and does not recommend using a combination of multiple, smaller lifting machines to complete unloading and assembly.



Lift Failure Hazard

Do not lift on the wings. There is a significant risk of hinge failure and lift collapse; either will result in major planter and lift equipment damage, serious injury, and even death.



Proper Equipment

Do not use an industrial lift without the proper 3-point hitch equipment attachment. Do not attempt to lift the planter center frame from the 3-point hitch in any other manner other than described in this manual. Failure to use proper equipment will result in significant damages to the planter and lifting equipment, and serious injury and even death.



Collision Risk

Do not place the industrial lift, or any other equipment, so close to the tractor trailer the wheels of the tractor trailer will not have sufficient clearance when pulling the trailer forward from under the planter. Serious damage can occur to the planter, tractor trailer, and the industrial lift equipment, and serious injury or even death can occur during a collision between the planter, tractor trailer, and/or industrial lift equipment.

1. Set the parking brake on the tractor trailer.
2. Ensure the industrial lift equipment is properly functioning with smooth movements.
3. Set the industrial lift into position.
4. Release, remove, and stow any shipping straps, chains, and shipping stands.
5. Securely attach the 3-point hitch attachment of the industrial lift to the 3-point hitch points on the planter. Please note the industrial lift must be rated for 30,000 lbs (14,000 kg) or higher. See “**Hitching to Planter**” on page 88 for more information.
6. If planter is equipped with hydraulic drive, connect the yellow colored color hydraulic hoses.
7. Raise and store the two front parking stands. If the planter is configured with a bulk hopper, raise and store the rear parking stand, too. See “**Parking Stands**” on page 23 for more information.
8. Slowly lift the planter off of the trailer bed.
9. Stop lifting the planter after about 12 inches or high as necessary to create enough clearance for the tractor trailer to be pulled straight out from under the lifted planter.
10. From a distance, inspect the tractor trailer and planter to determine proper clearance for the tractor trailer to be pulled straight out from under the lifted planter. If necessary, lift the planter further up to create sufficient clearance to avoid

any collisions between the planter and tractor trailer.

11. Have the truck driver slowly pull the trailer straight forward, without any turns, from under the planter.
12. Once the tractor trailer is completely clear of the assembly area, slowly lower the planter to the ground.
13. Set all of the parking stands. Block tires to prevent unintended movements during assembly.

■ List-Assist Installation (Option)



Crushing and Pinching Hazards

A falling section or part can cause severe injury or death by crushing. Always keep body and body parts out from under any parts or components of the planter. Ensure all equipment is properly rated for the load before attempting to unload or move parts, or assembly the planter. Ensure all equipment operates with smooth movements.



Secure Load

Obey all safety instructions from hoist and/or lifting equipment manufacturer. Be sure hoist chains and lift straps are properly rated for load and securely attached to planter part before moving or unloading parts.



Sharp Object Hazard

Opener disks are sharp and may result in injury. Wear hand protection when working in this area.



Crushing Hazard

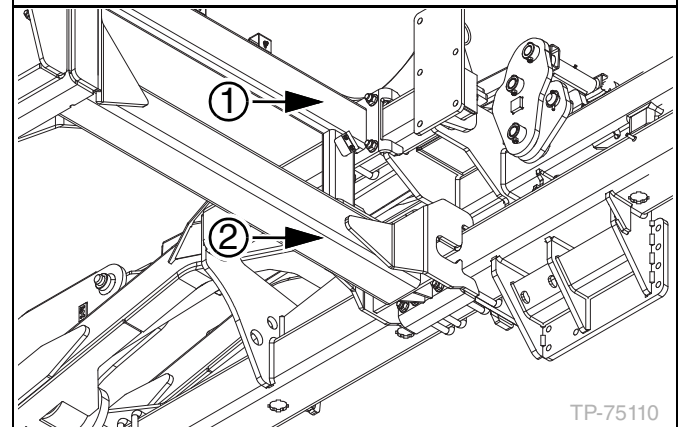
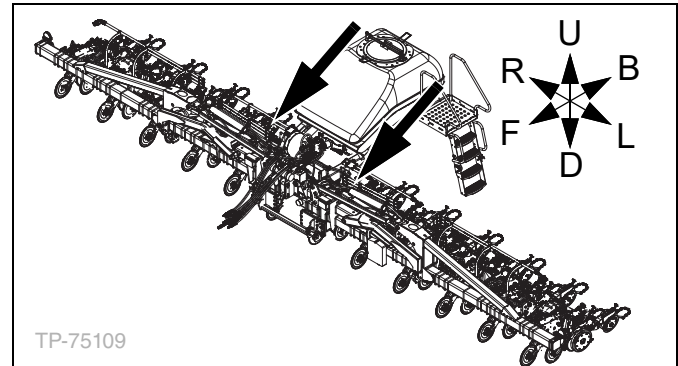
Make sure machine is secure before working on the machine. A falling machine can cause severe injury or death.

Great Plains recommends the planter is hitched to a suitable tractor while installing the lift-assist wheel assemblies. All parking stands should be used and the four gauge wheels should be blocked to prevent unintended movement during assembly.

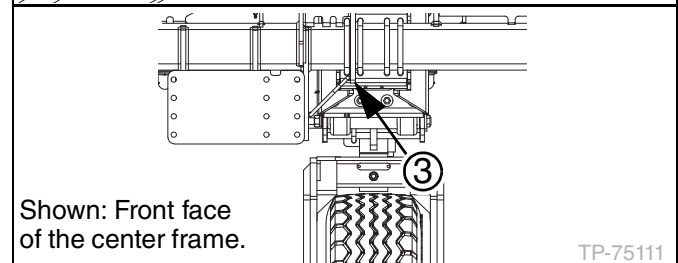
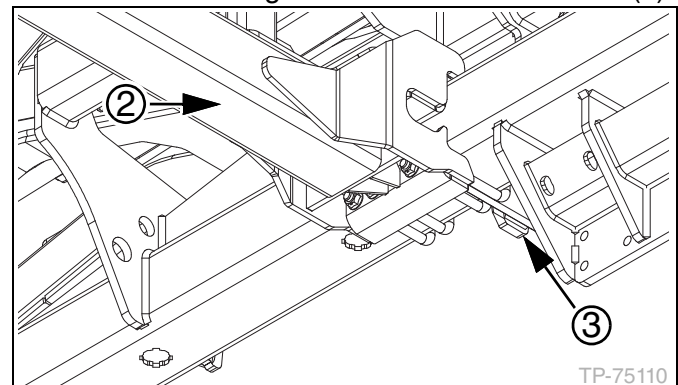
Lift-Assist Wheel Assembly

1. Familiarized yourself with where each lift-assist wheel assembly will be mounted to the center frame before beginning assembly. The upper extension weldment (1) and the lower extension

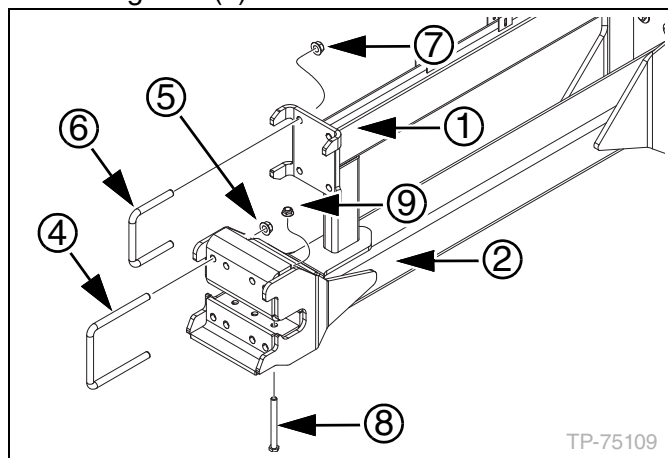
weldment (2) will mount to the rear face of the center frame.



2. Begin on the left lift-assist wheel assembly. Use a hoist to lift the lift-assist wheel assembly into position. The lower extension weldment (2) will be positioned on the rear face of the center frame, around a weldment (3) with the inner set of u-bolts flanking either side of the weldment (3).



- Secure the lower extension weldment (2) with four 3/4-10 X 7 X 8 1/2 u-bolts (4) and four locking nuts (5).



- Secure the upper extension weldment (1) with two 3/4-10 X 6 1/32 X 5 5/8 u-bolts (6) and two locking nuts (7).
- Secure the lower extension weldment (2) with three bolts (8) and three locking nuts (9).
- Complete steps 1 through 5 for the right lift-assist wheel assembly.

Hydraulic Cylinders



High Pressure Fluid Hazard

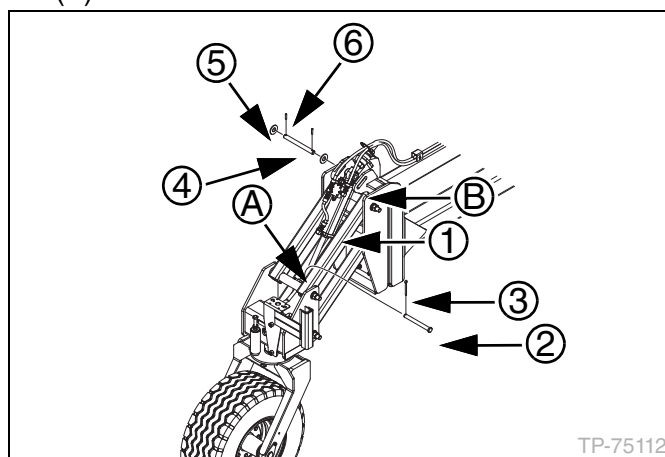
The hydraulic system comes from the factory fully charged. Great Plains strongly recommends that all hydraulic system adjustments and repair to be completed by a trained professional who is knowledgeable about how to safely complete hydraulic system work. Do not pinch or damage hydraulic hoses. Compromising a closed hydraulic system can cause serious injury or death.

- Beginning on the left side, locate where the lift-assist left hydraulic cylinder was stored for shipping with zip ties along the center frame. Release shipping zip ties.

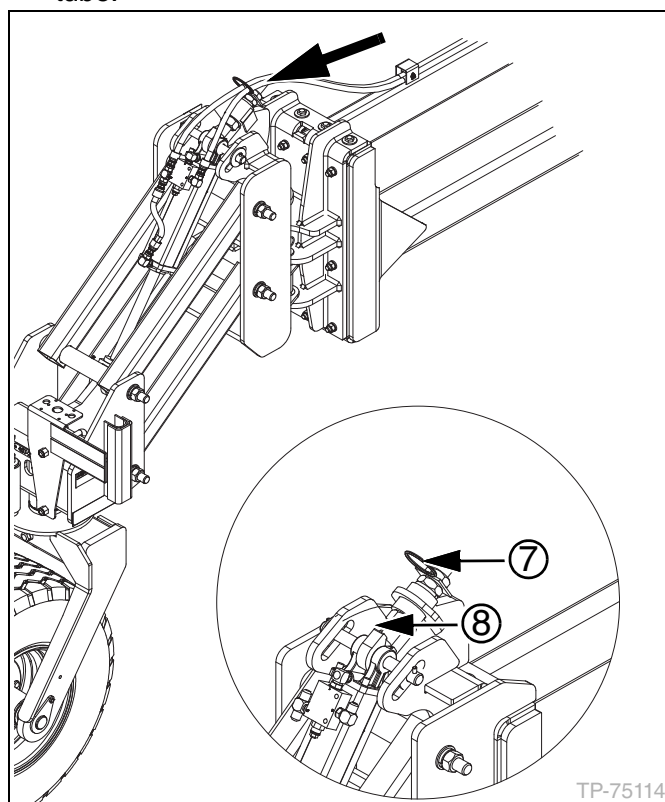


- Carefully position the hydraulic cylinder (1) into place with the rod-end in the lower mount bracket

- (A) and the rod-base in the upper mount bracket (B).



- Secure the rod-end of the hydraulic cylinder (1) into the lower mount bracket (A) using the clevis pin (2) secured by the cotter pin.
- Secure the rod-base of the hydraulic cylinder (2) into the upper mount bracket (B) using the pin (4), two washers (5), and two roll pins (6).
- Adjust the eyebolt (7) by turning the adjuster nut (8) until it is 4.5 in (11.4 cm) from the end of the tube.

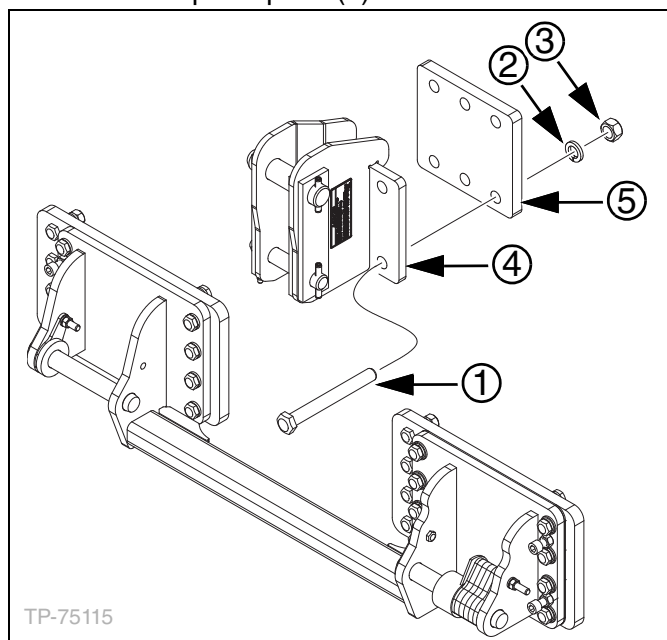


- Repeat steps 1-6 for the right lift-assist wheel assembly.

Shipping Top Link Removal

If the planter is configured with lift-assist, it is necessary to remove the shipping top link in the 3-point hitch. This top link has been included only for the purpose of shipping the planter. Planters with lift-assist will need a 2-point hitch all operations.

1. Loosen the four or six bolts (1), washers (2), and nuts (3), and remove the front top link plate (4) and rear top link plate (5).



2. Remove and discard shipping top link parts.

■ Height Switch



Crushing Hazard

Exercise extreme caution when adjusting the height switch. You may be severely injured or killed by being crushed by the planter and its components.

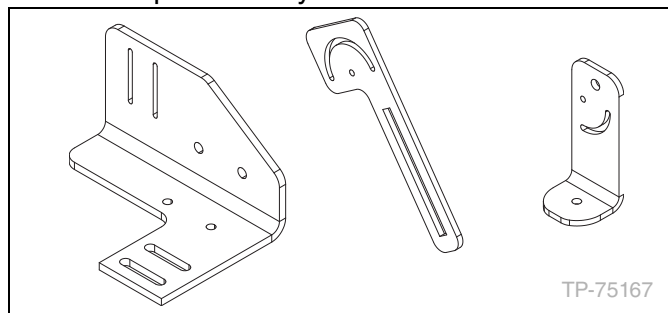


When the hydraulic drive planter is raised, the switch state is ignored during FILL DISK and 5 REV TEST operations. See your console manual for more information.

The height switch informs the seed monitoring system if the planter is raised or lowered on planters configured with ground drive. On all planters, the seed monitoring system only counts seed when the planter is lowered and the drive is activated. On hydraulic and electric drive planters, the height switch also enables or disables the drive.

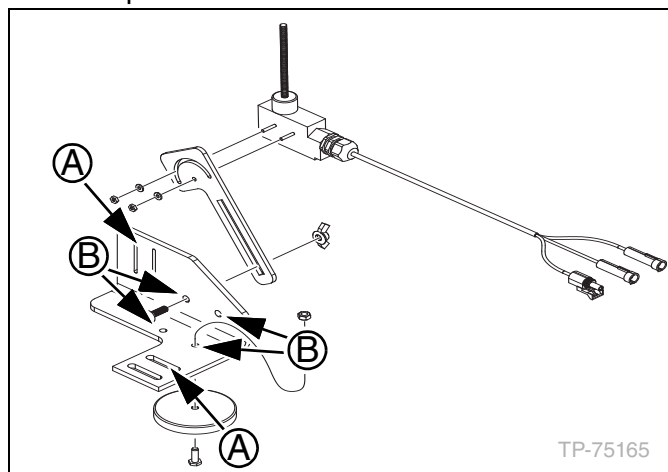
Install Height Switch Kit (413-063S) (S/N E1193K-)

The Height Switch Kit (413-063S) can be mounted in a variety of ways to accommodate the customer's preferences. Three brackets are included in the kit, any one bracket or combination of brackets may be used to mount the whisker switch sensor. Do not discard any unused brackets. Any unused brackets need to be stored with the planter and given to the customer upon delivery.

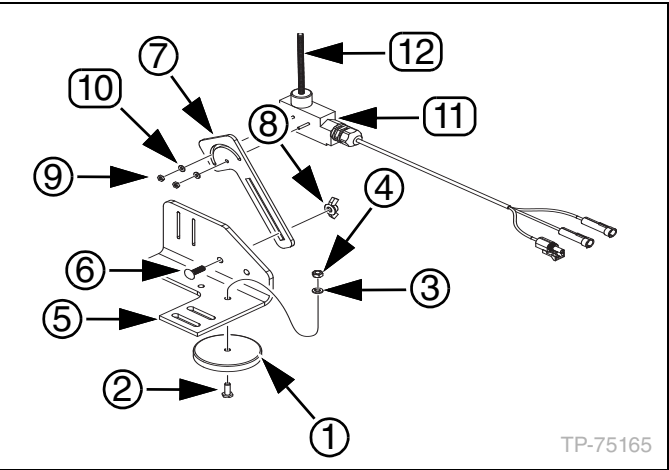


To install the height switch:

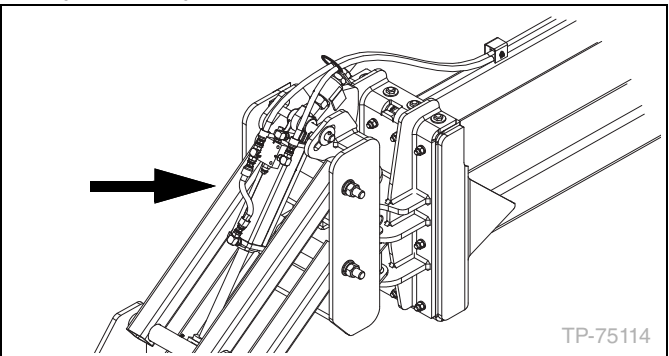
1. The brackets have several options for mounting for the height switch sensor (A) and multiple options for mounting the magnet (B). Chose the best option for your preferences, only one example is shown.



i You will install the height switch in a way to ensure whisker (12) will make contact with the tractor lift arms on planters configured with 3-point hitches, or with the lift assist gauge wheel assembly parallel arms near the hydraulic cylinder on planters configured with 2-point hitches.



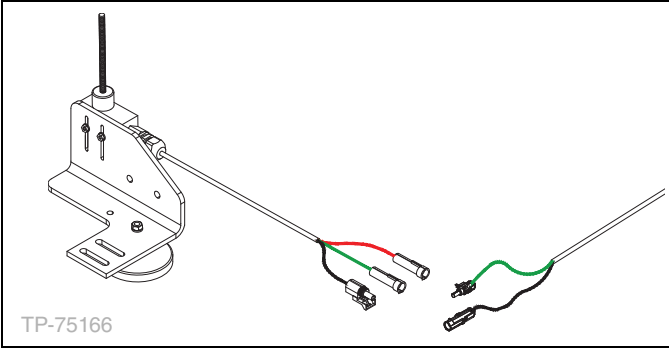
2. Secure the magnet (1) with one bolt (2), one washer (3), and one nut (4) on mounting bracket (5).
3. Secure bracket (7) with the one bolt (6) and one wing nut (8) to bracket (5).
4. Secure the height switch sensor (11) with two nuts (9) and two washers (10) on mounting bracket (7).
5. Using the magnet, secure the height switch to the side of the lift assist gauge wheels. The whisker (12) should make contact with the parallel arms in the lift assist gauge wheel assembly near the hydraulic cylinder.



Height Switch Electrical Connections

The sensor will plug into the extension harness, and the extension harness will plug into the main electrical harness. While making connections

ensure the electrical wires are clear of moving parts and will not be pinched, crushed, or otherwise damaged from nearby moving parts. If necessary, use zip ties to secure the electrical wires in place; leave enough slack to allow for machine movement during operation.



Connect the black wired connector on the sensor to the corresponding black wired connector on the extension harness. Connect the green wired connector on the sensor to the corresponding green wired connector on the extension harness. There will be an unused red wired connector on the sensor. The height switch will operate as follows:

Wire Color	Whisker Position	Function
black	power	power
green	bent	active
	straight	inactive

It is possible to change the function of the whisker position by connecting the red wired connector on the sensor to the green wired connector on the extension harness. There will be an unused green wired connector on the sensor. In this configuration, the height switch will operate as follows:

Wire Color	Whisker Position	Function
black	power	power
red	straight	active
	bent	inactive

i The black wired connector on the sensor will always be connected to the black wired connector on the extension harness.

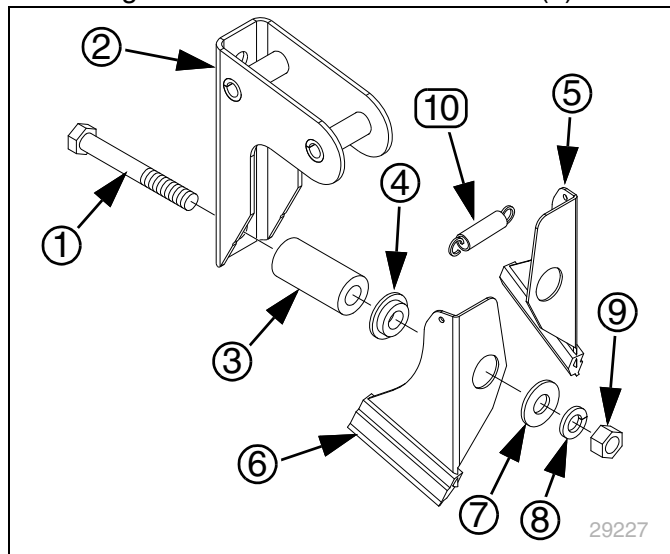
Height / Lift Switch (413-121S) (S/N E1194K+)
Refer to manual 421-034M for installation of the Height / Lift switch kit.

Option Installation

■ Inside Disk Scraper Installation

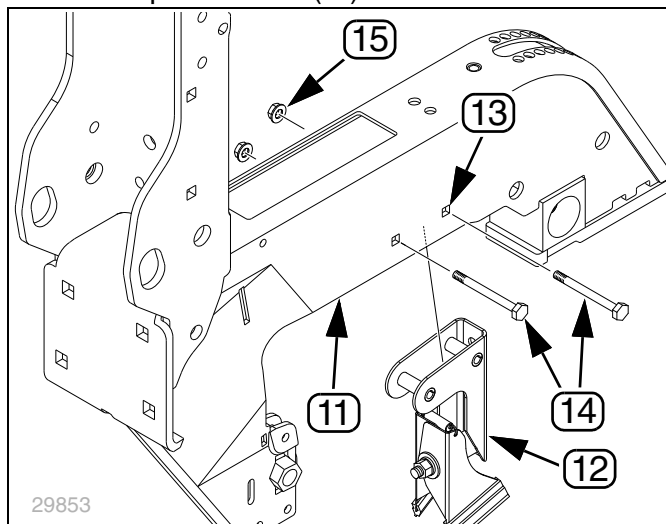
Start with the left-hand row unit and repeat the following steps for each row unit.

1. Insert the 3/16 x 3 inch bolt (1) from the rear, through the lowest hole of the bracket (2).



2. Place the tube (3) over the bolt (1).
3. Place the spacer (4) on the bolt (1) with the larger diameter toward the bolt head.
4. Put the left scraper blade (5) on the spacer (4), followed by the right scraper blade (6).
5. Fasten the scraper assembly with a flat washer (7), lock washer (8), and nut (9).
6. Tight the nut to the correct torque from the **"Torque Value Chart"** on page 80. Make sure the disks pivot freely.
7. Install the spring (10) by connecting the spring between the disks using the small top holes.

8. Remove one or both opener disks to gain access to the opener frame (11).



9. Install the scraper assembly (12) between the middle four lower square holes (13) of the opener frame.
10. Secure with two 5/8 x 2 1/2 inch bolts (14) and whiz nuts (15).
11. Reinstall the disk.



WARRANTY

Great Plains (a division of Great Plains Manufacturing, Inc.) warrants to the original purchaser that this Great Plains machine will be free from defects in material and workmanship for a period of one year (Parts & Labor) from the first use date when used as intended for personal use; ninety days for custom/commercial or rental use.

Second year limited warranty covers Parts ONLY (personal usage only, excluding labor and wear items). This warranty is limited to the replacement of any defective part by Great Plains. Great Plains reserves the right to inspect any equipment or part which are claimed to have been defective in material or workmanship.

The following items and/or conditions are **NOT COVERED UNDER WARRANTY**: Failures resulting from the abuse or misuse of the equipment, failures occurring as a result of accidental damage or Force Majeure, failures resulting from alterations or modifications, failures caused by lack of normal maintenance as outlined in the operator's manual, repairs made by non-authorized personnel, items replaced or repaired due to normal wear (such as wear items and ground-engaging components including, but not limited to, disc blades, chisel points, tires, bushings, and scrapers), repeat repair due to improper diagnosis or improper repair by the dealer, temporary repairs, service calls and/or mileage to and from customer location, overtime premium, or unit hauling expenses. The warranty may be voided if the unit is towed at speeds in excess of 20 miles per hour (32 kilometers per hour), or failures occurring from soils with rocks, stumps, or other obstructions.

Great Plains reserves the right to make changes in materials or design of the product at any time without notice. The warranty shall not be interpreted to render Great Plains liable for damages of any kind, direct or consequential or contingent to property. Furthermore, Great Plains shall not be liable for damages resulting from any cause beyond its control. This warranty does not extend to crop loss, losses caused by planting or harvest delays or any expense or loss of labor, supplies, rental machinery, or for any other reason.

No other warranty of any kind whatsoever expressed or implied, is made with respect to this sale; and all implied warranties of merchantability and fitness for a particular purpose which exceed the obligations set forth in this written warranty are hereby disclaimed and excluded from this sale.

This warranty is not valid unless registered by a certified Great Plains dealer.

Effective July 15, 2020

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Index

A			
air system			
air system clean-out	59		
airbox residue clean-out	59		
airbox shut-off gate	73		
auxiliary hydraulics	56		
B			
back-flow	69		
blank seed disk	38		
bridging	69		
brush			
drop	33		
strip	33		
C			
case drain hose	30		
cell	33		
chain lubrication	65		
chain routings	86		
chain slack	65		
chemicals	4		
clean-out			
air system clean-out	59		
airbox clean-out	59		
airbox residue clean-out	59		
funnel	60		
seed meter alternate clean-out	61		
seed meter clean-out	60		
seed tube clean-out	61		
D			
decals	6		
diagrams			
fan hydraulics	82		
fold hydraulics	81		
hydraulic drive hydraulics	85		
wing flex hydraulics	83		
disable seed meter	38		
disk			
scraper	64		
spreader	64		
doubles	32		
check	32		
down-pressure adjustment	46		
drop brush	33		
E			
earmuff	3		
earplugs	3		
electrical connections	15		
F			
fan hydraulics	82		
fan operation	30		
folding	28, 29		
furrow check	32, 34		
G			
gauge wheel offset	38		
gauge wheel offset distances	38		
grease fittings	65		
ground drive	86		
H			
height switch kit	91		
hitching	14		
hopper			
loading	21		
hydraulic			
hose colors	14		
hose connections	14		
hydraulic drive	44, 85		
hydraulic drive hydraulics	85		
hydraulic fan	29		
hydraulic fluid	4		
hydraulic system maintenance	58		
hydraulic system repair	58		
hydraulics			
air system hydraulics	29		
twin fan hydraulics	30		
I			
inlet, meter	33		
inside disk scraper	93		
inside disk scrapers	53		
intended use	1		
K			
Keeton Seed Firmers	51		
knockout brush	63		
L			
lift hydraulics	36		
lift-assist hydraulics	84		
lift-assist wheel offset	39		
M			
maintenance safety	5		
meter pressurization			
fine tuning	32		
P			
parking	24		
planting			
rate	44		
planting rate	33, 40		
pocket	33		
press wheel adjustments	48		
centering	49		
down pressure	49		
stagger	49		
prohibited use	1		
R			
range sprockets	40		
reflector	6		
row unit down pressure	45		
row unit lock-up	37		
row unit opener disks	47		
adjustments	47		
disk-to-disk spacing	47		
setting planting depth	47		
S			
safety decals	6		
scrapers			
gauge wheel			
adjustment	48		
inside disk scrapers	53		
side gauge wheel	48		
seed delivery			
verify accuracy	41		
seed disk	33, 42		
cleaning	63		
maintenance	63		
storing	63		
seed drop brush	63		
seed firmers	51		
Keeton Seed Firmers	51		
seed flap	65		
seed inlet			
gate	42, 43		
seed inlet gate	38		
seed inlet shutter	33		
seed lubricants	53, 87, 93		
seed meter	49		
adjustment	42		
alternate meter clean-out	61		
clean-out	60		
disk	42		
drive chain	65		
operation	44		
rain cover	42		
seed meter container	55		
seed meter brush			
knockout brush replacement	63		
maintenance	61		
replacement	62		
seed drop brush replacement	63		
strip brush replacement	62		
tufted brush replacement	62		
seed meter disks	55		
seed pocket	33		
seed pool			
recovery	69		
slope	44		
seed rate	71		
seed tube			
seed tube brush	54		
seed tube clean-out	61		
Seed-Lok firming wheels	51		
shutdown	5		
shutter	33		
side depth wheel	64		
side-shift hitch	35		
offset	35		
side-shift hitch offset	35		

skips	32
speed sensor	22
storage	5, 24
strip brush	33, 62
T	
transmission sprockets	40
transport speed	5
transporting	23
troubleshooting	68
tufted brush	62
twin-row conversion	35
U	
unfolding	28
unit mounted disk coulters	53
W	
waste disposal	4
wheel bearings	67
wing flex hydraulics	83
Y	
Y-tube	38



Great Plains Mfg.
1525 E. North St.
P.O. Box 5060
Salina, KS 67402