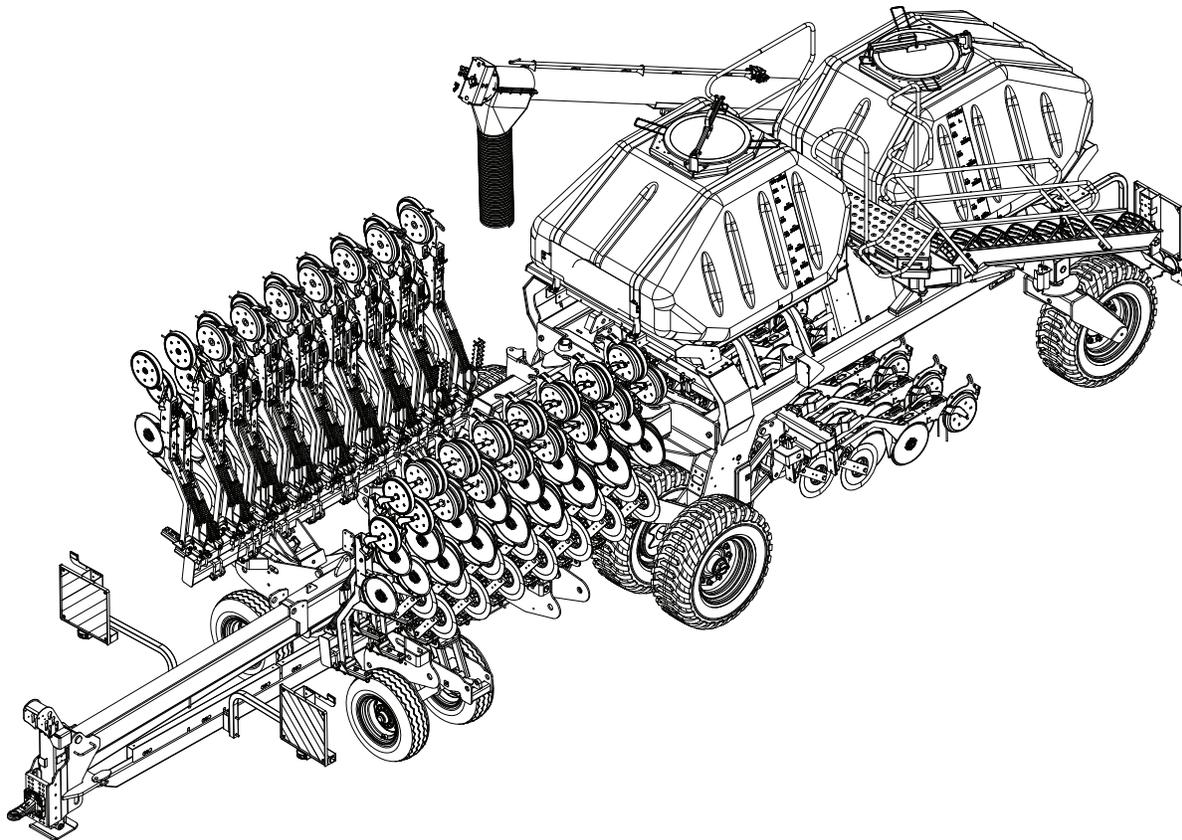


Great Plains

SPARTAN II

OPERATOR MANUAL

MODELS 8, 9, 10, AND 12 METER AIR DRILLS



166-490M

Original Instructions



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	<hr/> <hr/> <hr/>

■ Dealer Contact Information

Name: _____

Street: _____

City/State: _____

Telephone: _____

Email: _____

Dealer's Customer No.: _____

 **WARNING:** Cancer and Reproductive Harm - www.P65Warnings.ca.gov



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Introduction

Great Plains' Spartan^{II} drill is an integrated air drill for seeding and fertilizing production-agriculture crops only. Every Spartan^{II} drill is designed and built with care using only quality materials. For the best experience, read this manual and follow all instructions carefully. These pages will guide you through the operation and contain tips for easier adjustment and maintenance.

All information in this manual is current as of publication. Information contained within is subject to change to ensure top performance.

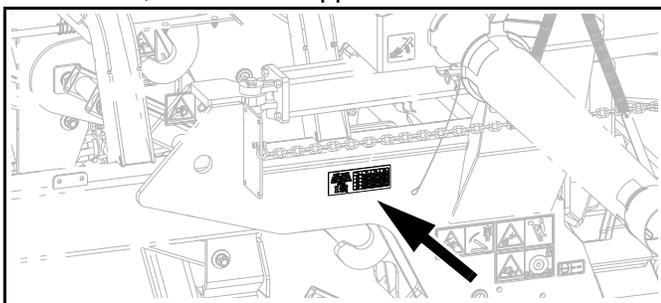
Spartan^{II} Models Covered

Spartan ^{II} 807	8m with 15cm and 19cm spacing available
Spartan ^{II} 907	9m with 15cm and 19cm spacing available
Spartan ^{II} 1007	10m with 15cm and 19cm spacing available
Spartan ^{II} 1207	12m with 15cm and 19cm spacing available

■ Owner Assistance

If you need customer service or repair parts, contact a Great Plains dealer. They have trained personnel, repair parts and equipment specially designed for Great Plains products.

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 Great Plains dealer. The serial-number plate is located on the right side of the main frame, above the hopper control lever.



Record your machine's model and serial number on the inside cover of this manual for quick reference.



Spartan^{II} QRC

The QR Code (Quick Response) to the left will take you to this machine's family of manuals. Use your smart phone or tablet to scan the QR Code with an appropriate App to begin viewing.



Document Family

166-490M	Owner's Manual (this document)
166-490Q	Pre-Delivery Manual
166-490P	Parts Manual
160-500M	DrillCommand User Guide

■ Further Assistance

Great Plains Manufacturing, Inc. and your Great Plains dealer want you to be satisfied with your new Spartan^{II}. 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 they are aware of any problems so they 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 67402-5060

Or go to www.greatplainsag.com and follow the contact information at the bottom of your screen for our service department.



Dealer QRC

The QR Code (Quick Reference) to the left will take you to available dealers for Great Plains products. Refer to the Parts Manual QR Locator for detailed instructions.



Safety Information

■ Look for Informational Symbols



SAFETY ALERT SYMBOL indicates there is a potential hazard to personal safety involved and extra precaution must be taken. When you see this symbol, be alert and carefully read the message that follows. In addition to design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness and proper training of personnel involved in the operation, transport, maintenance and storage of equipment.



NOTE indicates useful - but not crucial - information for machine operation, assembly, or adjustment. It may also direct you towards additional information.

■ Be Aware of Signal Words

Signal words designate a degree of level of hazard seriousness. The signal words are:

DANGER

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

WARNING

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

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

NOTICE

NOTICE indicates a potential hazard which, if not avoided, may result in moderate to severe damage to your machine, machine parts, or nearby property.

■ Be Familiar with Safety Decals



1. Thoroughly read and understand “**Locations of Safety Decals**” on page 6.
2. Read all instructions noted on the decals.
3. Keep decals clean. Replace damaged, faded, and illegible decals.

■ Wear Protective Equipment



1. Wear protective clothing and equipment appropriate for the job, such as safety glasses, hard hat, and ear plugs.
2. Clothing must fit snug without fringes and pull strings to avoid entanglement with moving parts.
3. Avoid using distracting multimedia devices, such as audio that requires headphones, tablet, or smart phone, while operating machinery.

■ Avoid High Pressure Fluids



⚠ WARNING: Escaping Fluid Hazard

Escaping fluid under pressure can penetrate the skin, causing serious injury.

1. Make sure all hydraulic fluid connections are tight and all hydraulic hoses and lines are in good condition before applying pressure to the system.
2. Avoid the hazard by relieving pressure before disconnecting hydraulic lines or performing any work on the system.
3. Wear protective gloves and safety glasses or goggles when working with hydraulic systems.
4. Escaping fluid under pressure can penetrate the skin causing serious injury.
5. Use a piece of paper or cardboard, NOT BODY PARTS, to check for suspected leaks.
6. DO NOT DELAY. If an accident occurs, seek immediate medical assistance from a physician familiar with this type of injury. Any fluid injected into the skin or eyes must be treated within a few hours or gangrene can result.
7. Hydraulic System repairs should be completed by a trained professional. Compromising a closed hydraulic system can cause serious injury or death.

■ Tire Safety

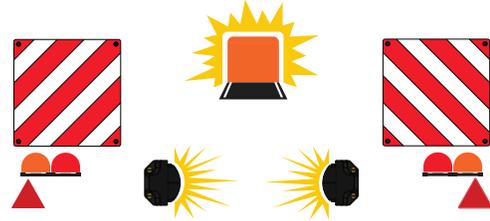


📖 NOTE: Use Correct Tire Changing Tools

Tire changing can be dangerous and must be performed by trained personnel using correct tools and equipment.

1. When inflating tires, use a clip-on chuck and extension hose long enough for you to stand to one side—not in front of or over tire assembly. Use a safety cage if available.
2. When removing and installing wheels, use wheel-handling equipment adequate for weight involved.

■ Use Safety Lights and Devices

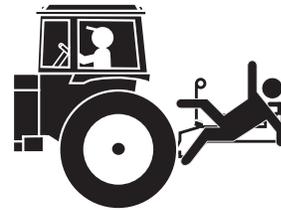


📖 NOTE: Always Use Safety Lighting

Slow-moving tractors and towed machinery can create a hazard when driven on public roads. They are difficult to see, especially at night.

1. If equipped, use flashing warning lights and turn signals whenever driving on public roads.
2. Use safety devices provided with implement.
3. Keep safety lights and signs clean and visible from rear of the machine.

■ Keep Riders Off Machinery



⚠ WARNING: Do Not Ride Machinery

Riders obstruct the operator's view. Riders could be struck by foreign objects or thrown from the machine.

1. Never carry riders or use machinery as a personal lift.
2. Riders obstruct the operators view.
3. Riders can be struck by foreign objects or thrown from the machine.
4. Never allow children to operate equipment.
5. Keep all bystanders away from machine during operation.

■ Transport Machinery Safely



📖 NOTE: Maximum Transport Speed

Maximum Transport speed for implement is 30 kph (20 mph). Some rough terrains require a slower speed. Sudden braking can cause a towed load to swerve and upset.

📖 NOTE: Empty Implement Prior to Transport

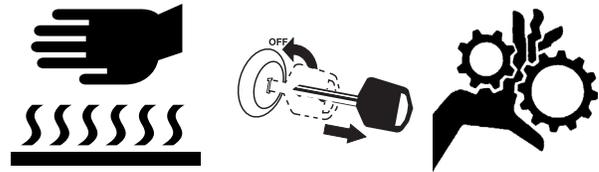
Before towing implement on roads, make sure to empty out all material from the hoppers.

1. Comply with state and local laws.
2. Carry reflectors or flags to mark machinery in case of breakdown on the road.
3. Keep clear of overhead power lines and other obstructions when transporting.
4. Do not fold or unfold the implement while the tractor is moving.
5. Do not tow an implement that, when fully loaded, weighs more than 1.5 times the weight of towing vehicle.
6. Turning tractor too tight can cause implement to tip over.
7. When towing on a trailer, secure implement with tie downs and chains.
8. When towing on a trailer, sudden braking can cause a trailer to swerve and upset. Reduce speed if trailer is not equipped with brakes.

■ Shutdown and Storage

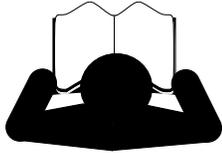
1. Park the tractor and implement on a solid, level surface where children normally do not play.
2. Fold and tilt wings then put tractor in park or set the parking brake. Turn off engine and remove switch key to prevent unauthorized starting.
3. Wait for all components to come to a complete stop before leaving the leaving the operator's seat.
4. Turn lockout valve and wing lock levers to locked position to prevent the wings from lowering.
5. Detach the tractor. Secure the implement using blocks.

■ Practice Safe Maintenance



1. Understand procedure before doing work. Use proper tools and equipment. Refer to this manual.
2. Work in a clean, dry area.
3. Lower the implement. Put tractor in Park, turn off engine. To prevent unauthorized starting, remove key before performing maintenance or service work.
4. If work must be performed with wings raised, set the wing tilt locks to the road position.
5. Make sure all moving parts have stopped and all system pressure is relieved.
6. Disconnect electronic monitor and lighting harness from the tractor before servicing or adjusting electrical systems.
7. Welding: Disconnect electronic monitor and lighting harness from the tractor. Protect hydraulic lines. Avoid fumes from heated paint.
8. Inspect all parts. Make sure parts are in good condition and installed properly.
9. Do not alter this machine in a way which will adversely affect its performance.
10. Remove buildup of grease, oil or debris.
11. Remove all tools and unused parts from implement before operation.

■ Safety At All Times



NOTE: Read Operator Manual

Thoroughly read and understand the instructions in this manual before operation. Read all instructions noted on the safety decals.

NOTE: Do Not Use Untrained Operators

Do not allow anyone to operate this equipment who has not fully read and comprehended this manual and who has not been properly trained in the safe operation of the equipment.

1. The operator must not use drugs or alcohol as they can change the alertness or coordination of that person while operating equipment. If over-the-counter drugs are used, seek medical advice on whether you can safely operate equipment.
2. Operator must be familiar with all functions of the tractor and attachments, and be able to handle emergencies quickly.
3. Make sure all guards and shields are in place and secured before operating the implement.
4. Keep all bystanders away from equipment and work area.
5. Operator must start tractor and operate controls from the driver's seat only, never from the ground.
6. Dismounting from a moving tractor can cause serious injury or death.
7. Be familiar with all functions of the implement.
8. Do not leave implement unattended with tractor engine running.
9. Do not stand between the tractor and the implement during hitching.
10. Watch out for wires, trees, etc., when folding and raising the implement.
11. Turning tractor too tight can cause hitched implement to ride up on wheels. This can result in injury or equipment damage.

■ Handle Chemicals Properly



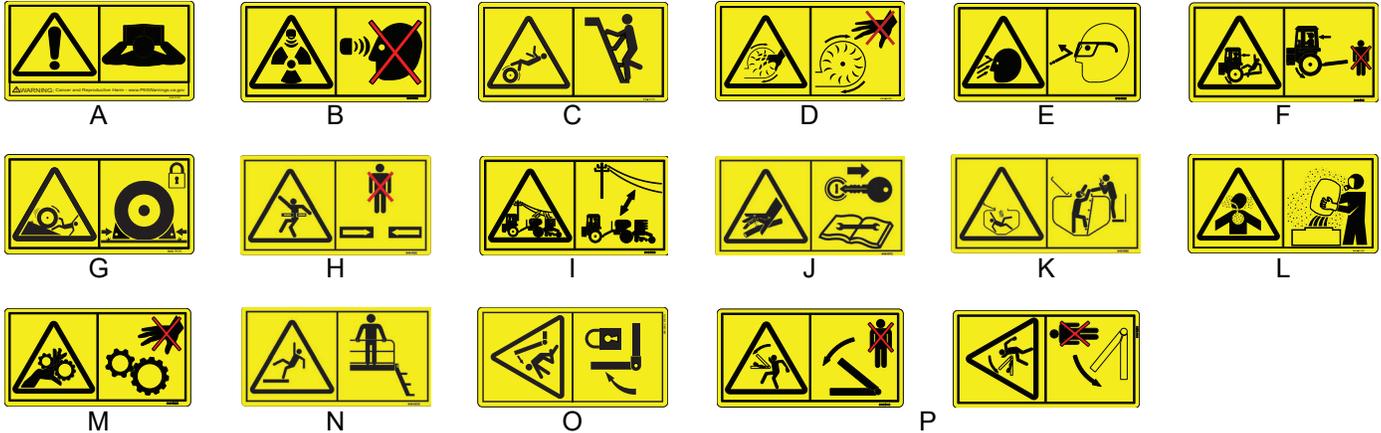
Warning: Chemical Exposure Hazard

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

1. Read and follow chemical supplier instructions.
2. Wear protective clothing.
3. Handle all chemicals with care.
4. Agricultural chemicals can be dangerous. Improper use can seriously injure persons, animals, plants, soil, and property.
5. Inhaling smoke from any type of chemical fire is a serious health hazard.
6. Store or dispose of unused chemicals as specified by the chemical manufacturer.
7. If chemical is swallowed, carefully follow the chemical manufacturer's recommendations and consult with a doctor.
8. If persons are exposed to a chemical in a way that could affect their health, consult a doctor immediately with the chemical label or container in hand. Any delay could cause serious illness or death.
9. Dispose of empty chemical containers properly. By law rinsing of the used chemical container must be repeated three times. Puncture the container to prevent future use. An alternative is to jet-rinse or pressure rinse the container.
10. Wash hands and face before eating after working with chemicals. Shower as soon as application is completed for the day.
11. Apply only with acceptable wind conditions. Wind speed must be below 5 mph. Make sure wind drift of chemicals will not affect any surrounding land, people or animals.
12. Never wash out a hopper within 100 feet (30 m) of any freshwater source or in a car wash.

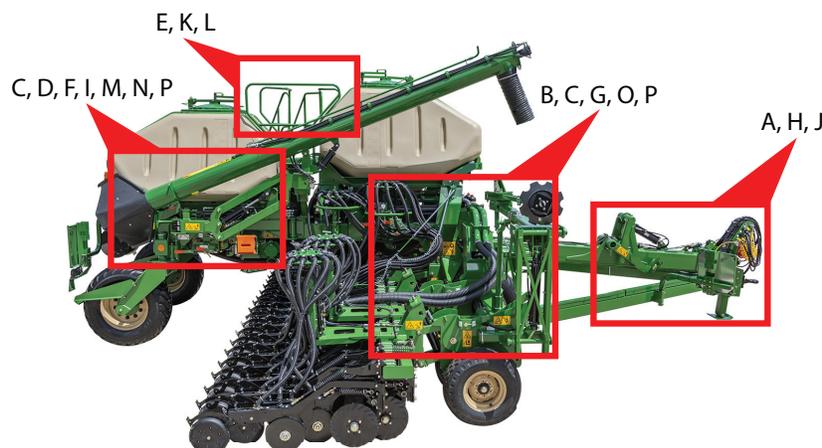
Safety Decals

Carefully read decal instructions until fully understood. Learn safe operation as part of operating drill correctly. If misused, heavy machinery is dangerous. Exercise extreme caution!



- A. **848-512C** - Carefully read all instructions and understand their meaning for machine and any installed options.
- B. **848-506C** - Avoid long exposure to radar radiation by not placing head directly underneath the machine.
- C. **848-507C** - Never climb onto the wheels of the machine. Use the provided ladder instead.
- D. **848-508C** - Do not operate or work with machine while fan is moving and exposed.
- E. **848-510C** - Avoid high pressure fluids contacting eyes by wearing safety goggles.
- F. **848-511C** - Do not operate and move tractor with someone working on or directly behind tractor hitch.
- G. **848-757C** - If no brake option is installed, use chock blocks to keep machine from moving while parked.
- H. **848-513C** - Avoid crushing hazard by not standing between folding parts or between hitches while tractor is moving.
- I. **848-516C** - To avoid electrocution, do not drive machine directly underneath low overhanging power wires.
- J. **848-517C** - Do not pull on or handle hydraulic hoses while machine is operating.
- K. **848-519C** - Avoid working in confined spaces on the machine without assistance.
- L. **848-520C** - Never work with chemicals without protective face covering to avoid inhalation of fumes and particles.
- M. **848-522C** - Do not stick hands into any moving parts on the machine while in use.
- N. **848-527C** - Always use handrail while on top of the machine to reduce risk of falling injury.
- O. **848-530C** - Always use wing lock when wings are not in use to avoid wings unexpectedly falling.
- P. **848-514C & 848-525C** - Avoid crushing hazard of wings folding by not standing between wings during operation.

Locations of Safety Decals



Adjustments

This section prepares your implement and tractor for use and covers tasks that need to be done for new machines, seasonally, or when the tractor/implement configuration changes.

Before using the implement in the field, you must hitch it to a suitable tractor, inspect systems, and level the machine. Before using implement for the first time and periodically thereafter, certain adjustments and calibrations are required.

Hitching Connection

The Spartan II has a hitch option for each different model. Make sure that your tractor has the necessary hitch for your implement model. Refer to the table to the right to determine the appropriate hitch you need.

WARNING: Crushing Hazard

Do not stand or place any part of your body between drill and moving tractor. You may be severely injured or killed by being crushed between the tractor and drill. Stop tractor engine and set park brake before installing the hitch pin.

1. Move the selector valve to the jack operating position as shown on the decal. Use tractor hydraulics to raise or lower the hydraulic jack until hitch is aligned with the tractor drawbar and then connect.
2. Plug drill electrical lead into the tractor seven-pin connector, and plug monitor cable into the iso plug connector. If your tractor is not equipped with a seven-pin or iso connector, contact your dealer for installation.
3. Connect all hydraulic and brake hoses to tractor ports.

NOTICE: Serious Machine Damage Risk

Make sure that caster locks are not engaged when operating machine in the field. Serious damage can be done to the implement if attempting to steer the implement side-to-side with caster locks engaged.

Electrical Hookup

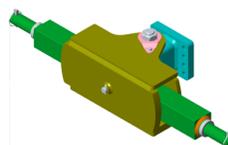
Make sure tractor is shut down with accessory power off before making connections.

Mate the following connections: lighting connector to tractor outlet, monitor connector to tractor harness, and any optional or after-market electrical connectors.

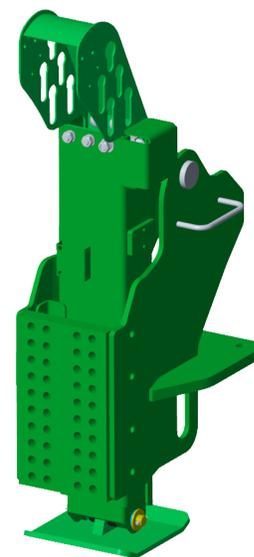
Make connections prior to air drill movement. Some drill hydraulic circuits are under monitor control.



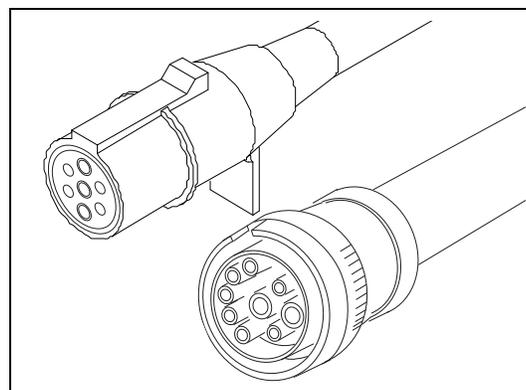
Pintle Hitch



Two-Point Hitch



Spartan ^{II} Model(s)	Appropriate Tractor Hitch
807, 907, & 1007	Pintle Hitch
1207 Models Only	Two-Point Hitch



Hydraulic Hose Connection

⚠ WARNING: High Pressure Fluid Hazard

Only trained personnel should work on system hydraulics. Relieve pressure before disconnecting hydraulic lines. Escaping fluid under pressure can have sufficient pressure to penetrate the skin causing serious injury. Use a piece of paper or cardboard, NOT BODY PARTS, to check for leaks. Wear protective gloves and safety glasses or goggles when working with hydraulic systems. If an accident occurs, seek immediate medical attention from a physician familiar with this type of injury.

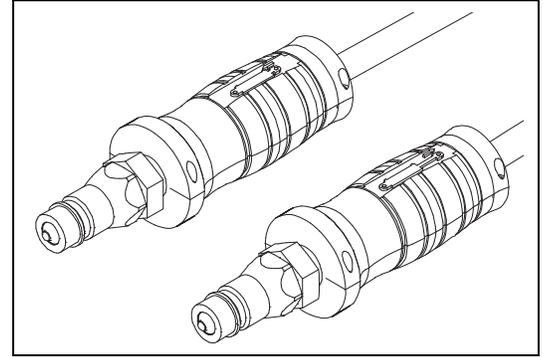
Hydraulic hoses have color coded handle grips to help you hookup hoses to your tractor outlets. Hoses that go to the same remote valve are marked with the same color.

To distinguish hoses on the same hydraulic circuit, refer to the symbol molded into the handle grip. Hoses with an extended-cylinder symbol feed cylinder base ends. Hoses with a retracted-cylinder symbol feed cylinder rod ends.

Hydraulic Hose Installation

Make sure all tractor levers are in neutral or float, or tractor hydraulics are off, before making connections.

1. Shut down tractor hydraulics.
2. Connect the case drain hydraulic hose then the motor return hydraulic hose to the tractor.
3. Connect the green circuit's retract hose then green circuit's extend hose. Repeat for remaining blue, yellow, and black circuits.
4. Check hose routing to ensure adequate slack and clearance from pinching or damaging the tractor and its components.



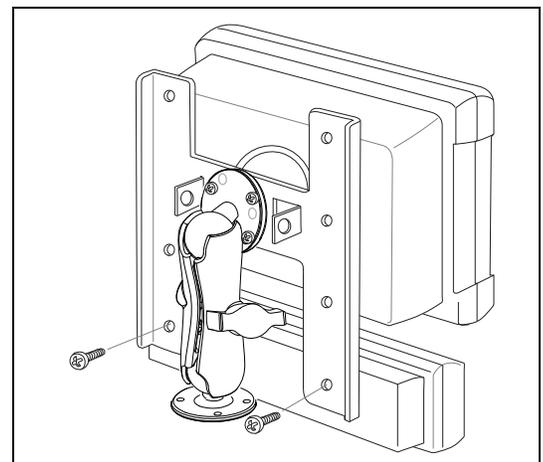
Color	Hydraulic Function
Unmarked large hose	Motor Return
Unmarked small hose	Case Drain
Yellow	Fold, Tilt, Transport Hook, Markers (Option)
Blue	Lift
Green	Meters
Black	Fan Pressure, Auger (Option)

Console Installation

Attach the control console securely into the supplied swivel bracket using the four 10-32 screws on the rear of the console. Make sure to install the console so it is within the driver's field of vision when driving the tractor forward.

You or your dealer must provide the mounting holes for the screws. Your dealer may have alternate suction cup or clamping brackets available if you prefer to avoid drilling holes.

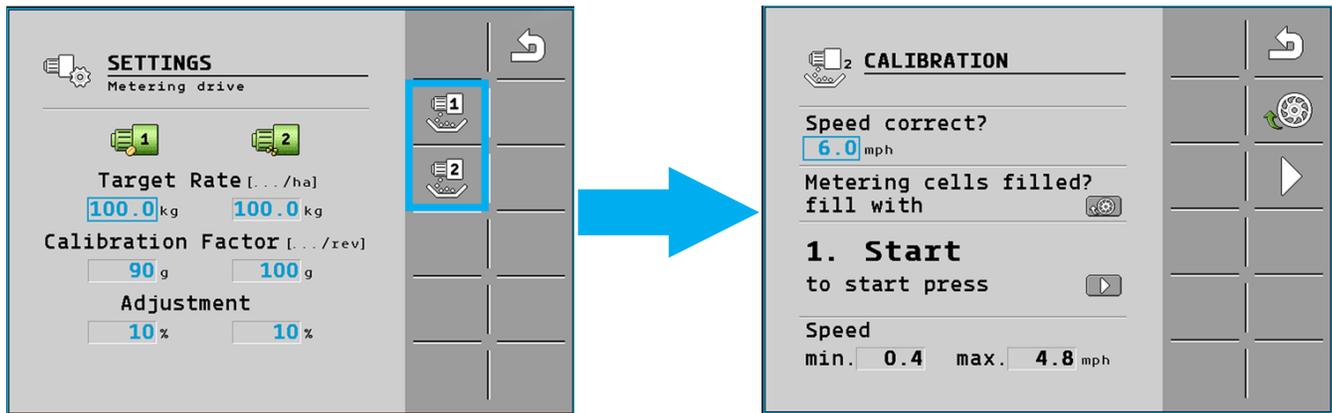
Refer to the included DrillCommand guide for terminal operation.



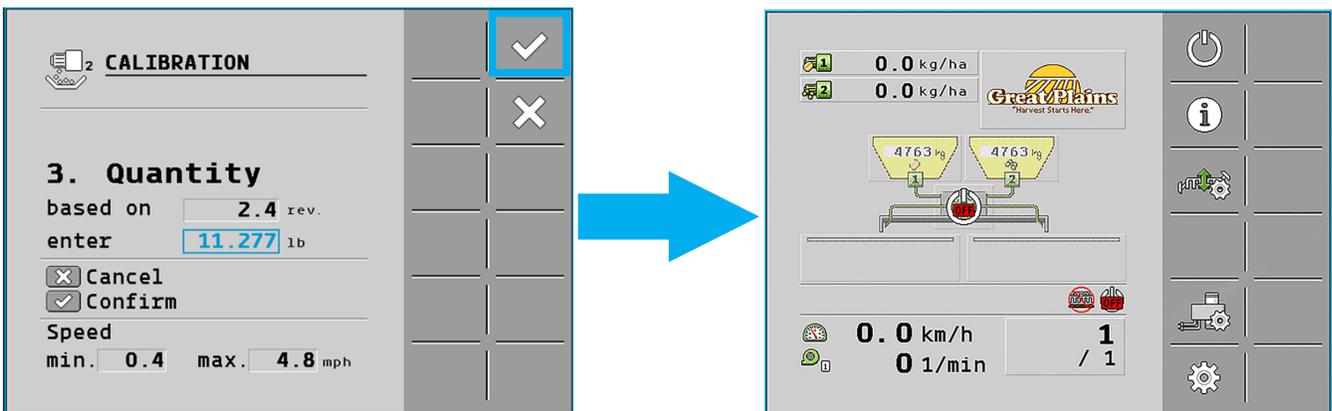
Material Rate Calibration

Calibration is essential for accurate application. You should perform calibration when using the drill for the first time, at the beginning of each season, or when changing material, meter gearing, or metering roller.

1. In DrillCommand, go to 'Meter Settings' and select field underneath 'Target Rate.' Enter your target rate, then enter the initial calibration factor. For more information on which initial calibration factor to use, see **"Planting Rate Information"** on page 40. Tap meter calibration to begin the corresponding hopper's calibration routine. Enter your desired travel speed. Tap perform revolution to run one test revolution. Tap start ► then exit the tractor cab and locate the calibration bag and scale and remove from the drill.



2. Hang the scale on the hook provided. Hang an empty bucket onto the scale and zero the scale. Attach or slide the calibration bag underneath the meter being tested.
3. Press and hold the red test button until a reasonable sample has been collected. Remove the calibration bag from the underneath meter, pour contents into bucket and weigh. Make a record of the weight.
4. Once the calibration button is released, a calibration confirmation screen will appear. Enter calibration weight. Then, if the speed range fully encompasses your desired travel speed, tap ✓ to confirm your calibration settings. If the results are not what you need and/or you don't want to enter the values manually, tap ✕ to cancel the settings and start a new calibration run.



5. Once calibration is complete, return to the home screen by using the ↶ icon. When you are on the home screen, lower the drill's hydraulics and turn on the fan. Ensure that the hopper lid is closed. Then tap ⏻ to turn on the drill.

Weight Transfer Adjustment

In conventional conditions, you may require no weight transfer. In challenging conditions, adjust the weight transfer to achieve consistent planting depth while keeping the wings level with the center section.

⚠ DANGER: Crushing and High Pressure Fluid Hazards

This adjustment requires working near the unfolded and lowered drill with the hydraulic system active. Assign two people to this task, one in the tractor cab, ready to shut the tractor down on hand signal from adjuster or any unplanned event.

1. Unfold (page 17) and lower drill (page 19). Park tractor and set parking brake.
2. Engage the meter's hydraulic circuit. Tap the monitor's metering icon.
3. Release lock disk. Adjust knob clockwise to increase weight transfer, and counterclockwise to reduce weight transfer. The recommended weight transfer pressure ranges for drilling are 70 to 170 bar (1000 to 2400 psi). Once pressure is set, secure knobs with lock disks.



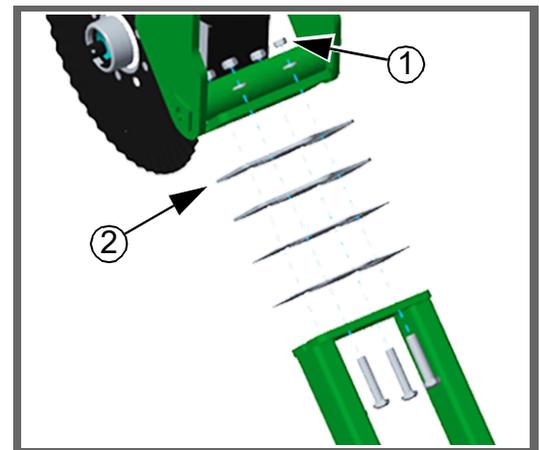
Sub-Frame Adjustment

The sub-frame is assembled with shims for normal conditions and requires no adjustment for operation. However, you can increase or decrease pressure by removing or adding shims. Additional shims are stored on the left-hand side of machine.

ⓘ NOTICE: Keep Adjustments Equal

When adding or removing shims, always make the same adjustments to both parallel arm connections.

1. Unfold wings and lower rows to ground. Shut off tractor.
2. At each shim site, loosen, but do not remove, four nuts (1) at shim end of lower parallel arm.
3. Use the top holes in the shim stack to remove or re-insert shims (2). Re-tighten nuts (1).



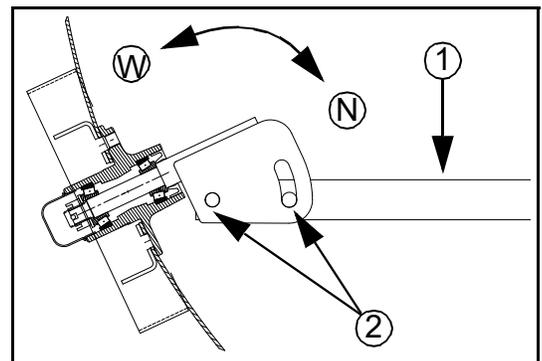
Marker Adjustment

To change angle of cut, and the width of the mark, loosen $\frac{1}{2}$ inch bolts (2) holding the disk assembly. For a wider mark (W), increase the angle of the marker with respect to the tube (1). For a narrower mark (N), reduce the angle. Tighten bolts (2).

Direction of Cut

To have the marker throw dirt out, invert the disk on the spindle, and invert the disk assembly.

Be sure to set angle only wide enough to make a visible mark in the soil. If the cut is too deep, it can affect the crop emergence in the area.



Row Unit Adjustment

Row unit springs normally require no adjustment. In some unusual conditions, rows in tire tracks may need a heavier setting by tightening the spring tension.

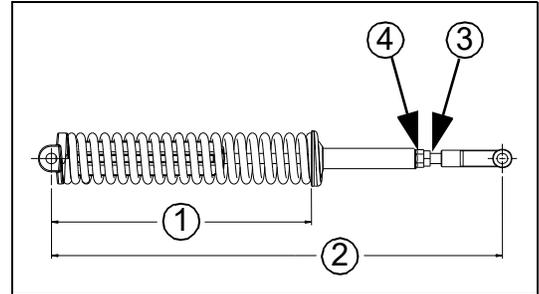
⚠ CAUTION: Compressive Spring Damage

Do not tighten spring to a total length shorter than 29.8cm (11³/₄"in). Overtightening may contribute to premature parts failure.

1. Make adjustments with the wings unfolded and the rows lifted off the ground, so that the springs are at full extension.
2. Loosen the jam nut ③. Rotate the adjuster nut ④. Shorten spring to increase down-force; lengthen spring to reduce down-force.

For each turn of adjuster nut, the down force at opener disk changes by approximately 1.7 kg/turn (3.7 lbs/turn).

3. Re-tighten jam nut after setting force.



Factory Setting Lengths

① Spring length	32.4 cm (12 ³ / ₄ in)
② Assembly length	56.2 cm (22 ¹ / ₈ in)

Disk Blade Adjustments

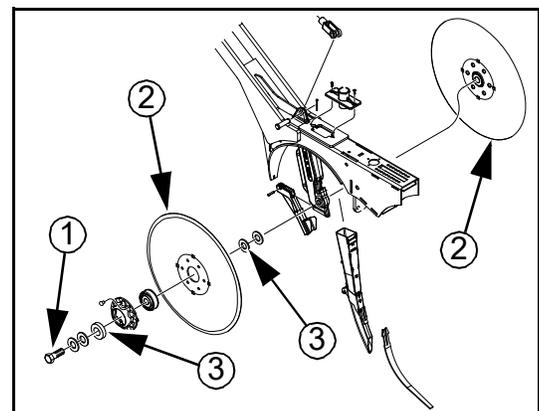
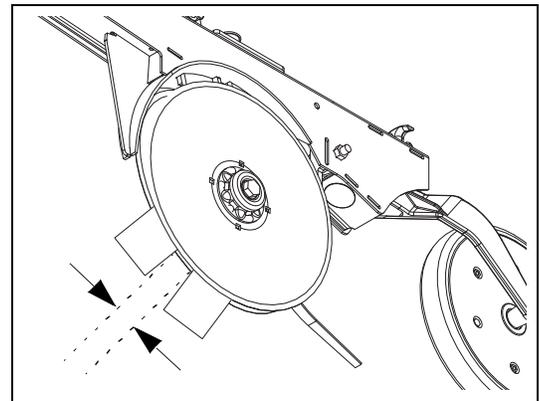
Disk spacing will need adjustment from day-to-day wear, and spacers need resetting when blades are replaced.

The ideal spacing causes the blades to be in contact for about 25mm. The gap between blades should be 0 to 0-4.4cm. If the contact area is significantly different or there is no contact at all, adjust contact by moving one or more spacer washers. If contact area varies with blade rotation, one or both blades are likely bent and in need to replacement.

ⓘ NOTICE: Fold Wings

Before making any adjustments, fold machine's wings.

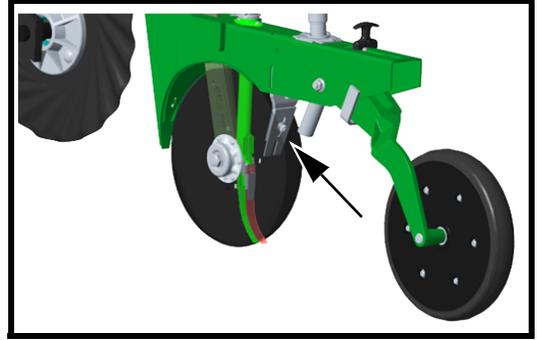
1. Remove the bolt (1) retaining the opener disk on one side. Carefully remove the blade (2), noting how many spacers (3) are outside the disk and how many are inside the disk. Do not lose the hub components and spacers.
2. To reduce the spacing between the disks (the normal case), move one spacer washer from the inside to the outside.
3. Re-assemble and check disk contact.



Disk Scraper Adjustment

Disk scrapers come standard on all models. To keep opener disks turning freely, dirt scrapers are mounted between disks to clean as disks rotate.

As field conditions vary, scrapers may need to be adjusted. In damp conditions, lower scrapers. If openers are not turning freely, raise scrapers. To adjust, loosen bolt and move scraper as needed.



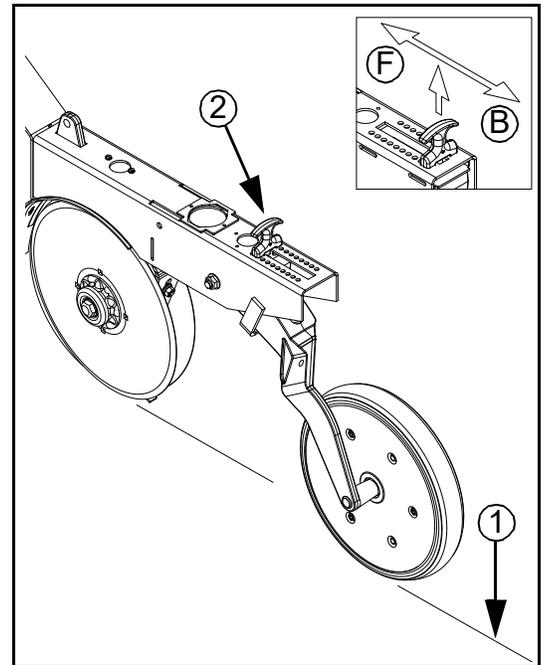
Press Wheel Adjustment

Each seed opener has a press wheel that controls seeding depth by pressing firmly down upon the seed and soil. The press wheels also close the seed trench and gently press soil over seeds during planting. To set the seeding depth (1), adjust the press-wheel height (2) on each opener.

To adjust, first raise openers slightly, then lift and slide T handles (2) on top of openers. Adjust all press wheels to the same height.

- For more shallow seeding, slide T handles forward (F) toward implement.
- For deeper seeding, slide T handles backward (B) away from implement.

If press wheels are lifting off the ground, increase hydraulic down pressure. If press wheels are digging into the ground, reduce hydraulic down pressure.



Options

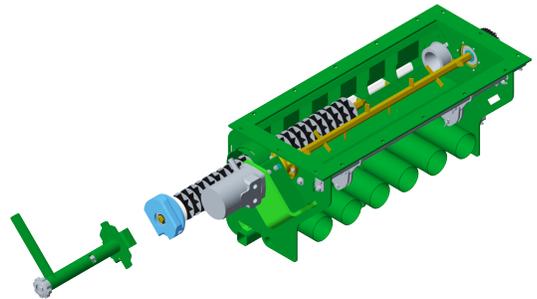
Alternative Meter Flutes

There are five meter shaft assemblies that come standard with all Spartan^{II} drills: a small seeds shaft, a pair of four star shafts, and a pair of two star shafts. The pair of two star shafts are installed in the meter boxes by default. **When using fertilizer, always use one of the four star shafts for the fertilizer meter box.**

To install a set of shafts (or re-install the standard shafts), start with the front meter. Save all parts for re-use. Hopper must be empty before proceeding. See **Unloading** on page 23.

For more information on when to replace star shafts with a different one, see **“Planting Rate Information”** on page 40.

1. Turn the seed shaft's extension handle and pull the handle outward to free the metering shaft. Separate metering shaft from handle casing and store inside the rear toolbox.
2. Slot new metering shaft onto extension casing and push in on the extension knob to engage. Slide entire assembly into the seed box. If the end of the metering shaft does not fully enter seed box housing, turn extension knob while pushing shaft into housing until metering shaft is secure.



Brake Connections

Air and hydraulic brake (trailer braking) systems are available for this drill. In both systems, the tractor's trailer brake system actuates the brakes on the drill. Tractor trailer braking systems are normally integrated with the tractor brakes and operate the trailer brakes when tractor brakes are used.

■ Air Brakes

1. Locate the button for the shunt valve on the left-hand side of the machine near the ladder. Make sure the button is pulled all the way out.
2. Inspect yellow and red palm couplings (1) before connecting. Clean elastomer seal surfaces and inlet ports.
3. Connect the yellow palm coupling. Once yellow coded brake line is attached, connect the red palm coupling.
4. Pull the ring on the bottom of the air reservoir to open drain valve. Drain any water from air reservoir. Release the ring to close the drain valve.



Fan Adjustment

All three fan hydraulic lines must be properly connected. See **Hydraulic Hose Connection** on page 8.

Use tractor remote hydraulic valve flow control to set fan speed. Start with flow on low setting. 30-45 liters/min (8-12 gpm) is average flow. Watch the seed monitor's fan RPM and adjust fan speed as necessary by increasing or decreasing hydraulic flow from the tractor.

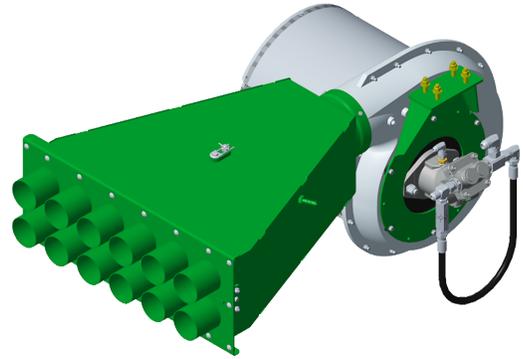
For more information on configuring your fan speed settings, refer to your DrillCommand User Guide.

⚠ **NOTICE: Check for Air Leaks**

Check bin-lid and meter-box seals for air leaks. Adjust the latch or replace the seals to prevent any leakage.

📖 **NOTE: Reduce Fan Speed**

Watch for excessive seed cracking and seed bounce from the furrow, then reduce fan speed as necessary.



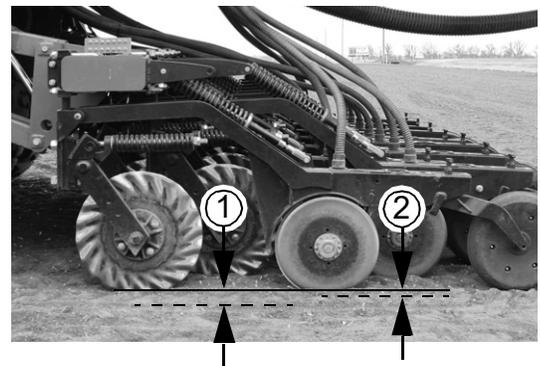
Recommended Fan Speeds

Seed / Fertilizer	Fan RPM
Sunflowers	2250 - 3000
Wheat	3250 - 4500
Soybeans	2750 - 3500
Milo	3250 - 4000
Dry Fertilizer	3500 - 4500

Frame-Mounted Disc Blades

Frame-mounted coulters are used “in row” and not “zone”. They are intended to prepare the soil directly ahead of the seed furrow. The factory setting, with fresh coultur blades, is a coultur depth of 6.4cm (2.5in).

Be sure to check actual seeding results while planting. Replace coultur blades when their diameter is worn to less than 40cm (15³/₄in).



Tramline Motors

⚠ **NOTICE: Tramline Creation**

Before installing motors, close all implement openers from your terminal. This will ensure that tramlines are made uniformly.

Tramlines are controlled via the in-cab terminal's DrillCommand software. In addition to your terminal and Spartan II software, you must fit your machine with tramline motors that will shut off the flow of seed to the desired openers.

To make changes to tramline patterns, locate the desired opener numbers on the back of your machine. Follow the seed hose to the corresponding tower port and attach a motor underneath each valve needed for tramlines. Secure each motor using the four bolts supplied. Remove any pre-existing motors from opener valves and install motors to valves necessary to create the desired tramline patterns.

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.

Operation

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

Pre-Start Checklist

Perform the following steps before transporting the Spartan^{II} air drill to the field.

- Review **Safety Information** on page 2.
- Lubricate as indicated at **Lubrication** on page 35.
- Check all tires for proper inflation. See **Tire Maintenance** on page 33.
- Check all bolts, pins, and fasteners. Torque as shown in **Torque Values Chart** on page 42.
- Check air drill for worn or damaged parts. Repair or replace parts before going to the field.
- Check hydraulic hoses, fittings, and cylinders for leaks. Repair or replace before going to the field.

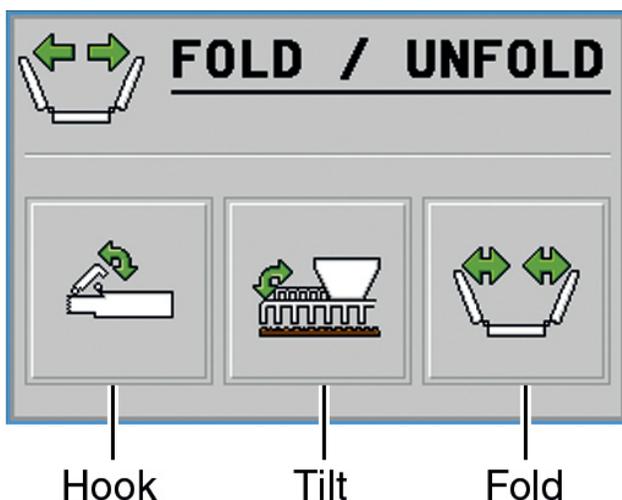
NOTICE: Serious Machine Damage Risk

Make sure that caster locks are not engaged when operating machine in the field. Serious damage can be done to the implement if attempting to steer the implement side-to-side with caster locks engaged.

DrillCommand Terminal Overview

Your machine is operated by using the DrillCommand software through your tractor terminal. DrillCommand controls, regulates, and monitors the functions of your drill.

DrillCommand's folding, unfolding, tilt, and transport hook functions are covered in this manual. They are accessed by tapping on the fold icon (seen right) and selecting a function from the following window.



For all other operations of your machine, refer to your DrillCommand User Guide for a Quick Start guide to get started quickly and easily with your machine.

For more information on how to determine your machine's initial calibration factor, see "**Planting Rate Information**" on page 40.

Folding/Unfolding Wings

■ Folding/Unfolding Safety Information

ⓘ NOTICE: General Information

- ! To prevent machine damage, do not unfold with openers lowered.
- ! Remove safety blankets from each wing and store out of the way.

⚠ WARNING: Pinch Point / Crushing Hazards

- ! Keep people away from the drill and tractor during unfolding. The distance between the tractor and the drill structure decreases by 3.2m (7.5ft) during unfolding. Drill, tractor, or both will move during this operation. Wings will tilt down and swing out. Risks include:
- ! Pinching or crushing at pivot points and at multiple sites in pivoting assemblies. Stay clear of the wing sweep arcs. Coulters and row openers are sharp.
- ! Crushing under lowering/moving wing wheels, under moving transport wheels, under lowering wings or under lowering openers.

⚠ CAUTION: General Safety

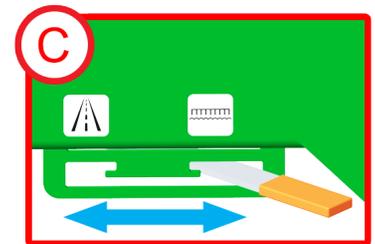
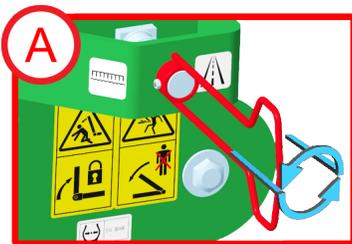
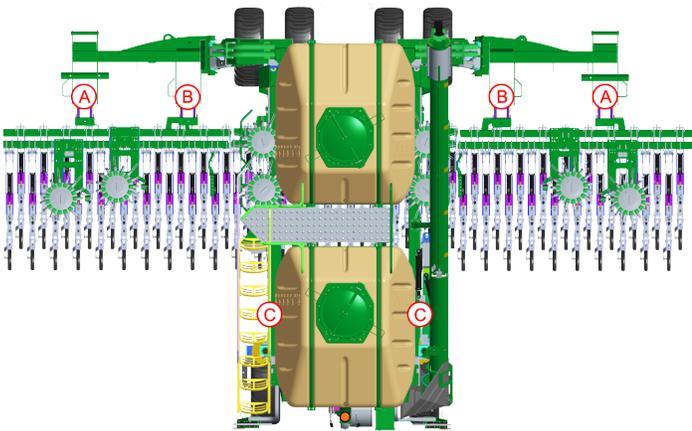
- ! Do not use tires as steps or platforms. Wing gauge wheel tires are off the ground in transport lift. Front and rear main transport tires can be lifted and free to spin on uneven ground and at some weight-transfer and row down-force settings.
- ! Unfold only with markers resting in transport cradles.
- ! Unfold only if hydraulic movements are smooth and the tractor's hydraulic oil reservoir is filled with hydraulic oil.

⚠ DANGER: Roll-Away Hazard

- Unfold only on hard level ground. Allow ample room. Drill, tractor, or both must be free to move during unfolding. On a slope, roll away could occur, causing an accident resulting in death, serious injury and substantial property damage.

Folding / Unfolding Instructions

Before folding / unfolding the machine, make sure markers, auger, and ladder are secured in transport positions. Raise openers and check that the transport hooks' hydraulic cylinders are fully retracted. For more information on DrillCommand, refer to **DrillCommand Terminal Overview** on page 16.

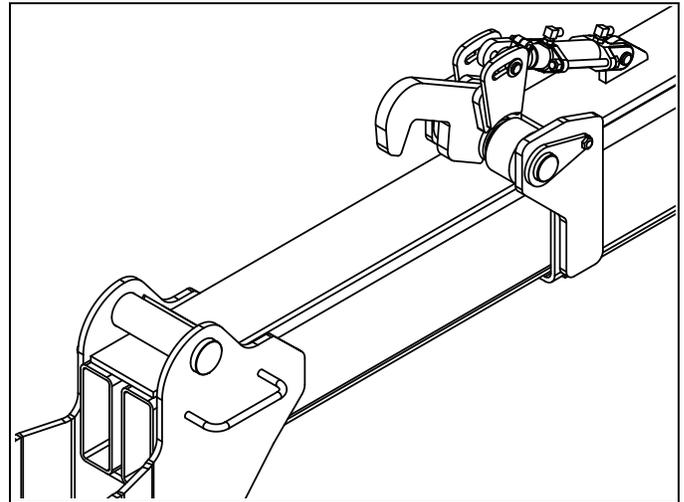
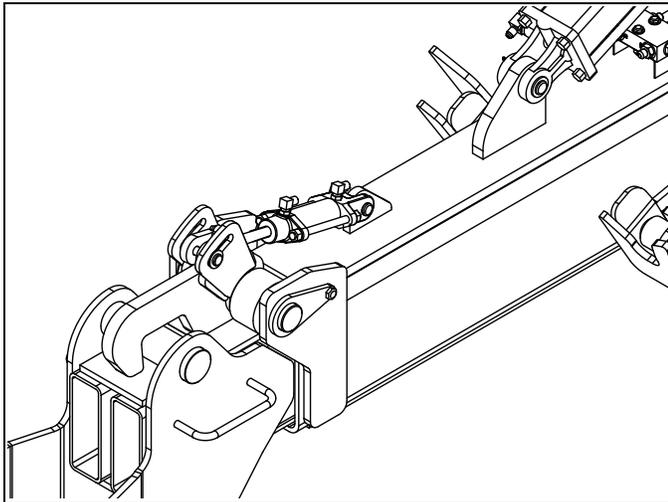


■ Folding

1. Reconfigure all six locks to **ROAD** setting. For locks on outer wing ends (A), pull handles outward then rotate the handle 180° with arrow pointing towards front of machine. For wing locks closer to the center of the machine (B), pull handles outward and swing pivoting foot inward so the tip of the pin points towards the road decal. Use the pivoting foot to keep lock in retracted position during folding.
2. In DrillCommand's main menu, tap on the fold/unfold icon and enable fold. Activate the fold circuit to fold wings up.
3. In DrillCommand's main menu, tap on the fold/unfold icon and enable tilt. Initiate tilt-up by extending the tilt cylinders. Observe the tilt-up operation. When movement stops, end cylinder extension.
4. In DrillCommand's main menu, tap on the fold/unfold icon and enable hook. Extend the transport hook cylinder. When cylinder is fully extended, set circuit to Neutral.

■ Unfolding

1. Reconfigure outer wing (A) and center frame (C) locks to **FIELD** setting. For locks on the outer wing ends (A), pull handles outward then rotate the handle 180° with arrow pointing towards the field decal.
2. In DrillCommand main menu, tap on the fold/unfold icon and enable tilt. Initiate tilt-up by extending the tilt cylinders. Observe the tilt-up operation. When movement stops, end cylinder extension.
3. In DrillCommand main menu, tap on the fold/unfold icon and enable hook. Extend the transport hook cylinder. When cylinder is fully extended, set circuit to Neutral.
4. In DrillCommand main menu, tap on the fold/unfold icon and enable fold. Activate the fold circuit to fold wings up. Tap on the fold/unfold icon to disable.



Transport hook configurations when in the folded (left) and unfolded (right) positions.

Lowering/Raising Openers

- ! The air drill *must* be raised for folding and unfolding. Always raise the air drill for any reverse/backing operations.
- ! On tractors with electronic timer controls for hydraulic circuits, set lift timers to no more than 2 seconds longer than needed.

■ Lowering/Raising

1. Activate dedicated lift circuit (normally Retract for lowering openers and Extend for raising openers).
2. Set circuit to Neutral to leave openers in the lowered position.

Ladder

The ladder on the mainframe's left-hand side provides access to the walk board for loading and routine lid/hopper maintenance. This ladder pivots diagonally, and is held in position by a spring-loaded hook.

📖 NOTE: Proper Ladder Usage

Ladder use is easiest and least obstructed when drill wings are folded (page 17). Ladder may be lowered, used and raised with wings unfolded, but lowest ladder step may strike lowered openers, and will strike raised openers.

■ Deploying Ladder

1. Use one hand to grab the ladder while pulling orange lever handle (1) down to release. Pull ladder out by lifting up and out and then release lever handle.
2. Carefully swing ladder down and out until the ladder's outer frame aligns with the walkway slot and lower the ladder into the slot until ladder is secure.

📖 NOTE: Properly Secure Ladder

If the ladder is not seated in the slot properly and moved too far out, ladder rung may become caught on openers.



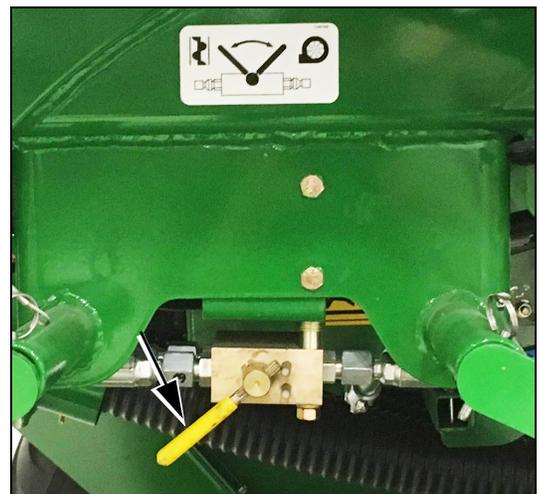
Fan

1. Check the fan/auger selector valve is set to FAN. This valve is located inside the right rear of the mainframe.
2. With the tractor engine at low rpm, slowly Extend the lever for the circuit. Bring the fan up to recommended speed. Let the fan warm up for 15 minutes before planting.

⚠️ CAUTION: Avoid Fan Damage

Always engage the fan with the tractor at a low engine speed. Engaging the fan when the tractor is at high speed may cause fan damage. Do not reverse hydraulic flow with the fan running.

3. At the end of application, raise openers and stop material flow before shutting off the fan.
4. Shut off the fan by carefully moving the circuit lever to Float or Neutral. Avoid moving the lever into Retract.



Hoppers

⚠ DANGER: Entrapment and Rapid Suffocation Hazard

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 operations. Keep lid locked, closed or, during storage, locked slightly open. Store ladder to discourage access to lid area. Keep children away from drill.

- ! A hopper that is full, or merely appears full, can be an entrapment hazard. You can sink entirely into the grain, or into an oxygen-deficient void, and suffocate in a matter of seconds. Grain bridges and crusts are especially dangerous.
- ! When hazardous fumes or low oxygen levels are present, you can be quickly overcome even in an empty hopper with the lid open. There may be no odors to alert you to the hazard.

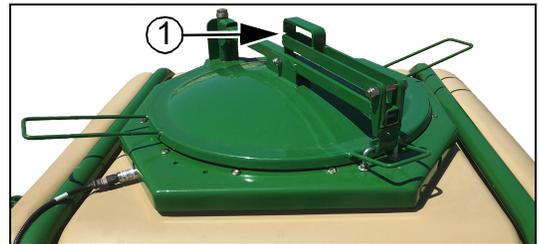
ⓘ NOTICE: Check Lid Seals

Avoid metering problems caused by air leaks. Air leaks can cause irregular metering of materials. Check lid seals for damage at frequent intervals. Check that latch closes lid tightly.

Keep lids closed for operations. Keep loosely closed for storage. Open only for material loading, hopper clean-out, and exceptional maintenance.

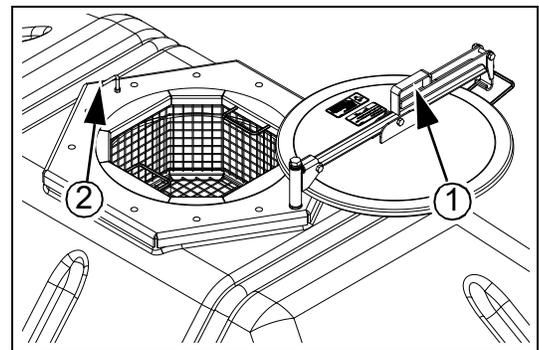
■ Lid Opening

1. Lift handle (1) and swing out until hook releases from u-bolt.
2. Move hook clear of u-bolt and re-close handle.
3. Lift lid slightly at pivot end to clear strainer (shown on next page).
4. Swing lid away from walkboard. Open only enough to accomplish the present task.



■ Lid Closing

1. Swing lid over opening until capture hook (2) is centered on U-bolt (3).
2. Open handle (1) and engage hook (2) on u-bolt (3).
3. Close handle (1) for operations or short-term parking. For long-term storage, do not engage hook or latch handle, to avoid deforming the seal.
4. For storage, a padlock deters unauthorized entry by persons unaware of possible confined space risks, and prevents entry of pests, debris and precipitation.

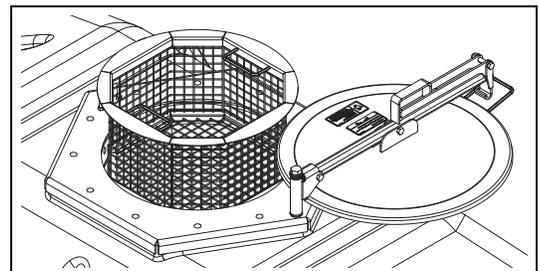


■ Strainer

Leave the strainer in place except during strainer and hopper cleaning.

Check the strainer for residue prior to each loading operation. Remove, empty and return it to the hopper afterward.

For strainer or hopper cleaning, the strainer lifts out when the lid is fully open.



Meters

Each meter box has two meter doors on the bottom: a front meter door and a rear meter door. Use the bottom meter door for calibration and the side door for clean-out. Use the decal next to each meter handle to determine its function.

The meter doors need to be closed and sealed tightly during planting and transport. Periodically inspect the levers for proper tension. Also inspect the elastomer seals for integrity and resiliency.

Meter Door Opening

■ Clean-Out

Rotate the corresponding handle up to open the meter doors and allow all material to empty out of the hopper.

■ Calibration

Rotate the corresponding handle up to open the meter doors and allow metered material to empty out of hopper.

Meter Door Closing

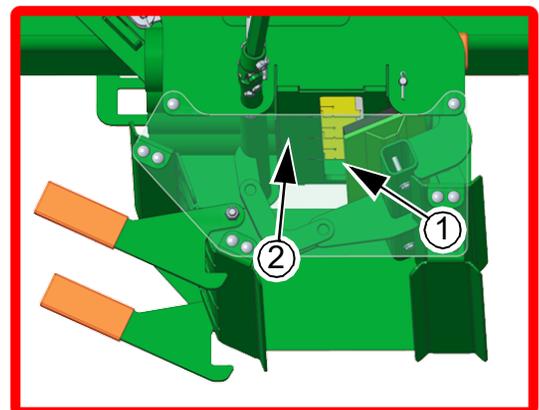
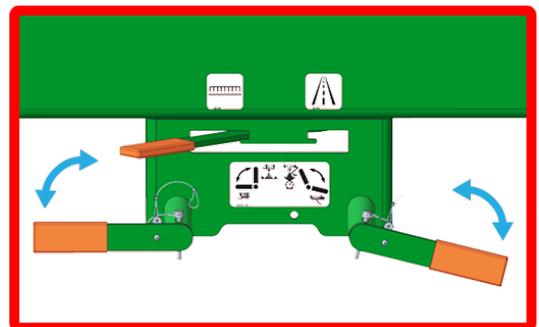
Remove unwanted material from face of elastomer seals on the meter doors (1) and meter box (2).

■ Clean-Out

Rotate the corresponding handle down to close the meter doors and stop material from flowing out of the hopper.

■ Calibration

Rotate the corresponding handle down to close the meter doors and stop material from flowing out of the hopper.



Loading & Unloading Materials

⚠ CAUTION: Chemical Hazards

Agricultural chemicals can be dangerous, including treatments on seeds and components of fertilizers. Improper use can seriously injure persons, animals, plants, soil and property.

ⓘ NOTICE: Material Loading Hazard

To avoid unnecessary cleanup of potentially hazardous materials or seed, and lessen the machine load while traveling, only load hoppers once in the field.

Loading

Securely hitch drill to a tractor with adequate weight and power. See **Tractor Requirements, Specifications and Capacities** on page 39. If a suitable tractor is not available, block multiple tires. Before loading hoppers, raise openers (page 19) and fold drill (page 17).

ⓘ NOTICE: Use Rear Hopper First

Use rear hopper for single loads. The rear hopper is easier to load and unload if materials are kept in hopper bin. If applying the same material from both hoppers, consume the front hopper first, rather than both at once.

1. At each empty hopper to be loaded, open meter clean-out door. See **Meters** on page 21. If any doors were opened, wipe seals and bottom flanges clean. Close and latch clean-out doors.
2. If the drill has been parked for more than a day, run the fan system for several minutes to blow moisture out of the meters, primary and secondary seed hoses. With the fan running, check hopper-lid and meter-box seals carefully for air leaks. Adjust bin latch or replace seals to prevent leakage.
3. Shut off all hydraulic power to the drill, and open lid of hopper to be loaded (page 20). Then check that the strainer basket is in place on top of the bin. Remove any foreign material from the basket.

■ Loading with Auger

⚠ DANGER: Rotating Auger Blades

Rotating auger. Keep loose hair, clothing, and body parts away from rotating auger. Do not remove or modify guards.

Review auger usage on page 27. If the auger is not used for material load, skip to step 9.

4. Set fan valve to the auger position. See **Fan** on page 19 for more information.
5. Before loading material in auger inlet hopper, operate auger to establish correspondence between control handle direction and auger screw direction. Swing the auger so the spout is centered over the hopper opening. Position your grain container for unloading into the auger hopper.
6. Energize tractor hydraulics for auger. Slowly turn on material flow and fill hopper. When the drill hopper is full, turn off the auger by moving the auger direction control to the center position.
7. When the drill hopper is full, reverse direction of auger to return any residual materials to hopper for recovery.
8. Shut off tractor hydraulics, or set auger/fan circuit to neutral or float. Return auger to storage/transport configuration (page 26). When circuit is off, set diverter valve to fan. See **Auger Hydraulic Controls** on page 28.

■ Loading: Close-Out

9. Remove any foreign matter from the strainer basket. Wipe any grain or foreign matter from lid-seal area on top of hopper bin. Close lids and latch securely.

Unloading

Before leaving the tractor cab, raise, fold, and hook machine (page 17). Then park and shutoff the tractor. While unloading materials from multiple hoppers on the machine, empty only one hopper at a time. For more information on opening and closing the meter doors, see **Meters** on page 21.

■ Unloading Without Auger

Front Hopper

1. Turn the diverter handle first to redirect material for clean-out. Attach sack hose to the clean-out port and route hose end to area for material. Then run the fan to blow out all loose material from the hopper and meter box. Once material stops flowing out, turn off the fan and remove the sack hose from port.
2. Cover the center frame's front openers with a tarp then open the clean-out door by turning the left-hand handle. Any remaining material will be difficult to dislodge and require being physically removed from the meter box.

Rear Hopper

1. Open calibration door first by turning the right-hand handle. Then open clean-out door by turning the left-hand handle. Expect material to flow in significant volume until the hopper is empty.
2. If unloading front hopper, and openers were not covered with a tarp, brush excess materials from openers. Move drill from collection area, recover materials, and wipe down doors and bottom of meter.

Once finished unloading both hoppers, close doors. For temporary parking or transport, fully close doors. For storage, close doors only until elastomer seals begin to touch meter housing, so that condensation can drain. Do not leave doors open wide enough for pest entry.

■ Unloading With Auger

The Spartan II auger can only unload the material from the rear hopper. For unloading the front hopper, use the **Front Hopper** steps above.

1. Shut down hydraulics or set fan / auger circuit to float or neutral. Set auger's collection hopper underneath rear hopper's meter. Position collection bin or vehicle under auger outlet.
2. Open (front) calibration door. A small amount of seed may fall into auger inlet hopper.

ⓘ **NOTICE: Hopper Material Loss**

Do not open (rear) clean-out door before auger is operating, or material may flow in large volume and overflow auger inlet hopper.

3. Activate fan/auger hydraulic circuit. Have a second person open the Clean-Out door and exit the area. As soon as the door operator is clear of the auger, operate auger controls to transfer material.

⚠ **DANGER: Rotating Auger Blades**

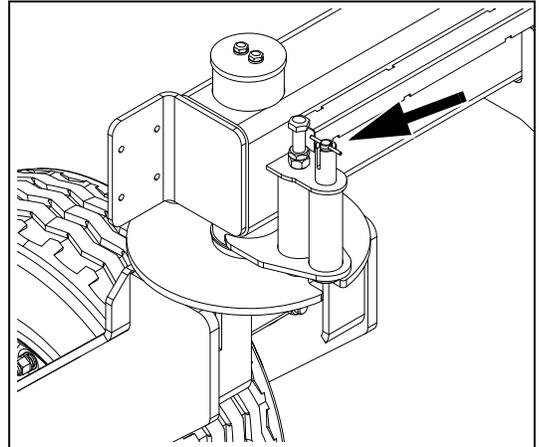
Rotating auger. Keep loose hair, clothing, and body parts away from rotating auger. Do not remove or modify guards.

4. When material stops flowing, set the auger controls to center/off. Then shut down hydraulic circuit for auger.

Flat Bed Transporting

When moving the machine onto or off of a flat bed trailer, the caster wheels can be locked so the machine can be moved in a straight line making it easier to load or unload.

A caster lock pin is located near each caster wheel pivot point.



Loading the Machine

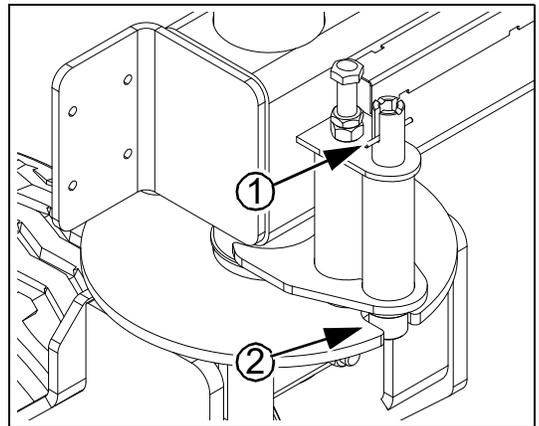
1. Line up the machine with the trailer.
2. Lift up the caster lock pin handle (1) and rotate 90°. Make sure the pin is aligned with the notch (2) in the circular plate on the caster weldment.

Once the caster lock pin is engaged, the caster will not rotate.

⚠ **NOTICE: Serious Machine Damage Risk**

Do not attempt to steer the machine side-to-side with the caster lock pin engaged. Serious damage could be done to the machine.

3. Back the machine onto the trailer and secure for transport.



Unloading the Machine

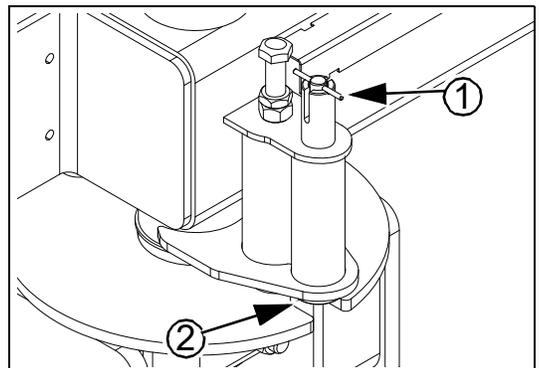
1. Before attempting to move the machine off the trailer, check to make sure the caster lock pins are fully engaged in the notches on the circular plate.
2. Hook up the tractor to the machine and carefully pull the machine off the truck.

Once the machine is on the ground, disengage the caster pivot lock pins before moving any further.

⚠ **NOTICE: Serious Machine Damage Risk**

Do not attempt to move the machine any further than just off the truck with the caster lock pins engaged. Serious damage could be done to the machine.

3. To disengage the caster lock pins, lift up on the handle (1). Rotate the handle 90°. Make sure the caster lock pin is completely out of the notch (2) on the circular plate.



Parking

Follow these steps when parking the drill for periods of less than 36 hours. For longer periods, see *Storage*, the next topic.

1. Check that hopper lids are latched and secure. See **Lid Closing** on page 20.
2. If ground is soft, place a wide block or plate under the jack to increase firm contact area.
3. Securely block drill tires to prevent jack from digging or sliding off plate. If optional brakes are installed, set parking brake.
4. Unhook electrical lines and protect with any plugs or caps provided.
5. Move valve on front of jack to jack position. Extend the jack to lessen load on the hitch.
6. Release pressure on hydraulic system, then disconnect hydraulic lines and pull all lines back onto drill tongue.

Storage

Store the drill where children do not play. If possible, store inside for longer life.

1. Unload all material in hoppers. See **Unloading** on page 23.
2. Unlatch the hopper lids 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.
3. Empty the hoppers completely. Run meter to empty completely. See **Material Rate Calibration** on page 9 for more information on operating the meter. Blow out the meters with air to remove all material.
4. Unless cleaned out at last loading or during unload above, deploy the auger, and run the motor in reverse until auger is completely empty. See **Loading & Unloading Materials** on page 22.
5. Return the auger to its cradle with the hopper in the extended storage orientation. See **Auger Operation** on page 26.
6. If equipped with optional air/hydraulic brake system, drain water from reservoir (page 32).
7. Lubricate the drill at all points listed under **Lubrication** on page 35.
8. Check all bolts, pins, fittings and hoses. Tighten, repair or replace parts as needed.
9. Check all moving parts for wear or damage. Make notes of any parts needing repair or replacement before the next season.
10. Open the meter-box doors completely to release seal pressure and allow rinse water to exit.
11. Thoroughly wash the hoppers with water to prevent corrosion from fertilizer or seed treatments.
12. Set doors to slightly open, but not wide enough for animals to enter the meters. Wire doors in place if needed. Do not store the drill with seals compressed.
13. Raise and stow the ladder, to discourage climbers.
14. Clean air drill of mud, dirt, excess oil and grease.
15. Grease exposed cylinder rods to prevent rust.
16. Use touch-up paint to cover scratches, chips and worn areas to prevent rust.

Auger Operation

Your drill's auger is hydraulically operated. Leave the tractor on while positioning and operating the auger. Take all necessary safety precautions to keep tractor from moving while auger is in use.

DANGER: Rotating Blades

Keep hands, feet, hair, and clothing away from rotating auger. Do not remove or modify any guards. Keep children well clear of work area.

WARNING: Unsupported Weight

If auger tube contains material or one auger end contains more material than the other, auger will become imbalanced and tip down without warning. Use all pins and latches provided and retain a firm grip on the auger bin during positioning. Empty auger tube before storage.

NOTE: Front Hopper Unloading

*The standard auger fits beneath the rear seed meter for unloading but is unable to fit beneath the front hopper's seed meter. See "**Unloading**" on page 23 for further information regarding unloading hoppers.*

Hand-Operated

Your auger is equipped with two hydraulic cylinders and control valves. One set lifts the auger by raising and lowering a set of parallel arms. The other set operates the angle of the auger. All in and out movement of the control arms is manual and each arm is equipped with a lock pin for securing position.

Deploying Auger

1. Squeeze the lock lever until latch on the auger is released from the frame. Move the left hydraulic lever to raise the parallel arms and lift the arm from the cradle. Rotate the auger away from the latch until clear.
2. Once the auger is removed from the frame, pull up on the auger arm's lock pin to free the lock on the inner auger arm. Grab the collection bin and position the inner arm as needed. Once finished, push down the lock pin to secure the arm in place.
3. To position the hopper bin and material outlet above a hopper, use the hydraulic levers to lift and tilt the auger. The left-hand lever controls the auger height, and the right-hand lever controls the auger angle. Pull a lever up to raise and down to lower. Once finished with making an adjust to either the height or angle of the auger, return lever to the neutral position.
4. Once auger is in position, lower until the auger hopper rests on the ground. Do not attempt to fill the hopper with seed with the hopper in the air or resting against the drill's openers.

Remote Option

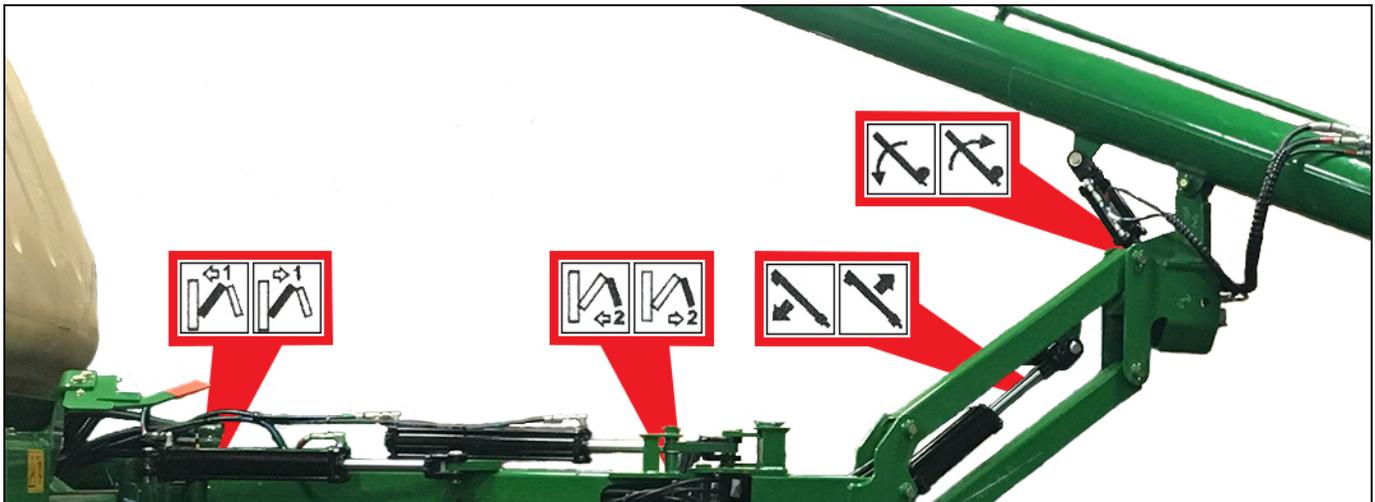
Deploying Auger

1. Squeeze the lock lever until latch on the auger is released from the frame. Rotate the auger away from the latch. Using the auger remote, raise the auger arm out of the cradle with the  button. Hold auger hopper firmly and lift the auger free of the rest.
2. While guiding the auger with one hand on the collection bin, use the auger remote to unfurl the arm. Each button on the auger remote controls a single function and moves the auger arm in a different way.
3. See the remote layout and review button functions in the key below.
4. Using remote and guiding auger with one hand on the hopper, position the auger so seed outlet is above the desired machine hopper.
5. Once auger is in position, lower until the auger hopper rests on the ground. Do not attempt to fill the hopper with seed with the hopper in the air or resting against the drill's openers.



⚠ DANGER

Do not press  to turn auger on while holding onto the auger hopper. Wait until positioning of the auger and hopper are finished and operators are clear before turning the auger on.



Auger Hydraulic Controls

Operating the auger involves one valve (with two handles) on the auger, one (selector) valve on the drill mainframe, and the tractor lever for the auger/fan hydraulic circuit.

⚠ DANGER: Rotating Auger Blades

Rotating auger. Keep loose hair, clothing, and body parts away from rotating auger. Do not remove or modify guards.

1. Before operating the auger/fan selector valve, shut down the auger/fan circuit. Shut off hydraulics entirely, or set circuit lever to Neutral or Float. Check that the auger direction control valve is set to OFF.
2. Move selector valve from Fan to Auger. Selector valve is located inside right rear corner of mainframe.

Auger Selector Valve Positions

Ⓐ Auger: Handle forward (make sure Auger control is in center-off position before moving handle to Ⓐ).

Ⓔ Fan: Handle rear (make sure circuit is off before moving handle to Ⓔ).

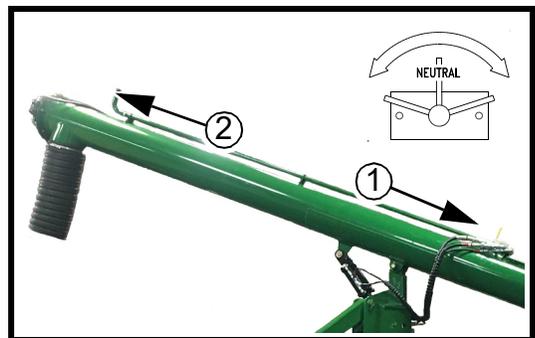
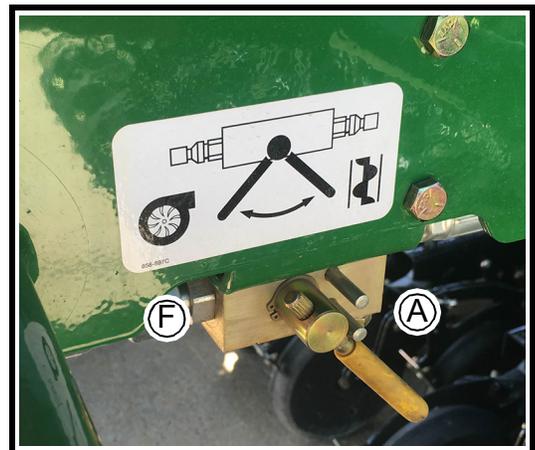
A valve ① toward the inlet end of the auger tube controls the direction of auger helicoid screw rotation. To allow flow control by an operator, the control handle for the valve has an extension and second handle ②.

Set valve to center when not moving material.

3. With the direction control valve OFF, and the selector valve to AUGER, activate the tractor auger/fan hydraulic circuit by setting the lever to Extend.
4. Gradually move the handle away from center-OFF. Note the direction of auger helicoid movement. When moving material, adjust speed as needed.

When auger operations are completed:

5. Set the auger direction control valve to center-OFF.
6. Return the auger to its default (non-use) position.
7. Shut down tractor hydraulics, or set the auger/fan circuit to Neutral or Float. Set the auger/fan selector valve to FAN.



Brakes

Main transport wheel brakes are standard. The trailer brake system is controlled by the tractor. It is connected to the tractor with a single hydraulic line or two air lines. The parking brake system is controlled by adjusting screws connected to the brakes.

■ Parking Brakes

Cable-operated parking brakes engage and release independently of service brake system. There is one operating handle on the drill, located at the rear of the machine.

To engage drill parking brakes, turn the adjustable handle all the way clockwise.

To release drill parking brakes, turn the adjustable handle all the way counter clockwise.

ⓘ **NOTICE: Parking Brake Usage**

The tractor cannot release the drill parking brakes. Make drill parking brake release part of your transport checklist. Transport with drill parking brakes set will result in tire or brake system damage.

Markers

Marker circuits must be fully charged with oil and free of air before operation. Prior to first use, or after maintenance, perform **Marker Chain Length** on page 34.

■ Dual Marker Operation

Dual markers are on the circuit which contains an adjustable automatic sequence valve. This valve is on a hydraulic circuit shared with fold, tilt, and transport hook cylinders.

1. To prevent unexpected marker movement when enabling the marker solenoid valve, set the shared circuit to Neutral or Float before operating the switches.
2. In your monitor's DrillCommand home screen, tap on the frame control icon. Then in the frame control window tap on the fold / unfold icon so it is highlighted green.
3. Clear the area within 6m (20ft) of marker arms on both sides of the drill.

📖 **NOTE: Marker Extension**

Which marker side extends first at circuit activation is somewhat unpredictable, as it depends on the final state of the sequence valve at last use.

4. Carefully move the circuit lever to extend and observe which marker side is extending.
5. If the marker extending is not on the desired side, set the lever to Retract until the marker returns to the cradle. Set the control to Neutral briefly, then to Extend again. This cycles the sequence valve and extends the alternate marker.
6. When marker is fully extended, set circuit to Neutral.
7. To fold marker, set circuit to Retract until marker is in cradle.
8. To extend other side, Extend once more, as at step 5.
9. In DrillCommand, tap on the frame control icon again and tap the fold / unfold icon so it is no longer highlighted green



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

Regular Maintenance

ⓘ **NOTICE: Machine Blocking**

Securely block machine before performing work on it.

- Lubricate areas listed under **Lubrication** on page 35.
- Check for air leaks at lids, doors, seals, caps, and hose connections.
- Inflate tires as specified on **Tire Maintenance** on page 33.
- Replace any worn, damaged or illegible safety decals.

⚠ **WARNING: High Pressure Fluid Hazard**

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 health care provider familiar with this type of injury.

Material Clean-Outs

To keep your machine in good condition, regularly clean out hoppers and air system when needed. Empty hoppers of material before cleaning machine. Once hoppers are empty, find a suitable place to park.

ⓘ **NOTICE: Remove Meter Shafts**

Prior to cleaning the machine, remove metering shafts and set aside. Return star shaft once cleaning is completed.

1. Remove and clean strainer (page 20). While strainer is removed, inspect hopper for signs of problems that may prevent normal clean-out, such as objects or congealed masses too large to exit through meter.
2. Open both calibration and clean-out doors on the meter of the hopper to be cleaned out.
3. Power wash the interior of the hopper while a second person cranks the meters.
4. Re-install strainer. Close lid tight and secure handle.
5. After cleaning out the last hopper, close all doors. Run air system for 10 minutes to blow moisture out of meters and lines. Open both front hopper meter doors. Run air for 5 minutes. Leave front meter doors open. Open rear hopper meter doors. Run air for 5 minutes.
6. Shut off air. Clean door seals and meter box faces then close meter doors. Move drill to storage area.

■ **Problem Clean-Outs**

If material fails to pass through the clean-out door, remove the hopper strainer and evaluate the problem. You may need to force the material out with either a long pole or wash-out.

- If the problem is a single movable large object, fishing out from above is a possible solution.
- If the problem is congealed materials, scoop out a sample from above and see if the mass dissolves in water. If so, and there is a small amount of the material involved, rinsing, or rinsing and pumping the hopper from above is the best solution.

For small amounts of residual materials, prodding with a long pole may push it through the clean-out door.

Hopper Entry

Normal use of the hopper and routine maintenance do not require entry. The hopper vent tube structure includes features to aid emergency egress. It is not intended for routine entry. However, do not remove the vent tube structure, as it is required for pressure-balancing the space above the material.

Before entering a hopper for hopper level, pressure sensor replacement, or difficult clean-out, you should review the chemical safety information on page 5. Only enter a hopper with at least one trained and equipped attendant present. Do not enter a hopper for routine maintenance, unloading, or cleaning.

⚠ DANGER: Rapid Suffocation Hazard

Any hollow spaces are highly likely to have insufficient oxygen and/or toxic gases from microbial action. Falling through a crust in either case can result in death in a matter of seconds. Never enter a hopper to dislodge a crust or bridge.

Should a situation arise where hopper entry is necessary, observe the following precautions:

Evaluate the hazards

All persons involved should review and retain the material safety data sheets (MSDS) for any treatments and/or fertilizers used in the hopper since it was last thoroughly cleaned, and the most recent materials even if the hopper was subsequently cleaned.

Empty the hopper

Follow the steps at **Unloading** on page 23. If a blockage makes this impossible, use an external pump line to remove as much material as possible without performing a hopper entry. Pump until at least some material is exiting the clean-out door. Leave the clean-out door open.

Clean the hopper

From the outside at the walkboard, power-wash the inside of the hopper. Use a mild detergent sprayer. Rinse thoroughly. Allow hopper to air with lid and clean-out door open until moisture has evaporated.

Hydraulic Maintenance

⚠ WARNING: High Pressure Fluid Hazard

Escaping fluid under pressure can have sufficient pressure to penetrate the skin causing serious injury. 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.

⚠ WARNING: 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. Compromising a closed hydraulic system can cause serious injury or death.

If hydraulics have not been bled, they will operate with jerky, uneven motions and could cause wings, openers, and markers to drop rapidly during operation. If hydraulics were not bled during initial implement setup or a hydraulic system part is replaced, the hydraulic system will need to be serviced before operation. Bleed hydraulics with the drill fully folded into transport configuration. If bled while tilted up, set all four (4) transport locks in the ROAD position and engage the pins behind pivoting plates. Hydraulics should only be bled by a trained professional.

Hydraulic Circuit Preparation

Each set of hydraulics requires a different active circuit for bleeding. Hydraulics should only be bled by a trained professional.

■ Tilt Hydraulics

⚠ **WARNING: Crushing Hazard**

Wings must be fully tilted down, with transport locks engaged, before performing a tilt bleed using this method. Verify that lock pins are engaged behind pivoting arm weldments before setting circuit to Float. Hydraulics should only be bled by a trained professional.

1. Set transport locks to ROAD. Leave MASTER and Tilt ON.

■ Fold Hydraulics

1. Fully unfold the machine. Leave MASTER and Wing Fold ON. Set circuit to Float.

■ Hook Hydraulics

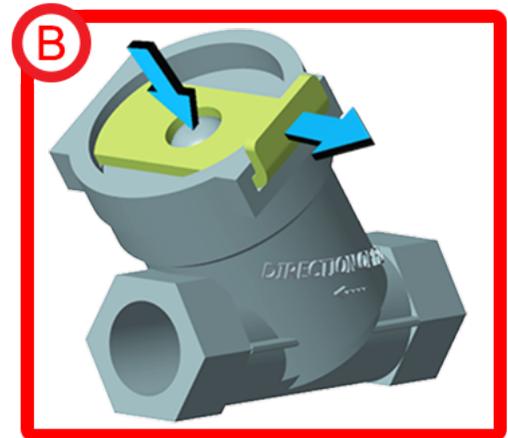
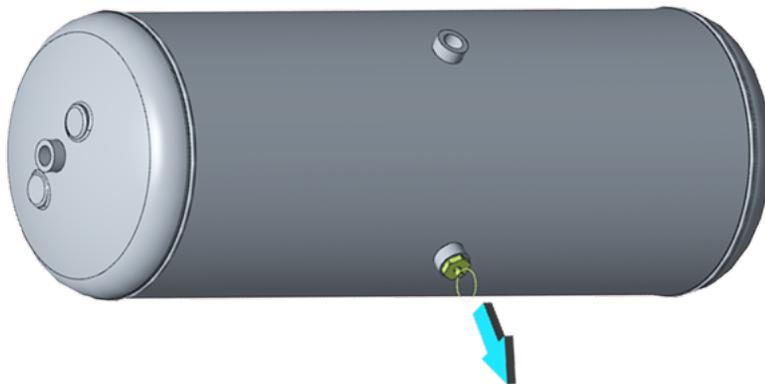
1. Partially unfold the machine. Leave MASTER and Wing Fold ON. Set circuit to Float.

■ Weight-Transfer Hydraulics

1. Fully unfold, tilt down, and lower the machine. Leave MASTER and Wing Fold ON. Set circuit to Float.

Air Brake Maintenance

Prior to storage, or daily in humid operations, drain water from the air brake reservoir tank to prevent rust inside the tank, and rust contamination of the brake valve system. The air brake system includes filters ① on the supply and service lines to trap debris from connection and disconnection.



Clean filters seasonally. Filters will need cleaned more often in dusty or arid conditions.

1. Park machine on a level surface and block tires to prevent movement. Do not set drill parking brakes.
2. Pull out on the air tank's valve ring (A) until no water flows.
3. Locate the two line filters (B). Push down on the filter cap with enough force to compress and slide out the pin. Then carefully remove the cap from filter.
4. Using gentle compressed air or a soft brush and compatible cleaning fluid, remove debris from the filter screen. Dry thoroughly. Clean the rest of the line filter with compressed air or water and mild detergent. Clean and inspect the O-ring. If wet, dry the cap.
5. Center the filter screen on the cap. Carefully re-insert in filter body. Place cap back on the filter, compress, and slide the pin into place.

Tire Maintenance

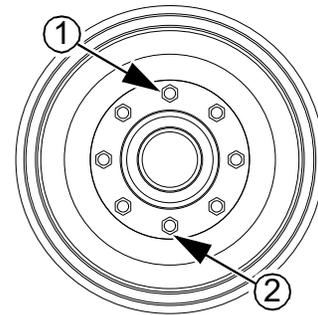
Always maintain proper pressure to ensure tire safety and longevity. Tires are factory-set to the prescribed level, but will lose pressure over time. Check tires daily and inflate as necessary.

When removing tires from the machine, take the appropriate safety precautions as prescribed on page 3.

1. Park tractor on a solid, level surface. Secure machine with brakes and chock blocks.
2. Use the proper tools to safely remove tires. Remove initial bolt ① followed by diagonally opposed bolt ②. Repeat until all bolts are removed.
3. Remove tire with equipment appropriate for heavy loads.

When installing tires, tighten hardware to specified torques as outlined in the **Torque Values Chart** on page 42.

Tire Size	Inflation
18-PLY 400/60-22.5	50 psi / 345 kPa
10-PLY 11L-15SL	50 psi / 345 kPa

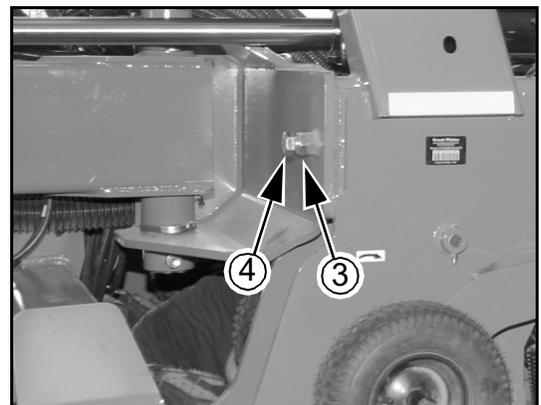


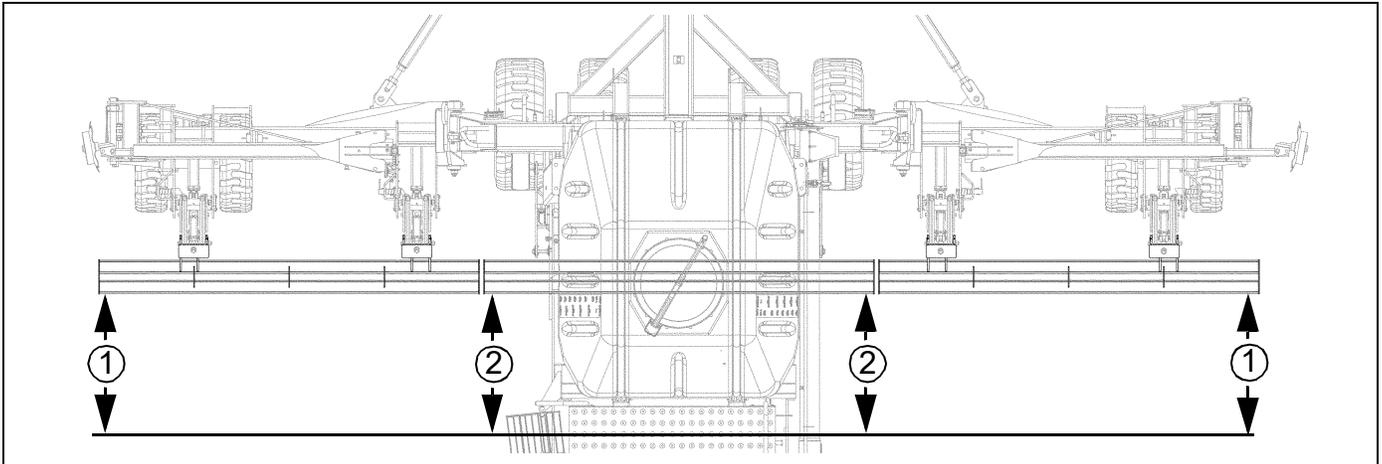
Leveling Drill

Wing alignment and sub-frame heights are adjustable. Frame heights are not adjustable. Center height is fixed by the front transport wheels. Wing height is fixed by the center section height and the wing gauge wheels.

Section Alignment

1. Unfold and lower machine wings. Set hitch height as described at **Hitching Connection** on page 7.
2. Sight along the rear face of the rear opener tool bar. Measure the wing end position relative to the center section.
3. If the wings are roughly 25mm - 37mm for 12 meter machines - ahead of the center, no adjustment is necessary.
4. Loosen wing fold stop bolt jam nuts ③, and fully seat stop bolts ④.
5. To adjust a wing lead, loosen the jam nut ⑤ at the pull bar for that side and rotate the turnbuckle nut ⑥ to move the wing forward or back.
6. Back out stop bolt ④ until it contacts wing. Secure with jam nut ③. Re-tighten jam nuts and align other side as needed.





Marker Maintenance

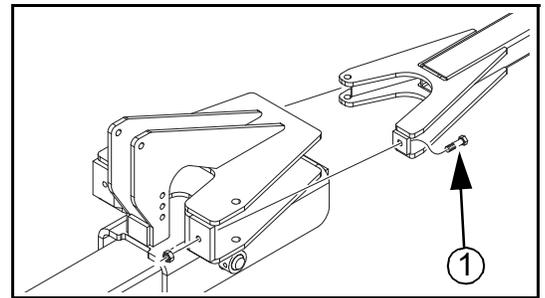
⚠ Caution: Avoid Marker Folding/Unfolding

You may be injured if hit by a folding or unfolding marker. Markers may fall quickly and unexpectedly if the hydraulics fail. Never allow anyone near the drill when folding or unfolding markers.

Marker Shear Bolt

The marker arm is attached to marker body with a shear bolt ①, which is intended to fail if the marker strikes an obstruction, allowing the marker to swing back around the pivot bolt ②.

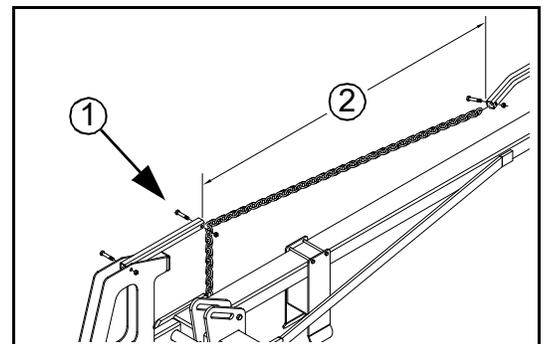
If your conditions result in frequent shears, the marker shear base has storage holes for spare bolts.



Marker Chain Length

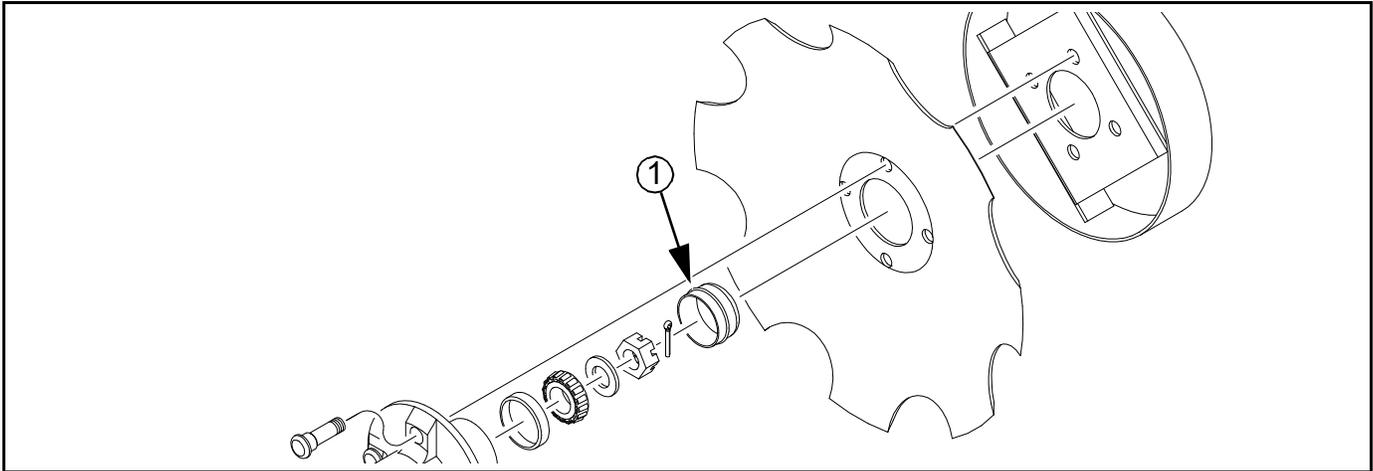
If markers fail to touch ground or excessive amounts of the chain drag, adjust the chain's length.

1. Unfold marker and adjust/set Marker Extension (page 29) before adjusting chain length.
2. Remove take-up bolt ①. Re-insert bolt to obtain a chain length of 160 cm (63 in) ②. Then tighten bolt.
3. Fold, unfold and re-fold marker to test new chain length.



Marker Grease Seal

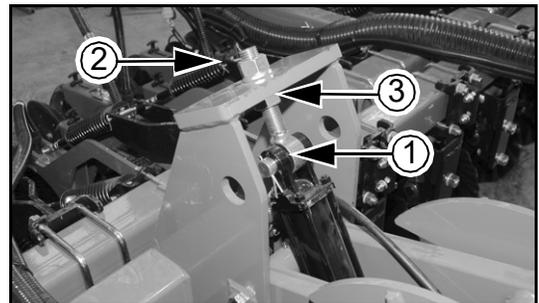
If grease-seal cap ① for marker disk hub bearings is damaged or missing, disassemble and clean hub. Repack with grease and install a new seal or grease cap.



Tool Bar Heights

Before planting, check and adjust tool bar heights in representative field conditions with openers lowered to planting height and pulled forward in the ground.

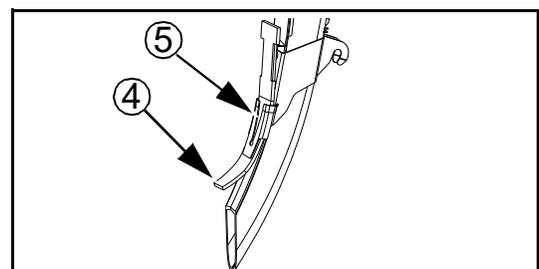
1. Until the center section disks make contact with the ground, adjust wings so the disks all contact at the same time. Adjust weight transfer as needed (page 10).
2. To adjust an eyebolt back the upper jam nut ② up a few turns. Adjust the lower nut ③. The adjustment is about 2.8mm (0.11in) of opener height per turn of the adjuster nut. Secure the 1-8 jam nut ② to torque spec (page 42).
3. Check and set all four (4) wing ends and eyebolts.



Seed Flap Replacement

To replace a seed flap ④ use a needle nose pliers or similar tool to grasp "T" top of flap. Pull upward to pull flap up out of metal bracket ⑤.

Push new seed flap ④ down through metal bracket ⑤ until flap snaps into place with "T" top resting on top of bracket.

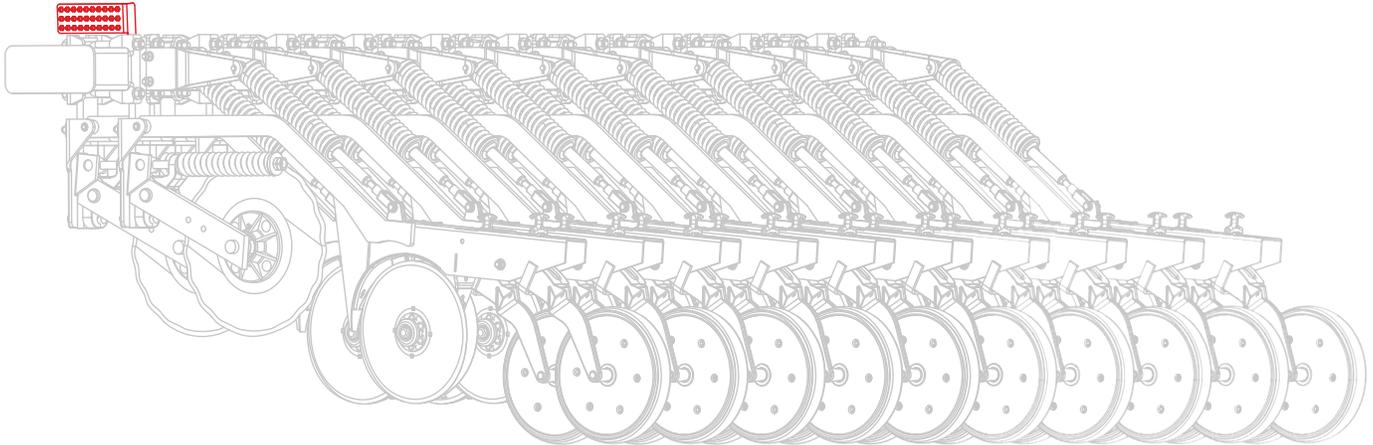


Lubrication

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.

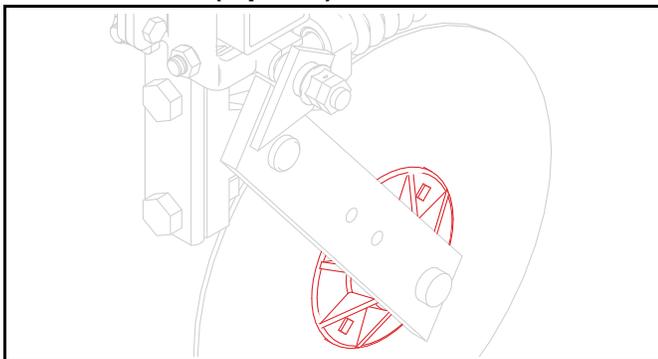
Apply a small amount of grease to the following areas after the amount of use indicated. If you operated the machine in extremely wet and/or muddy conditions, lubricate grease fittings more frequently.

■ **Lubricating Coulter Pivots - Every 10 hours**

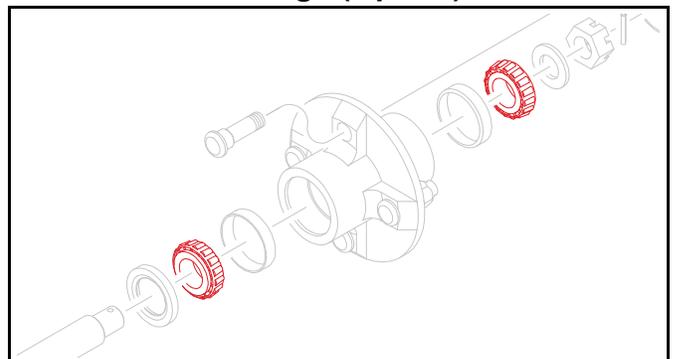


■ **Lubricating Grease Fittings - Every 50 hours**

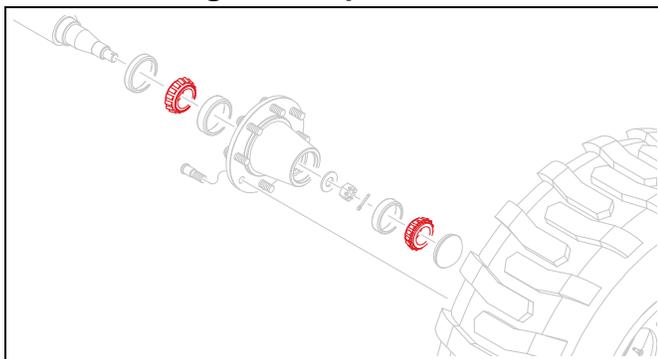
Coulter Hubs (Option)



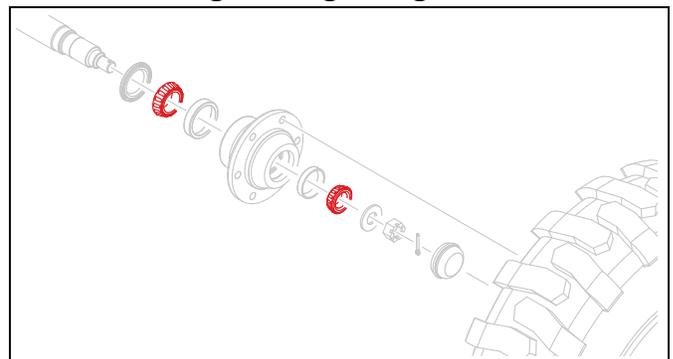
Marker Disk Bearings (Option)



Wheel Bearings, Transport



Wheel Bearings, Wing Gauge



Machine Troubleshooting

Problem	Causes	Solutions
No material flow (all rows)	Fan pressure too low	Adjust fan diverter so hoppers that are in use receive air pressure
	Fan speed too low	Check pulses-per-rev setting for fan in seed monitor. Increase fan speed as recommended.
No material flow (multiple rows)	Primary seed hose blocked	Check seed hoses for kinks, congealed materials at low spots, nests and pests.
No material flow (one or two rows)	Seed tube blocked at row	Inspect and clear seed tube.
	False alarm - seed tube sensor disconnected or failed	Run monitor self-test. Swap sensor with a working row to verify failure. Replace sensor.
Material is flowing, but is not detected by seed monitor	This is normal during the first few meters/feet of planting, as it takes some time for material to reach rows.	Lower openers 3m/10ft before planting is to begin. Monitor does not check for blockage during first 5 seconds.
	Lift switch mis-adjusted, failed or mis-wired.	Check, adjust or replace switch.
Planting too little	Incorrect seed rate, meter flutes, rate range or gearbox setting.	Check seed rate information beginning on page 9.
	Air system leaks weakening material flow above meters	Check hopper lids, meter seals, manifold caps and seed hose connections. Adjust latch and/or replace seals as needed.
	Seed or fertilizer density and granularity may vary from season to season, batch to batch and between different suppliers	Re-calibrate if materials might have changed since last calibration.
	Fan won't run fast enough	Tractor must be able to supply 18 gallons/minute at 200 psi.
Planting too much	Incorrect seed rate, meter flutes, rate range or gearbox setting	Check seed rate information beginning on page 9.
	Seed size and weight or fertilizer density and granularity vary from chart	Calibrate. Adjust rate to compensate.
	Dividers damaged or missing in towers	Disassemble tower turrets. Replaced damaged or worn parts.
	Worn/damaged flute "stars" in meter	Pull out meter shaft, inspect, and repair or replace damaged "stars."
Uneven seed depth	Excessive field speed	Slow down. Check Seeding Rate Chart for correct maximum field speed.
	Drill not level	Check instructions for leveling (page 10) and weight transfer (page 10).
	Planting conditions too wet	Wait until drier weather.
Uneven seed spacing	Excessive field speed.	Reduce field speed.
	Drill not level	Check instructions for leveling (page 10) and weight transfer (page 33)
	Partially plugged opener seed tube	Lift drill, expose bottom of seed tube, and clean out

Brake Troubleshooting (Option)

Problem	Causes	Solutions
Smoke or odd burning odor from axle area	Overheated brakes, typically on long steep hills	Stop immediately. Wait for brakes to cool completely. Moderate downhill speed by using lower gear and frequent full stops. Check brake components for heat distortion.
	New brakes may exhibit slight smoking or odors until linings seat on drums.	Check brakes if problem persists, or braking action is insufficient.
Braking insufficient, one wheel	Tire under-inflated.	Inflate all tires to specification.
	Worn brake linings and/or drum	Service brakes.
Braking insufficient, all wheels	Air in drill brake lines	Check for loose fittings. Check for damaged fittings and lines. Check for damage or worn operating components. Correct source of leak. Add hydraulic oil to tractor reservoir.
	Hydraulic/Hydraulic system: air in brake line from tractor	Bleed and recharge brake line.
	Brake linings and/or drums worn	Service brakes.
	Brake linings replaced with unapproved parts having inadequate friction rating	Replace shoes with approved parts.
	Pressure supplied by tractor insufficient	80 psi / 55 kPa minimum for air system.
No braking, one wheel	Bleed port open	Close port. Service system.
	Brake lining worn or missing	Inspect and repair as needed.
	Brake parts broken or missing	Inspect and repair as needed.
No braking, all wheels	Loss of air/fluid in drill brake lines	Check for fluid loss at all fittings and bleed ports. Close ports and/or service system.
	Line(s) to tractor improperly connected	Check connections.
	Trailer brake system disabled or malfunctioning in tractor	Check function with another trailer.
	Tractor line pressure insufficient	Have dealer check pressure at port.
Brakes always engaged, all wheels	Parking brake set	Release parking brake
	Over-extended adjuster	Reset adjuster pawls and allow system to self-adjust.
	Air/Hydraulic system: Tractor air brake lines reversed, and Supply line is causing brakes to be always on	Reverse air line connections at hitch.
	Hydraulic/Hydraulic system: Drill brake line connected to incorrect always-on remote.	Connect drill brake line to correct remote.
	Pressure supplied by tractor brake line is always too high (hydraulic), or too low (air brake)	Maximum allowed hydraulic pressure is: 150 bar / 2175 psi. Minimum required air pressure is: 550 kPa / 80 psi
Brakes grab, chatter or rattle	Drum worn, distorted or out of round	Re-surface drum if run-out is within specification, otherwise replace.
	Under-inflated or undersized tire in pair	Replace tire if inflation to specification does not solve unequal contact problem.



Appendix A - Reference Information

Specifications and Capacities

MODEL INFO	807-2		907-2		1007-2		1207-2	
Models	5206	4075	6006	4875	6406	5275	7806	6675
Row Count	52 Rows	40 Rows	60 Rows	48 Rows	64 Rows	52 Rows	78 Rows	66 Rows
Row Spacing	15 cm	19cm	15cm	19cm	15cm	19cm	15cm	19cm
Tractor Requirements	210 hp		250 hp		270 hp		300 hp	
DIMENSIONS								
Field Width	8.0 meters		9.0 meters		10.0 meters		12.0 meters	
Field Height	3.8 meters							
Field Length	8.5 meters				9.0 meters			
ATTACHMENTS								
Hitch	Pintle Hitch						Two-Point Hitch	
Hopper Capacity	3500L per hopper							
Hydraulic Requirements	Closed-Center							
Tires, Transport	400/60-22.5							
Tires, Wing Gauge	11L-15SL 10PLY							
CLEARANCE								
Minimum Weight, Empty	15,720kg	14,820kg	16,200kg	15,330kg	16,580kg	15,580kg	17,300kg	16,100kg
Transport Width	3 meters							
Transport Height	4 meters							
Transport Length	11.6 meters				12.0 meters			

Planting Rate Information

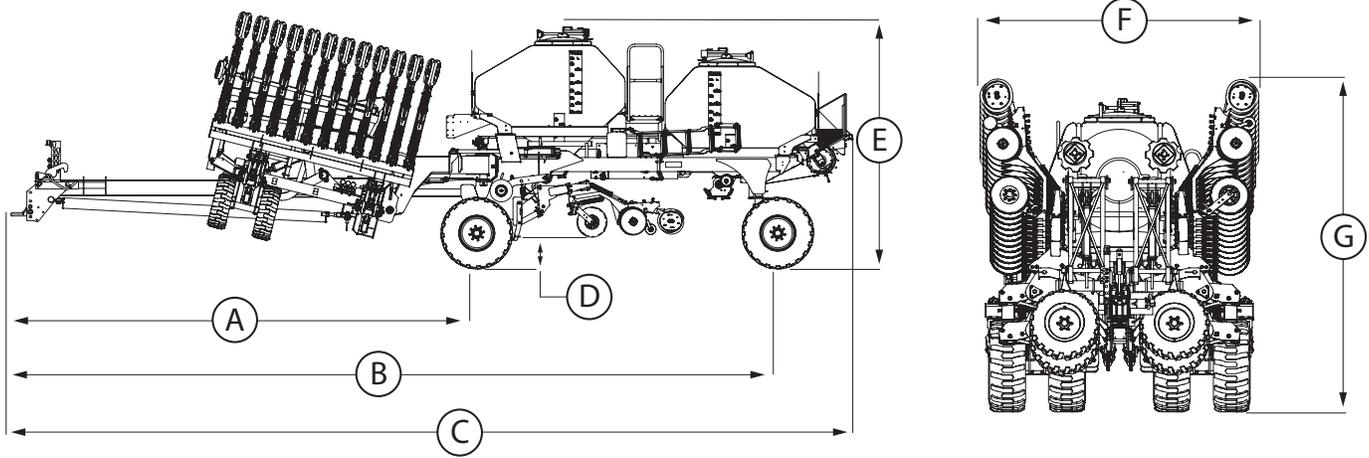
Spartan^{II} 807, 907, and 1007

Planting Rate Chart

Kilograms per Hectare Range		Star Shaft			Gear Configuration						Calibration Factor (g)	
		Small Seeds	Two Star	Four Star	Driving			Driven				
8 kph	14 kph							17-T	36-T	54-T	17-T	36-T
Wheat												
30 - 172	17 - 98											150.00
28 - 168	16 - 96											598.00
49 - 285	28 - 163											644.00
96 - 300	55 - 300											1288.00
196 - 300	112 - 300											2640.00
Oats												
14 - 81	8 - 46											180.00
61 - 300	35 - 210											816.00
117 - 300	67 - 300											1550.00
Soybeans												
16 - 88	9 - 50											580.00
30 - 175	17 - 100											1110.00
Milo												
2 - 12	1 - 7											30.00
5 - 33	3 - 19											58.00
18 - 107	10 - 61											230.00
42 - 245	24 - 140											548.00
Canola												
2 - 12	1 - 7											30.00
Fertilizer												
23 - 135	13 - 77											303.00
35 - 201	20 - 115											1378.00
205 - 300	117 - 300											2770.00

Select a desired range of kilograms per hectare for your product, and use the corresponding star shaft, driving / driven gear configuration, and initial calibration factor for planting.

Transport Dimensions



Spartan^{II} 807

Callout	Dimension	Measurement
A	Hitch to Front Wheel Length	6.66 M
B	Hitch to Rear Wheel Length	11.12 M
C	Transport Length	11.68 M
D	Transport Clearance	0.47 M
E	Hopper Clearance	3.61 M
F	Transport Width	3.00 M
G	Transport Height	3.96 M

Spartan^{II} 907

Callout	Dimension	Measurement
A	Hitch to Front Wheel Length	6.66 M
B	Hitch to Rear Wheel Length	11.20 M
C	Transport Length	11.68 M
D	Transport Clearance	0.47M
E	Hopper Clearance	3.61 M
F	Transport Width	3.00 M
G	Transport Height	3.96 M

Spartan^{II} 1007

Callout	Dimension	Measurement
A	Hitch to Front Wheel Length	6.84 M
B	Hitch to Rear Wheel Length	11.38 M
C	Transport Length	12.00 M
D	Transport Clearance	0.47 M
E	Hopper Clearance	3.61 M
F	Transport Width	3.00 M
G	Transport Height	3.96 M

Spartan^{II} 1207

Callout	Dimension	Measurement
A	Hitch to Front Wheel Length	6.84 M
B	Hitch to Rear Wheel Length	11.38 M
C	Transport Length	12.00 M
D	Transport Clearance	0.47 M
E	Hopper Clearance	3.61 M
F	Transport Width	3.00 M
G	Transport Height	3.96 M

Torque Values Chart

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

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

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

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



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 call 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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