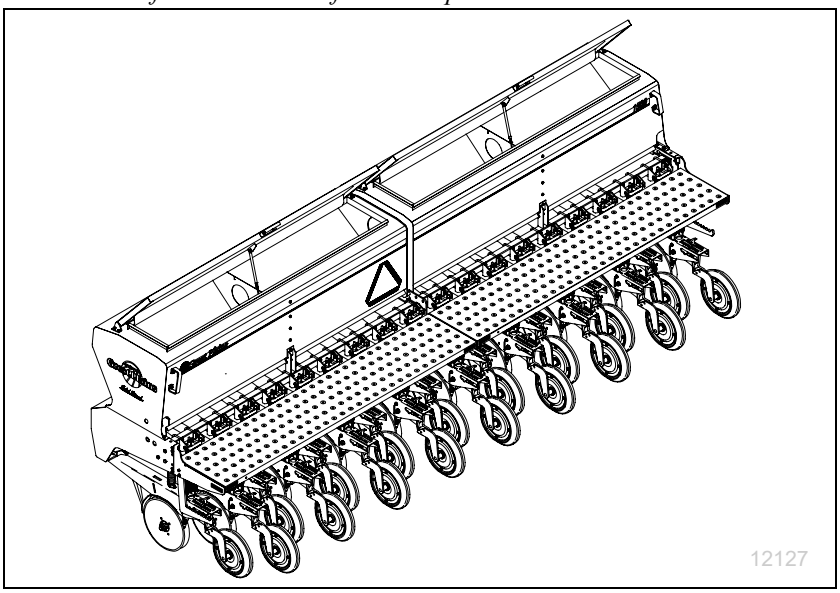
Operator Manual

12, 15, and 20 Foot Series
Three Point Drills

Great Plains
Manufacturing, Inc.
www.greatplainsmfg.com

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



Illustrations may show optional equipment not supplied with standard unit.

ORIGINAL INSTRUCTIONS

EN

 Printed 04/29/2024 118-389M-A

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.: _____

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

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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, and the color Safety Red, indicate an imminent hazard which, if not avoided, will result in death or serious injury. This signal word is limited to the most extreme situations, typically for machine components that, for functional purposes, cannot be guarded.

WARNING, and the color Safety Orange, indicate a potential hazard 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.

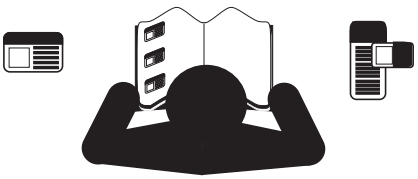
CAUTION, and the color Safety Yellow, indicate a potential hazard which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

Prepare for Emergencies

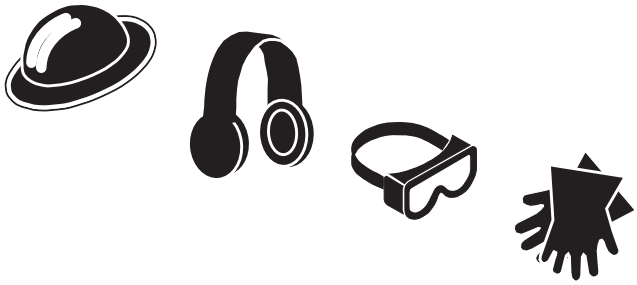
- *Be prepared if a fire starts*
- *Keep a first aid kit and fire extinguisher handy.*
- *Keep emergency numbers for doctor, ambulance, hospital and fire department near phone.*

Be Familiar with Safety Decals

- *Read and understand "**Safety Decals**" on page 5, thoroughly.*
- *Read all instructions noted on the decals.*
- *Keep decals clean. Replace damaged, faded and illegible decals.*



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.*

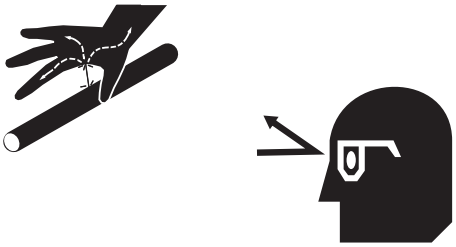
Handle Chemicals Properly

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

- ▲ *Do not use liquid seed treatments with the 800.*
- ▲ *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.*

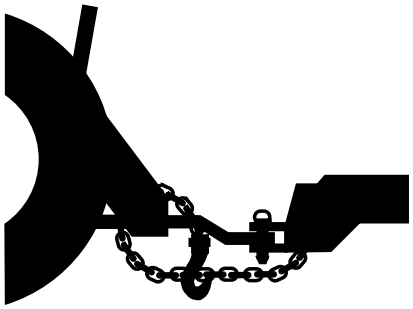
Avoid High Pressure Fluids

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.

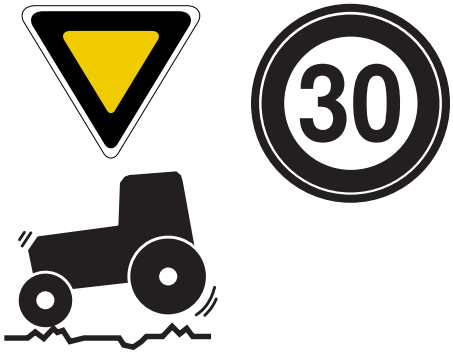
- ▲ *Never allow children to operate equipment.*
- ▲ *Keep all bystanders away from machine during operation.*

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 implement.*

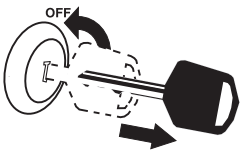
Transport Machinery Safely



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

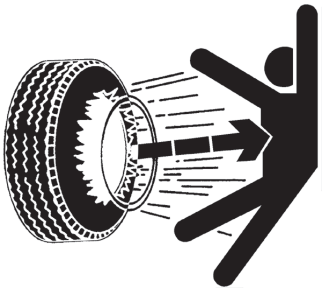
- ▲ *Ensure towing vehicle weighs at least $^{2}/_{3}$ (67%) of gross implement weight.*
- ▲ *Do not exceed 20 mph (30 kph). Never travel at a speed which does not allow adequate control of steering and stopping. Reduce speed if product is not equipped with brakes.*
- ▲ *Comply with state and local laws.*
- ▲ *Carry reflectors or flags to mark Three Point Drill in case of breakdown on the road.*

Shutdown and Storage



- ▲ *Park on level ground.*
- ▲ *Unhitch and store the Three Point Drill in an area where children normally do not play.*

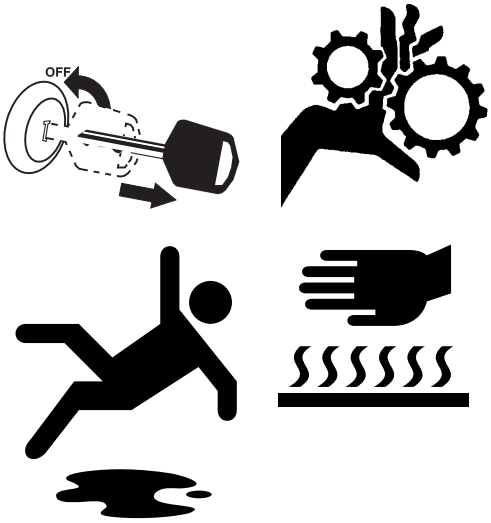
Tire Safety



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

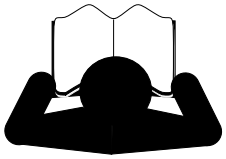
- *When inflating tires, use a clip-on chuck and extension hose long enough for you to stand to one side–not in front of or over tire assembly. Use a safety cage if available.*
- *When removing and installing wheels, use wheel-handling equipment adequate for weight involved.*

Practice Safe Maintenance



- *Understand procedure before doing work. Use proper tools and equipment. Refer to this manual.*
- *Work in a clean, dry area.*
- *Lower the Three Point Drill, put tractor in park, turn off engine, and remove key before performing maintenance. If work must be performed with implement raised, use blocks or jackstands rated for the Three Point Drill weight.*
- *Make sure all moving parts have stopped and all system pressure is relieved.*
- *Allow product to cool completely.*
- *Disconnect battery ground cable (-) before servicing or adjusting electrical systems.*
- *Welding: Disconnect battery ground. Avoid fumes from heated paint.*
- *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 Three Point Drill before operation.*

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 product functions.*
- *Operate machinery from the driver's seat only.*
- *Do not leave product unattended with tractor engine running.*
- *Do not stand between the moving tractor and product during hitching.*
- *Keep hands, feet and clothing away from power-driven parts.*
- *Wear snug-fitting clothing to avoid entanglement with moving parts.*
- *Make sure all persons are clear of working area.*

Safety Decals

Safety Reflectors and Decals

Your implement comes equipped with all safety decals in place. They were designed to help you safely operate your implement.

- ▲ *Read and follow decal directions.*
- ▲ *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:

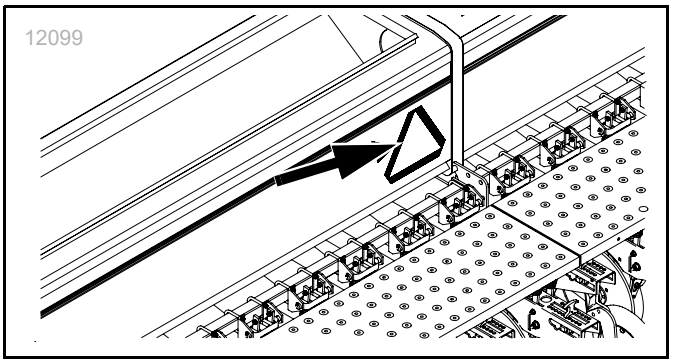
1. Clean the area on which the decal is to be placed.
2. Peel backing from decal. Press firmly on surface, being careful not to cause air bubbles under decal.

Reflector: Slow Moving Vehicle (SMV) Emblem, Decal

818-003C

Decal applied on rear of seed box near center,

one decal total

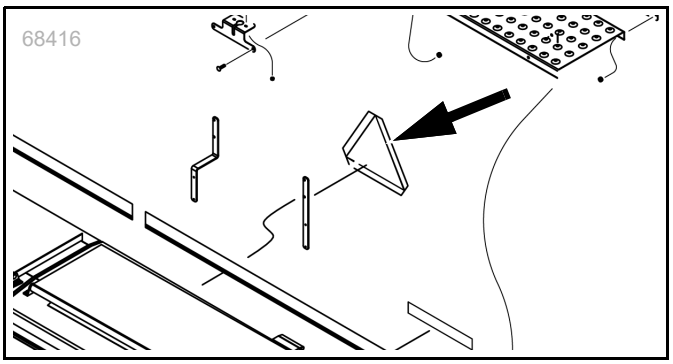


Reflector: Slow Moving Vehicle (SMV) Emblem, Galvanized Backing

818-055C

Installed on mounting bracket at rear of seed box near center,

one sign total



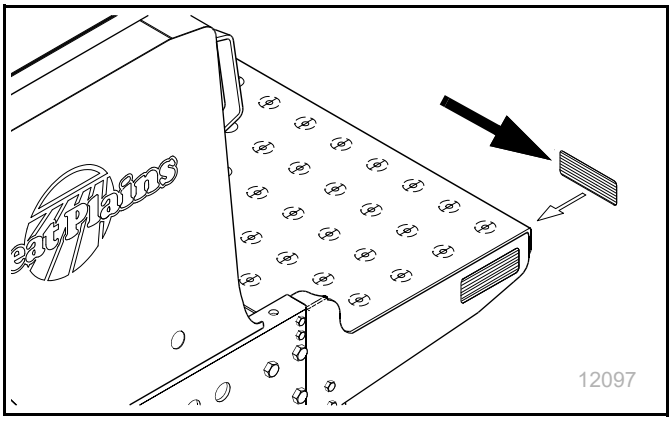
Reflectors: Red

(1200 S/N 1829D- and 1500 S/N 12173C-)

838-266C

On left-hand and right-hand outboard ends of walkboard;

two decals total.



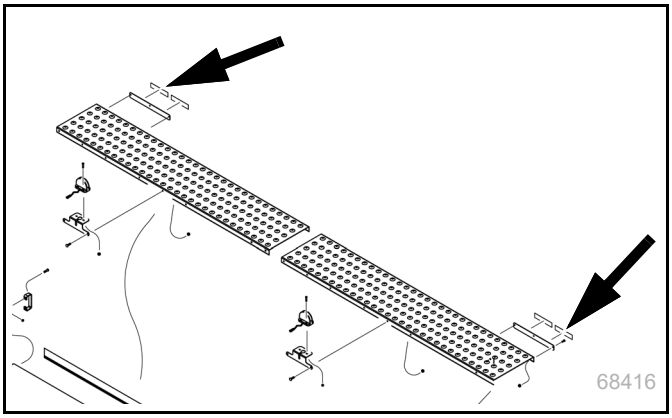
Reflectors: Red

(1200 S/N 1830D+ and 1500 S/N 12174C+)

838-266C

On left-hand and right-hand outboard ends of walkboard,
outboard of daytime reflectors;

two decals total.



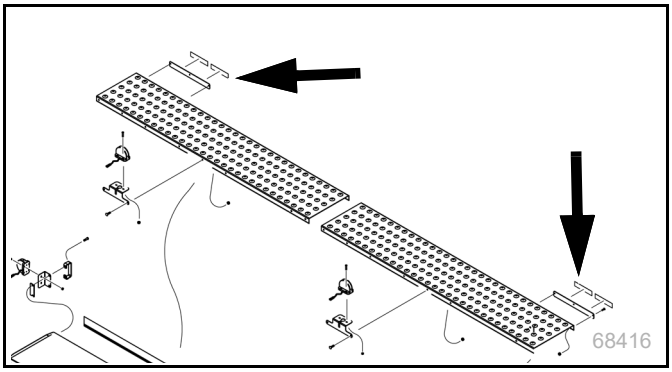
Reflectors: Daytime

(1200 S/N 1830D+ and 1500 S/N 12174C+)

838-267C

On left-hand and right-hand outboard ends of walkboard,
inboard of red reflectors;

two decals total.



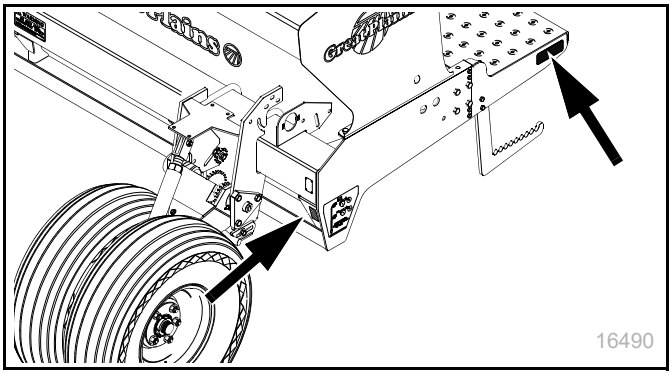
Reflectors: Amber

(1200 S/N 1829D- and 1500 S/N 12173C-)

838-265C

On left-hand and right-hand ends of mainframe,

four decals total.



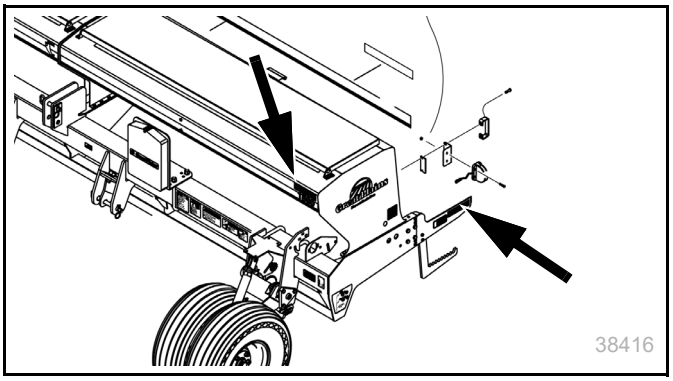
Reflector: Amber Reflector

(1200 S/N 1830D+ and 1500 S/N 12174C+)

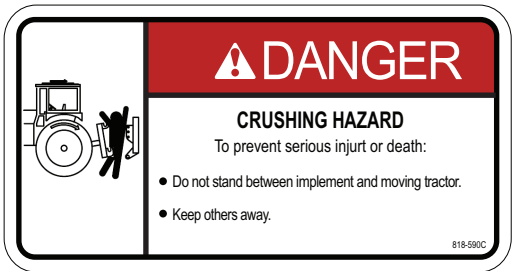
838-265C

On left-hand and right-hand ends of mainframe, on front outer corners of seed box,

four decals total.



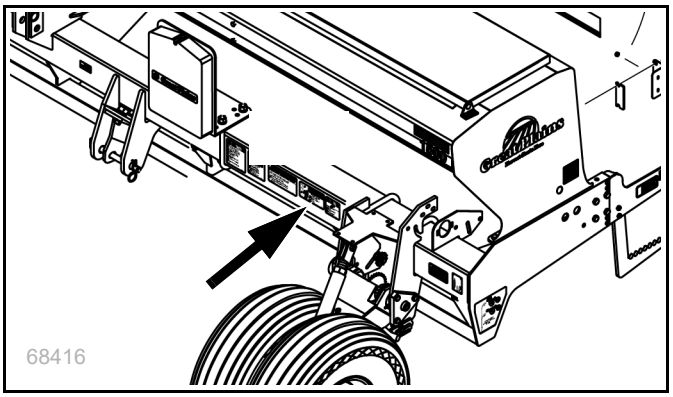
Danger: Crushing Hazard



818-590C

On front left-hand and right-hand sides of mainframe;

Two total

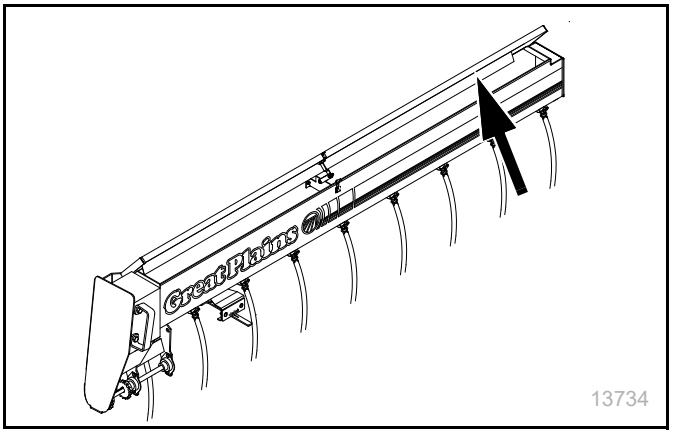


Danger: Possible Chemical Hazard

838-467C

Underside of small seeds box lid;

One total

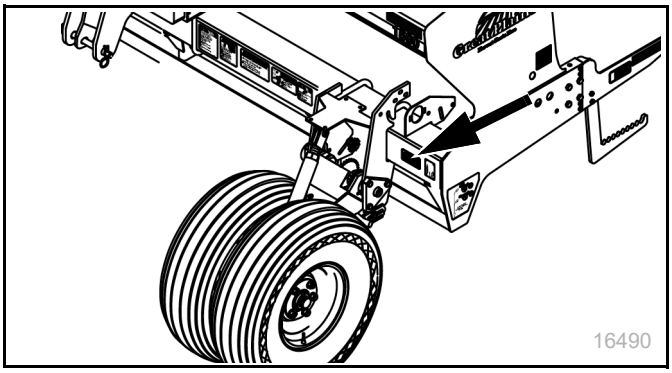


Caution: Tire Inflation (for Rib Tire)

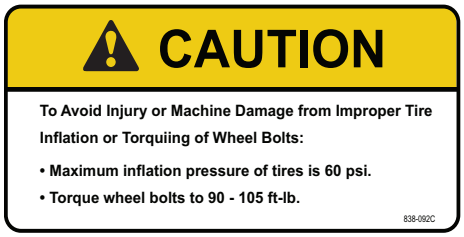
858-669C

On both front corners of mainframe;

2 decals total



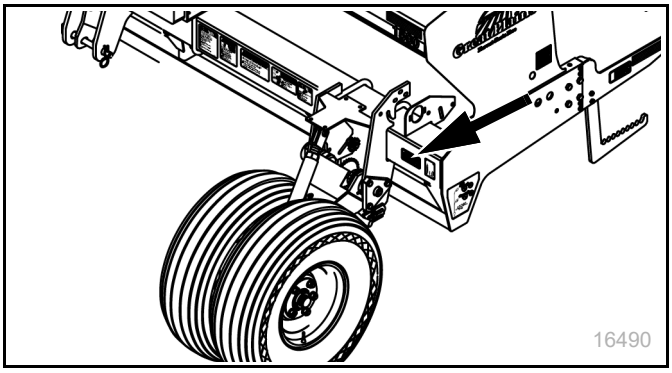
Caution: Tire Inflation (for Skid Tire)



838-092C

On both front corners of mainframe;

2 decals total

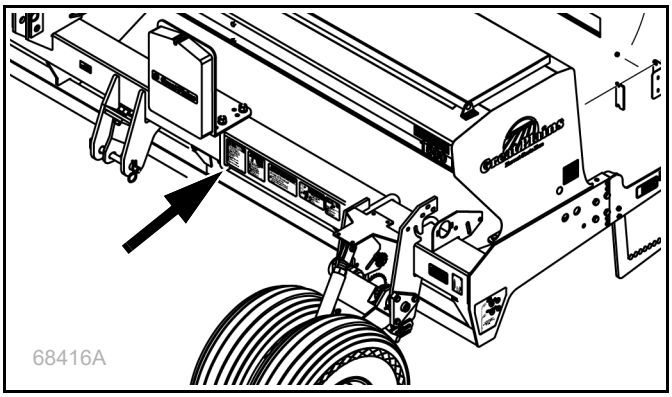


Caution: General Caution

818-587C

On front left-hand side of mainframe,

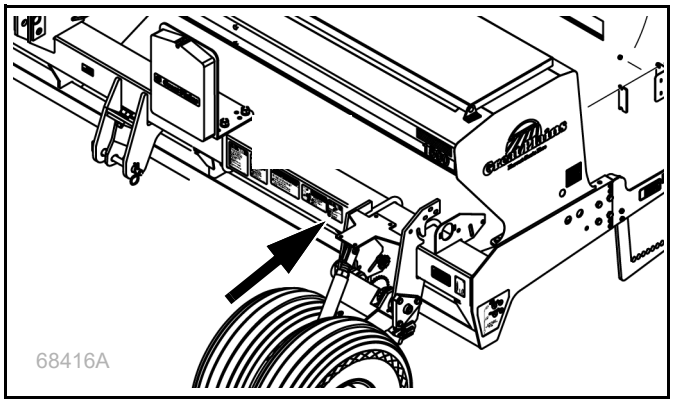
One total



Caution: Tires Not A Step

818-398C

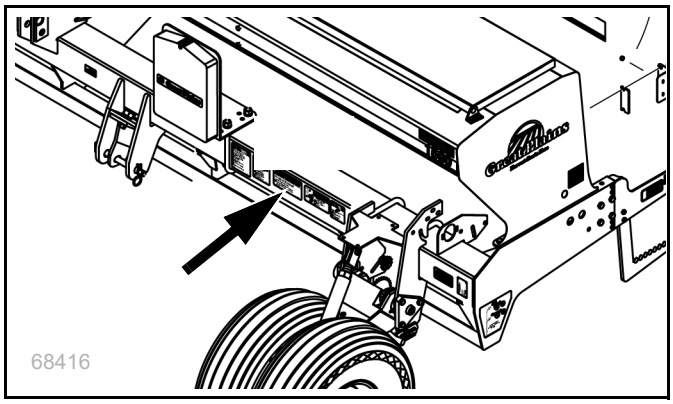
On front left-hand and right-hand sides of mainframe;
Two total



Warning: Transport Speed

818-188C

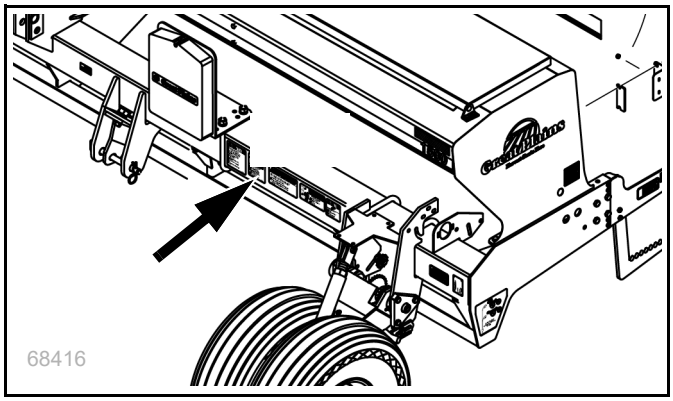
On front left-hand side of mainframe,
One total



Warning: High Pressure Fluid Hazard

818-339C

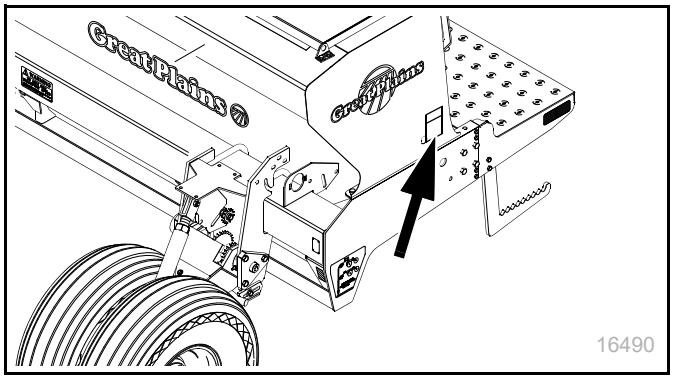
On front left-hand side of mainframe;
One total



Notice: Lubrication Instructions

858-679C

On right-hand and left-hand ends of seed box; two decals total.



Introduction

Great Plains' 12-, 15-, and 20-Foot Drills are pull type units designed for conventional- and minimum-till seed planting. The drill can be used in no-till conditions when used in conjunction with a center-pivot hitch. Every machine we build is designed and built with care using only quality materials. For the best user experience, read this manual and follow all instructions carefully. These pages will guide you through the operation and contain tips for easier adjustment and maintenance.

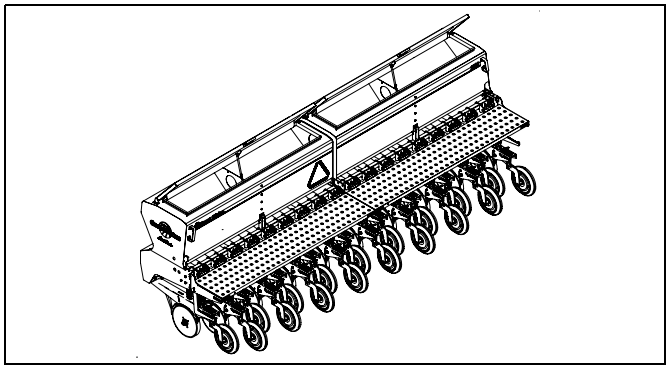
All information in this manual is current as of publication. Information contained within is subject to change to ensure top performance.

Document Family

118-389B	Seed Rate Manual
118-389M-A	Operator Manual (this document)
118-389P	Parts Manual

Models Covered

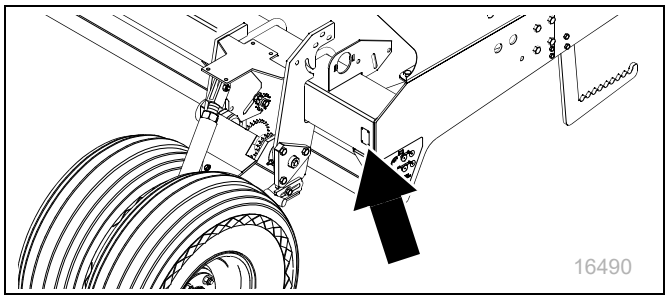
Models	Row Spacing	Row Count		
		12 Foot	15 Foot	20 Foot
1200-1410 1210-1410 1500-1810 1510-1810 2000-2410 2010-2410	10 inch	14 rows	18 rows	24 rows
1200-1808 1210-1808 1500-2208 1510-2208 2000-3008 2010-3008	8 inch	18 rows	22 rows	30 rows
1200-1975 1210-1975 1500-2475 1510-2475 2000-3275 2010-3275	7.5 inch	19 rows	24 rows	32 rows
1200-2007 1210-2007 1500-2607 1510-2607 2000-3407 2010-3407	7 inch	20 rows	26 rows	34 rows
1200-2406 1210-2406 1500-3006 1510-3006 2000-4006 2010-4006	6 inch	24 rows	30 rows	40 rows



Owner Assistance

If customer service or repair parts are needed, contact your Great Plains dealer. They have trained personnel, parts, and service equipment specially designed for Great Plains products.

Your machine's parts were specially designed and should be replaced with Great Plains parts only. 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 main frame.



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

Further Assistance

Great Plains Manufacturing, Inc. wants 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 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.

Parts Manual QRC

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

Product Manuals QRC

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

Preparation and Setup

Pre-start Checklist

This section will help you prepare your tractor and drill for use.

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. Refer to "**Lubrication**" on page 47.
4. Check that all safety decals and reflectors are correctly located and legible. Replace decals if damaged. See "**Safety Decals**" on page 5.
5. Inflate tires to pressure recommended and tighten wheel bolts as specified. See "**Torque Values Chart**" on page 59.

Tractor Hitch Requirements

Use your drill with category II or III tractors.

Models 1200, 1500 and 2000

Refer to Figure 1 and Figure 2

Your drill is factory set for Category II tractors. To change your drill for Category III tractors, switch the left- and right-hand pin supports.

You also may need the following bushings not supplied by Great Plains for your quick hitch or three-point arms.

Upper Link: 1-in. ID x 1-1/4-in. OD x 2-1/8-in. max. long.

Lower Link: 1-1/8-in. ID x 1-7/16-in. OD x 2-1/4-in. max. long.

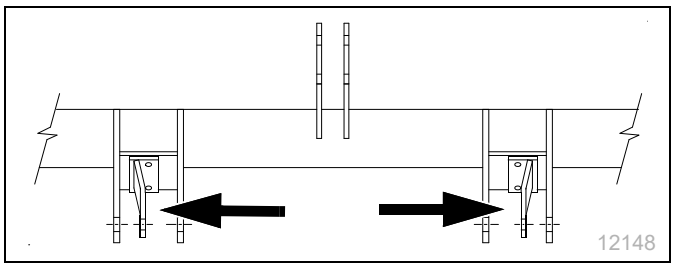


Figure 1
Category II Hitch

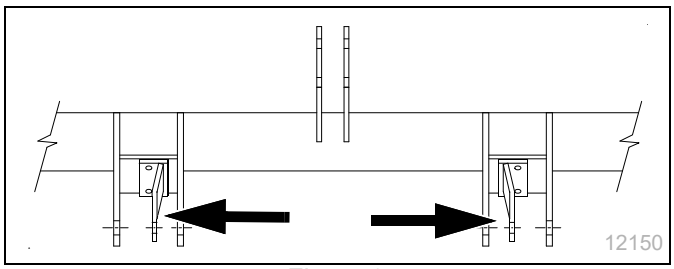


Figure 2
Category III Hitch

Models 1210, 1220, 1510, 1520, and 2010

Your drill is equipped with extension brackets that raise the drill 3-1/2 inches (8.89 cm). This places drill openers at the same height as coulters on Center Pivot and All Seeds hitches.

Refer to Figure 3

If you will not use your drill with a Great Plains hitch, remove extensions and install standard pin supports. Pin supports are stored inside drill box.

1. Remove 1-1/8-inch hex bolt (1), washer (2) and nut (3) from hitch plates and extension bracket.
2. Remove 5/8-inch hex bolt (4), flat washer (5), lock washer (6) and nut (7). Save bolt, lock washer, and nut.

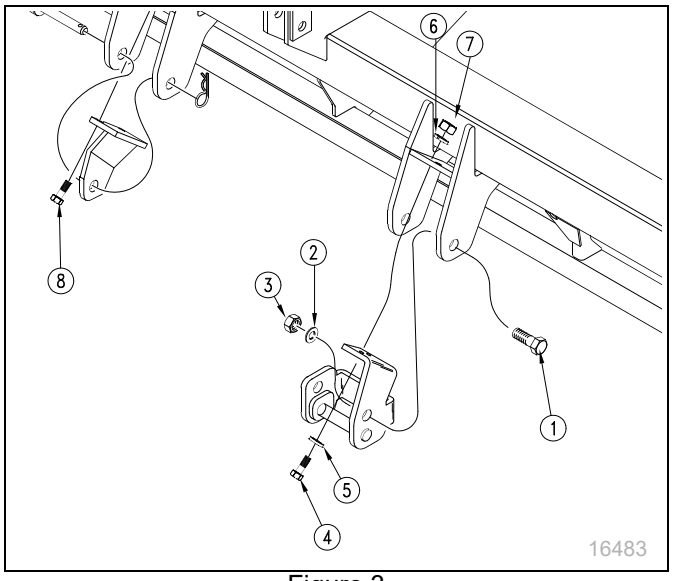


Figure 3
Extension Removal

Refer to Figure 4

3. Install bracket for standard pin support using 5/8-inch hex bolt (8), washer (9), and nut (10) removed in Step 2.
4. Repeat steps for other lower link.

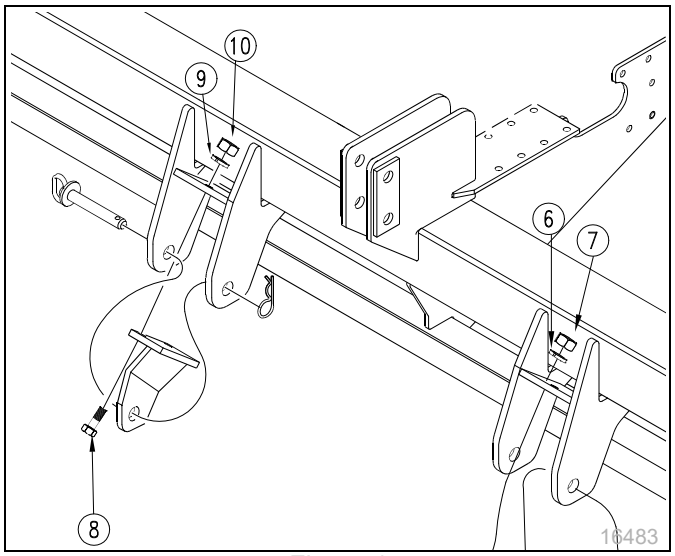


Figure 4
Installing Standard Pin Support

2020 Owners

If your drill is 1995 or newer, it is equipped with a lift kit that is compatible with Category III quick hitches. This lift kit raises the drill 4 inches (10.16 cm) using 1 7/16-inch diameter pins.

If you own a 1994 drill, you can order the lift kit, part number 117-041A, from your Great Plains dealer.

Refer to Figure 5

1. Raise or lower tractor three-point arms as needed. Pin lower arms to drill.
2. Pin upper arm to drill. For Category II tractors, install hitch pin in the lower hole. For Category III tractors, install hitch pin in the upper hole.
3. Slowly raise drill. Watch for cab interference.
4. If using the optional parking stand, unpin stand tubes. Rotate stand up into field position and repin.
5. Adjust top three-point link so top edge of drill box is parallel with the ground when drilling.

📖 Do not use top three-point link to adjust opener depth. For opener adjustments, refer to “**Adjustments**” on page 26.

6. Set your tractor three-point draft control to float position.

Hitching with Optional Pull Package

The pull package attaches to the drill with a quick-coupling hitch and is equipped with a threaded or telescoping top link.

- Use the threaded link to adjust your drill so it runs horizontal to the ground when drilling.
- The telescoping link allows your drill to float front-to-back and follow the ground contour.

When hooking up to the drill, be sure the quick hitches are latched securely.

Hitching Tractor to Drill

Refer to Figure 5

⚠ WARNING

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 drill and moving tractor. Stop tractor engine and set park brake before installing pins.

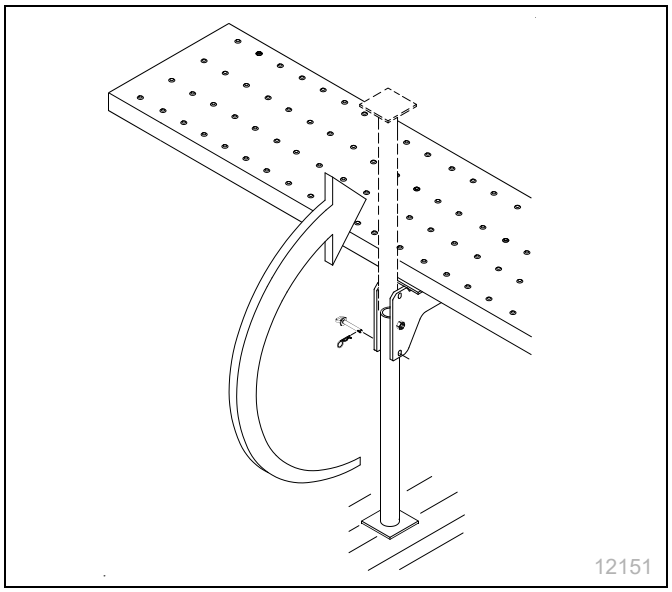


Figure 5
Parking Stand

Hydraulic Hookup

Refer to Figure 6

Great Plains hydraulic hoses are coded to help you hookup to your tractor outlets. To distinguish hoses on the same hydraulic circuit, refer to plastic hose holder. Connect hose under extended cylinder to outlet you choose for cylinder extension. Connect hose under retracted symbol to outlet for cylinder retraction.

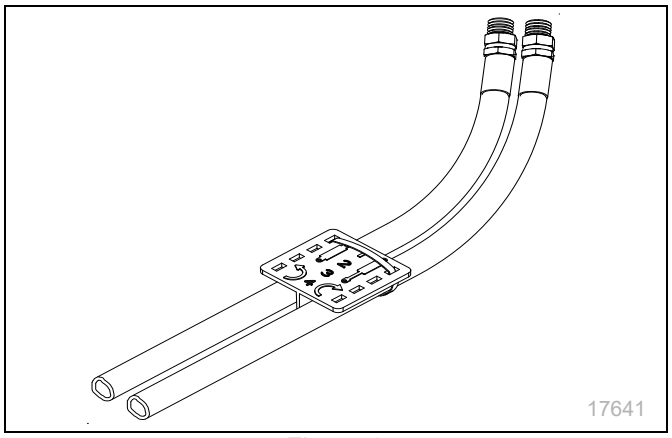


Figure 6
Hydraulic Hose Color Ties

Leveling Drill

Models 1200, 1500, and 2000

Refer to Figure 7

Initially adjust drill so opener tube runs 18-1/4 inches (46.36 cm) above ground when drill is lowered in field.

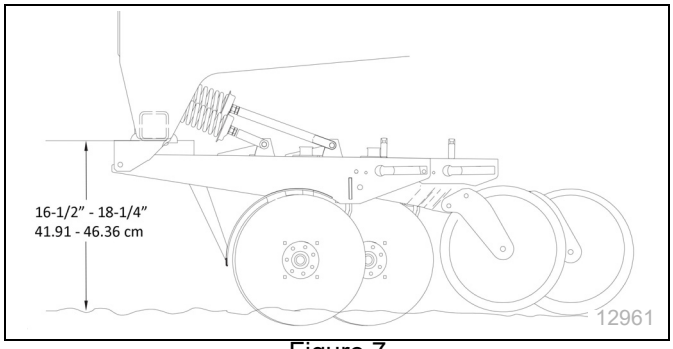


Figure 7
Initial Operating Height, Straight-Arm Openers

Refer to Figure 8

To adjust:

1. Loosen jam nut (1) near top clevis of each gauge-wheel turnbuckle.
2. Bolt upper clevis in upper mount hole (2) as shown.
3. Set turnbuckle length. Turn turnbuckle to shorten or lengthen as necessary. Initially set length to 17-3/16 inches (43.66 cm) between pin centers to achieve the 18-1/4-inch (46.36-cm) dimension mentioned above. When adjusting turnbuckle, remember:

- Lengthening turnbuckle raises drill.
- Shortening turnbuckle lowers drill.

4. After adjusting both turnbuckles to same length, tighten jam nuts.

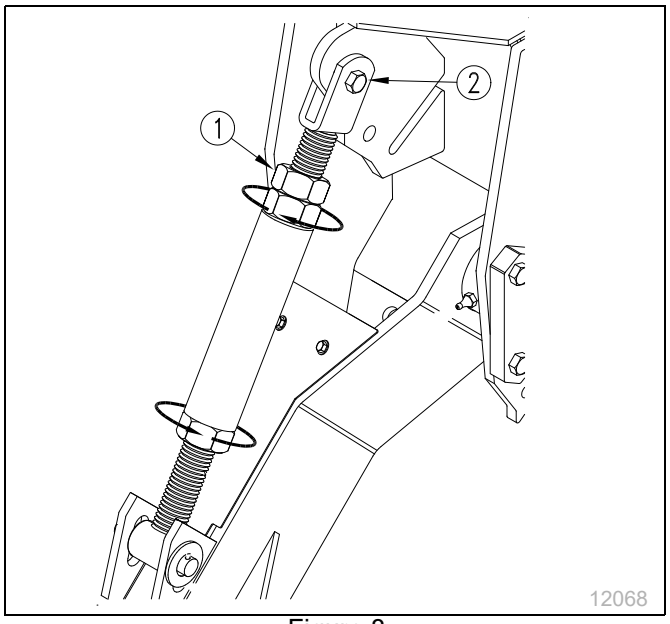


Figure 8
Gauge-Wheel Turnbuckle, Straight Arm Openers

Refer to Figure 9

5. Level drill with top three-point link. When drill is level, the gap between the spring-rod casting and the cross bolt will be about 2 inches (5.08 cm). This is a general dimension that will vary with the amount of down pressure required for your planting conditions.

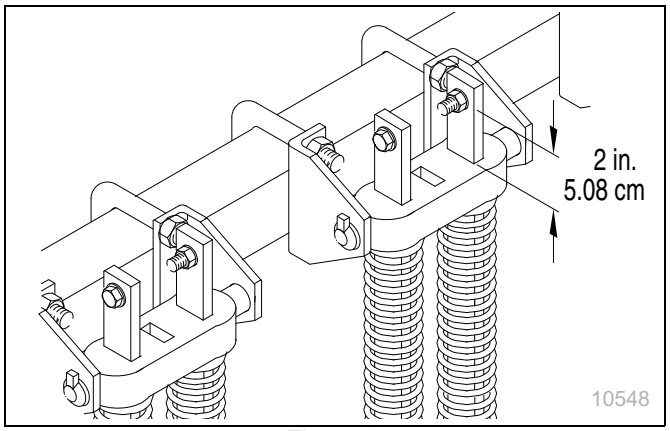


Figure 9
Normal Spring Rod Setting

Models 1210, 1220, 1510, 1520, 2010, and 2020

Refer to Figure 10

Initially adjust drill so opener tube runs 21 inches (53.34 cm) above ground when drill is lowered in field.

To adjust:

1. Loosen jam nut (1) near top clevis of each gauge-wheel turnbuckle.

📖 Jam nut is left-hand threaded.

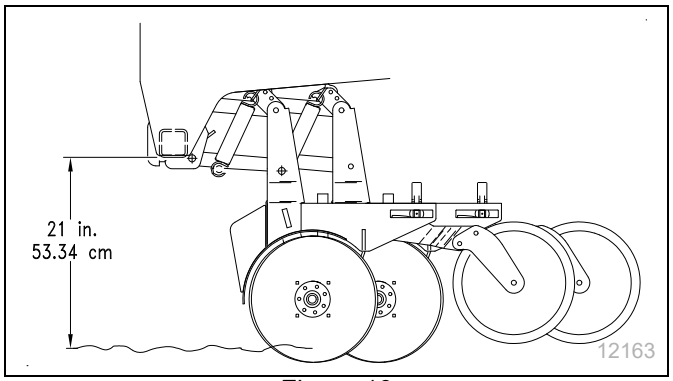


Figure 10
Initial Operating Height, Parallel-Arm Openers

Refer to Figure 11

2. Bolt upper clevis in lower hole (2) as shown.
3. Set turnbuckle length. Turn turnbuckle to shorten or lengthen as necessary. Initially set length to 17-9/16 inches (44.61 cm) between pin centers to achieve the 21 inch (53.34 cm) dimension mentioned above. When adjusting turnbuckle length, remember:

- Lengthening turnbuckle raises drill.
- Shortening turnbuckle lowers drill.

4. After adjusting both turnbuckles to the same length, tighten jam nuts.

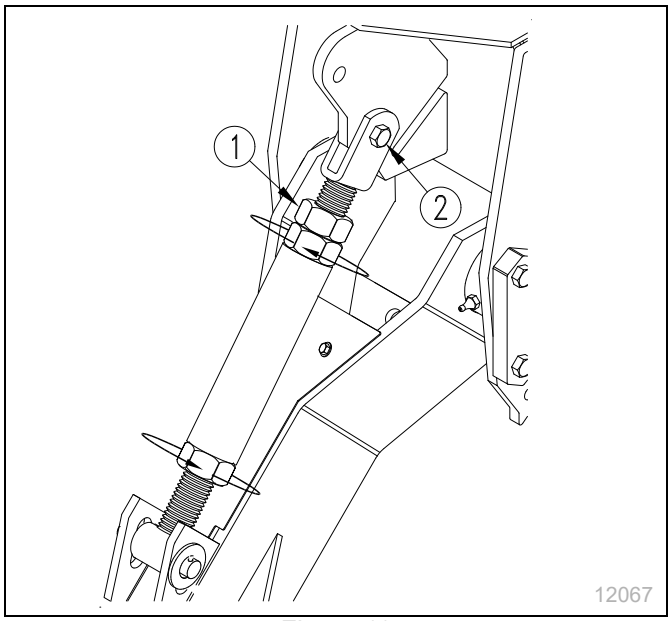


Figure 11
Gauge Wheel Turnbuckle, Parallel-Arm Openers

Refer to Figure 12

5. Level drill with top three-point link. When drill is level, opener tube (1) will be higher than opener body (2) with parallel links at a slight angle to the ground.

The dimension shown is a general dimension that will vary with planting conditions.

NOTICE

Make sure opener mount is running higher than opener body. This will help prevent opener damage if opener strikes a rock or other object.

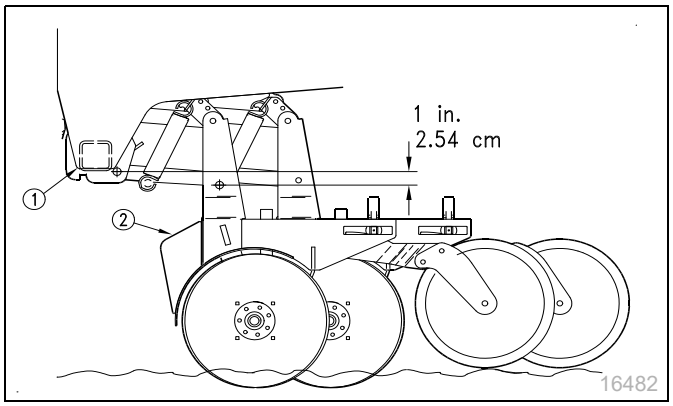


Figure 12
Leveling Drill

Operating Instructions

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

Pre-start Checklist

1. Carefully read “**Important Safety Information**” on page 1.
2. Lubricate drill as indicated under “**Maintenance and Lubrication**” on page 45.
3. Check all tires for proper inflation as indicated in “**Tire Inflation Chart**” on page 58.
4. Check all bolts, pins and fasteners. Torque as specified in “**Torque Values Chart**” on page 59.
5. Check drill for worn or damaged parts. Repair or replace parts before going to the field.
6. Check hydraulic hoses, fittings and cylinders for leaks. Repair or replace before going to the field.
7. Check disc scrapers for proper adjustment. Refer to “**Disc Scraper Adjustment**” on page 41.
8. Rotate drive wheels to see that seed cups and drive are working properly and free from foreign material.

Field Operation

1. Hitch drill to a suitable tractor. Refer to “**Tractor Hitch Requirements**” on page 13. Adjust top three-point link so top edge of drill box is parallel to the ground when drilling.
2. Set and calibrate seeding rate as explained under “**Seeding Rate**” on page 30.
3. Check that seed-cup-door handles are set the same across the drill. Refer to “**Seeding Rate**” on page 30.

📖 If you notice excessive cracking on large seeds, adjust all seed-cup doors to a wider setting. Use the widest setting only for seed-cup clean out.

4. Load box with clean seed.
5. Record acremeter readout. Subtract initial reading from later readings to determine area drilled.
6. Pull forward, lower drill and begin seeding.
7. Always lift drill out of the ground when turning at row ends and for other short-radius turns. Seeding will stop automatically as drill is raised in the field.

Opener Operation

Never back up with openers in ground. If you do, check all openers to be sure none are clogged or damaged.

For information on opener adjustments, refer to *"**Adjustments**"* on page 26. For more information on troubleshooting opener problems, see "**Troubleshooting**" on page 43.

Marker Operation

Optional marker attachments are available from your Great Plains dealer. Before operating the markers, make sure the hydraulics have been bled properly as described under "**Marker Adjustments**" on page 38.

Some markers packages include a sequence valve to ease marker operation. Starting with both markers folded, the sequence is:

1. Activate lever. Right unfolds; left stays folded.
2. Reverse lever. Right folds up; left stays folded.
3. Activate lever. Left unfolds; right stays folded.
4. Reverse lever. Left folds up; right stays folded.
5. Sequence repeats.

Markers are equipped with valve to set folding speed. Refer to "**Marker Adjustments**" on page 38, and adjust folding speed to a safe rate. Folding markers at high speed can damage markers.

Optional Pull Package Operation

When in field position, raise transport wheels off the ground to ensure proper drill operation.

Shaft Monitor Operation

To operate the optional shaft monitor, turn system on by activating on-off switch on monitor. If the seed-cup shaft stops for 30 seconds or more, an alarm will sound and the light on the monitor will flash.

The 30-second delay is to prevent nuisance alarms when turning at the end of the field. If a failure does occur and the alarm sounds, remember you have traveled for 30 seconds without planting.

Transporting

⚠ WARNING

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. Check that your tractor has enough ballast to handle the weight of the drill. Refer to your tractor operator's manual for ballast requirements.

Before transporting the drill, follow and check these items:

Unload drill box. The drill can be transported with a full box of grain, but the added weight will increase stopping distance and decrease maneuverability**.** Unload drill box before transporting if at all possible.

Road rules. Comply with all federal, state and local safety laws when traveling on public roads.

Clearance. Remember that the drill is wider than the tractor. Allow for safe clearance.

Transporting with Optional Pull Package

Your pull hitch has a 90° degree-turn valve at the rod-end port of the hydraulic cylinder. For transport, raise drill, then turn valve to stop oil from the lift cylinder.

Check that your hitch is securely attached to the tractor drawbar and that the hitch safety chain has been securely attached to the tractor.

Check that the transport tires on the hitch are properly inflated as listed on the "**Tire Inflation Chart**" on page 58.

Transporting with Markers

Always transport the markers in the folded position.

Acremeter Operation

A battery-operated electronic acremeter is supplied with the product. The display module for the system is normally on the front face of the main toolbar near the left gauge wheel.

Acremeter Console 80377

The acremeter calculates and displays the field acres and total acres accumulated.

The meter counts rotations of the main ground drive shaft before the clutch. The meter tallies all movements with the drill unfolded, whether planting or not.

There are three buttons on the face of the acremeter:

Select - Navigates to the next screen. If the current screen has any settings, pressing the Select button will also save the current screen's settings.

Pressing Select while the screen is inactive will activate display mode starting on screen A1.

Up Arrow - Increments current value. If the current screen only displays a reading, then arrow buttons can be used to reset current reading or for navigation.

Down Arrow - Decrements current value. If the current screen only displays a reading, then arrow buttons can be used to reset current reading or for navigation.

Operating Instructions

The electronic acremeter operates in two modes: sleep and entry. In sleep mode, the display is blank, and the counter is accumulating acres. Sleep mode will be entered if a button is not pressed for 20 seconds. In entry mode, the display is on, and the operator can enter values.

To access entry mode, press and hold the SELECT button, the acre counter will cycle through the functions that it can perform. The available screens, in order, are:

- Field Acre Count
- Total Acre Count
- Battery Life
- Password
- Pulses per 400ft
- Swath Width
- Calibration
- Units of Measurement
- Sensor Count
- Change Password

Acremeter Screens

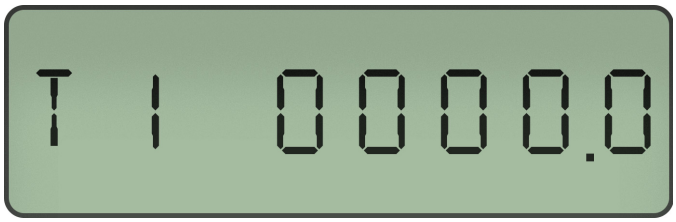
Field Acre Count

Displays the number of acres covered since the field acre counter was last reset. if there is an additional acre counting sensor on the machine, an A2 screen will immediately follow the A1 and T1 screens.

Pressing Select navigates to screen T1 or T2.

Press and hold both arrow buttons to reset the current field acre counter.

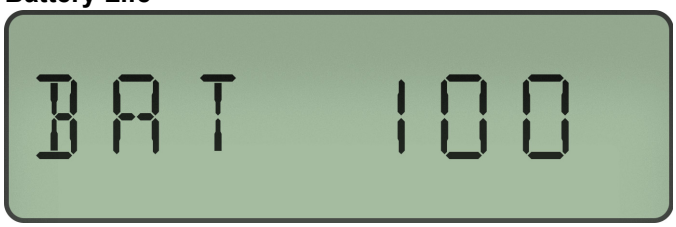
Total Acre Count



Displays the total number of acres covered since the total acre counter was last reset. if there is an additional acre counting sensor on the machine, a T2 screen will immediately follow the T1 and A2 screens.

Pressing Select navigates to screen BAT or A2.

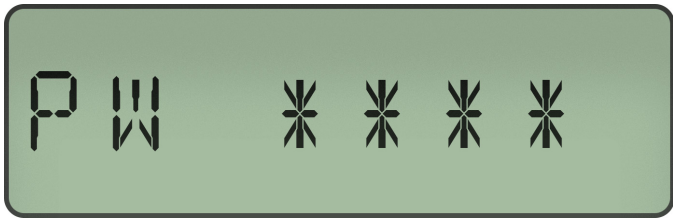
Battery Life



Displays the percentage of remaining battery life.

Pressing Select navigates to screen PW.

Password



Displays the password screen. Entering your system password enables access to configuration parameters.

The default password screen shows a salted - **** - password. Press either arrow button to bring up the password input screen. The factory set password is 0000.

Use the arrow buttons to enter your 4 digit password.

Pressing Select while password is salted - **** - will navigate to the A1 screen.

Pressing Select while the correct password value is entered will navigate to the P1 screen. If the password is incorrect, the PW screen is reset.

Pulses Per Distance

Displays the pulse scaling factor. This value affects the number of pulses emitted per 400ft traveled.

Use the arrow buttons to increase or decrease the scaling factor.

Pressing Select will save the configuration and navigate to the P2 or SW screen.

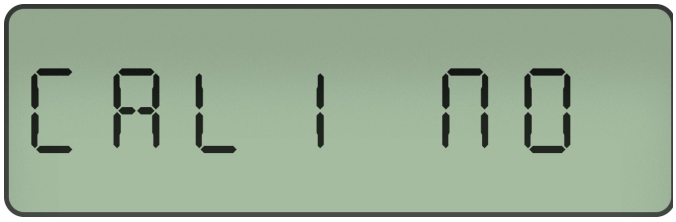
Swath Width

Displays the machine's swath width. To correctly calculate the number of acres planted, the acre meter needs the swath width of the product.

Use the arrow buttons to increase or decrease the swath width.

Pressing Select will save the configuration and navigate to the CAL1 screen.

Calibration



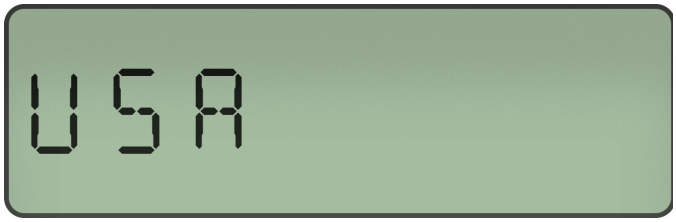
Displays either the calibration request status or the current calibration value.

If displaying the request status - YES or NO - and status is YES, pressing Select begins sensor calibration.

If displaying the request status and status is NO, pressing Select does not begin sensor calibration and instead navigates to the UNITS or CAL2 screen.

When calibrating and calibration value is greater than the acremeter's minimum required value, pressing Select saves the calibration value and navigates to the UNITS or CAL2 screen.

Units of Measurement



Displays the units of measurement used by the acre meter.

Use the arrow buttons to change the units of measurement to either USA - Imperial - or METRIC.

Pressing Select saves the unit selection, converts the swath width value, and navigates to the SENSOR screen.

Sensor Count

Displays the number of active sensors in the system.

Use the arrow buttons to change the entry value.

Pressing Select saves the sensor count configuration and navigates to the CHPW screen.

Change Password

Displays either the password change status or the new password value.

If displaying the change status - YES or NO -, use the arrow buttons to switch the change status.

If displaying a new password value, use the arrow buttons to increase or decrease the new password value. Holding the arrow buttons will automatically increase or decrease the password value.

If displaying the change status - YES or NO - and the status is YES, pressing Select allows for a new password to be entered.

If displaying the status and status is NO, pressing Select navigates to the A1 screen.

Parking

See “***Storage***” on page 46 for additional information on long-term storage.

Refer to Figure 13

1. Park drill on a level, solid area.
2. Unpin and rotate optional parking stands down into parking position. Replace pins. If ground is soft, place a board or plate under stand to increase contact area.

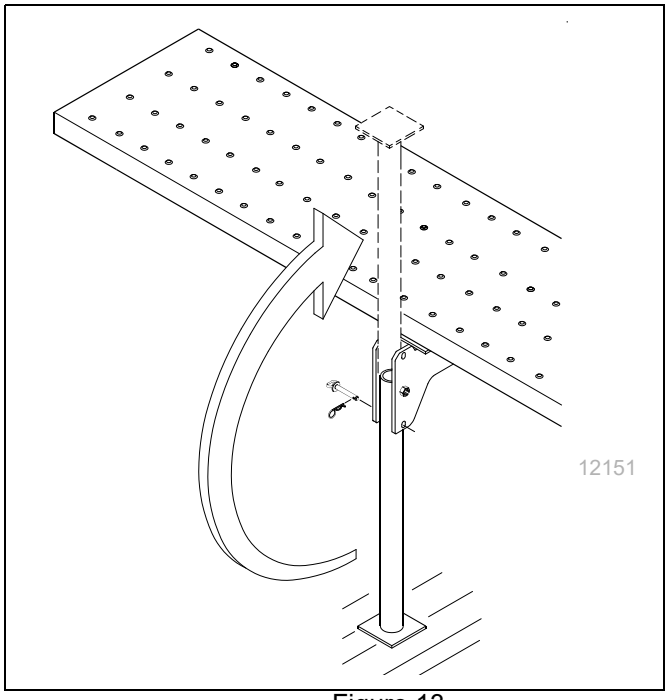


Figure 13
Optional Parking Stand

3. Lower three-point hitch until drill is on the ground.
4. Extend or retract top three-point link until top three-point pin is free. Remove pin.
5. Remove pins from lower three-point links.

Adjustments

Seeding Depth

The three-point drill has double-disc openers with press wheels. The following is an explanation to how the openers work.

Models 1200, 1210, 1500, 1510, 2000, and 2010

Down Pressure: Opener springs provide the down pressure necessary for opener discs to open a seed trench. The springs allow openers to float down into depressions and up over obstructions.

Seeding Depth: A press wheel attached to each opener body controls seeding depth. To maintain consistent depth, the relationship between the bottom of the opener discs and press wheel is fixed upwardly by an adjustable stop on each opener. The position of the adjustable stop determines seeding depth. Raising the stop increases seeding depth. Lowering the stop decreases seeding depth.

Soil Firming: The press wheels also close the seed trench and gently press soil over seed. To provide consistent soil firming, press wheels are free to move down from normal operating position. This maintains pressing action even if opener discs encounter obstructions or hard soil.

Models 1220, 1520, and 2020

Down Pressure: Opener springs provide the down pressure necessary for opener discs to open a seed trench. The springs allow the openers to float down into depressions and up over obstructions.

Seeding Depth: Side depth wheels on the opener discs gauge opener seeding depth. The position of the adjustable stop determines seeding depth. Raising the stop raises the side depth wheels and increases seeding depth. Lowering the stop lowers the side depth wheels and decreases seeding depth.

Soil Firming: Press wheels are attached to each opener body. The press wheels close the seed trench and gently press soil over seed. An adjustable spring in the press-wheel mechanism creates the down pressure needed to close the seed trench.

Opener Down Pressure

You can adjust down pressure individually for each opener. This is useful for penetrating hard soil and planting in tire tracks.

Use only enough down pressure to cut the seed trench and maintain proper soil-firming over seed. Excessive opener down force will lead to premature wear on opener components.

Models 1200, 1500, and 2000

Refer to Figure 14

To adjust down pressure, remove the W clip from spring rod. Put clip in a higher hole for more pressure or in a lower hole for less pressure as shown.

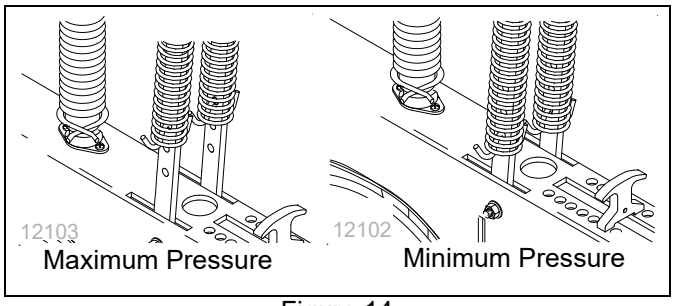


Figure 14
Opener Spring Adjustment, 00 Series Openers

Models 1210, 1510, and 2010

Refer to Figure 17

To adjust down pressure, use adjustment tool stored under walkboard. Position tool in holes on spring mounting plates. Pull down on adjuster as shown. Move the adjustment cam to the new setting.

Refer to Figure 15

Minimum and maximum settings are indicated by position of adjustment cam.

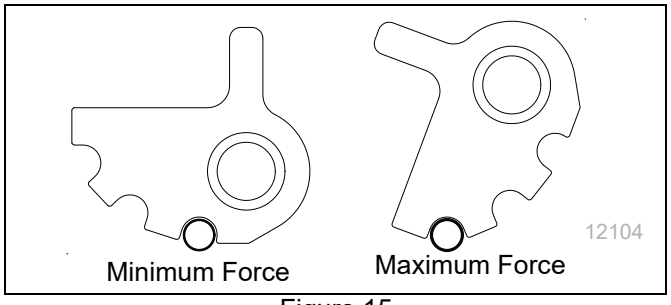


Figure 15
Adjustment Cam

Models 1220, 1520, and 2020

Refer to Figure 16

To adjust down pressure, raise drill. Use a crowbar or other lever to lift spring plate (1) off removable pin (2). Remove pin, then move spring plate to a new position. Replace pin to hold spring plate in its new position.

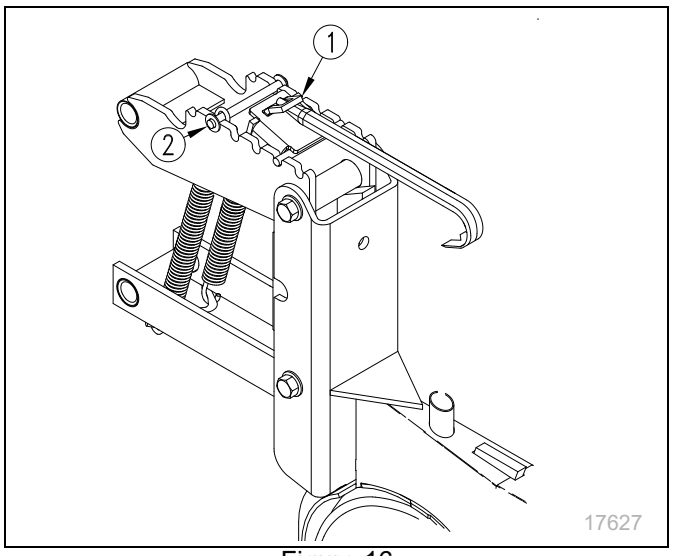


Figure 16
Opener Spring Adjustment, 20 Series Openers

Refer to Figure 17

Move spring plate forward to decrease down pressure. Move spring plate back to increase spring pressure. Figure 17 shows minimum and maximum spring settings.

A spring in the press-wheel mechanism creates down pressure on the press wheels. The amount of force needed to close the seed trench will vary with field conditions.

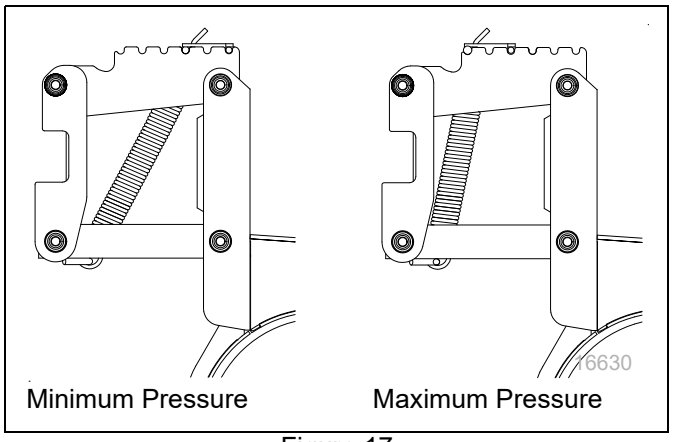


Figure 17
Spring Pressure, 20 Series Openers

Refer to Figure 18

To adjust, move adjustment lever as shown.

- For less down pressure, move handle forward toward drill.
- For more down pressure, move handle back away from drill.

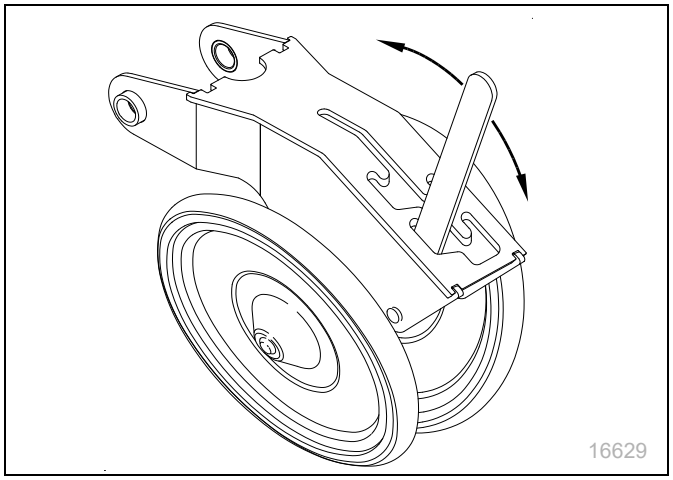


Figure 18
Press Wheel Adjustment, 20 Series Openers

Opener Depth

Refer to Figure 19

Set opener seeding depth by adjusting T-handles. To adjust, first raise drill slightly, then lift and slide T-handles on top of openers as shown. Adjust all T-handles to the same setting.

- For shallower seeding, slide T-handles forward toward drill.
- For deeper seeding, slide T-handles back away from drill.

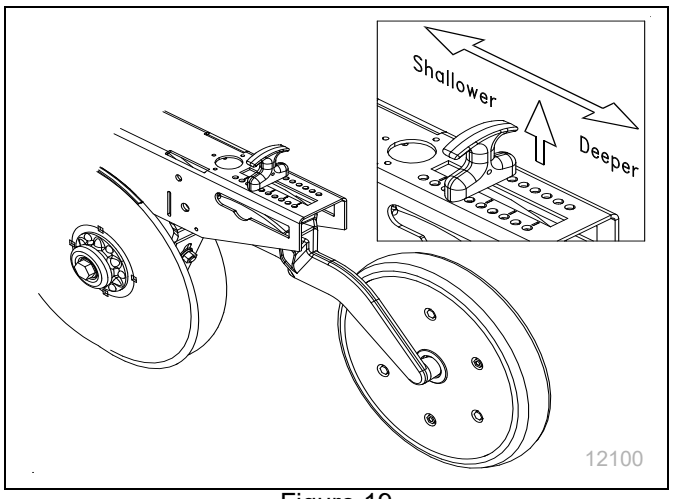


Figure 19
Opener Depth

Frame Height

Drill operating height directly affects the working range of the drill openers. Initially adjust frame height as explained under “**Leveling Drill**” on page 16. You can make further adjustments to compensate for field conditions.

When adjusting the gauge-wheel turnbuckles, remember:

- Lengthening turnbuckles raises drill and allows less opener down float.
- Shortening turnbuckles lowers drill and allows less opener up float.

After adjusting gauge-wheel turnbuckles, level drill with top three-point link.

📖 Lowering the drill increases the risk of opener damage on rocks or obstructions.

Seeding Rate

Calibrating the seeding rate requires four steps: shifting the gearbox, setting the seed-rate handle, positioning the seed-cup doors, and checking the seeding rate.

Refer to the seed-rate charts starting on page 32. These charts list the proper drive types and seed-rate handle settings for various seeds and seeding rates.

The seed-rate charts are based on cleaned, untreated seed of average size and test weight. The rates are based on 9.5L x 15 rib implement gauge-wheel tires on the 12- and 15-foot drills and 11L x 15 rib implement tires on the 20-foot drill. Many factors affect seeding rates including foreign material, seed treatment, seed size, field conditions, tire pressure and test weight. You likely will need to make minor adjustments. Set and check the seeding rate using the procedures below, then re-adjust the rate as necessary.

Before setting the seeding rate, rotate the drive gauge wheels. Check that seed cups and drive are working properly and free from foreign material.

Refer to Figure 20

1. Shift gearbox drive type

Refer to the seed-rate charts for the correct drive type–1, 2, 3 or 4–for your desired seeding rate. Move the selector handle on the gearbox until the correct number appears in the handle window as shown. Rotate the tires a few turn to make sure the gearbox has engaged.

🕮 If your drill has more than one gearbox, make sure both are shifted to the same drive type.

Gearbox Ratios:
Drive Type 2 is 2.06 Times Faster Than 1
Drive Type 3 is 3.08 Times Faster Than 1
Drive Type 4 is 5.03 Times Faster Than 1

Refer to Figure 21

2. Set Seed-Rate Handle

Position handle for each drill box to setting indicated on chart. One handle is shown in Figure 21. To adjust, loosen the wing nut under the handle. Slide handle past desired setting, then move handle back until indicator lines up with correct setting. Tighten wing nut.

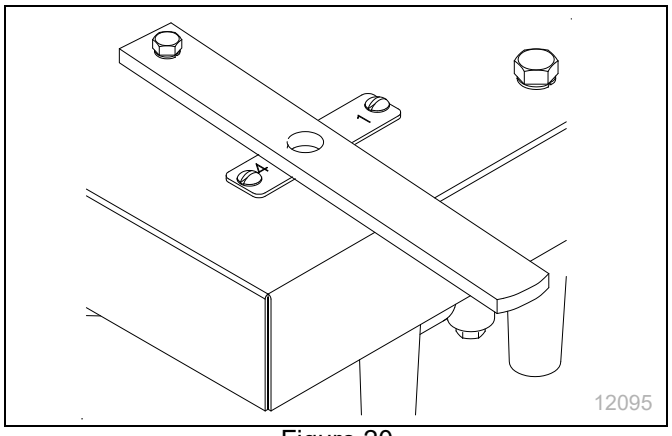


Figure 20
Seed Rate Gearbox

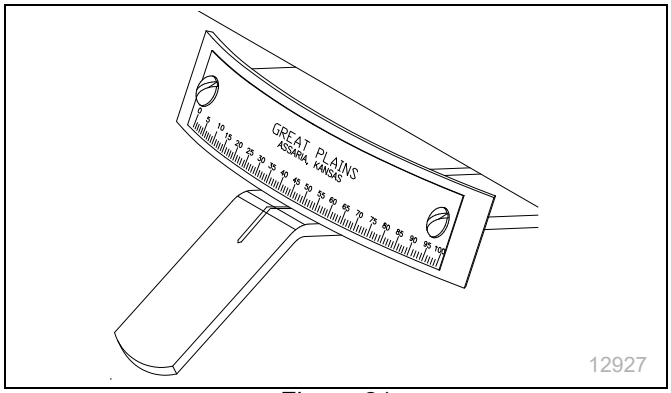


Figure 21
Seed-Rate Handle

Refer to Figure 22

3. Position Seed-Cup Doors

For wheat and other small seeds, move seed-cup- door handles to the highest position. For soybeans and other large seeds, lower handles to the second position. If excessive seed cracking occurs, lower handles to the third position. For seed-cup clean out, move handles to the fourth, wide-open position. Make sure all handles are in the same position before drilling.

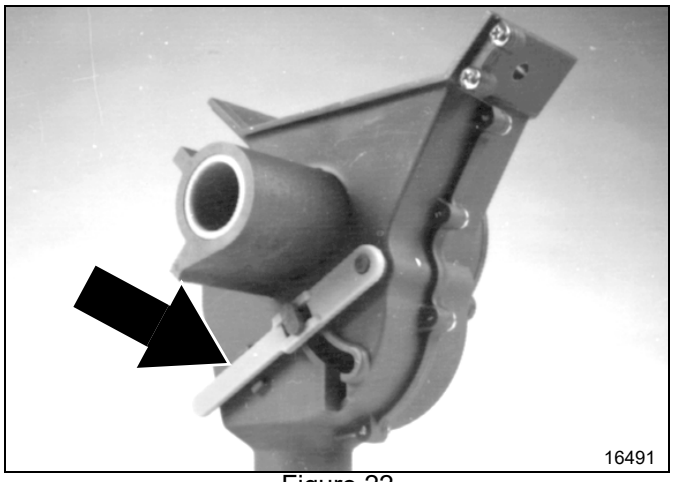


Figure 22
Seed-Cup Door Handle

4. Check Seeding Rate

a. Record weight of an empty container large enough to hold seed metered for one acre.
b. Place several pounds of seed over three seed cups on an outside end of drill box. Pull seed tubes off these three openers.
c. Raise drill off the ground. If using a hitch, insert transport lock pins or turn 90° hydraulic lock valve, depending on hitch style.
d. Turn drive gauge wheel a few turns to fill cups with seed. Turn wheel until seed drops to the ground from all three cups.
e. Place a container under the three seed tubes to gather seed as it is metered.
f. Turn drive gauge wheel for one acre (450 rotations on a 12-foot drill, 364 rotations on a 15-foot drill, or 283 rotations on a 20-foot drill). Check that the three seed cups have plenty of seed coming into them.
g. Weigh the metered seed. Subtract initial weight of the empty container. Divide by three for the amount metered by each seed cup, then multiply by the number of drill openers for the pounds-per-acre seeding rate. If this figure is different than desired, adjust seed-rate handle and recheck the rate.

📖 If your results vary greatly from the charts, you may want to repeat the calibration procedure.

When drilling, note acres drilled, amount of seed added and level of seed in drill box. If you are seeding more or less than desired, adjust seeding rate slightly to compensate for field conditions.

Seed Rate Chart (pounds per acre)

Setting number		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
Alfalfa or Rape Drive Type 1 (Based on 60#/bu)	Row Spacing 6"	2	6	8	12	15	19	23	27	32	37	41	45	50	54	59	63	69	74	79	82	84
	7"	2	5	7	10	13	16	20	23	27	32	35	38	43	47	51	54	59	63	68	70	72
	7.5"	2	4	7	10	12	15	18	22	25	29	33	36	40	43	47	51	55	59	63	65	67
	8"	2	4	6	9	12	14	17	20	24	28	31	34	37	41	44	47	52	55	60	61	63
	10"	1	3	5	7	9	12	14	16	19	22	25	27	30	33	35	38	41	44	48	49	50
Barley Drive Type 1 (Based on 51#/bu)	Row Spacing 6"	2	5	8	11	14	18	22	26	30	35	39	43	48	53	57	62	66	69	73	73	74
	7"	2	4	7	9	12	16	19	22	26	30	33	37	41	45	49	53	56	59	62	63	63
	7.5"	2	4	6	9	12	15	18	21	24	28	31	35	38	42	46	49	52	55	58	59	59
	8"	1	3	6	8	11	14	17	20	23	26	29	32	36	40	43	46	49	52	54	55	55
	10"	1	3	5	6	9	11	13	16	18	21	23	26	29	32	34	37	39	42	44	44	44
Barley Drive Type 2 (Based on 51#/bu)	Row Spacing 6"	4	9	16	22	30	37	45	54	62	71	76	87	96	104	114	123	133	142	152	154	156
	7"	3	7	14	19	26	32	39	46	53	61	68	75	82	89	97	105	114	122	130	132	134
	7.5"	3	7	13	17	24	30	36	43	49	57	64	70	77	83	91	98	106	114	121	123	125
	8"	3	7	12	16	22	28	34	40	46	53	60	65	72	78	85	92	100	107	114	116	117
	10"	2	5	10	13	18	22	27	32	37	43	48	52	58	63	68	74	80	85	91	92	94
Barley Drive Type 4 (Based on 51#/bu)	Row Spacing 6"	9	21	39	53	73	90	110	131	151	174	194	213	234	255	278	300	325	348	371	377	382
	7"	7	18	33	45	63	78	95	113	130	149	166	182	201	218	238	257	278	299	318	323	328
	7.5"	7	17	31	42	58	72	88	105	121	139	155	170	188	204	222	240	260	279	297	301	306
	8"	6	16	29	40	55	68	83	99	113	130	146	160	176	191	208	225	244	261	278	282	287
	10"	5	13	23	32	44	54	66	79	91	104	117	128	141	153	167	180	195	209	222	226	230
Buck Wheat Drive Type 3 (Based on 48#/bu)	Row Spacing 6"	0	11	21	29	42	52	65	78	92	107	123	136	150	165	180	195	209	224	240	242	245
	7"	0	10	18	25	36	45	56	67	79	92	106	116	129	142	154	168	179	192	205	207	210
	7.5"	0	9	17	24	34	42	52	62	74	85	99	109	120	132	144	156	167	179	192	194	196
	8"	0	8	16	22	31	39	49	59	69	80	92	102	113	124	135	147	157	168	180	181	183
	10"	0	7	13	18	25	31	39	47	55	64	74	81	90	99	108	117	126	134	144	145	147
Flax or Sudan Drive Type 1 (Based on 55#/bu)	Row Spacing 6"	0	4	8	12	16	20	24	28	33	37	42	46	50	54	59	65	70	76	82	83	85
	7”	0	3	7	10	14	17	21	24	28	32	36	39	43	47	51	55	60	65	70	71	73
	7.5"	0	3	7	9	13	16	19	23	26	30	34	37	40	44	47	52	56	61	66	67	68
	8"	0	3	6	9	12	15	18	21	25	28	31	34	37	41	44	49	52	57	61	62	64
	10”	0	2	5	7	10	12	15	17	20	22	25	27	30	33	35	39	42	45	49	50	51
Millet Drive Type 1 (Based on 60#/bu)	Row Spacing 6"	1	5	8	12	16	20	23	27	32	36	40	44	49	52	57	62	66	71	76	77	78
	7"	1	4	7	10	13	17	20	23	27	31	34	38	42	45	49	53	57	61	65	66	67
	7.5"	1	4	7	9	13	16	19	22	25	29	32	35	39	42	46	49	53	57	61	62	63
	8"	1	4	6	9	12	15	18	20	24	27	30	33	36	39	43	46	50	53	57	58	59
	10"	1	3	5	7	9	12	14	16	19	21	24	26	29	32	34	37	40	43	46	46	47
Milo Drive Type 1 (Based on 64#/bu)	Row Spacing 6"	0	5	9	13	18	23	28	34	39	45	52	57	63	69	75	81	87	92	98	100	102
	7"	0	4	8	11	15	19	24	29	34	38	44	49	54	59	64	69	74	79	84	86	88
	7.5”	0	4	7	10	14	18	22	27	31	36	41	45	50	55	60	65	69	73	78	80	82
	8"	0	4	7	10	13	17	21	25	29	34	39	43	47	52	56	61	65	69	73	75	77
	10"	0	3	5	8	11	14	17	20	23	27	31	34	38	41	45	49	52	55	59	60	61
Oats Drive Type 3 (Based on 37#/bu)	Row Spacing 6"	0	5	12	17	24	32	39	47	55	63	72	80	88	96	105	113	121	130	139	140	140
	7"	0	5	10	15	21	27	33	40	47	54	62	68	76	82	90	97	104	111	119	120	120
	7.5"	0	4	10	14	19	25	31	37	44	51	58	64	70	77	84	90	97	104	111	112	112
	8"	0	4	9	13	18	24	29	35	41	47	54	60	66	72	78	85	91	97	104	105	105
	10"	0	3	7	10	14	19	23	28	33	38	43	48	53	58	63	68	73	78	83	84	84

Setting number		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
Peas Drive Type 3 (Based on 61#/bu)	Row Spacing 6"	0	0	19	34	52	69	84	102	119	137	154	169	186	202	218	235	251	266	281	283	284
	7"	0	0	16	29	45	59	72	87	102	118	132	145	160	173	187	202	215	228	241	243	244
	7.5”	0	0	15	27	42	55	67	82	95	110	123	136	149	161	175	188	201	213	225	226	227
	8"	0	0	14	26	39	52	63	76	89	103	116	127	140	151	164	177	188	200	211	212	213
	10"	0	0	11	20	31	41	50	61	71	82	93	102	112	121	131	141	151	160	169	170	171
Pinto Beans Drive Type 1 (Based on 61#/bu)	Row Spacing 6"	0	0	9	13	17	24	30	35	41	47	53	58	64	69	74	81	85	91	97	96	96
	7"	0	0	7	11	15	20	25	30	35	40	45	50	55	59	64	69	73	78	83	83	83
	7.5"	0	0	7	10	14	19	24	28	33	38	42	47	51	55	60	65	68	73	77	77	77
	8"	0	0	6	10	13	18	22	27	31	35	40	44	48	52	56	61	64	68	72	72	72
	10"	0	0	5	8	10	14	18	21	25	28	32	35	38	41	45	49	51	54	58	58	58
Rice Short Grain Drive Type 3 (Based on 43#/bu)	Row 6"	3	11	18	28	38	46	56	64	73	84	96	107	117	128	139	148	167	165	174	174	174
	7"	3	9	16	24	33	39	48	54	63	72	82	92	101	110	119	127	134	142	149	149	149
	7.5"	2	9	14	23	31	37	44	51	59	67	77	85	94	102	111	118	125	132	139	139	139
	8"	2	8	14	21	29	34	42	48	55	63	72	80	88	96	104	111	117	124	131	131	131
	10"	2	7	11	17	23	27	33	38	44	50	57	64	70	77	83	89	94	99	105	105	105
Rice Short Grain Drive Type 4 (Based on 43#/bu)	Row 6"	5	18	29	46	63	74	91	104	120	137	156	174	191	209	226	241	255	269	284	284	284
	7"	4	15	25	40	54	64	78	89	103	117	134	149	164	179	194	207	219	231	243	243	243
	7.5"	4	14	24	37	50	60	72	83	96	109	125	139	153	167	181	193	204	215	227	227	227
	8"	4	13	22	35	47	56	68	78	90	102	117	131	143	156	169	181	191	202	213	213	213
	10"	3	11	18	28	38	45	54	62	72	82	94	105	115	125	136	145	153	162	170	170	170
Rice Long Grain Drive Type 1 (Based on 47#/bu)	Row Spacing 6"	0.0	1.4	4.4	7.4	10.	13.	16.	19.	22.	26.	31.	32.	35.	38.	41.	44.	46.	49.	51.	52.	53.
	7"	0.0	1.2	3.8	6.3	8.9	11.7	14.	17.	19.	22.	27.	27.	30.	32.	35.	38.	40.	42.	44.	45.	46.
	7.5"	0.0	1.1	3.6	5.9	8.3	10.	13.	15.	18.	20.	25.	25.	28.	30.	32.	35.	37.	39.	41.	42.	43.
	8"	0.0	1.1	3.3	5.5	7.8	10.	12.	14.	17.	19.	23.	24.	26.	28.	30.	33.	35.	37.	38.	39.	40.
	10"	0.0	0.8	2.7	4.4	6.2	8.2	10.	11.9	13.	15.	19.	19.	21.	22.	24.	26.	28.	29.	30.	31.	32.
Rice Long Grain Drive Type 2 (Based on 47#/bu)	Row 6"	0	3	9	15	21	28	35	41	47	54	65	66	72	78	85	91	96	102	106	109	111
	7"	0	3	8	13	18	24	30	35	40	46	56	57	62	67	72	78	83	87	91	93	95
	7.5"	0	2	7	12	17	23	28	33	38	43	52	53	58	63	68	73	77	81	85	87	89
	8"	0	2	7	11	16	21	26	31	35	40	49	50	54	59	63	68	72	76	80	82	83
	10"	0	2	6	9	13	17	21	25	28	32	39	40	43	47	51	55	58	61	64	65	67
Rice Long Grain Drive Type 3 (Based on 47#/bu)	Row 6"	0	0	13	22	32	42	53	61	71	81	90	98	107	116	125	135	144	153	161	167	173
	7”	0	0	11	19	27	36	45	53	61	69	77	84	91	99	107	116	124	131	138	143	148
	7.5"	0	0	11	17	25	34	42	49	57	65	72	79	85	92	100	108	116	123	129	134	138
	8"	0	0	10	16	24	31	40	46	53	61	67	74	80	87	94	101	108	115	121	125	130
	10"	0	0	8	13	19	25	32	37	42	49	54	59	64	69	75	81	87	92	97	100	104
Rice Long Grain Drive Type 4 (Based on 47#/bu)	Row Spacing 6"	0	0	22	35	52	68	86	100	115	132	146	160	174	188	204	220	235	250	263	273	282
	7"	0	0	18	30	44	59	74	86	99	113	125	137	149	161	175	188	202	214	225	234	242
	7.5"	0	0	17	28	41	55	69	80	92	105	117	128	139	151	163	176	188	200	210	218	226
	8"	0	0	16	27	39	51	65	75	87	99	110	120	130	141	153	165	177	187	197	204	211
	10”	0	0	13	21	31	41	52	60	69	79	88	96	104	113	123	132	141	150	158	164	169
Rye Drive Type 1 (Based on 57#/bu)	Row Spacing 6"	0	3	8	13	19	24	28	35	41	47	53	58	63	68	74	81	87	94	101	102	102
	7"	0	2	7	11	16	21	24	30	35	40	45	50	54	59	63	69	74	80	87	87	88
	7.5"	0	2	6	10	15	19	22	28	33	38	42	46	50	55	59	64	69	75	81	81	82
	8"	0	2	6	10	14	18	21	26	31	35	40	44	47	51	55	60	65	70	76	76	77
	10"	0	2	5	8	11	14	17	21	24	28	32	35	38	41	44	48	52	56	61	61	61

Setting number		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
Soybeans Drive Type 1 (Based on 58#/bu)	Row Spacing 6"	0	3	8	13	19	23	29	34	39	45	49	55	61	66	71	77	82	87	93	93	93
	7"	0	2	7	11	17	20	25	29	34	38	42	48	52	57	61	67	70	75	79	80	80
	7.5"	0	2	6	11	15	19	23	27	31	36	40	44	49	53	57	62	65	70	74	74	75
	8"	0	2	6	10	15	17	22	25	29	34	37	42	46	50	54	58	61	65	69	70	70
	10"	0	2	5	8	12	14	17	20	24	27	30	33	37	40	43	46	49	52	56	56	56

Soybeans Drive Type 2 (Based on 58#/bu)	Row Spacing 6"	0	6	16	27	40	48	59	69	80	92	102	114	125	136	147	158	167	179	190	191	192
	7"	0	5	14	23	34	41	51	59	69	79	87	98	107	117	126	136	144	153	163	164	164
	7.5”	0	5	13	22	32	38	47	55	64	73	81	91	100	109	118	127	134	143	152	153	153
	8"	0	4	12	20	30	36	44	52	60	69	76	86	94	102	110	119	126	134	143	143	144
	10"	0	4	10	16	24	29	35	42	48	55	61	68	75	82	88	95	101	107	115	115	115

Soybeans Drive Type 3 (Based on 58#/bu)	Row Spacing 6"	0	12	23	40	60	71	89	101	116	131	148	164	181	196	214	228	248	265	284	284	284
	7"	0	10	19	35	51	61	76	87	100	113	127	141	155	168	183	195	213	227	244	243	244
	7.5"	0	9	18	32	48	57	71	81	93	105	119	131	145	157	171	182	199	212	227	227	227
	8"	0	9	17	30	45	53	67	76	87	99	111	123	136	147	160	171	186	199	213	213	213
	10"	0	7	14	24	36	42	53	61	70	79	89	98	108	118	128	137	149	159	170	170	170

Soybeans Drive Type 4 (Based on 58#/bu)	Row Spacing 6"	0	19	37	66	97	115	145	165	190	214	241	267	295	320	348	371	405	433	463	463	464
	7"	0	16	31	56	83	99	124	141	163	184	207	229	253	274	299	318	347	371	397	397	397
	7.5"	0	15	29	53	78	92	116	132	152	171	193	214	236	256	279	297	324	346	370	371	371
	8"	0	14	28	49	73	86	109	124	142	161	181	200	221	240	261	278	304	324	347	347	348
	10"	0	11	22	40	58	69	87	99	114	128	145	160	177	192	209	223	243	260	278	278	278

Sun flowers Drive Type 1 (Based on 28#/bu)	Row Spacing 6"	0	0	2	4	6	8	11	13	15	18	20	23	25	27	30	32	34	36	38	39	41
	7"	0	0	2	4	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	34	35
	7.5"	0	0	2	3	5	7	9	10	12	14	16	18	20	22	24	26	27	29	31	32	33
	8"	0	0	2	3	5	6	8	10	12	13	15	17	19	21	22	24	26	27	29	30	31
	10"	0	0	1	3	4	5	6	8	9	11	12	14	15	16	18	19	20	22	23	24	24

Wheat Drive Type 2 (Based on 64#/bu)	Row 6"	0	13	22	30	40	50	57	70	80	91	105	115	127	140	152	164	177	190	203	205	206
	7"	0	11	19	26	34	43	49	60	69	78	90	99	109	120	131	141	152	163	174	176	177
	7.5"	0	10	18	24	32	40	46	56	64	73	84	92	102	112	122	131	142	152	162	164	165
	8"	0	9	17	23	30	37	43	52	60	69	79	86	96	105	114	123	133	143	152	153	154
	10"	0	8	13	18	24	30	34	42	48	55	63	69	76	84	91	99	106	114	122	123	124

Wheat Drive Type 3 (Based on 64#/bu)	Row 6"	0	16	31	45	60	74	88	104	120	137	153	168	186	202	220	240	256	274	290	297	299
	7"	0	14	26	38	51	64	75	89	103	117	131	144	159	174	189	206	219	235	248	254	256
	7.5"	0	13	25	36	48	59	70	83	96	109	123	134	149	162	176	192	205	219	232	237	239
	8"	0	12	23	34	45	56	66	78	90	102	115	126	139	152	165	180	192	205	217	223	224
	10"	0	10	18	27	36	45	53	62	72	82	92	101	111	121	132	144	154	164	174	178	179

Wheat Grass Drive Type 1 (Based on 23#/bu)	Row Spacing 6"	0	1	2	3	4	5	6	7	8	10	11	12	13	14	15	17	18	19	19	21	21
	7"	0	1	2	3	4	4	5	6	7	8	9	10	11	12	13	14	15	17	16	18	18
	7.5"	0	1	2	2	3	4	5	6	7	8	9	10	11	11	12	13	14	15	15	17	17
	8"	0	1	2	2	3	4	5	6	6	7	8	9	10	11	12	13	13	15	14	16	16
	10"	0	1	1	2	3	3	4	4	5	6	7	7	8	9	9	10	11	12	11	13	13

Small Seeds Attachment

To set and calibrate the seeding rate on the optional small seeds attachment, follow these steps.

1. Set the seed-rate handle on the small seeds attachment as indicated by this small seeds rate chart.
2. Calibrate the small seeds attachment to your material by following the steps under “**Seeding Rate**” on page 30.

Small Seeds Rate Chart

Setting Number		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
Kentucky Blue Grass, Fescue, Annual Rye Grass	Row Spacing 6"	0	.2	1.2	1.9	2.7	3.3	4.1	4.6	5.2	5.8	6.3	6.8	7.3	7.8	8.3	8.8	9.2	9.7	10.0	10.5
	7"	0	.2	1.0	1.6	2.3	2.8	3.5	4.0	4.5	5.0	5.4	5.9	6.3	6.7	7.1	7.5	7.9	8.0	8.6	9.0
	7.5"	0	.2	.9	1.5	2.2	2.7	3.3	3.7	4.2	4.6	5.1	5.5	5.9	6.3	6.7	7.0	7.4	7.7	8.1	8.4
	8"	0	.2	.9	1.4	2.0	2.5	3.0	3.5	3.9	4.3	4.8	5.1	5.5	5.9	6.2	6.6	6.9	7.5	7.5	7.9
	10"	0	.1	.7	1.1	1.6	2.0	2.4	2.7	3.1	3.4	3.7	4.0	4.3	4.6	4.9	5.2	5.4	5.7	5.9	6.2
Ladino Clover, Canary Grass, Timothy, Canola	Row Spacing 6"	0	1.1	2.1	3.3	4.7	6.1	7.6	9.2	10.7	12.2	13.8	15.5	17.0	18.5	20.3	21.7	23.4	25.4	27.3	29.2
	7"	0	.9	1.7	2.8	4.1	5.2	6.6	7.9	9.2	10.5	11.8	13.3	14.6	15.9	17.4	18.7	20.0	22.0	23.4	25.1
	7.5"	0	.9	1.6	2.6	3.9	4.9	6.1	7.4	8.6	9.8	11.1	12.5	13.7	14.9	16.3	17.6	18.8	20.4	21.9	23.5
	8"	0	.8	1.5	2.5	3.6	4.6	5.7	6.9	8.0	9.2	10.3	11.6	12.8	13.9	15.2	16.4	17.5	19.0	20.5	21.9
	10"	0	.6	1.5	1.9	2.5	3.6	4.5	5.4	6.3	7.2	8.1	9.1	10.0	10.9	12.0	12.9	13.8	14.9	16.1	17.2
Bermuda, Red Top, Unhulled Lespedeza, Sercia, Sand & Weeping Love Grass	Row Spacing 6"	0	.7	1.1	1.7	2.6	3.3	4.1	5.0	5.9	6.6	7.2	7.8	8.4	9.0	9.5	10.2	10.9	11.6	12.2	12.9
	7"	0	.6	.9	1.5	2.2	2.8	3.6	4.3	5.1	5.6	6.2	6.7	7.1	7.7	8.1	8.7	9.4	10.0	10.5	11.0
	7.5"	0	.5	.9	1.4	2.1	2.6	3.3	4.0	4.7	5.3	5.8	6.3	6.7	7.2	7.6	8.2	8.8	9.3	9.8	10.4
	8"	0	.5	.8	1.3	2.0	2.5	3.1	3.8	4.4	4.9	5.4	5.9	6.5	6.7	7.1	7.6	8.2	8.7	9.2	9.7
	10"	0	.4	.6	1.0	1.5	1.9	2.4	3.0	3.5	3.9	4.2	4.6	4.9	5.3	5.6	6.0	6.4	6.8	7.2	7.6
Red & Sweet Clover, Lespedeza Hulled	Row Spacing 6"	0	1.5	3.4	5.2	7.1	9.0	11.3	13.2	15.3	17.0	19.0	20.8	22.5	24.5	26.4	28.3	30.1	32.1	33.8	35.6
	7"	0	1.3	2.9	4.5	6.1	7.7	9.7	11.3	13.1	14.6	16.3	17.8	19.3	21.0	22.7	24.6	25.8	27.5	29.0	30.5
	7.5"	0	1.2	2.7	4.2	5.7	7.2	9.1	10.6	12.3	13.7	15.3	16.7	18.1	19.7	21.2	22.7	24.2	25.8	27.2	28.6
	8"	0	1.1	2.5	3.9	5.3	6.7	8.5	9.9	11.5	12.8	14.3	15.6	16.9	18.3	19.8	21.2	22.6	24.1	25.4	26.7
	10"	0	.9	2.0	3.1	4.2	5.3	6.7	7.8	9.0	10.0	11.2	12.2	13.3	14.4	15.6	16.6	17.8	18.9	19.9	20.9
Bird's-foot Trefoil, Sudan	Row Spacing 6"	0	1.7	3.3	5.2	6.8	8.7	10.7	12.7	14.7	16.8	19.2	21.2	23.4	25.6	28.0	29.9	32.1	34.2	36.3	38.4
	7"	0	1.5	2.8	4.5	5.8	7.5	9.2	10.9	12.5	14.4	16.5	18.2	20.0	21.9	24.0	25.6	27.5	29.0	31.1	32.9
	7.5"	0	1.4	2.6	4.2	5.4	7.0	8.6	10.2	11.9	13.5	15.4	17.0	18.8	20.5	22.5	24.0	25.8	27.6	29.1	30.9
	8"	0	1.3	2.5	3.9	5.1	6.6	8.1	9.5	11.0	12.6	14.4	15.9	17.5	19.2	21.0	22.4	24.1	25.7	27.2	28.8
	10"	0	1.0	1.9	3.1	4.0	5.1	6.3	7.5	8.6	9.9	11.3	12.5	13.8	15.1	16.5	17.6	18.9	20.2	21.4	22.7
Orchard Grass	Row Spacing 6"	0	0	.3	.7	.9	1.3	1.5	2.0	2.4	2.8	3.3	3.5	3.9	4.4	4.8	5.0	5.5	5.7	6.1	6.3
	7"	0	0	.2	.6	.7	1.1	1.3	1.7	2.1	2.4	2.8	3.0	3.4	3.7	4.1	4.3	4.7	5.0	5.2	5.4
	7.5"	0	0	.2	.5	.7	1.1	1.2	1.6	1.9	2.3	2.6	2.8	3.2	3.5	3.9	4.0	4.4	4.6	4.9	5.1
	8"	0	0	.2	.5	.7	1.0	1.1	1.5	1.8	2.1	2.5	2.6	2.9	3.3	3.6	3.8	4.1	4.3	4.6	4.8
	10"	0	0	.1	.4	.5	.8	.9	1.2	1.4	1.7	1.9	2.1	2.3	2.6	2.8	3.0	3.2	3.3	3.6	3.7

Setting Number		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
Millet, Reed Canary	Row Spacing 6"	.4	1.4	2.4	3.5	4.4	5.5	6.5	7.5	8.5	9.5	10.5	11.5	12.5	13.6	14.6	15.6	16.6	17.6	18.5	19.0
	7"	.4	1.2	2.1	3.0	3.8	4.7	5.6	6.4	7.3	8.1	9.0	9.9	10.7	11.6	12.5	13.3	14.2	15.1	15.9	16.1
	7.5"	.3	1.2	2.0	2.8	3.6	4.4	5.2	6.0	6.8	7.6	8.4	9.3	10.1	10.9	11.7	12.5	13.3	14.1	14.9	15.1
	8"	.3	1.1	1.8	2.6	3.3	4.1	4.9	5.6	6.4	7.1	7.9	8.6	9.4	10.2	10.9	11.7	12.4	13.2	13.9	14.1
	10"	.3	.8	1.4	2.0	2.6	3.2	3.8	4.4	5.0	5.6	6.2	6.8	7.4	8.0	8.6	9.2	9.8	10.4	10.9	11.5

Alfalfa, Red Alsike, Crimson Clover	Row Spacing 6"	0	2.2	3.5	4.8	6.0	7.5	8.7	9.8	11.2	12.5	13.8	15.1	16.4	17.5	18.6	20.2	21.4	22.9	24.0	25.2
	7"	0	1.9	3.0	4.1	5.1	6.4	7.5	8.4	9.5	10.8	11.8	12.9	14.0	15.0	16.3	17.3	18.3	20.0	20.6	21.6
	7.5"	0	1.8	2.8	3.9	4.8	6.0	7.0	7.9	9.0	10.0	11.1	12.1	13.2	14.0	15.3	16.2	17.2	18.3	19.3	20.3
	8"	0	1.6	2.6	3.6	4.5	5.6	6.6	7.4	8.4	9.4	10.3	11.3	12.3	13.1	13.0	15.2	16.1	17.1	18.0	18.9
	10"	0	1.3	2.1	2.8	3.5	4.4	5.1	5.8	6.6	7.4	8.1	8.9	9.7	10.3	11.2	11.9	12.6	13.4	14.2	14.9

Fertilizer Meter Rate

Fertilizer application rates will vary with fertilizer type, density and particle size. Relative humidity and field conditions can also affect application rates. The chart on this page is based on material with a density of 65 pounds per cubic foot (1.04 kg/L) and average particle size. Initially set the rate according to the charts, then calibrate the drill to your material as described below.

Fertilizer Rate Chart (pounds per acre)

Setting number		15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
Row Spacing	6"	13	25	48	67	89	112	131	154	173	197	218	234	261	279	292	303	306	308
	7"	13	23	41	57	78	95	111	131	148	165	184	199	221	235	246	256	259	261
	7.5"	11	20	38	54	72	89	105	123	138	157	174	187	209	223	234	242	245	247
	8"	11	20	36	50	69	84	98	115	130	146	163	176	195	207	219	226	228	231
	10"	8	16	29	40	54	67	79	92	104	118	131	140	157	167	175	182	183	185

Density Conversion Chart

The fertilizer meter rate charts are based on fertilizer with a density of 65 pounds per cubic foot (1.04 kilograms per liter). If you are applying fertilizer of a different density, use the following table to convert application rate.

Density, lb/ft^3 (kg/l)	45.0 (0.72)	50.0 (0.80)	55.0 (0.88)	60.0 (0.96)	65.0 (1.04)	70.0 (1.12)	75.0 (0.87)	80.0 (0.81)
Conversion Factor	1.45	1.30	1.20	1.10	1.00	0.93	0.87	0.81

Example: Your fertilizer has a density of 75 pounds per cubic foot, and you want to apply 100 pounds per acre. Multiply the desired application rate by the conversion factor.

100 x 0.87 = 87

Adjust drill to the setting closest to 87 pounds per acre.

If your drill has two boxes, remember to repeat the following steps for each drill box.

1. Raise the drill with the tractor hydraulics so the drive wheels are off the ground. Rotate the drive wheels to see that the metering system is working properly and free from foreign material.
2. From the chart, find the setting number for your row spacing and desired application rate. Rotate the gate adjustment knob to the number obtained from the chart.

NOTICE

The fertilizer rate chart is for granular fertilizer with a density of 65 pounds per cubic foot (1.04 kg/L). If you are applying fertilizer with a different density, use the density conversion chart.

3. Check that your gauge-wheel tires are the correct size (9.5 L x 15 for 12- and 15-foot drills and 11L x 15 for 20-foot drills) and properly inflated.
Refer to “**Tire Inflation Chart**” on page 58.
4. Record the weight of an empty container large enough to hold the fertilizer metered for one acre.
5. Place several pounds of fertilizer over three fertilizer feed cups on the outside end of the drill box. Pull the fertilizer tubes off of these three openers.
6. Turn the gauge wheels a few turns to fill the feed cups with material. Continue to turn until fertilizer drops to the ground from all three tubes.
7. Place a container under the three tubes to gather metered fertilizer.
8. Turn the gauge wheel until for one acre (450 tire rotations on a 12-foot drill, 364 on a 15-foot drill or 283 rotations on a 20-foot drill). Check that the three feed cups have plenty of fertilizer coming into them.
9. Weigh the metered material. Subtract the initial weight of the empty container. Divide by three. Multiply by the number of openers on your drill to determine total pounds-per-acre metered. If this figure is different than desired, reset adjustment knob accordingly.

🕮 You may want to repeat the calibration procedure if your results vary greatly from the chart.

When drilling, check the rate by noting acres drilled, amount of fertilizer added to drill and level of material in drill box. If you are applying more or less than desired, adjust the metering rate slightly to compensate for field conditions.

Marker Adjustments

Disc Adjustments

Refer to Figure 23

Changing disc angle. If mark left by marker disc is not clearly visible, adjust disc angle to make a wider mark. Loosen two 1/2-inch bolts (1) holding disc assembly (2). Rotate disc assembly as desired.

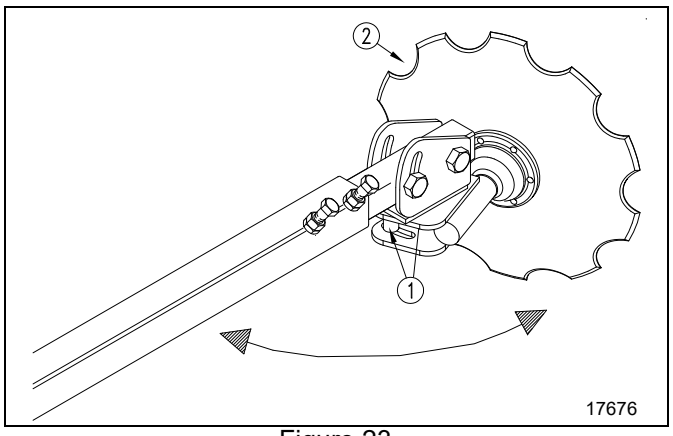


Figure 23
Disc Angle

Refer to Figure 24

Changing disc direction. To change the direction of cut to make different marks in different soil conditions:

1. Reverse disc (1) by removing four lug bolts (2) on disc hub. Reserve disc and remount depth band (3) and lug bolts.
2. Turn entire disc assembly by removing two 1/2-inch bolts, washers and nuts (4). Turn assembly (5) over. Reinstall 1/2-inch bolts and set disc angle as desired.

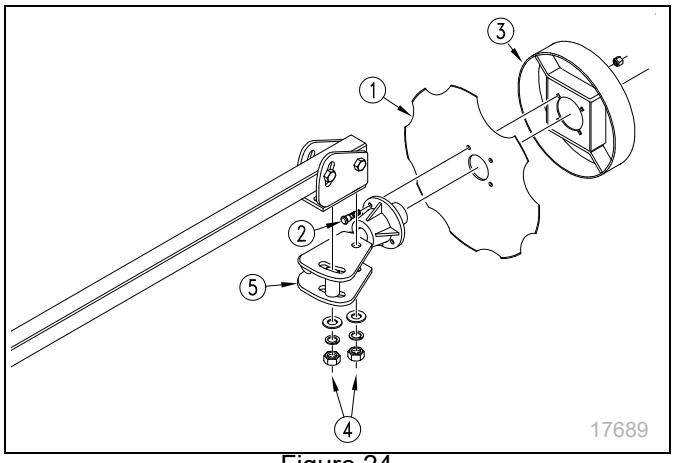


Figure 24
Direction of Cut Reversed

Refer to Figure 25

Leveling marker disc. If the marker disc is not square with the ground when the marker is lowered in the field, or if the marker arm tends to fold up while lowered in the field, adjust the marker mount.

To adjust, loosen bolts (1) and rotate marker mount (2) until marker disc is square with the ground (3).

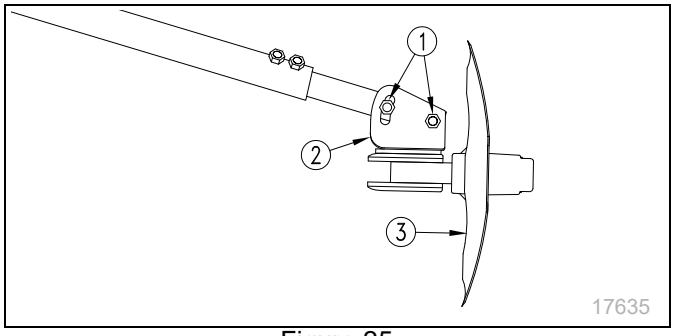


Figure 25
Disc Square

Folding Speed

Refer to Figure 26

With needle valves. A needle valve controls the folding speed of markers that are plumbed separately. 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.

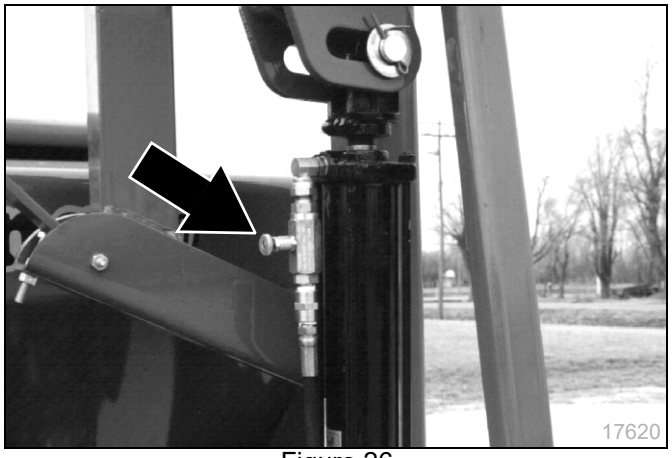


Figure 26
Needle Valve

Refer to Figure 27

With sequence valve. If markers are tied together with an optional sequence valve, adjust folding speed with hex adjustment screws on the sequence-valve body. There is one adjustment screw for raising speed (1) and one for lowering speed (2). Identify adjustment screws by markings stamped in valve body.

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

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

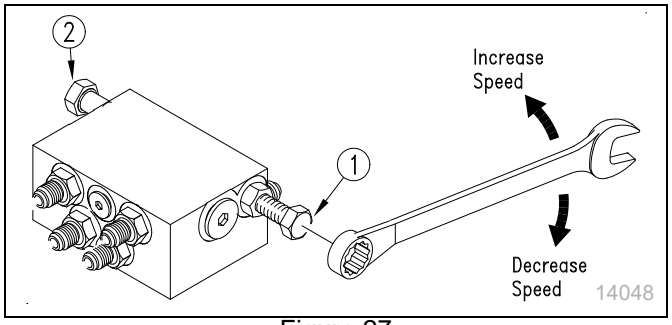


Figure 27
Speed Adjustment, Sequence Valve

Bleeding Marker Hydraulics

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

⚠ CAUTION

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.

⚠ WARNING

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 medical assistance from a doctor that is familiar with this type of injury. Foreign fluids in the tissue must be surgically removed within a few hours or gangrene will result.

1. Check that tractor hydraulic reservoir is full.
2. With both markers lowered into field position, loosen hydraulic-hose fittings at rod and base ends of marker cylinders. If applicable, loosen fittings on back side of sequence valve.

NOTICE

Never bleed an O-ring fitting. Instead, bleed a nearby pipe or JIC fitting.

3. With tractor idling, activate tractor hydraulic valve until oil seeps out around a loosened fitting. Tighten that fitting.

NOTICE

JIC fittings do not require high torque. JIC and O-ring fittings do not require sealant. Always use liquid pipe sealant when adding or replacing pipe-thread fittings. To avoid cracking hydraulic fittings from over tightening, do not use plastic sealant tape.

4. Reactivate tractor hydraulic valve until oil seeps out around another loosened fitting. Tighten that fitting. Repeat process until all loosened fittings have been bled and tightened.

Disc Scraper Adjustment

Refer to Figure 28

To keep the double-disc openers turning freely, dirt scrapers are mounted between the discs to clean as the discs rotate.

As field conditions vary, you may need to adjust the scrapers. In damp conditions, lower the scrapers. If openers are not turning freely, raise the scrapers. To adjust, loosen the 3/8-inch bolt and move scraper as needed.

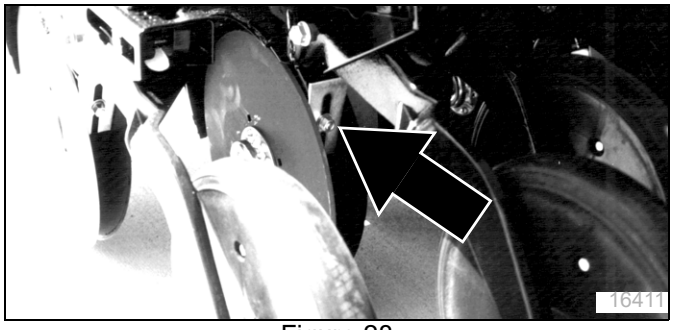


Figure 28
Disc Scraper Adjustment

Seed-Lok

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.

Refer to Figure 29

To lock up firming wheels on 00 and 10 series openers, hook one end of chain in the opener-body hole just above the wheel arm (1). Pull firming-wheel arm (2) up as high as possible and wrap chain around arm. Hook other end of chain in a link. Leave no slack in chain; secure wheel arm in its highest position.

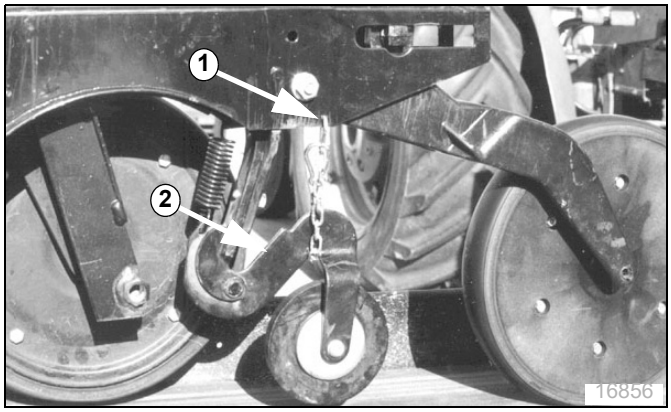


Figure 29
Seed-Lok Lock Up, 00 and 10 Series Openers

Refer to Figure 30

To lock up firming wheels on 20 series openers, remove lock-up handle (1) from its keeper under drill walkboard. Insert handle through hole in opener body as shown. Hook handle around firming wheel (2). Pull up on wheel until arm is secured by self-loading lock-up spring (3).

To unlock firming wheels on 20 series openers, use lock-up handle to lift firming wheel. With your free hand, reach into opener body and unlatch spring from wheel arm.

📖 Openers in Figure 29 and Figure 30 are disassembled for illustrative purposes only.

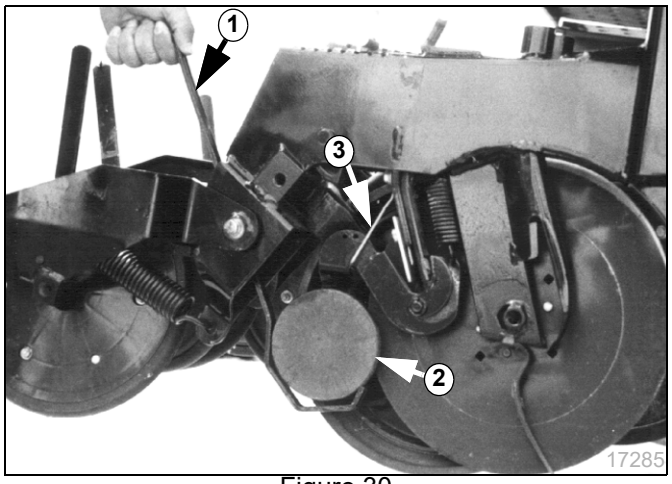


Figure 30
Seed-Lok Lock Up, 20 Series Opener

Harrow Adjustment

Refer to Figure 31

This shows one harrow setting that has been successful in no- and minimum-till conditions. Because of different soil moisture, trash levels and trash types, you may need to reposition the tube frame or tines.

To adjust the frame tube, loosen four hex nuts (1) on the U-bolts and rotate the frame tube (2).

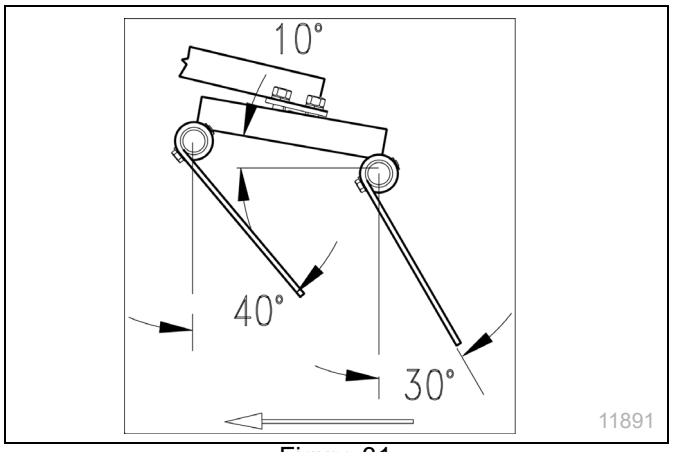


Figure 31
Spring Tine Angles

Refer to Figure 32

To adjust the tines, loosen four 1/2-inch hex nuts (3) on the 1/2-inch U-bolts (4) on the support bar (5). Rotate tine tubes (6) so the tines (7) are against the stop bushings (8) and are at the desired angle. Tighten hex nuts on U-bolts.

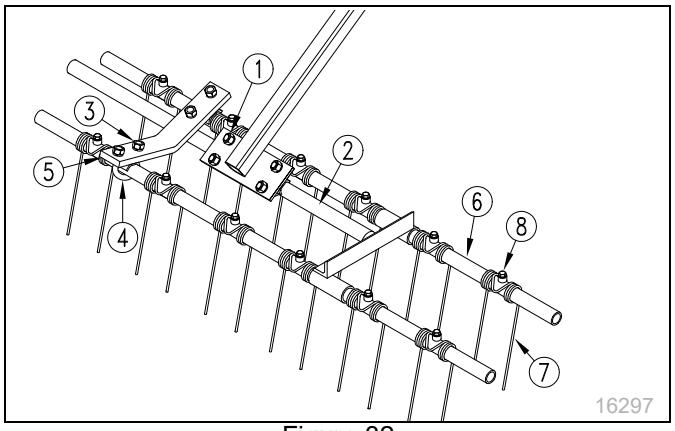


Figure 32
Harrow Adjustment

Troubleshooting

Problem	Solution
Uneven seed spacing or uneven stand	Check for plugging in seed cups.
	Check for plugging in seed tubes.
	Reduce ground speed.
	Check if opener discs are turning freely.
	Use faster drive type and position seed-rate handle to a lower setting.
	🕮 Increase opener spring pressure to penetrate low spots. See “**Opener Down Pressure**” on page 26.
	Check for trash or mud build-up on Seed-Lok wheels.
Opener discs not turning freely	Check for trash or mud build-up on disc scraper. Adjust scraper. Refer to “**Disc Scraper Adjustment**” on page 41.
	Check if scraper is adjusted too tight, restricting disc movement. Refer to “**Disc Scraper Adjustment**” on page 41.
	Check disc bearings.
	Check opener frame for damage.
	🕮 If opener discs turn freely by hand but not in field, reduce down pressure on disc opener. Refer to “**Opener Down Pressure**” on page 26.
	🕮 Check press wheel adjustment. On 00 Series and 10 Series openers, see “**Opener Depth**” on page 28. On 20 Series openers, see “**Opener Down Pressure**” on page 26.
Actual metering rate is different than desired	Check tire pressure. Proper inflation is listed on “**Tire Inflation Chart**” on page 58.
	Check tire size. Proper size is 9.5L x 15 for 12- and 15-foot drills and 11L x 15 for 20-foot drills.
	Regularly clean seed treatment from seed cups.
	Check drill box setting.
	Refer to “**Seeding Rate**” on page 30, or “**Fertilizer Meter Rate**” on page 37 for instructions on calculating metering rate.
Acremeter does not measure accurately	Check tire pressure. Proper inflation is listed in “**Tire Inflation Chart**” on page 58.
	Check tire size. Proper size is 9.5L x 15 for 12- and 15-foot drills and 11L x 15 for 20-foot drills.
	Check planting operation for excessive overlap or gaps between passes.
	Consider soil conditions. Loose soil and slippage will cause variations in acres registered.
	Check that your acremeter is for your width of drill. Refer to the parts manual.
Press wheels not compacting the soil as desired	🕮 Reset press-wheel depth. On 00 Series and 10 Series openers, refer to “**Opener Depth**” on page 28. On 20 Series openers, refer to “**Opener Down Pressure**” on page 26.
	🕮 Increase down pressure on disc openers. Refer to “**Opener Down Pressure**” on page 26.
Excessive seed cracking	Use slower drive type and position seed-rate handle to a higher setting.
	Position seed-cup handles to a lower notch.
Drill boxes not emptying evenly	Certain models do not have the same number of cups between each divider of bulkhead. The section with more cups will empty sooner.

Problem	Solution
Press wheel or openers plugging	Consider soil conditions–may be too damp or wet.
	Reduce down pressure on openers. Refer to “**Opener Down Pressure**” on page 26.
	Do not back up or allow drill to roll backward with openers in the ground.
	Check Seed-Lok wheels. If conditions are too wet, you may need to remove the wheels.
Seed-cup sprockets locked up or twisted seed-cup drive shaft	Check for foreign material stuck in the seed-cup sprockets.
	Check for dried liquid insecticide in seed cups. Remove build up by disassembling seed cups and scraping foreign substances from turning surfaces.
Drill is not pulling level (parallel to ground, front to rear)	Readjust top hitch link to level drill.
	If using pull-package or hitch equipped with a telescoping top link, increase opener spring pressure to rock drill forward. Refer to “**Opener Down Pressure**” on page 26.
Gauge wheel leans to left or right	Realign brackets where gauge wheel is attached to main frame by adjusting U-bolts.
	Check if axle bearings are securely attached to gauge-wheel arm.
Uneven fertilizer metering	Check for plugging in metering gate.
	Check to see if seed tubes are plugged.
	Reduce ground speed.
	Check for lumps in the material. Screen these out if needed.
	Check all drive chains, sprockets, keys and pins.
	Check for build-up on metering wheel or gate. High humidity can cause build up and uneven feeding.
Fertilizer metering system locked up or damaged drive system	Check for dried fertilizer in the metering tray. Remove build up by disassembling the tray and washing or scraping buildup from metering surfaces.
	When humidity is high, take extra care to avoid drive-system damage due to material buildup. Clean out feed system if parking drill. After parking drill overnight, check for binding before going to field by turning drive system by hand.
Hydraulic marker functioning improperly	Check all hose fittings and connections for air or oil leaks.
	Check that chain on the folding marker is slack when marker is both fully extended and raised. Refer to “**Marker Adjustments**” on page 38.
	Check tractor hydraulic oil level.
	Check all bolts and fasteners.
	Open needle valve, cycle markers slowly and reset needle valve if plugged.
Marker blade does not mark	Check that the marker folding linkage has enough slack to allow the marker disc to drop into field depressions. Maximum down float should be limited by the slot at the rod end of the marker cylinder–not by the chain. Refer to “**Marker Adjustments**” on page 38.
	Reverse the blade to pull or throw dirt. Refer to “**Marker Adjustments**” on page 38.
Chain-debris/retainer clip	Be sure retainer clip is facing opposite way of chain travel

Maintenance and Lubrication

Maintenance

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

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

DANGER

Some chemicals will cause serious burns, lung damage and death. Avoid contact with skin or eyes. Wear proper protective equipment as required by chemical manufacturer. Avoid prolonged breathing of chemical fumes. Wear respirator as required by chemical manufacturer. Seek medical assistance immediately if accident occurs. Know what to do in case of an accident.

WARNING

Crushing hazard: You could be severely injured or killed by the falling implement. Always have frame sufficiently blocked up when working on implement.

WARNING

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 medical assistance from a doctor that is familiar with this type of injury. Foreign fluids in the tissue must be surgically removed within a few hours or gangrene will result.

After using drill for several hours, check all bolts to be sure they are tight. Lubricate areas listed under "**Lubrication**" on page 47.

1. Adjust idlers to remove excess slack from chains. Clean and use chain lube on all chains as needed.
2. Inflate tires as specified in "**Tire Inflation Chart**" on page 58.
3. Check disc scrapers for proper adjustment. Refer to "**Disc Scraper Adjustment**" on page 41.
4. Clean nozzles on optional rear-mount boom with a low pressure (less than 30 psi) air hose. Periodically replace nozzles. Always wear rubber gloves when making repairs or adjustments.
5. Replace any worn, damaged or illegible safety decals. Order new decals from your Great Plains dealer. Refer to "**Safety Decals**" on page 5.

Marker Maintenance

Refer to Figure 33

The marker arm is attached to marker body with a 3/8-inch, grade 2, shear bolt. If the shear bolt breaks, replace it with a grade 2 bolt.

🕮 Failure to replace the shear bolt with a grade 2 bolt can cause marker damage.

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

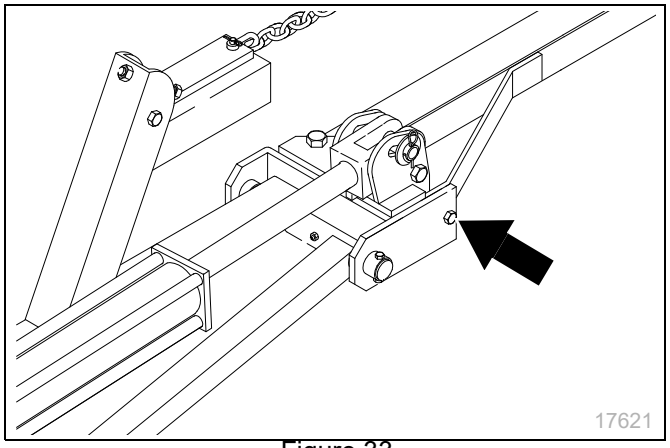


Figure 33
Shear Bolt

Storage

1. Clean the drill as necessary. Be sure that the seed boxes are cleaned completely before storing. If the drill is outfitted with a fertilizer box, clean thoroughly with high-pressure water.
2. Lubricate as indicated under "**Lubrication**" on page 47. Be certain the seed-cup drive sprocket is oiled inside its bore.

If possible, store the drill inside for longer drill life.

Lubrication

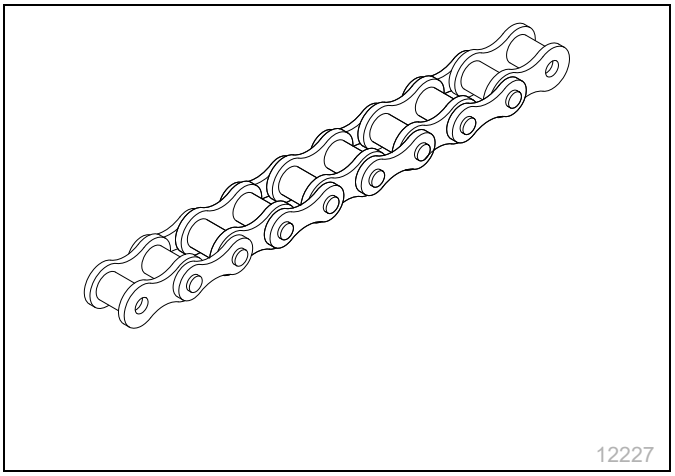
Multi-purpose spray lubricant | Multi-pupose grease lubricant | Multi-purpose oil lubricant | Inspection | 50 Intervals (operating hours) at which service is required

Chains (All)

As Required

Type of Lubrication: Chain Lube
Quantity = Coat thoroughly

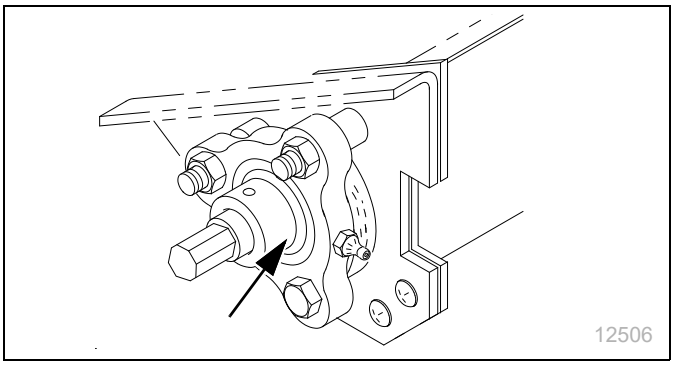
📖 Lubricate chains any time there is a chance of moisture, and when being stored at the end of the planting season.



Fertilizer-Tray Bearings

15

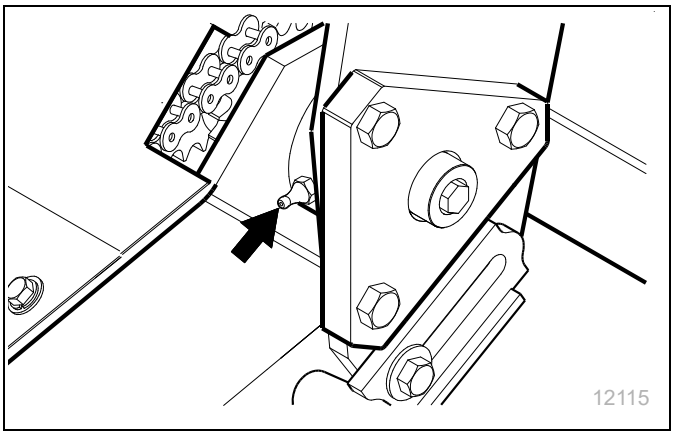
Both ends of shaft.
Type of Lubrication: Grease



Gauge-Wheel Arm Pivots

15

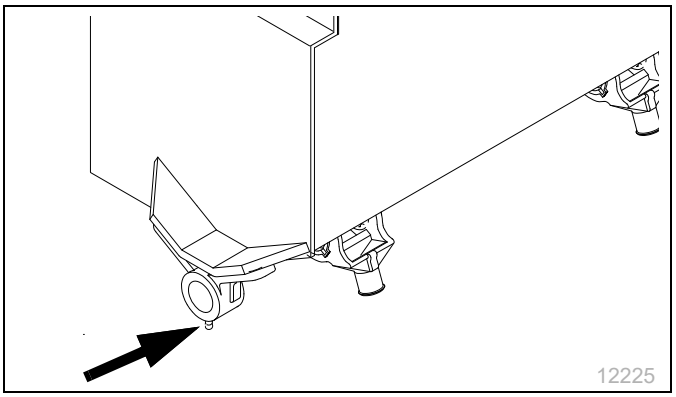
Type of Lubrication: Grease
Quantity: Until grease emerges



Drive-Sprocket-Hanger Bearing

	15

Type of Lubrication: Grease

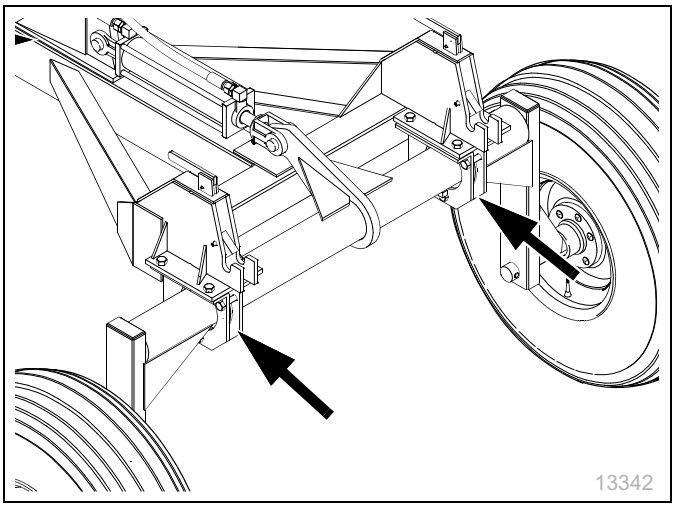


Axle Pivot Bearings

Type of Lubrication: Grease

	20

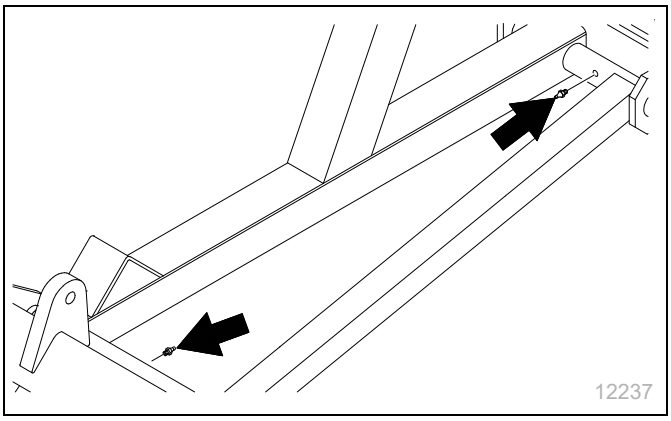
Quantity: Until grease emerges



Marker Hinges

	25

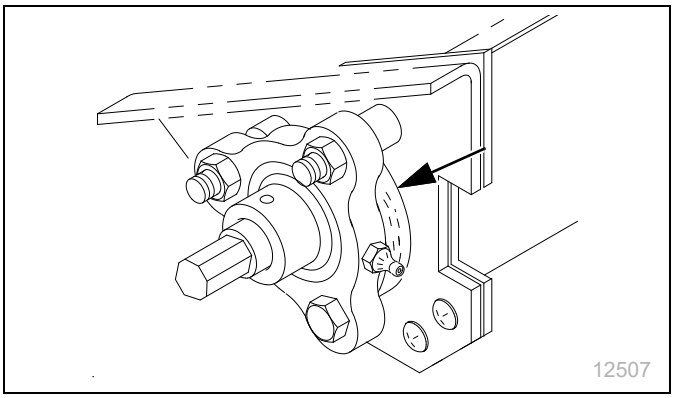
Type of lubrication: Grease



Felt Barrier Washers

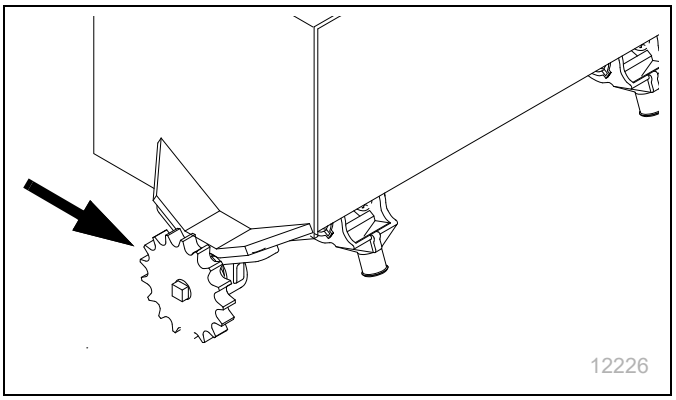
Next to each fertilizer-tray bearing.

Type of Lubrication: Oil



Small Seeds Seed-Cup Drive Sprocket

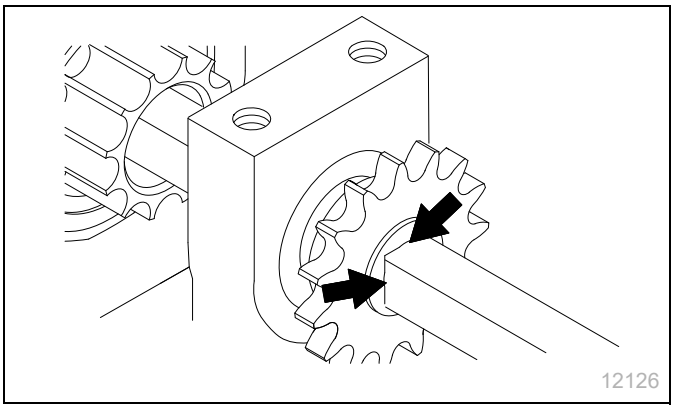
Type of Lubrication: Oil



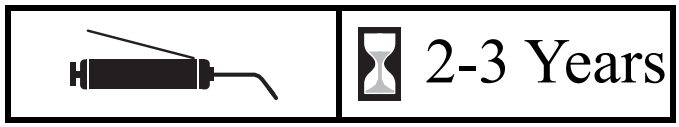
Seed-Cup-Drive Sprocket

Oil sprocket hub in its square bore. Squirt oil on the square seed-cup shaft and move seed-rate handle back and forth to get oil into the square bore.

Type of Lubrication: Oil

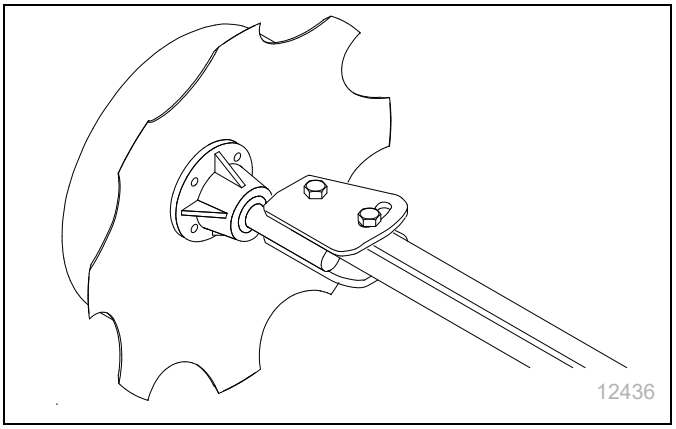


Marker Disc Bearings



If the grease seal cap is damaged or missing, disassemble and clean the hub. Repack with grease and install a new seal or grease cap.

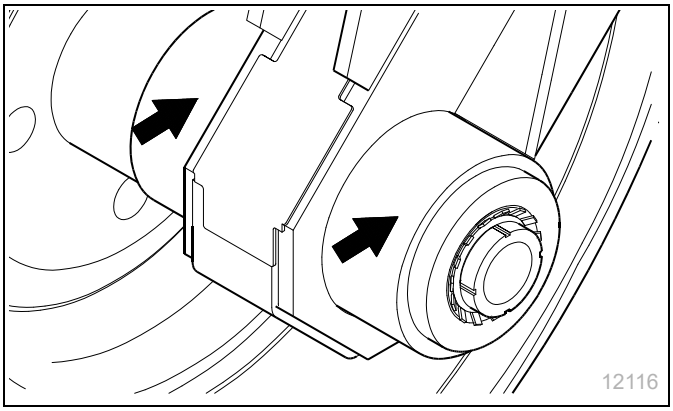
Type of Lubrication: Grease
Quantity: Until grease emerges



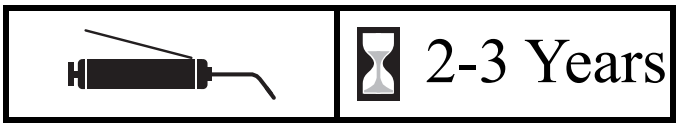
Axle Bearings

Repack

Type of Lubrication: Grease

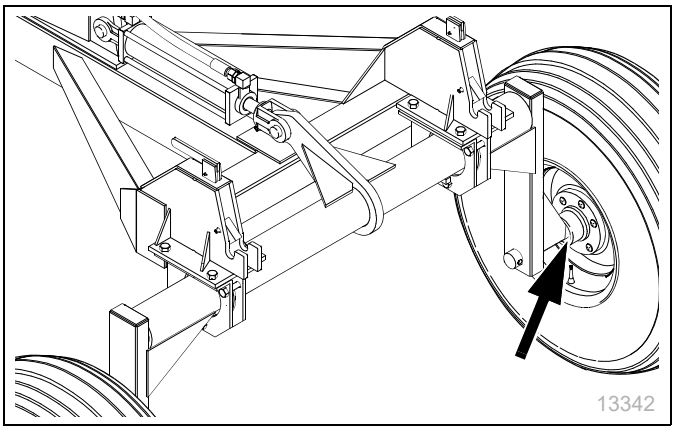


Wheel Axle Bearings



Repack

Type of Lubrication: Grease
Quantity: Until grease emerges



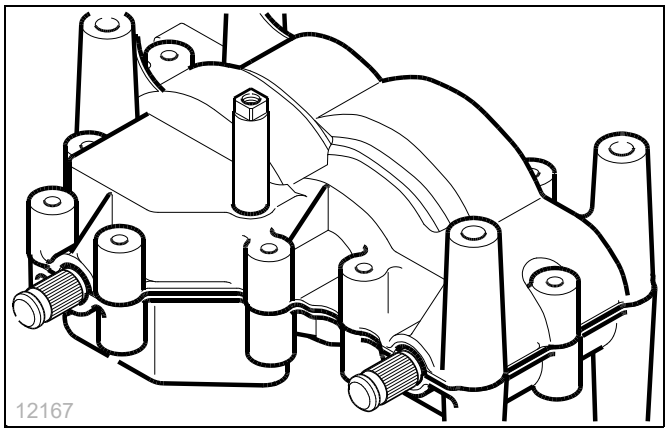
Speed-Change Box

The speed-change gearbox is lubricated and sealed at the factory. Under normal conditions, it does not require maintenance or lubrication.

If you open the gearbox for repair, repack all gears and around the shaft bearings with least 7 ounces of lithium-based, wheel-bearing grease.

It is important to keep moisture and dirt out of the gearbox. Inspect the rubber seals on the gearbox drive and shifter shafts. Replace seals if necessary.

Before bolting them back together, spread a very thin coat of anaerobic sealant (such as Loctite 525) on the gear case mating surfaces.



NOTICE

Use sealant sparingly! Excess sealant may squeeze off surface and lock bearings of gears.

Type of lubrication: Grease

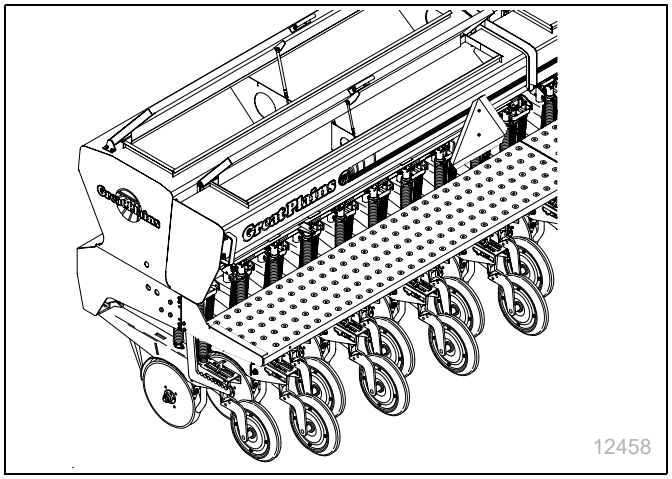
Options

Fertilizer Attachment

The optional fertilizer attachment allows you to plant seed and apply fertilizer in the same field pass. The fertilizer box mounts on the rear of the main drill box. A fertilizer drive meters dry, granular fertilizer.

Refer to "**Fertilizer Meter Rate**" on page 37 for instructions on calibrating the metering rate. Refer to "**Storage**" on page 46 for information on cleaning the fertilizer box. Refer to "**Maintenance and Lubrication**" on page 45 for lubrication points.

To order the fertilizer attachment, contact your Great Plains dealer. Refer to the table below for the correct part number for your drill. (Fertilizer attachment is not available for drills outfitted with 20 Series openers.)



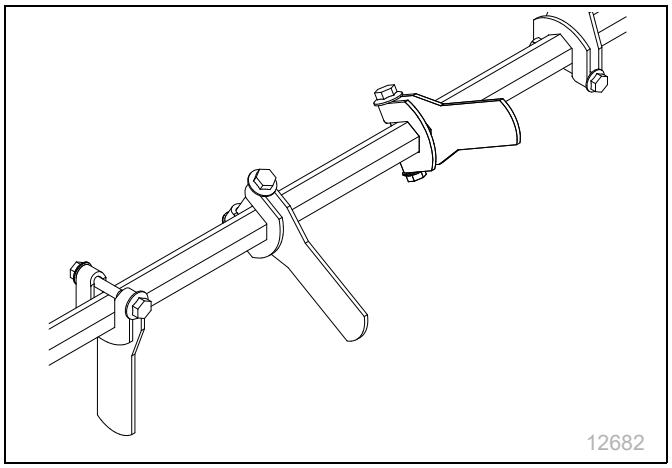
	Fertilizer Attachment	Field Install Kits	Part Number	Field Install Kits
Drill Size	**00 Series Openers**	**00 Series Openers**	**10 Series Openers**	**10 Series Openers**
12-ft., 6-in. Rows	142-616A	142-655A	--------	--------
12-ft., 7-in. Rows	142-617A	142-656A	142-621A	142-660A
12-ft., 7 1/2-in. Rows	142-618A	142-657A	142-622A	142-661A
12-ft., 8-in. Rows	142-619A	142-658A	142-623A	142-662A
12-ft., 10-in. Rows	142-620A	142-659A	142-624A	142-663A
15-ft., 6-in. Rows	142-528A	142-650A	----------	--------
15-ft., 7-in. Rows	142-529A	142-651A	142-592A	142-646A
15-ft., 7 1/2-in. Rows	142-530A	142-652A	142-593A	142-647A
15-ft., 8-in. Rows	142-531A	142-653A	142-594A	142-648A
15-ft., 10-in. Rows	142-532A	142-654A	142-595A	142-649A
20-ft., 6-in. Rows	142-533A	142-664A	----------	--------
20-ft., 7-in. Rows	142-534A	142-665A	142-597A	142-669A
20-ft., 7 1/2-in. Rows	142-535A	142-666A	142-598A	142-670A
20-ft., 8-in. Rows	142-536A	142-667A	142-599A	142-671A
20-ft., 10-in. Rows	142-537A	142-668A	142-600A	142-672A

Seed Box Agitator

An optional agitator can be added to the main seed boxes. The agitator is designed to stir the seed directly above the metering cups. The agitator helps prevent bridging of light, fluffy seeds and separate individual soybeans that become sticky from inoculant.

A seed-box agitator without a drive is available for use with drills equipped with a small-seeds or fertilizer attachment.

To order the agitator, contact your Great Plains dealer. Refer to the table below for the correct agitator part for your drill.



Agitator Attachment Part Number						
Drill size	00 Series Opener		10 Series Opener		20 Series Opener	
	With Drive	W/O Drive	With Drive	W/O Drive	With Drive	W/O Drive
12-ft.						
6-in.	118-542A	118-569A	-------	-------	-------	-------
7-in.	118-543A	118-570A	118-557A	118-570A	-------	-------
7.5-in.	118-544A	118-571A	118-558A	118-571A	118-558A	118-571A
8-in.	118-545A	118-572A	118-559A	118-572A	118-559A	118-572A
10-in.	118-546A	118-573A	118-560A	118-573A	118-560A	118-573A
15-ft.						
6-in.	118-547A	118-1574A	-------	-------	-------	-------
7-in.	118-548A	118-575A	118-561A	118-575A	-------	-------
7.5-in.	118-549A	118-576A	118-562A	118-576A	118-562A	118-576A
8-in.	118-550A	118-577A	118-563A	118-577A	118-563A	118-577A
10-in.	118-551A	118-578A	118-564A	118-578A	118-564A	118-578A
20-ft.						
6-in.	118-552A	118-579A	-------	-------	-------	-------
7-in.	118-553A	118-580A	118-565A	118-580A	-------	-------
7.5-in.	118-554A	118-581A	118-566A	118-581A	118-566A	118-581A
8-in.	118-555A	118-582A	118-567A	118-582A	118-567A	118-582A
10-in.	118-556A	118-583A	118-568A	118-583A	118-568A	118-583A

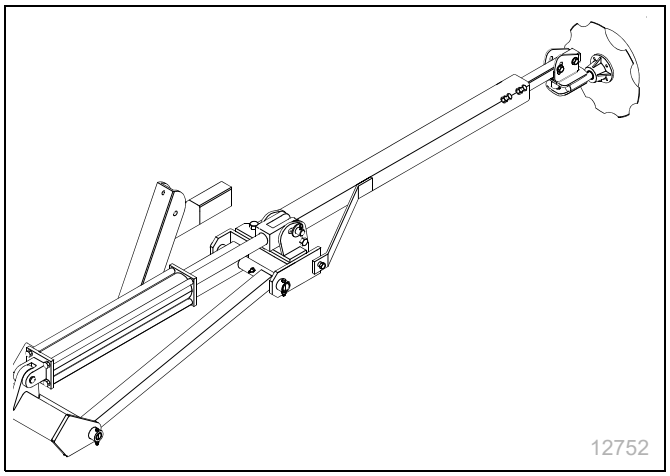
Markers

Hydraulic markers are available. The units have a cast hub, tapered roller bearings and a bolt-on notched blade to leave a mark for you to follow on the next field pass. Markers are sold as dual units and are equipped with a sequence valve for easy operation.

For information on how to operate the markers, refer to "**Field Operation**" on page 19. For information on transporting the markers, refer to "**Transporting**" on page 21. For information on how to adjust the markers, refer to "**Marker Adjustments**" on page 38. For information on lubricating the markers, refer to "**Maintenance and Lubrication**" on page 45.

To order markers, contact your Great Plains dealer.

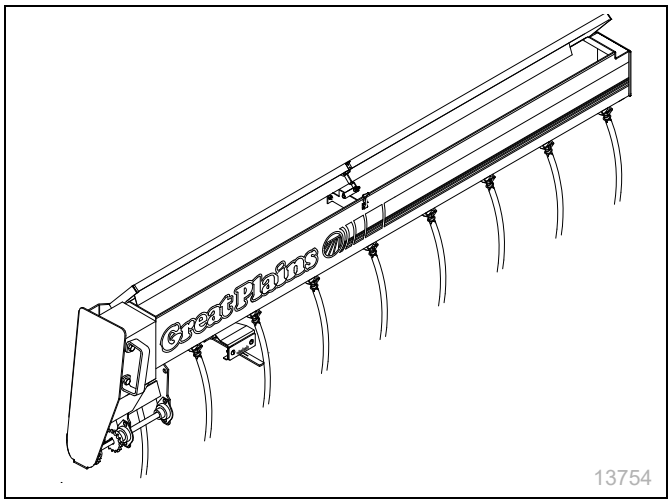
Marker Package	Part Number
15-Ft. Dual Hydraulic Flat Fold w/ Sequence	113-490A
20-Ft. Dual Hydraulic Flat Fold w/ Sequence	113-491A



Small Seeds Attachment

The small-seeds attachment mounts behind the main drill box and delivers small seeds evenly and gently. With a Y-tube, small seeds are placed through the opener seed tube. Otherwise, seeds are placed directly in front of the press wheel. For setting the seeding rate on the attachment, refer to "**Small Seeds Attachment**" on page 35. For lubrication points, refer to "**Maintenance and Lubrication**" on page 45.

To order the small seeds attachment, contact your Great Plains dealer. Refer to the tables below for the correct part number for your drill.



Small Seeds Attachment - For Use Without Fertilizer Attachment						
	00 Series Opener		10 Series Opener		20 Series Opener	
Drill	Y-Tube	P. Wheel	Y-Tube	P. Wheel	Y-Tube	P. Wheel
12-ft.	----------	----------	----------	----------	----------	----------
6-in.	123-865A	123-864A	----------	----------	----------	----------
7-in.	123-867A	123-866A	123-874A	123-878A	----------	----------
7.5-in.	123-869A	123-868A	123-875A	123-879A	123-875A	123-882A
8-in.	123-871A	123-870A	123-876A	123-880A	123-876A	123-883A
10-in.	123-873A	123-872A	123-877A	123-881A	123-877A	123-884A
15-ft.	----------	----------	----------	----------	----------	----------

6-in.	123-755A	123-754A	----------	----------	----------	----------
7-in.	123-757A	123-756A	123-837A	123-847A	----------	----------
7.5-in.	123-759A	123-758A	123-838A	123-848A	123-838A	123-856A
8-in.	123-761A	123-760A	123-829A	123-849A	123-839A	123-857A
10-in.	123-763A	123-762A	123-840A	123-850A	123-840A	123-858A
20-ft.	----------	----------	----------	----------	----------	----------
6-in.	123-765A	123-764A	----------	----------	----------	----------
7-in.	123-767A	123-766A	123-842A	123-852A	----------	----------
7.5-in.	123-769A	123-768A	123-843A	123-853A	123-843A	123-859A
8-in.	123-771A	123-770A	123-844A	123-854A	123-844A	123-860A
10-in.	123-773A	123-772A	123-845A	123-855A	123-845A	123-861A

Small Seeds Attachment - For Use With Fertilizer Attachment				
	00 Series Openers		10 Series Openers	
Drill Size	Y-Tube	Wheel	Y-Tube	Press
12-ft., 6-in.	123-940A	123-906A	----------	----------
12-ft., 7-in.	123-941A	123-907A	123-945A	123-911A
12-ft., 7 1/2-in.	123-942A	123-908A	123-946A	123-912A
12-ft., 8-in.	123-943A	123-909A	123-947A	123-913A
12-ft., 10-in.	123-944A	123-910A	123-948A	123-914A
15-ft., 6-in.	123-949A	123-915A	----------	----------
15-ft., 7-in.	123-950A	123-916A	123-954A	123-920A
15-ft., 7 1/2-in.	123-951A	123-917A	123-955A	123-921A
15-ft., 8-in.	123-952A	123-918A	123-956A	123-922A
15-ft., 10-in.	123-953A	123-919A	123-957A	123-923A
20-ft., 6-in.	123-958A	123-924A	----------	----------
20-ft., 7-in.	123-959A	123-925A	123-963A	123-929A
20-ft., 7 1/2-in.	123-960A	123-926A	123-964A	123-930A
20-ft., 8-in.	123-961A	123-927A	123-965A	123-931A
20-ft., 10-in.	123-962A	123-928A	123-966A	123-932A

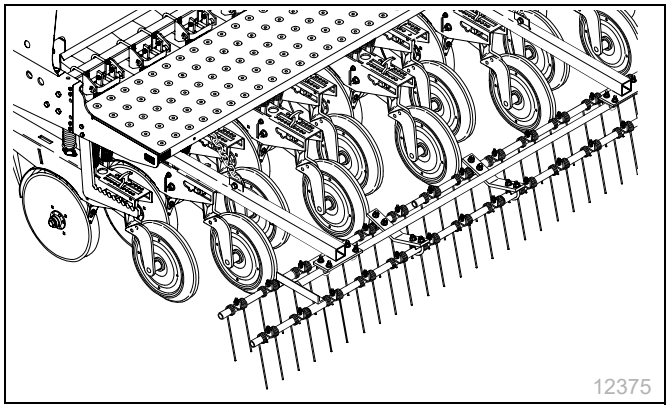
Harrow Attachment

The coil-tine harrow finishes no-till surfaces by leveling and distributing residue for enhanced seed emergence.

For information on how to adjust the harrow, refer to "**Harrow Adjustment**" on page 42.

To order the harrow attachment, contact your Great Plains dealer. Refer to the table below for the correct harrow package for your drill.

Harrow Package	Part Number
12-ft. Coil Tine Harrow	116-158A
15-ft. Coil Tine Harrow	116-159A
20-ft. Coil Tine Harrow	116-160A
15-ft., 7 1/2-in. Rows	123-951A
15-ft., 8-in. Rows	123-952A



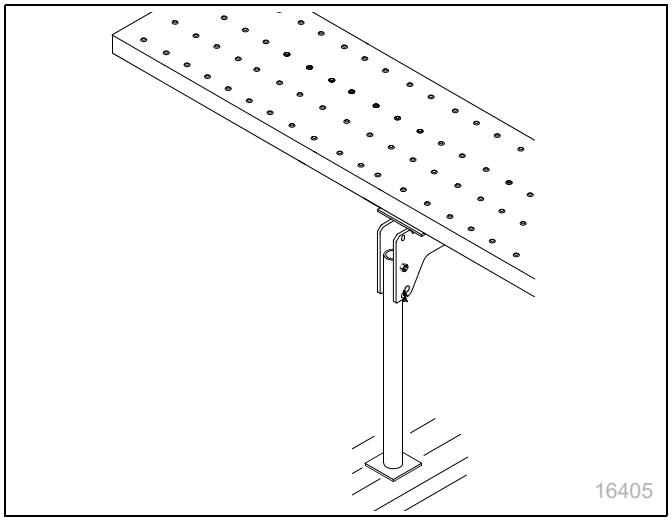
15-ft., 10-in. Rows	123-953A
20-ft., 6-in. Rows	123-958A
20-ft., 7-in. Rows	123-959A
20-ft., 7 1/2-in. Rows	123-960A
20-ft., 8-in. Rows	123-961A
20-ft., 10-in. Rows	123-962A

Parking Stand

The optional parking stand allows you to safely and easily park the three-point drill. The stand attaches to the rear of the main seed box or optional fertilizer box. Simply unpin the stand and rotate up for field operations.

To order the stand, contact your Great Plains dealer. Refer to the table below for the correct part number.

	Parking Stand Part Number	
Opener Style	For Main Seed	With Fert. Attach.
Straight-Arm	119-247A	119-248A
Parallel-Arm & Side-Depth	119-249A	119-250A

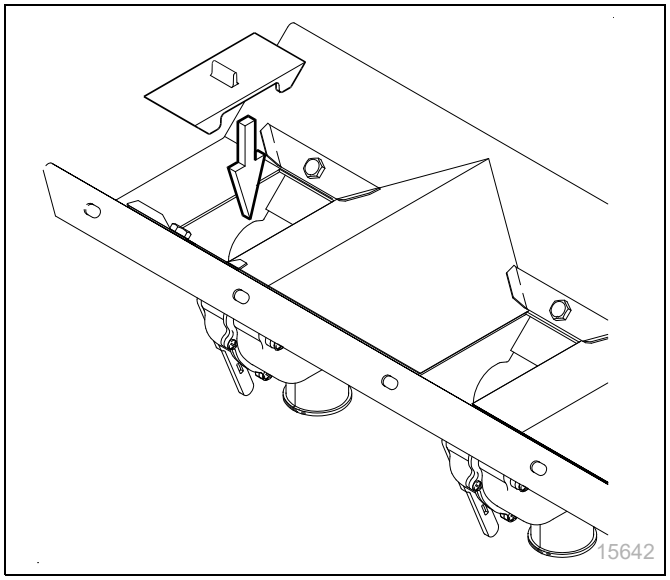


Seed-Cup Plugs

Seed-cup plugs are available to block off individual rows when you want wider row spacing. These plugs are installed by pushing them into the seed-cup openings on the desired rows.

To order seed-cup plugs, contact your Great Plains dealer.

Seed Cup Plugs Package	Part Number
1-3/4-in. Wide Seed-Cup Plug	817-087C



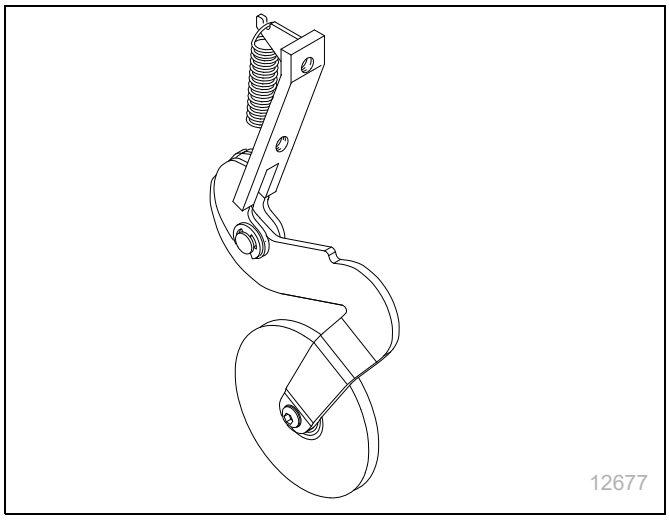
Seed-Lok Firming Wheels

Seed-Lok firming wheels press seed directly into the bottom of the seed trench. By firming all seeds into the moist soil at a uniform depth, Seed-Lok promotes more even plant emergence and higher yields.

For information on adjusting Seed-Lok firming wheels, refer to “**Seed-Lok**” on page 41.

To order Seed-Lok, contact your Great Plains dealer.

Seed-Lok Bundle	Part Number
Removable 5-in. Seed-Lok, 00 and 10 Series	122-193K
Removable 5-in. Seed-Lok, 20 Series	122-195K



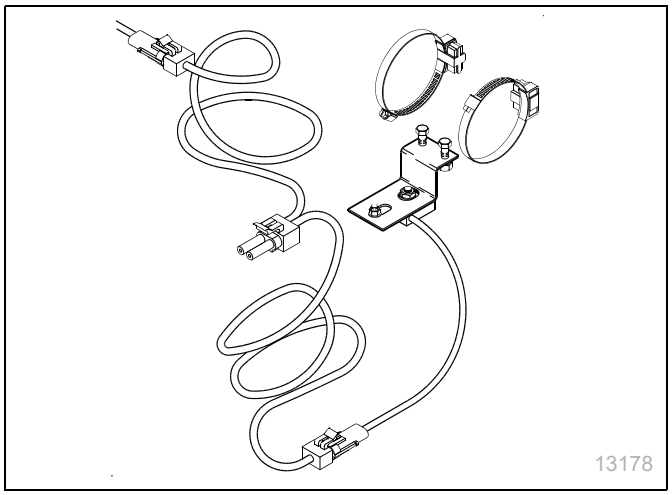
Shaft Monitor

The optional shaft monitor detects when the seed-cup shaft stops turning. If the shaft stops for more than 20 seconds, an alarm sounds and a warning light flashes.

For information on how to operate the shaft monitor, refer to “**Shaft Monitor Operation**” on page 20.

To order shaft monitors, contact your Great Plains dealer.

Monitor Bundle	Part Number
Vansco 2-Channel Shaft	116-120A



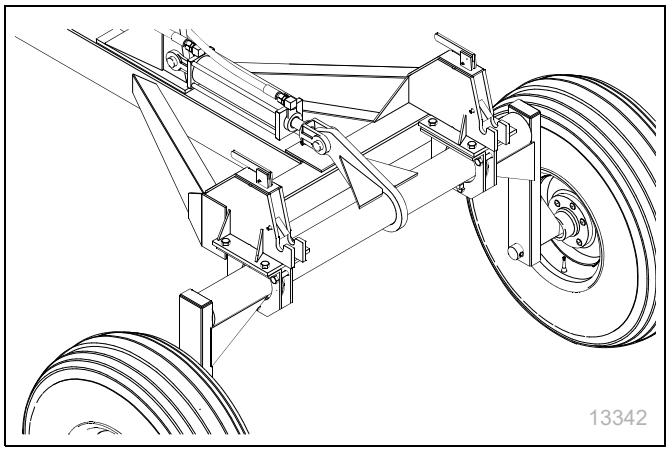
Three-Point Pull Package

The Great Plains Pull Package is available to turn your three-point drill into a pull-type unit. It comes equipped with single wheels for a 12- or 15-foot drill or dual wheels for a 20-foot drill.

For information on operating your drill with the pull hitch, refer to “**Field Operation**” on page 19. For lubrication points, refer to “**Maintenance and Lubrication**” on page 45.

To order the pull hitch, contact your Great Plains dealer.

Pull Hitch Package	Part Number
12- and 15-Foot three-point	124-025A
20-Foot three-point Pull Hitch	124-027A



Rear Mount Boom

The drill boom mounts under the walkboard and allows you to apply liquid herbicides or pesticides behind the drill press wheels. The kit includes mounting hardware, boom plumbing and nozzle bodies for 20-inch spacing. Tractor tanks, pump, plumbing to the drill and nozzles are required.

To order the boom, contact your Great Plains dealer.

Package	Part Number
20-Foot Spray Boom	116-198A

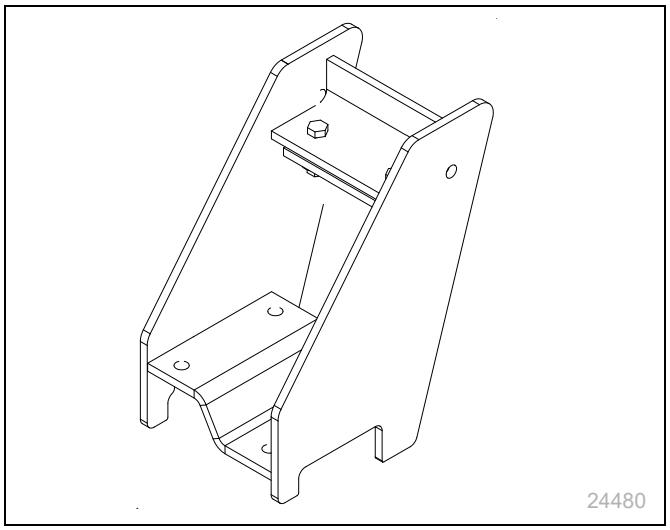
Weight Bracket Kit

The optional weight bracket kit is used to add weight to the drill frame.

📖 This kit comes with a pair left-hand and right-hand weight brackets. The right-hand weight bracket is shown in the illustration on the left.

To order the Weight Bracket Kit, contact your Great Plains dealer.

Package	Part Number
20F/24F Weight Bracket Kit	118-072A



Specifications and Capacities

12 Series Drills		15 Series Drills	20 Series Drills
Tractor Requirements	Category II or III		
Hydraulic Circuits		1 (markers)	
Hitch	3-point (or pull-type with accessory)		
Width	12 ft. (3.66 m)	15 ft. (4.57 m)	20 ft. (6.10 m)
Clearance	{depends on tractor 3-point lift height}		
Height		8 ft. 4 in.	
Tire Size	9.5L x 15	9.5L x 15	11L x 15
Seed Box Capacity	2.4 bushels per linear foot (289.04 L/m)		
Fertilizer Attachment Capacity	1 cubic foot per linear foot (94.4 L/m)		
Small Seeds Box Attachment Capacity	0.24 bushel per linear foot (27.7 L/m)		

Drill Weights (lb/kg)									
	12-Foot Drills			15-Foot Drills			20-Foot Drills		
Rows	Straight-	Parallel-	Side-	Straight-	Parallel-	Side-	Straight-	Parallel-	Side-
6-in.	2959/1342	N.A.	N.A.	3573/1621	N.A.	N.A.	4780/2168	N.A.	N.A.
7-in.	2719/1233	3079/1397	N.A.	3333/1512	3801/1724	N.A.	4420/2005	5032/2282	N.A.
7.5-	2659/1206	2346/1064	3856/174	3213/1457	3645/1653	4725/2143	4300/1950	4876/2212	6316/286
8-in.	2599/1179	2271/1030	3733/169	3093/1403	3489/1583	4479/2032	4180/1896	4720/2141	6070/275
10-in.	2359/1070	2105/955	3241/147	2853/1294	3177/1441	3987/1808	3820/1733	4252/1929	5323/241

Number of Rows			
Row Spacing	12 Series	15 Series	20 Series
6 in.	24	30	40
7 in.	20	26	34
7.5 in.	19	24	32
8 in.	18	22	30
10 in.	14	18	24

Tire Warranty Information

All tires are warranted by the original manufacturer of the tire. Tire warranty information is found in the brochures included with your Operator's and Parts Manuals or online at the manufacturer's web sites listed below. For assistance or information, contact your nearest Authorized Farm Tire Retailer.

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

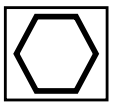
Tire Inflation Chart

Tire Size	Inflation PSI
9.5L x 15 in. 6-Ply Rib Implement	44
265/70B16.5 NHS Skid Steer	60

Tire Size	Inflation PSI
11L x 15 in. 8-Ply Rib Implement	44

Appendix

Torque Values Chart

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

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

a. in-tpi = nominal thread diameter in inches-threads per inch

b. N· m = newton-meters

c. mm x pitch = nominal thread diameter in mm x thread pitch

d. ft-lb = foot pounds

Torque tolerance + 0%, -15% of torquingvalues. Unless otherwise specified use torquevalues listed above. 25199

Great Plains
"Harvest Starts Here."

WARRANTY

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

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

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

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

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

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

Effective July 15, 2020

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