

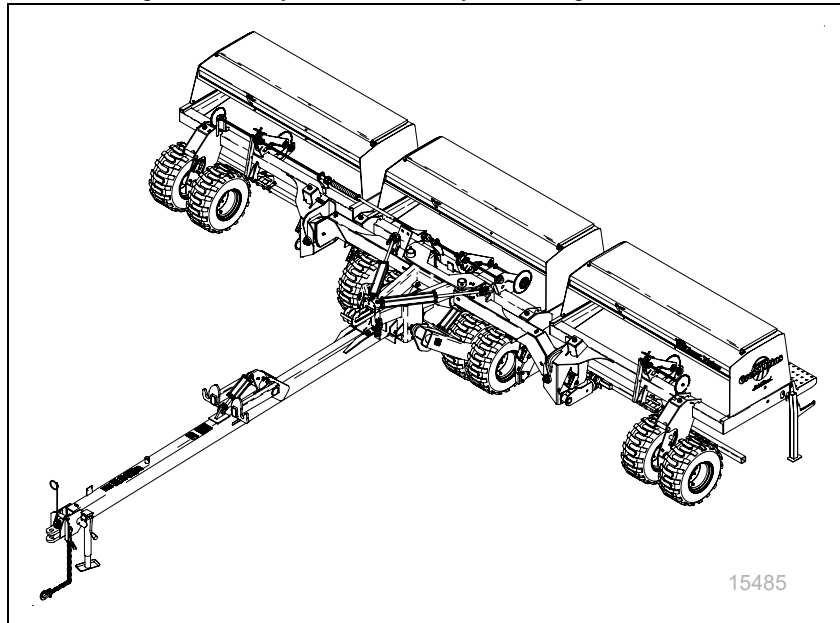
Operator Manual

3S-3000HD

3-Section 30-Foot Folding HD Drill



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 or may depict similar models where a topic is identical.

ORIGINAL INSTRUCTIONS



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195-068M

Machine Identification

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

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

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

Dealer Contact Information

Name: _____

Street: _____

City/State: _____

Telephone: _____

Email: _____

Dealer's Customer No.: _____

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



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Printed in the United States of America

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Important Safety Information

Look for Safety Symbol

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



Be Aware of Signal Words

Signal words designate a degree or level of hazard seriousness.

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is limited to the most extreme situations, typically for machine components that, for functional purposes, cannot be guarded.



WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.

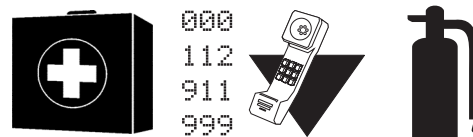


CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.



Prepare for Emergencies

- Be prepared if a fire starts
- Keep a first aid kit and fire extinguisher handy.
- Keep emergency numbers for doctor, ambulance, hospital and fire department near phone.



Be Familiar with Safety Decals

- Read and understand “**Safety Decals**” on page 6, thoroughly.
- Read all instructions noted on the decals.
- Keep decals clean. Replace damaged, faded and illegible decals.



Avoid High Pressure Fluids

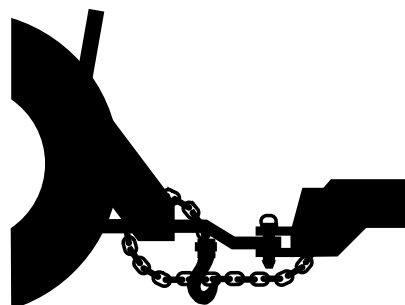
Escaping fluid under pressure can penetrate the skin, causing serious injury.

- *Avoid the hazard by relieving pressure before disconnecting hydraulic lines.*
- *Use a piece of paper or cardboard, NOT BODY PARTS, to check for suspected 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.*



Use A Safety Chain

- *Use a safety chain to help control drawn machinery should it separate from tractor drawbar.*
- *Use a chain with a strength rating equal to or greater than the gross weight of towed machinery.*
- *Attach chain to tractor drawbar support or other specified anchor location. Allow only enough slack in chain to permit turning.*
- *Replace chain if any links or end fittings are broken, stretched or damaged.*
- *Do not use safety chain for towing.*



Keep Riders Off Machinery

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

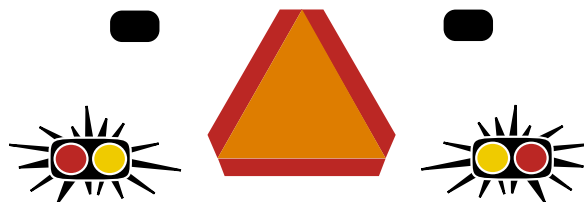
- *Never allow children to operate equipment.*
- *Keep all bystanders away from machine when folding/unfolding, raising/lowering markers, raising/lowering openers, and transporting.*



Use Safety Lights and Devices

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

- *Use flashing warning lights and turn signals whenever driving on public roads.*
- *Use lights and devices provided with the drill.*



Transport Machinery Safely

Maximum transport speed for drill is 20 mph (32 kph). Some rough terrains require a slower speed. Sudden braking can cause a towed load to swerve and upset.

- *Do not exceed 20 mph (32 kph). Never travel at a speed which does not allow adequate control of steering and stopping. Reduce speed if towed load is not equipped with brakes.*
- *Comply with national, regional and local laws.*
- *Follow your tractor manual recommendations for maximum hitch loads. Insufficient weight on tractor steering wheels will result in loss of control.*
- *Carry reflectors or flags to mark drill in case of breakdown on the road.*
- *Keep clear of overhead power lines and other obstructions when transporting. Refer to transport dimensions under “**Specifications and Capacities**” on page 96.*



Check for Overhead Lines

Drill markers contacting overhead electrical lines can introduce lethal voltage levels on drill and tractor frames. A person touching almost any metal part can complete the circuit to ground, resulting in serious injury or death. At higher voltages, electrocution can occur without direct contact.

- *Avoid overhead lines during seed loading/unloading and marker operations.*



Wear Protective Equipment

- *Wear protective clothing and equipment.*
- *Wear clothing and equipment appropriate for the job. Avoid loose-fitting clothing.*
- *Because prolonged exposure to loud noise can cause hearing impairment or hearing loss, wear suitable hearing protection such as earmuffs or earplugs.*
- *Because operating equipment safely requires your full attention, avoid wearing entertainment headphones while operating machinery.*



Handle Chemicals Properly

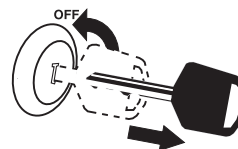
Agricultural chemicals can be dangerous. Improper use can seriously injure persons, animals, plants, soil and property.

- *Do not use liquid treatments with drill.*
- *Read and follow chemical manufacturer's instructions.*
- *Wear protective clothing.*
- *Handle all chemicals with care.*
- *Avoid inhaling smoke from any type of chemical fire.*
- *Never drain, rinse or wash dispensers within 100 feet (30m) of a freshwater source, nor at a car wash.*
- *Store or dispose of unused chemicals as specified by chemical manufacturer.*
- *Dispose of empty chemical containers properly. Laws generally require power rinsing or rinsing three times, followed by perforation of the container to prevent re-use.*



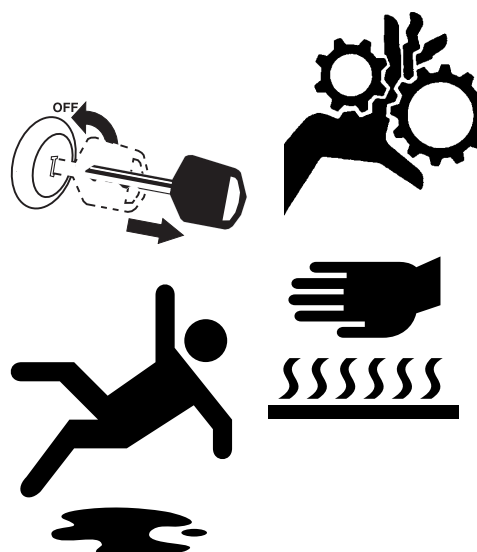
Shutdown and Storage

- *Clean out and safely store or dispose of residual chemicals.*
- *Secure drill using blocks and transport locks. Lower openers if not locked up.*
- *Store in an area where children normally do not play.*



Practice Safe Maintenance

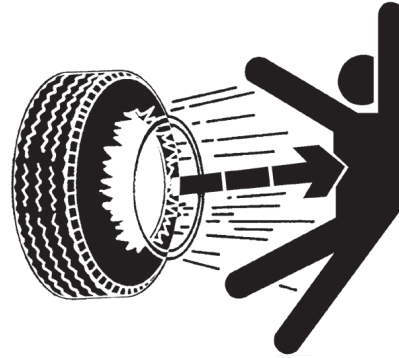
- *Understand procedure before doing work. Use proper tools and equipment. Refer to this manual for additional information.*
- *Work in a clean, dry area.*
- *Put tractor in park, turn off engine, and remove key before performing maintenance.*
- *Make sure all moving parts have stopped and all system pressure is relieved.*
- *Disconnect battery ground cable (-) before servicing or adjusting electrical systems or before welding on drill.*
- *Inspect all parts. Make sure parts are in good condition and installed properly.*
- *Remove buildup of grease, oil or debris.*
- *Remove all tools and unused parts from drill before operation.*



Tire Safety

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

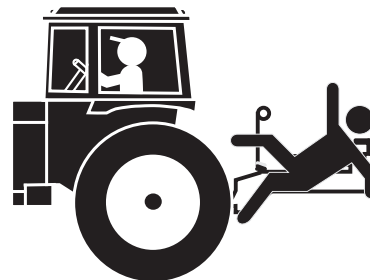
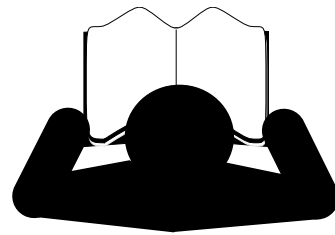
- *When inflating tires, use a clip-on chuck and extension hose long enough for you to stand to one side—not in front of or over tire assembly. Use a safety cage if available.*
- *When removing and installing wheels, use wheel-handling equipment adequate for weight involved.*



Safety At All Times

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

- *Be familiar with all drill functions.*
- *Operate machinery from the driver's seat only.*
- *Do not leave drill unattended with tractor engine running.*
- *Do not dismount a moving tractor. Dismounting a moving tractor could cause serious injury or death.*
- *Do not stand between the tractor and drill during hitching.*
- *Keep hands, feet and clothing away from power-driven parts.*
- *Wear snug-fitting clothing to avoid entanglement with moving parts.*
- *Watch out for wires, trees, etc., when folding and raising drill. Make sure all persons are clear of working area.*
- *Do not turn tractor too tightly, causing drill to ride up on wheels. This could cause personal injury or equipment damage.*



Safety Decals

Safety Reflectors and Decals

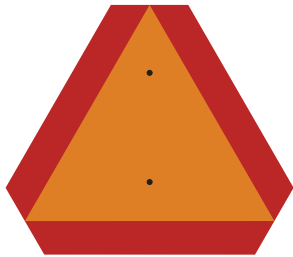
Your drill comes equipped with all lights, safety reflectors and decals in place. They were designed to help you safely operate your drill.

- *Read and follow decal directions.*
- *Keep lights in operating condition.*
- *Keep all safety decals clean and legible.*
- *Replace all damaged or missing decals. Order new decals from your Great Plains dealer. Refer to this section for proper decal placement.*
- *When ordering new parts or components, also request corresponding safety decals.*

To install new decals:

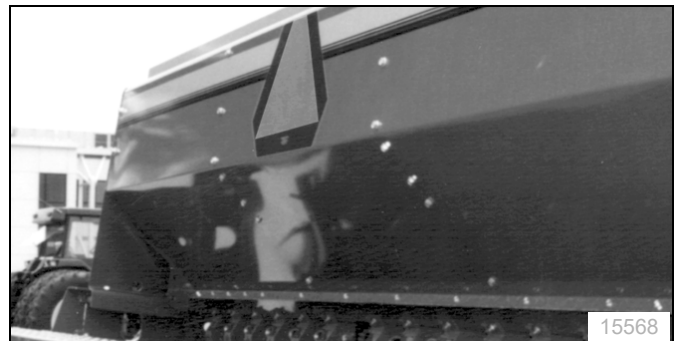
1. Clean the area on which the decal is to be placed.
2. Peel backing from decal. Press firmly on surface, being careful not to cause air bubbles under decal.

818-055C



Slow Moving Vehicle Reflector

Center of rear center section;
1 total

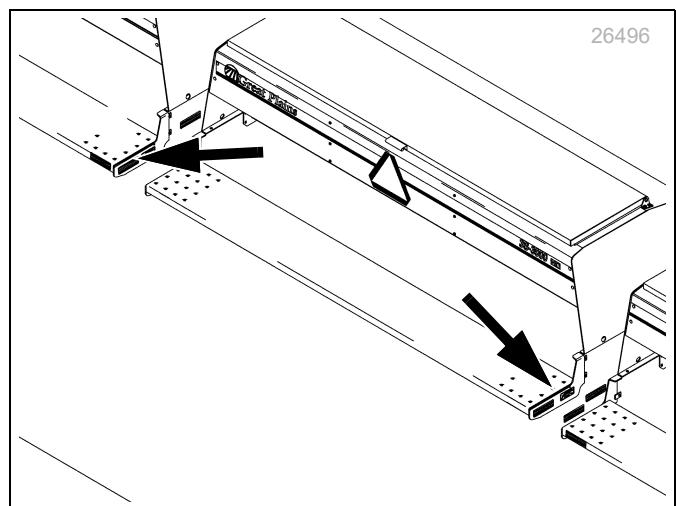


838-266C



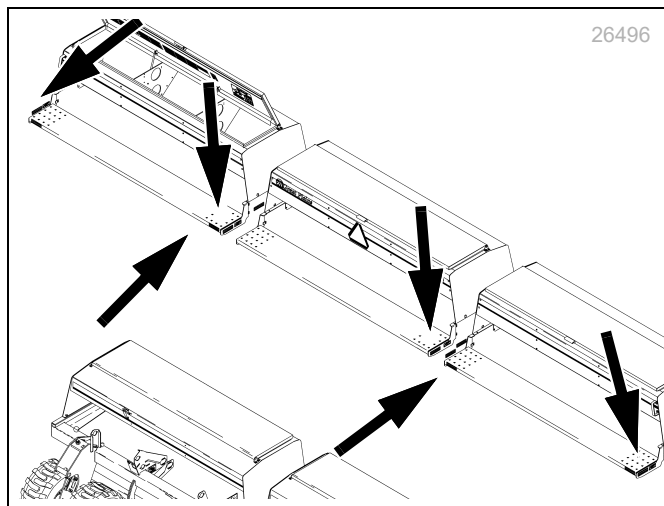
Red Reflectors

On wing walkboard inside end faces;
2 total

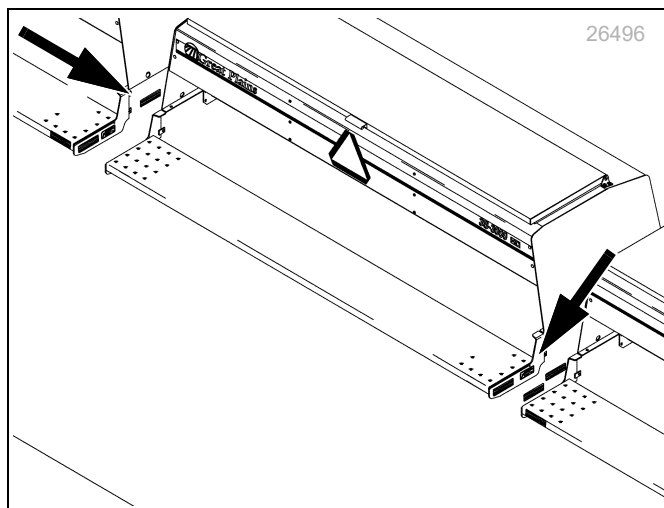


838-265C**Amber Reflectors**

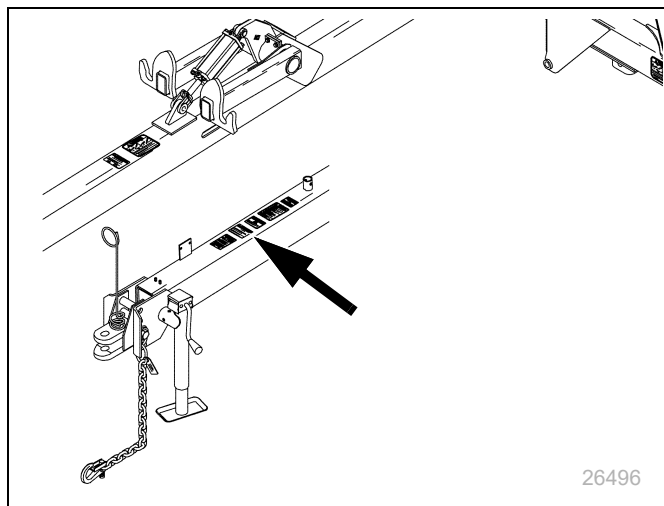
On wing walkboard rear faces, outside corners,
on outside end face of wing walkboards,
on outside end faces of center walkboard;
8 total

**838-267C****Daytime Reflectors**

On outside end faces of center walkboard, inboard of red
reflectors; 2 total

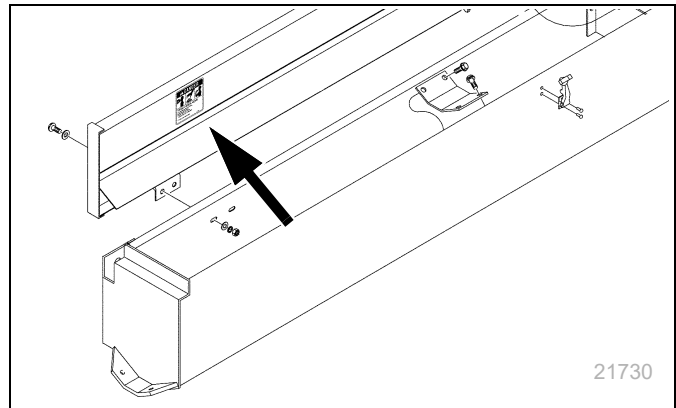
**818-557C****Danger: Cannot Read English**

On the tongue, close to hitch;
1 total



838-467C**Danger: Possible Chemical Hazard**

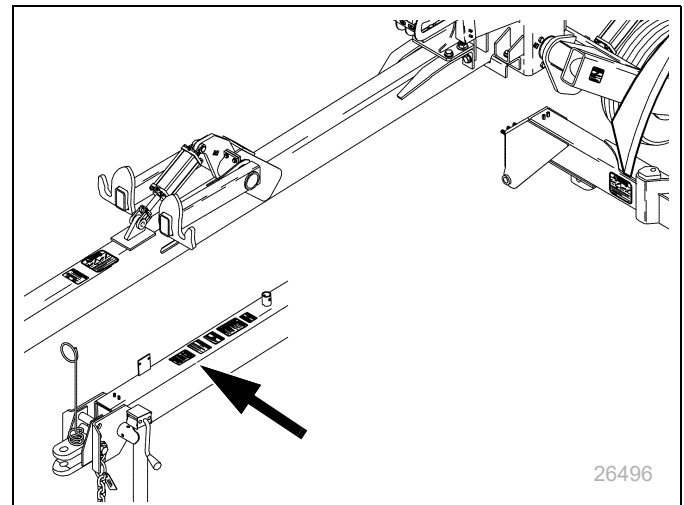
Inside lid of optional Small Seeds box lefthand side,
one each box;
2 total



21730

818-019C**Warning: Negative Tongue Weight**

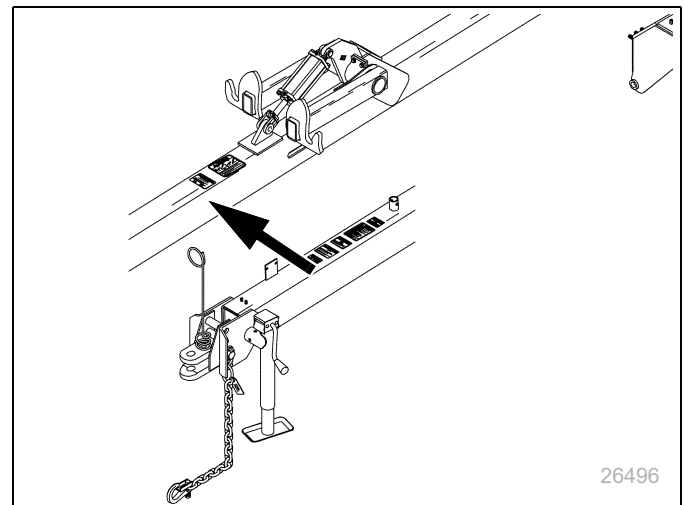
On tongue at hitch;
1 total



26496

818-045C**Warning: Pinch/Crush Hazard**

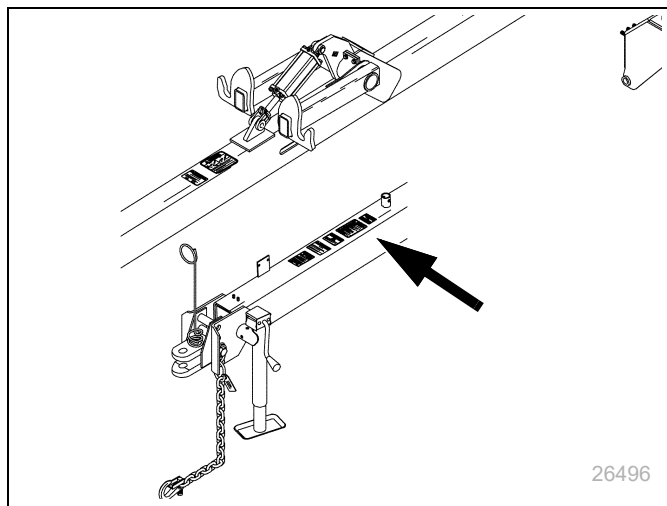
On tongue near transport hooks;
1 total



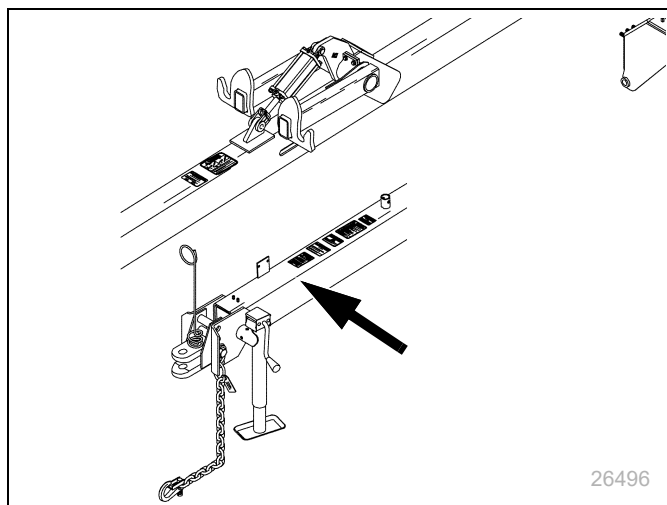
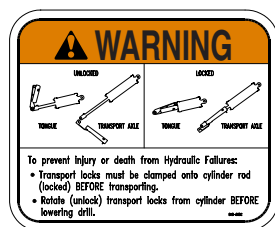
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818-337C**Warning: Excessive Speed Hazard**

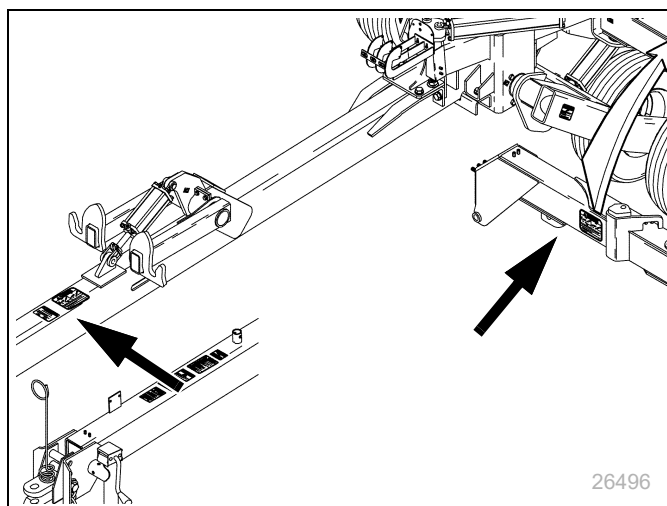
On tongue near hitch;
1 total

**818-339C****Warning: High Pressure Fluid**

On tongue near hitch;
1 total

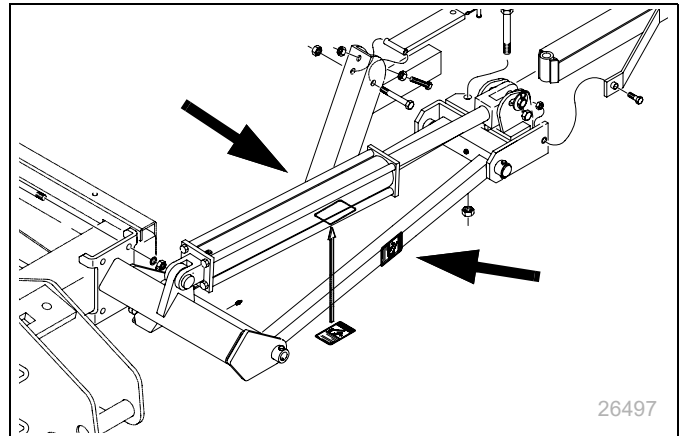
**818-660C****Warning: Transport Locks**

On tongue near transport hooks,
on back of wing tool bar (outside when folded);
3 total

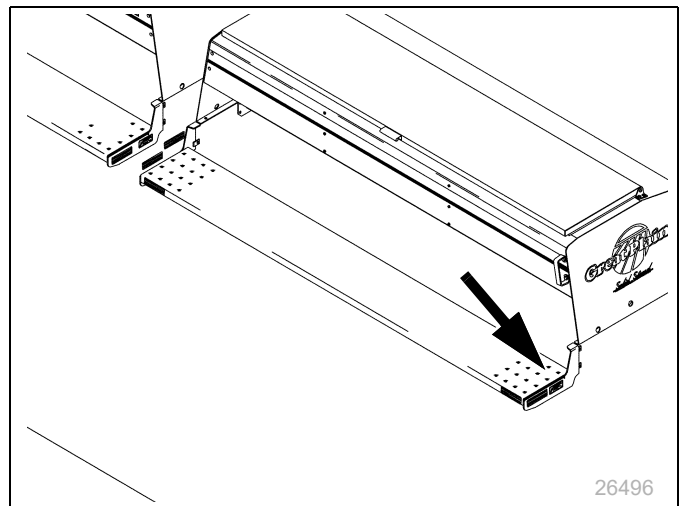
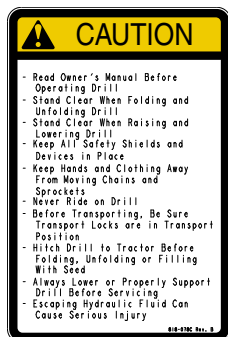


818-682C**Warning: Marker Pinch Crush**

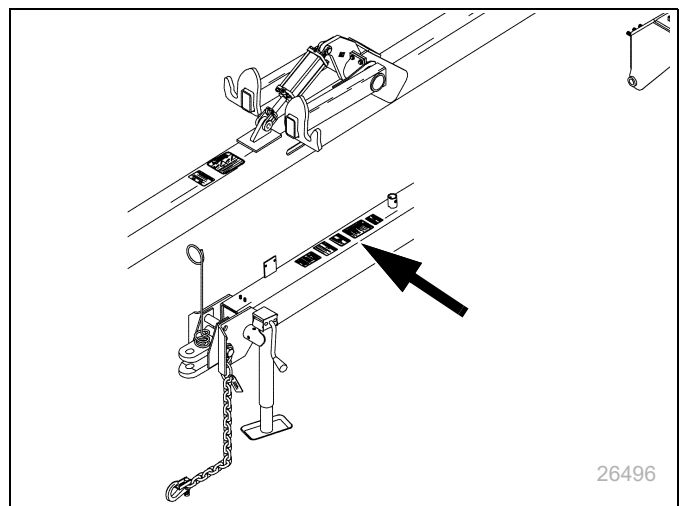
On front and outside faces of first marker section,
two each marker installed;
2 or 4 total

**838-102C****Warning: Falling Hazard**

On outside walkboard end above step
or forward of ladder top;
2 total

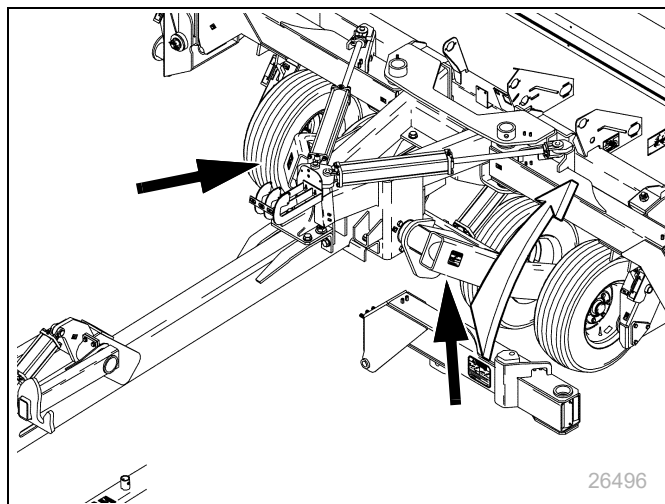
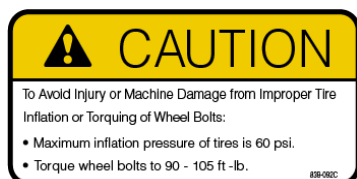
**818-078C****Caution: General**

On tongue near hitch;
1 total

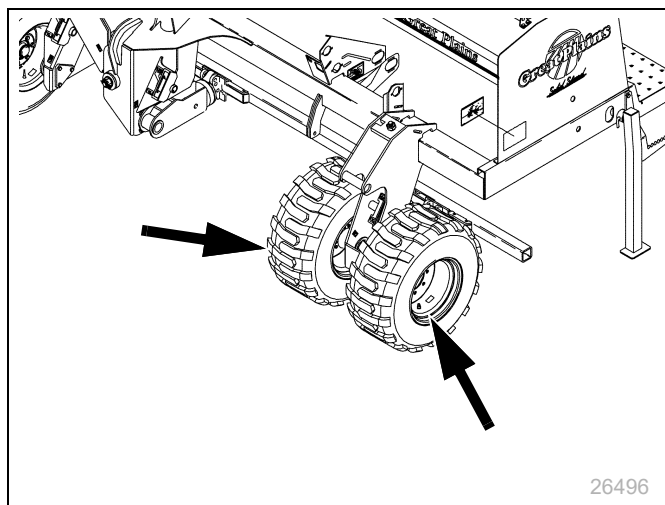
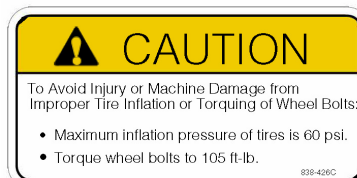


818-398C**Caution: Tires Not A Step**

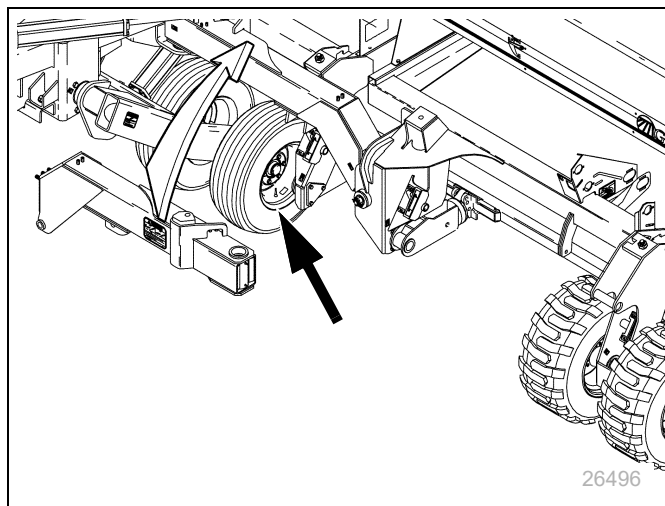
On each axle leg (transport wheels);
2 total

**838-092C****Caution: 60 PSI Tire Pressure**

On rim of each gauge wheel;
4 total

**838-426C****Caution: 60 PSI Tire Pressure**

On rim of each transport wheel;
4 total

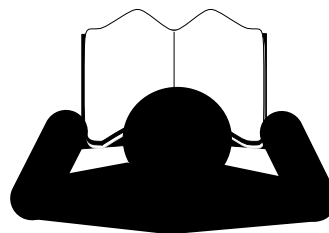


Introduction

Great Plains welcomes you to its growing family of new product owners. Your Three-Section Folding HD Drill has been designed with care and built by skilled workers using quality materials. Proper setup, maintenance, and safe operating practices will help you get years of satisfactory use from the machine.

Document Family

195-068M	Owner's Manual (this document)
195-068P	3S-3000HD Parts Manual
195-068B	Seed Rate Manual



Description of Unit

The 3S-3000HD is a towed seeding implement. This three section drill has a working width of 30 feet (9.1m). The drill has straight arm, double disk heavy duty openers. The opener disks make a seed bed, and seed tubes mounted between the disks place seed in the furrow. Press wheels following the opener disks close the furrow and gauge opener seeding depth. A T-handle on the opener body is for seeding depth adjustments. Seeding rates are adjustable with the seed rate adjustment handle and sprocket changes.

The 3S-3000HD features active hydraulic down pressure on the opener frames. When used on a tractor with closed-center hydraulics, constant down pressure ensures even opener penetration in uneven ground. Hydraulic down pressure is adjustable at a single point.

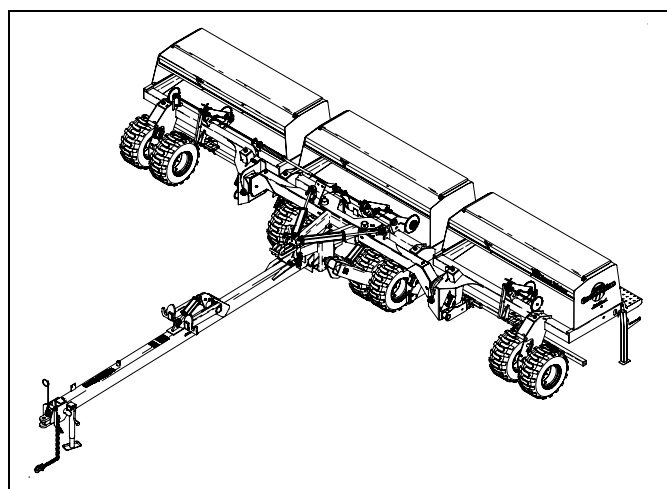


Figure 1
3S-3000HD Drill

15485

Intended Usage

Use this implement to seed production-agriculture crops in conventional or minimum tillage applications.

Models Covered

3S-3000HD-3610	36-row, 10in (24.5cm)
3S-3000HD-4875	48-row, 7.5in (19.1cm)
3S-3000HD-6006	60-row, 6in (15.2cm)
3S-3000HDF-3610	Fertilizer, 36-row, 10in (24.5cm)
3S-3000HDF-4875	Fertilizer, 48-row, 7.5in (19.1cm)
3S-3000HDF-6006	Fertilizer, 60-row, 6in (15.2cm)

Using This Manual

This manual familiarizes you with safety, assembly, operation, adjustments, troubleshooting, and maintenance. Read this manual and follow the recommendations to help ensure safe and efficient operation.

The information in this manual is current at printing. Some parts may change to assure top performance.

Definitions

The following terms are used throughout this manual.

Right-hand and left-hand as used in this manual are determined by facing the direction the machine will travel while in use unless otherwise stated.

NOTICE

Paragraphs in this format present a crucial point of information related to the current topic.

Read and follow the directions to:

- remain safe,
- avoid serious damage to equipment and
- ensure desired field results.

Note: Paragraphs in this format provide useful information related to the current topic.

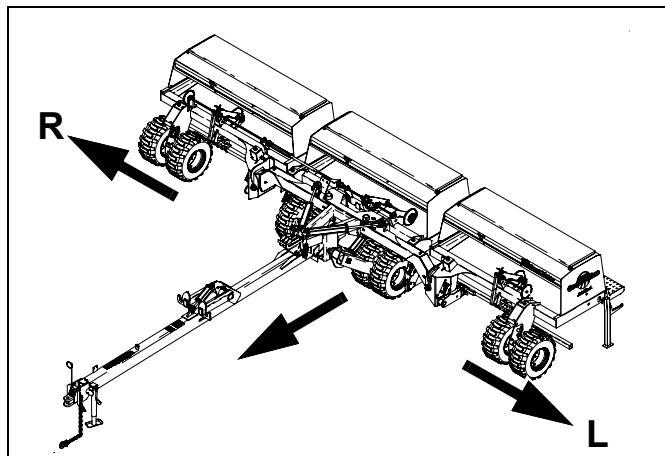


Figure 2
Left/Right Notation

15485

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.

Refer to Figure 2

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 left side of the drill frame below the front of the seed box.

Record your drill model and serial number here for quick reference:

Model Number: _____

Serial Number: _____

Further Assistance

Great Plains Manufacturing, Inc. and your Great Plains dealer want you to be satisfied with your new product. If for any reason you do not understand any part of this manual or are otherwise dissatisfied, please take the following actions first:

1. Discuss the matter with your dealership service manager. Make sure 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.

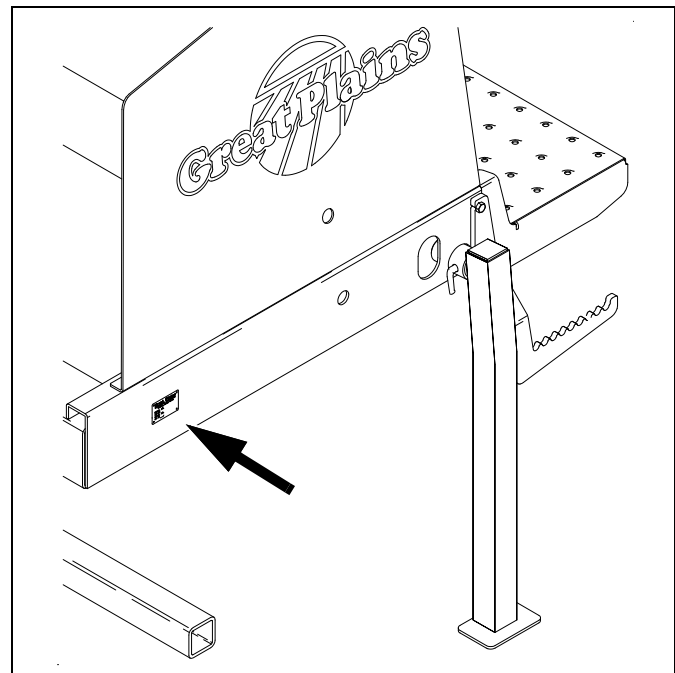


Figure 3
Serial Number Plate

15614

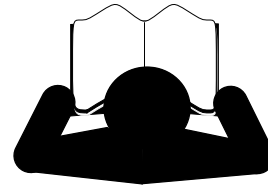


Preparation and Setup

This section helps you prepare your tractor and drill for use. Before using the drill in the field, you must hitch the drill to a suitable tractor and also setup the drill.

Pre-Setup Checklist

1. Read and understand “**Important Safety Information**” on page 1.
2. Check that all working parts are moving freely, bolts are tight, and cotter pins are spread.
3. Check that all grease fittings are in place and lubricated. See “**Lubrication**” on page 83.
4. Check that all safety decals and reflectors are correctly located and legible. Replace if damaged. See “**Safety Decals**” on page 6.
5. Inflate tires to pressure recommended and tighten wheel bolts as specified. “**Appendix A - Reference Information**” on page 96.
6. Complete any initial setup items from “**Appendix B - Initial Setup**” on page 105.



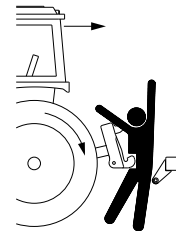
Hitching

⚠ DANGER

Crushing

Hazard:

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

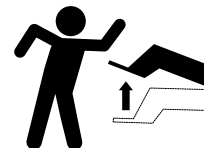


⚠ WARNING

Transport

Hazard:

This drill can have positive and negative tongue weight, which can work the hitch pin loose during transport. To avoid serious injury or death due to a road accident, always use a clevis hitch or clevis drawbar with a locking-style hitch pin.



Choose a drill-hitch option (page 91) that is compatible with your tractor drawbar.

The 3S-3000HD has three hitch options:

- a clevis hitch,
- a small-hole, single-strap hitch or;
- a large-hole, single-strap hitch.

Use the clevis hitch with tractors that have single-tang drawbars. Use the single-strap hitch for tractors with clevis drawbars. Always use a locking-style hitch pin sized to match the holes in the hitch and drawbar.

Refer to Figure 4 and Figure 5

1. Adjust the drill hitch to match your tractor-drawbar height. Mount tongue jack on side of tongue. Use jack to raise drill tongue so lowest hitch hole is 18 inches (45.7cm) above ground level with drill lowered to FIELD position.

Refer to Figure 5

2. Bolt drill hitch onto drill tongue to match your tractor-drawbar height. You can turn the hitch over for a total of six different hitch heights. Always have two (2) bolts in two holes of both tongue and hitch.

Note: When hitching drill to a different tractor, check for a difference in drawbar heights. If heights are different, readjust hitch height accordingly.

3. Securely attach safety chain to an anchor on a tractor capable of pulling the drill.



Figure 4
Jack in Lifting Location

15564

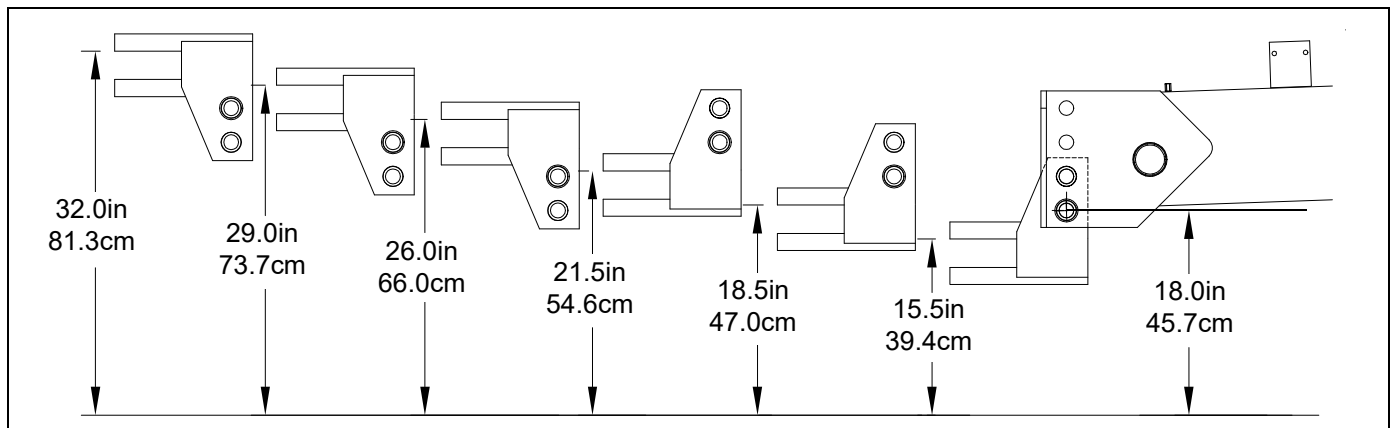


Figure 5
Heights for Various Hitch Positions - Correct Tongue Height

15563

Refer to Figure 6

4. Use crank to raise jack foot. Remove pin and jack. Store jack on top of tongue.



Figure 6
Jack in Storage Location

15563

Electrical Connections

Refer to Figure 7

Plug drill electrical lead into tractor seven-pin connector. If your tractor is not equipped with a seven-pin connector, contact your dealer for installation.

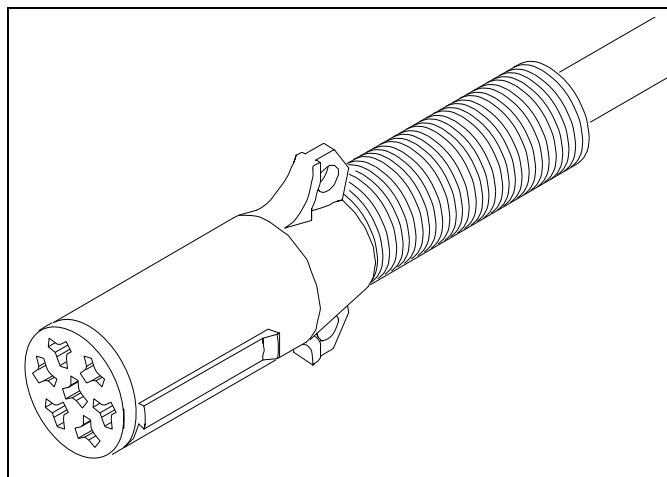


Figure 7
Lighting Connector

26467

Refer to Figure 8

If the drill is equipped with the optional shaft monitor, mate the connector for the cab display.

See “**Shaft Monitor**” on page 93 for ordering information.

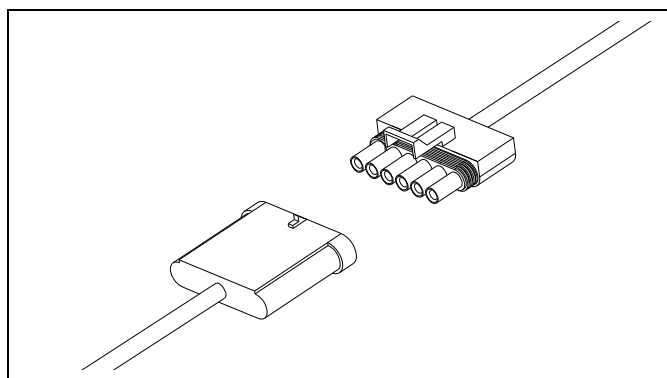


Figure 8
Shaft Monitor Connector

34222

Refer to Figure 9

If the drill is equipped with the point row option, mate the connector for the cab control.

See “**Point Row Clutch**” on page 92 for ordering information.

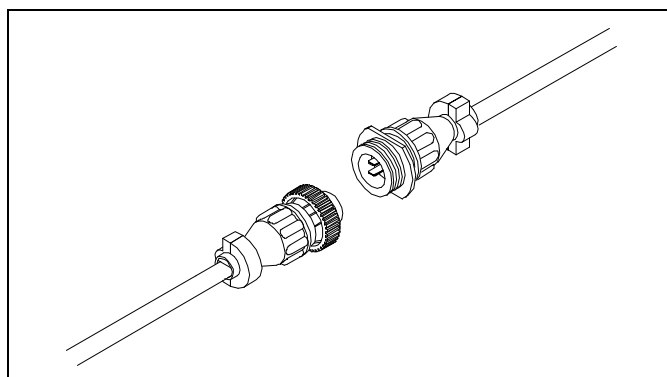


Figure 9
Point-Row Connector

26469

Hydraulic Hose Hookup

⚠ WARNING

High Pressure Fluid Hazard:
Only trained personnel should work on system hydraulics!

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

Current Style Color Coded Hose Handles

Refer to Figure 10

Great Plains 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.

Color	Hydraulic Function
Red	Opener Lift Cylinders
Blue	Transport Lift Cylinders
Gray	Fold Cylinders
Green	Marker Cylinders

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.

1. Connect opener-lift hoses to circuit designated for hydraulic-motor control.
2. Connect transport-lift hoses to tractor remote valve.
3. Connect fold hoses to tractor remote valve.
4. Connect marker hoses to tractor remote valve.

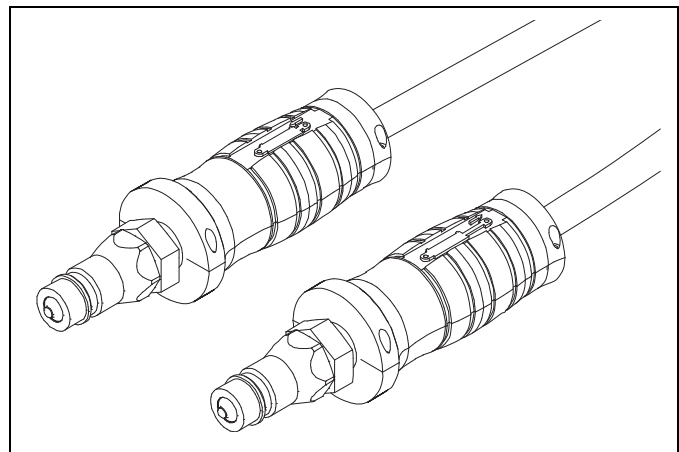


Figure 10
Color Coded Hose Grips

31733

NOTICE

To run drill on tractors with open-center hydraulics or on tractors with fixed-displacement hydraulic pumps, you must install a Great Plains kit, part number 194-143A. If you are not familiar with your tractor hydraulics, consult your tractor dealer.

Note: If your tractor has only two remote valves, you must install a double-selector valve to combine the transport-lift and opener-lift circuits. See “**Two Outlet Hydraulic Kit**” on page 91.

Older Style Hoses with Color Ties

Refer to Figure 11

To distinguish hoses on the same hydraulic circuit, refer to plastic hose label. The hose under an extended-cylinder symbol feeds a cylinder base end. The hose under a retracted-cylinder symbol feeds a cylinder rod end.

Great Plains hydraulic hoses are color coded to help you hookup hoses to your tractor outlets. Hoses that go to the same remote valve are marked with the same color tie.

Color	Hydraulic Function
Red	Opener Lift Cylinders
Blue	Transport Lift Cylinders
White	Fold Cylinders
Orange	Marker Cylinders

1. Connect opener-lift hoses to circuit designated for hydraulic-motor control.
2. Connect transport-lift hoses to tractor remote valve.
3. Connect fold hoses to tractor remote valve.
4. Connect marker hoses to tractor remote valve.

Check Drill Level

These items are set and verified at the factory, but need to be checked prior to first use.

- “Center Box Frame Leveling” on page 74
- “Opener Frames Level” on page 75
- “Wing Box Alignment” on page 76
- “Align Transfer Drive Shaft” on page 77
- “Toolbar Height” on page 79
- “Opener-Frame Clearance” on page 80

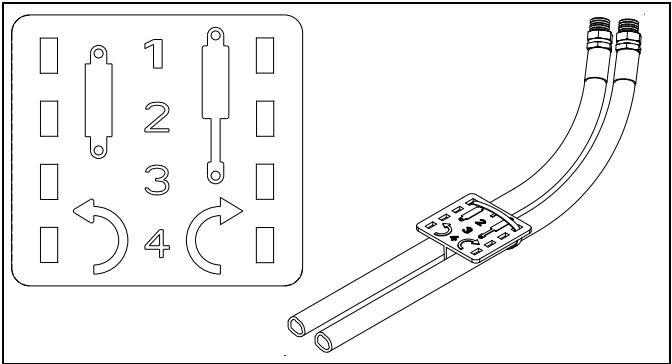


Figure 11
Older Style Hoses with Label

817-348c
17641

NOTICE

To run drill on tractors with open-center hydraulics or on tractors with fixed-displacement hydraulic pumps, you must install a Great Plains kit, part number 194-143A. If you are not familiar with your tractor hydraulics, consult your tractor dealer.

Note: If your tractor has only two remote valves, you must install a double-selector valve to combine the transport-lift and opener-lift circuits. See “Two Outlet Hydraulic Kit” on page 91.

Setting the Bypass Valve

Refer to Figure 12

A bypass valve ① is plumbed into the opener down pressure circuit. Tractors with load-sensing, closed-center hydraulics require this bypass valve to protect the tractor hydraulic system.

If you are unsure what type of hydraulic system is on your tractor, contact your tractor manufacturer.

Turn the locking disc ② counter-clockwise to enable adjustment.

Turn the adjustment knob ③ counter-clockwise to increase flow.

Turn the adjustment knob ③ clockwise to decrease flow. Turning it fully clockwise stops all bypass flow.

Tractors with Open Center Hydraulics

Release locking disc. Close bypass valve for no oil flow by turning knob on valve clockwise completely. Tighten locking disc. Always operate the drill with the bypass valve locked closed.

Tractors with Pressure Compensating Closed Center Hydraulics (PC Closed)

Release locking disc. Close bypass valve for no oil flow by turning knob clockwise completely. Tighten locking disc. Always operate the drill with the bypass valve locked closed.

Tractors with Load Sensing Closed Center Hydraulics (LS Closed) or Pressure Flow Compensating (PFC) Systems

NOTICE

Machine Damage Risk: Failure to use the bypass valve on load-sensing tractors may cause major tractor damage.

1. Release locking disc. Initially close bypass valve for no oil flow by turning knob on valve clockwise completely.
2. With tractor at half throttle, adjust flow-control valve on tractor so openers raise and lower at a reasonable speed. Keep tractor at one-half throttle for remaining steps.

Note: The faster openers raise and lower, the greater potential for oil heating, premature wear or tractor damage.

3. Engage tractor hydraulics and lower openers. Lock hydraulic lever on tractor for continuous operation. See “**Raising and Lowering Openers**” on page 23.

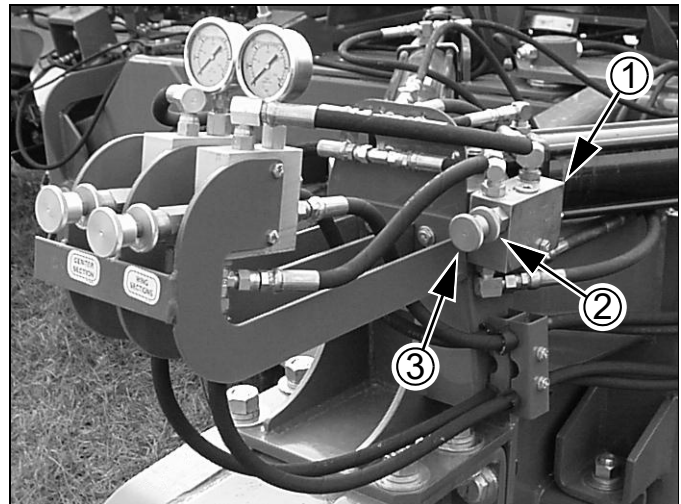


Figure 12
Bypass Valve

19045

Refer to Figure 12 on page 20 and Figure 13 at right

4. Release locking discs ⑤ on down-pressure valves. Adjust knobs ⑥ on pressure-control valves for opener down pressure so gauges ④ are at 2100 psi.
5. While watching gauges on drill, slowly turn knob on bypass valve counterclockwise. Adjust bypass valve just until needles on gauges begin to move down from 2100 psi. Lock bypass valve at this setting. (See also note below.)
6. Re-adjust pressure-control valves on drill to desired opener down pressure as explained under See **"Opener Frame Down-Force"** on page 50.

Note: The higher the bypass pressure, the greater the potential for oil heating and premature tractor damage. At the same time, for proper opener operation the bypass valve must be set at least 300 psi above the opener down-pressure setting when the tractor is at one-half throttle. Therefore, you should set the bypass valve as low as possible while staying at least 300 psi above the opener down pressure setting.

While 2100 psi is a good starting point for setting the bypass valve, if you consistently operate the drill with low opener down pressure you can set the bypass valve below 2100 psi. If you consistently operate the drill with very high opener down pressure, you may need a bypass-valve setting above 2100 psi.

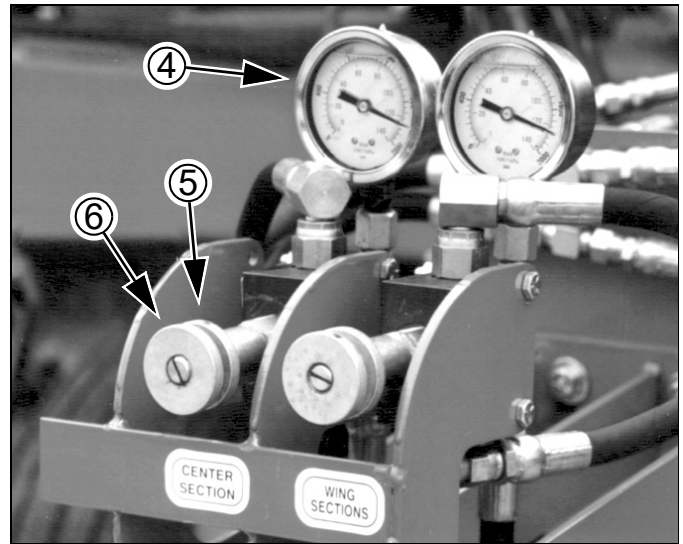


Figure 13
Down Pressure for Bypass

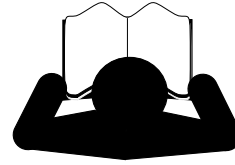
26471



Operating Instructions

This section covers general operating procedures. It assumes that setup items have been completed for both drill and tractor.

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



General Description

On the standard 3S-3000HD, field operations are controlled by tractor cab hydraulic levers. When openers are lowered, mechanical clutches engage, and the gauge wheels drive the seed meter shafts. Markers, if installed, are on a separate circuit.

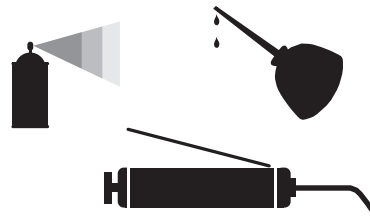
If the Point Row Option is installed, openers are controlled by section, and are raised and lowered by solenoid valves operated by the point row controller.

Seed meters operate at a rate proportional to ground speed, as set by Drive Type and Seed Rate Handles, based on the Seed Rate charts, and calibration.

Seeding depth and furrow coverage are controlled by drill down pressure and row unit setup.

Pre-Start Checklist

- ? Lubricate the drill as indicated under Lubrication, “**Maintenance and Lubrication**” on page 66.
- ? Check the tires for proper inflation according to “**Tire Inflation Chart**” on page 98.
- ? Check for worn or damaged parts and repair or replace before going to the field.
- ? Check all nuts, bolts and screws. Tighten bolts as specified on “**Torque Values Chart**” on page 97



Raising and Lowering Openers

Opener sub-frames are on a dedicated hydraulic circuit. Openers raise and lower independently of the drill frame (which is raised and lowered by the transport lift circuit).

When lowered, the opener circuit can use live hydraulic power to regulate down-pressure. To operate with live hydraulic power, connect the opener lift circuit to the #1 remote hydraulic circuit or the circuit designed for HYDRAULIC MOTOR control. On many CLOSED CENTER or PRESSURE/FLOW COMPENSATED tractors the #1 circuit is the circuit designed to supply live hydraulic power to remote locations.

On the standard 3S-3000HD drill, the openers raise and lower as a group, from a tractor cab lever. If the Point Row Option is installed, each section can raise and lower independently, using switches on the point row control module in the tractor cab.

If the Two Outlet conversion kit is installed, a selector valve near the hitch must be operated to switch between Opener Lift and Transport Lift. During field operations, this valve is in the Opener Lift position.

Opener Lock Up

The openers must be locked up for transporting or for working under the drill.

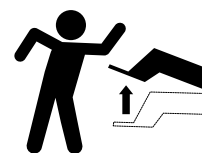
Refer to Figure 14

Each opener lift assembly has wire rod lock handle ①, and a cylinder lock status indicator ② on the lock hook.

Note: Opener transport lock handles ① can be moved with openers up or down, but transport locks only engage after openers are raised completely and disengage after openers are lowered completely. There are two lock handles on each drill section, six handles total.

Lock Up Openers

1. Position opener transport handles in ROAD position.



⚠ WARNING

Crushing

Raising openers on unfolded, unhitched drill will cause drill tongue to rise suddenly, which could cause serious injury or death. Be certain that drill is hitched securely to your tractor drawbar and the safety chain is securely attached to tractor before raising openers and unfolding drill.

Hazard:

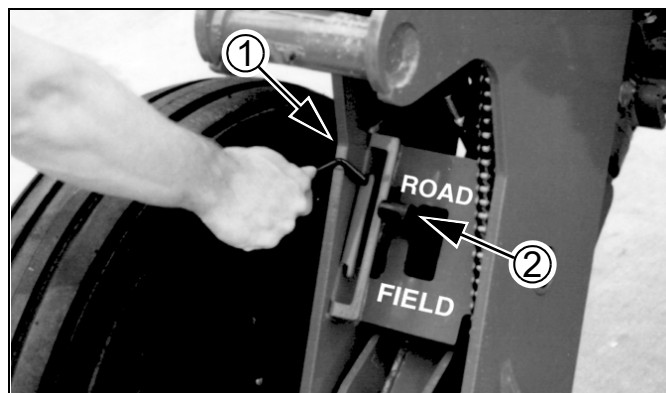


Figure 14
Opener Lock-Up

15549

2. Raise openers completely.

Unlock Openers

Refer to Figure 15

1. Position opener transport lock handles in FIELD position.
2. Raise openers completely.

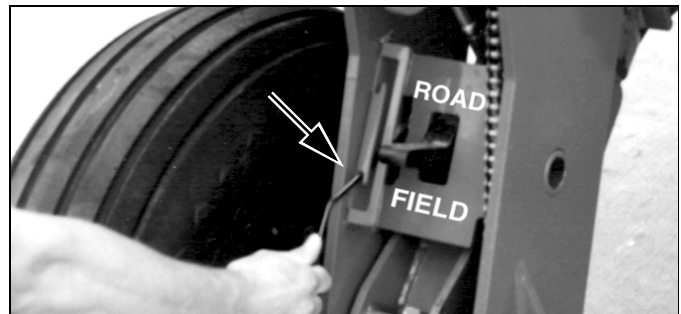


Figure 15
Opener Unlock

15548

Folding

WARNING

Crushing

Bystanders could be crushed between the folding drill boxes and the drill tongue. To avoid serious injury or death, keep all bystanders well away during folding operation.

Hazard:

1. Park tractor and drill on level ground with tractor transmission in Park. Be aware of clearance needed to fold drill.
2. Fold up markers if installed. See “**Marker Operation**” on page 42. Return selector valve handle to Fold position.

Refer to Figure 16

3. Opener subframe must be raised for folding. Position all six opener lock handles in ROAD position and completely raise openers. See “**Raising and Lowering Openers**” on page 23.



Figure 16 - Fold
Opener Lock Up

15549

Note: The opener transport lock handles are spring loaded and can be moved to ROAD position with openers up or down, but locks only engage when openers are completely raised. There are two locks on each drill section.

4. Make sure transport lift cylinders and front box lift cylinder are completely retracted (drill is lowered, although openers are raised).
5. Slowly supply oil to rod (retract) end of fold circuit. Completely fold wing frames until both wing gauge wheels contact tongue tube.

Fold (for transport) is not complete until Transport Lift is completed. In particular, the transport hooks only engage, lift and secure the wings as part of Transport Lift (the next topic).

Refer to Figure 17

6. Allow transport lift cylinders to settle back against lock channels.
7. Before transporting, check that hydraulic cylinders are holding lock channels securely.

Raising Drill (Transport Lift)

Transport Lift is on a dedicated hydraulic circuit. The center main frame raises and lowers independently of the opener sub-frames (which are raised and lowered by the Opener Lift circuit).

The Transport Lift circuit also includes a cylinder for the Transport Hooks, which lifts and restrains the outer/forward ends of the wing sections when folded.

Transport Lift is normally used only after the drill is folded. Opener Lift, and not Transport Lift, is used for headland turns in field operations.

Note: If the drill is unfolded, gauge wheels do not lift off the ground during Transport Lift. The wing sections pivot, and the gauge wheels remain on the ground. As they do not caster, they can drag sideways if Transport Lift is used before fold.

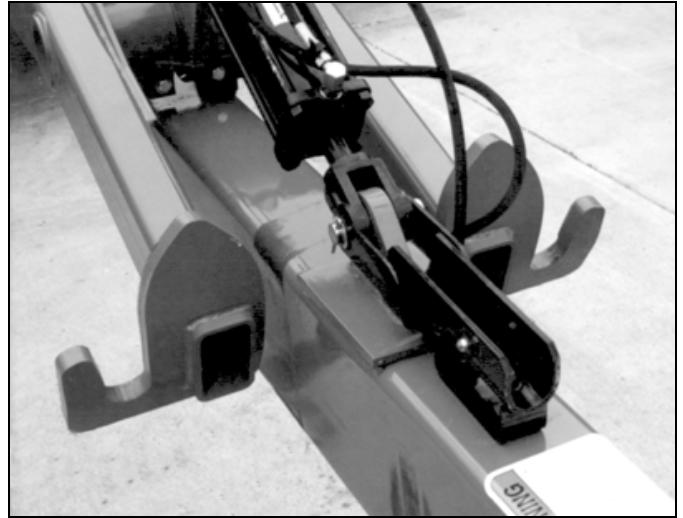


Figure 17
Front Box Lift Awaiting Wings

15553

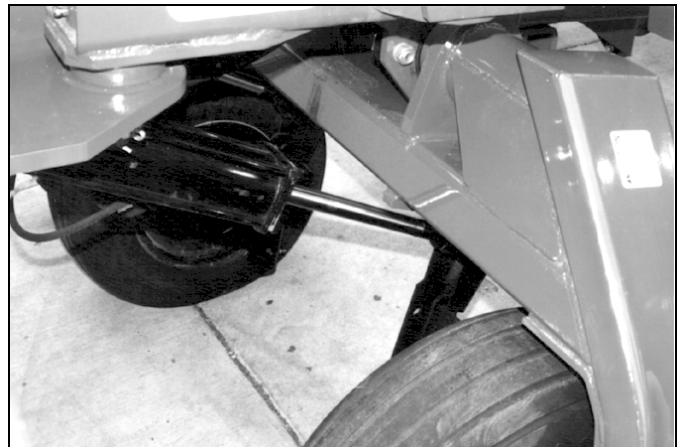


Figure 18
Transport Lift Cylinder

15551

Transport Lift

1. Fold the drill (unless this lift is for maintenance or adjustment). See **"Folding"** on page 24.
2. If the Two Outlet conversion kit is installed, a selector valve near the hitch must be operated to switch between Transport Lift and Opener Lift. See **"Lift Selector Valve Operation"** on page 43.
3. Supply oil to the base (extend) ends of the Transport Lift cylinders.

Refer to Figure 18

4. Leave the circuit extended until mainframe lift is complete, the transport hooks have engaged, the wing ends are lifted off the ground, and the front box lift cylinder is fully extended.

Refer to Figure 19

5. Swing the locks up and onto the transport lift cylinders. They are temporarily held in place with polymer bumpers. They are firmly held in place when the cylinder is relaxed in step 7.
6. Rotate cylinder lock channel over rod on front box lift cylinder.

Note: Bumpers hold the transport lift cylinder lock channels in place temporarily. The channels will remain in position when cylinders settle against channels.

7. Slowly reverse the Transport Lift circuit lever until all three lock channels are resting firmly on the rod ends of the transport lift and box lift cylinders. Set circuit lever to off.

The drill is now ready for the pre-transport checklist. See **"Transport"** on page 26.



Figure 19 - Fold
Transport Lift Cylinder Lock

15552

Transport

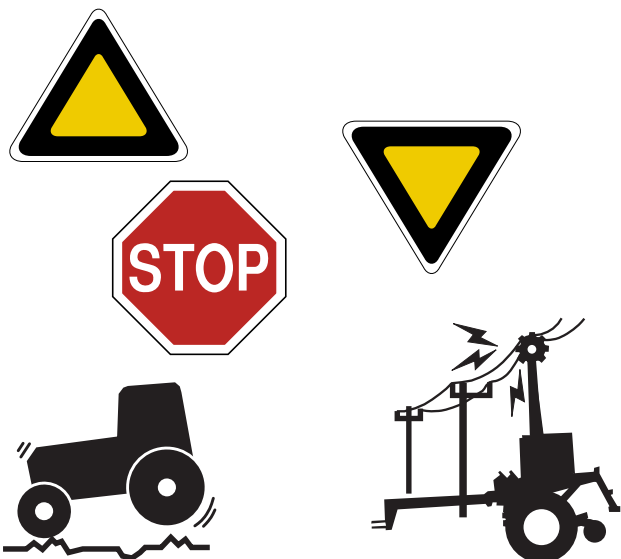
WARNING

Loss of Control Hazard:
Towing the drill at high speeds or with a vehicle that is not heavy enough could lead to loss of vehicle control. Loss of vehicle control could lead to serious road accidents, injury and death. To reduce the hazard:

Do not exceed 20 mph (32 kph).

Do not tow a drill that, when fully loaded, weighs more than 1.5 times the weight of the towing vehicle.

In the following table, multiply the total drill weight by 0.67 ($\frac{2}{3}$) to determine minimum tractor weight.



Weights for Tractor Requirements

Drill Model	Drill Weight (Pounds / Kilograms)		
	3S-3000HD-6006	3S-3000HD-4875	3S-3000HD-3610
Standard "HD" Drill	12447 lbs / 5646 kg	12425 lbs / 5636 kg	12409 lbs / 5629 kg
For "HDF" Model, add...	+1051 lbs / +477 kg	+1029 lbs / +467 kg	+1007 lbs / +457 kg
With Single Markers, add...	+456 lbs / +207 kg	+456 lbs / +207 kg	+456 lbs / +207 kg
With Dual Markers, add...	+887 lbs / +402 kg	+887 lbs / +402 kg	+887 lbs / +402 kg
For Full Main Box Seed Load, add...	+5933 lbs / +2691 kg	+5933 lbs / +2691 kg	+5933 lbs / +2691 kg
Small Seeds	+852 lbs / +387 kg	+832 lbs / +377 kg	+812 lbs / +368 kg
Maximum Configuration: (HDF, Dual Markers, Seed Loaded, Point Row Option, 2-Outlet Option)	20464 lbs / 9283 kg	20420 lbs / 9262 kg	20383 lbs / 9245 kg

Marker Transportation

Refer to Figure 20

Always transport markers folded flat. Make sure second marker section rests securely on transport carrier.

Transport Checklist

Before transporting the drill, check the following items:

- ? Transport only with a tractor of proper size. See "**Specifications and Capacities**" on page 96.
- ? **Safety Chain in Place** (page 15) - Attach safety chain to an anchor on tractor.
- ? **Drill Securely Hitched** (page 15) - Always use a locking-style pin sized to match holes in hitch and drawbar (minimum of 1in (2.4cm) diameter).
- ? **Openers Raised and Locked** (page 23) - Lock openers up into ROAD position.
- ? **Tires** (page 98) - Check that all tires are properly inflated
- ? **Bystanders** - Check that no one is in the way before moving. Do not allow anyone to ride on the drill.
- ? **Warning Lights** - Always use tractor and drill warning lights in transport.
- ? **Clearance** (page 96) - Know the maximum dimensions of the drill in transport position and follow a route that provides adequate clearance from all obstructions.
- ? **Stopping Distance** - Allow sufficient stopping distance and reduce speed prior to any turns or maneuvers. If the drill is transported full, allow extra stopping distance.
- ? **Road Rules** - Comply with all national, regional and local laws when transporting on public roads.

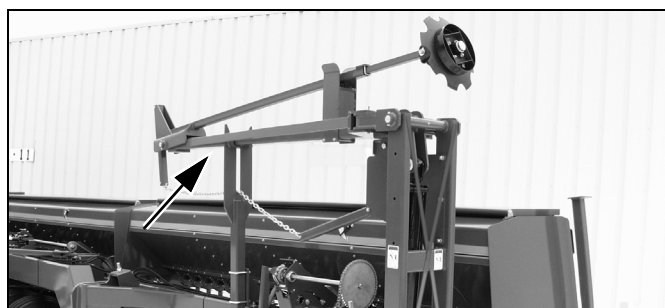


Figure 20
Marker in Transport Cradle

18857

- ? **Parking Stands Raised** (page 45) - Rotate stands up and pin.
- ? **Walkboard Ladders Raised** - (if equipped)
- ? **Drill Raised and Locked** (page 25) - Make sure drill is folded properly. Secure cylinder lock channels on transport-cylinder rods and front box lift cylinders. Allow transport lift cylinders to settle against lock channels.

Lowering Drill (Transport Lift)

Lowering from Transport Lift must be completed prior to unfolding.

Transport Lift is on a dedicated hydraulic circuit. The center main frame raises and lowers independently of the opener sub-frames (which are raised and lowered by the Opener Lift circuit).

The Transport Lift circuit also includes a cylinder for the Transport Hooks, which lifts and restrains the outer/forward ends of the wing sections when folded.

Transport Lift is normally used only when the drill is folded. Opener Lift, and not Transport Lift, is used for headland turns in field operations.

Transport Lower

1. Park tractor and drill on level ground with tractor transmission in Park. Be aware of clearance needed to unfold drill.
2. If the Two Outlet conversion kit is installed, confirm that the selector valve, located near the hitch, is set for Transport Lift operations. See "**Lift Selector Valve Operation**" on page 43.
3. Slowly extended the Transport Lift circuit lever until all three Transport Lift circuit cylinders are fully extended (2 at transport wheels; 1 at transport hooks on tongue). Set circuit lever to off or neutral (not float).

Refer to Figure 21

4. Rotate cylinder lock channels down and forward off transport lift cylinders.

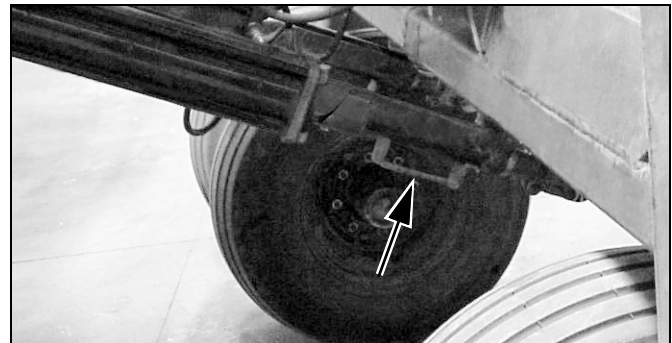


Figure 21
Transport Lift Cylinder Lock

18960

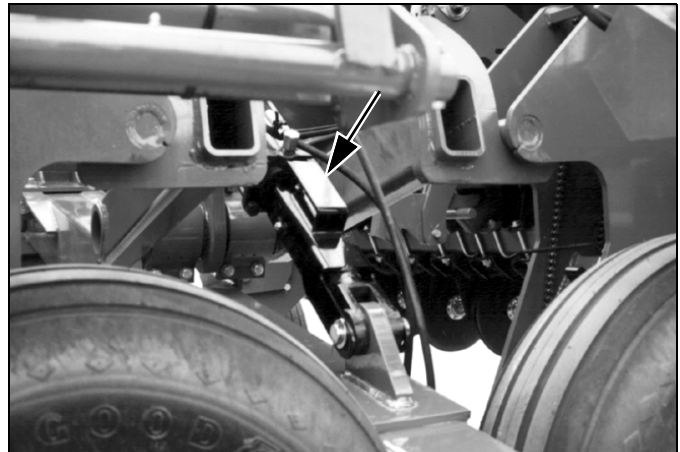


Figure 22
Front Box Lift Cylinder
Locked for Transport

15631

Refer to Figure 22

5. Rotate cylinder lock channel up and forward off front box lift cylinder.
6. Slowly reverse the lift circuit lever and begin lowering the drill. Keep the circuit engaged until all three cylinders are completely retracted. Set circuit to off or neutral.

The drill is now ready for unfolding.

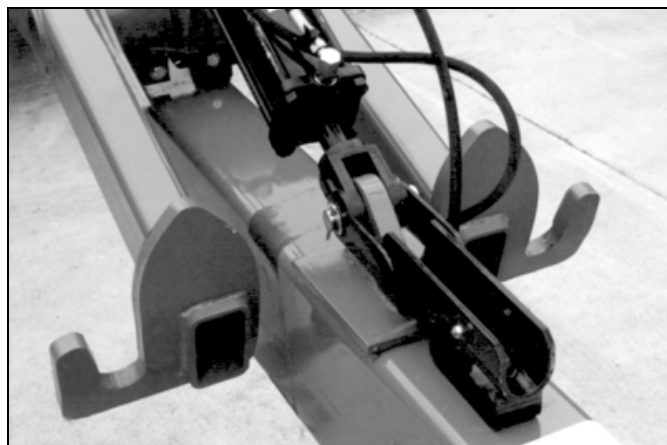


Figure 23
Front Box Lift Cylinder
in Field Configuration

15553

Unfolding

Drill must be lowered from transport lift prior to unfolding. See “**Lowering Drill (Transport Lift)**” on page 28.

1. Verify that the site has clearance needed to unfold drill.
2. If markers are installed, set Marker/Fold valve at hitch to Fold.

Refer to Figure 24

3. Verify that the opener sub-frames are still raised and locked up (handles in ROAD position).
4. Slowly supply oil to base end of fold circuit. Unfold wing frames by completely extending fold cylinders.

If field operations are planned:

5. Position all six opener transport lock handles in FIELD position.
6. Completely raise openers to allow opener transport locks to disengage.

Note: The opener transport lock handles are spring loaded and can be moved to field position with openers up or down, but locks will only disengage when openers are completely raised. There are two lock handles on each drill section.

Folding and Unfolding Quick Reference

To Fold Drill for Transport

- Fold markers (page 42).
- Raise openers (page 23).
- Fold drill (page 24).
- Raise drill (page 25).

To Unfold Drill for Field

- Lower drill (page 29).
- Unfold drill (page 29).
- Set openers for FIELD (page 23).

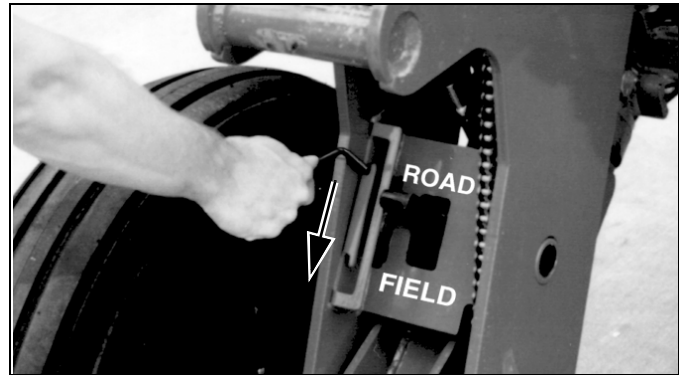


Figure 24 - Unfold
Opener Unlock

15549

Opener Operation

DANGER

Crushing

Hazard:

You will be seriously injured or killed if you are caught between raising openers and drill frame. Always stop tractor engine, set park brake, and remove key before adjusting or servicing openers. Keep all bystanders well away during drill operation.



The openers are raised and lowered on their own hydraulic circuit. When used with an active hydraulic system, constant hydraulic down pressure is placed on openers for even soil penetration across the drill. To operate openers with live hydraulic power, always connect the opener-lift hoses to the circuit designated for hydraulic-motor control.

To achieve proper opener flotation, the opener hydraulic circuit must be powered by an active hydraulic system. An active hydraulic system requires a tractor with closed-center hydraulics or pressure-flow compensated hydraulics powered by a variable displacement hydraulic pump.

To run drill on tractors with open-center hydraulics or on tractors with fixed-displacement hydraulic pumps, you must install a Great Plains kit, part number 194-143A. Contact your Great Plains dealer for ordering information.

If you are not familiar with your tractor's hydraulics, consult your tractor dealer.

After first initial operation of the drill, inspect the opener mounting bolt and nut for proper torque. This check should be repeated before each drilling season. See **"Opener Mounting Bolt"** on page 90 for additional information on torque and maintenance.

For more information on opener adjustments, see **"Troubleshooting"** on page 63.

WARNING

High

Pressure

Fluid

Hazard:

Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic lines. Use a piece of paper or cardboard, NOT BODY PARTS, to check for suspected 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.



Active Hydraulic Systems

1. Lock hydraulic lever forward during field operation for constant hydraulic flow to openers.

John Deere tractors with Sound-Gard® Body:

Use lever lock clip, John Deere part number R52667, to lock lever forward. See your tractor dealer for clip purchase and installation.

John Deere 7000 Series tractors: Rotate valve detent selector to motor position to lock lever in forward position.

John Deere 8000 Series tractors: Set timer to continuous. Push lever forward until detent clicks.

Case-IH Magnum tractors: Lock lever forward in detent position. You may need to turn up detent pressure to its maximum setting. Do not tie hydraulic lever past detent position with a strap. See your tractor dealer for hydraulic-system details.

Other tractors: Lock lever forward in detent position. You may need to turn up detent pressure to maximum or use a mechanical detent holder to hold lever forward. See your tractor dealer for proper means of providing constant flow to openers.

Refer to Figure 25

2. With tractor hydraulic lever locked forward and openers in field position, release lock disk ① and set down-pressure with adjustment knob ②. Watch pressure gauge and dial in desired pressure on openers. There is one pressure-control valve for openers on center section and one for openers on wing sections of drill.

Note: Rotate knob clockwise to increase pressure and counterclockwise to decrease pressure.

3. Once pressure is set, set knobs with lock disks ①.
4. In some applications, pressure on center section is set slightly higher than the wings to account for additional compaction from drill transport tires and tractor tires. The recommended pressure range for drilling is between 1200 psi and 1800 psi.
5. For more information on adjusting hydraulic down pressure, see “Row Unit Down Pressure (Spring)” on page 55.

NOTICE

Equipment Damage Risk:

During operation always raise openers before turning. Never back up or turn sharply with openers in the ground. Doing so will plug openers and may damage equipment.

NOTICE

Machine Damage Risk:

Tractors with load-sensing hydraulics must use the bypass valve to operate the 3S-3000HD. Failure to use the bypass valve can cause major tractor damage. Before adjusting opener down pressure, set bypass valve per “Setting the Bypass Valve” on page 20.

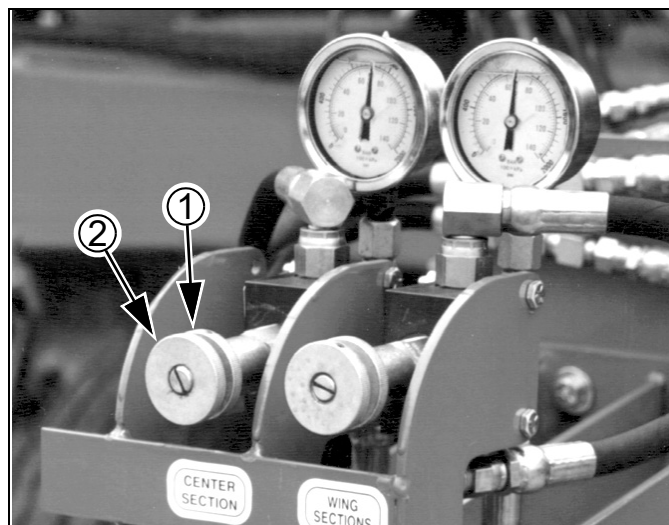


Figure 25 - Active Pressure Control Valves

26477

NOTICE

Population Risk: Do not operate at pressures so high that the gauge wheels lose traction, or are off the ground, resulting in skips and poor seed metering.

Priority Flow Hydraulic Systems

On some tractors with load-sensing hydraulics, the circuit #1 is capable of taking nearly 100 percent of available hydraulic flow. Operating the openers or markers on circuit #1 will starve the other circuit, making one function inoperable.

To operate markers and constant opener down pressure at the same time, connect the openers to circuit #2 and the markers to circuit #3.

Non-Active Hydraulic System

To run drill with open-center hydraulics or fixed-displacement hydraulic pumps requires a Great Plains kit, part number 194-143A. After installing the kit, refer to the following instructions for opener operation.

1. Lower opener frames by pushing forward on tractor hydraulic lever. Lock lever temporarily in this position while adjusting opener down pressure.

Refer to Figure 26

2. With tractor hydraulic lever locked forward, release lock disk ① and set down-pressure with adjustment knob ②. Watch pressure gauge and dial in desired pressure on openers. There is one pressure-control valve for openers on center section and one for openers on wing sections of drill.

Note: Rotate knob clockwise to increase pressure and counterclockwise to decrease pressure.

3. Once pressure is set, set knobs with lock disks ①.
4. After opener down pressure is set, return tractor hydraulic lever to neutral. This locks-in the selected pressure, and opener frames remain fixed in this position.

NOTICE

Machine Damage Risk: Open-center tractors and tractors with fixed-displacement pumps are not designed to provide a continuous supply of pressurized oil to remote valves. Locking hydraulic lever forward on these tractors can cause overheating of hydraulic oil and tractor damage. After setting opener down pressure, always return hydraulic lever to neutral.

Note: On some tractors with very positive remote hydraulic checks, a slight increase in the reading on the pressure gauges may occur after tractor remote lever is returned to neutral. This is caused by back pressure on opener cylinders and should be ignored. The net operating pressure on opener cylinders is maintained at the pressure you selected while tractor remote lever was held forward-not at the apparently increased pressure. Reactivating tractor lever forward will confirm this.

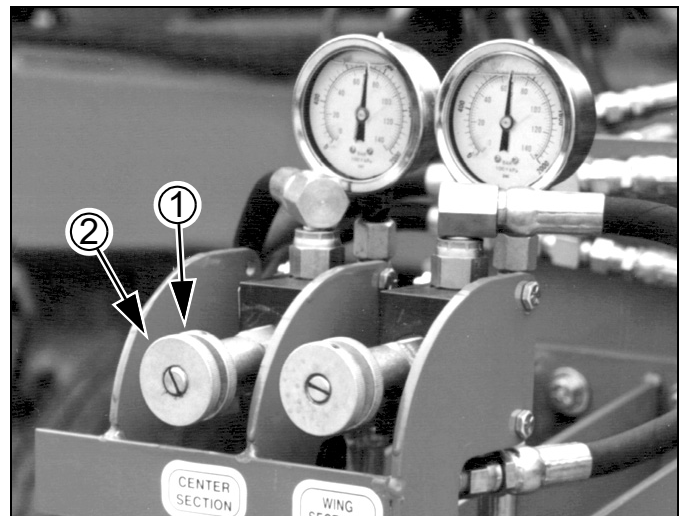


Figure 26 - Non-Active Pressure Control Valves

26477

During operation:

- Each time openers are lowered, hold tractor remote hydraulic lever forward for a few seconds to recharge circuit, then return it to its neutral position. The tractor and drill should be on level ground when returning tractor lever to neutral.
- When approaching rough terrain where you need active hydraulics to maintain even opener penetration, push tractor hydraulic lever forward momentarily. As soon as you return to level ground, return lever to neutral. Do not activate tractor hydraulic lever for more than 20 seconds at a time, once every 2 minutes. Always wait until tractor and drill are on level ground before returning lever to neutral. You can bump tractor hydraulic lever forward any time on level ground to assure the preset pressure is correctly locked in and to reset the system.
- Always raise openers before turning. Never back up or turn sharply with openers in the ground. Doing so will plug openers and may damage equipment.

Position Seed Cup Doors

If planting from the main seed box, check/set all the meter doors before loading seed.

Refer to Figure 27,

which depicts the seed cup door handle in position ③.

At each main seed box seed tube, adjust the seed cup door handle ④ for the seed size.

The handle has three normal operating position detents:

- ① (top detent) is for the smallest seeds.
Use it for wheat and similar small seeds.
- ② (middle detent) is for larger seeds.
Use it for soybeans and similar larger seeds.
- ③ (bottom detent) is for oversize or fragile seeds.
If you experience excessive cracking with setting ②, use setting ③.

Note: Handle position ⑤ is used for clean-out, not planting. If set to this position with seed loaded, it may be difficult to reset it to a normal operating position.

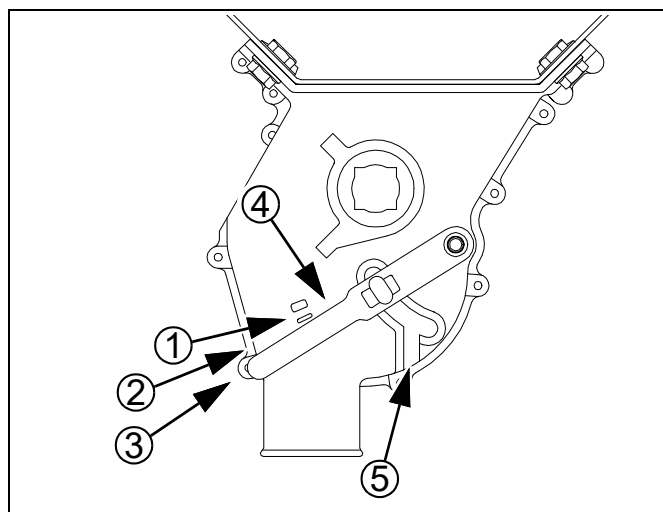


Figure 27
Seed Cup Door Handle

26211

Loading Seed Boxes

Seed may be loaded in the field or prior to transport. Fully loaded with dense seed, the drill can weigh an additional 5933 lbs (2691 kg). Include this weight when checking tractor capability.

The drill must be hitched for seed loading. The mainframe may be raised or lowered. Lowered places the walkboards closer to the ground, reducing effort when manually loading bagged seed. If equipped with ladders, swing them down.

Main Seed Box Loading

1. Check that all meter doors are positioned for the seed size, and not set for clean-out. See **“Position Seed Cup Doors”** on page 34. If loading prior to transport, set them to position 1 (smallest seed).
2. Install or remove optional seed plugs as desired for the row spacing planned. See **“Seed Tube Plug”** on page 93.
3. If loading prior to transport, and calibration has not yet been done, set Seed Rate Handles to 0. At 0, and with the doors at 1, no seed can leak during transport.
4. On HDF (fertilizer-capable) drill models:
 - Check that any offset box dividers are set to the desired compartment ratio. See **“Offset Box Divider”** on page 92.
 - Check that the divider flap is set as desired (separate compartments, or all-seed). See **“Fertilizer Box Operation”** on page 36.
 - If seeding only from the forward (seed) compartment, flip the top spill flap (page 38) back to prevent seed from entering the fertilizer compartment. See **“Fertilizer Box Operation”** on page 36.
5. Take all necessary materials safety precautions if the seed is treated.
6. Load seed evenly into seed boxes.
7. To reduce wear, remove main shaft drive chains for small seed boxes.

Seeding with Both Compartments

1. Clean out boxes. See **“Main Seed Box Clean-Out”** on page 67 and **“Fertilizer Box Clean-Out”** on page 67.

Refer to Figure 28

2. Open divider door between seed and fertilizer compartments - loosen knobs ①. Loosen knobs until bent clips can be turned away from door ①.
3. When all bent clips have been turned, lift vinyl dew shield (not shown) and flip the flap ② backward over fertilizer-tray openings ③.

Refer to Figure 29

4. With seed/fertilizer flap ② covering fertilizer openings, lower vinyl dew shield ④ to hold flap over fertilizer openings and away from divider.

Small Seeds Box Loading

1. If loading prior to transport, and calibration has not yet been done, set Seed Rate Handles to 0. At 0, no seed can leak during transport.
2. Take all necessary materials safety precautions if the seed is treated.
3. Load seed evenly into seed boxes.
4. To reduce wear, remove main shaft drive chains for main seed boxes.

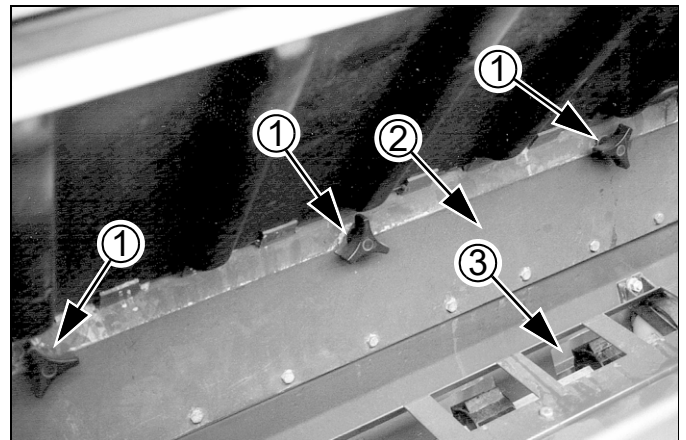


Figure 28
Open Seed/Fertilizer Flap

16383

- To avoid unnecessary wear, remove all three fertilizer Range drive chains.

Fertilizer Box Operation

The 3S-3000HDF models are equipped with a fertilizer compartment capable of planting seed only, or seeding and applying fertilizer in the same field pass.

Use only dry, granular fertilizer in the fertilizer box.

Seeding and applying fertilizer

- Clean any seed or debris from fertilizer compartment. See **"Fertilizer Box Clean-Out"** on page 67.

Refer to Figure 30

- Adjust dividers between seed and fertilizer compartments to desired capacity.

The standard fertilizer dividers partition the drill boxes into:

60% seed : 40% fertilizer, or;
100% seed : 0% fertilizer (see page 35).

The optional offset dividers partition the drill boxes into:

68% seed : 32% fertilizer,
55% seed : 45% fertilizer, or;
100% seed : 0% fertilizer (see page 35).

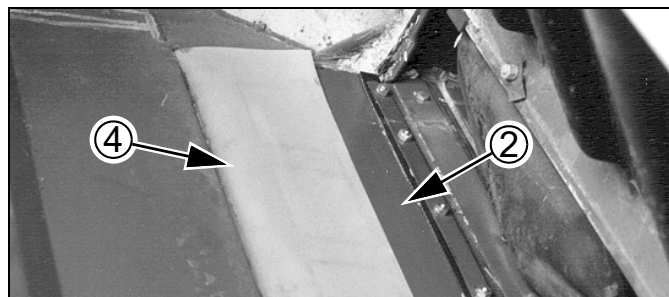


Figure 29
Flap Secured

16380

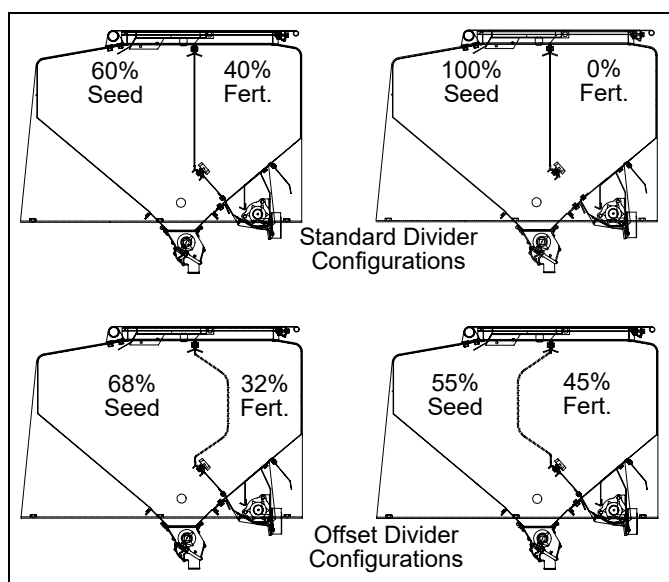


Figure 30
Seed Box Divider

27003

Divided Capacities

	Capacity Ratio		Total Capacity	
	Seed	Fertilizer	Seed	Fertilizer
None	100%	0%	92.7 bu 3267 ltr.	0
Standard	60%	40%	55.6 bu 1960 ltr.	37.1 bu 1307 ltr.
Offset to Back	68%	32%	63.0 bu 2221 ltr.	29.7 bu 1045 ltr.
Offset Forward	55%	45%	51.0 bu 1797 ltr.	41.7 bu 1470 ltr.

Divider Removal**Refer to Figure 31**

- Remove $\frac{5}{16}$ in bolts ① and flange nuts ② from tabs ③ at each end of drill box (2 locations).
- Remove $\frac{5}{16}$ in bolts ④ and nuts ⑤ from lid-hinge brackets ⑥ (3 locations).
- Loosen but do not remove $\frac{1}{4}$ in bolts ⑦ and nuts that clamp the lid assembly ⑧ angle irons to the plastic dividers ⑨.
- Lift lid assembly ⑧ out of drill box. Lift dividers ⑨ out of drill box. Reinstall standard or offset dividers.
- Reinstall lid assembly by reversing step d through step a.

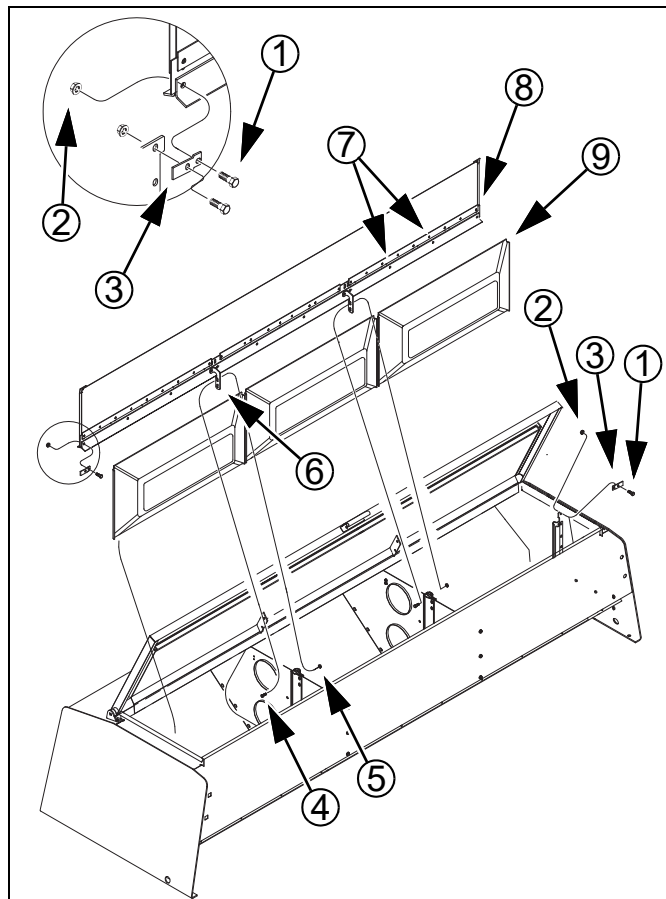


Figure 31
Box Divider Removal

27050

Refer to Figure 32

- Check that the seed/fertilizer flap is closed so seed and fertilizer cannot pass between compartments.

Flap flips forward to block passage. The flap top edge is secured to the dividers. Rotate the bent clips to engage the edge of the flap, and tighten the knobs.



Figure 32
Seed/Fertilizer Flap Closed

16383

Refer to Figure 33

7. Check that fertilizer clean-out door is latched securely ① as shown. Close all door latches before loading fertilizer compartment.

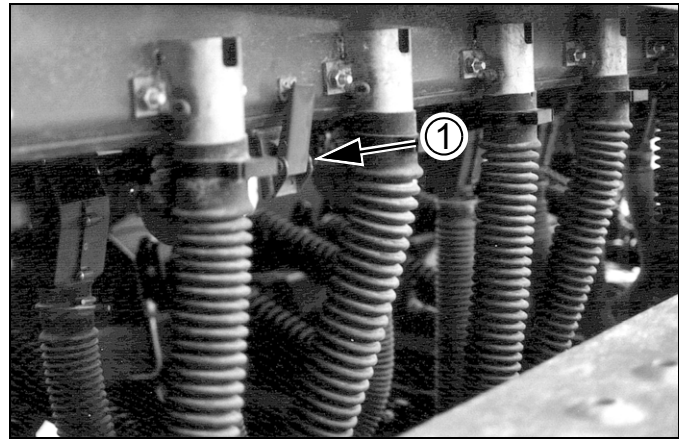


Figure 33
Cleanout Door Latch

16377

Refer to Figure 34

8. Open main seed box lid.
9. Raise spill flap over fertilizer compartment and swing it forward until it rests against open drill-box lid. The spill flap serves as a spill guard to keep fertilizer out of the seed compartment.
10. Fill fertilizer compartment.
11. Calibrate fertilizer-application rate per Seed Rate manual.

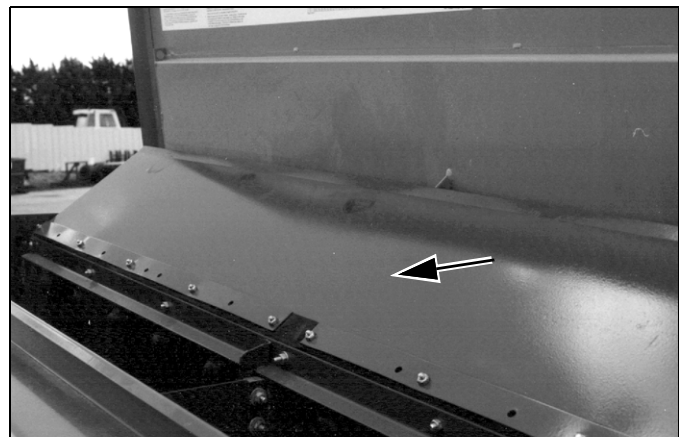


Figure 34
Spill Flap Open to Fertilizer

14875

Initial Seeding Depth

Refer to Figure 35

12. Set opener seeding depth by adjusting press-wheel height ①. 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. T handles adjust at $\frac{1}{4}$ in (6.4mm) seeding depth change per minimum handle step.

- For more shallow seeding, slide T handles forward ⑥ toward implement.
- For deeper seeding, slide T handles backward ⑦ away from implement.

13. While seeding, remember:

- Raise openers before turning. Never back up or turn sharply with openers in the ground. Doing so will plug openers and may damage equipment.
- Check periodically for plugged openers and hoses.

For information on opener adjustments, “**Row Unit Adjustments**” on page 54. For information on troubleshooting opener problems, see “**Troubleshooting**” on page 63.

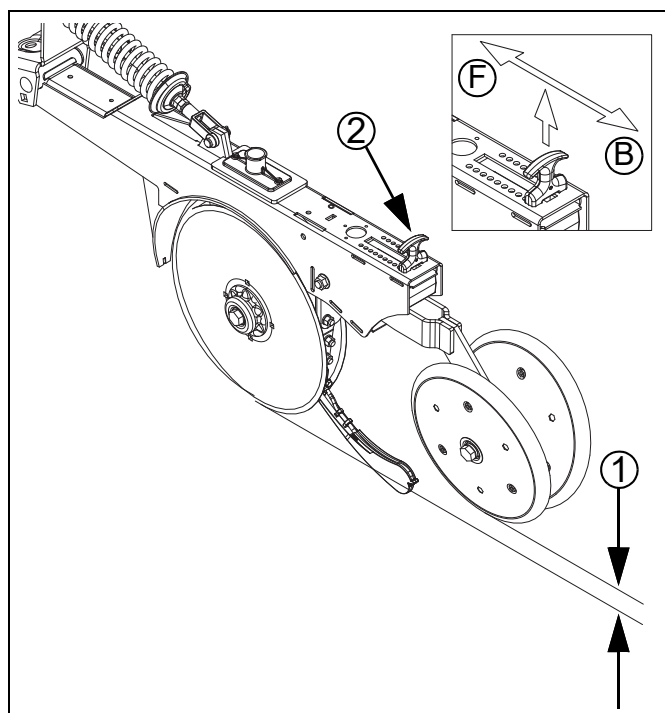


Figure 35
Initial Opener Depth

26441

Acrometer Operation

The acrometer, located on the drill clutch shaft, counts shaft rotations whenever the shaft is rotating - this is with the drill lowered and in motion or during calibration crank operation. The meter is programmed to display rotations as acres or hectares^a, when using all rows, factory-specified tires and tire inflations.

Note: Unusual conditions and/or non-standard row spacings can cause the acrometer tally to vary from actual acres planted.

Normal Operating Sequence

Note: The acrometer counts rotations during drill calibration (and if so, can be useful for calibration, although the meter must be on, or moved to the shaft being cranked).

1. Record the acrometer reading at the start of planting (and after calibration). The large "12345.6" format display is the grand total area since meter installation. The smaller number in the lower left corner is the number of revolutions per acre for which the meter was factory-programmed. If the display is blank, see "**Dormant Display**" below.
2. Lower drill and plant. Acrometer counts shaft rotations, calculates acres or hectares, and adds to the running grand total.



Figure 36
Electronic Acrometer

27378

a. See page 95 for replacement and alternate meters.

3. During planting (drill lowered and moving forward), the display blanks (goes dormant), but area tally continues.
4. When raised for turns, obstructions and transport, the clutch disengages, the shaft stops, and the meter counts no additional (non-planting) rotations.
5. Whenever shaft rotation stops, the LCD display activates after 30 to 60 seconds, and remains visible for 30 to 45 minutes.
6. At the completion of planting, record the final reading or the grand total. If the display goes dormant before you can read it, see “**Dormant Display**”.
7. Subtract the reading at Step 1 from the reading at Step 6 for the total planted in the present session.

Dormant Display

Refer to Figure 37

To conserve power, the LCD display blanks itself most of the time. If you need to read the display after it has “timed out” and gone dormant:

- use the calibration crank to turn the jackshaft once, or
- gently tap or wave a magnet at either of the Great Plains logo spots ① on the lower region of the display. Be careful not to scratch the window.



Figure 37
Meter Display (Acres)

29130

Marker Operation

Optional markers are equipped with a double-selector valve, on the tongue near the hitch, to combine the box-fold circuit with the marker circuit. On a 2-outlet tractor, there is a second selector valve, for the lift circuits, mounted above the marker/fold selector.

Refer to Figure 38

After drill is unfolded for field operation, move double-selector valve handle from forward fold position ① to marker circuit (back ②). Before operating markers, make sure they are properly bled as described in “**Bleeding Hydraulics**” on page 69.

Single Marker Operations

To operate a single marker, activate tractor remote hydraulic lever to move marker in desired direction.

Single markers are equipped with a needle valve to control marker folding speed. Excessive folding speed can damage markers, so adjust needle valve to a safe operating speed as described under “**Marker Speed**” on page 62.

Dual Marker Operations

Dual markers are equipped with an automatic sequence valve to control lift sequence. Starting with both markers up, the sequence is:

- Activate hydraulic lever; right marker lowers while left marker stays up.
- Reverse hydraulic lever; right marker raises while left marker stays up.
- Activate hydraulic lever; left marker lowers while right marker stays up.
- Reverse hydraulic lever; left marker raises while right marker stays up.

Pattern repeats.

Folding speed of dual markers is adjusted with adjustment screws on sequence-valve body. Excessive folding speed can damage markers, so adjust markers to a safe folding speed as described under “**Marker Adjustments**” on page 59.

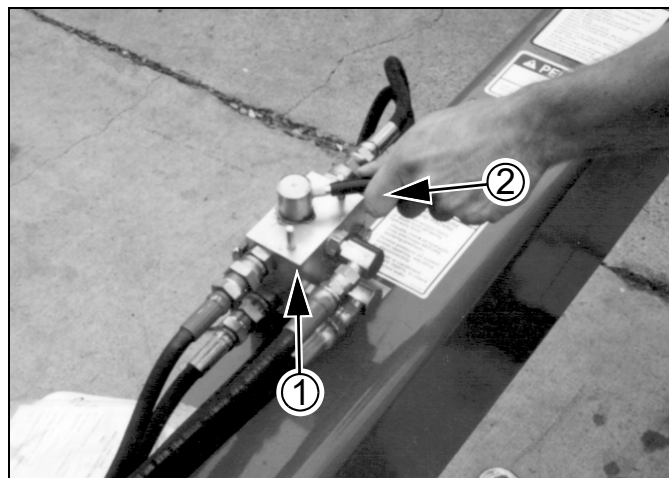


Figure 38
Fold / Marker Selector

15550

Lift Selector Valve Operation

Tractors with only two remote circuits need an optional selector valve, which shares a single tractor circuit between transport lift and opener lift. Two Outlet Tractor Hydraulic Kit Great Plains Part number 194-122A. This combines the transport lift hydraulic circuit and opener lift hydraulic circuit.

If no markers are installed, the lift selector valve is mounted on the standard tongue valve plate near the hitch. If markers are also installed, the lift selector valve mounts above the marker valve on an extension plate.

Refer to Figure 39, which depicts the optional lift selector valve on a drill without markers.

To operate, move handle from forward transport lift position ① to rear opener lift position ②.

Note: Do not rely on this valve to lock up either transport lift circuit or opener subframe circuit. Use the lift locks.

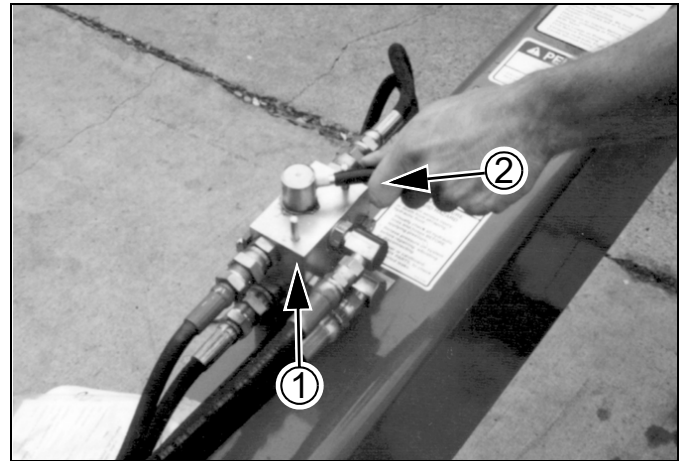


Figure 39
Optional Lift Selector

15550

Point Row Operation

Refer to Figure 39

The optional point-row controller allows you to raise and lower openers on one drill section independently of the others. A POINT ROW CONTROL module in the tractor cab operates solenoid valves on the drill, which raise and lower opener sub-frames independently (or together). The mechanical clutches on each section suspend seeding when raised.

To raise and lower openers on all sections together, set POWER switch ① ON-left, so MASTER LIFT CONTROL indicator ② is illuminated. Raise or lower with the ALL UP / ALL DOWN switch ③ under the indicator.

To raise and lower opener sections independently, set POWER switch ① ON-right so SECTION CONTROL indicator ④ is illuminated. Raise and lower openers on each section by operating the UP / DOWN switches ⑤ illuminated under the SECTION CONTROL.

Note: Turn Point Row POWER switch ① to OFF-center when tractor is off.

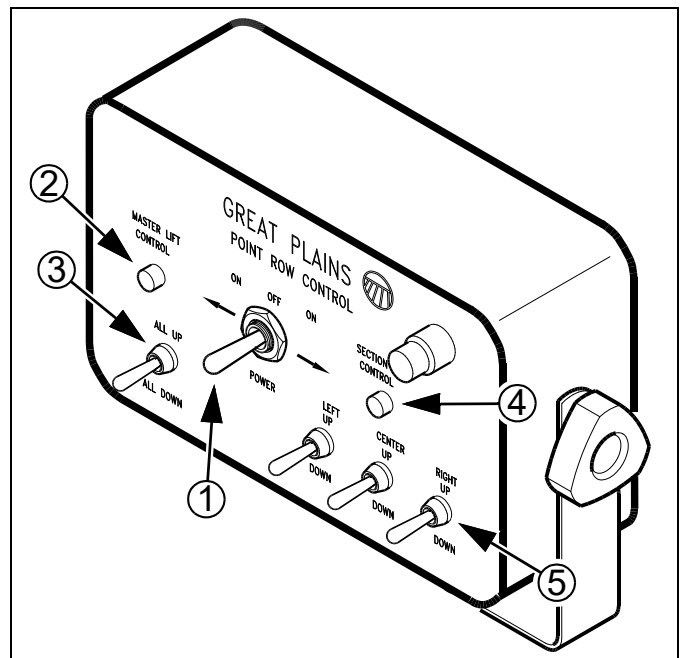


Figure 40
Point Row Controller

17060

Shaft Monitor Operation

The optional shaft monitor generates an alarm if any one or more of the three main seed box meter shafts on the drill stop turning for more than 20 seconds.

Refer to Figure 41

To operate shaft monitor, turn system on by activating on-off switch ① on monitor head. If seed-cup shafts are turning, all three indicator lights are illuminated and no alarm sounds.

If any seed-cup shaft stops for 20 seconds, an alarm sounds and the indicator for that section flashes on the monitor, designating the failed shaft.

Note: The 30-second delay is to prevent nuisance alarms when turning at the end of the field.

Note: If a failure does occur and an alarm sounds, remember you have traveled for 20 seconds without planting with that drill section. If due to wheel lift or low tire pressure, you may have been planting at progressively lower populations before that.

Note: Older (Vansco) monitors alarm dwell time was 30 seconds.

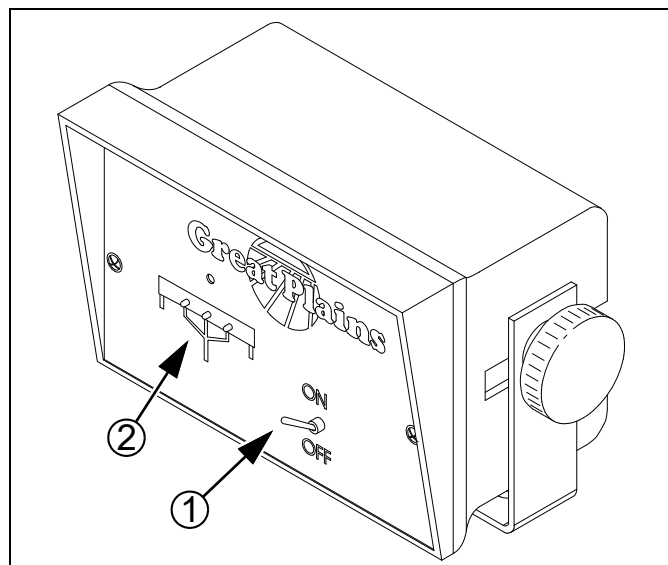


Figure 41
Shaft Monitor Head

18943

Field Operations

This section presumes that all pre-operation checks have been made on both tractor and drill, and drill is loaded with seed and any treatments.

Final Field Checklist

- ? Drill hitched, chained and unfolded. See page 15 and page 29.
- ? Set seed and fertilizer drives per charts and calibration. See page 48 and page 48.
- ? Set drill selector valves (if present) to Markers and Opener Lift. See page 42 and page 43.
- ? Record acremeter reading if acreage monitoring is desired.
- ? If installed, Shaft Monitor power ON.
- ? If installed, Point Row Control module ON, and set for either ALL or SECTION CONTROL.

Planting Sequence

1. Lower drill openers at initial seeding point.
2. Pull forward and begin planting.
3. Raise drill for turns (meters stop automatically).

Planting Speed

The Seed Rate charts were developed at a test speed of 6.5 mph (10.5 kph) and are valid for all lower speeds under most conditions.

Parking

Following these steps when parking the drill for periods of less than 36 hours. For longer periods, see “Storage” on page 46.

Parking with Drill Unfolded

1. Remove jack from storage location on top of tongue and pin it on post on left side of tongue as shown on page 16. Extend jack until weight of tongue is on jack. Leave tractor hitched for the moment.

Refer to Figure 42 and Refer to Figure 42

2. Lower parking stands located on outer ends of drill by unpinning keeper pin and rotating stands down. Place a block under foot of stand if it does not contact the ground.
3. Lower openers and reduce hydraulic down pressure to zero.
4. Unplug drill hydraulic hoses and electrical lines from tractor.

CAUTION

Use caution when removing the hitch pin. Slight tongue elevation may occur, even with openers and parking stands lowered.

5. Remove hitch pin first, then safety chain from tractor drawbar.

Note: After unhitching the unfolded drill, the tongue may rise above tractor-drawbar height. Lower tongue by connecting the opener-lift circuit and pressurizing openers.

Parking with Drill Folded

1. Raise, lock and fold drill into transport position.
2. Park drill on a level, solid area.
3. Remove tongue jack from its storage location on top of tongue and pin it on post on left side of tongue as shown on page 16. Extend jack until weight of tongue is on jack. If ground is soft, place a board or plate under jack to widen ground-contact area.
4. Unplug hydraulic hoses and electrical lines from tractor.
5. Remove hitch pin first, then safety chain from tractor drawbar.



WARNING

Crushing Hazard: This drill has a negative tongue weight when unfolded and openers are raised. Lower parking stand, lower openers and remove hydraulic down pressure before unhitching the drill in the unfolded position. Unhitching in the unfolded position with the openers raised could result in sudden elevation of the tongue, causing injury or death.



Figure 42
Wing Stand Pinned Up

18837



Figure 43
Wing Stand Pinned Down

18837

Storage

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

1. Perform the drill Parking checklist.
2. If storing with openers lowered, disconnect seed hoses at openers to prevent deformation.
3. Lubricate the drill at all points listed under “**Lubrication**” on page 83.
4. Check all bolts, pins, fittings and hoses. Tighten, repair or replace parts as needed.
5. Check all moving parts for wear or damage. Make notes of any parts needing repair before the next season.
6. Plug or cap seed delivery and fertilizer tubes to prevent pest entry.
7. Apply grease to exposed cylinder rods to prevent rust.
8. Use touch-up paint to cover scratches, chips and worn areas to prevent rust.



Adjustments

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

The 3S-3000HD has double-disk openers with depth-control press wheels mounted on floating opener frames. Opener bodies are staggered for easy soil flow. All openers pivot on a common axis to maintain consistent depth as the opener frames follow contours. A spring provides the down pressure necessary for opener double disks to open a seed furrow. The spring allows openers to float down into depressions and up over obstructions. Individual openers can be adjusted to account for tire tracks.

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

Seed and Fertilizer Rate

Materials are applied by fluted feed meters driven by the gauge wheels. Independent mechanisms control seed and fertilizer application. Optional Small Seeds rate is controlled entirely by Rate Handles. Details are found in the Seed Rate Manual (195-068B).

Main Box Seed rate is controlled by adjustments for:

- Drive Type sprocket (one sprocket each gauge wheel)
- Seed Rate Handle (one handle each seed box)
- Feed Cup Door (one each seed tube)

Fertilizer rate is controlled by:

- Range sprockets (one set each fertilizer box)
- Final Driver/Driven sprockets (one set each box)

Planting Depth

Setting nominal planting depth, and achieving it consistently, is affected by multiple adjustable drill functions, from greatest to least effect they are:

- Opener Depth (Press Wheel Height)
- Opener Frame Down-Force,
- Row Unit Down Pressure (Spring),
- Opener Height,
- Opener-Subframe Adjustment,
- Frame Weight (at higher pressures), and;
- Disk Blade Adjustments (as blades wear).

Adjustment	Page	The Adjustment Affects
Setting Main Box Seed Rate	48	
Setting Drive Type	195-068B	Coarse control of seeding rate
Main Box Seed Rate Handle	195-068B	Fine control of seeding rate
Position Seed Cup Doors	34	Consistent seed delivery for certain seed sizes
Setting Fertilizer Rate	48	
Setting Fertilizer Drive Range	195-068B	Coarse control of application rate
Setting Fertilizer Final Drive	195-068B	Fine control of application rate
Frame Level	49	Section-to-section planting consistency
Small Seeds Rate	48	Small seeds population
Opener Frame Down-Force	50	Consistent seeding depth
Opener-Subframe Adjustment	53	Level row unit running in desired pressure range
Frame Weight	50	Achieving higher down-force settings
Row Unit Adjustments	54	
Opener Height	55	Seeding depth in tire tracks
Row Unit Down Pressure (Spring)	55	Level row units and consistent seeding depth in tire tracks
Disk Blade Adjustments	56	Consistent seeding depth
Seed Firmer Adjustments	57	Consistent seed placement and coverage
Opener Depth (Press Wheel Height)	58	Seeding depth
Marker Adjustments	59	Correctly offset and visible pass marks

Setting Material Rates

Details of seed and fertilizer rate setting are found in the Seed Rate Manual, and rely on data from that manual, normally located in the manual pak enclosure at the rear of the left wing.

Rate setting controls are different for each box, but independent for each box. All chart rates, for all boxes, are approximate. Great Plains strongly recommends calibration of each box to the material to be applied.

	Main Box	Fertilizer	Small Seeds
Coarse Rate	Drive Type	Range Sprockets	
Fine Rate	Rate Handle	Driver/Driven Sprockets	Rate Handle
Cup Adjustment	Seed Cup Door		

Setting Main Box Seed Rate

Accurately obtaining the desired seed population requires four steps:

1. Setting Drive Type sprockets (from chart)
2. Setting initial Seed Rate Handle (from chart)
3. Positioning Seed Cup Door (by seed type)
4. Calibration: checking actual seeding rate

Seed rate charts are provided in the separate Seed Rate Manual (which is normally stored in a weatherproof holder on the drill, for field reference). The charts list proper sprocket pairings and seed-rate-handle settings for various seeds and seeding rates.

Setting Fertilizer Rate

The 3S-3000HDF fertilizer meters are driven from the clutch shaft through a series of sprockets. This system is independent of the seed meter drive, and is unaffected by Drive Type. Fertilizer rate is adjusted in three steps:

1. Setting the Range sprocket per the Seed Rate Manual
2. Setting the Driver/Driven sprockets
3. Calibrating

Small Seeds Rate

Seeding rate from the optional Small Seeds Attachment is controlled entirely by seed rate handles on each small seeds box. No sprocket changes are required, and small seeds rate is unaffected by settings for main seed box. Small Seeds rate is adjusted in two steps:

1. Setting rate handles per the Seed Rate Manual
2. Calibrating

Adjustments | 55

Main Box Seed Rate Charts

Metric charts begin on page 118.

Alfalfa or Rape

Drive Type	1	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
Rows																						
6 inch	0	8	8	9	12	13	13	23	27	32	37	41	45	52	54	59	63	66	74	79	82	84
7.5 inch	0	4	7	10	12	15	18	22	25	29	33	36	40	43	47	51	55	59	63	65	67	
10 inch	0	3	5	7	9	12	14	16	18	22	25	27	30	33	35	38	41	44	48	49	50	

Barley (1 of 3)

Drive Type	1	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
Rows																						
6 inch	0	5	8	11	14	16	22	26	30	35	38	41	44	53	57	62	66	69	73	73	74	
7.5 inch	0	4	6	8	12	15	18	21	24	28	31	35	38	42	46	49	52	55	58	59	59	
10 inch	0	3	5	6	8	10	12	14	16	18	21	23	26	28	32	34	37	39	42	44	44	

Barley (2 of 3)

Drive Type	2	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
Rows																						
6 inch	0	9	16	22	30	37	43	52	57	60	67	76	80	84	104	114	123	133	142	152	156	
7.5 inch	0	7	13	17	24	30	36	43	49	57	64	70	77	83	91	98	106	114	121	123	125	
10 inch	0	5	10	13	18	22	27	32	37	43	48	52	58	63	68	74	80	85	91	92	94	

Barley (3 of 3)

Drive Type	3	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
Rows																						
6 inch	0	21	30	33	33	30	100	133	151	174	194	215	234	255	278	300	325	348	371	371	382	
7.5 inch	0	17	31	42	58	72	86	105	121	139	155	170	188	204	222	240	260	279	297	301	306	
10 inch	0	13	21	32	44	54	66	79	91	104	117	130	141	153	167	180	195	209	222	236	238	

Buckwheat

Drive Type	3	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
Rows																						
6 inch	0	0	11	21	28	42	52	65	78	92	107	123	138	150	165	180	195	209	224	237	242	
7.5 inch	0	9	17	24	34	42	52	62	74	85	98	109	120	132	144	156	167	179	192	194	196	
10 inch	0	7	13	18	25	31	39	47	55	64	73	81	90	99	108	117	126	134	144	145	147	

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Calibration

Calibration procedures and examples are found in the Seed Rate Manual.

Frame Level

Refer to Figure 44

The 00HD Series openers are designed to produce optimal results when the opener frames are level with the ground. Operating with drill frame level is also recommended, and this is set by hitch height (page 16).

If planting depth is not as desired on just one or two drill sections, first check the setup items for “**Leveling the Drill**” on page 74. Then check and adjust the following items:

- opener sub-frame adjustment: all gauge wheel trunnions in same frame pivot holes - see “**Opener-Sub-frame Adjustment**” on page 53,
- opener pivot height: all openers pivoting in same hole at their mounts (possibly excepting rows in tire tracks) - see page 55,
- opener press wheel height: all row units set the same - see page 58, and;
- opener spring down-force: all row units set the same (possibly excepting rows in tire tracks) - see page 55.

Refer to Figure 45

This photograph illustrates openers too high in front. Increase hydraulic pressure and/or lengthen opener springs.

Check sub-frame pivot in use at higher pressures.

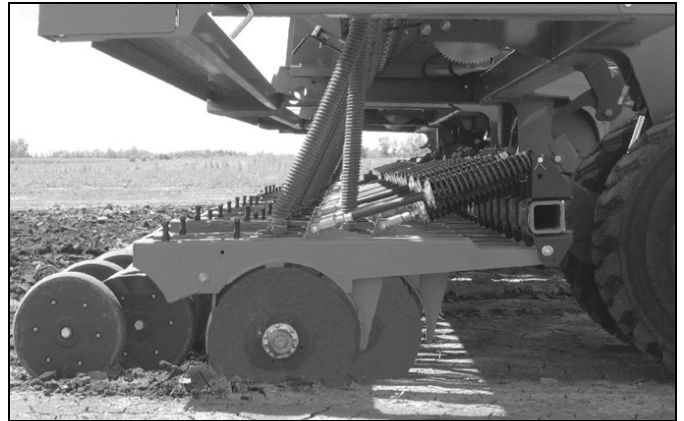


Figure 44
Frame & Openers Level

29131



Figure 45
Openers Too High in Front

29132

Refer to Figure 46

This photograph illustrates openers too low in front, also known as “bulldozing”. Decrease hydraulic pressure and/or shorten opener springs.

Check sub-frame pivot if pressures have recently been reduced.



Figure 46
Openers Too Low in Front

29133

Frame Weight

The standard 3S-3000HD includes 1697 pounds (770kg) of weight bars inside the main tool bar. This, plus the extra weight of 00HD row units, permits adjustment of the full range row unit down forces. If markers are installed, additional force is available.

Although suitcase weight brackets are available for earlier model 3S-3000 (non-HD) drills, these weight kits are not recommended for 3S-3000HD drills.

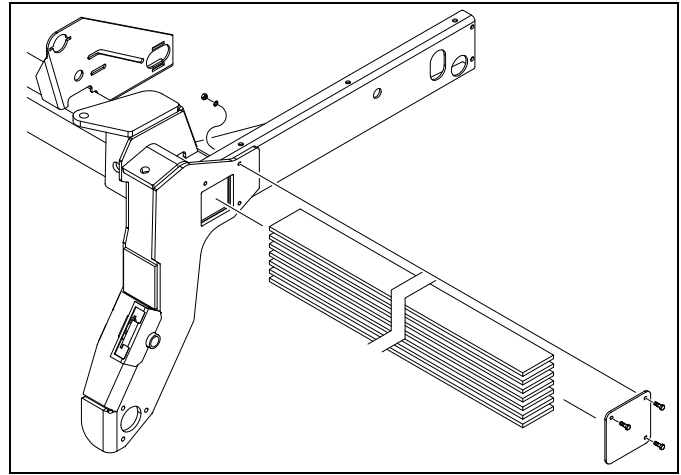


Figure 47
Standard Frame Weights

26014

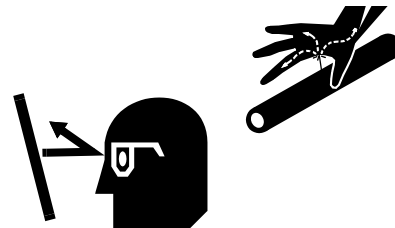
Opener Frame Down-Force

⚠ DANGER

Crushing Hazard: You will be seriously injured or killed if you are caught between raising openers and drill frame. Always stop tractor engine, set park brake, and remove key before adjusting or servicing openers. Keep all bystanders well away during drill operation.

⚠ WARNING

High Pressure Fluid Hazard: Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic lines. Use a piece of paper or cardboard, NOT BODY PARTS, to check for suspected leaks. Wear protective gloves and safety glasses or goggles when working with hydraulic systems. If an accident occurs, see a doctor immediately.



Hydraulic opener down pressure controls drill-wide opener penetration and press-wheel soil firming. Use only enough down pressure to cut a furrow and maintain proper soil-firming over seed. Excessive opener down force may cause bulldozing of the openers in light soil conditions, and leads to premature wear on opener components.

The table at right shows the approximate force at openers for a given pressure at the pressure control valve.

Note: To account for additional compaction from drill and tractor tires, set pressure on center openers slightly higher than wing openers.

To run the drill with constant opener down pressure requires an Active Hydraulic System. An Active Hydraulic System requires a tractor with closed-center hydraulics or pressure/flow compensated hydraulics powered by a variable displacement hydraulic pump. (If you are not familiar with your tractor's hydraulics, consult your tractor dealer.)

NOTICE

Machine Damage Risk: Tractors with load-sensing hydraulics must use the bypass valve to operate the 3S-3000HD. Failure to use the bypass valve can cause major tractor damage. Before adjusting opener down pressure, set bypass valve per "Setting the Bypass Valve" on page 20.

Note: To run the drill on tractors with open-center hydraulics or on tractors with fixed displacement hydraulic pumps you must install a Great Plains kit, part number 194-143A. Contact your Great Plains dealer for ordering information. See "Non-Active Hydraulic System" on page 33.

Gauge Setting	Pounds of Force at Opener Disks		
	Row Spacing		
	6in	7.5in	10in
200 PSI	130	135	144
300 PSI	136	144	155
400 PSI	143	152	167
500 PSI	148	160	179
600 PSI	154	167	189
700 PSI	157	172	196
800 PSI	161	178	205
900 PSI	166	184	213
1000 PSI	171	190	223
1100 PSI	172	194	228
1200 PSI	180	203	240
1300 PSI	184	208	248
1400 PSI	189	215	258
1500 PSI	193	220	264
1600 PSI	198	227	274
1700 PSI	202	232	281
1800 PSI	209	240	291
1900 PSI	213	247	300
2000 PSI	217	253	309
2100 PSI	222	260	318
2200 PSI	227	266	327
2300 PSI	232	273	336

Setting Hydraulic Down-Pressure

1. Lower openers to the ground. Lock hydraulic lever forward for constant hydraulic flow.

NOTICE

You must lock hydraulic lever forward. See “Opener Operation” on page 31.

Refer to Figure 48

2. Release lock disk ①. Turn knob ② on pressure-control valve while watching pressure gauge, turn knob until gauge shows desired pressure. Turn clockwise to increase pressure. Turn counterclockwise to decrease pressure.

There is one pressure-control valve for openers on the center section and one for openers on the wing sections of the drill.

Refer to the chart on page 51 for approximate force at the openers for a given pressure setting. As a general starting point, set hydraulic down pressure to 1200 psi. For most field conditions, adjust down pressure between 1200 and 1800 psi.

NOTICE

Population Risk:

Do not operate at pressures so high that the gauge wheels loose traction, or are off the ground, resulting in skips and poor seed metering.

3. Once pressure is set, lock knob with lock disk. If using a non-active hydraulic system to run drill, unlock the hydraulic remote lever and return it to neutral.

NOTICE

Machine Damage Risk:

Open-center tractors and tractors with fixed-displacement pumps are not designed to provide a continuous supply of pressurized oil to remote valves. Locking hydraulic lever forward on these tractors can cause overheating of hydraulic oil and tractor damage. After setting opener down pressure, always return hydraulic lever to neutral.

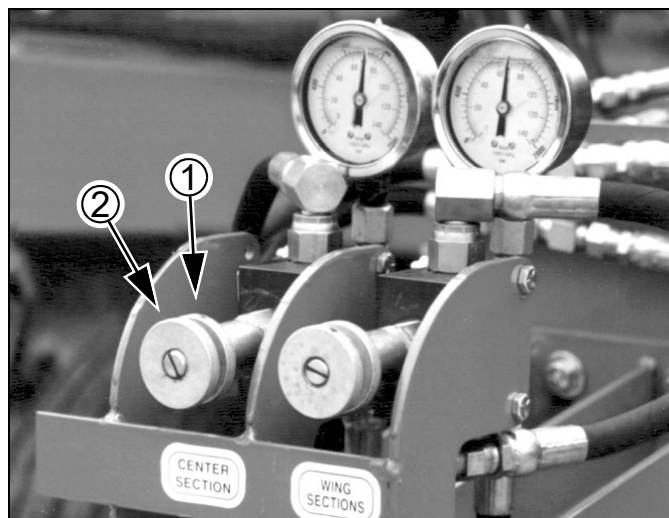


Figure 48
Down-Pressure Valves

26477

Opener-Subframe Adjustment

Refer to Figure 49

Each drill section has an opener frame which pivots ① about the centerline of the drill gauge wheels. These floating opener frames have the ability to rock the openers 15 degrees up and 15 degrees down as a group. By pivoting at the gauge wheels, openers maintain a consistent depth as opener frames rock up and back.

Down pressure for each opener frame is provided by two cylinders working on a constant lever arm. When combined with live hydraulics, the cylinders provide constant down pressure across the width of each opener frame – regardless of how the frame is positioned. Two cylinders per opener frame along with special trunnions ② also provide some ability for one end of an opener frame to rock independent of the other while maintaining constant opener down pressure across the frame.

At higher down-pressures (above 1800 psi), the row units can tend to tip forward. An adjustment to the mainframe/subframe pivot corrects this. The opener frame has one adjustment point ② for two different operating positions.

Refer to Figure 50 (shown at factory setting)

You can adjust opener frames between two operating positions—one for normal down pressure and one for higher down pressure. The adjustment is near the opener frame pivots. There are three holes and two bolts. The bottom bolt ③ serves as the pivot. The top bolt is for adjustment.

- For normal drilling conditions, keep top bolt in second (middle) hole ④ at all six frame pivots. Use this setting when drilling with opener down pressure below 1800 psi.
- When drilling with opener down pressure above 1800 psi, place top bolt in top hole ⑤ on all six pivot points across drill.

To change the bolts (to high pressure):

1. Have a jack at hand.
2. Loosen the nuts on all the top bolts ④.
3. Lower the opener sub-frames.
4. Put the tractor hydraulic circuit for the openers in float.
5. Place jack under an opener tool bar at an arm.
6. Lift the tool bar until the bolt is free.
7. Remove the bolt.

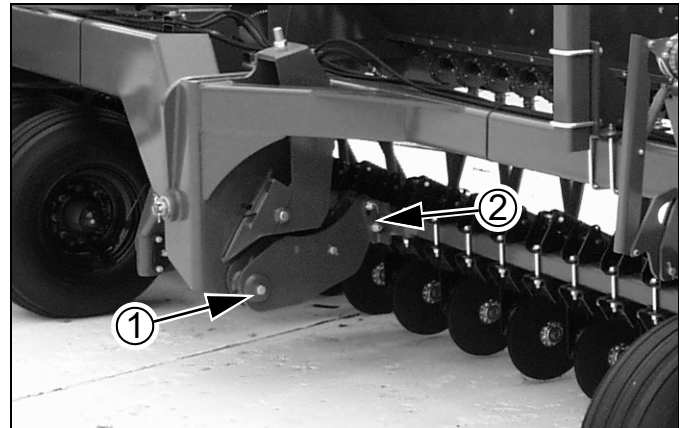


Figure 49
Opener-Frame Pivot

18857

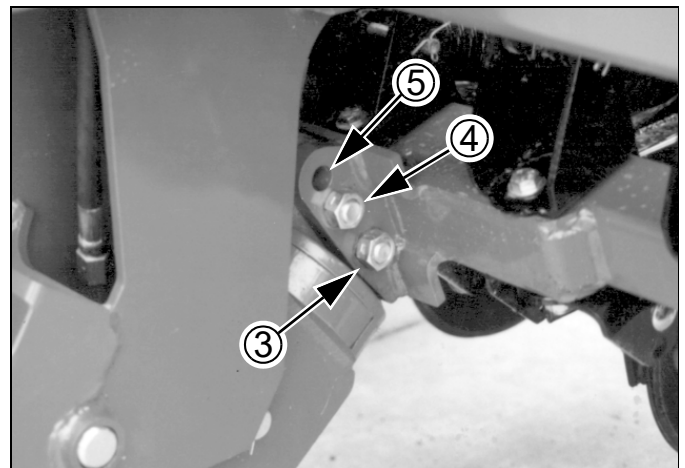


Figure 50
Opener-Frame Adjustment

15558

8. Repeat step 5 through step 7 the other arm of the subframe.
9. Raise the jack until the top holes are aligned.
10. Insert the bolt in the top hole ⑤ and spin on a nut.
11. Repeat step 5 through step 10 for each sub-frame.
12. Tighten all nuts.

Changing from high to low is similar, except lower the jack at step 6 and reverse the bolt movement.

Row Unit Adjustments

Refer to Figure 51

(which depicts a row unit fully populated with all optional accessories supported for use with the 3S-3000HD drill)

From front to back, a Great Plains 00HD Series row unit can include the following capabilities (some optional):

1. Opener height adjustment: standard
If a few rows need to run deeper, such as in tire tracks, the arm's pivot point may be lowered. See "**Opener Height**" on page 55.
2. Single Down Pressure Spring: standard
Each row unit is mounted on the drill as a pivoting arm which allows the row unit to independently move up and down. The adjustable spring provides the force to get the row unit and attachments into the soil. See "**Row Unit Down Pressure (Spring)**" on page 55.
3. Disc Blades: standard, 2 per row unit
Double disc blades open a furrow, creating the seed bed. Spacers adjust the blades for a clean furrow. See "**Disk Blade Adjustments**" on page 56.
4. Seed delivery tube: standard
No adjustments are necessary.
5. Disk Scraper: optional
In sticky soils, a scraper helps keep the opener disks operating freely. See "**Disk Scraper Adjustments**" on page 56.
6. Seed firmer: seed flap (not shown) standard:

Keeton seed firmer (shown)
Improves seed-soil contact, and provides a stable arm for a low-rate liquid fertilizer delivery tube. See "**Keeton Seed Firmer Adjustment**" on page 57.

Seed-Lok™ firming wheel (not shown)
Improves seed-soil contact. See "**Seed-Lok™ Seed Firmer Lock-Up**" on page 57.
7. Press wheels: standard (choice of types)
These close the seed trench. The wheels also support the free end of the row unit, and provide the primary control over seeding depth. See "**Opener Depth (Press Wheel Height)**" on page 58.

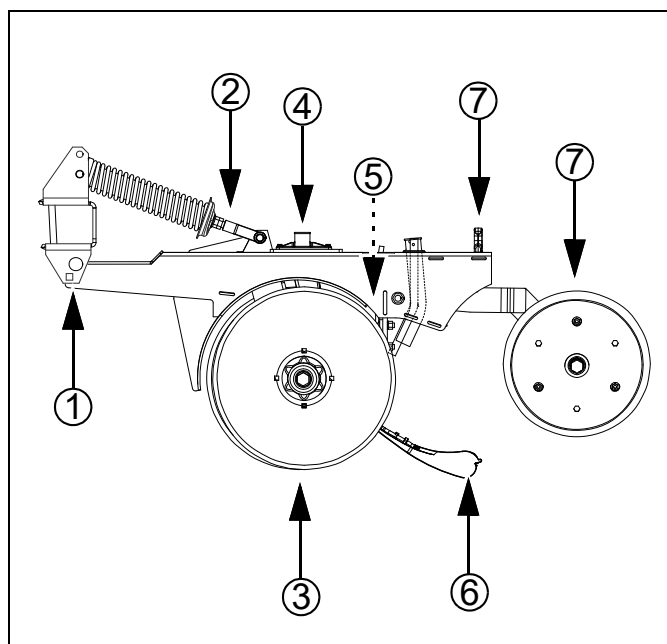


Figure 51
00HD Series Row Unit

26427

NOTICE

Certain Machine Damage:

Do not back up with row units in the ground. To do so will cause severe damage and row unit plugging.

Opener Height

The depth to which the opener disk blades penetrate the soil is controlled in front by the tool bar and pivot (opener height), and in the back by the press wheel height.

If the actual ground level is lower for some rows, such as those in tire tracks, you can lower that row unit by lowering the pivot point.

Refer to Figure 52

1. Raise the drill just enough to relieve tension in the down-pressure spring.
2. Remove the bolt from the upper hole ①.
3. Re-position the arm at the lower hole ②, and secure with bolt.

Note: No spring tension or position adjustment is required if opener height is changed. The pivot holes are designed for neutral effect on spring tension. (The bolt at the top end of the spring uses a hole ③ that depends on spring length, and not opener height.)

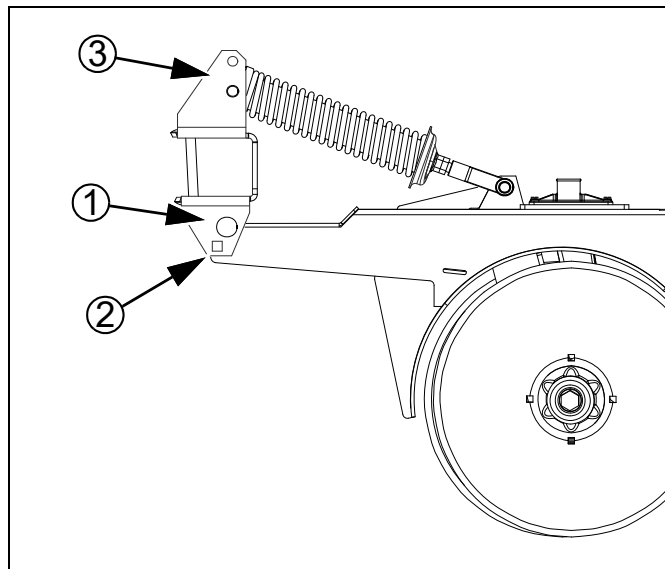


Figure 52
Pivot Point Bolt Holes

26427

Row Unit Down Pressure (Spring)

For planting in tire tracks, and for no-till conditions, you can increase spring pressure on individual openers, or all openers. Adjust the spring in conjunction with the subframe down-force, and opener height, to keep the top of the row unit parallel to the ground.

Refer to Figure 53 and Figure 54

To increase spring pressure:

1. Loosen jam nut ① at lower end of opener spring.
2. Tighten flange against spring tension.

Note: Each $\frac{1}{4}$ inch adjustment adds about 17 pounds of force at opener disk (approximately 12 kg per cm).

3. After adjusting, lock flange nut in place with jam nut.

The length ② of the spring is factory-set to:
12 $\frac{9}{16}$ in (31.9cm).

The reference points for this length are the center of the upper/front clevis pin ③ and the top edge of the lower/rear spring stop cup ④.

The factory preset length is recommended for conventional till and min-till conditions. Shorten it for no-till conditions. The minimum recommended length is: 12 $\frac{1}{4}$ in (31.1cm).

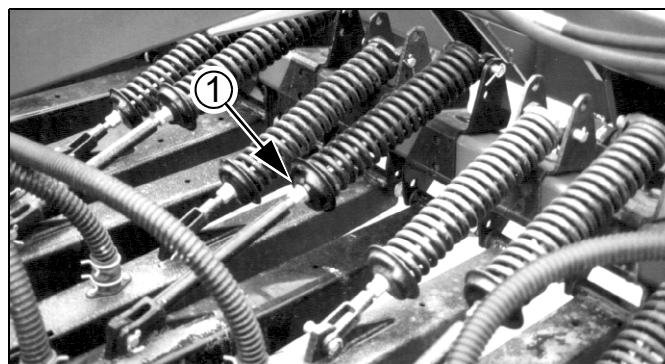


Figure 53
Row Unit Spring Tension

17158

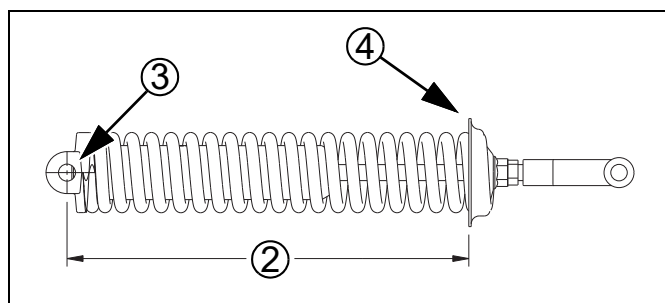


Figure 54
00HD Spring Length

26452

Disk Blade Adjustments

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

Refer to Figure 55

The ideal spacing causes the blades to be in contact for about one inch. If you insert two pieces of paper between the blades, the gap between them should be 0 to 1.75in (0-4.4cm).

If the contact region is significantly larger or smaller (or there is no contact at all), it needs to be adjusted by moving one or more spacer washers. If the contact region varies with blade rotation, one or both blades is likely bent and in need of replacement.

Adjusting Disc Contact

CAUTION

Sharp Object Hazard: Row unit disk blades may be sharp. Use caution when making adjustments in this area.

Refer to Figure 56

1. Raise the drill and lock it up by moving the Transport/Field handle to TRANS.
2. Remove the bolt ① retaining the opener disc on one side. Carefully remove the blade ②, noting how many spacers ③ are outside the flange dust cover ④ and inside the disk. Do not lose the hub components and spacers.
3. To reduce the spacing between the discs (the normal case), move one spacer washer from the inside to the outside of the flange dust cover.
4. Re-assemble and check disc contact.

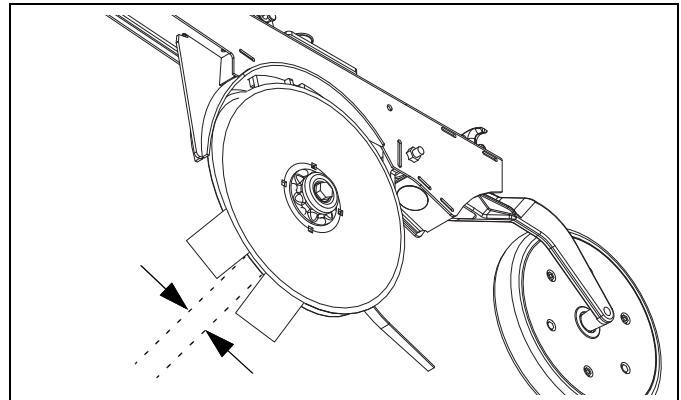


Figure 55
Checking Disk Contact

26395

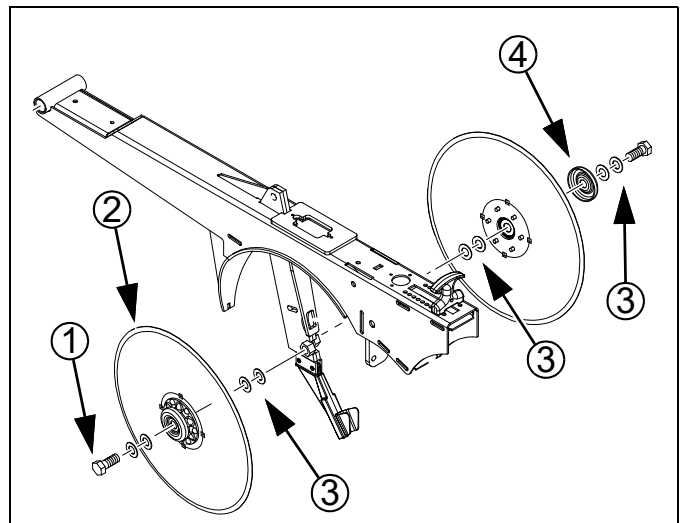


Figure 56
Adjusting Disk Spacers

26385

Disk Scraper Adjustments

CAUTION

Sharp Object Hazard: Row unit disk blades may be sharp. Use caution when making adjustments in this area.

Disk scrapers are optional. See page 94 ordering information and page 105 for installation. To keep opener disks turning freely, dirt scrapers are mounted between disks to clean as disks rotate.

Refer to Figure 57

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.

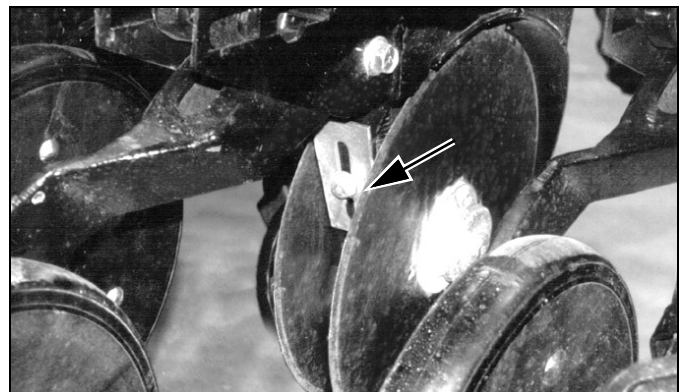


Figure 57
Opener Disk Scraper

26463

Seed Firmer Adjustments

00HD Series row units include a seed flap, and accept one of two optional seed firmers.

The seed flap requires no adjustment, but may need to be replaced if worn, and may need to be shortened if an optional seed firmer is added after initial delivery.

CAUTION

Sharp**Objects****Hazard:**

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

Keeton Seed Firmer Adjustment

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

Refer to Figure 58

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

Seed-Lok™ Seed Firmer Lock-Up

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

Refer to Figure 59

To lock up Seed-Lok wheels:

1. Pull up on Seed-Lok arm ①.
2. Raise lever ②.

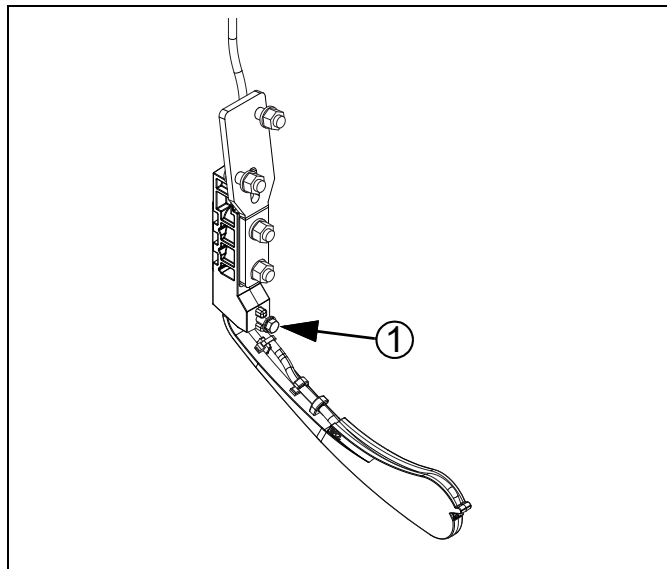


Figure 58
Keeton Seed Firmer

26443

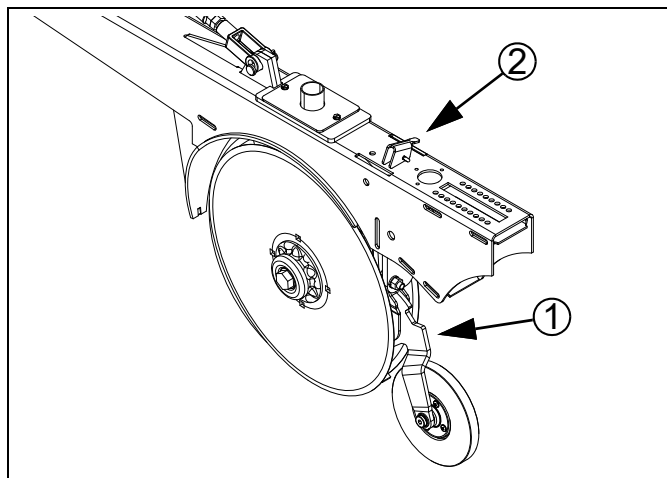


Figure 59
Seed-Lok™ Lock-Up

24453

Opener Depth (Press Wheel Height)

Refer to Figure 60

Set opener seeding depth ① by adjusting press-wheel height ②.

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.

- Each increment of the handle adjusts the seeding depth by approximately $\frac{1}{4}$ in (6.3mm). The range is approximately 0 to $3\frac{1}{2}$ in (0-8.9cm) seeding depth.
- For more shallow seeding, slide T handles forward ⑥ toward implement.
- For deeper seeding, slide T handles backward ⑦ away from implement.

If press wheels are lifting off ground, increase hydraulic down pressure.

If press wheels are digging into ground, reduce hydraulic down pressure.

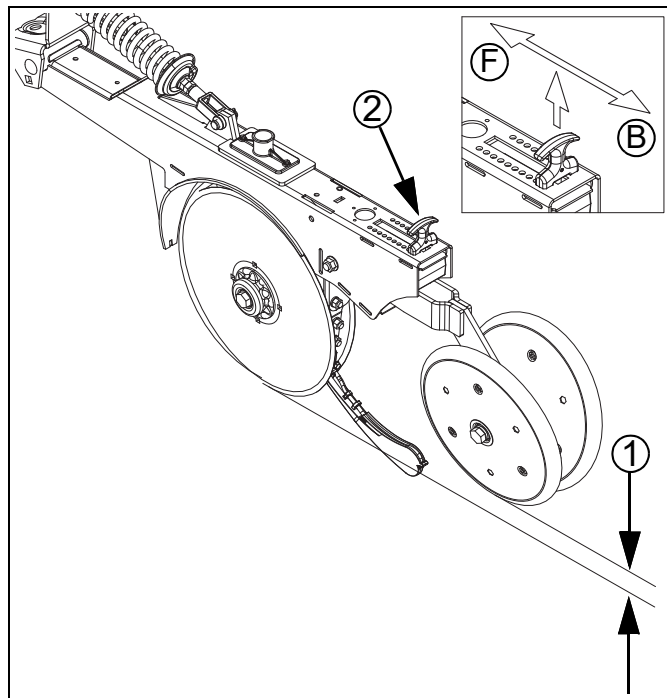


Figure 60
Adjusting 00HD Opener Depth

26441

Marker Adjustments

CAUTION

Pinch, Crush and Sharp Object Hazards:
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 the markers.

There are four operating adjustments for markers:

- **Marker Width**
Once set for a specific row spacing, this only needs periodic checking to ensure the clamp is secure.
- **Disk Angle**
Even if your row spacing rarely changes, you may need to adjust disk angle for soil conditions and planting speed.
- **Chain Length**
You may want to adjust the chain length to ensure the markers track uneven ground, and do not drag excessively when markers are folded.
- **Marker Speed**
Once initially set by your dealer, this rarely needs modification.

There are also three maintenance items for markers:

- **“Bleeding Marker Hydraulics”** on page 73
- **“Marker Shear Bolt”** on page 80
- **“Marker Disk”** on page 81

Marker Width

Marker extension depends on drill size, row unit spacing and row units in use.

See **“Marker Setup”** on page 106 for initial values for marker extension.

Refer to Figure 61

To adjust marker width, loosen two jam nuts and then their bolts ① and slide arm tube ② in or out. Re-tighten bolts, then the jam nuts.

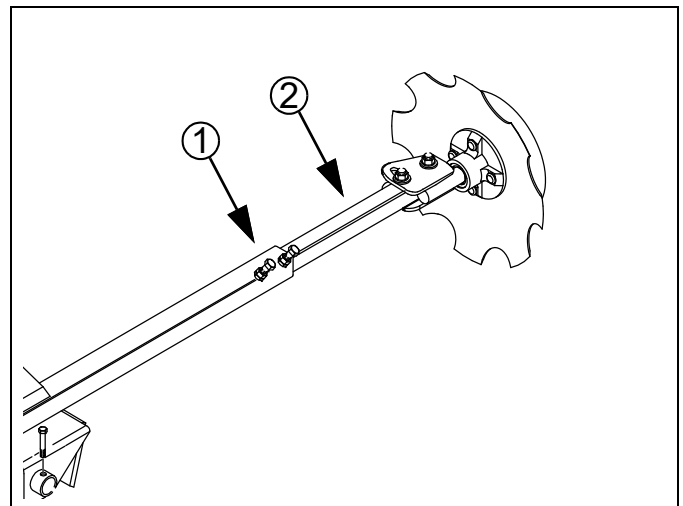
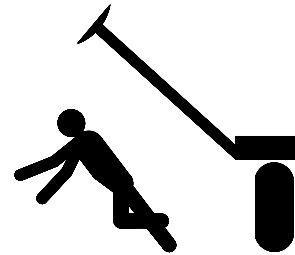


Figure 61
Marker Extension Adjustment

26497

Marker Chain Adjustment

There are two basic adjustments needed on the marker chain, especially in new installation. These adjustments are interrelated and should be done in the following order:

Refer to Figure 62

Marker Lifting Slack

1. Start with the marker in the unfolded position.
2. Loosen jam nuts ①. Back the full threaded adjustment bolt ② toward the nuts until the head extends as little as possible.
3. Slowly fold the marker, observing the motion of the disk.

If the marker disk slides across the ground more than about a foot (30cm) before the chain and linkage lifts it up, the chain is too long. Shorten the chain by moving the clevis ③ one or two links inboard from the end of the chain. Check the adjustment by repeating the folding process.

If the chain is too short when the marker is unfolded, it will prevent the end of the marker from dropping down to follow a depression in the field. Correct this condition by moving the utility clevis ③ one or two links toward the end of the chain to make it longer.

Marker Folding Slack

1. After the adjustments in step one have been completed, fold the marker.
2. The full threaded adjustment bolt ② is provided to take the slack out of the chain while the marker is in the folded position. Fold the marker and extend this bolt until the slack is out of the chain.
3. Lock the bolt in this position by tightening the jam nuts ① on either side of upright channel.

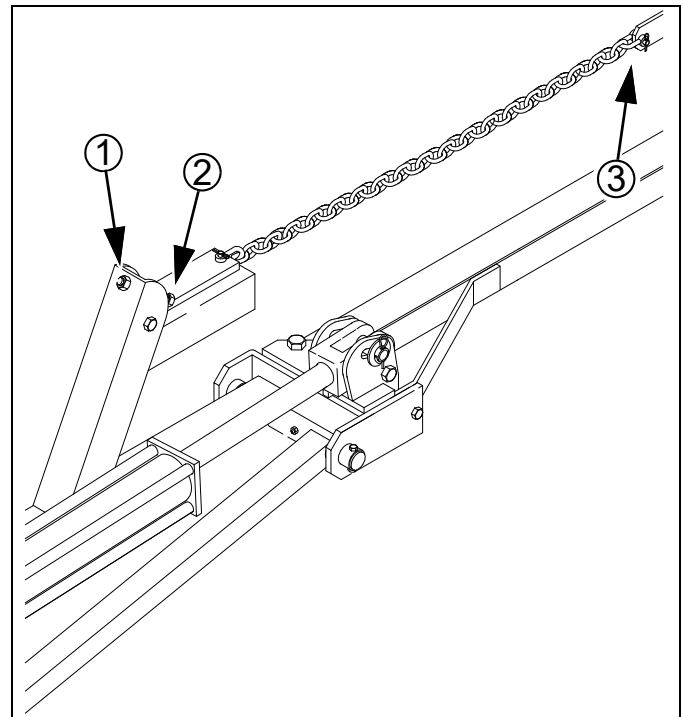


Figure 62
Marker Chain

15669

Marker Disk Adjustment

CAUTION

Sharp

Object

Hazard:

Marker disks may be sharp. Use caution when making adjustments in this area.

Mark Width

Refer to Figure 63

① is the direction of travel.

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 ④, increase the angle of the marker with respect to the tube ①. For a narrower mark ③, 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.

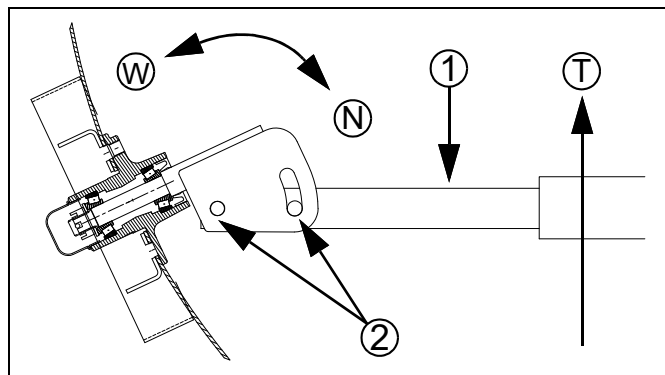


Figure 63
Marker Disk Angle

11757

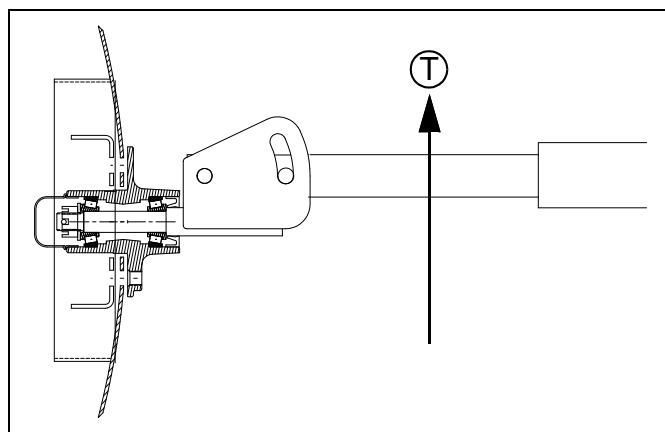


Figure 64
Marker Disk Inverted

11248

Marker Speed

The procedure for adjusting marker speed is different for single marker with needle valve and dual markers with sequence valve.

Single Marker/Needle Valve Speed

Refer to Figure 65

A needle valve controls the folding speed. The needle valve is near the rod end of the marker cylinder.

With tractor idling at a normal operating speed, adjust marker folding to a safe speed. Turn adjustment knob clockwise to reduce folding speed or counterclockwise to increase folding speed. Excessive folding speed could damage markers and void the warranty.

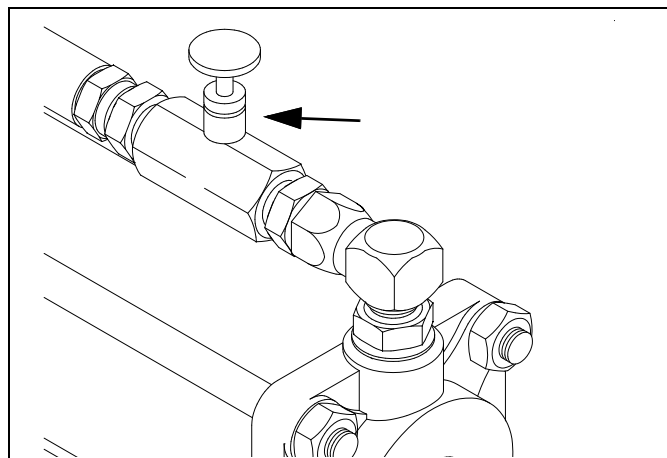


Figure 65
Needle valve Adjustment

15625

Dual-Marker/Sequence Valve Speed

There is one adjustment screw for unfolding speed ① and one for folding speed ②. You can identify adjustment screws by markings stamped in valve body.

Turn adjustment screws clockwise (Ⓢ: slower) to decrease [un]folding speed and counterclockwise (ⓕ: faster) to increase [un]folding speed.

With tractor idling at a normal operating speed, adjust marker folding to a safe speed. Excessive [un]folding speed could damage markers and void the warranty.

After adjusting the folding speed, tighten jam nuts on hex adjustment screws to hold settings.

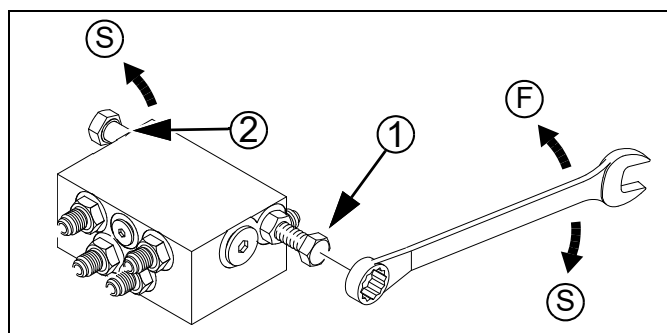


Figure 66
Sequence Valve Adjustment

14048



Troubleshooting

Problem	Solution
Uneven seed spacing or uneven stand	Check for plugging in feed cup.
	Check to see if seed tubes are plugged.
	Reduce ground speed.
	Check opener disks to see they turn freely.
	Use faster drive type speed and close feed cup flutes to a more narrow position.
	Hydraulic pressure on openers set too low causing opener to not penetrate.
	Check for trash or mud build-up on Seed-Lok Wheel.
	Hydraulic pressure on openers set too high causing gauge wheels to loose contact with ground
Opener disks not turning freely	Check for trash or mud build-up on disk scraper. Readjust scraper.
	Check to see if scraper is adjusted too tight and is restricting disk movement.
	Check disk bearings.
	Check opener frame for possible damage.
	If opener disks turn freely by hand but not in field, lessen down pressure on opener hydraulics.
	Check press wheel adjustment for seeding depth.
Actual seeding rate is different than desired	Check tire pressure. See "Tire Inflation Chart" on page 98.
	Check wing gauge wheel size. Proper size is 265/70B 16.5 NHS skid steer.
	Seed treatment will affect seeding rate if the chemicals build up in seed cup. Unless cleaned regularly, this build-up can cause breakage of the feed shaft.
	Check drill box setting.
	Heavier or lighter than average seed weight being planted. See Operator's Manual for instructions on calculating seed rate.
Excessive seed cracking	Use slower drive speed and open flutes in feed cup to a wider position.
	Position feed cup handles to a lower notch.
Acrometer doesn't measure accurately	Check tire pressure. See "Tire Inflation Chart" on page 98.
	Check gauge wheel tire size: 9.5L-15 6 ply or 265/70B 16.5 NHS skid steer.
	Check planting operation for excessive overlap or gaps between passes.
	Loose soil conditions and slippage will cause variations in acres registered.
	To check accuracy of acrometer, see "Main Box Seed Rate Calibration" in the Seed Rate Manual.
	Check to be sure your acrometer is for your drill.
Uneven seeding depth	See "Adjustments" on page 47.
	See "Hitching" on page 15, and "Leveling the Drill" on page 74.
Press wheel not compacting the soil as desired	Reset press wheel depth. See "Opener Depth (Press Wheel Height)" on page 58.
	Hydraulic down pressure on disk openers is not enough.

Problem	Solution
Grain box not emptying evenly	Certain models do not have the same number of seed cups between each divider of bulkhead. The section with the larger number of cups will empty sooner.
	If drill has multiple boxes, check drive sprocket arrangement on each box to see that they are set the same.
Press wheel or openers plugging	Drilling in damp or wet conditions may increase this problem.
	Reduce hydraulic down pressure on openers.
	Does not back up drill in field, or stop and allow drill to roll backwards with openers in the ground.
	Check Seed-Lok Wheel.
Feed cup sprockets locked up or twisted feed drive shaft	Check for foreign matter lodged in one or more feeder cup sprockets.
	Liquid insecticide from seed has dried within feed cups. Remove build up by disassembling each feed cup and scrape foreign substance from the turning surfaces. NOTE: Liquid insecticide should be applied with caution and care should be taken to clean the feed system after drilling treated seeds.
Openers drill too deep (Bulldozing)	Reduce hydraulic down pressure on openers
	Check press wheel adjustment
Front of openers dropping too low in hard or minimum till conditions	Set opener frame cross bolt in top hole. See “ Opener Height ” on page 55.
	Opener hydraulic down pressure set too high
Openers raise when tractor remote hydraulic lever is held forward and lower when lever is held rearward	Reverse the hydraulic hoses at the tractor quick couplers.
Opener frames do not float over uneven terrain	Tractor remote hydraulic lever not being held in the forward position on the circuit designed for hydraulic motor control. See “ Active Hydraulic Systems ” on page 32.
Pressure gauges read zero when openers are lowered and tractor remote hydraulic lever is held forward.	The hoses are routed incorrectly between the pressure control valve and the opener lift cylinders. See “ Opener Lift: Standard Closed-Center ” on page 102 or “ Opener Lift: Optional Open-Center ” on page 103.
Pressure gauges show pressure when the openers are raised.	The hoses are routed incorrectly between pressure control valve and opener lift cylinders. See “ Opener Lift: Standard Closed-Center ” on page 102 or “ Opener Lift: Optional Open-Center ” on page 103.
Transport lock channels will not stay in position for transport.	Check u-shaped clip in lock channel. Clip must clasp cylinder rod securely. If necessary, tighten or loosen clip by turning the bolt on the clip.
	Before transporting, check that the hydraulic cylinders have settled against the lock channels. The weight of the cylinders help hold the lock channels in place.
Hydraulic marker functioning improperly (Optional equipment)	Check all hose fittings and connections for air and oil leaks.
	Check tractor hydraulic oil level.
	Check all bolts and fasteners.
	If needle valve is plugged; open valve, cycle markers, and reset the needle valve.

Problem	Solution
Marker disk does not mark (Optional equipment)	The maximum marker down float is limited by the slots at the rod end of the marker cylinder. If the blade does not drop down to follow depressions in the field, make sure the marker cylinder is fully extended.
	The blade may be reversed to pull dirt in or throw dirt out depending on soil conditions.
	If a smooth blade does not provide an adequate mark an optional notched (no-till) blade assembly is available through your Great Plains dealer. Under some conditions, the more aggressive notched blade will leave a more visible mark.
Chain-debris/retainer clip	Be sure retainer clip open end is facing the opposite way of chain travel.



Maintenance and Lubrication

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

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

WARNING

Crushing

You may be severely injured or killed by being crushed under a falling implement. Always have frame sufficiently blocked up when working on, and particularly under implement.

Hazard:

WARNING

High

Pressure

Fluid

Hazard:

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

After using drill for several hours, check all bolts to be sure they are tight.

1. Securely block drill before working on it.
2. Lubricate areas listed under “**Lubrication**” on page 83.
3. Clean any fittings that do not take grease.
4. Inflate tires as specified on “**Tire Inflation Chart**” on page 98.
5. Inspect hydraulic hoses for cuts, cracks and aging. Check fittings for evidence of leaks.
6. Keep disk scrapers properly adjusted.
7. Replace any worn, damaged or illegible safety decals. Order new decals from your Great Plains dealer. See “**Safety Decals**” on page 6.



Materials Clean-Out

Main Seed Box Clean-Out

Refer to Figure 67, which depicts the seed cup door handle ① in a normal operating position.

1. Set the Seed Rate Handle to zero (0) for the section of the drill to be cleaned out. This moves the seed cup sprockets out of the seed path.
2. Position a tarp or bucket under each row or set of rows to be cleaned out.
3. At the seed cup for that row, pull the door handle ① out of the operating detent range, and swing it down to position ②.
4. Open the main seed box and use a small brush to sweep seed toward seed cups set to clean-out. If seed does not flow freely, inspect seed cup, hose and seed tubes for obstructions.
5. Wash out the seed box with high pressure water.

It is not necessary to operate the seed meter drive shaft for clean-out. With the Seed Rate set to zero, nothing moves inside the seed cups; however, an inspection of the flutes for excess wear and damage does require shaft rotation.

Set the Seed Rate Handles to 100. With openers raised, the seed meter jackshaft can be slowly turned by one person with a $\frac{7}{8}$ in (22mm) open-end wrench, while another inspects the flutes from the open seed boxes.

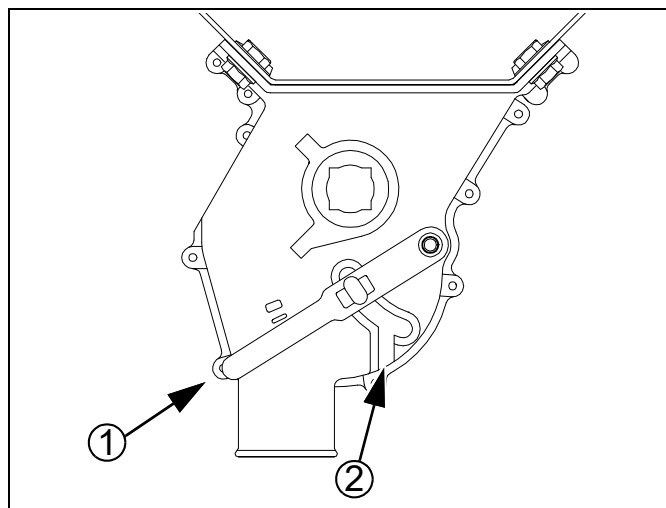


Figure 67
Seed Cup Cleanout

26211

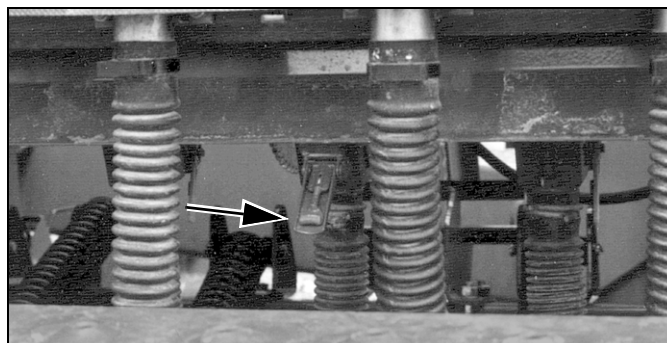


Figure 68
A Fertilizer Cleanout Latch

16376

Fertilizer Box Clean-Out

After applying fertilizer, clean drill boxes as soon as possible. Fertilizers often contain chemicals corrosive to metal.

Refer to Figure 68

With a small scoop or can, remove as much fertilizer as possible from drill boxes.

Clean-out releases material across the entire length of a section box. Have collection equipment prepared.

Release all clean-out latches on a drill section, and open clean-out door. Leave door open until after washout.

Refer to Figure 69

Wash inside of drill boxes with water under high pressure. To aid clean out, lift vinyl dew shield and spray into fertilizer trays (with clean-out door open).

Let drill boxes dry before closing clean-out doors.



Figure 69
Dew Shield at Openings

16382

Small Seeds Box Clean-Out

1. Open lid of each box and scoop out as much seed as possible.
2. To recover remaining seed, place a collection tarp under the small seeds tubes at the openers.
3. Raise drill.
4. Set Small Seeds rate handles to 100.
5. Rotate gauge wheels until no seed flows.
6. If a vacuum cleaner is available, remove any residual seed from top of meters.

Chain Maintenance

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

Chain Slack

Check slack within the first 8 hours of operation and tighten idlers as necessary.

Refer to Figure 70, which, for clarity, greatly exaggerates slack, and omits the idlers.

1. Measure the span ① for allowable slack:
Locate the longest span of each chain (usually the span which does not run through the idlers).
2. Determine the ideal slack:
Long chains (over 36in/91cm): $\frac{1}{4}$ in per foot
Vertical short chains: $\frac{1}{4}$ in per foot (2.1cm/m)
Horizontal short chains: $\frac{1}{2}$ in per foot (4.2cm/m).
3. Measure the current slack ②:
Acting at a right angle to the chain span at the center of the span, deflect the chain in both directions. The slack is the distance of the movement.
4. Adjust the idlers for ideal slack.

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

Refer to Figure 71

Note: Install clip with open end facing away from direction of chain travel (shown by gray or striped arrows in chain routing diagrams).

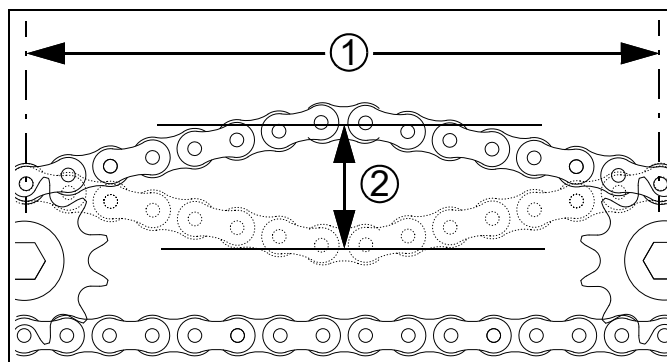


Figure 70
Measuring Chain Slack

27264

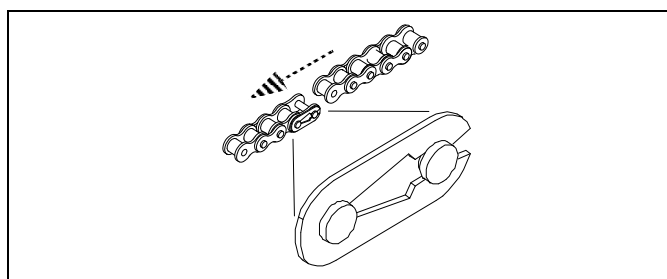


Figure 71
Chain Clip Orientation

26482

Bleeding Hydraulics

To function properly, the hydraulics must be free of air. If hydraulics have not been bled, they will operate with jerky, uneven motions and could cause wings to drop rapidly during folding or unfolding. If hydraulics were not bled during initial implement setup or if you replace a part in hydraulic system during the life of the drill, complete the following procedures.

WARNING

High Pressure Fluid Hazard:
Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard. Relieve pressure before disconnecting hydraulic lines. Use a piece of paper or cardboard, NOT BODY PARTS, to check for suspected 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.

WARNING

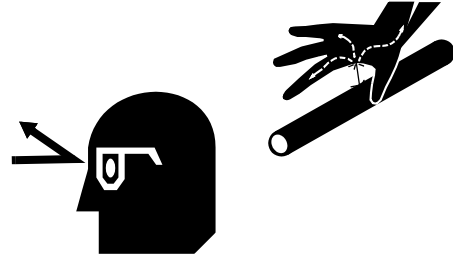
Crushing Hazard:
Raising openers on unfolded, unhitched drill will cause drill tongue to rise suddenly, which could cause serious injury or death. Be certain that drill is hitched securely to your tractor drawbar and the safety chain is securely attached to tractor before raising openers and unfolding drill.

NOTICE

Bleed only at:
JIC (Joint Industry Conference, 37° flare) or
NPT (National Pipe Thread, tapered thread) fittings.
Never bleed at:
ORB (O-Ring Boss) or
QD (Quick Disconnect coupler) fittings.

Check hydraulic fluid level in tractor reservoir and fill to proper level. Add fluid to system as needed.

Note: System capacity for entire drill is about
4½ U.S. gallons
(17 liters). Bleeding Fold Hydraulics



NOTICE

Over-Torque Leak Risk:
JIC fittings do not require high torque. Excess torque causes leaks. JIC and O-ring fittings do not require sealant.

NOTICE

System Contamination Risk:
Always use liquid pipe sealant when adding or replacing (NPT) pipe-thread fittings. To avoid cracking hydraulic fittings from over tightening, and to keep tape fragments from clogging filters, do not use plastic sealant tape.

Refer to Figure 72

1. Review warnings, bleeding notes and system information on page 69.
2. With drill unfolded and fold cylinders completely extended, disconnect rod end pins and swing the cylinders so they will not contact anything when extended.
3. Loosen rod end hose JIC fitting ① at elbow on right fold cylinder.
4. Slowly supply oil to rod end of fold cylinders (line ③) until oil appears at loosened hose fitting. Tighten fitting and completely retract fold cylinders.
5. With cylinders completely retracted, loosen base end hose JIC fitting ② at elbow on right fold cylinder.
6. Slowly supply oil to base end of fold cylinders (line ④) until oil appears at loosened hose fitting. Tighten base end hose fitting and cycle fold cylinders in and out several times.
7. Re-pin cylinder rod clevis.

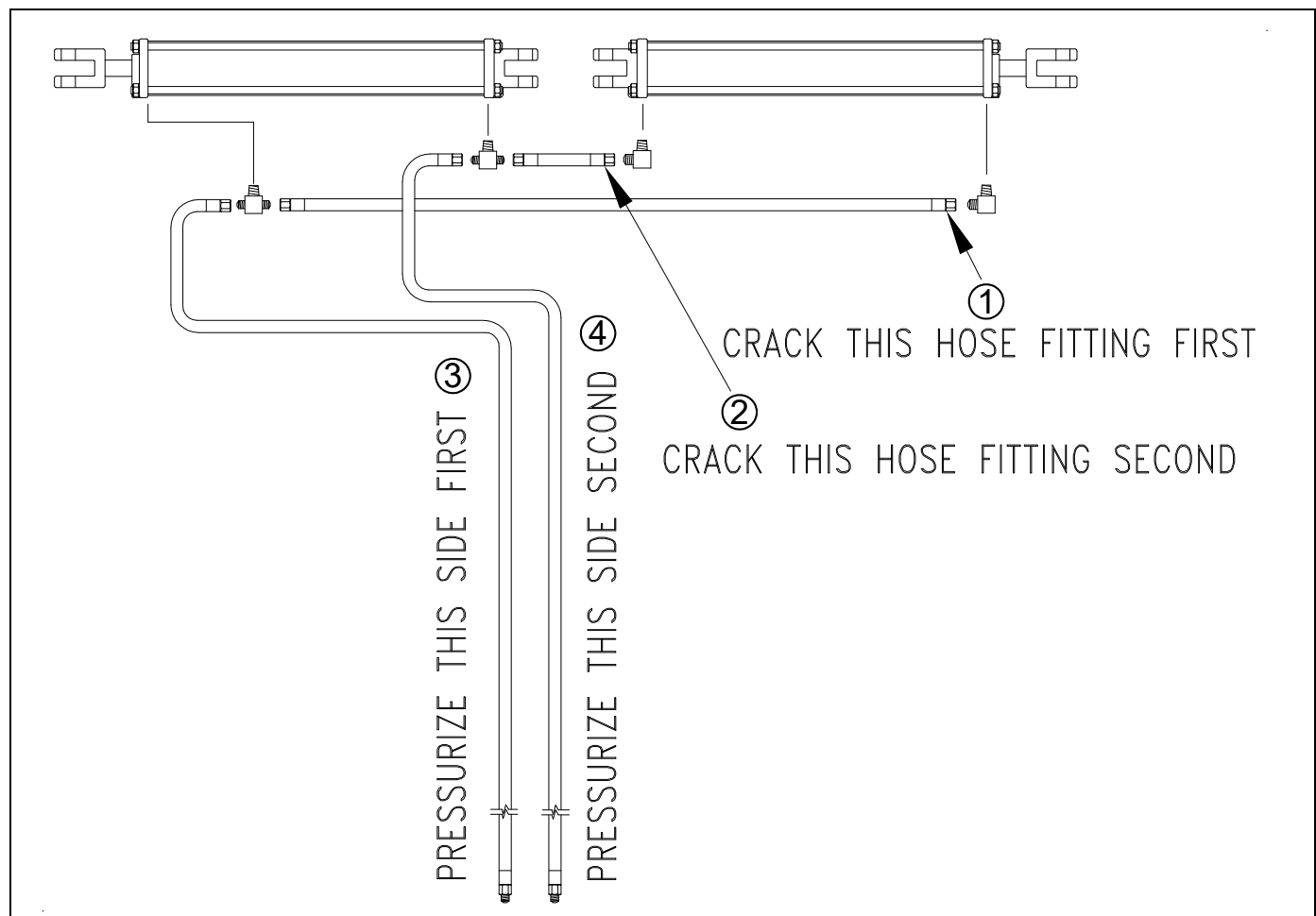


Figure 72
Bleeding Fold Hydraulics

15644

Bleeding Opener Lift Hydraulics

Refer to Figure 73

1. Review warnings, bleeding notes and system information on page 69.
2. Make sure opener frames are locked up in ROAD position. Refer to Opener Lock Up, page 23.
3. Turn knob on both pressure-control valves completely counterclockwise, then turn valves clockwise far enough to build up 1000 psi (about three turns).
4. Turn knob on bypass valve completely clockwise for no oil flow.
5. Loosen six hose-end JIC fittings at three locations on the opener-lift circuit:
 - both JIC fittings on the two $\frac{3}{8}$ in opener lift hoses feeding the center opener lift cylinders,
 - the JIC fittings on the two $\frac{3}{8}$ in opener lift hoses feeding the center opener lift cylinders, and;
 - the end where these center two hoses tee at the middle of the center box frame.
6. Slowly supply oil to top side of pressure-control valves until oil begins to appear at a loosened hose fitting. As oil begins to appear at a fitting, tighten that fitting.
7. Slowly supply oil to bottom side of pressure-control valves until oil begins to appear at remaining loosened hose fitting. As oil begins to appear at the fitting, tighten fitting. Continue to supply oil to bottom side of pressure-control valves until all openers are raised completely.
8. Move opener transport locks to FIELD position and cycle openers up and down ten times. Each time you lower openers, hold tractor remote lever until opener circuit builds up to pressure set at control valves.
9. After cycling openers, return opener transport locks to ROAD position, and lock openers up.

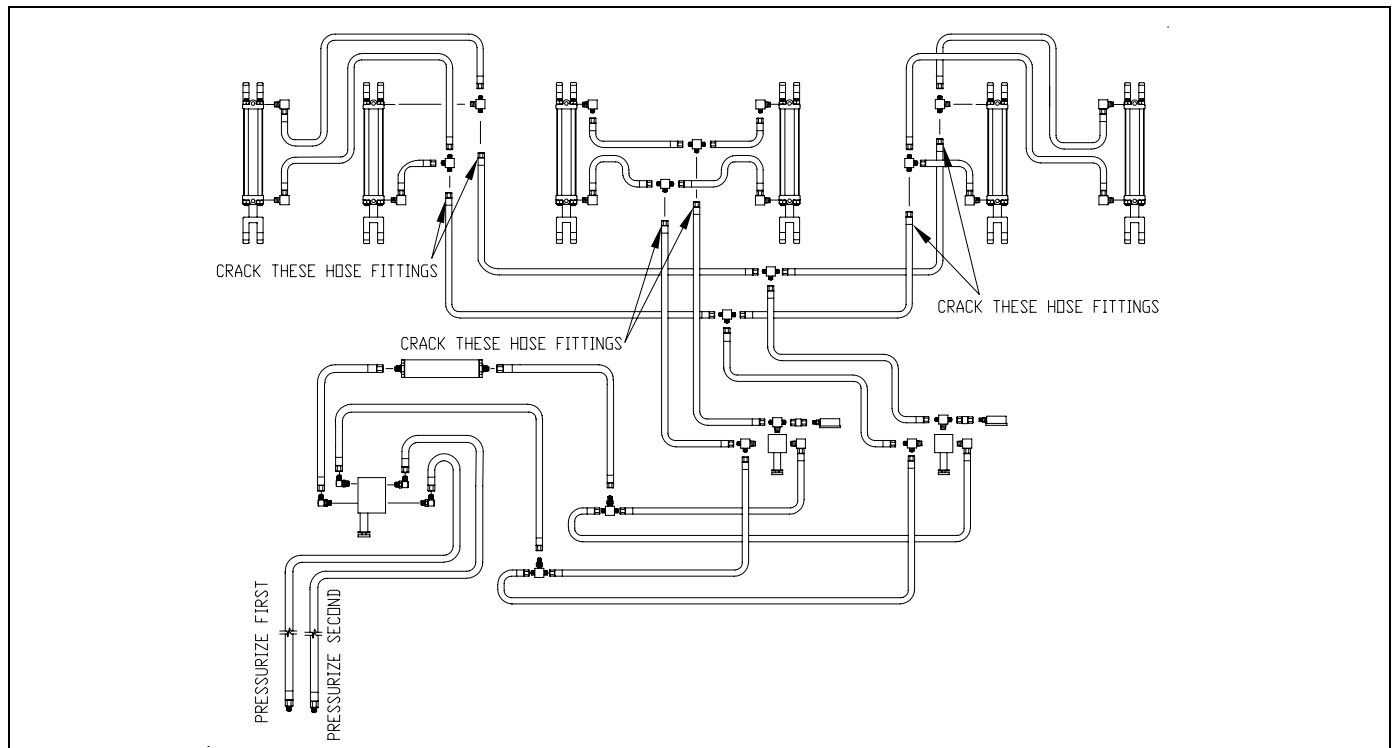


Figure 73
Bleeding Opener Lift Hydraulics

15644

Bleeding Transport Lift Hydraulics

Refer to Figure 74

1. Start with the transport axle in the lowered (field) position, and the box lift cylinder (at the middle of the tongue) completely retracted. Loosen the base end hose fitting at the elbow on the left transport lift cylinder and the base end hose fitting on the box lift cylinder at the middle of the tongue.
2. Slowly supply oil to the base end of the transport lift cylinders until oil appears at the loosened hose fittings. Oil may not appear at both location at same time. As oil begins to appear at a fitting, tighten that fitting and proceed until both fittings have been tightened. Completely extend the transport lift cylinders and IMMEDIATELY lock the cylinders up by flipping up the cylinder lock channels on both transport lift cylinders and the box lift cylinder at the middle of the tongue.
3. When the cylinder lock channels are in place, loosen the rod end hose fitting at the elbow on the left transport lift cylinder and the rod end hose fitting on the box lift cylinder at the middle of the tongue.
4. Slowly supply oil to the rod end of the transport lift cylinders until oil appears at the loosened hose fittings. As oil begins to appear at a fitting, tighten that fitting and proceed until both fittings have been tightened.
5. Extend the transport lift cylinders, and remove the cylinder lock channels. Completely cycle the transport lift hydraulics several times.

NEVER CRAWL UNDER THE DRILL IN THE RAISED POSITION WITHOUT THE CYLINDER LOCK CHANNELS IN PLACE.

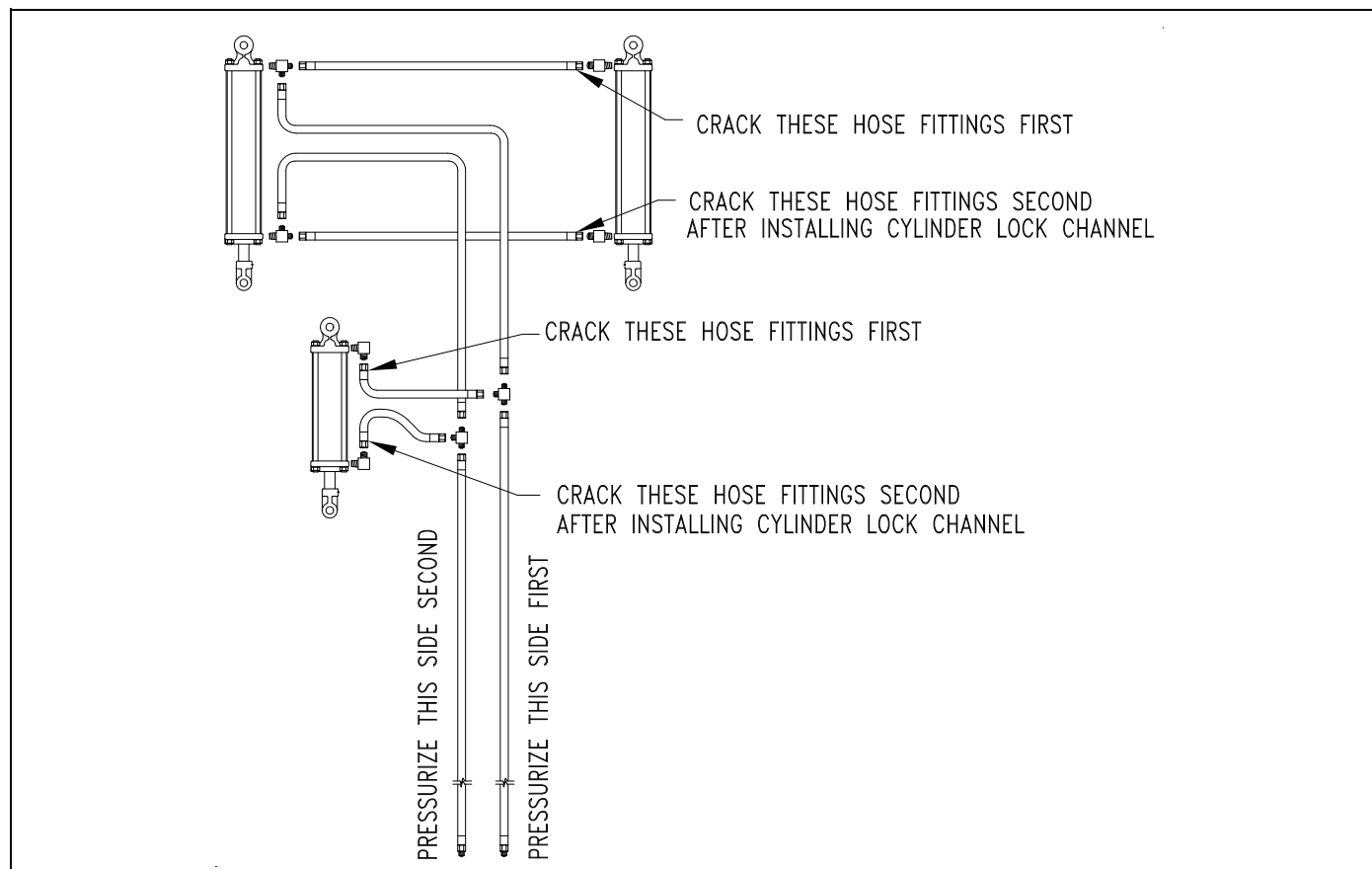


Figure 74
Bleeding Transport Lift Hydraulics

15645

Bleeding Marker Hydraulics

⚠ CAUTION

Crushing and Sharp Object Hazard: 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.

1. Review warnings, bleeding notes and system information on page 69.

Refer to Figure 75

2. With markers unfolded in field position, crack hydraulic-hose JIC fittings ① at base and rod ends of each marker cylinder.
3. With tractor at idle speed, activate tractor hydraulic valve forward until oil appears at a fitting. When oil begins to seep out around a fitting, tighten that fitting. Reverse the tractor hydraulic valve until oil appears at opposite hose fitting. Tighten that fitting.
4. If you have dual markers, activate tractor hydraulic valve forward again until oil seeps out around a fitting on the other marker cylinder. Tighten that fitting. Reverse tractor hydraulic valve until oil seeps out around remaining hose fitting and tighten it.
5. Fold and unfold markers slowly to work out all air.

Note: Use caution when folding and unfolding markers for the first time, checking for pinching and kinking of hoses.

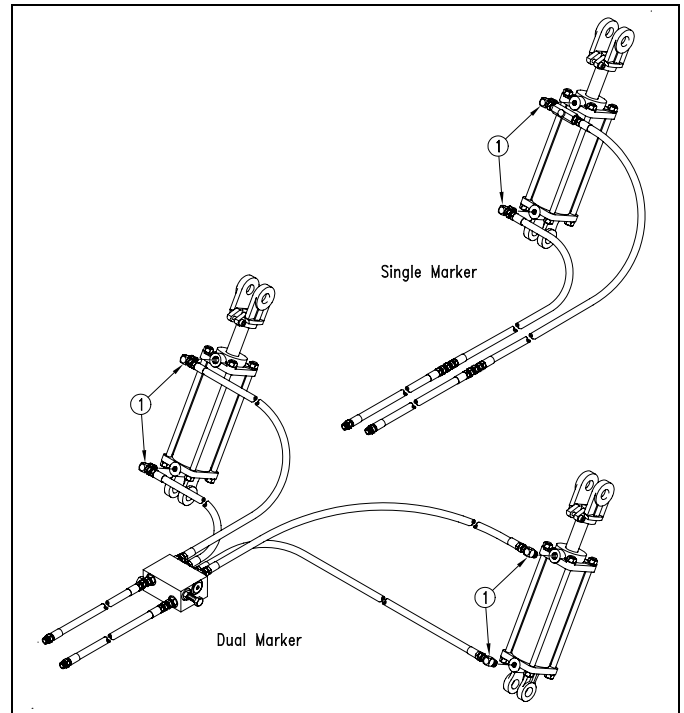


Figure 75
Bleeding Marker Hydraulics

18942

In-Line Filters

If the raising or lowering times of the openers slow noticeably, check the in-line filters and clean if needed.

Refer to Figure 76

Two filters are located on one each of the down-pressure adjustment valves. If the Point Row option is installed, another filter is located on the third adjustment valve.

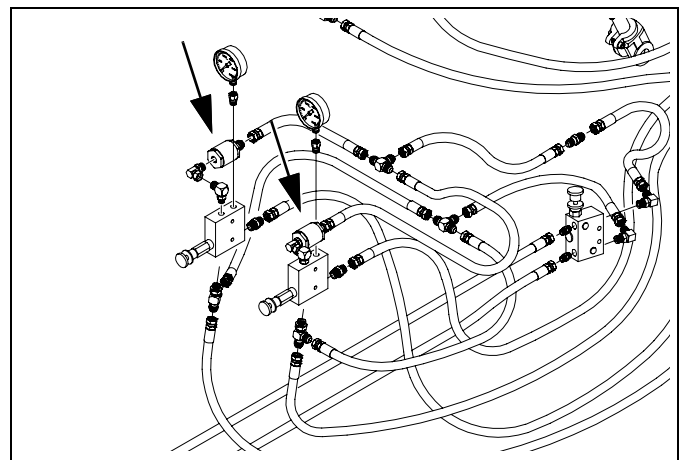


Figure 76
In-Line Filter Locations

22968

Refer to Figure 77

To disassemble unscrew end cap of filter. Remove top retaining washer and screen.

Clean filter screen with solvent and compressed air, or replace if needed.

When reassembling put screen into filter. Place retaining washer on top of filter and screw on end cap.

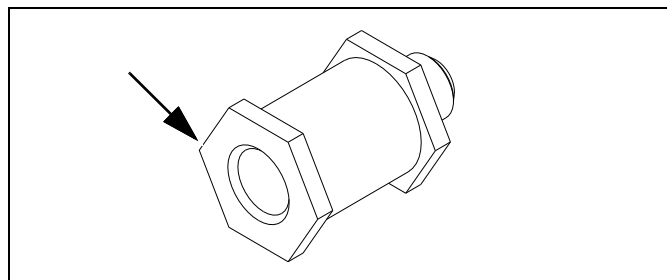


Figure 77
In-Line Filter

25187

Leveling the Drill

To perform leveling, the drill must be hitched to a tractor, with at least the hydraulics connected.

**Negative****Tongue****Weight:**

Raising openers on unfolded, unhitched drill will cause drill tongue to rise suddenly, which could cause serious injury or death. Be certain that drill is hitched securely to your tractor drawbar and the safety chain is securely attached to tractor before raising openers and unfolding drill.



Center Box Frame Leveling

1. Park the drill on a clean level surface.
2. Raise the openers and lock them up. See **“Raising and Lowering Openers”** on page 23 for opener lift and lock instructions.

Refer to Figure 78

(bolts, nut and washers shown removed for clarity - loosen, but do not remove them).

3. Loosen the eight center box mount bolts, four bolts on each side of tongue and slide center box frame sideways until it is centered with mainframe and transport axle.

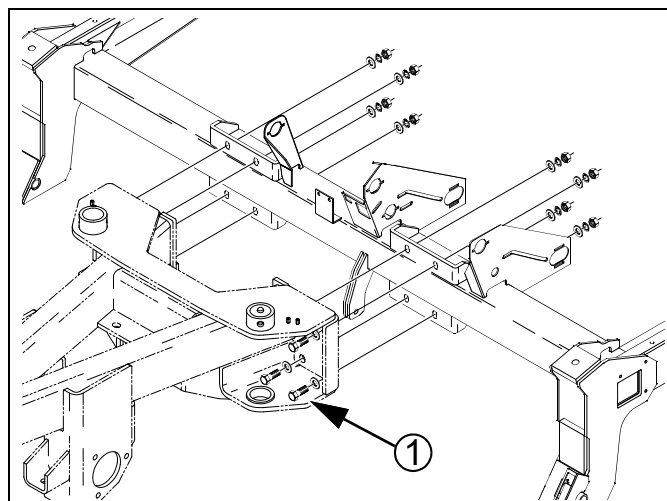


Figure 78
Center Box Mount Bolts

26498

Refer to Figure 79 and Figure 78

4. Measure the height of center box opener frame pivots ② from the level surface and raise low end of box frame up until both opener frame pivots measure the same distance from the ground.
5. Tighten the $\frac{7}{8}$ -9in box mount bolts ① to torque specified in “**Torque Values Chart**” on page 97.

Opener Frames Level

Check that opener frames are level across drill. When fully raised, top of opener mounts should clear bottom of drill frame tube by at least $\frac{1}{2}$ in (1.3cm).

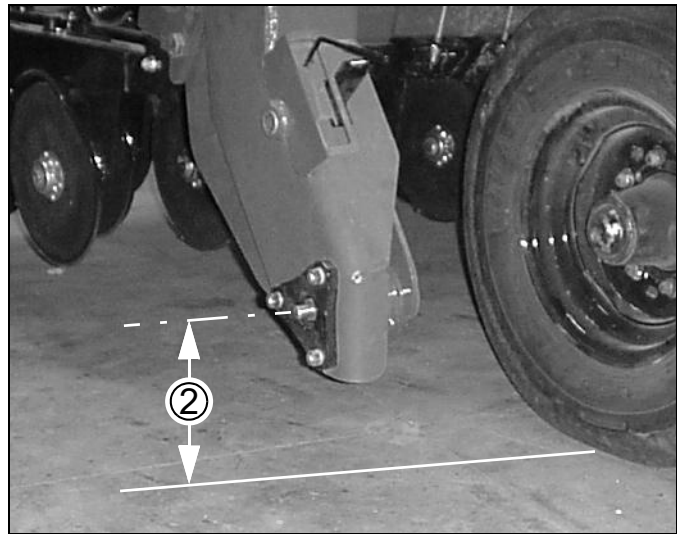


Figure 79
Opener Frame Pivot Height

18874

Wing Box Alignment

1. Place a block ahead of the wing gauge wheels.

Refer to Figure 80

2. Pull forward against blocks to rock wing frames back. Pull forward until stop bolts ③ are firmly against toolbars.

Refer to Figure 81

3. Check for proper alignment by running a string line ④ across back of drill toward outer ends of wings. Make sure string is parallel to center box (both measurements ⑤ equal).
4. For proper alignment, outside ends of boxes ⑥ should be about 1in to 1¼in (2.5 to 3.2cm) ahead of inside ends ⑦.
5. To adjust box alignment, shorten or lengthen stop bolts ③ to change the contact point with the toolbars. Loosen jam nut and thread stop bolt in or out. Adjust stop bolts in or out until outside ends of boxes are 1in to 1¼in (2.5 to 3.2cm) ahead of inside ends.
6. Tighten jam nut.

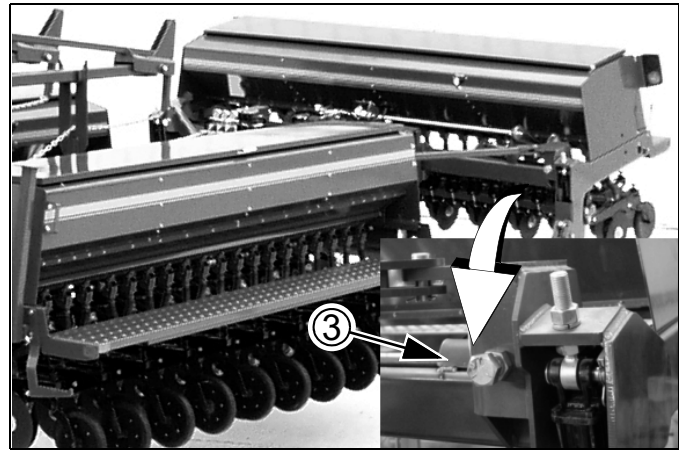


Figure 80
Stop Bolt Location

18988

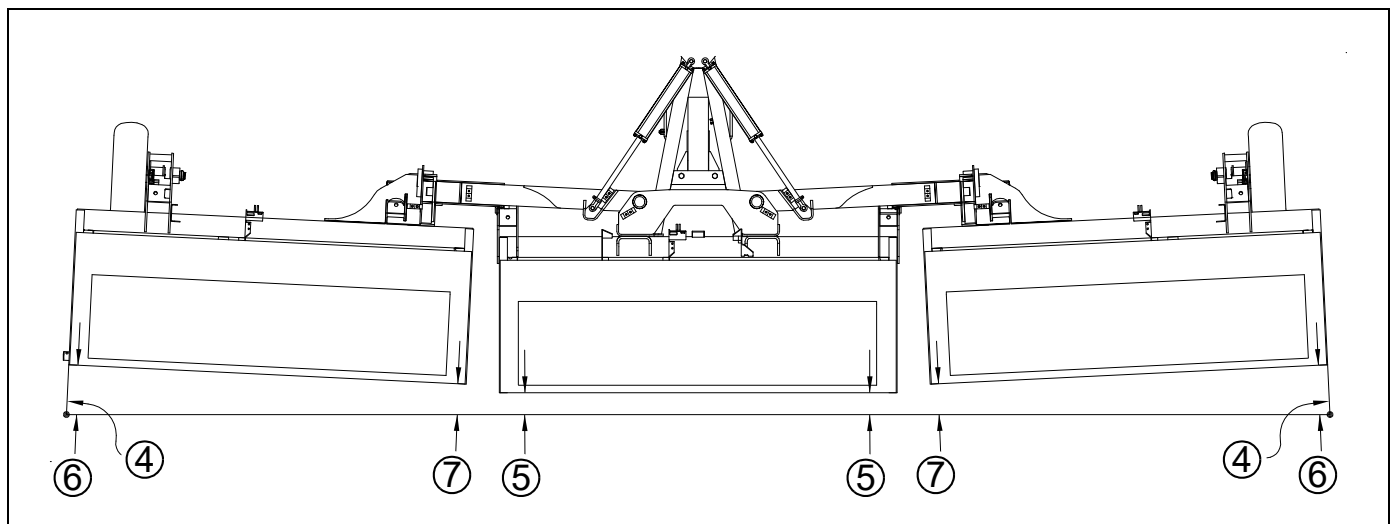


Figure 81
Wing Box Alignment Measurement

15654

Align Transfer Drive Shaft

Refer to Figure 82 and Figure 83

After wing boxes are properly aligned, the transfer drive shaft must be aligned so the pair of break-away jaws ① are fully engaged and are concentric. The $\frac{7}{8}$ in hex drive shafts holding the clutch jaws should not contact each other ② when wing boxes are properly aligned and back against their stops.

1. Place a 4x4in (10x10cm) or similar sized block ahead of the wing gauge wheels and pull forward or push wing box frames back until the tool bar is firmly against tool bar stop bolts on the center box frame.
2. To align the clutch jaws vertically, loosen the two $\frac{5}{8}$ inch bolts ③ securing the bearing flangettes ④. Slide the flangettes in the desired direction. Tighten bolts.

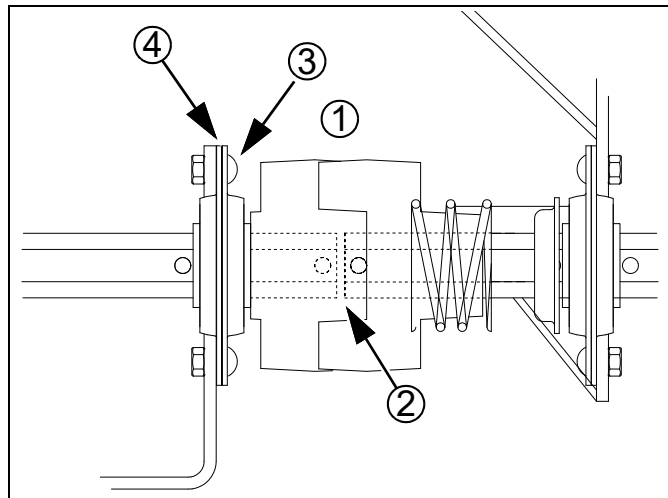


Figure 82
Transfer Drive Jaws

18955

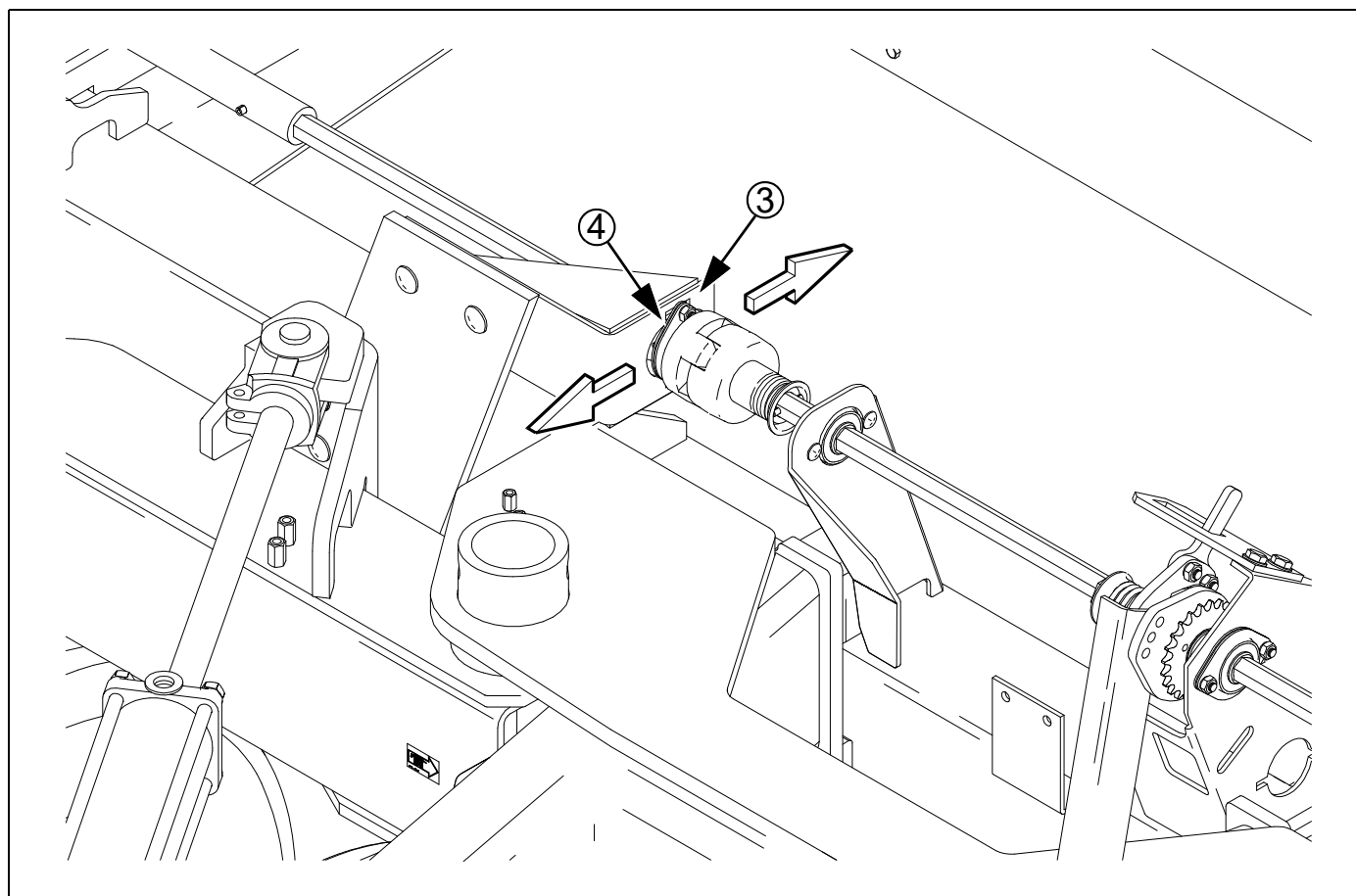


Figure 83
Transfer Drive Shaft Front-Back Adjustment

15620

Refer to Figure 84 and Figure 85

3. To align the clutch jaws ① vertically, loosen the two $\frac{5}{16}$ inch bolts ⑤ at the bottom of the breakaway clutch bracket ⑥, and adjust the bracket as needed.
4. To adjust clutch jaws for full jaw contact, loosen the two $\frac{5}{16}$ inch carriage bolts ⑧ and slide breakaway clutch bracket ⑨ until jaws on the fixed half of clutch make full contact with jaws on spring loaded half of clutch without compressing clutch spring.

Note: The two $\frac{7}{8}$ inch hex shafts ⑦ should have $\frac{1}{8}$ inch (3.2mm) gap ② between them when the clutch jaws have full contact.

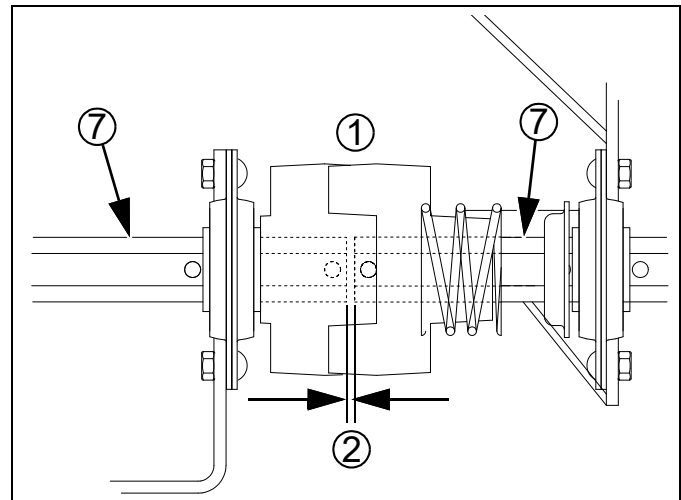


Figure 84
Transfer Drive Shaft Gap

18955

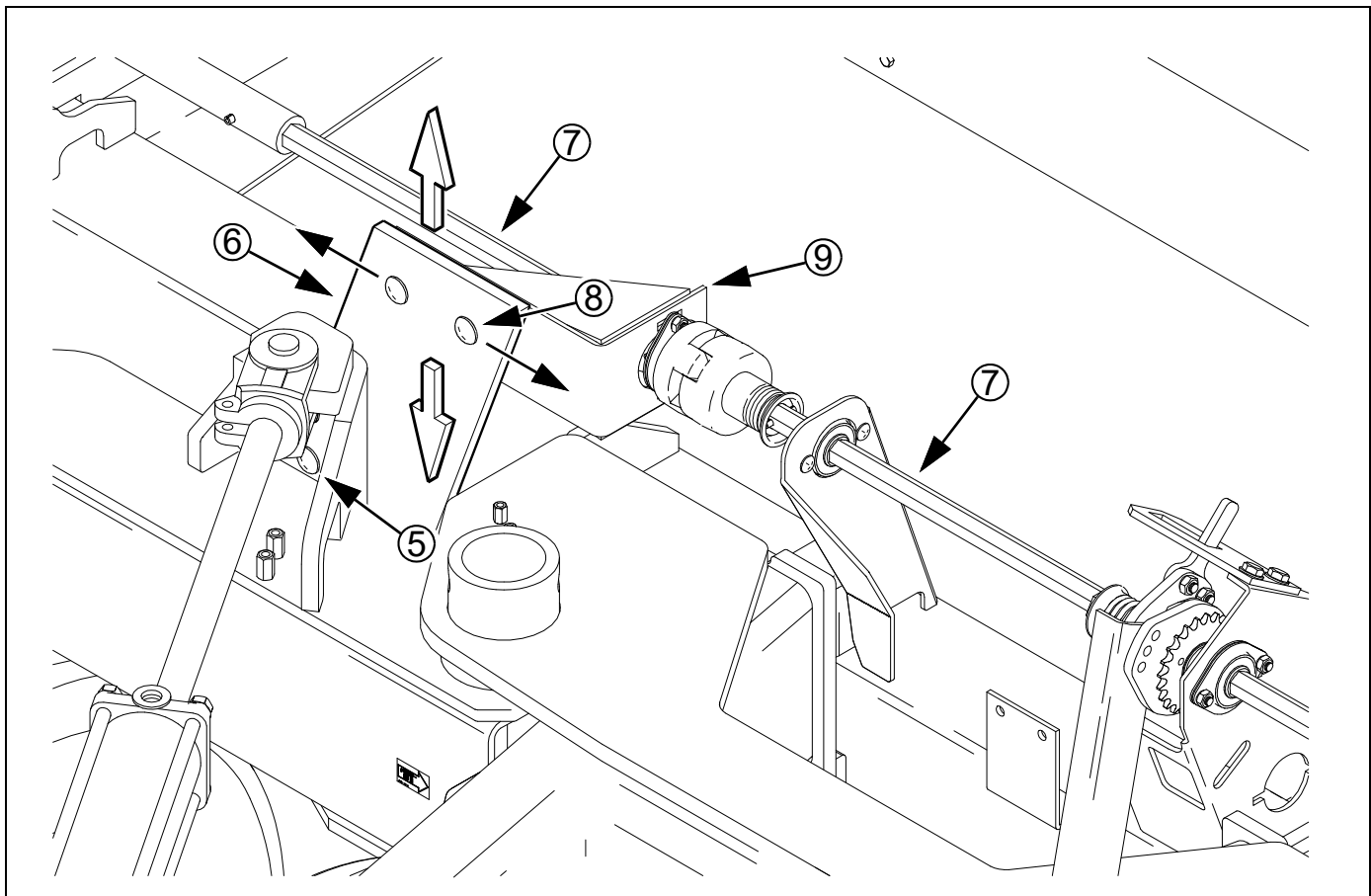


Figure 85
Transfer Drive Shaft Vertical and Left-Right Adjustment

15621

Toolbar Height

Refer to Figure 86 and Figure 87

Toolbar height ① above ground level ② is factory set and normally does not require adjustment. If you tear down the drill for repair, or if the tool bar is visibly not level, spacer washers ③ on vertical pivot pins allow for a small amount of tool bar-height adjustment.

To check tool bar height, park drill on a level surface, and check for correct tire inflation. Measure from ground to horizontal pivot pin ①. If dimension on either side of drill varies more than $\frac{1}{4}$ inch (6.4mm), adjust tool bar height.

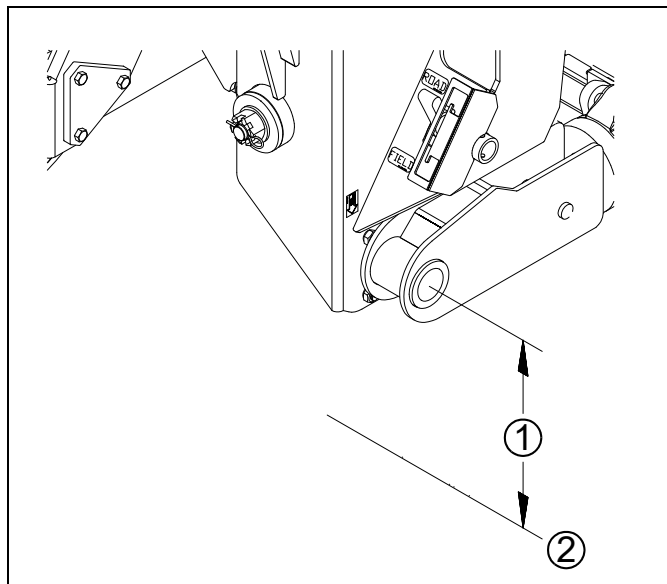


Figure 86
Toolbar Height

15616

To adjust tool bar height, reposition spacer washers ③. First lower openers and set enough opener down pressure to help balance frame. Raise tool bar by removing spacer washers from top of the vertical pivot and placing them on bottom side of pivot. Lower tool bar by removing spacer washers from bottom of vertical pivot and placing them on top of pivot.

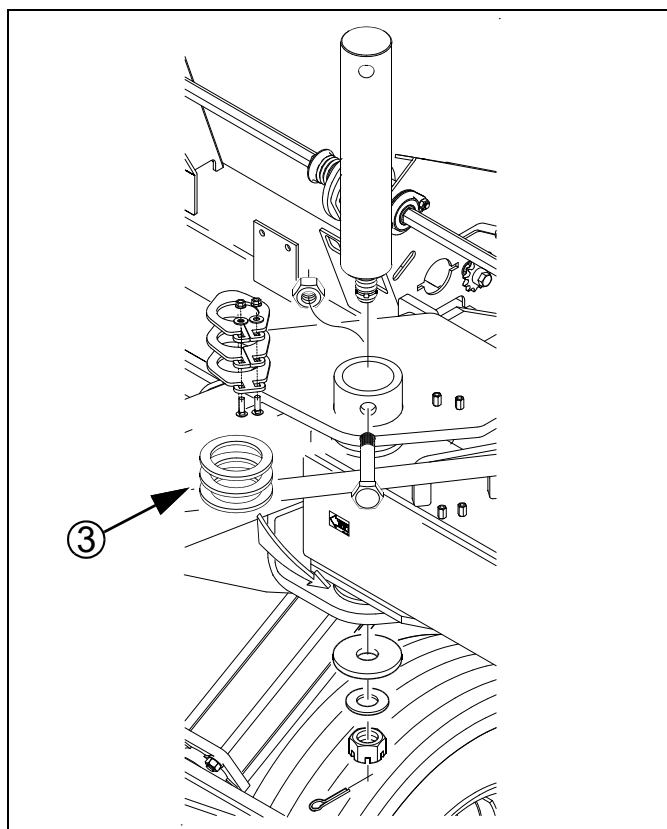


Figure 87
Toolbar Height Adjustment

15617

Opener-Frame Clearance

Refer to Figure 88

When fully raised, top of opener mounts ① should clear bottom of drill frame tube by at least $\frac{1}{2}$ inch (12.7mm).

To adjust opener frames so all openers have the same clearance, loosen jam nut ② on opener lift cylinders and turn adjustment nut. When openers are at the correct height, retighten jam nut. Repeat at each opener lift cylinder if necessary.

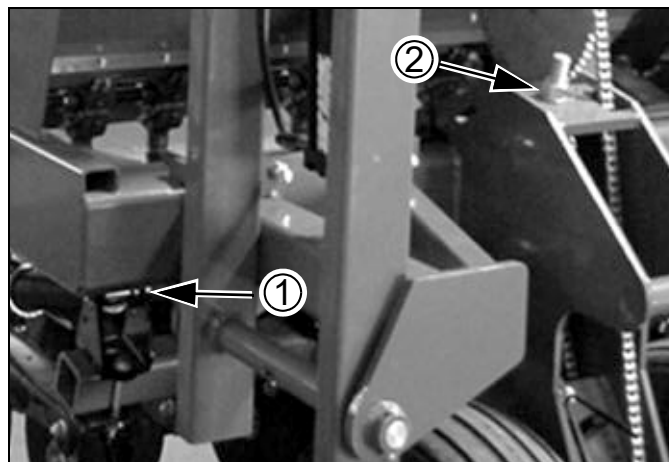


Figure 88
Opener Frame Clearance

18853

Marker Maintenance

Marker Transport Carrier

When marker is folded, the second section should be centered in transport carrier saddle and be parallel with top of drill box.

Refer to Figure 89

To adjust height of saddle, loosen $\frac{1}{2}$ x2in U-bolts ① that hold carrier tube to mounting bracket. Slide carrier tube up or down as needed.

Marker Shear Bolt

The marker arm is attached to marker body with a shear bolt ②, which is intended to fail if the marker strikes an obstruction, allowing the marker to swing back around a second bolt ③.

If the shear bolt breaks, replace it with an equivalent $\frac{3}{16}$ -16x2in Grade 2 bolt (Great Plains part 802-266C). If that size is not available in your local market, temporarily substitute an M10x1.5 Class 5.8 metric bolt and nut.

Note: Replacing the bolt with a lower grade, or smaller size, can result in nuisance shears.

NOTICE

Equipment Damage Risk:

Replacing the bolt with a higher grade can result in marker damage.

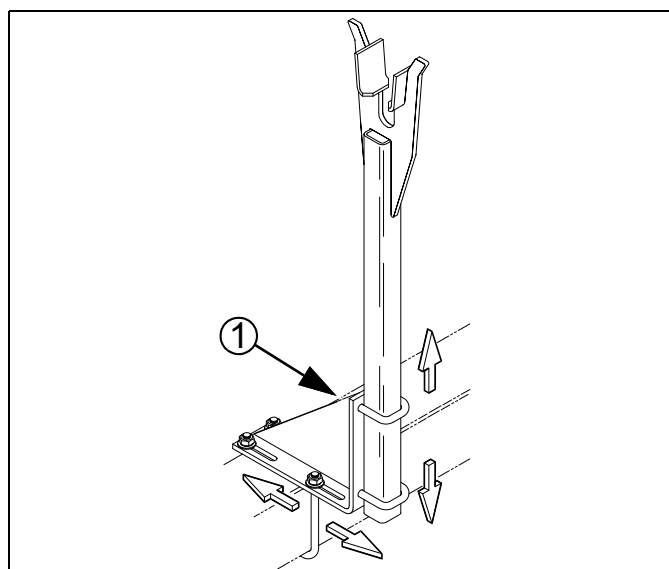


Figure 89
Marker Transport Carrier

15632

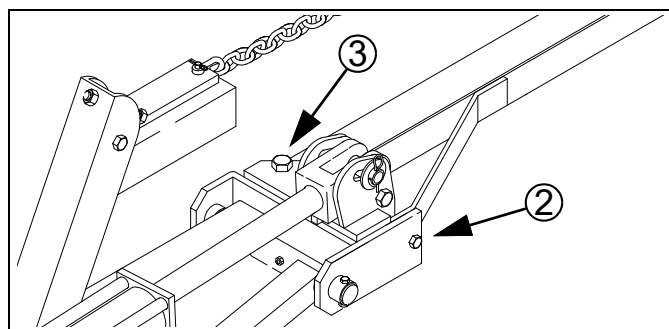


Figure 90
Marker Shear Bolt

15669

Marker Disk

Refer to Figure 91

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.

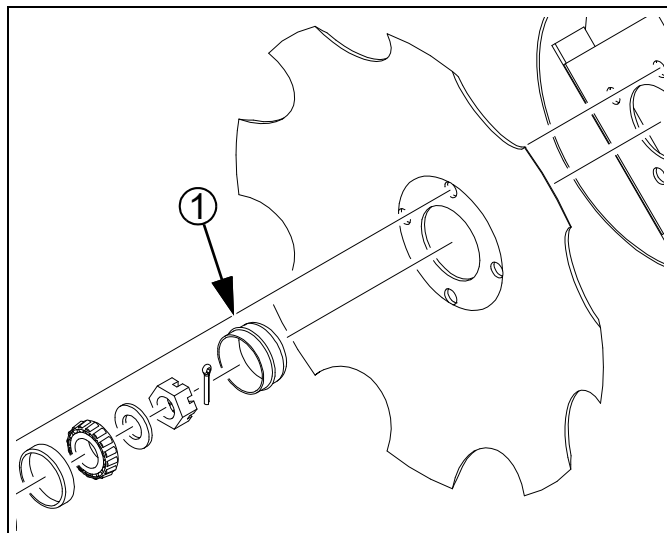


Figure 91
Marker Bearing and Cap

18795

Seed Flap Replacement (s/n S2363+)

Refer to Figure 92

To replace an 816-302C seed flap ① use a needle nose pliers or similar tool to grasp “T” top of flap. Pull upward to pull flap up out of metal bracket ②.

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

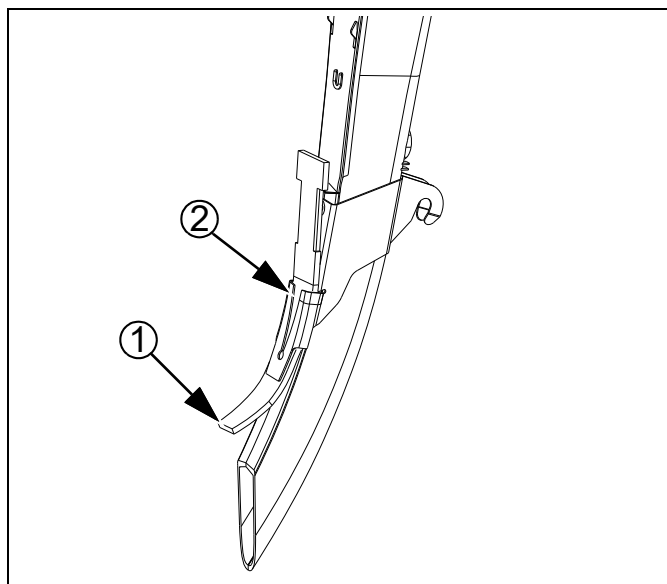


Figure 92
816-302C Seed Tube Flap

31047

Seed Flap Replacement (s/n S2362-)

Refer to Figure 93

To replace a seed flap ① use a needle nose or similar tool and squeeze the tabs ② together. Pull plastic seed flap ① down out of metal bracket ③.

Push new seed flap ① up through metal bracket ③ until tabs ② on seed flap snap in place.

If replacing with 816-302C:

See seed flap replacement instructions below.

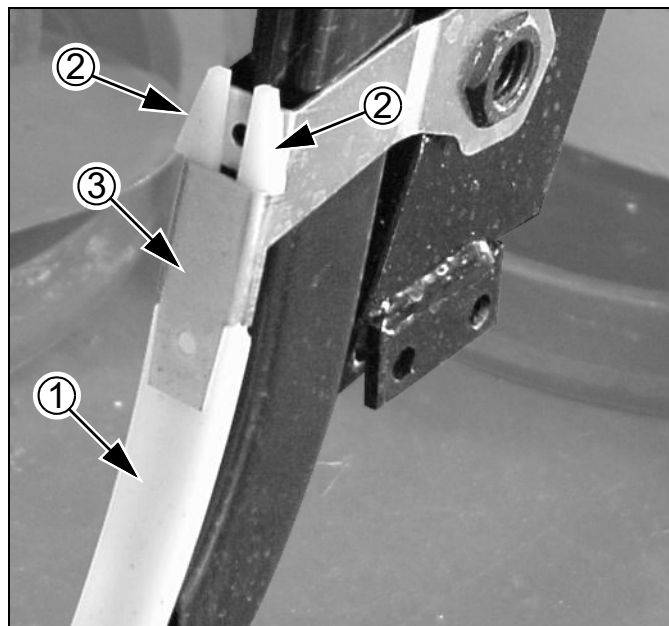
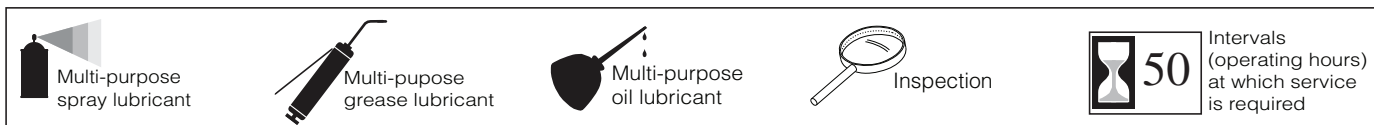


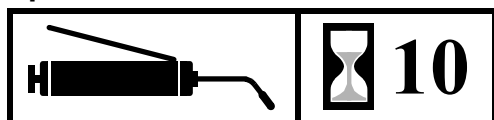
Figure 93
817-349C Seed Tube Flap

19398

Lubrication



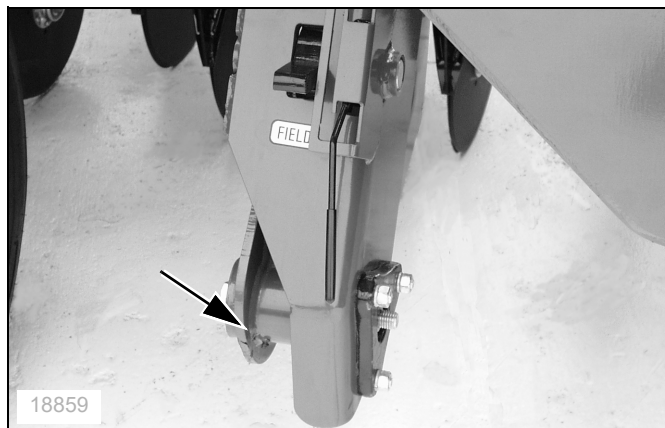
Opener Frame Pivots



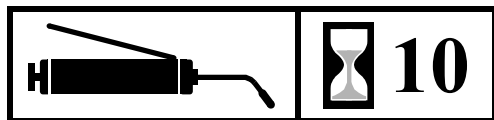
2 zerks on center section,
1 zerk each wing section; 4 total

Type of Lubrication: Grease

Quantity: Until grease emerges at pivot ends.



Gauge Wheel Opener Frame Pivots



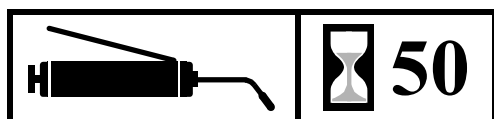
1 zerk each gauge wheel pivot; 2 total

Type of Lubrication: Grease

Quantity: Until grease emerges at pivot ends.



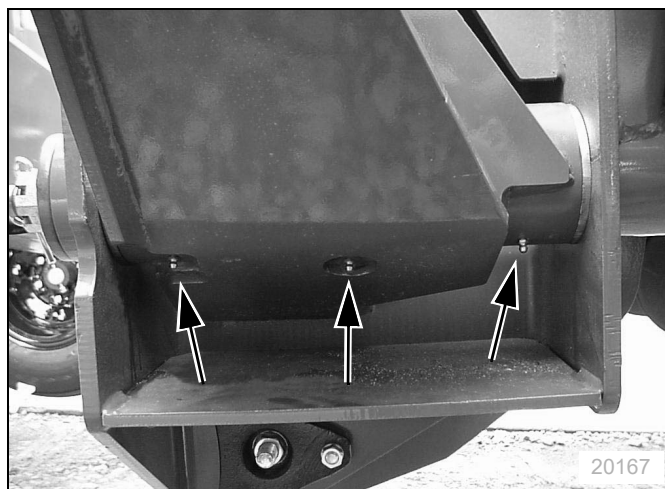
Box Frame Pivots

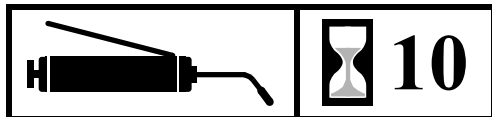


3 zerks each pivot; 6 total

Type of Lubrication: Grease

Quantity: Until grease emerges.

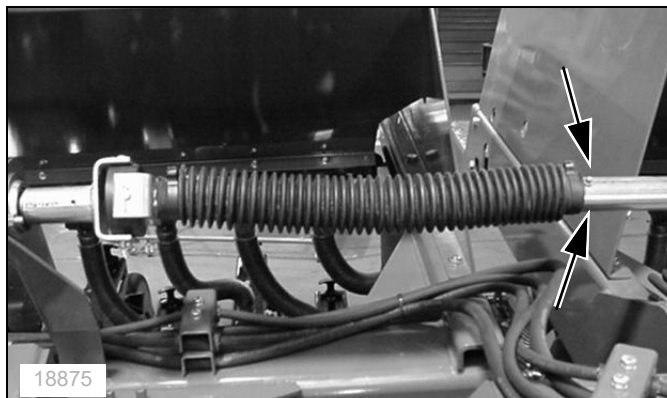
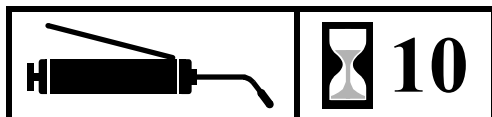


Telescoping Drive Shaft

2 zerks

Type of Lubrication: Grease

Quantity: Until grease emerges.

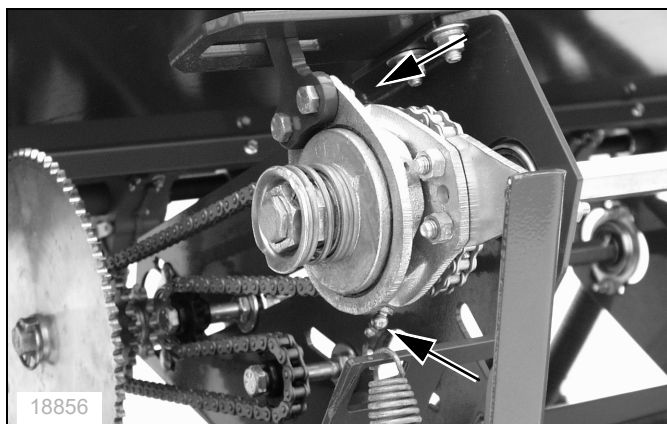
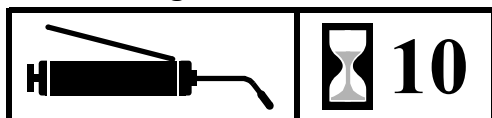
**Drive Shaft Clutches**

2 zerks each of 3 clutches; 6 total

Type of Lubrication: Grease. In dry dusty conditions, clean grease out and apply graphite spray lubricant. (seasonally).

Quantity: Until grease emerges or coated with graphite spray.

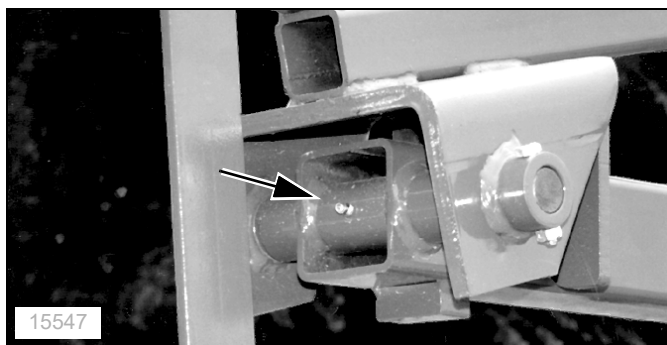
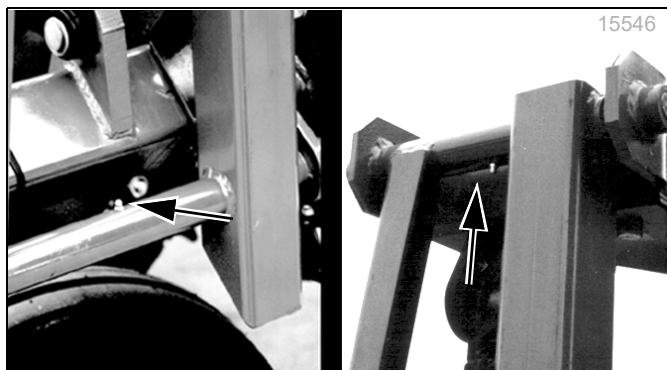
Also smear grease or graphite spray on clutch engagement.

**Marker Hinge Pivots**

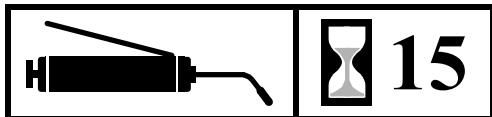
1 zerk at mount pivot,
 1 zerk and 1st to 2nd section pivot,
 1 zerk at 2nd section to arm pivot;
 3 or 6 total

Type of Lubrication: Grease

Quantity: Until grease emerges at pivot ends



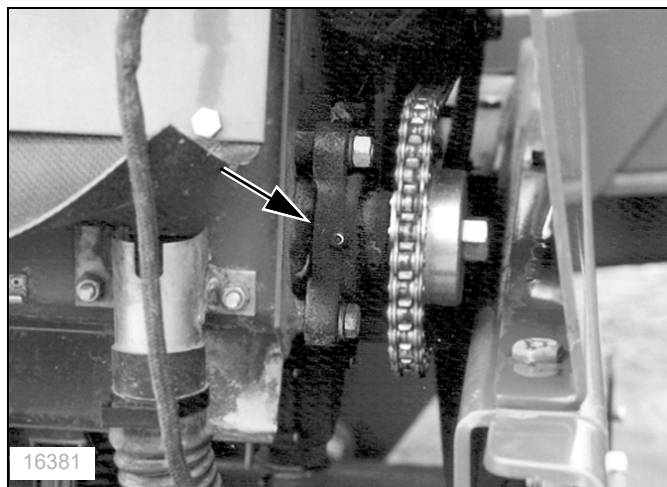
Fertilizer Shaft Bearings



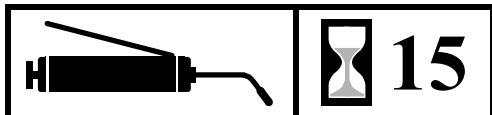
1 zerk each bearing, 2 per shaft; 6 total

Type of Lubrication: Grease

Quantity: Until resistance is felt



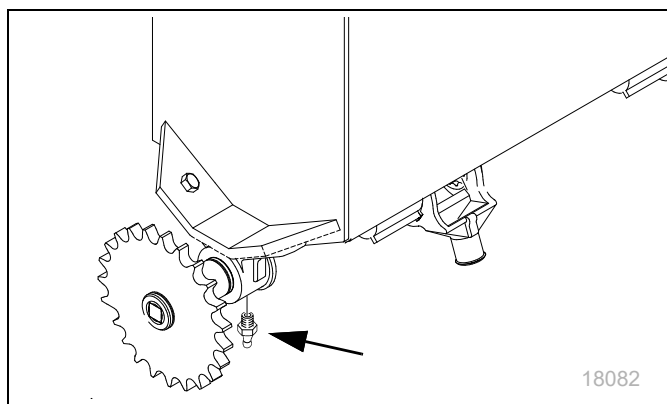
Small Seeds Shaft Bearings



1 zerk each bearing, 2 per shaft; 6 total

Type of Lubrication: Grease

Quantity: Until grease emerges



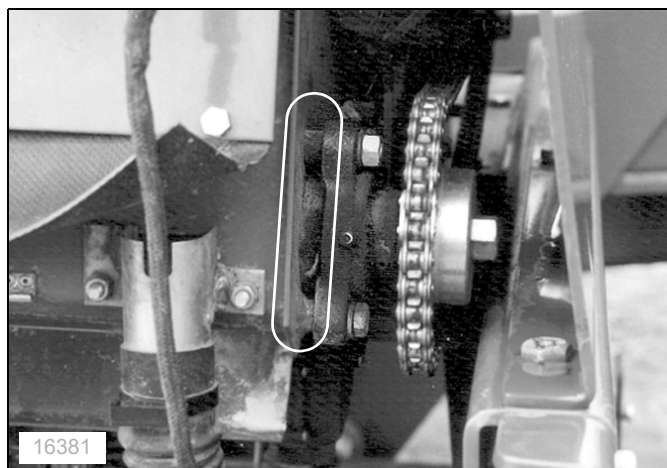
Felt Barrier Seals

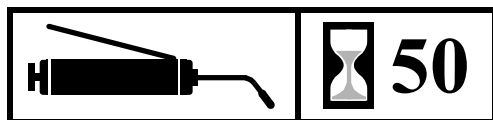


1 seal at each shaft end, 2 per shaft; 6 total

Type of Lubrication: Oil

Quantity: Soak seal

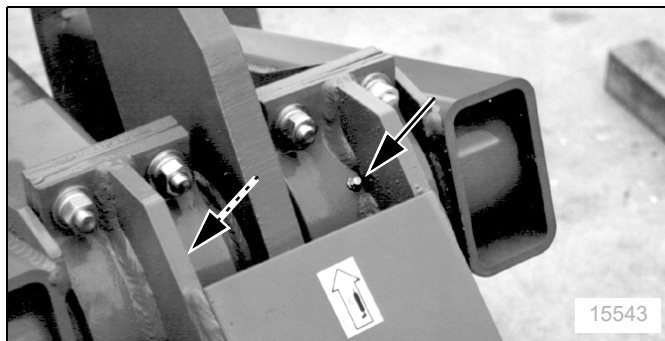
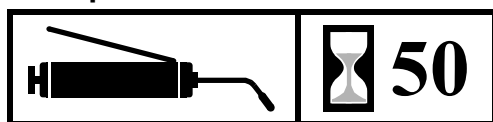


Transport Lift Pivots

2 zerks inside pivot

Type of Lubrication: Grease

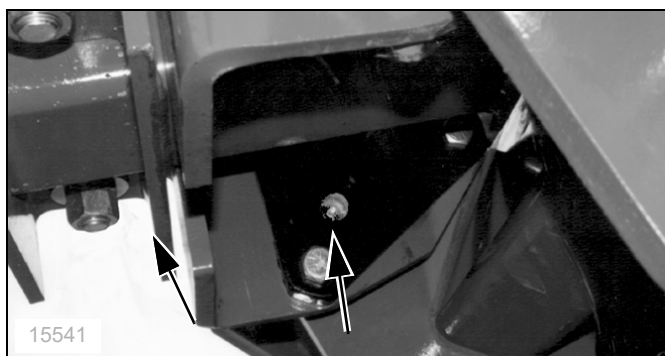
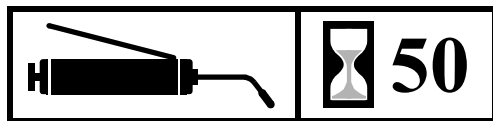
Quantity: Until grease emerges at pivot ends

**Transport Axle**

2 zerks

Type of Lubrication: Grease

Quantity: Until grease emerges

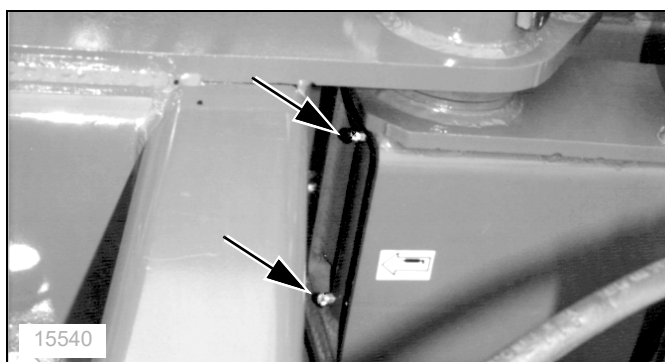
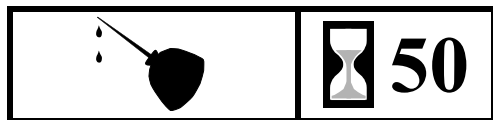
**Mainframe Pivots**

2 zerks each pivot; 4 total

Type of Lubrication: Grease

Quantity: Until grease emerges

These zerks are more accessible with the drill folded.

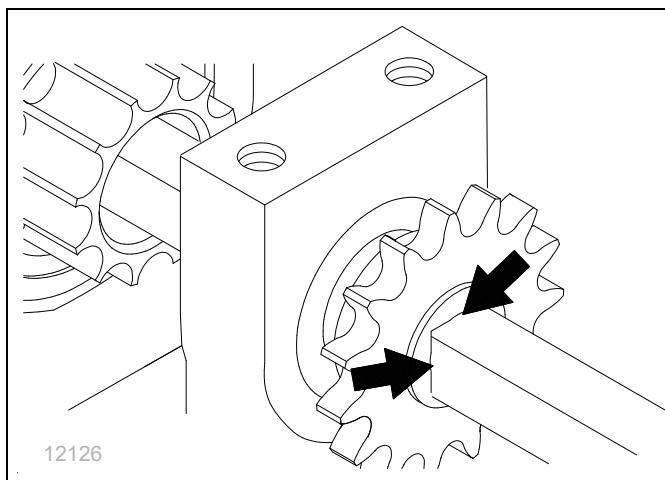
**Seed Cup Drive Shaft Sprocket**

2 sliding sprockets; one each side

Type of Lubrication: Oil

Quantity: Coat thoroughly

Move the Seed Rate adjustment handle back and forth to get oil into the square bore. Perform this with seed box empty, or handle may be difficult to set to 100.



Gauge Wheel Chain

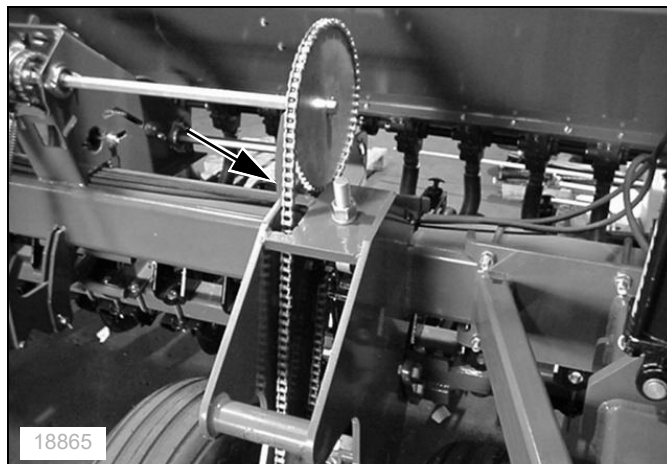


1 chain per gauge wheel; 2 total

Type of Lubrication: Chain Lube

Quantity: Coat thoroughly

Slack: $\frac{1}{2}$ in (13mm) in top span



Clutch to Seed Jackshaft Chain

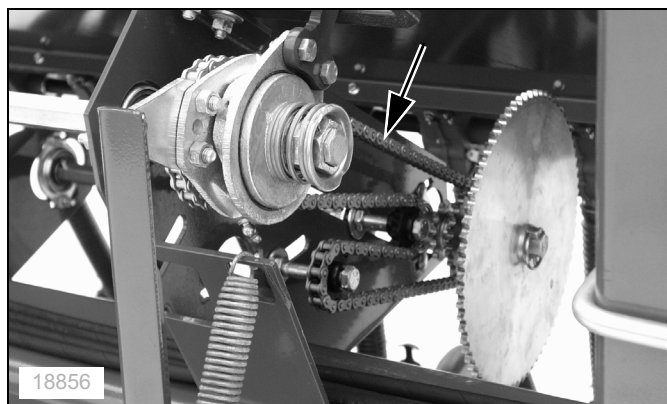


1 chain per section; 3 total

Type of Lubrication: Chain Lube

Quantity: Coat thoroughly

Slack: $\frac{1}{4}$ in (7mm) in top span



Seed Jackshaft to Meter Shaft Chain



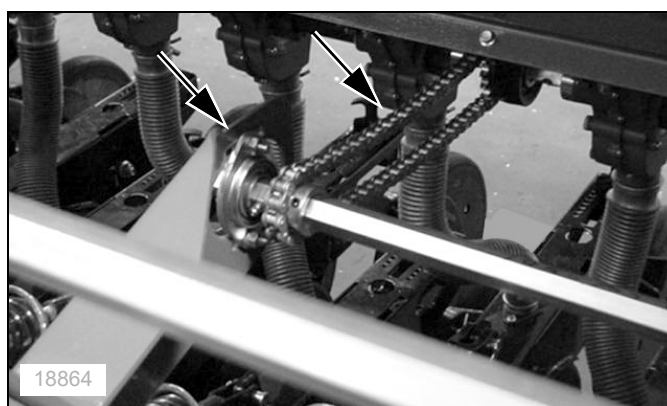
1 chain per section; 3 total

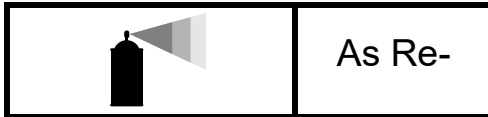
Type of Lubrication: Chain Lube

Quantity: Coat thoroughly

Slack: $\frac{1}{2}$ in (13mm) in top span

To remove slack, loosen bolts securing adjacent bearing flangette. Move flangette to obtain desired slack, and tighten bolts.



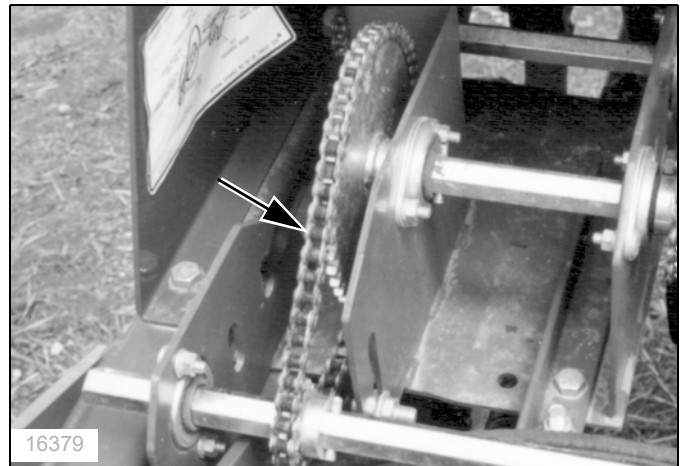
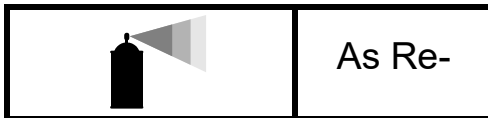
Clutch Shaft to Fertilizer Range Chain

1 chain per section; 3 total

Type of Lubrication: Chain Lube

Quantity: Coat thoroughly

Slack: $\frac{1}{4}$ in (7mm) in top span

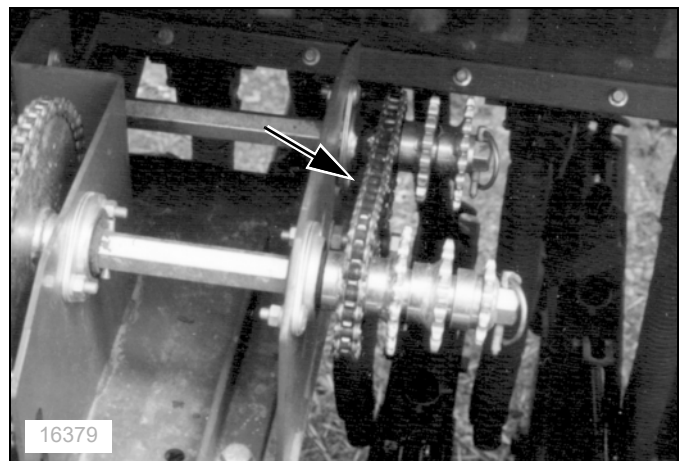
**Fertilizer Range to Jackshaft Chain**

1 chain per section; 3 total

Type of Lubrication: Chain Lube

Quantity: Coat thoroughly

Slack: $\frac{1}{4}$ in (6mm) in top span

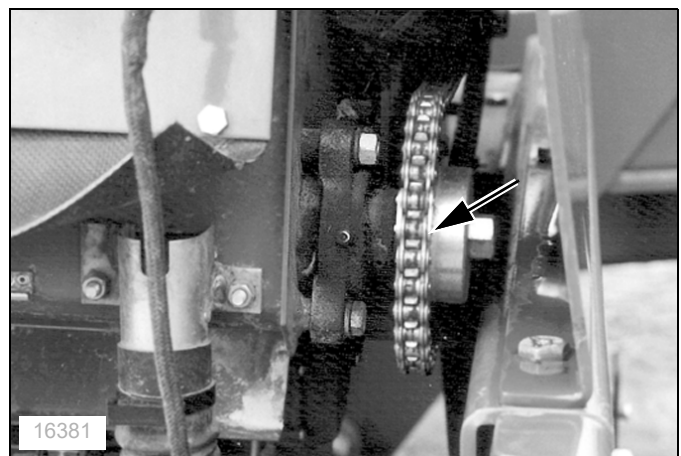
**Fertilizer Jackshaft to Meter Shaft Chain**

1 chain per section; 3 total

Type of Lubrication: Chain Lube

Quantity: Coat thoroughly

Slack: $\frac{1}{2}$ in (13mm) in top span



Small Seeds Drive Chains

2 chains per section; 6 total

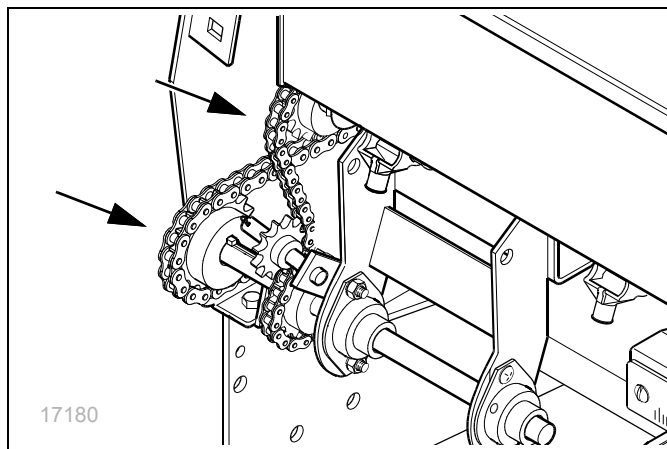
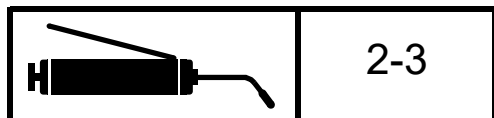
Type of Lubrication: Chain Lube

Quantity: Coat thoroughly

Slack:

$\frac{1}{2}$ in (13mm) in top span of long chain

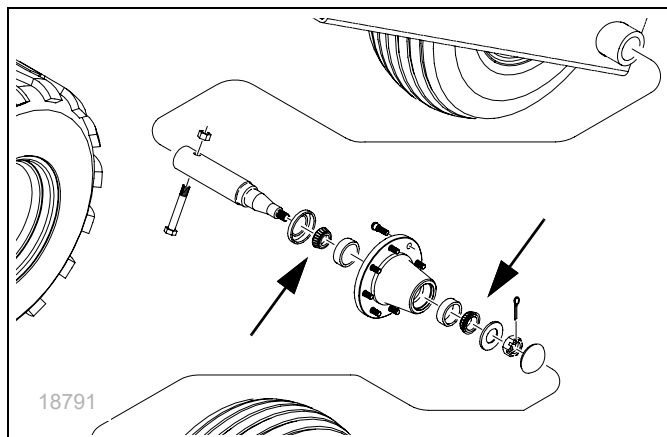
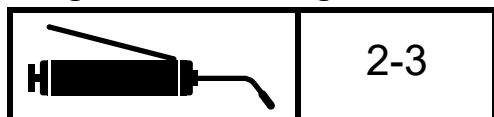
$\frac{1}{4}$ in (7mm) in longest span of final drive chain

**Transport Wheel Bearings**

2 races each of 4 wheels; 8 total

Type of Lubrication: Grease

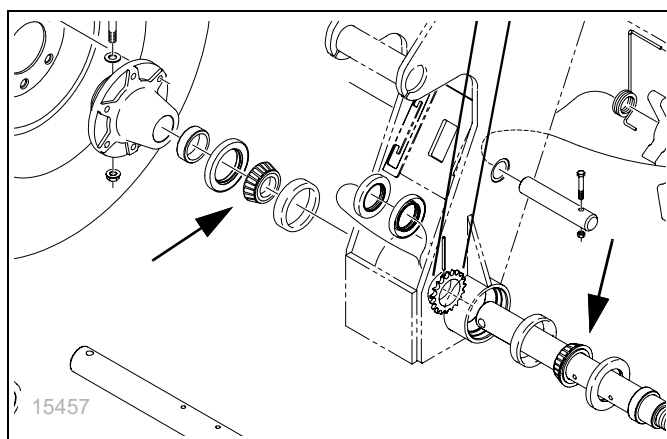
Quantity: Repack

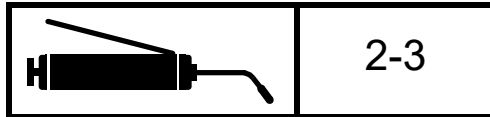
**Gauge Wheel Bearings**

2 races each of 4 wheels; 8 total

Type of Lubrication: Grease

Quantity: Repack

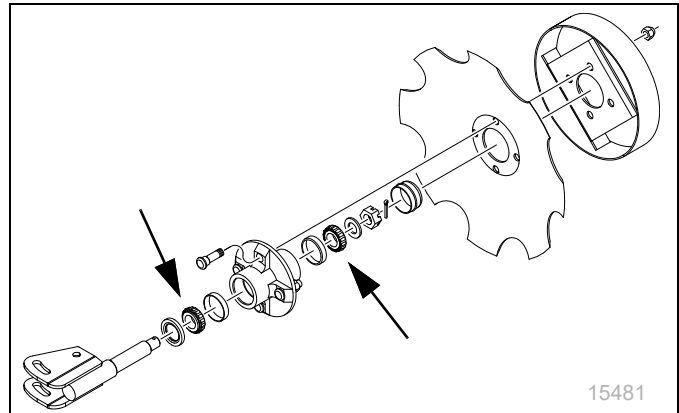
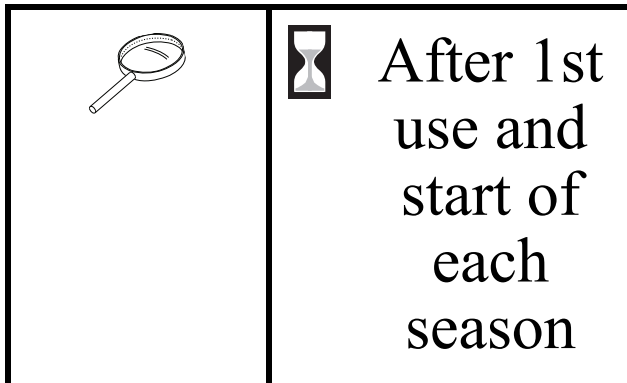


Marker Disk Bearings

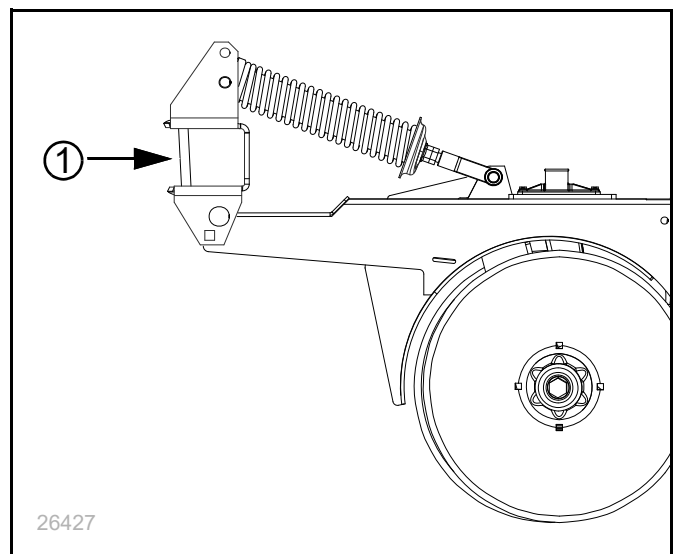
2 races each marker; 2 or 4 total

Type of Lubrication: Grease

Quantity: Repack

**Opener Mounting Bolt**

After first initial operation of the drill, inspect the opener mounting bolt and nut (1) for proper torque. This check should be repeated before each drilling season. This nut should be torqued to 85 ft./lbs +5/-0. If replacing this nut, it should be Great Plains part number 803-549c.

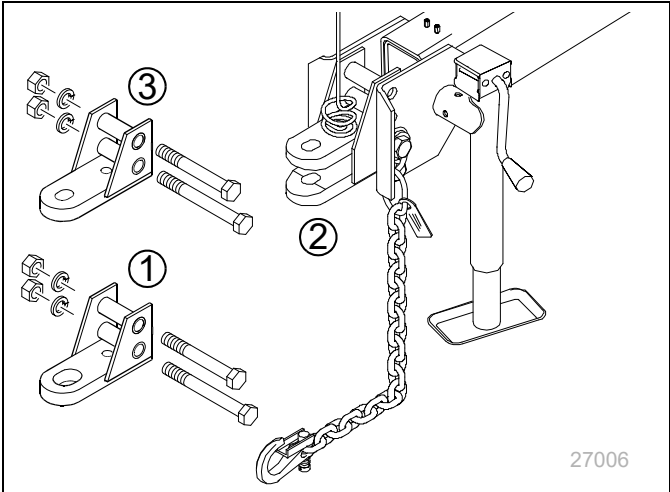


Options

Hitches

One hitch is selected upon initial order of an 3S-3000HD Drill, and includes the spring wire loop, safety chain, and all fasteners. Additional hitches may be ordered for conversion in the field, and include extra hitch mounting bolts, lock washers and nuts.

Hitch Description	Part Numbers
① Large Strap	170-038A
② Clevis	170-039A
③ Small Strap	170-059A

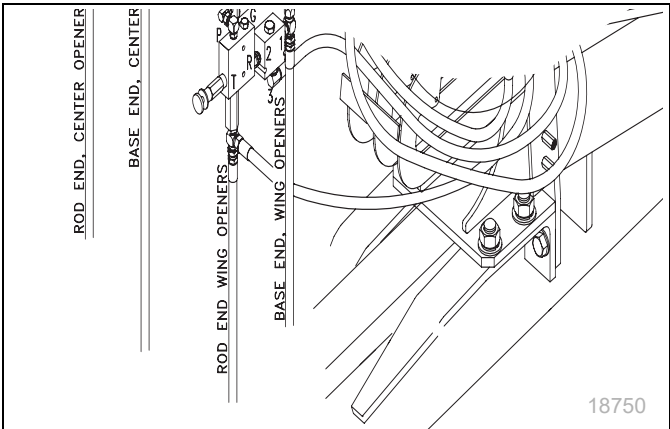


Open Center Conversion

The standard 3S-3000HD drill is compatible with tractors having “active” or “closed center” hydraulic systems. For use with “non-active” or “closed center” tractors, a conversion kit is available. Order one kit per drill.

Description	Part Number
Open Center Hydraulic Kit	194-143A

For operations, see “**Tractors with Open Center Hydraulics**” on page 20.



Two Outlet Hydraulic Kit

The standard 3S-3000HD drill requires three remote outlet circuits on the tractor. If only two are available, this kit enables the Transport and Opener Lift circuits to share a single remote, via a selector valve on the tongue at the hitch. Order one kit per drill.

Description	Part Number
Two Outlet Tractor Conversion	194-122A

For operations, see “**Lift Selector Valve Operation**” on page 43.

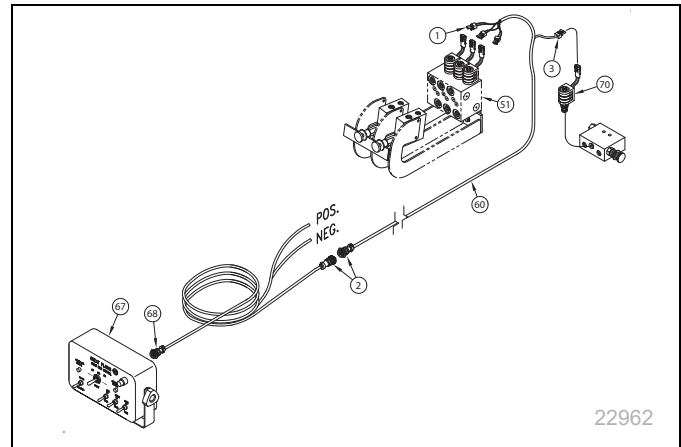


Point Row Clutch

On the standard 3S-3000HD drill, all sections raise and lower simultaneously. Shutting off seed flow on one or two sections requires stopping and making setup changes. The Point Row Clutch option provides cab control of opener lift on a section-by-section basis. Order one kit per drill.

Description	Part Number
3S-3000HD Point Row Accessory	195-306A

For operations, see **"Point Row Operation"** on page 43.



Flat Folding Markers

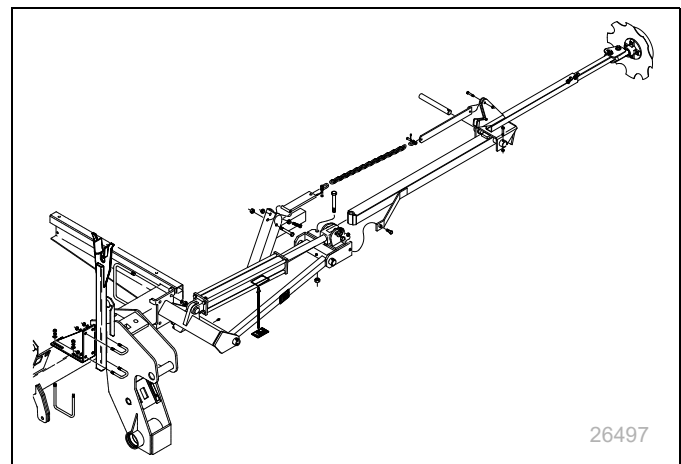
Hydraulically operated markers provide precise pass-to-pass spacing by leaving a user-controlled visible score mark to one side.

The single marker is left-side mounted. Dual markers are operated through an automatic sequence valve. After each fold operation, the next unfold extends the other marker. Order one kit per drill.

Description	Part Number
3S-3000HD Dual Markers	113-553A
3S-3000HD Single (LH) Marker	113-552A

Dual Markers add 887 lbs (402 kg) to the drill.
Single Marker adds 456 lbs (207 kg).

See **"Marker Operation"** on page 42. See also **"Marker Setup"** on page 106, **"Marker Adjustments"** on page 59 and **"Marker Maintenance"** on page 80.



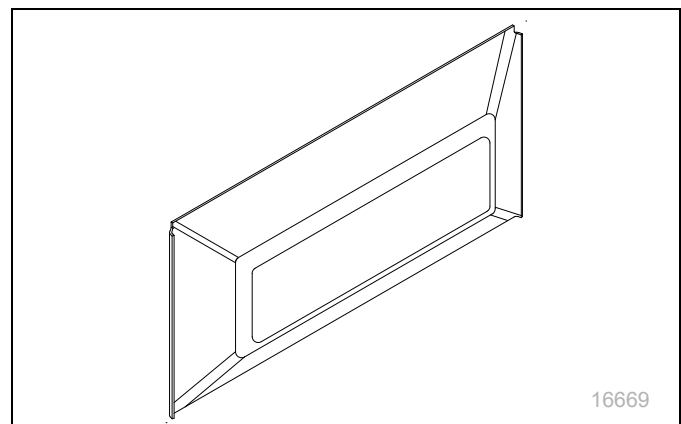
Offset Box Divider

The standard 3S-3000HDF has flat main seed box dividers supporting application at:
100% seed, 0% fertilizer, or
60% seed and 40% fertilizer.

This reversible divider replaces the 60/40 partition, and supports application at:
100% seed, 0% fertilizer,
68% seed, 32% fertilizer, or;
55% seed, 45% fertilizer.

Order 3 dividers per box, 9 per drill.

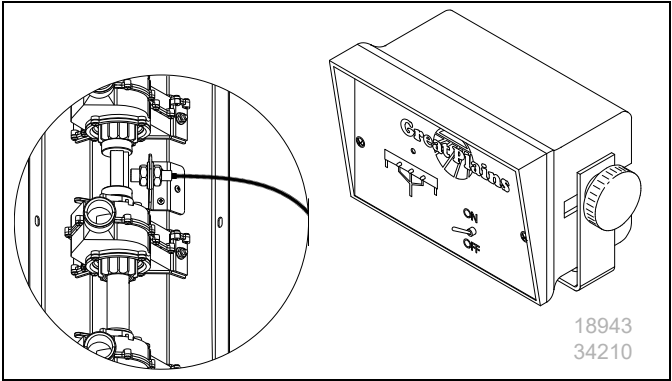
Description	Part Number
3S-3000HD Offset Divider	817-322C



Shaft Monitor

This kit provides a cab alarm in the event that a main box seed meter shaft stops turning (which might result from excess down-pressure lifting a gauge wheel, low tire pressure/flat tire, chain break or clutch malfunction). Order one kit per drill.

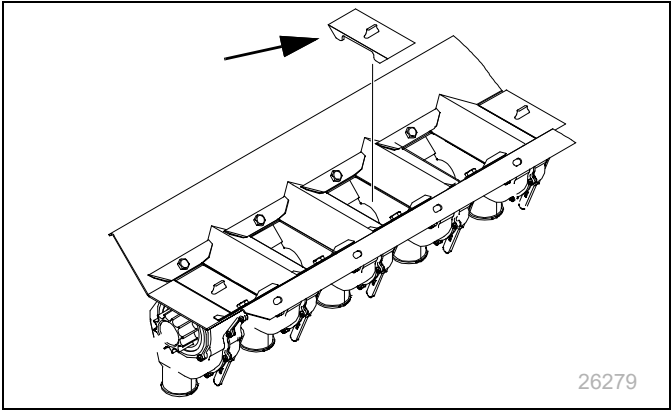
Description	Part Number
3-Channel Shaft Monitor	116-283A



Seed Tube Plug

This plug stops seed flow from the main seed box at the top of a seed tube. It prevents flow independently of the sliding sprocket in the seed cup. Order one per row to be set inactive.

Description	Part Number
Fluted Feed Meter Plug	817-087C



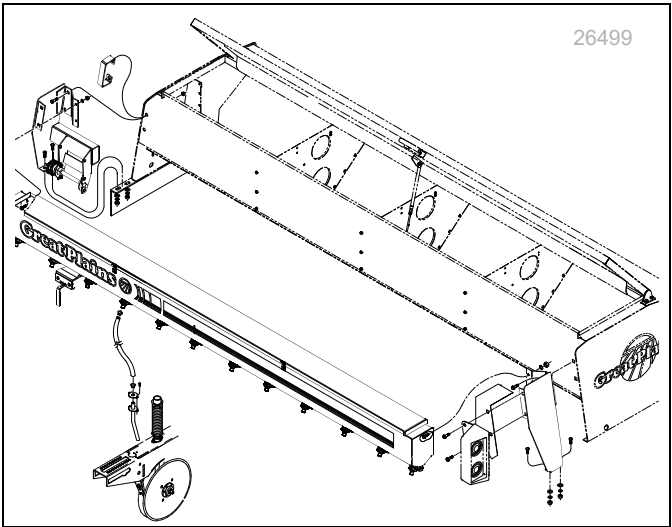
Small Seeds Attachment

These kits deliver the smallest seeds evenly and gently. A kit adds to each main seed box: a clutched drive line, a second seed box, small seed fluted feeder cups, seed drop tubes for each row, and all necessary hardware.

Small Seeds capability may be specified on the initial drill order (Sequence No. 91), or added later.

Description	Part Number
3S-3000HD-3610 10in Small Seeds	133-200A
3S-3000HD-4875 7.5in Small Seeds	133-201A
3S-3000HD-6006 6in Small Seeds	133-202A
3S-3000HDF-3610 10in Small Seeds	133-203A
3S-3000HDF-4875 7.5in Small Seeds	133-204A
3S-3000HDF-6006 6in Small Seeds	133-205A

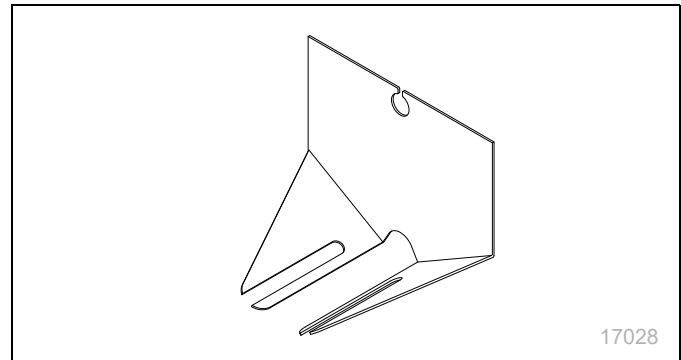
See “Weights for Tractor Requirements” on page 27 for weight added to drill. For operation, see “Loading Seed Boxes” on page 34 and see “Small Seeds Rate” on page 48.



Removable Partition

This partition reduces side-to-side seed flow in the small seeds box. This can prevent seed pile-up when drilling across slopes and in other situations where the seed is particularly fluid. Order one per partition.

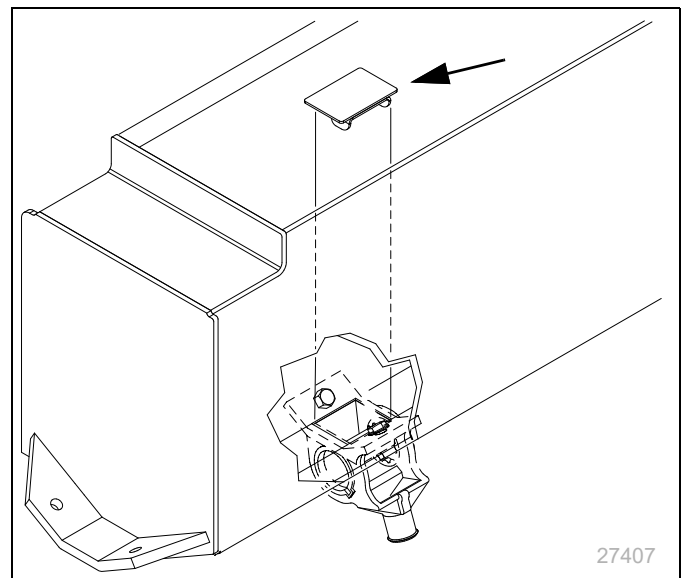
Description	Part Number
RMVBL SMALL SEED BOX PARTITION	123-409D



Seed Tube Plug (Small Seeds)

This plug stops seed flow from the small seeds box above the meter. Order one per row to set inactive.

Description	Part Number
SML SDS CUP PLUG	133-315H

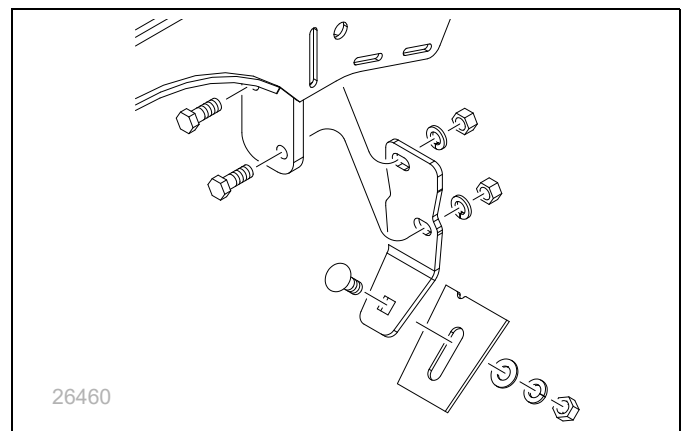


Opener Disk Scraper

Optional disk scrapers help clear any soil and debris not removed by the standard disk spreaders at the seed tube. Scrapers cannot be mounted if optional seed firmers are used. Scrapers are compatible with the standard seed flap.

Description	Part Number
00HD Scraper Assembly (Order one per row)	122-015A

See “**Scraper Installation**” on page 105, and “**Disk Scraper Adjustments**” on page 56.



Seed Firmers

The standard 3S-3000HD drill includes seed flaps. A choice of firmers is an option in the product bundles, or may be field-installed as kits. Only one type of seed firmer may be installed at the same time. Order one firmer kit per opener.

Seed-Lok® Seed Firmer

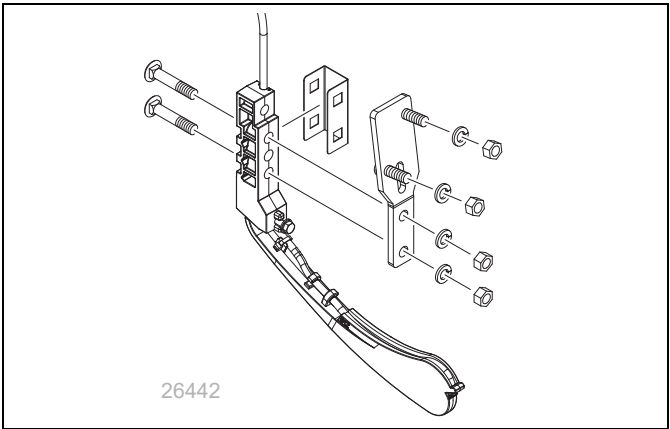
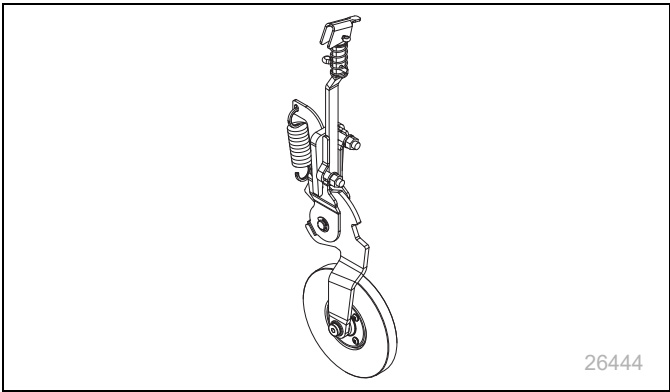
Description	Part Number
Series Seed-Lok® kit	122-009K

For operations, see “Seed Firmer Adjustments” on page 57.

Keeton Seed Firmer

Description	Part Number
Keeton seed firmer (per opener)	890-902C

For operations, see “Seed Firmer Adjustments” on page 57.



Press Wheels

A variety of single and dual press wheels are available, as bundle options at the time of initial drill order. Kits are not presently available to convert these in the field. Parts may be ordered to do so.

Acremeter

One digital electronic acremeter is standard on the 3S-3000HD drill. If you require a replacement, or alternate units of measure, order one of the parts below.

Units of Measure	Acremeter Part Number
U.S. Customary	891-059C
Metric	891-060C

See “Acremeter Operation” on page 40.



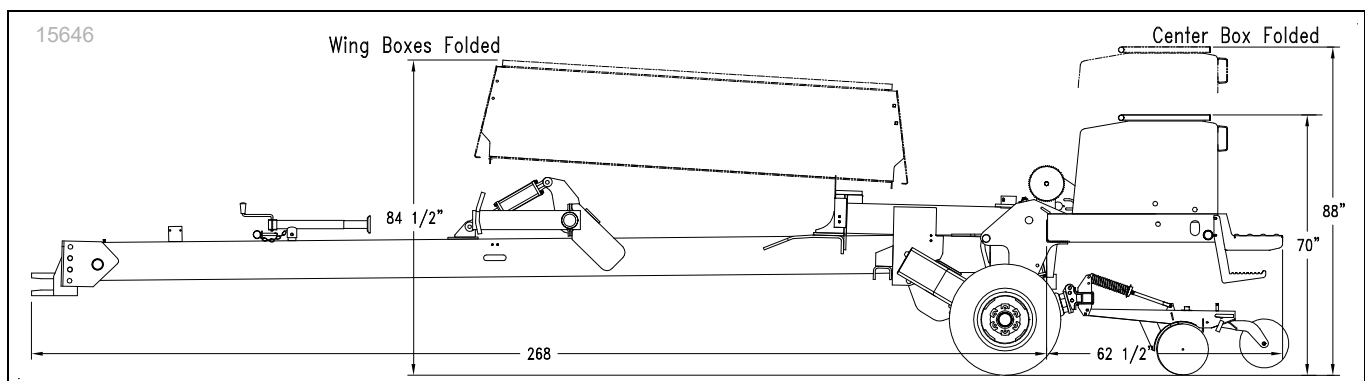


Appendix A - Reference Information

Specifications and Capacities

	3S-3000HD-6006	3S-3000HD-4875	3S-3000HD-3610
Row Count	60	48	36
Row Spacing	6 in (15.2 cm)	7.5 in (19.1 cm)	10 in (25.4 cm)
Main Seed Box Capacity	92.7 bushels (3267 liters)		
Tractor Requirements	125 hp minimum		
Weight, standard HD model^a	12447 lbs (5646 kg)	12425 lbs (5636 kg)	12409 lbs (5629 kg)
Weight, standard HDF model^a	13496 lbs (6123 kg)	13454 lbs (6102 kg)	13416 lbs (6085 kg)
Down-Force per Row	130-207 lbs (59-94 kg)	135-280 lbs (61-127 kg)	144-373 lbs (65-169 kg)
Opener Travel	8in (20cm)		
Hydraulic Circuits	3 circuits required, load-sensitive or closed-center 15 to 30 gpm at 2300 psi Optional kits are available for two-circuit, and open center.		
Hitch Load	3700 lbs (1678 kg) folded with seed loaded Caution: <i>negative tongue weight when raised and unfolded</i>		
Transport Width	15 feet (4.6 meters)		
Operating Width	30 feet (9.1 meters)		
Swath	365 in (9.271m)	362 in (9.195m)	360 in (9.144m)
Height	7 feet 4 inches (224 cm)		
Length	27 feet 7 inches (8.4 meters)		
Tire Sizes	Gauge Wheels: 265/70B16.5 NHS Skid Steer Transport: 395/55B16.5 NHS Skid Steer		

a. See page 26 for additional weight data.



Torque Values Chart

Bolt Size in-tpi ^a	Bolt Head Identification			mm x pitch ^c	Bolt Head Identification		
	 Grade 2	 Grade 5	 Grade 8		 Class 5.8	 Class 8.8	 Class 10.9
	N-m ^b	N-m	N-m		N-m	N-m	N-m
1/4-20	7.4	11	16	M 5 X 0.8	4	6	9
1/4-28	8.5	13	18	M 6 X 1	7	11	15
5/16-18	15	24	33	M 8 X 1.25	17	26	36
5/16-24	17	26	37	M 8 X 1	18	28	39
3/8-16	27	42	59	M10 X 1.5	33	52	72
3/8-24	31	47	67	M10 X 0.75	39	61	85
7/16-14	43	67	95	M12 X 1.75	58	91	125
7/16-20	49	75	105	M12 X 1.5	60	95	130
1/2-13	66	105	145	M12 X 1	90	105	145
1/2-20	75	115	165	M14 X 2	92	145	200
9/16-12	95	150	210	M14 X 1.5	99	155	215
9/16-18	105	165	235	M16 X 2	145	225	315
5/8-11	130	205	285	M16 X 1.5	155	240	335
5/8-18	150	230	325	M18 X 2.5	195	310	405
3/4-10	235	360	510	M18 X 1.5	220	350	485
3/4-16	260	405	570	M20 X 2.5	280	440	610
7/8-9	225	585	820	M20 X 1.5	310	650	900
7/8-14	250	640	905	M24 X 3	480	760	1050
1-8	340	875	1230	M24 X 2	525	830	1150
1-12	370	955	1350	M30 X 3.5	960	1510	2100
1 1/8-7	480	1080	1750	M30 X 2	1060	1680	2320
1 1/8-12	540	1210	1960	M36 X 3.5	1730	2650	3660
1 1/4-7	680	1520	2460	M36 X 2	1880	2960	4100
1 1/4-12	750	1680	2730				
1 3/8-6	890	1990	3230				
1 3/8-12	1010	2270	3680				
1 1/2-6	1180	2640	4290				
1 1/2-12	1330	2970	4820				

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

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

25199m

Tire Inflation Chart

Tire Size	Inflation
265/70B16.5 NHS Skid Steer	60 psi 413 kPa
395/55B16.5 NHS Skid Steer	60 psi 413 kPa

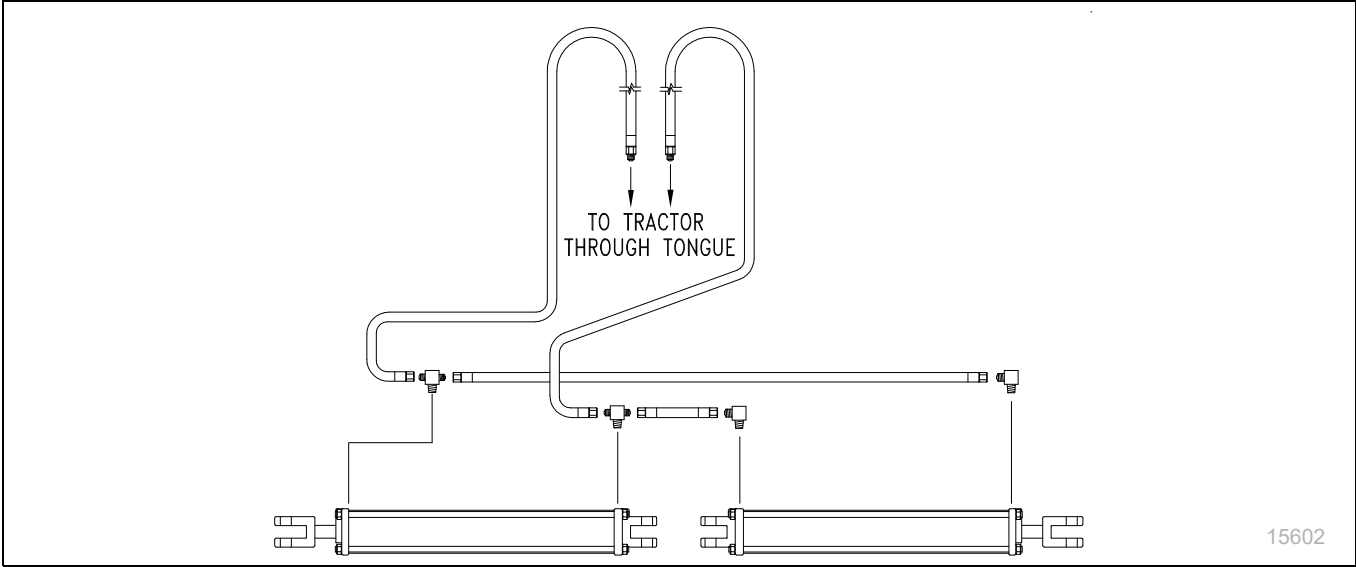
Tire Warranty Information

All tires are warranted by the original manufacturer of the tire. Tire warranty information is found online at the manufacturer's websites listed below. For assistance or information, contact your nearest Authorized Farm Tire Retailer.

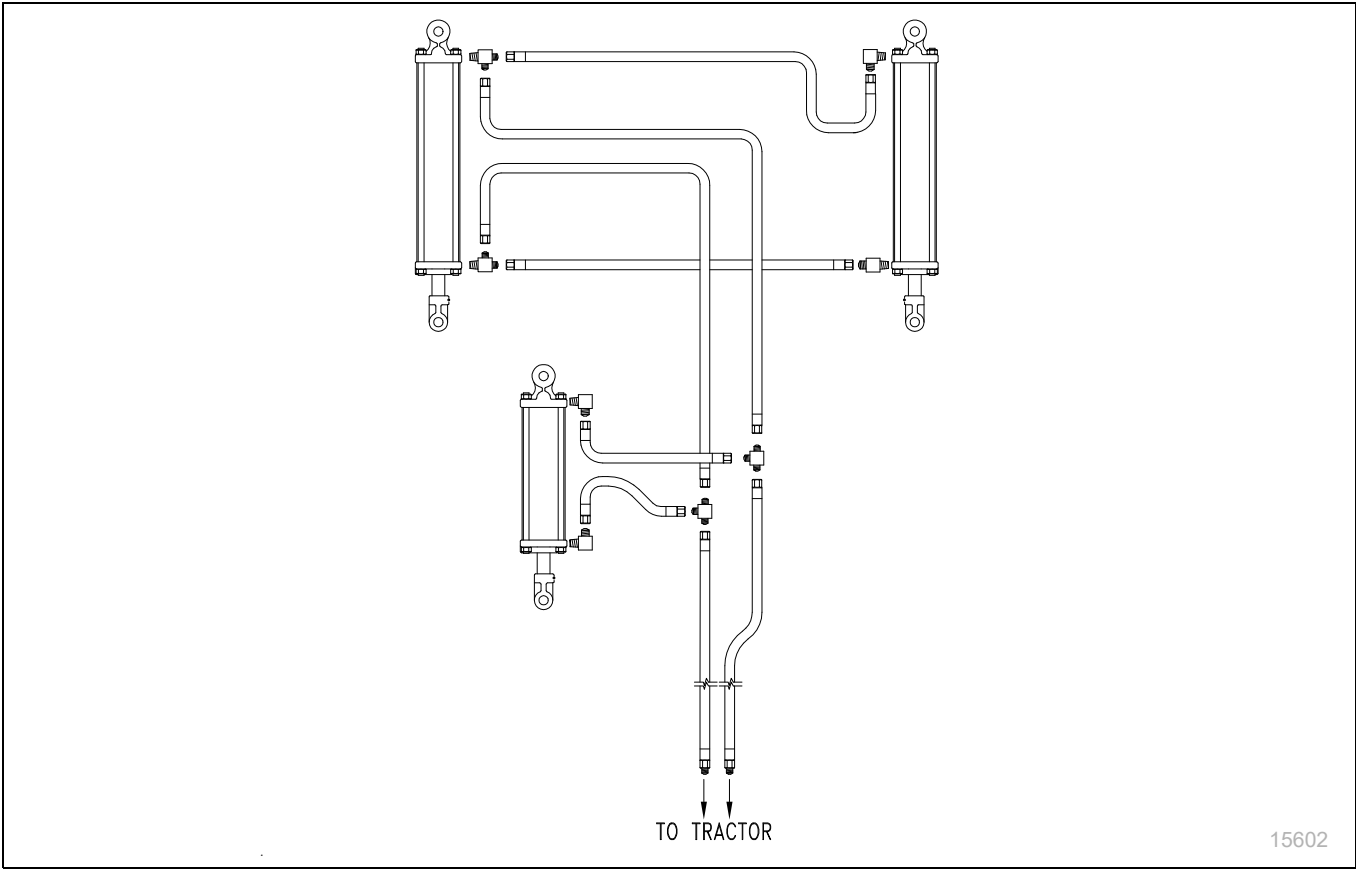
<u>Manufacturer</u>	<u>Website</u>
Firestone	www.firestoneag.com
Gleason	www.gleasonwheel.com
Titan	www.titan-intl.com

Hydraulic Diagrams

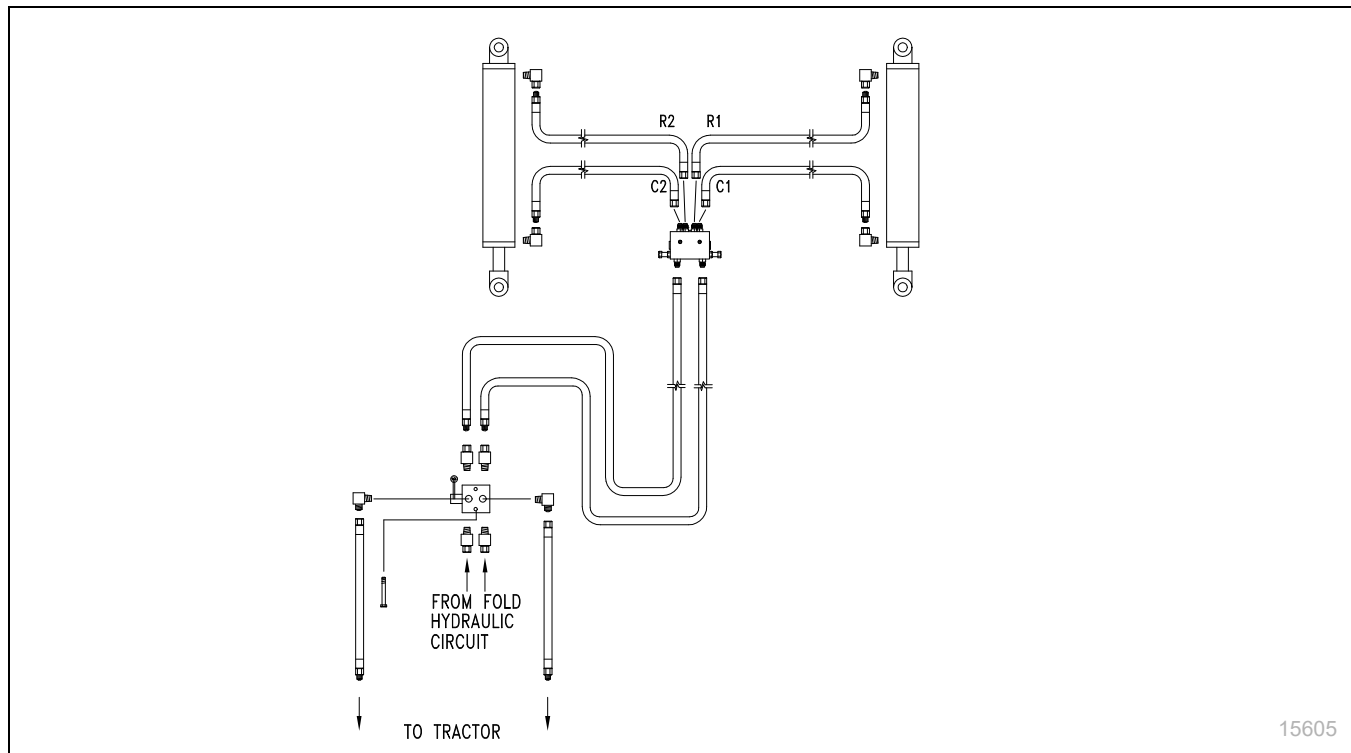
Transport Lift



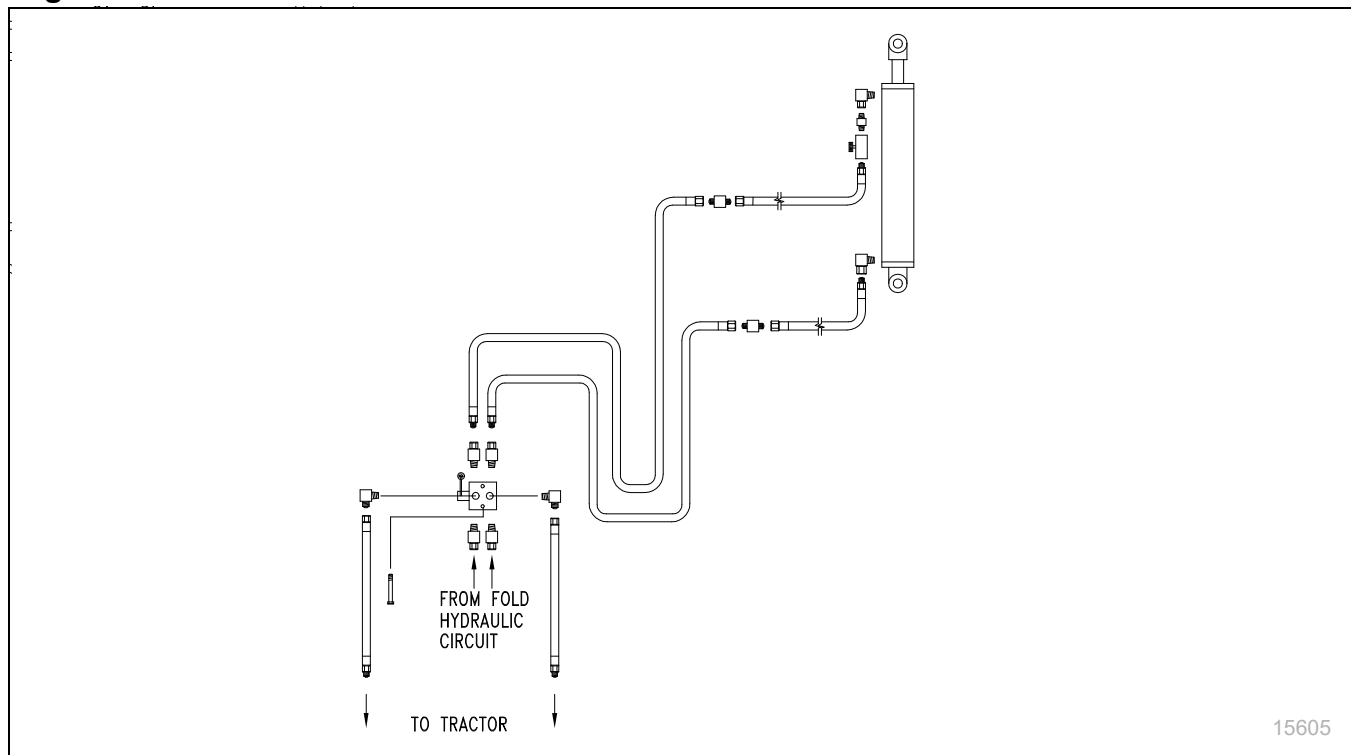
Fold



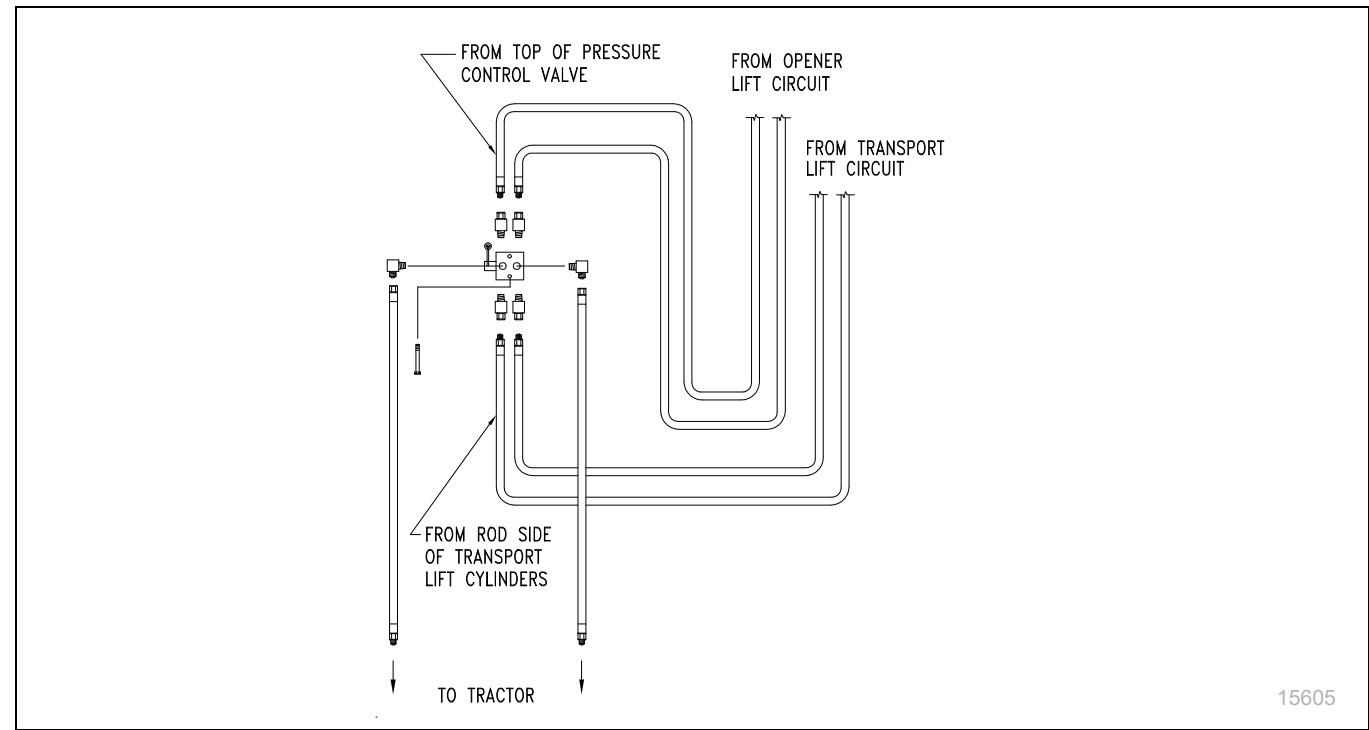
Dual Markers

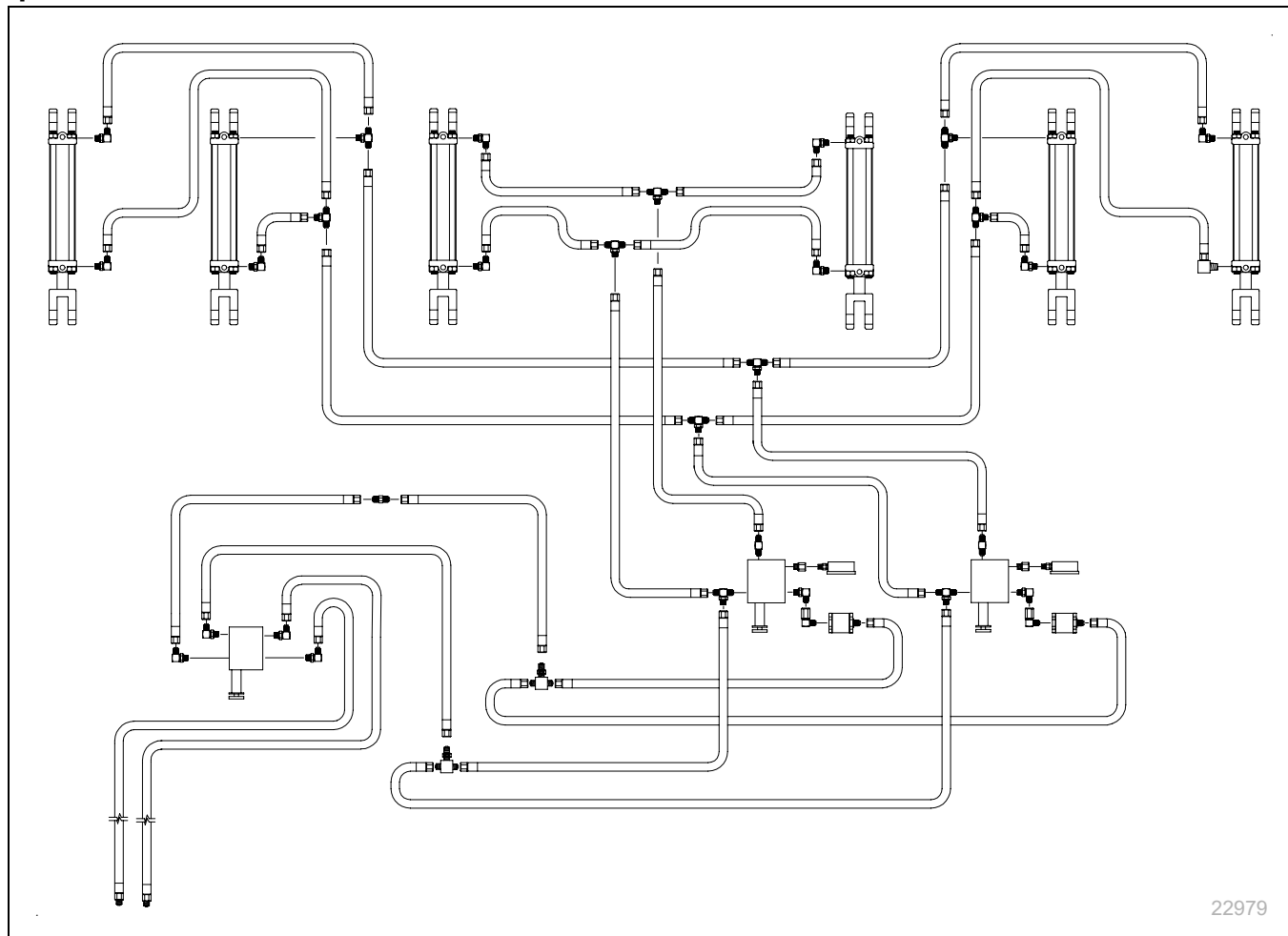


Single Marker

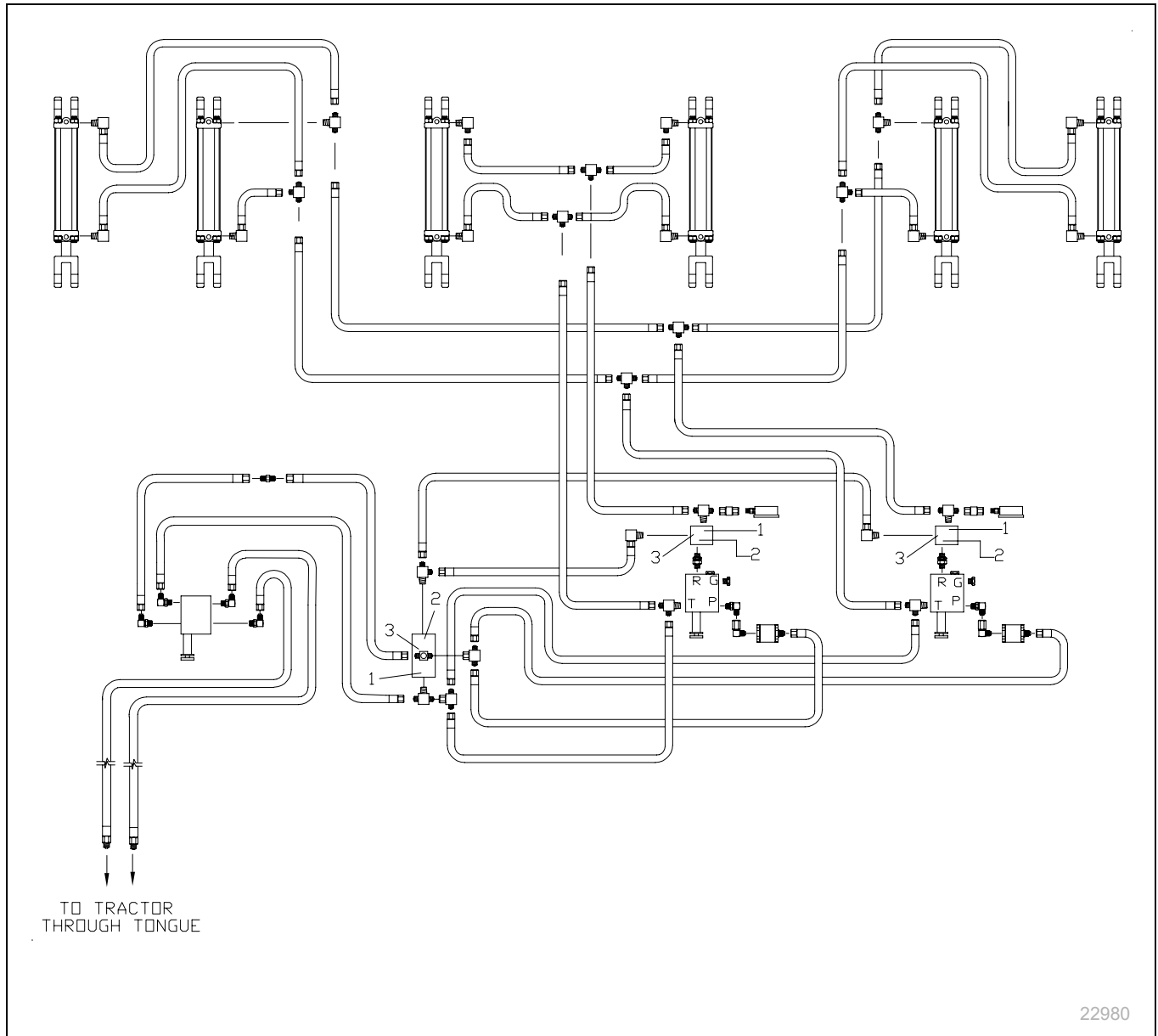


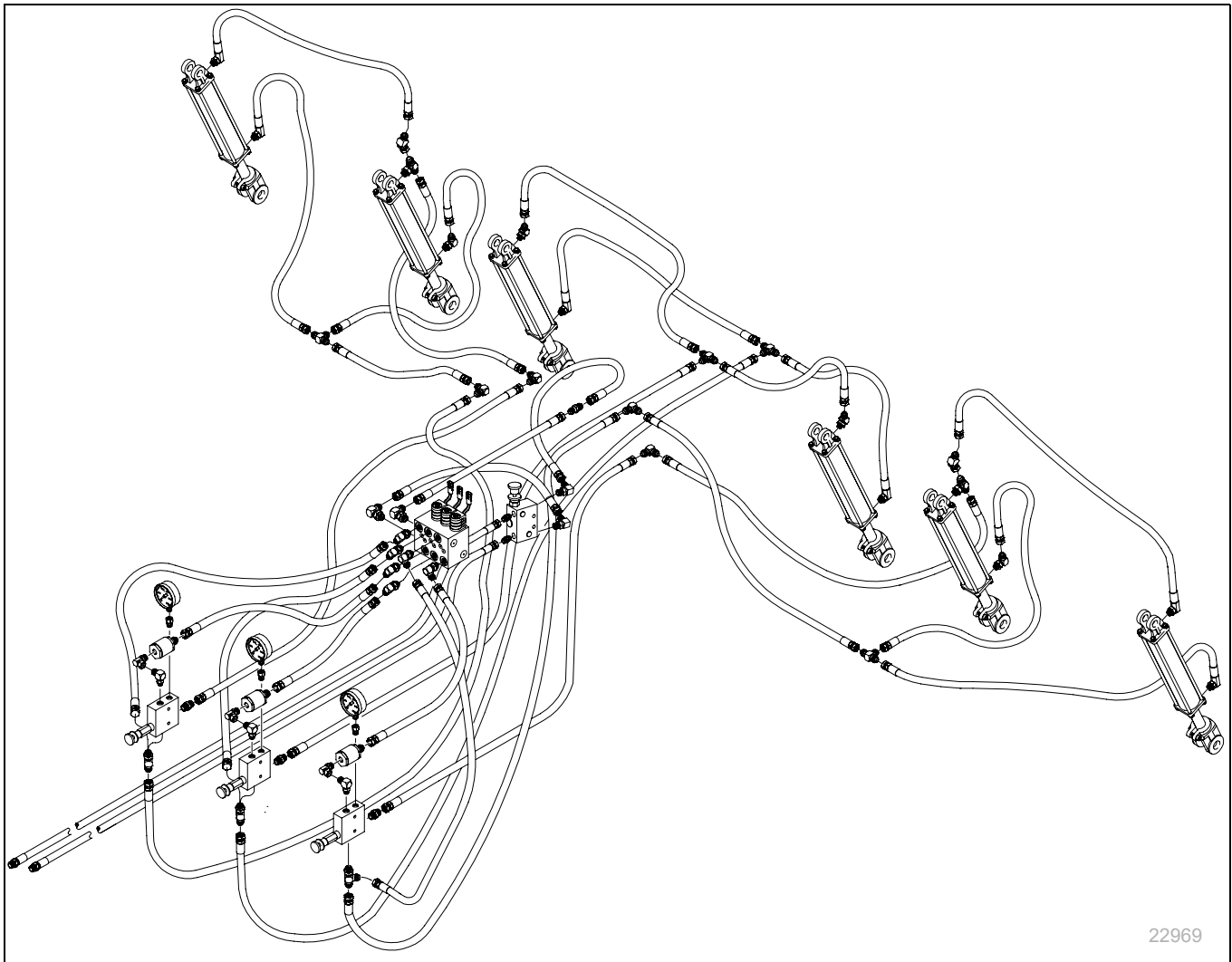
Two Outlet Conversion



Opener Lift: Standard Closed-Center

Opener Lift: Optional Open-Center



Point-Row

Appendix B - Initial Setup

Scraper Installation

Optional disk scrapers are not factory installed. To install them in the field:

1. Remove one or both disk blades to gain safe access to the mount. Note the position of bushings and spacers for correct re-assembly (page 56).

Refer to Figure 94

2. Position the inside scraper mount ① to the rear of the seed firmer mount ② on the opener weldment.

Secure it with two HHCS $\frac{3}{8}$ -16x1in hex head bolts, lock washers and nuts. Insert the bolts from the front.

3. Position the scraper blade ③ below and behind the inside scraper mount ①, with the notch on top to machine right.

Secure it loosely with one RHSNB $\frac{3}{8}$ -16x1 round head square neck bolt, flat washer, lock washer and nut.

4. Re-mount the removed disk blade.
5. Adjust the scraper blade per “**Disk Scraper Adjustments**” on page 56.

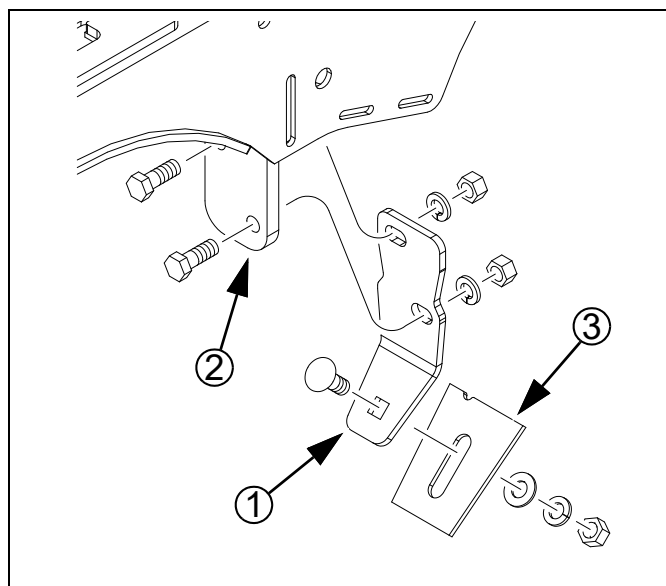


Figure 94
Scraper Installation

26460

Marker Setup

Refer to Figure 95

Markers are field-installed, but usually do not have their extension length ⑤ precisely set. The drill must be leveled per **“Center Box Frame Leveling”** on page 74, and marker(s) must be in correct working order per **“Marker Maintenance”** on page 80.

Row unit centerline stations on 3S-3000HD drills are symmetrical about machine center, so left and right extensions are normally identical, for both opposing and concentric passes.

Set the initial length of the marker(s) as follows:

1. Lower drill and openers to field position (**“Raising and Lowering Openers”** on page 23).
2. Extend a marker on one side. Pull forward several feet to leave a mark.
3. Sighting parallel to the main tool bar, measure ⑤ from the centerline of the left outside row unit to the mark.
4. Adjust the marker extension ⑤ so that the mark is one half ④ the span ⑥ plus one row unit spacing ③. See **“Marker Adjustments”** on page 59 for setting marker extension.

Model	Spacing ③	Extension ⑤
3S-3000HD-3610	10 in	185.0in (469.9cm)
3S-3000HD-4875	7.5 in	184.75in (469.3cm)
3S-3000HD-6006	6 in	185.5in (471.2cm)

5. Pull forward several feet, and re-measure to verify any adjustment. Validate the mark by making a pass to one or both sides.
6. Fold marker. Extend other side and adjust.

Note: If field conditions require inverting the marker disk (page 61), the mark moves, and the extension needs to be re-measured and reset. Marking also changes slightly if the opener frame trunnion position is changed (page 53).

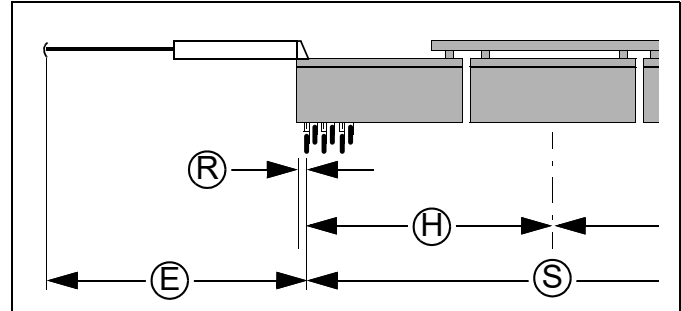


Figure 95
Marker Extension

Warranty

Great Plains Manufacturing, Incorporated warrants to the original purchaser that this seeding equipment will be free from defects in material and workmanship for a period of one year from the date of original purchase when used as intended and under normal service and conditions for personal use; 90 days for commercial or rental purposes. This Warranty is limited to the replacement of any defective part by Great Plains Manufacturing, Incorporated and the installation by the dealer of any such replacement part. Great Plains reserves the right to inspect any equipment or part which are claimed to have been defective in material or workmanship.

This Warranty does not apply to any part or product which in Great Plains' judgement shall have been misused or damaged by accident or lack of normal maintenance or care, or which has been repaired or altered in a way which adversely affects its performance or reliability, or which has been used for a purpose for which the product is not designed. This Warranty shall not apply if the product is towed at a speed in excess of 20 miles per hour.

Claims under this Warranty must be made to the dealer which originally sold the product and all warranty adjustments must be made through such dealer. Great Plains reserves the right to make changes in materials or design of the product at any time without notice.

This Warranty shall not be interpreted to render Great Plains liable for damages of any kind, direct, consequential, or contingent, to property. Furthermore, Great Plains shall not be liable for damages resulting from any cause beyond its reasonable control. This Warranty does not extend to loss of crops, losses caused by harvest delays or any expense or loss for labor, supplies, rental machinery or for any other reason.

No other warranty of any kind whatsoever, express 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 with Great Plains Manufacturing, Incorporated within 10 days from the date of original purchase.

25198



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