

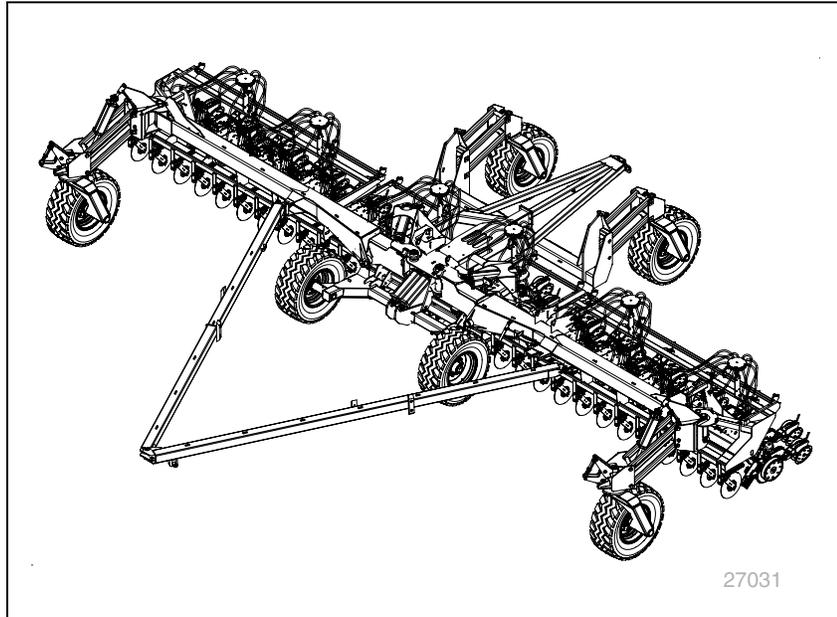
Operator Manual

3N-4010HDA

3-Section 40-Foot No-Till Air Drill Implement



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



Illustrations may show optional equipment not supplied with standard unit or may depict similar models where a topic is identical.

ORIGINAL INSTRUCTIONS



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196-444M

Machine Identification

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

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

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

Dealer Contact Information

Name: _____

Street: _____

City/State: _____

Telephone: _____

Email: _____

Dealer's Customer No.: _____

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



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Printed in the United States of America

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Important Safety Information

Look for Safety Symbol

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

Be Aware of Signal Words

Signal words designate a degree or level of hazard seriousness.

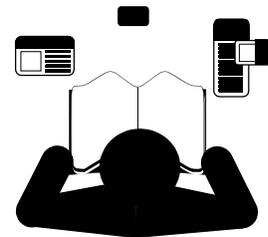
DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is limited to the most extreme situations, typically for machine components that, for functional purposes, cannot be guarded.

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

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

Be Familiar with Safety Decals

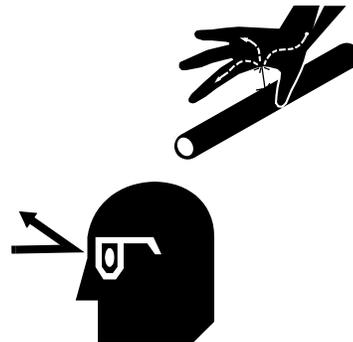
- ▲ Read and understand “*Safety Reflectors and Decals*” on page 6, thoroughly.
- ▲ Read all instructions noted on the decals.
- ▲ Keep decals clean. Replace damaged, faded and illegible decals.



Avoid High Pressure Fluids

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

- ▲ *Avoid the hazard by relieving pressure before disconnecting hydraulic lines.*
- ▲ *Use a piece of paper or cardboard, NOT BODY PARTS, to check for suspected leaks.*
- ▲ *Wear protective gloves and safety glasses or goggles when working with hydraulic systems.*
- ▲ *If an accident occurs, seek immediate medical attention from a physician familiar with this type of injury.*



Use A Safety Chain

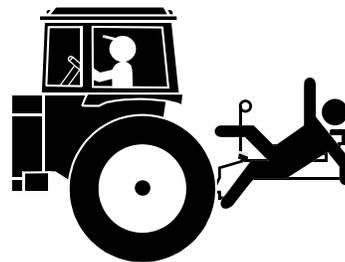
- ▲ *Use a safety chain to help control drawn machinery should it separate from tractor drawbar.*
- ▲ *Use a chain with a strength rating equal to or greater than the gross weight of towed machinery.*
- ▲ *Attach chain to tractor drawbar support or other specified anchor location. Allow only enough slack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



Keep Riders Off Machinery

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

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



Check for Overhead Lines

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

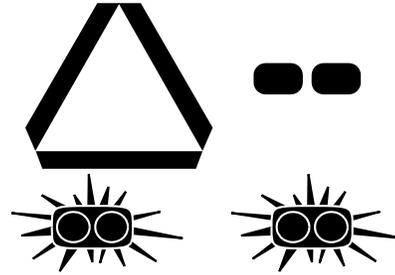
- ▲ *Avoid overhead lines during seed loading/unloading and marker operations.*



Use Safety Lights and Devices

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

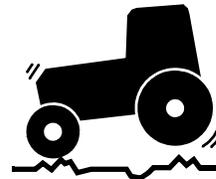
- ▲ Use flashing warning lights and turn signals whenever driving on public roads.
- ▲ Use lights and devices provided with the drill.



Transport Machinery Safely

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

- ▲ Do not exceed 20 mph (32 kph). Never travel at a speed which does not allow adequate control of steering and stopping. Reduce speed if towed load is not equipped with brakes.
- ▲ Comply with national, regional and local laws.
- ▲ Follow your tractor manual recommendations for maximum hitch loads. Insufficient weight on tractor steering wheels will result in loss of control.
- ▲ Carry reflectors or flags to mark drill in case of breakdown on the road.
- ▲ Keep clear of overhead power lines and other obstructions when transporting. Refer to transport dimensions under “Specifications and Capacities” on page 74.



Wear Protective Equipment

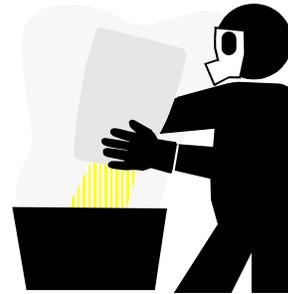
- ▲ Wear protective clothing and equipment.
- ▲ Wear clothing and equipment appropriate for the job. Avoid loose-fitting clothing.
- ▲ Because prolonged exposure to loud noise can cause hearing impairment or hearing loss, wear suitable hearing protection such as earmuffs or earplugs.
- ▲ Because operating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



Handle Chemicals Properly

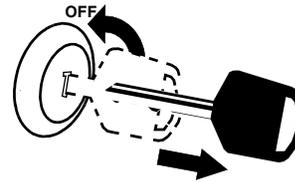
Agricultural chemicals can be dangerous. Improper use can seriously injure persons, animals, plants, soil and property.

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



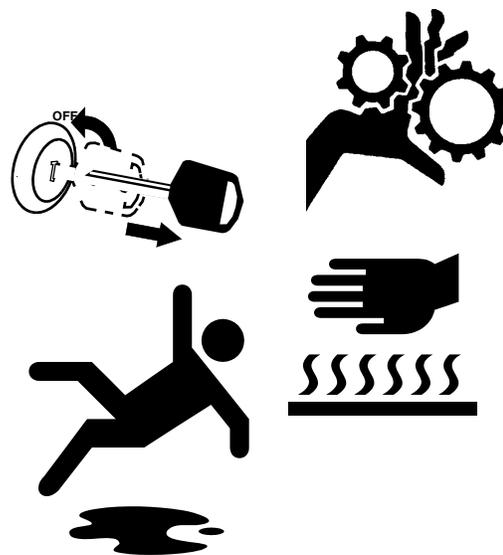
Shutdown and Storage

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



Practice Safe Maintenance

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



Tire Safety

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

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



Prepare for Emergencies

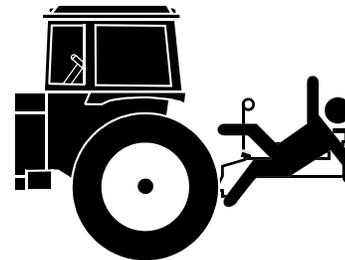
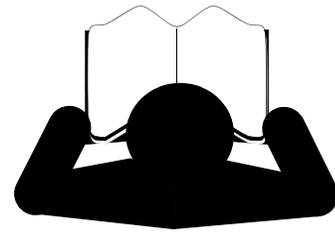
- ▲ *Be prepared if a fire starts*
- ▲ *Keep a first aid kit and fire extinguisher handy.*
- ▲ *Keep emergency numbers for doctor, ambulance, hospital and fire department near phone.*



Safety At All Times

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

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



Safety Reflectors and Decals

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

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

To install new decals:

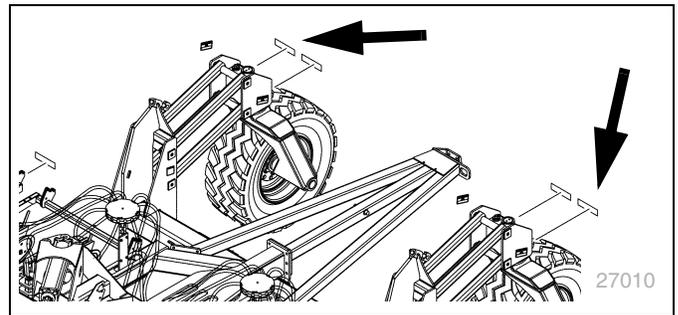
1. Clean the area on which the decal is to be placed.
3. Peel backing from decal. Press firmly on surface, being careful not to cause air bubbles under decal.

Red Reflectors



838-266C

rear face, outside ends, rear casters;
2 total

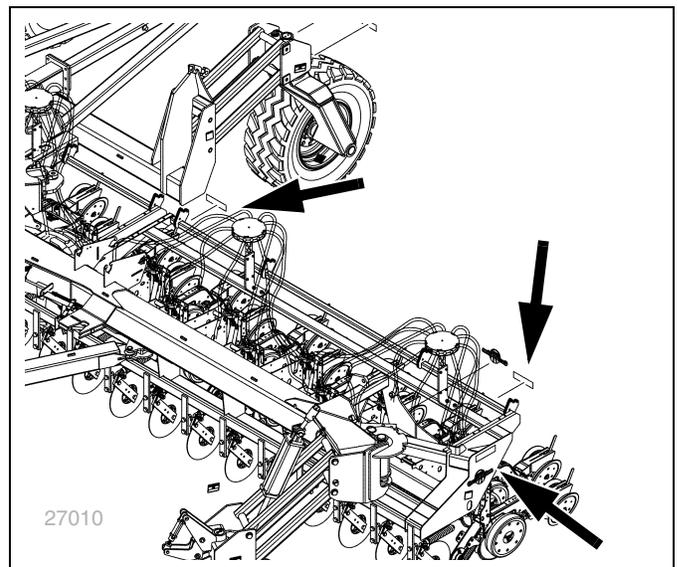


Amber Reflectors



838-265C

rear face, inside ends, wing tower tool bars,
rear face, outside ends, wing tower tool bars,
outside face of wing end plates;
6 total

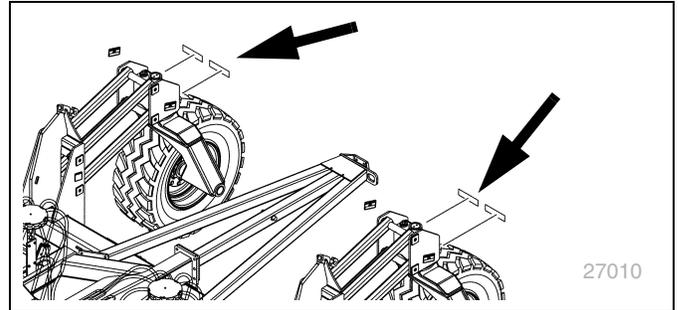


Daytime Reflectors



838-267C

rear face, rear casters, inboard of red reflectors;
2 total

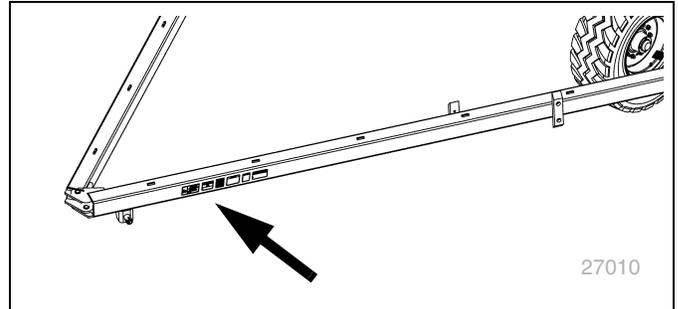


Danger: Read Manual

848-512C



On tongue at hitch;
1 total

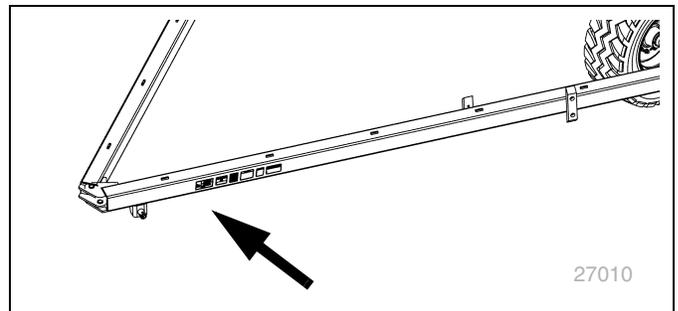


Danger: Pinch/Crush Hazard



818-590C

On outside of left tongue near hitch;
1 total

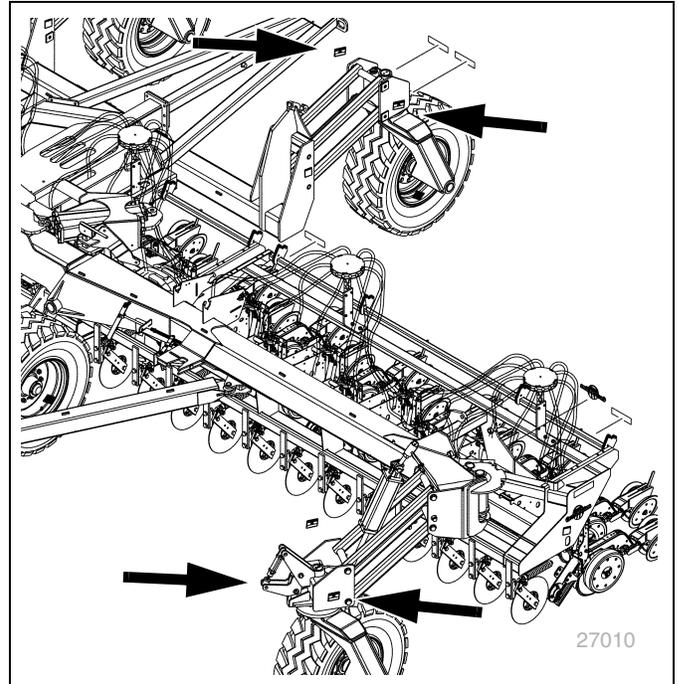


Warning: Pinch/Crush Hazard



818-045C

inside and outside faces, all caster pivots;
8 total

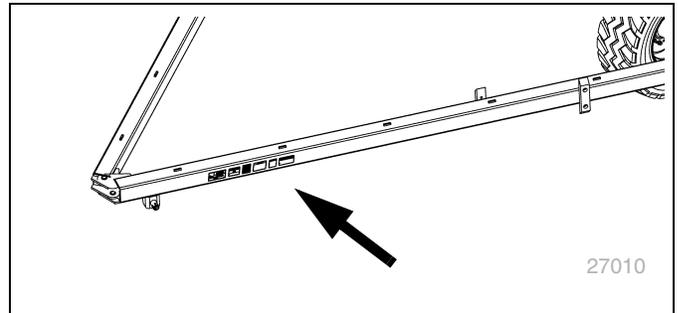


Warning: Excessive Speed Hazard



818-188C

On outside of left tongue near hitch;
1 total

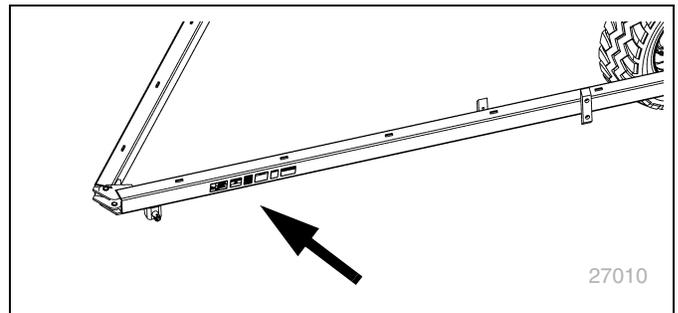


Warning: High Pressure Fluid



818-339C

On outside of left tongue near hitch;
1 total

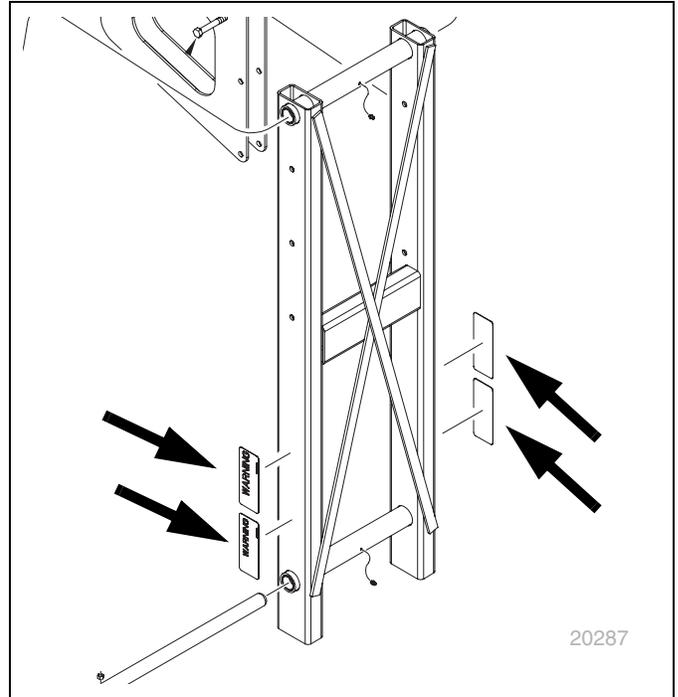


Warning Marker Pinch Point (Option)



818-579C

on either side of inner marker arm,
two each marker installed;
2 or 4 total

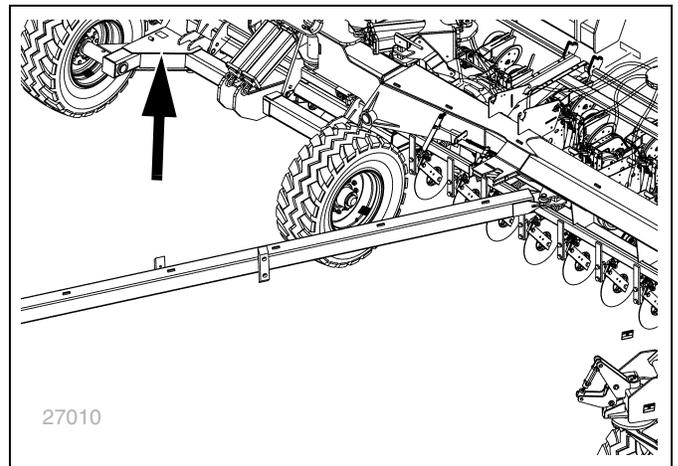


Warning Overhead Marker (Option)



818-580C

on either side of inner marker arm,
two each marker installed;
2 or 4 total

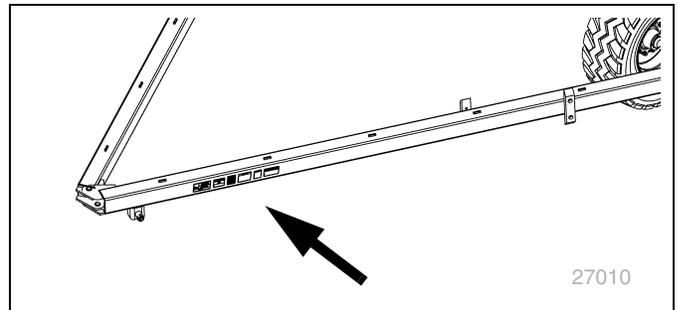


Caution: Tires Not A Step



818-398C

Top face, each side of rockshaft;
2 total



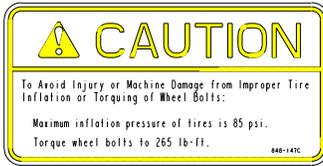
Caution: General



818-587C

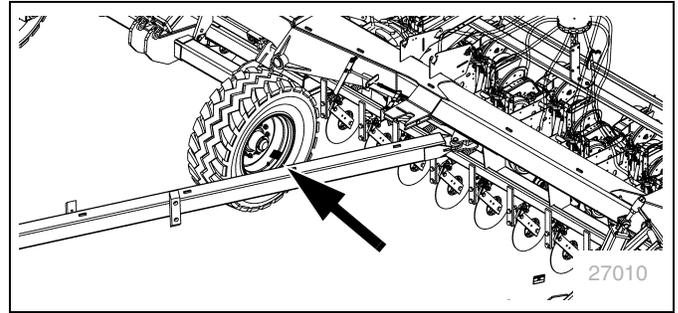
On outside of left tongue near hitch;
1 total

Caution: 85 PSI Tire Pressure



848-147C

On rim of each wheel;
6 total





Introduction

Great Plains welcomes you to its growing family of new product owners. Your 3-Section 40-Foot No-Till Air Drill Implement has been designed with care and built by skilled workers using quality materials. Proper setup, maintenance, and safe operating practices will help you get years of satisfactory use from the machine.

Document Family

196-444M	Operator Manual (this document)
196-444P	3N-4010HDA Parts Manual
167-085B	Seed Rate Manual
167-085M	Air Cart Operator Manual
110011445	DICKEY-john Air Cart Operator
110011461	3N40 QUICKSTART GUIDE

Description of Unit

The 3N-4010HDA is a pull-type 3-section folding drill intended to pull, and take seed from, a trailing ADC-2350B air cart. The drill has a working width of 40 feet (12.2 m). The drill has 10HD Series Heavy Duty parallel-arm double disk openers. The opener disks make a seed bed, and seed tubes mounted between the disks place seed in the furrow. Press wheels following the opener disks close the furrow and gauge opener seeding depth. Each opener body is independently adjustable for both for seeding depth and row unit down-force.

Intended Usage

Use this drill to seed production-agriculture crops in no till or minimum tillage applications. Do not modify the drill for use with attachments, accessories or uses other than those specified by Great Plains.

Models Covered

3N-4010HDA:
 3N-4010HDA-4810 (10 in / 24 cm)
 3N-4010HDA-6675 (7.5 in / 19 cm)



Manual Family QRC

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

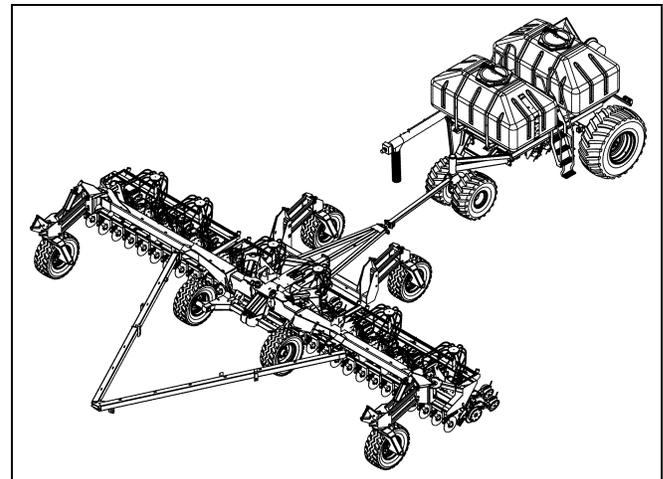
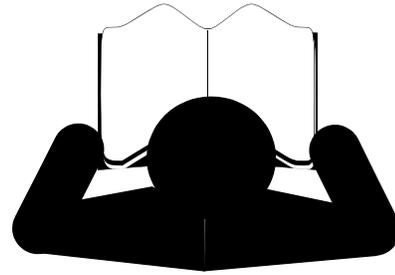


Figure 1
3N-4010HDA and Air Cart

27114



Dealer QRC

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

Using This Manual

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

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

Definitions

The following terms are used throughout this manual.

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

NOTICE

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

Read and follow the directions to:

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

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

Further Assistance

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

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

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

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

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

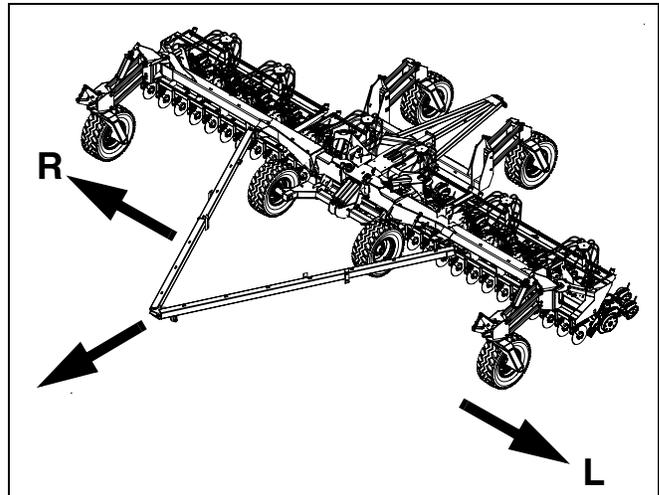


Figure 2
Left/Right Notation

27031



Preparation and Setup

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

Pre-Setup Checklist

1. Read and understand “**Important Safety Information**” on page 1.
2. Check that all working parts are moving freely, bolts are tight, and cotter pins are spread.
3. Check that all grease fittings are in place and lubricated. See “**Lubrication**” on page 64.
4. Check that all safety decals and reflectors are correctly located and legible. Replace if damaged. See “**Safety Reflectors and Decals**” on page 6.
5. Inflate tires to pressure recommended and tighten wheel bolts as specified. “**Appendix**” on page 74.

Hitching to Tractor

⚠ DANGER

Crushing Hazard:

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

Choose a drill-hitch option (page 71) that is compatible with your tractor drawbar.

The 3N-4010HDA has three hitch options:

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

Always use a locking-style hitch pin sized to match the holes in the hitch and drawbar, and at least 1½in (3.8cm) in diameter.

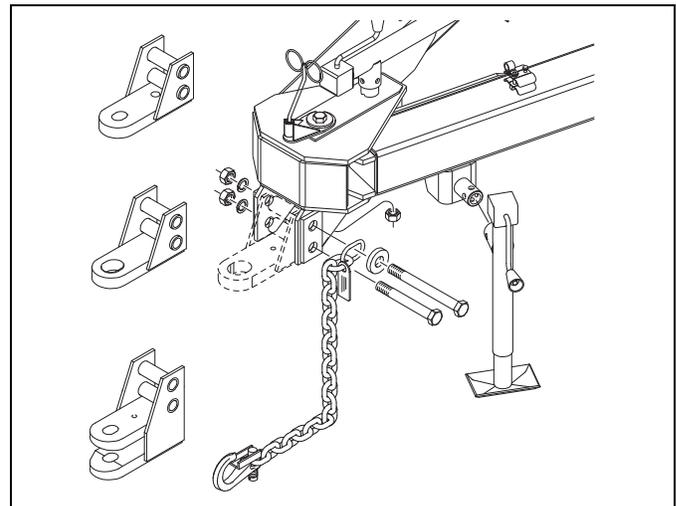
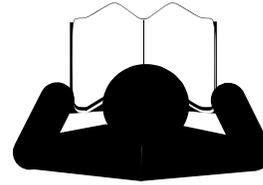


Figure 3
Hitch Options

27061

Refer to Figure 4

1. Adjust the drill hitch to match your tractor-drawbar height, using crank of tongue jack on side of tongue.
 - 📖 The precise height is not critical, as the drill leveling is set at the mainframe and is independent of tongue level.
 - 📖 The hitch may be mounted inverted if necessary, but always have two (2) bolts in two holes of both tongue and hitch.
2. Securely attach safety chain to an anchor on a tractor capable of pulling the drill.



Figure 4
Drill Hitched

20273

Refer to Figure 5

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

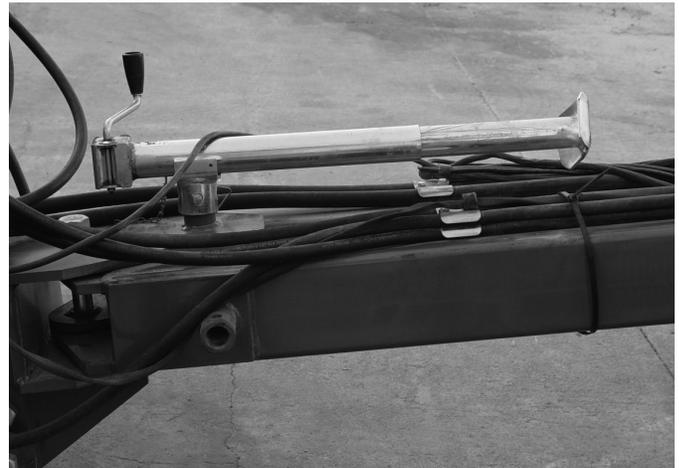


Figure 5
Jack in Storage Location

20272

Tractor Electrical Connections**Refer to Figure 6**

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

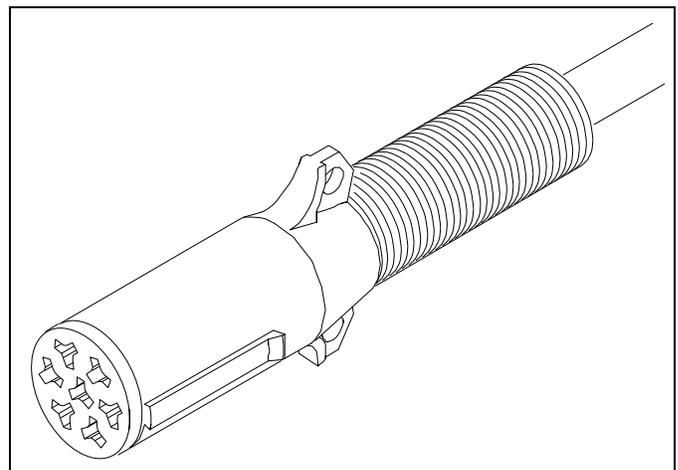


Figure 6
Lighting Connector

26467

Refer to Figure 7

Connect the tractor and drill 9-pin seed monitor connectors at the hitch.

If this is the first connection, it may first be necessary to install the seed monitor terminal in the tractor cab. See page 19.

Cart Connections

There are also electrical connections between the drill and trailing air cart. The steps for making these connections are detailed in the air cart Operator manual.

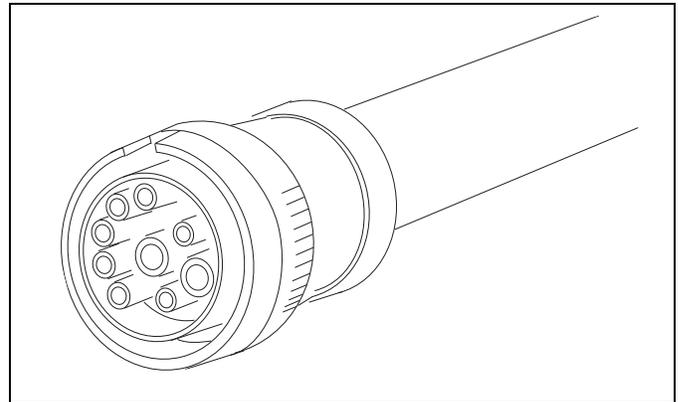


Figure 7
Seed Monitor Connector

27080

Tractor Hydraulic Hose Hookup

WARNING

High Pressure Fluid Hazard:

Only trained personnel should work on system hydraulics!

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

Refer to Figure 8

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

1. Connect sump return line.
2. Connect pass-through fan hoses to circuit designated for hydraulic-motor control.
3. Connect transport-lift hoses to tractor remote valve.
4. Connect fold/marker hoses to tractor remote valve.
5. Connect lock hoses to tractor remote valve.

Sump First and Last

Seals in the hydraulic fan motor can be damaged if the return line is pressurized. Always connect the SUMP hose first and disconnect it last. The sump hose has a larger (1.06in) quick-connect coupling.

NOTICE

The hose, and large connector, labeled SUMP refers to high volume hydraulic motor return and should always be connected to the port on the tractor capable of handling high volume low pressure return oil. DO NOT connect this line to low volume case drain lines or low volume sump lines on the tractor. See tractor manufactures recommendations for high volume hydraulic motor return.

Fan Priority

If your tractor has a priority circuit for hydraulic motors, connect the auger/fan (Yellow) to this circuit. The fan uses only the Extend side of this circuit (return flow is via Sump line).

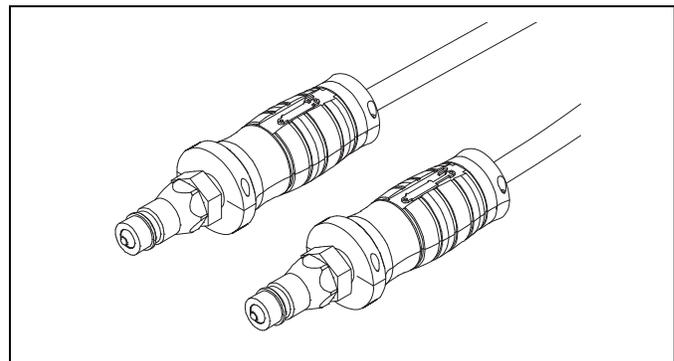
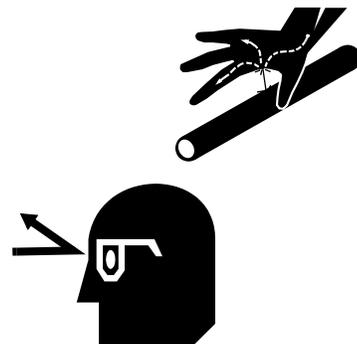


Figure 8
Color Coded Hose Grips

31733

Color	Hydraulic Function
Blue	Drill Lift Cylinders
Gray	Drill: Fold Cylinders via selector valve if installed to: Optional: Markers
Yellow	Drill: <no function> pass-through to Cart: Fan and Auger (Extend side of circuit only)
Orange	Drill: Lock Cylinders
<none>	Drill: <no function> pass-through to Cart: Sump: Fan/Auger Return

Cart Hydraulics

There is also a hydraulic connection between the drill and trailing air cart. The steps for making this connection are detailed in the air cart Operator manual.

Older Style Hoses with Color Ties

Refer to Figure 9

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

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

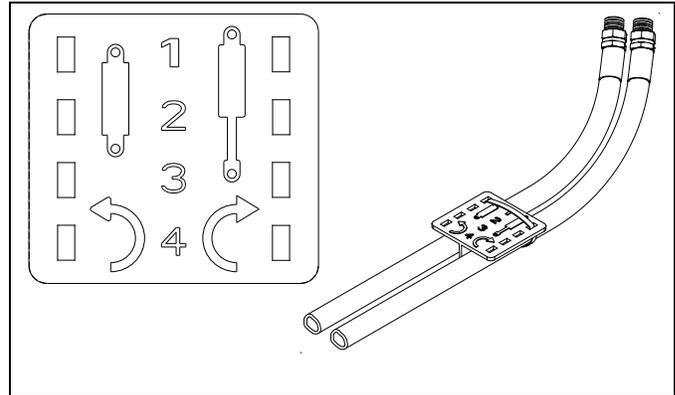


Figure 9
Older Style Hoses with Label

817-348c
17641

Color	Hydraulic Function
Blue	Drill Lift Cylinders
White	Drill: Fold Cylinders via selector valve if installed to: Optional: Markers
Yellow	Drill: <no function> pass-through to Cart: Fan and Auger (Extend side of circuit only)
Orange	Drill: Lock Cylinders
<none>	Drill: <no function> pass-through to Cart: Sump: Fan/Auger Return

Hydraulic Charge

The hydraulic system was fully charged and bled when the drill left the factory. If any changes were made prior to delivery (such as installing markers), or there is any question about the status of the system, see “**Bleeding Hydraulics**” on page 53.

After some use, it is normal for the lift cylinders to get out of phase. If one or more sections are not fully lifting, or are lifting to different heights, see “**Re-phasing Lift System**” on page 23.

Drill Level

A new drill has been aligned at the factory and should not require adjustment prior to first use. Level needs to be checked periodically, and possibly adjusted.

See “**Leveling Drill**” on page 55

- “**Side-to-Side Level**” on page 55
- “**Front-to-Back Level**” on page 56
- “**Section Alignment**” on page 57

Hitch Air Cart

Consult the air cart Operator manual for detailed instructions on hitching. Secure pintle hitch before making seed hose connections.

Connect Seed Hoses

Refer to Figure 10

Inspect the gasket on the cart side of the bulkhead and replace if not intact.

Making sure that neither hose bundle is rotated, mate the air cart and drill main seed tube bulkheads.

Secure them with the latches.

Make electrical and hydraulic connections at bulkhead.

Attach safety chain.

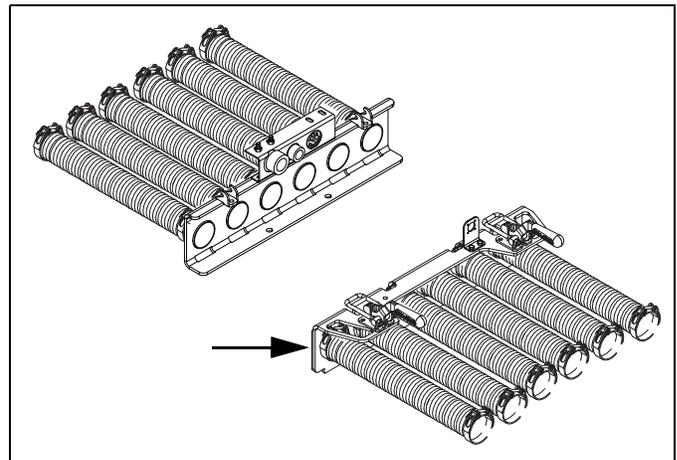


Figure 10
Cart-Drill Bulkheads

27082

Install Seed Monitor Terminal

The ADC2350B cart's standard seed monitor system includes a virtual terminal that must be mounted in the tractor cab. As supplied by DICKEY-john, the kit includes an "H" bracket for any modules, and a ball swivel for mounting the bracket in the tractor.

NOTICE

Mount the modules so that they are easy to observe during planting, but do not interfere with safe operation of the tractor in the field or on public roads.

The ball swivel includes four 10-32 screws. You or your dealer must provide the mounting holes for the screws. Your dealer may have alternate suction cup or clamping brackets available if you prefer to avoid drilling holes.

See the DICKEY-john manual for harness connections. The monitor needs to be configured with information about your air drill, after hitching and electrical connections. See **"Setup Seed Monitor for Air Drill"** in air cart Operator manual.

Once configured for your air drill and your material, the seed monitor performs the following functions:

On the Air Cart:

- Fan Speed monitoring
- Hopper material level monitoring
- Hopper air pressure monitoring
- Meter rate monitoring
- Ground speed monitoring

On the Drill:

- Drill lift switch monitoring
- Seed flow blockage detection (optional)

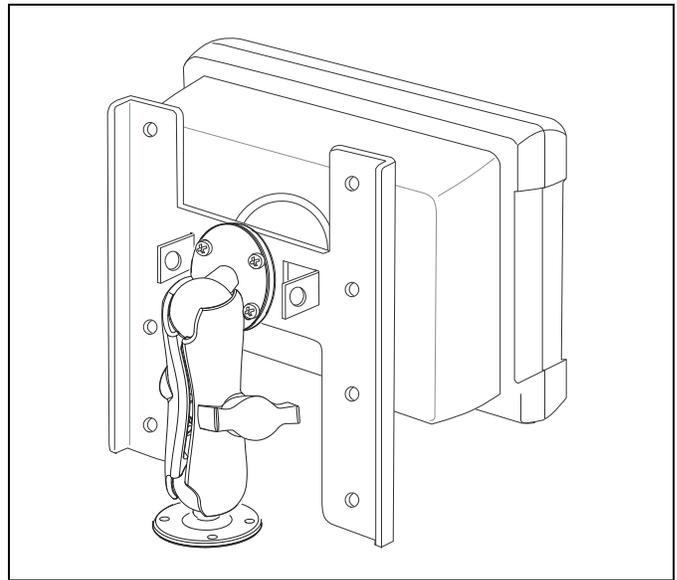


Figure 11
Terminal and Mount Hardware

26429

Marker Setup

If markers were ordered with the drill, they were factory-installed. If they were ordered separately, install them now, per the instructions included with the markers.

1. Review “**Marker Operation**” on page 28.
2. Bleed the marker circuit. See “**Bleeding Marker Hydraulics**” on page 61.
3. If you know that your conditions require a specific marker disk orientation, change it now. See “**Marker Disk Adjustment**” on page 48.
4. Adjust marker speed. See “**Marker Speed**” on page 62.
5. Set the initial marker extension, below.
6. Fold the markers.

Initial Marker Extension

Marker Extension is the distance from the centerline of the outboard row unit on each side to the centerline of the mark left in the ground by the marker.

The 3N-4010HDA is symmetrical, and the values are the same on each side and independent of next pass direction. On a dual-marker drill, set each side.

To change marker extension:

If this is not the first adjustment to marker length.

1. Position drill on level ground and lower to planting position.
2. Fully extend a marker.
3. If you plan to change the marker blade angle or invert the blade, make that adjustment now (see page 48).
4. Pull forward several feet to leave a mark.
5. Sighting along a line parallel to a tool bar, measure the distance from the outside row unit centerline (opener discs or furrow) to the mark. If the distance matches the suggested value above, no marker extension adjustment is needed.
6. Loosen U-bolt nuts ① securing outer marker tube ②.
7. Slide the tube in or out to change extension. Secure the nuts.
8. Pull forward and re-measure new mark. Return to step 6 if further adjustment is needed.

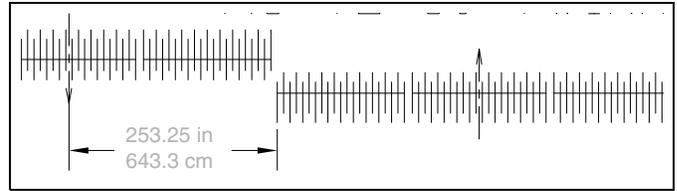


Figure 12 - Marker Extension for 7.5 in (19.5 cm) Rows 20361

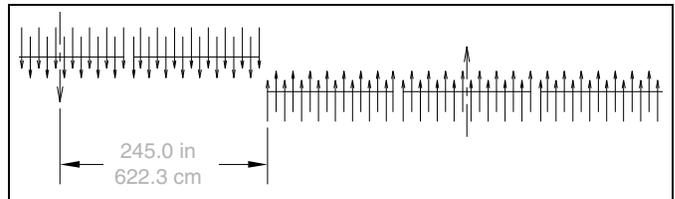


Figure 13 Marker Extension for 10 in (25.4 cm) Rows 20361

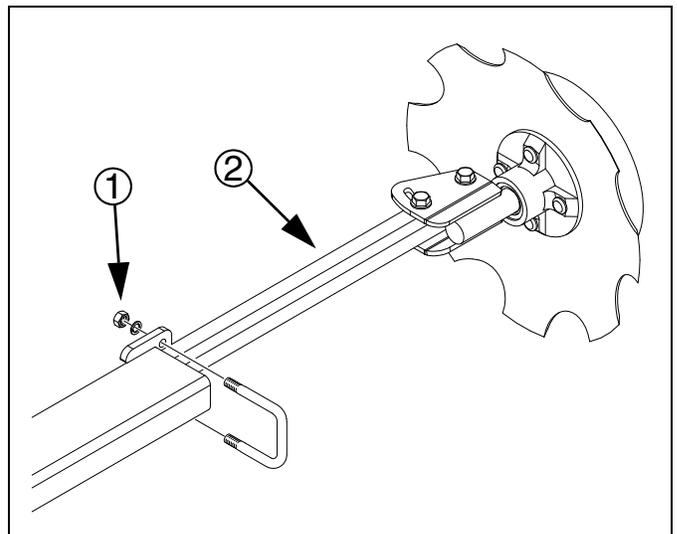


Figure 14 Adjust Marker Extension 18878



Operating Instructions

This section covers general operating procedures. It assumes that Setup items have been completed for both drill and air cart.

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

General Description

Drill hydraulic functions (except fold and markers) are on separate circuits for lift, lock, and air cart. The Fold circuit may be shared, if optional Markers are present and a selector valve is installed.

Field operations are entirely controlled from the tractor cab. Setup and loading operations require setting valve handles on the drill and air cart.

Planting Operation

Via an adjustable lift switch on the drill, the 3N-4010HDA controls the meter drive clutch on the air cart, turning it on and off as the drill is lowered and raised.

Seed is delivered to the row units by air, powered by the fan on the air cart. Seed rate is determined by air cart setup, and the cart meter rate self-adjusts for changes in ground speed. Seeding stops when motion stops or the drill is raised.

The metered seed is carried by air through the hoses to the distribution towers on the drill. These towers then divide the air and seed into individual rows.

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

Pre-Start Checklist

- ? Lubricate the drill as indicated under Lubrication, **“Maintenance and Lubrication”** on page 52.
- ? Check the tires for proper inflation according to **“Tire Inflation Chart”** on page 62.
- ? Check for worn or damaged parts and repair or replace before going to the field.
- ? Check all nuts, bolts and screws. Tighten bolts as specified on **“Torque Values Chart”** on page 75
- ? Check drill lift switch on drill
- ? Complete all pre-start checklist items on the air cart.

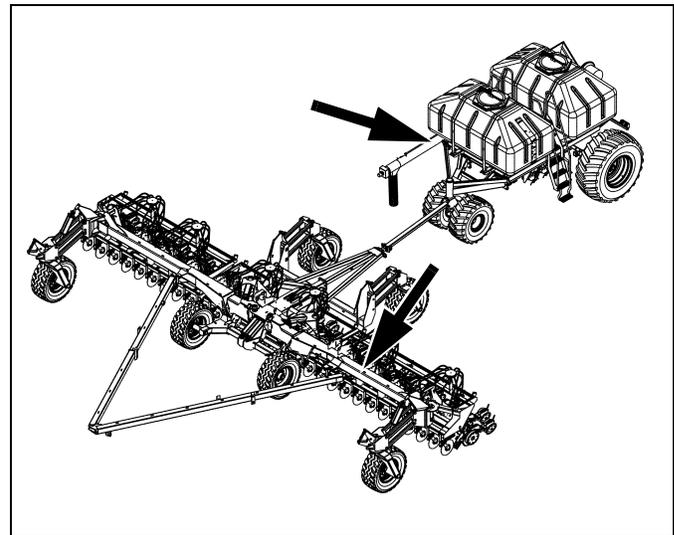
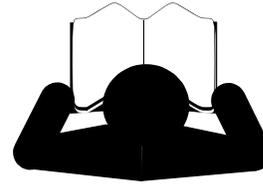
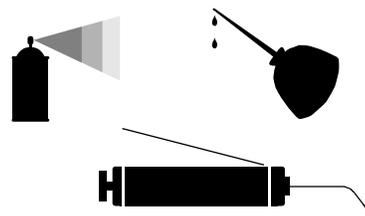


Figure 15
Selector Valve Locations

27114



Raising and Lowering (Lift)

The drill Lift function is used only when the drill is unfolded. The drill must be fully lifted and locked when folded.

When unfolded, the lift function is used for headland turns, adjustments and maintenance, and in preparation for folding.

Raising

1. Operate the tractor lever for the Lift circuit to fully extend the lift cylinders. Set lever to Neutral to hold at lift. If raising for turns or short field moves, lift is complete.
2. If lifting for adjustments, maintenance or in preparation for Fold, install lift locks.

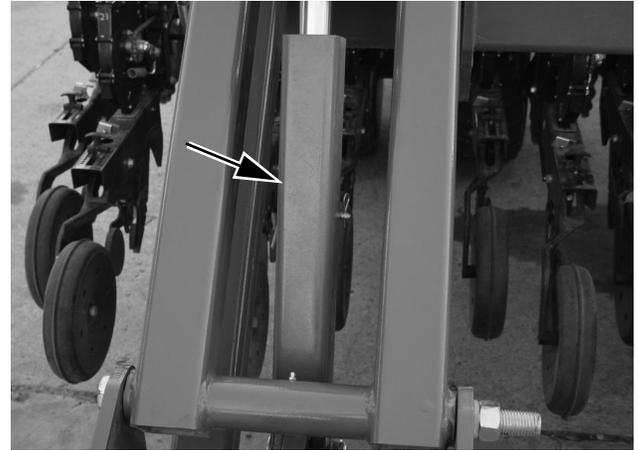


Figure 16
Rear Lift Cylinder Lock

20264

Lift Locks

Refer to Figure 16

3. Remove lock channels from storage locations on the rockshaft.
4. Install lock channels over extended lift cylinder rods. Six cylinder rods total.

Lowering

Lower drill only when fully unfolded.

1. Extend lift cylinders to fully raised (in case cylinders have settled against lock channels). Set circuit lever to neutral.
2. Remove lock channels and stow them at their storage locations.
3. Retract lift cylinders and fully lower drill.

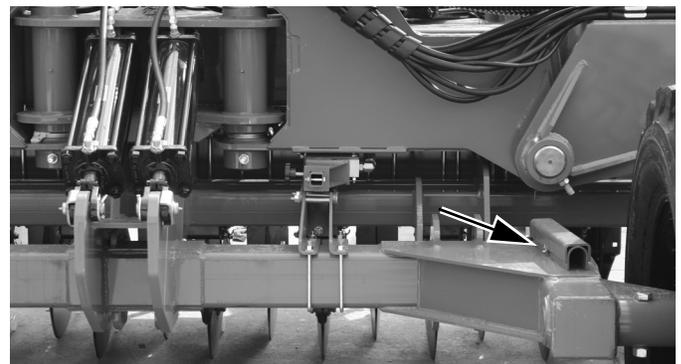


Figure 17
Rockshaft Lock Channel

27189

Lock Channel Storage

Refer to Figure 18

When not in use, install the lock channels in the storage positions.

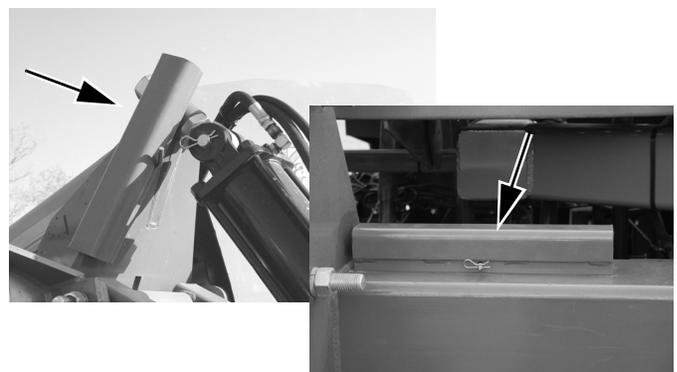


Figure 18
Lock Channel Storage

20268

20269

Re-phasing Lift System

Over a period of normal use the cylinders may get out of phase. This will cause some drill sections to run higher than others. To rephase cylinders:

1. Raise the drill completely and hold the hydraulic remote lever on for several seconds until all cylinders are fully extended. Do this every 3 or 4 times you raise drill out of ground.
2. When all cylinders are fully extended, momentarily reverse hydraulic remote lever to Retract height $\frac{1}{2}$ in (6.3 cm) to maintain levelness.

Fold Selector Valve

If optional markers are installed the hydraulic circuit is shared with the fold cylinders. A selector valve on the drill switches the circuit between Fold and Markers.

Refer to Figure 19
(a front view of the valve set for Marker operations)

The drill selector valve is located on the left wing tool bar near the tongue drawbar.

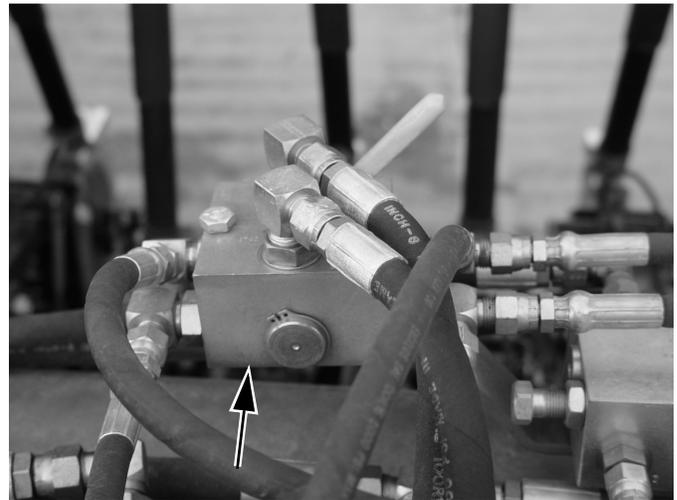


Figure 19
Fold/Marker Selector Valve

21844

Folding

WARNING

Pinch Point and Crushing Hazard:

To prevent serious injury or death:

- ▲ Always use transport locks when drill is folded.
- ▲ Fold only if hydraulics are bled free of air and fully charged with hydraulic oil.
- ▲ Stay away from frame sections when they are being raised or lowered.
- ▲ Keep away and keep others away when folding or unfolding drill.

Fold the drill on level ground with the tractor in neutral.

NOTICE

The hitch-to-hitch length of the 3N-4010HDA increases by 12 feet (3.7m) during folding. Allow at least 12 feet (3.7m) of clearance ahead of and behind the complete air drill assembly when folding.

Tractor can move forward during folding, if tractor is in neutral with brakes released.

Center section of drill, and hitched air cart, can move backward during folding if tractor is in Park, has brakes set, or otherwise cannot move.

1. Raise drill with lift cylinders until cylinders are fully extended.
2. Install lift locks. See **"Raising"** on page 22.
3. Set the drill Fold/Marker selector valve to the Fold cylinder circuit. See **"Fold Selector Valve"** on page 23
4. Retract the Lock cylinder circuit lever to: disengage the tool bar lock, disengage swivel locks, disengage caster locks, and enable the self-latching transport lock. Set circuit to neutral.
5. Extend the Fold cylinder circuit lever to slowly fold wings forward. The transport lock automatically captures the right wing tool bar for transport.

It may be necessary to ease forward slightly with the tractor to assist wings in folding completely.

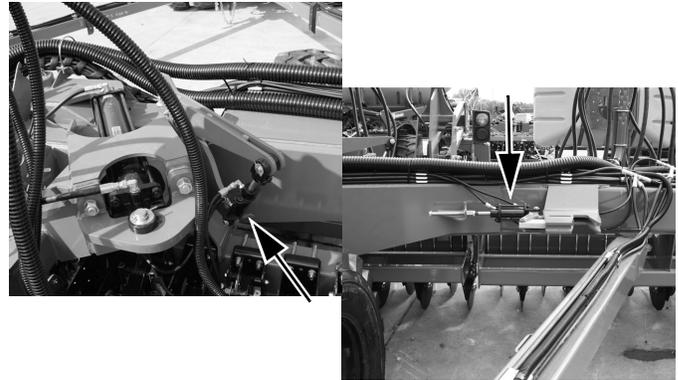


Figure 20 Tool Bar & Transport Lock Cylinders

27184
28185



Figure 21 Swivel Lock Cylinder

27183

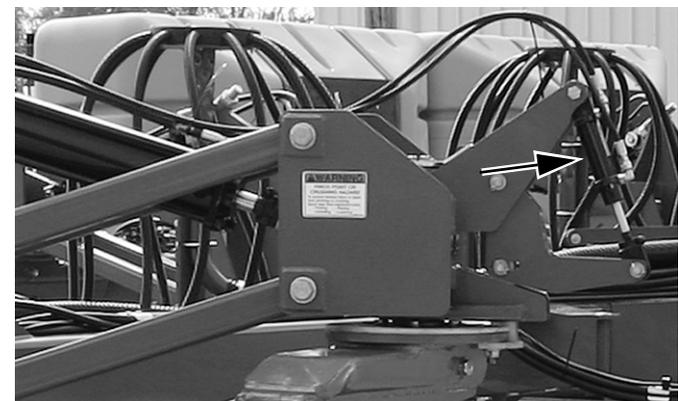


Figure 22 Caster Lock Cylinder

21842

Unfolding

WARNING

To prevent serious injury or death:

- ▲ *Always use transport locks when drill is folded.*
- ▲ *Fold only if hydraulics are bled free of air and fully charged with hydraulic oil.*
- ▲ *Stay away from frame sections when they are being raised or lowered.*
- ▲ *Keep away and keep others away when folding or unfolding drill.*

Unfold the drill on level ground with the tractor transmission in neutral.

NOTICE

The hitch-to-hitch length of the 3N-4010HDA decreases by 12 feet (3.7m) during unfolding.

Keep all persons away from all drill wheels, and the air cart wheels during unfolding.

Tractor can move backward during folding, if tractor is in neutral with brakes released.

Center section of drill, and hitched air cart, can move forward during folding if tractor is in Park, has brakes set, or otherwise cannot move.

1. If markers are installed, check that the Fold/Marker selector valve is set to the Fold cylinder circuit. See “**Fold Selector Valve**” on page 23.
2. Extend the Lock circuit lever to:
 - enable the tool bar lock,
 - enable the swivel locks,
 - enable the caster locks, and
 - release the transport lock.Set circuit to neutral.
3. Retract the Fold circuit to unfold drill.

The tool bar, swivel and caster locks automatically engage, either at the completion of unfolding, or during next forward movement of the drill.

4. Extend the Lift circuit as needed to raise the lift cylinder bodies off their lock channels.
5. Remove lock channels from all six wheel cylinders. Store lock channels.
6. Lower drill. See “**Lowering**” on page 22
7. If present, set Fold/Marker selector valve to Marker. See “**Fold Selector Valve**” on page 23.

Transport

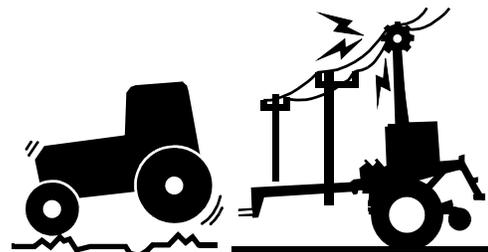
⚠ DANGER

Electrocution Hazard: To prevent serious injury or death from electric shock, keep clear of overhead power lines when transporting, folding, unfolding or operating all air drill components. Machine is not grounded. At higher voltages, electrocution can occur without direct contact.

Great Plains recommends transporting the complete air drill assembly with cart empty. Although designed for highway movement when loaded, the additional weight of seed may cause the complete air drill assembly to exceed the rated ability of the tractor, making the complete air drill assembly more difficult to control and stop, and increases wear on cart tires and wheel bearings.

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

- ▲ Do not exceed 20 mph (32 kph).
- ▲ Do not tow a complete air drill assembly that weighs more than 1.5 times the weight of the towing vehicle. (The tractor must weigh at least $\frac{2}{3}$ or 67% of the complete air drill assembly weight - see table below.)



Drill and Cart Weights* for 3N-4010HDA

Rows	7.5 in (18.9 cm)	10 in (24.8 cm)	7.5 in (18.9 cm)	10 in (24.8 cm)
Base 3N-4010HDA (implement only)	30896 lbs 14014 kg	28736 lbs 13034 kg	30896 lbs 14014 kg	28736 lbs 13034 kg
Add for Frame-Mounted Coulters^a	4026 lbs (1826 kg)	2928 lbs (1328 kg)	4026 lbs (1826 kg)	2928 lbs (1328 kg)
Add for Dual Markers	1860 lbs 844 kg	1860 lbs 844 kg	1860 lbs 844 kg	1860 lbs 844 kg
Add for extra Weights (maximum of 3 sets)	1000 lbs per set (454 kg) per set			
Your Weight Kits^b				
Total: Your Implement Only				
ADC2350B Air Cart	Cart Empty		Cart Full	
	9800 lbs 4445 kg	9800 lbs 4445 kg	34000 lbs 15422 kg	34000 lbs 15422 kg
Total: Your Assembly Configuration^b				
Example: Maximum Possible Configurations	49703 lbs 22545 kg	46445 lbs 21067 kg	73903 lbs 33522 kg	70645 lbs 32044 kg

a. For Unit-Mounted Coulters, use 2640 lbs (1197kg) for the model -6675 and 1920 lbs (871kg) for the -4810.
 b. Cells left blank. Enter the values for your configuration.

Pre-Transport Checklist

Before transporting the cart, check and observe the following items.

- ? Make sure the weight of the tractor equals or exceeds 67% the complete air drill assembly.

Air Cart Checklist Complete

- ? Including: cart drive chain locked-out, auger latched, hopper lids secured, ladders latched up.

Marker Checklist Complete

- ? Markers must be folded in transport carriers.

Drill Folded and Locked

Tires

- ? Check that all tires are properly inflated as listed on “**Tire Information Chart**” on page 74.

Bystanders

- ? Check that no one is in the way before moving. Do not allow any one to ride on the cart or drill.

Warning Lights

- ? Always use tractor, cart and drill warning lights when transporting the air drill.

Clearance

- ? Know the maximum dimensions of the cart and drill in transport position and follow a route that provides adequate clearance from all obstructions, including overhead lines.

See “**Specifications and Capacities**” on page 74.

Stopping Distance

- ? Allow sufficient stopping distance and reduce speed prior to any turns or maneuvers. If the cart is transported full, allow extra stopping distance.

Road Rules

- ? Comply with all national, regional and local laws when transporting on public roads.

Watch Traffic

- ? The cart hoppers obstruct a portion of your rear view. Be prepared for sudden maneuvers from following vehicles.

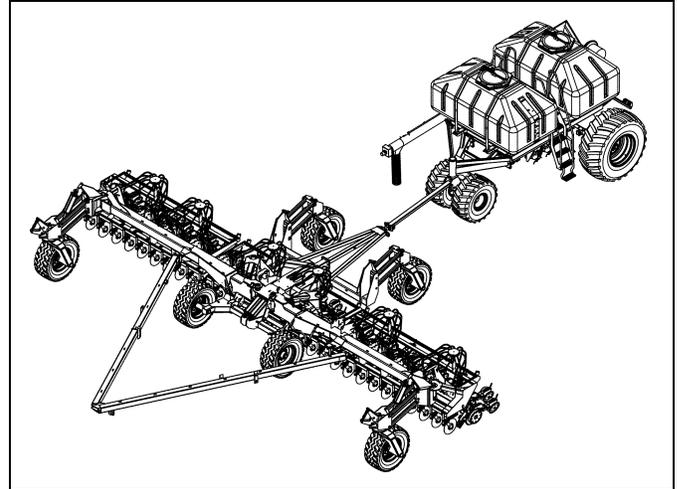


Figure 23
Review Transport Checklist

27114

Fan Speed

This information is repeated from the air cart Operator’s manual, which has additional guidance.

NOTICE

Machine Damage Risk:

Always engage the fan with the tractor at a low engine speed. Engaging the fan when the tractor is at high speed may cause fan damage.

Do not reverse hydraulic flow with the fan running.

Fan speed is monitored and reported by the seed monitor, but is manually controlled. The optimum rate depends on the seed type and treatments. See “**Fan Speed Adjustment**” in the cart Operator’s Manual for further information.

NOTICE

The proper reading for the magnehelic air pressure gauge is 12 to 25 inches of water. A sudden drop in pressure is a sign of a possible leak which can adversely affect seeding.

Recommended Fan Speeds

Seeds	Fan RPM
Sunflowers	2,250 - 3,000
Wheat	3,250 - 4,000
Soybeans	2,750 - 3,500
Milo	3,250 - 4,000

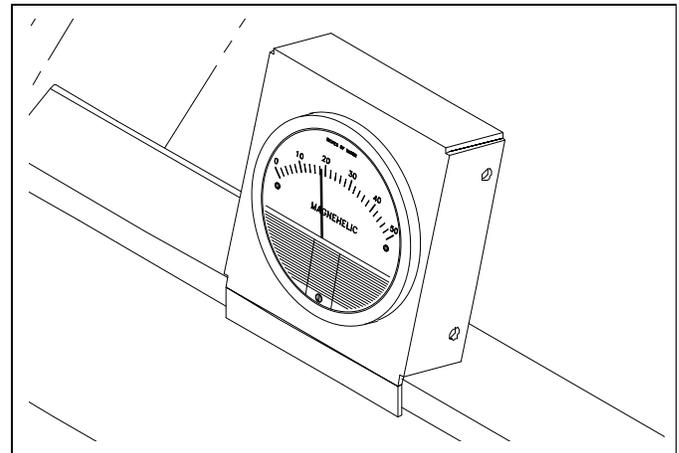


Figure 24
Fan Air Pressure

26425

Marker Operation

Single (left side) or dual markers are optional on the 3N-4010HDA. See “**Flat Fold Markers**” on page 71 for ordering information.

Markers share the hydraulic circuit with the Fold circuit. The selector valve is present to select between Marker and Fold circuits.

Set Selector Valve

Refer to Figure 25
(front view depicting valve set to Markers)

Before operating markers, make sure the drill is configured for the planned field operations or marker maintenance, and the set the drill selector valve to enable the marker hydraulic circuit.

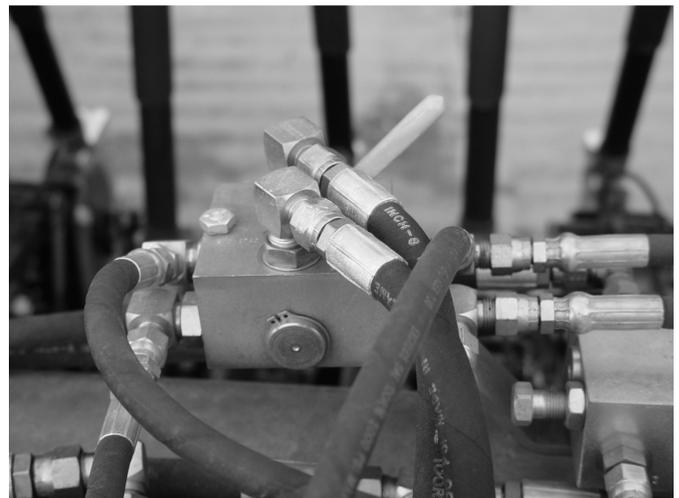


Figure 25
Drill Selector Valve

21844

Single Marker Operation

The single marker is extended and retracted directly by the tractor lever, and has a needle valve adjustment for speed.

At the start of each pass, Extend the circuit to fully unfold the marker, and return the lever to neutral. At the end of each pass, Retract the circuit to fold the marker for the turn, and return the lever to neutral.

Dual Marker Operation

Dual markers are on circuit which contains an adjustable automatic sequence valve.

At first use, observe the markers carefully, in case the side that unfolds is not the intended side.

When the circuit is first Extended, normally the right marker unfolds, and the left remains in the cradle. When the circuit is reversed (Retracted), the right marker folds, and the left remains cradled.

When the circuit is next Extended and Retracted, the marker on the opposite side unfolds/folds, and the previous marker remains cradled.

At the start of the first pass (assuming right marker desired), Extend the marker circuit until the right marker is fully unfolded. Set lever to neutral.

At the end of the pass, Retract the circuit until the right marker is fully folded.

At the start of the next pass, Extend the circuit to deploy the opposing marker.

Special Dual-Marker Operations

Passes with same marker side:

- Retract (raise) the marker and make the turn.
- Begin to extend the opposite marker.
- Retract it, and extend the original marker.

Both markers unfolded:

- Fully extend one side.
- Momentarily Retract, then Extend to deploy opposite side.



Field Operations

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

Final Field Checklist

- ? Drill unfolded.
- ? Seed loaded in cart.
- ? Set cart seed meters per chart or calibration.
- ? If markers are installed and will be used, check drill selector valve set to Markers.
- ? Check cart selector valve set to Fan
- ? Set fan to speed suitable for seed. Watch fan at start-up to ensure correct direction of rotation.
- ? Run fan for at least 15 minutes before planting.
- ? Check fan air pressure gauge for 12-25 inches of water pressure.
- ? Check all seed hoses secure.
- ? Check for air leaks at lids and meter box seals.

Planting Sequence

1. Lower drill 5 to 10 feet (1.5-3m) before initial seeding point.
2. Extend marker for next pass centerline.
3. Pull forward and begin planting.
4. Raise drill for turns (seed flow stops automatically).
5. Retract marker and make turn.

NOTICE

Do not make short radius turns with the drill in the ground.

Planting

Be aware of the 5 to 10 feet (1.5-3 m) of in-ground operating distance required for seed to reach the row units.

If you stop in the middle of a pass, raise the drill and back up 10 feet (3 m) before resumption of seeding.

NOTICE

Do not back up with the drill in the ground, or row unit plugging will occur, and severe damage may occur. Always raise the drill during reverse moves.

Seed Monitor

The seed monitor, included with the air cart, performs the following functions:

On the drill:

- Drill lift switch monitoring
- Seed flow blockage (optional)
- On the Air Cart:
- Fan Speed monitoring
- Hopper material level monitoring
- Hopper air pressure monitoring
- Meter rate monitoring
- Ground speed monitoring

Consult the DICKEY-john manual for how to configure reporting and alerts.

Parking

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

1. Position the drill on firm, level ground.
- Do not unhitch on a slope.*
2. Raise the drill.
 3. Install lift locks.
 4. Fold as necessary for the parking space available.
 5. Perform the air cart parking checklist.
 6. Securely block drill and cart tires to prevent rolling.
 7. Dismount jack from storage stob and pin to mount on side of hitch. If ground is soft, place a board or masonry block under jack.
 8. Extend jack until tongue weight is off tractor drawbar.
 9. Disconnect hydraulic lines, and arrange them so they cannot contact the ground.
 10. Disconnect electrical connections.
 11. Remove hitch pin.
 12. Remove safety chain.



Figure 26
Jack in Parking Position

20273

NOTICE

Block tires when unhitching. Tongue weight at jack is not sufficient to anchor drill.

Always remove safety chain last.

Storage

If possible, leave the cart and drill connected for extended storage.

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

1. Perform the cart Storage checklist.
2. Perform the drill Parking checklist.
3. Lubricate the drill at all points listed under "**Lubrication**" on page 64.
4. Check all bolts, pins, fittings and hoses. Tighten, repair or replace parts as needed.
5. Check all moving parts for wear or damage. Make notes of any parts needing repair before the next season.
6. Plug or cap seed delivery tubes to prevent pest entry.
7. If the cart is disconnected from the drill for storage, plug all 2½ inch (64 mm) openings to prevent pests from entering and nesting.
8. Use touch-up paint to cover scratches, chips and worn areas to prevent rust.



Adjustments

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

The 3N-4010HDA has frame-mounted or unit-mounted coulters, and double-disk parallel-arm openers with depth-controlling press wheels. This system provides accurate depth control and seed placement over uneven terrain.

Each opener is mounted on a floating opener frame, held parallel to the ground. Opener bodies are staggered for easy soil flow. A spring provides the down pressure necessary for opener double disks to open a seed furrow. The spring allows openers to float down into depressions and up over obstructions. Individual openers can be adjusted to account for tire tracks.

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

Planting Depth

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

- Opener Depth (Press Wheel Height)
- Row Unit Down Pressure,
- Opener Frame Height,
- Frame-Mounted Coulters Force,
- Unit-Mounted Coulters Depth Adjustment,
- Frame Weights (at higher pressures), and;
- Disk Blade Adjustments (as row unit blades wear).

Adjustment	Page	The Adjustment Affects
Fan Speed	28 ^a	Consistent seed population and minimum seed damage
Opener Frame Height	33	
Frame-Mounted Coulters	33	
Frame Height - Frame Mounted Coulters	33	Coulters depth and planting depth
Individual Frame-Mounted Coulters Depth	35	Rows in tracks
Frame-Mounted Coulters Force	36	Unusual conditions
Frame Height without Frame-Mounted Coulters	37	Proper row unit operation
Frame Weights	39	Achieving higher no-till down-force settings
Marker Adjustments		
Marker Extension Adjustment	20	Pass alignments with no overlap or excessive gap
Marker Disk Adjustment	48	Visibility of mark for next pass
Marker Speed	62	Efficient marker operation at turns
10HD Series Row Unit Adjustments	40	
Unit-Mounted Coulters Adjustments	41	
Row Unit Down Pressure	43	Consistent seeding depth in tire tracks
Disk Blade Adjustments	45	Consistent seeding depth
Seed Firmer Adjustments	46	Consistent seed placement and coverage
Opener Depth (Press Wheel Height)	47	Seeding depth
Side-to-Side Level	55	Center vs. wing planting consistency
Front-to-Back Level	56	Correct seeding depth and furrow coverage
Implement Lift Switch	59	Avoiding wasted and unplanted seed

a. See air cart operator's manual for complete fan information.

Opener Frame Height

Frame height adjustment methods depend on coulter configuration:

Refer to Figure 27

1. Frame-Mounted Coulters
frame height information begins on this page.
2. Unit-Mounted Coulters
frame height information begins on page 37.
3. No Coulters
use the same frame height setup as #2, page 37.

Frame-Mounted Coulters

Frame-mounted coulters are an optional alternative to unit-mounted coulters. Only one type of coulter may be installed. See page 70 for ordering information.

Frame-mounted coulters are used “in row” and not “zone”. They are intended to prepare the soil directly ahead of the seed furrow.

With frame-mounted coulters, the coulter depth controls opener depth and performance. Set the frame height to achieve the desired coulter depth.

There are three adjustments for frame-mounted coulters:

Refer to Figure 28

4. Frame height - the running depth of all coulters as a group. This is set by a hydraulic stop, the next topic.
5. Individual coulter depth - a mechanical adjustment for a few rows in tire tracks. See page 35.
6. Individual coulter down-force - this is a spring adjustment for rows in tracks, or all rows - in unusually light or heavy no-till conditions. See page 36.

Frame Height - Frame Mounted Coulters

Refer to Figure 29

In regular or heavy no-till conditions, set
⑦ the coulter depth to about 1 in (2.5 cm) deeper than
⑧ seeding depth.

For example, if

- ⑧ the desired seeding depth is 1 in (2.5 cm), set
- ⑦ the coulters to run at 2 in (5.1 cm) deep.

Setting coulters too deep for conditions can cause opener plugging and uneven or too-deep seed depth. In light no-till or conventional till conditions, it may be necessary to set coulter depth ⑦ to less than 1 in (2.5 cm) below seeding depth ⑧, or even $\frac{1}{4}$ in (6 mm) above seeding depth.

In addition to checking depths at setup, be sure to check actual seeding results while planting.

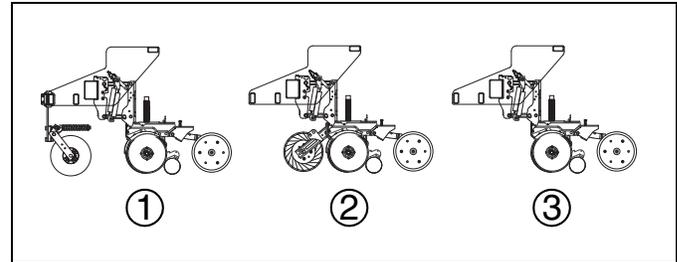


Figure 27
Coulter Configurations

27211

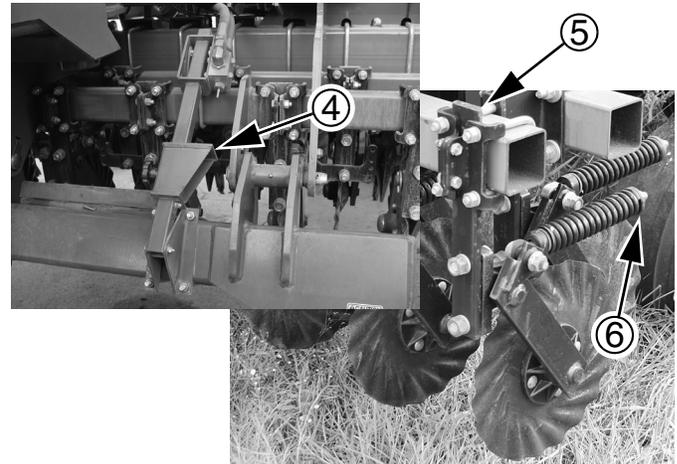


Figure 28
FMC Coulter Adjustment Points

20274
27215

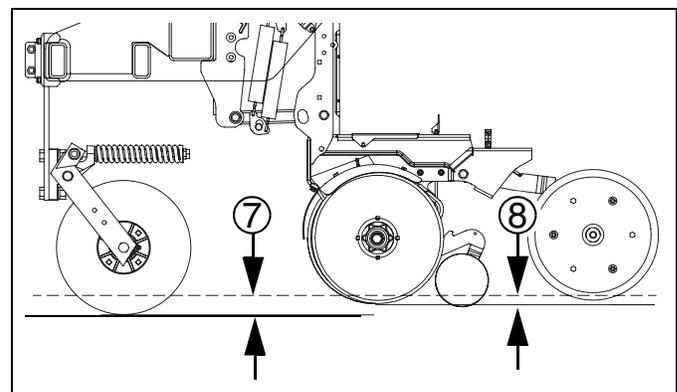


Figure 29
FMC Coulter to Opener Depth

27070

⚠ DANGER

Crushing Hazard: Make all down-stop adjustments with circuit in neutral and drill raised (actuator plunger not in contact with down-stop). Loosening the down-stop with circuit active and drill lowered results in rapid lowering of the frame.

NOTICE

Make sure the drill is level and the lift system bled and re-phased before adjusting the tool bar height. If the center section does not consistently stop at the set height, or the wings do not run at the same height as the center, the lift system may have air or be out of phase (above), or the wings may not be level. See “**Leveling Drill**” on page 55.

Adjusting the coulters height may be done with or without the air cart hitched.

Refer to Figure 30

 The change in coulters height is greater than the change in down-stop adjustment. Make adjustments in small amounts.

The lift system includes an adjustable stop valve ① to fix the height of the opener frame when the drill is lowered.

To adjust the stop height

(assuming a desired 1¹/₄ in / 3.2 cm coulters depth):

1. Move to smooth level ground with soil as similar as possible to field conditions.
2. Lower the drill until the coulters blades just touch the ground. Hold that height by setting the lift circuit to neutral.
3. Loosen the knob ② on the stop ③.
4. Adjust the stop ③ position on the tube ④ until it just touches the actuator ⑤.
5. Raise and then fully lower the drill.
6. Pull forward 10 feet (3 m) and stop.
7. Measure the depth at which the coulters are running. Measure only in non-tire-track rows where the coulters springs are not in compression (arm is at full extension). If the coulters are at the desired depth, no further adjustment is necessary. Skip to step 11.
8. Raise the drill and set the lift circuit to neutral.
9. Adjust the stop up (to raise depth) or down (to lower depth). Adjust in small increments. Secure the stop with the knob on the bolt ②.
10. Check the new setting starting at step 5.
11. Raise and lower several times and confirm that the drill stops consistently at the new height.

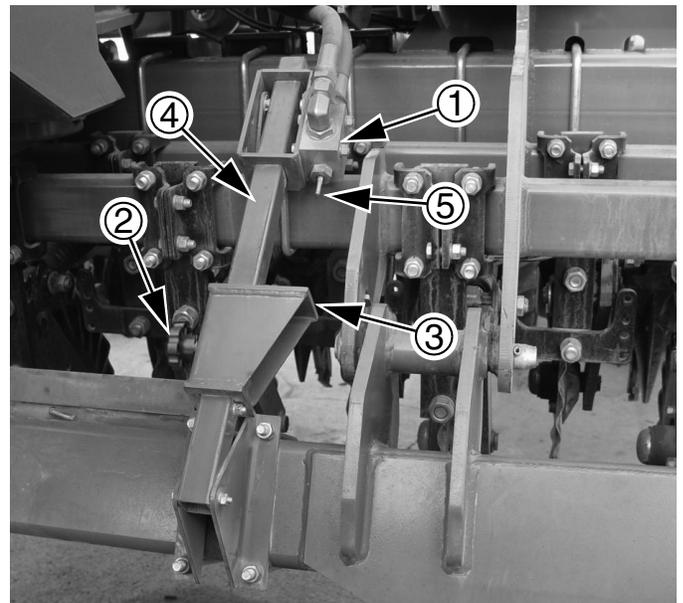


Figure 30
FMC Opener Depth Stop

20274

 It is important that all of the tires remain in contact with the ground to maintain levelness of machine from front to rear. Setting the depth control too deep combined with high opener spring force can cause the drill to tip forward when planting, which may cause plugging.

Running with the front tires floating or skimming on the ground will cause uneven coulters depth and may cause uneven seed depth.

Before making any adjustments to individual frame-mounted coulters, setup the seeding depth on the row units, and verify that the coulters tool bar height is set for your conditions.

Individual Frame-Mounted Coulters Depth

The running depth of all coulters is adjusted simultaneously by changing the tool bar height. Adjusting the height of a small number of coulters may be useful for rows in tire tracks.

Adjust individual coulters as follows.

1. On level ground, lower the drill until coulters just touch the ground.
2. Raise the drill by the extra amount you need to lower the rows in tracks.

Refer to Figure 31

3. At each frame-mounted coulters to be adjusted, slightly loosen all six bolts (①, ②) at the mount.
4. Using a rubber mallet, tap the spring bar ③ up or down until the bottom edge of the coulters disk is at ground level.
5. Tighten the two clamp bolts ① until both U-bolts are firmly against the edge of the spring bar ③. It is normal for there to be a small gap between the clamps.
6. Tighten the four U-bolts ②.
7. Lower the drill to planting height and pull forward 30 feet (10 m).
8. Check coulters blade to opener blade (furrow centerline) alignment.

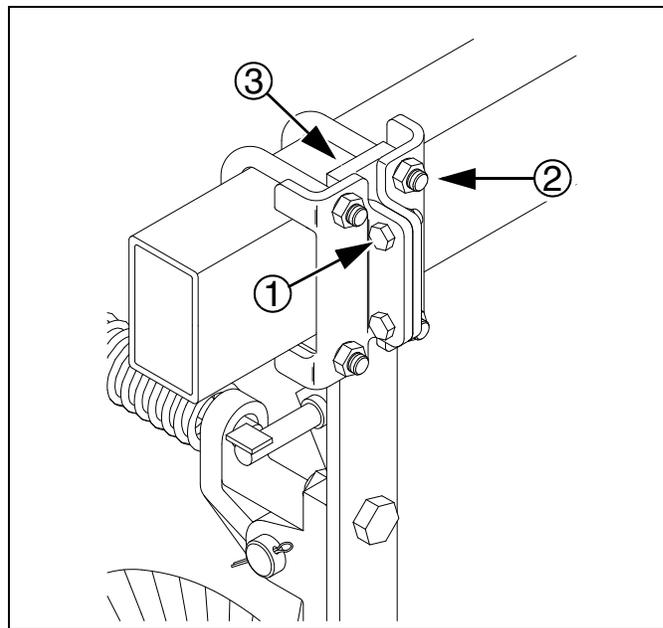


Figure 31
Frame-Mounted Coulters Height

10300

Frame-Mounted Coulter Force

Coulter springs are set to 400 lbs (181 kg). In normal operation at target running depth, the spring is at full extension or only slightly compressed. It compresses briefly as obstructions and denser soil are encountered.

- In heavy no-till conditions, you may observe the springs in compression most of the time. This means that the blades are not reaching the desired coulter depth. If adequate drill weight is available, you can increase the spring down-force to compensate.
- In light but rocky conditions, the factory spring setting may be higher than needed. You can extend blade life by reducing the force at which the blades ride up over obstructions.

To adjust the coulter spring:

Refer to Figure 32

1. Raise the drill and install transport locks. See “Raising” on page 22.
2. Determine the new spring length ① desired. See the table at right.
3. Measure the current length of the spring(s) to be changed. If already shorter than 9¾ in (24.8 cm), or longer than 10 ¼ in (26 cm), do not further adjust them.
4. Loosen the jam nut ②.
5. Rotate the adjuster nut ③ until the spring is at the new length. Tighten the jam nut.

 If all springs are continuously in compression, the coulters can lift the wing frames off the ground (at the gauge wheels), resulting in uneven coulter depth and/or uneven seed depth. If high forces are required, frame weights are probably required.

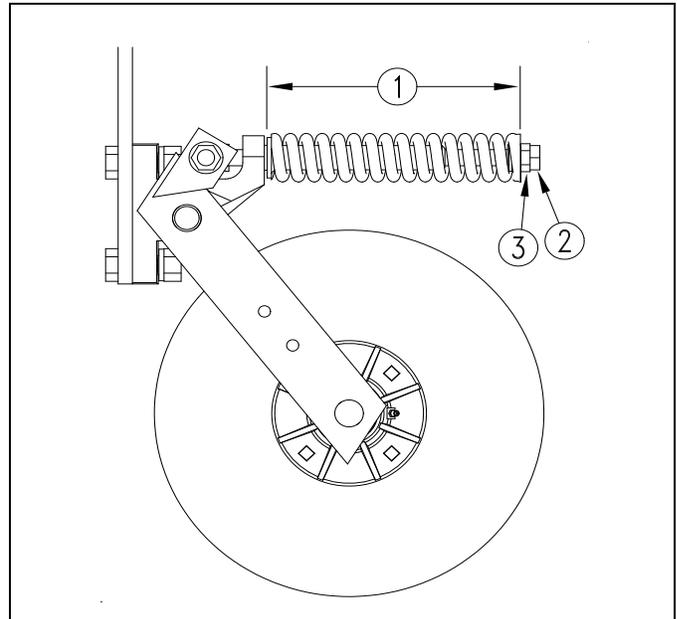


Figure 32
Frame-Mounted Coulter Spring

27139

Spring Length ①	Force at Blade
10.25 in (26.0 cm)	300 lbs (136 kg)
10.00 in (25.4 cm)	400 lbs (181 kg)
9.75 in (24.8 cm)	525 lbs (238 kg)

NOTICE

Do use spring lengths shorter than 9.75 in (24.8 cm). It may contribute to premature parts failure which will not be covered by warranty.

Frame Height without Frame-Mounted Coulters

Use these instructions with a drill having no coulters, or having unit-mounted coulters. Adjustments to individual unit-mounted coulters themselves are on page 41.

If the drill has *frame*-mounted coulters, use the height procedure on page 33.

Refer to Figure 33

Frame height ① is measured from the bottom of the opener tool bar (the largest of the tool bars), and is measured with the drill lowered.

The recommended height depends on your field conditions (see table below), and whether unit-mounted coulters are installed.

Conditions	Opener ① Tool Bar Height
Light no-till, or conventional tillage, with unit-mounted coulters or no coulters	Above 26 in (above 66 cm)
Moderate to challenging no-till with unit-mounted coulters	At 26in (66cm)

For no-till conditions, a 26 in (66 cm) height allows the opener parallel arms to run parallel to the ground giving the opener the maximum upward or downward flotation.

In loose or conventional planting conditions, a frame height above 26 in (66 cm) helps keep the no-till spring forces from burying the openers.

- 📖 “Setting the frame above the 26 in (66 cm) limits the opener downward flotation.
- 📖 Running with the frame below 26 in (66 cm) limits opener upward flotation and could cause opener damage especially at center of the drill.

⚠ DANGER

Make all down-stop adjustments with circuit in neutral and drill raised (actuator plunger not in contact with down-stop). Loosening the down-stop with circuit active and drill lowered results in rapid lowering of the frame.

NOTICE

Make sure the drill is level and the lift system bled and re-phased before adjusting the tool bar height. If the center section does not consistently stop at the set height, or the wings do not run at the same height as the center, the lift system may have air or be out of phase (above), or the wings may not be level. See “Leveling Drill” on page 55.

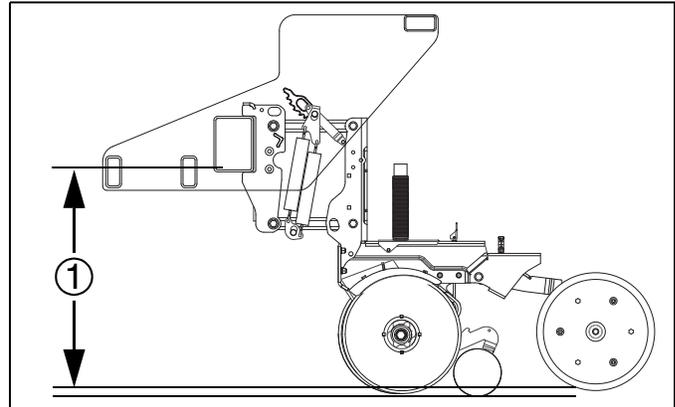
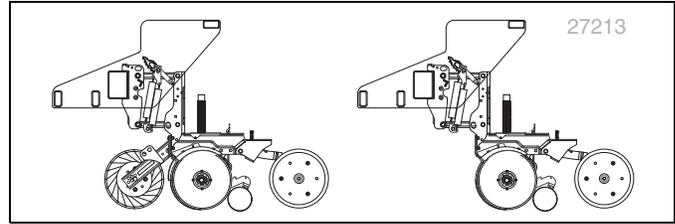


Figure 33
UMC/NC Frame Height

27214



Refer to Figure 34

The lift system includes an adjustable stop valve ① to fix the height of the opener frame when the drill is lowered.

NOTICE

Make sure the drill is level and the lift system bled and re-phased before adjusting the tool bar height.

To adjust the stop height:

1. Move to smooth level ground representative of field conditions.
2. Lower the drill and measure the present tool bar height. If the drill cannot be fully lowered due to row unit spring settings, temporarily move the cams to a lower setting, or out of notch entirely.
3. Raise the drill.
4. Loosen the knob ② on the stop ③.
5. Adjust the stop ③ position on the tube ④. Adjust up (to raise) or down (to lower). Adjust by half the last difference. Secure the stop with the knob bolt ②.
6. Lower the drill and measure the tool bar height. If the error is more than about $\frac{1}{8}$ in (3 mm), repeat the adjustment process from step 3.
7. Raise and lower several times and confirm that the drill stops consistently at the new height.

 It is important that all of the tires remain in contact with the ground to maintain levelness of machine from front to rear. Setting the depth control too deep combined with high opener spring force can cause the drill to tip forward when planting, which may cause plugging.

Running with the front tires floating or skimming on the ground will cause uneven coulters depth and may cause uneven seed depth.

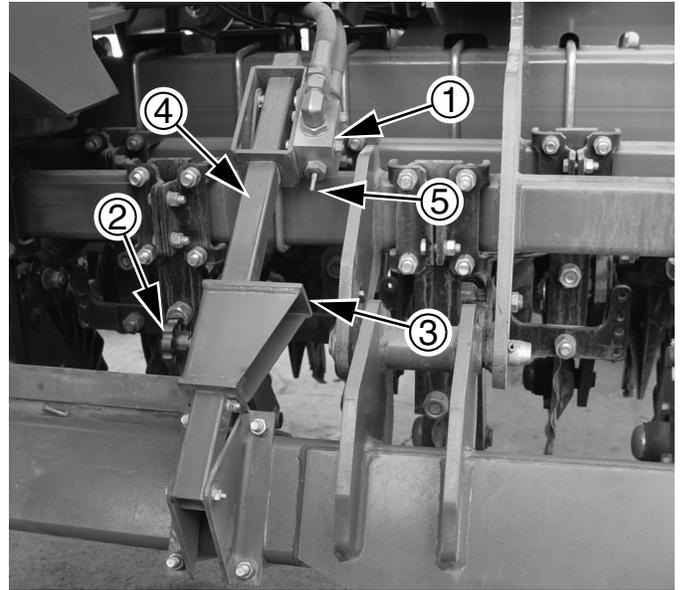


Figure 34
UMC/NC Opener Depth Stop

20274

Frame Weights

In challenging no-till conditions, some row-unit down-pressure settings (across all rows), and many frame-mounted coulter settings, may be high enough to lift the wing gauge wheels off the ground. To avoid inconsistent results, add weight to the wings.

Two pairs of (four total) weight brackets are standard. The weights required are common “suitcase” tractor weights, and are widely available, although not supplied by Great Plains.

Each bracket accepts up to five standard weights, about 500 lbs (227 kg) per wing, or 1000 lbs (454 kg) per kit.

An optional third bracket kit is available (see “Dual Weight Kit” on page 72). The kit includes a pair of brackets (one for each wing). The kit does not include weights.

If an additional weight kit is required, have your dealer contact the factory for special instructions.

Great Plains recommends loading no more than three sets of brackets, representing 3000 lbs (1361 kg) total.

Do not add weight to the center section. It is always heavier than even a fully weighted wing, and never requires additional weights.

Available Down Force

Each Weight set assumed to be fully populated with five 100 pound weights.

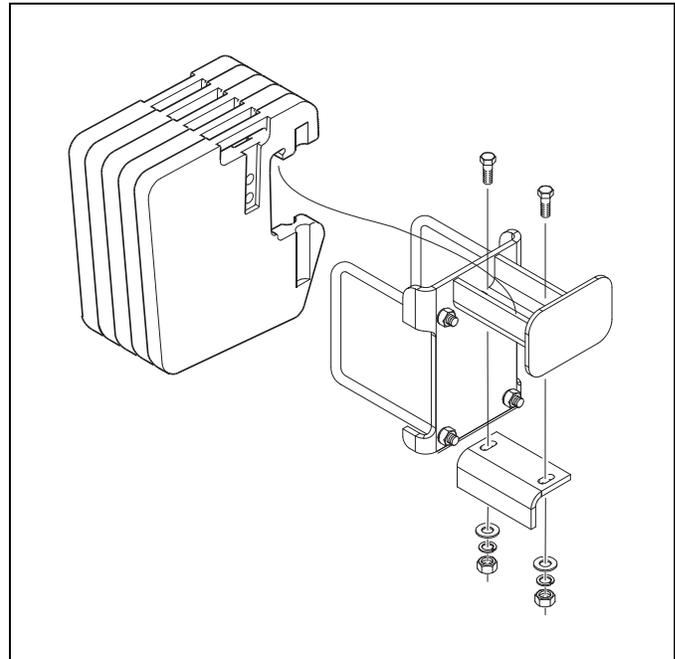


Figure 35
Installing Frame Weights

27068

Wing Configuration	Additional Weight Available to Each Row	
	3N-4010HDA-6675 7.5in (66 Rows)	3N-4010HDA-4810 10in Rows (48 Rows)
1 Weight Set (no markers)	23 lbs (10 kg)	31 lbs (14 kg)
Marker (no weight sets)	42 lbs (19 kg)	58 lbs (26 kg)
2 Weight Sets (no markers)	45 lbs (21 kg)	63 lbs (28 kg)
Marker and 1 Set	65 lbs (29 kg)	89 lbs (41 kg)
3 Weight Sets (1 Kit, no markers)	68 lbs (31 kg)	94 lbs (43 kg)
Marker and 2 Weight Sets	88 lbs (40 kg)	121 lbs (55 kg)
Marker and 3 Weight Sets (1 Kit)	110 lbs (50 kg)	152 lbs (69 kg)

 This table does not include the effect of adding frame-mounted coulters to the drill.

Although frame-mounted coulters add 61 lbs (28 kg) to each row, they also rely on the available weight per row, and can easily require more weight than they contribute.

Although this reduces the weight available to the openers, the opener workload is also reduced by having the furrow prepared by the coulters.

10HD Series Row Unit Adjustments

Refer to Figure 36

(which depicts a row unit fully populated with all optional accessories supported for use with the 3N-4010HDA)

From front to back, a Great Plains 10HD Series row unit can include the following capabilities (some optional):

1. Unit-Mounted Coulter (UMC): optional
UMCs are used instead of frame-mounted coulters and are often preferred where soils are not rocky.
2. Dual Down Pressure Springs: standard
Each row unit is mounted on the drill via parallel arms which allow the row unit to independently move up and down while remaining parallel to the ground. The adjustable spring provides the force to get the row unit and attachments into the soil.
3. Row Unit Spring Cam: standard
This adjustment sets the down-force used by the row unit. See "**Row Unit Down Pressure**" on page 43.
4. Disc Blades: standard, 2 per row unit
Double disc blades open a furrow, creating the seed bed. Spacers adjust the blades for a clean furrow. See "**Disk Blade Adjustments**" on page 45.
5. Seed delivery tube: standard
No adjustments are necessary.
6. Scraper Separator: standard
No adjustments are necessary.
7. Seed firmer: seed flap (not shown) standard:

Keeton seed firmer (not shown)

Improves seed-soil contact, and provides a stable arm for a low-rate liquid fertilizer delivery tube. See "**Keeton Seed Firmer Adjustment**" on page 46.

Seed-Lok™ firming wheel (shown)

Improves seed-soil contact. See "**Seed-Lok™ Seed Firmer Lock-Up**" on page 46.

8. Press wheels: standard (choice of types)
These close the seed trench. The wheels also support the free end of the row unit, and provide the primary control over seeding depth. See "**Opener Depth (Press Wheel Height)**" on page 47.

NOTICE

Certain Machine Damage:

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

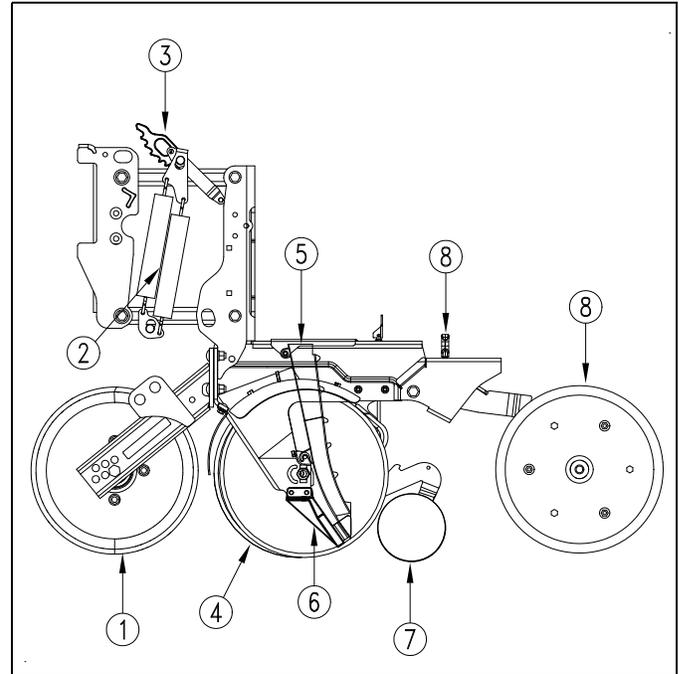


Figure 36
10HD Series Row Unit

27064

Unit-Mounted Coulters Adjustments

Unit-mounted coulters are an optional alternative to frame-mounted coulters. Only one type of coulters may be installed. See page 69 for ordering information.

 Unit-Mount Coulters are not factory-installed. Check alignment and depth prior to first use.

 For frame-mounted coulters adjustments, see page 33.

Coulters Depth Adjustment

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

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

Refer to Figure 37 and Figure 38

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

To adjust coulters depth:

1. Determine the present opener and coulters depths.
2. Note which bracket hole the coulters is presently using.
3. Determine which new hole will position the coulters closer to the 1/4 in-above depth. See the table below.
4. Remove the 5/8-11 x 4 in bolt, lock washer and nut (7 in Figure 37).
5. Move the blade to the new position. Insert the bolt, and tighten on the lock washer and nut.

Hole No.	Depth of (new) coulters blade relative to (new) opener blades
2	1 in above
3	5/8 in above
5	1/4 in above
1	0 (factory standard hole)
4	3/8 in below
6	3/4 in below

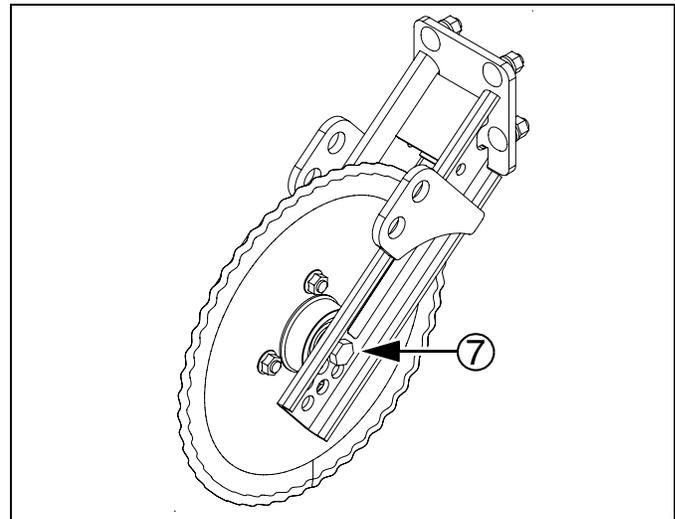


Figure 37
10HD Series Unit-Mounted Coulters

22817

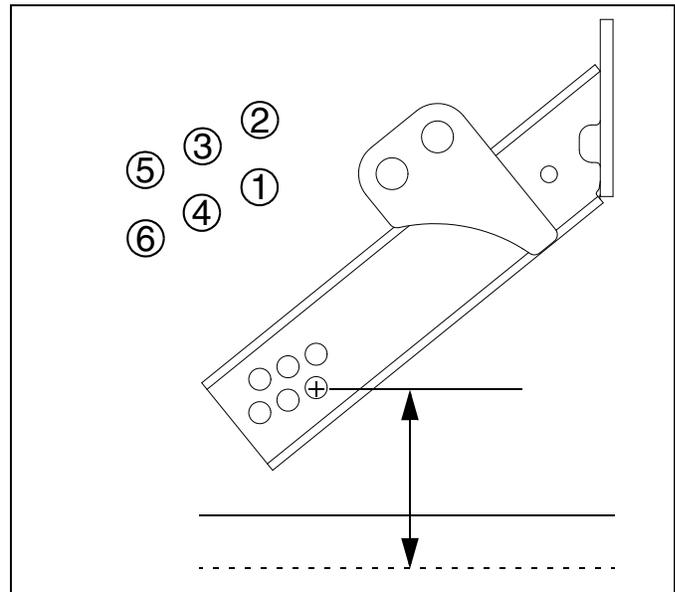


Figure 38
Coulters Blade Mounting Holes

23288

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

Coulters Row Alignment

Refer to Figure 39

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

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

The exacting test of correct alignment is field results. Operate the drill on some test ground (no seed required), and verify that the opener blades are in the groove opened by the coulters.

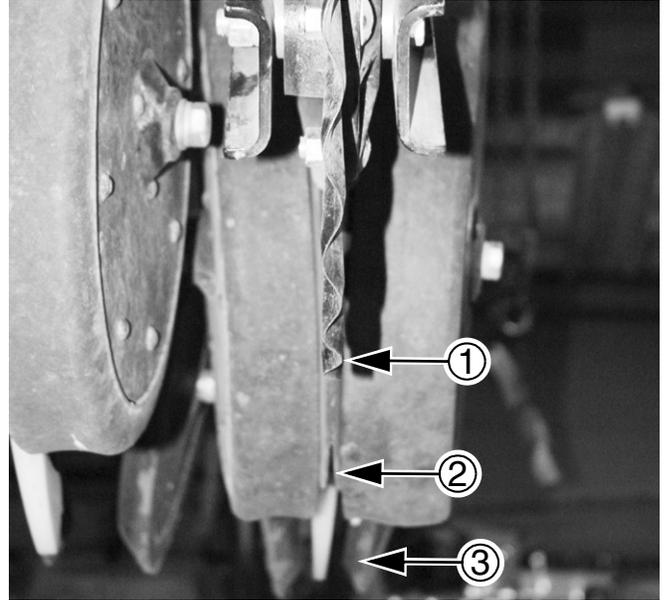


Figure 39
10HD Series Coulters Alignment

26125

Refer to Figure 40

To adjust unit-mounted coulters alignment, loosen the four bolts ④ that attach its bracket to the row unit. The holes on the row unit are slotted, side-to-side, and allow the coulters bracket sideways and rotational adjustment.

Keep the coulters blade vertical while adjusting.

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

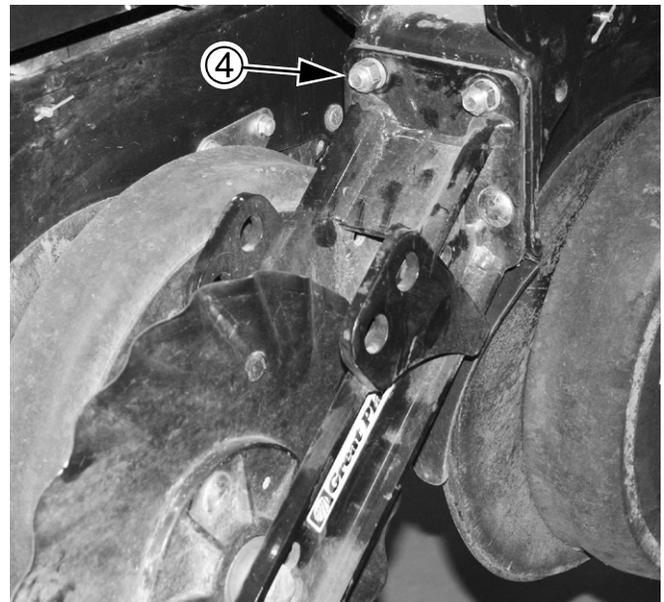


Figure 40
10HD Series Coulters Mount

26126

Row Unit Down Pressure

Refer to Figure 41

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

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

At several row units, inspect the furrow created by the opener discs and closed by the press wheels.

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

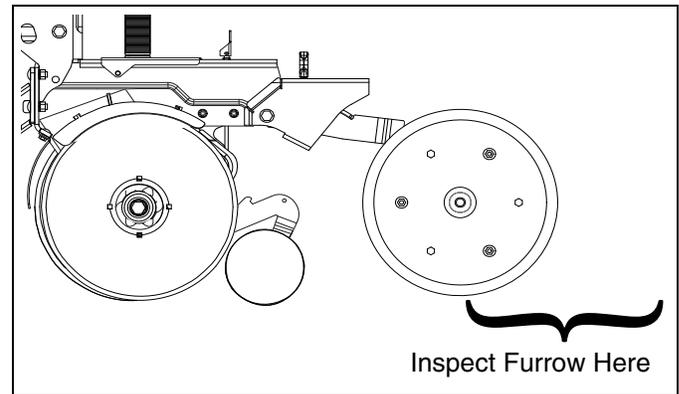


Figure 41
Checking Furrow

27064

Refer to Figure 42

1. If the press wheels are leaving no tracks, or light tracks, increase down-force.
2. If the wheels are compressing trash and loose soil, and leaving clear tracks right at the top of the subsoil, down-force is probably correct and needs no adjustment.
3. If the wheels are creating a trench into the subsoil, down-force is too high and needs to be reduced.

Adjusting Row Unit Down Force

The springs allow the row units to float down into depressions and up over obstructions.

With Frame-Mounted Coulters

With frame-mounted coulters, the seed trench is primarily opened by the coulters. Row unit springs provide only additional assistance needed to make a furrow “V” shaped and ensure furrow closure by the press wheels.

Often, the rows may be run at the minimum spring setting, other than in tire tracks, which commonly need some adjustment.

If trench depth is not being achieved across all rows, adjust the force and/or depth of the coulters before making row unit spring adjustments.

With Unit-Mounted Coulters (or no coulters)

Without frame-mounted coulters, the row unit springs provide the primary down force for cutting through residue and opening the seed trench.

If you cannot achieve enough down force, adding a weight kit may help. See “**Frame Weights**” on page 39.

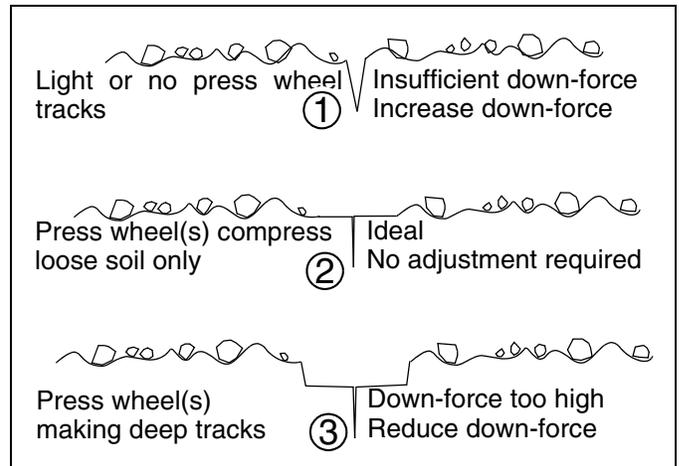


Figure 42
Assessing Down-force

Row Unit Down Pressure

10HDP Series Down-Pressure

Refer to Figure 43

An adjuster cam sets row unit spring down pressure individually for each row unit. This is useful for penetrating hard soil and planting in tire tracks.

The notes in the left table below are based on a air drill implement without coulters. About 120 pounds (54 kg) of the down-force is the weight of the row unit itself. The additional force is due to the springs lifting against the mass of the air drill implement.

Test, without seeding, in your conditions, to determine optimal down-force settings.

To adjust down pressure, use an adjustable or open-end 1 1/8 inch (29 mm) wrench.

1. Raise the air drill implement. Although this adjustment can be made with the air drill implement lowered, the springs will be in tension, and will require more effort. The extra force required may also damage tools.
2. Put tractor in Park and shut it off.
3. Position wrench on hex nut weldment.
4. Pull upper spring link back.
5. Move the adjustment cam to the new setting on the spring adjust bar.

2-Spring 10HD Cam Down-Force Settings

These settings apply to 2009+ air drill implements, or updated older air drill implements, that have two parallel arm springs per row.

Cam Notch	Pounds	Kilograms
zero (out of notch)	Lock-Up & Maintenance	
one	125	55
two	140	60
three	155	70
four	185	85
five	215	100
six	245	110
tip	Do Not Use	

36026

4-Spring 10HD Cam Down-Force Settings

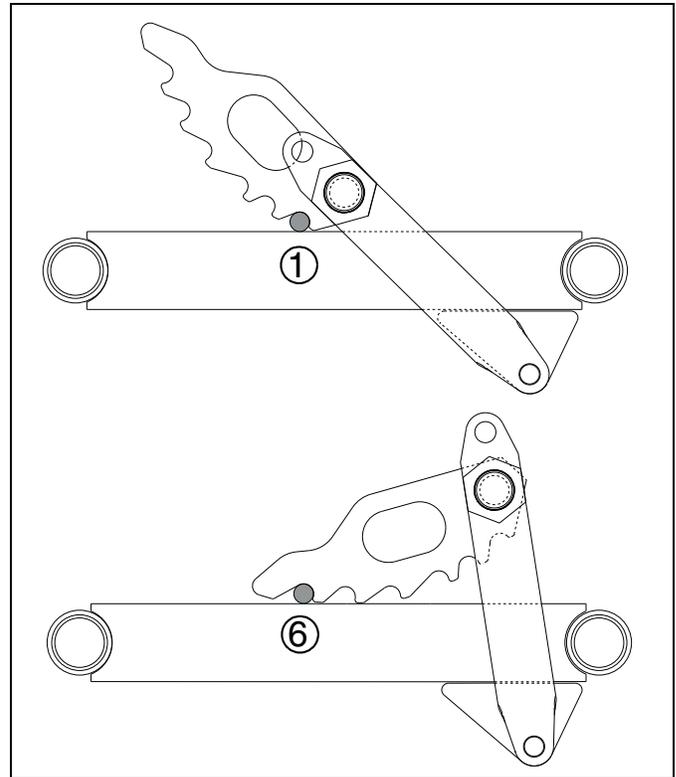


Figure 43:10HDP:
Row Unit Minimum (one)
and Maximum (six)

27065

These settings apply to older air drill implements, not yet updated^a, that have four parallel arm springs per row.

Cam Notch	Pounds	Kilograms
zero (out of notch)	Lock-Up & Maintenance	
one	250	115
two	275	125
three	310	140
four	370	170
five	430	195
six	490	220
tip	Do Not Use	

31452

With 4-spring rows, do not set all rows so high that planting becomes uneven or gauge wheels lift off ground.

a. Contact your Great Plains dealer for update kit information.

Disk Blade Adjustments

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

Refer to Figure 44

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

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

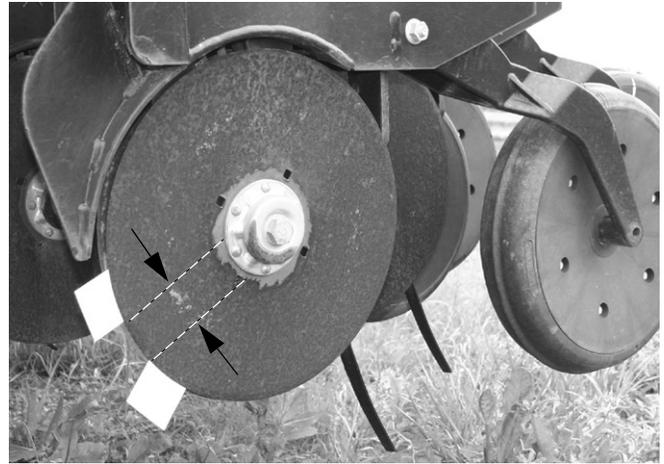


Figure 44
Checking Disk Contact

26447

Adjusting Disc Contact

CAUTION

Sharp Object Hazard:

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

Refer to Figure 45

1. Raise the drill and install the transport locks.
2. Remove the bolt retaining the opener disc on one side. Carefully remove the disc, noting how many spacers are outside the disc and inside the disc. Do not lose the hub components and spacer washers.
3. To reduce the spacing between the discs (the normal case), move one spacer washer from the inside to the outside of the disc.
4. Re-assemble and check disc contact.

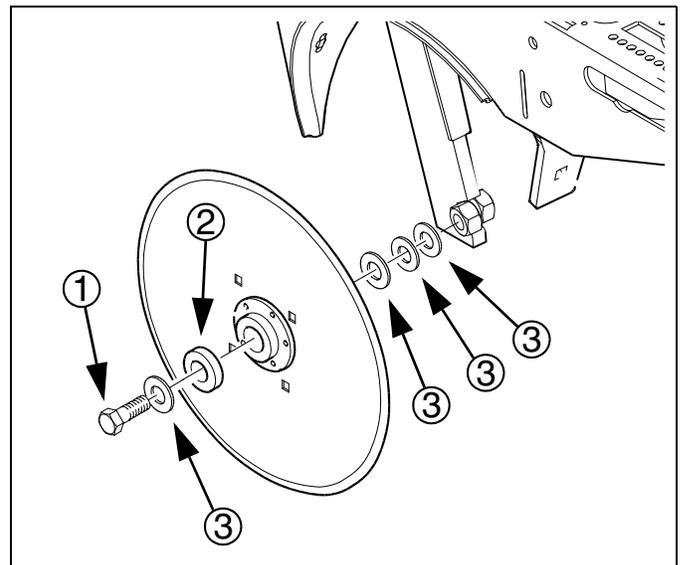


Figure 45
Adjusting Disk Spacers

26385

Seed Firmer Adjustments

10HD Series row units include a seed flap, or one of two optional seed firmers.

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

CAUTION

Sharp Object Hazard:

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

Keeton Seed Firmer Adjustment

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

Refer to Figure 46

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

Seed-Lok™ Seed Firmer Lock-Up

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

Refer to Figure 47 (which depicts a row unit with the opener blades removed for clarity)

To lock up Seed-Lok wheels:

1. Pull firming-wheel arm ① up as high as possible.
2. Flip the lock tip ② to hold the arm up.

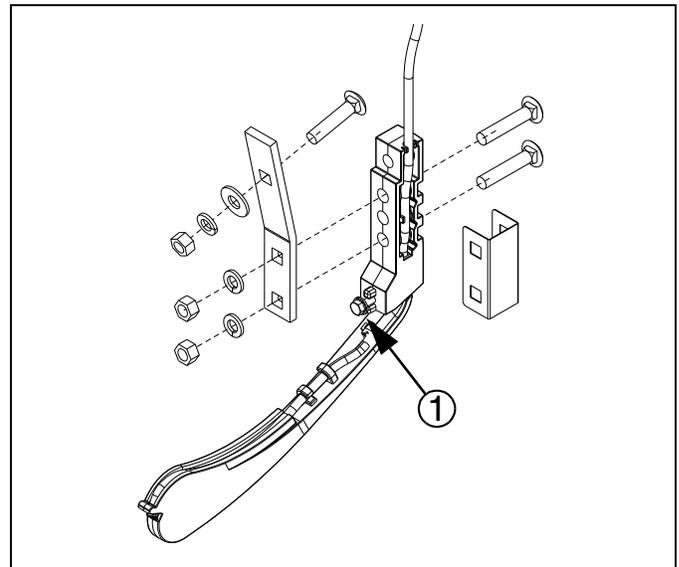


Figure 46
Keeton Seed Firmer

26390

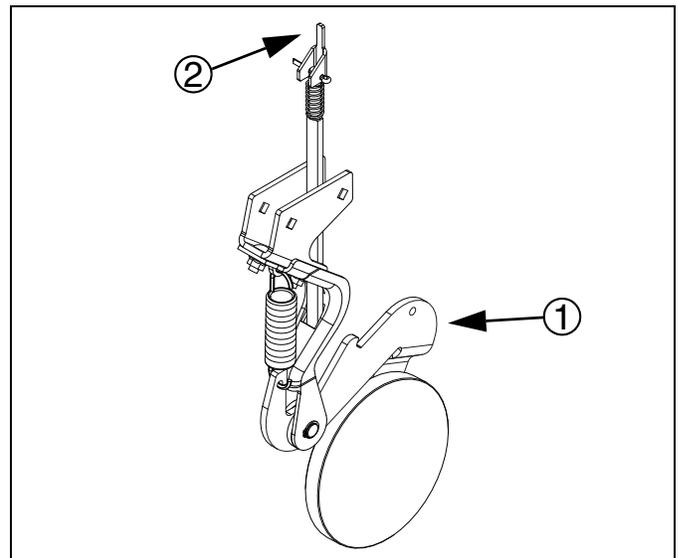


Figure 47
Seed-Lok™ Lock-Up

27072

Press Wheel Adjustments

Opener Depth (Press Wheel Height)

Seeding depth on 3N-4010HDA is set by frame-mounted coulter depth (if installed) and row unit depth. Whether frame-mounted coulters are installed or not, set frame height (page 33 or page 37) before making row unit depth adjustments.

10HD Series press wheel height is a stop adjustment and not a spring adjustment. It establishes a fixed relationship between opener depth and the closed-furrow surface at the press wheel

Refer to Figure 48

Set opener seeding depth by adjusting press-wheel height ①. To adjust, first raise openers slightly, then lift and slide T handles ② on top of openers. Initially adjust all press wheels to the same height. Individual rows running in tire tracks may need to be set deeper^a.

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

If press wheels are lifting off ground, check front-to-back level, and increase row unit spring down force.

If press wheels are digging into ground, reduce spring down force at the row units.

Press Wheel Spacing

Double V Press Wheel Adjustment

Refer to Figure 49

The double-V closing wheels ① can be moved inward and outward to alter how they close the seed trench and press soil over the seed.

To move the wheels in toward the center of the trench, remove one of the $\frac{1}{4}$ in (6.4 mm) spacer bushings ② next to the press wheel arm and position it under the head of the hex head cap screw ③.

On wider row spacings the closing wheels can be moved outward by relocating the spacers to the inside, next to the press wheel arm ④.

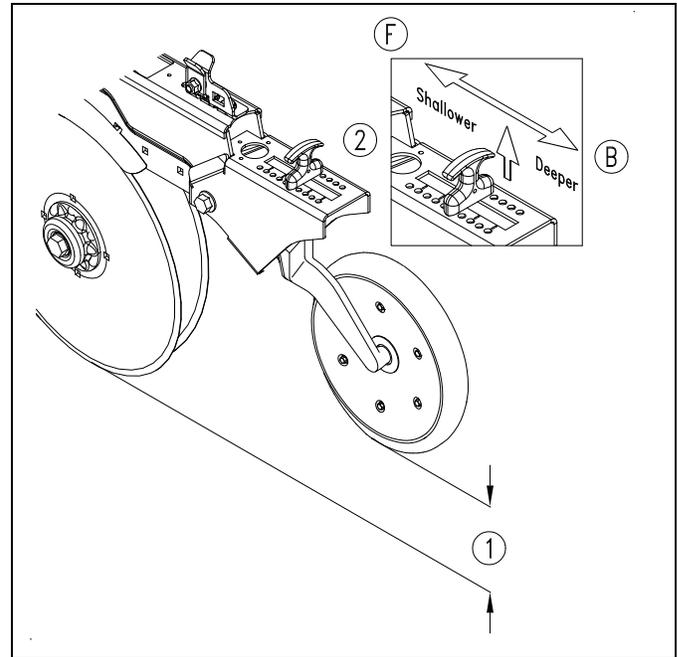


Figure 48
Initial Opener Depth

27124

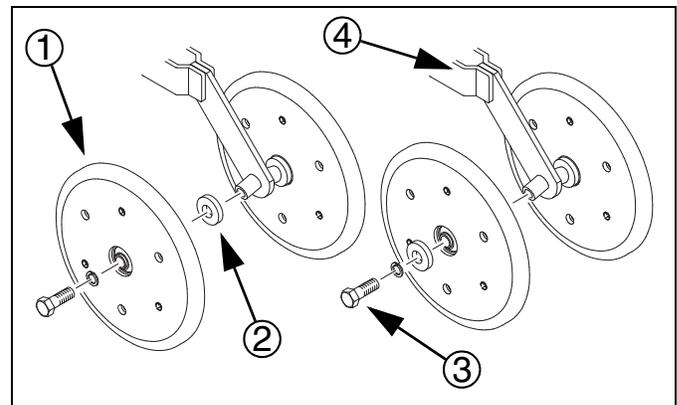


Figure 49
Double-V Press Wheels

23428

a. If frame-mounted coulters are installed, adjust them for tire tracks before adjust T-handles. The coulter depth adjustment may be all that's required to compensate for tracks.

Marker Adjustments

This section covers marker items that may need adjustment for current conditions, and assumes that the markers are installed, set to the correct initial extension and in proper working order. See also:

- “Marker Setup” on page 20
- “Marker Maintenance” on page 61

Marker Disk Adjustment

CAUTION

Sharp Object Hazard:
 Marker disks may be sharp. Use caution when making adjustments in this area.

Adjusting Mark Width

Refer to Figure 50

Ⓣ is the direction of travel.

To change angle of cut, and the width of the mark, loosen 1/2 inch bolts ② holding the disk assembly.

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

Tighten bolts ②.

Direction of Cut

Refer to Figure 51

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

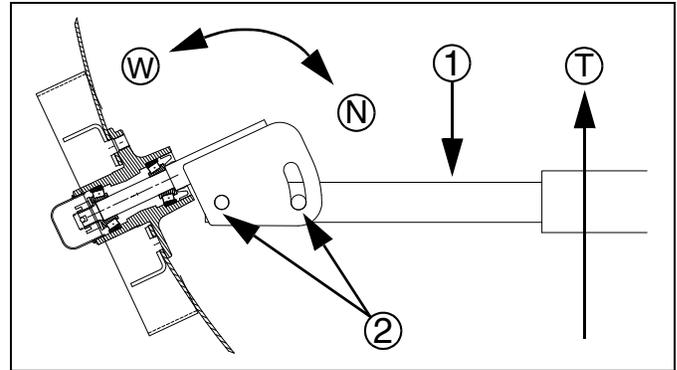


Figure 50
 Marker Disk Angle

11757

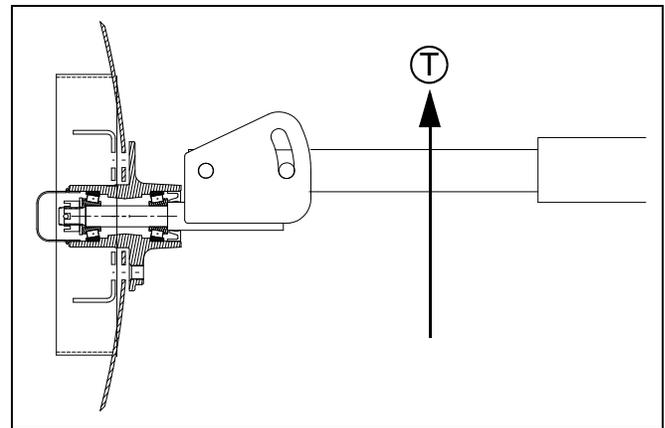


Figure 51
 Marker Disk Inverted

11248



Troubleshooting

Problem	Cause	Solution
Planting too much	Excessive overlap	Adjust marker, page 20.
	Seed meter incorrectly set	Verify initial setting, calibration and double-check meter box flute “stars”.
	Seed size and/or density varies from charts	Calibrate air cart seed meter for your seed.
	Setup sprockets incorrect for drill	Check tooth count in air cart Operator manual.
	Meter flutes damaged	Open meter box calibration door, inspect and replace as needed.
	Actual field size is different	Verify field size.
Planting too little	Excessive field speed	Slow down.
	Seed meter incorrectly set	Verify initial setting, calibration and double-check meter box flute “stars”.
	Seed size and/or density varies from charts	Calibrate air cart seed meter for your seed.
	Setup sprockets incorrect for drill	Check tooth count in air cart Operator manual.
	Fan speed too low	Increase fan speed. See page 28.
	Plugged primary or secondary seed tube	Disconnect tubes at clamps. Inspect and clear.
	Obstruction in meter	Unload hopper and clear obstruction.
	Hopper vent line plugged	Clear any top obstruction. Unload hopper and clear any low obstruction.
	Plugged opener seed tube	Lift drill, inspect and clear tube.
	Contaminated seed	Use new clean seed.
No Seed Flow	Fan not operating	Check selector and shut off valves, and hydraulic flow to cart
	Lift switch mis-adjusted or malfunctioning	Check that air cart clutches cycle with switch operation. Readjust switch engagement point (page 59).
	Clutch failure	Lower drill to engage lift switch and cart clutches. Clutch-to-gearbox chain should be impossible to move (using calibration crank) if clutch is engaged.
	Chain break	Check all four stages of chains from cart wheel to meter boxes.
	Gearbox set to 0 or malfunctioning	Open air cart meter box calibration door and check for seed flow using calibration crank.
	Seed run-out	Check seed hopper.
Uneven seed spacing	Seed-Lok plugging	Lock up Seed-Lok, page 46.
	Damaged or missing seed flap	Replace seed flap.
	Opener disks not turning.	See “Opener disks not turning freely” in this Troubleshooting chart.
	Gearbox setting too low	Operate variable rate gearboxes at scale settings of 20 or higher for consistent results.
	Fan speed too low	Check fan speed, page 28.

Problem	Cause	Solution
Uneven seed depth	Excessive field speed	Slow down.
	Coulter depth adjustment	Verify coulter-to-opener relationship.
	Coulter down-force insufficient - coulters not achieving depth	Add weight or, if weight is sufficient, increase coulter spring settings.
	Insufficient opener down force for conditions	Adjust row unit cam, page 44.
	Conditions too wet	Wait for dryer weather.
	Seed-Lok plugging	Lock up Seed-Lok, page 46.
	Damaged or missing seed flap	Replace seed flap.
	Damaged opener seed tube	Check for damage at tip of seed tube.
	Partially plugged opener seed tube	Lift up drill, expose bottom of seed tube and clean out.
	Incorrect choice of coulter	Change coulter blade.
	Skimming (gauge wheels skipping, or off ground entirely)	Reduce coulter and/or row unit down forces, or add weights.
Opener disks not turning freely	Opener plugged with dirt	Clean opener. Adjust scraper.
	Planting conditions too wet	Wait until drier weather.
	Seed-Lok is plugging opener	Lock up Seed-Lok, page 46.
	Too much blade-to-blade contact	Adjust disk contact. See page 45.
	Failed disk bearings	Replace disk bearings.
	Bent or twisted opener frame	Replace opener frame.
Press wheels not compacting the soil as desired	Too wet or cloddy	Wait until drier weather or rework ground.
	Coulter set too shallow	Adjust coulter depth. See page 33 or page 41.
	Incorrect press wheel depth setting	Adjust T-handle. See page 47.
	Opener spring pressure too low or too high	Reduce opener spring pressure.
Excessive seed cracking	Excessive field speed	Slow down.
	Unclean seed.	Use clean seed.
	Damaged flute “stars” in air cart meter	Open calibration door and inspect flutes.
	Damaged, old or dry seed	Use clean, new seed.
Press wheel or openers plugging	Planting conditions too wet	Wait until drier weather.
	Coulters not set deep enough to cut residue	Check coulter adjustment.
	Coulters set too deep, bring up excess dirt and moisture	Check coulter adjustment.
	Drill not set to run level from front to rear, carrying enough weight on gauge wheels to prevent “nosing over”, or set too low on rear caster eyebolts allowing it to run “nose high”	Check “ Leveling Drill ” on page 55.
	Opener set too deep	Readjust, page 47.
	Opener spring force too high	Readjust, page 43.
	Backed up with drill in the ground	Clean out and check for damage.
	Failed disk bearings	Replace disk bearings.
	Disk blades worn	Adjust or replace disk blades, page 45.
	Scraper worn or damaged	Replace scraper blade.

Problem	Cause	Solution
Marker Malfunction	Air or oil leaks in hose fittings or connections	Check all hose fittings and connections for air or oil leaks.
	Marker circuit not selected	Check Fold/Marker selector valve (if installed on drill)
	Low tractor hydraulic oil level	Check tractor hydraulic oil level.
	Loose or missing bolts or fasteners	Check all bolts and fasteners.
	Needle valve plugged (single marker)	Open needle valve, cycle markers slowly and reset needle valve, refer to page 62.
	Needle valve(s) in sequence valve plugged	Open needle valves, cycle markers slowly and reset needle valves, refer to page 62.
Marker disk does not mark	Marker folding linkage does not have enough slack to allow marker disk to drop into field depressions	Check chain length, page 62.
	Disk angle or orientation not optimal	Angle marker disk blade, or reverse blade to pull or throw dirt.
Drill does not fold or unfold fully	Air in lines	Bleed fold system.
	Cylinder mounts misaligned	Check spacers, page 54.
	Fluid run-out	Check tractor fluid level.
Drill hunts in transport	Worn skid blocks	Replace blocks or add shims
	Locks not engaged	Check lock operation



Maintenance and Lubrication

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

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

WARNING

Crushing Hazard:

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

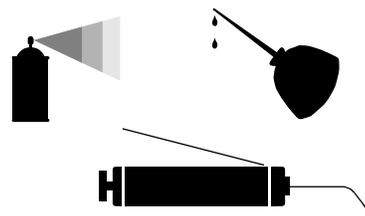
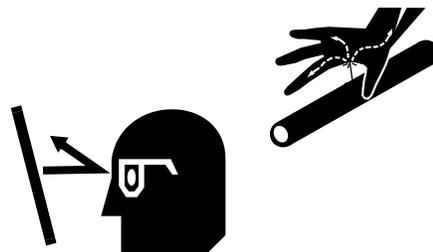
WARNING

High Pressure Fluid Hazard:

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

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

1. Securely block drill before working on it.
2. Lubricate areas listed under “**Lubrication**” on page 64.
3. Clean any fittings that do not take grease.
4. Inflate tires as specified on “**Tire Information Chart**” on page 74.
5. Inspect hydraulic hoses for cuts, cracks and aging. Check fittings for evidence of leaks.
6. Keep disk scrapers properly adjusted.
7. Replace any worn, damaged or illegible safety decals. Order new decals from your Great Plains dealer. See “**Safety Reflectors and Decals**” on page 6.



Bleeding Hydraulics

This section covers standard drill hydraulics. See also “**Bleeding Marker Hydraulics**” on page 61.

Bleeding Lift Hydraulics

The lift system is equipped with rephasing hydraulic cylinders requiring a special procedure for bleeding air from the system. Read and follow the procedure carefully.

1. Lower drill to ground.
2. Unpin rod ends of all six lift cylinders. Pivot cylinders up and wire or otherwise safely support rod ends higher than base ends. You may need to remove the gauge-wheel cylinders from the rockshaft so you can orient them with rod ends higher than base ends.
3. With the tractor engine at idle speed, energize the lift hydraulics. When the cylinders have extended completely, hold the remote lever on for one minute. Check all hydraulic hoses, cylinders and fittings for leaks.
4. Retract the cylinder rods. Extend the rods again and hold the remote lever on for one more minute. Repeat this step two more times.
5. Again, check all hydraulic hoses, cylinders and fittings for leaks. Recheck the tractor hydraulic reservoir. Fill to the proper level.
6. Re-pin all cylinders.

Bleeding Fold and Lock Cylinder Hydraulics

The fold system is equipped with rephasing hydraulic cylinders requiring a special procedure for bleeding air from the system. Read and follow the procedure carefully.

Bleeding Lock cylinders

1. Unpin the small lock cylinders, pivot cylinders so the rod end is free to move.
2. Crack fittings at base end of cylinders. Extend cylinders to purge air from system. Tighten fittings.
3. Crack fittings at rod end of cylinders. Retract cylinders to purge remaining air from system. Tighten fittings.
4. Repeat step 2 and step 3.
5. Re-pin small lock cylinders.



Bleeding Fold cylinders

- 📖 Unfolding drill retracts fold cylinders.
 - 📖 If markers are on a selector valve, select Fold at that valve for this procedure.
1. Unpin rod ends of fold cylinders. Pivot cylinders up and wire or otherwise safely support rod ends higher than base ends.
 2. With the tractor engine at idle speed, energize the fold hydraulics. When the cylinders have extended completely, hold the remote lever on for one minute. Check all hydraulic hoses, cylinders and fittings for leaks.
 3. Retract the cylinder rods. Extend the rods again and hold the remote lever on for one more minute. Repeat this step two more times.
 4. Again, check all hydraulic hoses, cylinders and fittings for leaks. Recheck the tractor hydraulic reservoir. Fill to the proper level.
 5. Re-pin both cylinders.

Adjusting Fold Cylinders

Refer to Figure 52

If the drill does not fold or unfold fully it may be necessary to add or remove shims from the base of the wing fold cylinder.

1. With the drill in the folded or unfolded position make sure drill is on level ground and all safety locks are in place.
2. Place tractor in park, turn off ignition and remove ignition key.
3. Remove bolts from cylinder base plate and add or remove shims as necessary.
4. Tighten fold cylinder base bolts and activate fold cylinders to make sure wings travel to full open and full closed position. If not repeat above steps until full open and full closed are achieved.

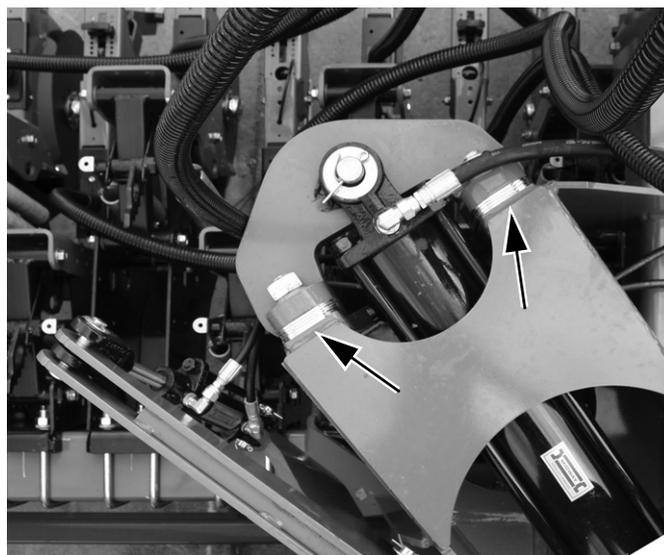


Figure 52
Fold Cylinder Shims

27186

Leveling Drill

Make sure hydraulic system is fully charged, bled and re-phased before making any other adjustments to level.

Side-to-Side Level

All frame sections must be level to maintain even seeding depth. Before using the drill in the field, follow these steps to make sure the drill is level side-to-side. Also check that any frame-mounted coulters, and all row units, are set to matching depth and down-force^a (other than in tracks).

Periodic frame-leveling adjustments should not be necessary, but if you are having problems with uneven depth, check drill levelness and follow these procedures.

1. Complete **“Bleeding Hydraulics”** on page 53, before proceeding.

Refer to Figure 53

Adjustment Starting Point:

2. Locate the threaded eyebolts ① at the base end of the gauge-wheel cylinders. The eye bolt is locked in place by a jam nut ②. Observe the amount of thread exposed above the upper nut and below the lower adjustment nut ③. If the exposed threads are roughly equal, no initial adjustment is needed. Go to step 4.
3. If the exposed threads above and below the nuts are not equal, loosen and adjust the jam nuts until the amount of exposed thread is about the same above and below. Repeat for other end of drill.

Adjustment Procedure:

4. Move the drill to a level area. With the drill unfolded, raise the drill to its highest position with the lift cylinders. With the tractor idling, rephase the cylinders by holding the hydraulic lever on for an additional 30 seconds. Immediately lower the sections until the coulters and openers are just ready to touch the ground.
 5. Move the gauge-wheel eyebolt adjustment nuts ③ until the openers on the outside end of the drill are the same height as the center openers.
-  Eye-bolt adjustments are easier if the drill is first lowered to the ground to remove some of the force on the cylinders.
6. Repeat the steps above until the drill is level end-to-end when drilling in actual seeding conditions.

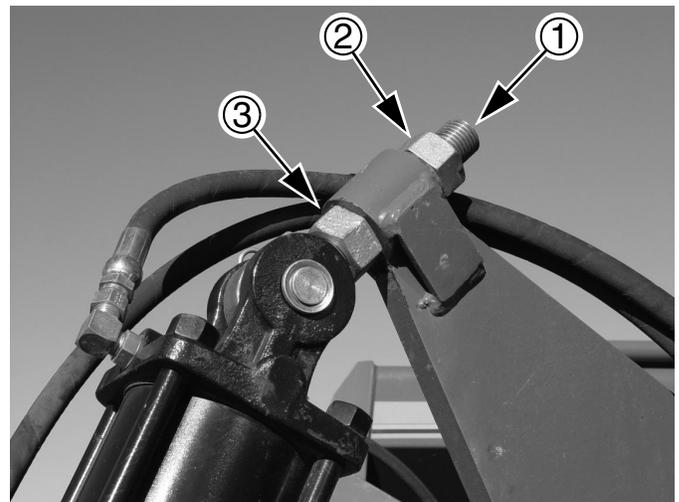


Figure 53
Gauge Wheel Eyebolt

20316

a. If row unit settings are not equal, they can cause section heights to be dissimilar. Balance rows before adjust frame level.

Front-to-Back Level

Level the drill front-to-rear using only the eyebolts located on the rear axle. Adjust only until level front-to-rear when drilling in actual seeding conditions.

 Drill must be level front to rear in actual planting use or row plugging will occur. Adjusting gauge wheel depth stop too low or excess opener spring force can cause the front of drill to roll forward when planting. Conventional till ground can also cause drill to run low in the front if gauge wheel depth is set too low.

Refer to Figure 54

1. In representative field conditions, lower the drill and pull forward to place openers in ground. If openers^a are operating at desired depth, and row units are parallel to the ground, check frame level front-to-back.
-  When drill is level, opener bodies will be level or slightly higher at rear.

Adjustment Starting Point:

2. Locate the threaded eyebolts ④ at the base end of the rear axle cylinders. The eye bolt is locked in place by a jam nut ⑤. Observe the amount of thread exposed above the upper nut and below the lower adjustment nut ⑥. If the exposed threads are roughly equal, no initial adjustment is needed. Go to step 4.
3. If the exposed threads above and below the nuts are not equal, loosen and adjust the jam nuts until the amount of exposed thread is about the same above and below for both eyebolts.

Adjustment Procedure:

4. Lower the drill into actual seeding conditions.
5. Have an assistant check front to rear level while planting by observing the drill from a safe distance. Drill should run with frame level or slightly lower in the front. Adjust eyebolts as needed.

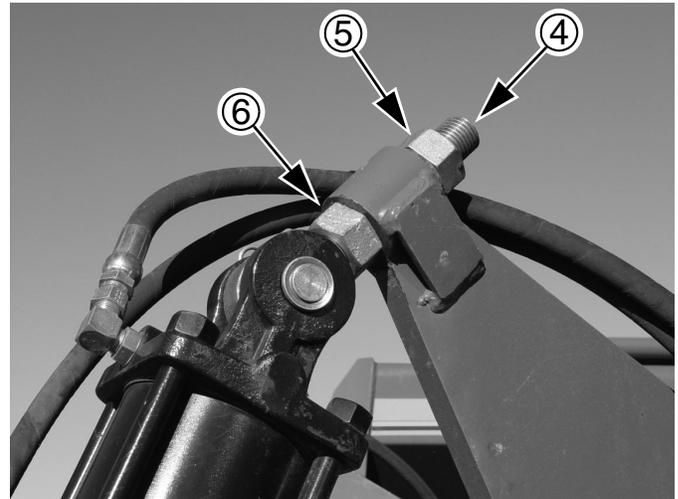


Figure 54
Rear Lift Eyebolt

20316

a. If openers are not level, or at correct depth, adjust depth and down-force settings before adjusting frame level.

Section Alignment

To check and adjust section alignment:

6. Unfold drill, see “**Unfolding**” on page 25, and place a block ahead of each wing gauge wheel. Pull drill forward against blocks to rock frames back. Pull forward until stop bolts are firmly against toolbars.

Refer to Figure 55

7. Check for proper alignment by running a string line across back of drill toward outer ends of wings. Measure to the back face of the tool bar supporting the row units.

For proper alignment, outside ends of wings (dimension ⑨) should be 0-to- $\frac{1}{4}$ in (0-to-6.4 mm) ahead of inside ends (dimension ⑧).

Refer to Figure 56

8. To adjust section alignment, shorten or lengthen stop bolts to change the contact point with the toolbars. Adjust stop bolts ⑦ in or out until dimension ⑨ is 0 to $\frac{1}{4}$ in greater than dimension ⑧.

Lack of proper fold cylinder adjustment can cause difficulties with gauge wheels by not allowing full rotation of gauge wheel arm assemblies.

- 📖 If you have trouble getting a section aligned, it may be necessary to adjust fold cylinders, see “**Adjusting Fold Cylinders**” on page 54. Do not over-adjust or you may cause fold latching problems.
- 📖 Section alignment, fold cylinder and tongue spacer shim adjustments are closely interrelated and may have to be adjusted in tandem. Adjust fold cylinders to enable complete 90 degrees of travel to latch

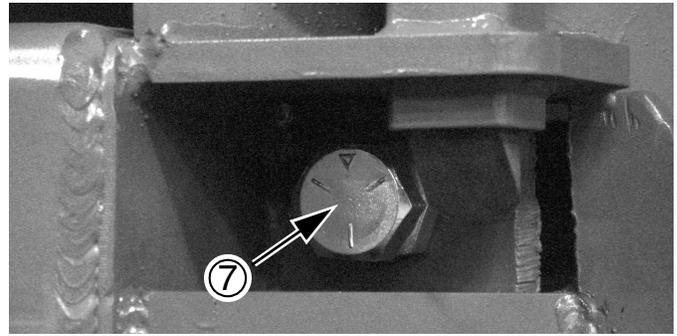


Figure 55
Stop Bolt

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wings and to unfold for section alignment. Then adjust tongue shims to remove as much play as possible in transport without preventing proper latch operation.

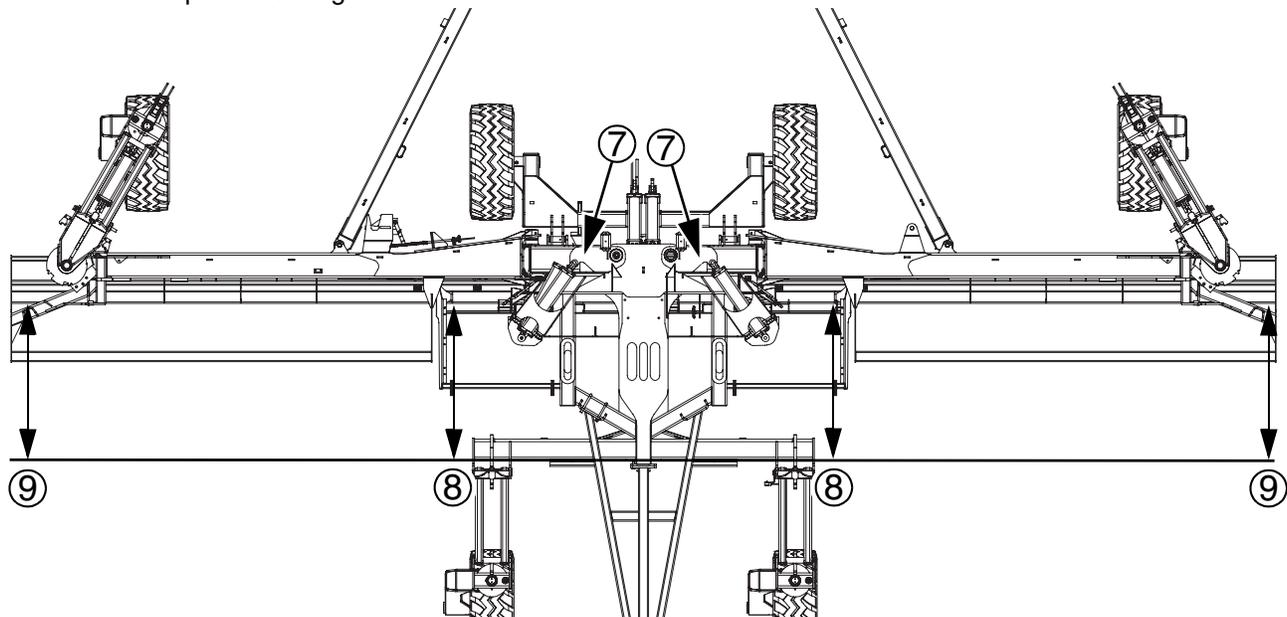


Figure 56
Section Alignment

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Tongue Spacer Block

If the folded drill does not pull straight, wanders back and forth while being towed, or fails to latch during folding, it may be necessary to replace or adjust one or more tongue spacer block assemblies.

Refer to Figure 57 (which depicts right tongue tube)

There are four of these block assemblies on the drill tongue. Two ① are on the inside, and contact each other when folding. Two ② are on the outside, and contact the wing main frames when folded.

The amount of contact should be just enough to prevent sway, but not so much that it prevents reliable transport latching during fold.

If the skid blocks (③, ④) are worn or deformed, replace them.

If the skid blocks are serviceable, and there is a gap when folded, add a shim ⑤. Consult the latest Parts manual for the current shim part number.

When re-installing:

- The inside blocks ① must be exactly opposite each other, and are located 122 in (3.1 m) from the forward end of the tongue tube wall (dimension ⑥).
- The outside blocks ② are located 155 in (3.74 m) from the forward end of the tongue tube wall (dimension ⑦).

📖 It is normal for the tongue assembly to rotate slightly when the wings move up and down independently. Adjusting tongue shims does not eliminate this.

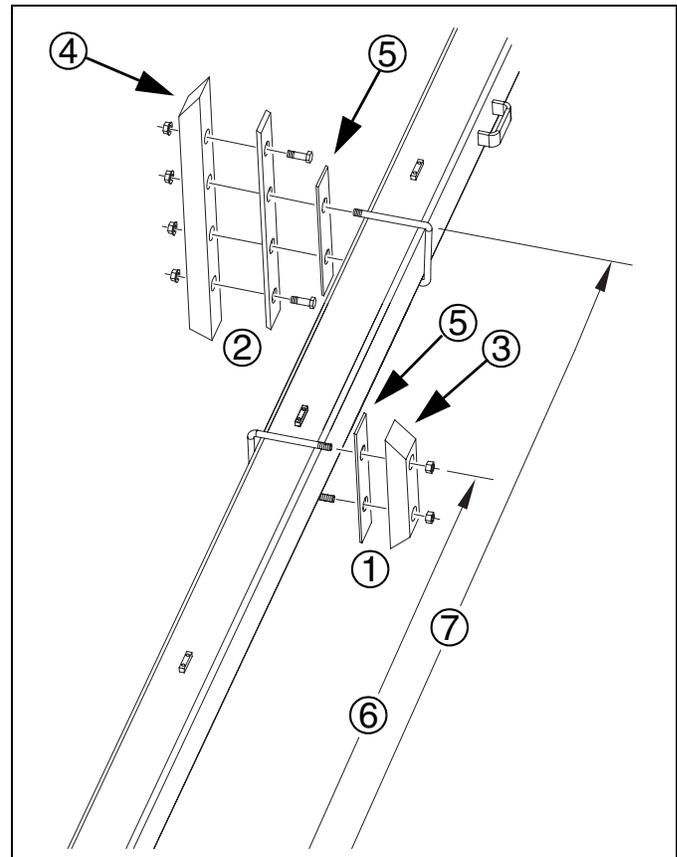


Figure 57
Tongue Spacer Blocks

20362

Implement Lift Switch

S/N C1003M-

Refer to Figure 58

The lift switch turns the air cart seed metering on and off as the 3N-4010HDA is lowered and raised. The switch ① is mounted at the upper end of the parallel arms on the right rear wheel assembly.

When the 3N-4010HDA is raised, the upper parallel arm contacts the flexible switch arm extension (whisker) ② and operates the switch.

If the switch is otherwise operating properly, but metering is not stopping when raised, or not resuming when lowered, the switch may need some adjustment.

The whisker should extend under the parallel arm enough so that the whisker cannot slip off the arm when the drill is raised, but not so far it bends severely. To adjust, loosen the bolts ③ attaching the switch to the bracket and slide the switch left or right as needed and re-tighten.

The whisker should operate (prevent seeding) whenever the openers are just beginning to lift off the ground. To adjust:

1. Lower the implement until at a height where seeding should start (usually just above ground). Set the lift circuit to neutral.
2. Turn off the tractor and remove the key.
3. Securely support implement frame at this height with jack stands or blocks.
4. Loosen switch bracket bolts ④.
5. Slide switch up until the flexible switch toggle is just past the point at which the switch clicks (the turn-off-seeding state).
6. Slide it down carefully until it switch clicks once more (the turn-on-seeding state).
7. Tighten the bolts.

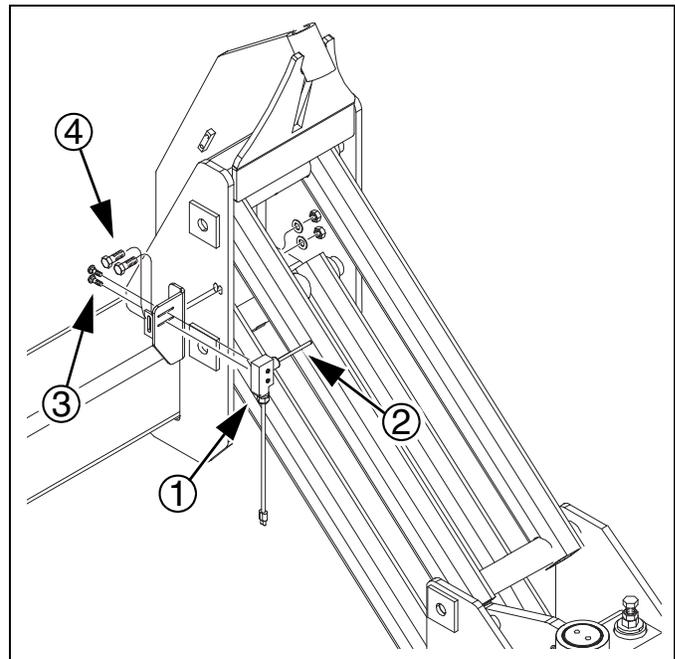


Figure 58
Implement Lift Switch

27069

- For reference, the switch wiring is:
 Black (switch) to black (extension)
 Red (switch) to red (extension)
 Switch closed when drill is raised

S/N C1004M+**Refer to Figure 59**

The implement lift switch ① is a proximity type switch, mounted on the right-hand rear wheel assembly. The lift switch turns seed metering on and off as the implement is lowered and raised. The lift switch is actuated by the upper lift arm ②.

To adjust the height at which the seed metering is turned on, do the following.

⚠ DANGER

Do not place any part of body under implement while making adjustments.

1. Park the tractor, drill, and, if equipped, the seed cart on a solid, level surface.
 2. Unfold the drill.
 3. Lower the implement to the height where seeding should start (usually just above ground). Raise the openers an additional 1/2 in (12 mm). Set the lift circuit to neutral.
- 📖 Do not set the lift switch to come on too low. The openers can ride up over irregular ground and an early switch can result in patches of no seeding.
4. Stop the tractor engine and apply the tractor parking brake. Turn the key to the ON position to provide power to the lift switch.

⚠ DANGER

Have another person set in the tractor seat during the adjustment procedure. Have the person make sure the hydraulics are not engaged and the tractor is not started during the adjustment procedure.

5. Find the lift switch ①. Check the distance between the face ② of the lift switch and the upper lift arm ③. The distance must be $\frac{5}{16}$ in (8 mm) or less. If the distance is not correct, adjust the nuts on the lift switch as necessary.
 6. Loosen the outer nut ④ on the lift switch just enough so the lift switch can move in the adjustment slot.
 7. Slide the lift switch up or down in the slot until the yellow lamp in lift switch goes from off to on.
 8. Tighten the outer nut on the lift switch without moving the lift switch.
 9. Start the tractor engine and lower the implement all the way.
 10. Stop the tractor engine. Remove the key and take the key with you.
- 📖 NOTE: If adjustments are made to hydraulic coultter depth, check lift switch adjustment. Adjust lift switch as necessary.

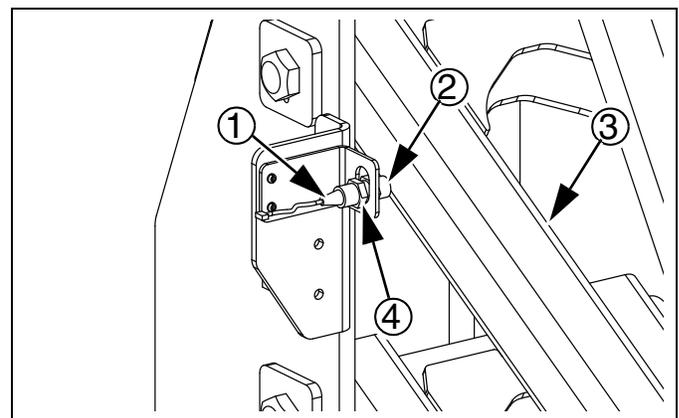


Figure 59
Implement Lift Switch

68493A

Seed Flap Replacement

Refer to Figure 60

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

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

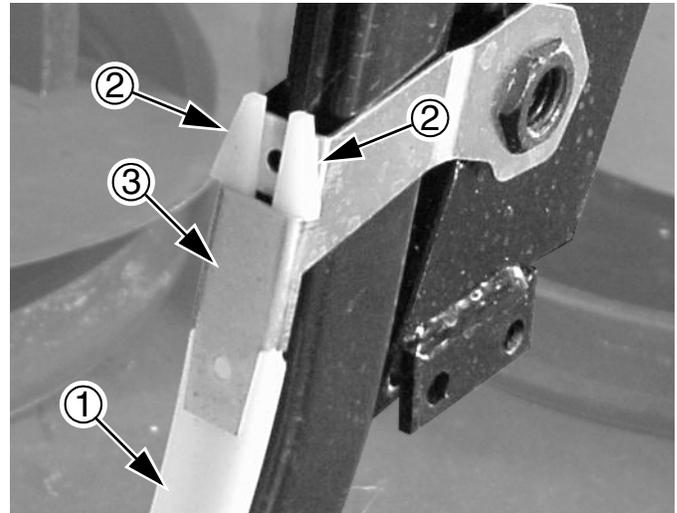


Figure 60
Seed Tube Flap

19398

Marker Maintenance

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

Bleeding Marker Hydraulics

NOTICE

Bleed only at:

JIC (Joint Industry Conference, 37° flare) or
NPT (National Pipe Thread, tapered thread) fittings.

Never bleed at:

ORB (O-Ring Boss) or
QD (Quick Disconnect) fittings.

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 (NPT) pipe-thread fittings. To avoid cracking hydraulic fittings from over tightening, and to keep tape fragments from clogging filters, do not use plastic sealant tape.

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

CAUTION

Crushing and Overhead Hazard:

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

1. Check that tractor hydraulic reservoir is full. Review “**Marker Operation**” on page 28.
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.
3. With tractor idling, activate tractor hydraulic valve until oil seeps out around a loosened fitting. Tighten that fitting.
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.

Marker Speed

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

Single Marker/Needle Valve Speed

Refer to Figure 61

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

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

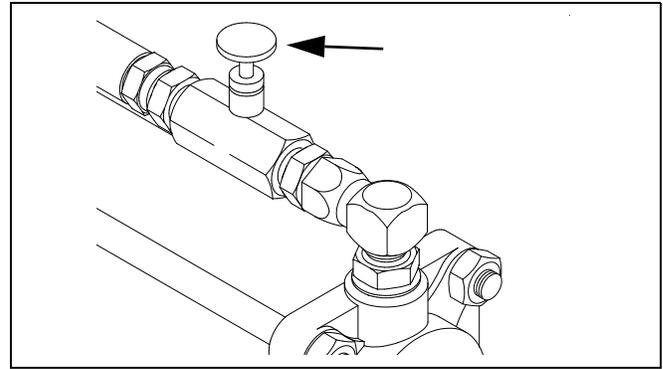


Figure 61
Needle valve Adjustment

15625

Dual-Marker/Sequence Valve Speed

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

Turn adjustment screws:

- clockwise (Ⓢ: slower) to decrease folding and unfolding speeds
- counterclockwise (ⓕ: faster) to increase folding and unfolding speeds.

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

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

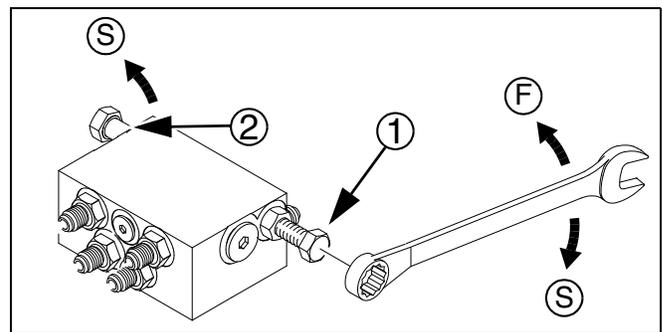


Figure 62
Sequence Valve Adjustment

14048

Marker Chain Length

Refer to Figure 63

With marker unfolded, adjust chain to a length ① of 67in (170cm)

Slowly fold marker while observing disk. If marker disk slides across the ground more than a foot (0.3m) before chain and linkage lifts it up, the chain is too long.

Remove bolt ② and shorten chain one or two links. Check adjustment by repeating folding process.

If chain is too short when marker is unfolded, it will prevent the marker blade from dropping into field depressions, causing skips in the mark line. Correct this condition by lengthening chain one or two links.

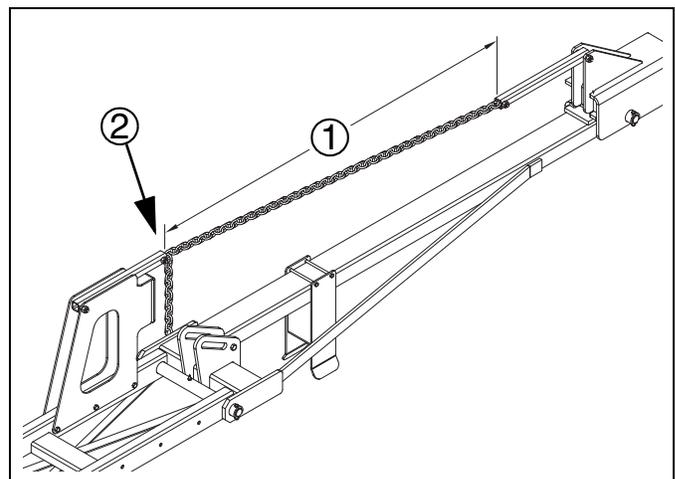


Figure 63
Marker Chain Length

18962

Marker Shear Bolt Replacement

Refer to Figure 64

The marker arm is attached to marker body with a pivot bolt ① and a shear bolt ②. A third clamp bolt ③ acts as a hold-down for the top of the marker shear base.

The shear bolt ② is designed to fail if the marker tip gets hung up on an obstacle. This prevents damage to the marker.

If the shear bolt fails, replace it with a bolt of identical size and grade, or one of similar strength.

The supplied bolt ② is Great Plains part: 802-589C HHCS 7/16-14X2 GR5

This is a $\frac{7}{16}$ -14 x 2 in Grade 5 bolt. If an exact replacement is not immediately available, temporarily substitute a metric bolt, M10x0.75 Class 8.8.

NOTICE

Machine Damage Risk:

Do not replace the shear bolt with a higher grade bolt, or the next obstruction may result in marker damage.

 Do not replace the shear bolt with a lower grade bolt, or smaller bolt, or you may experience nuisance shears.

If conditions are causing frequent shears, keep spare bolts in the storage holes of the marker shear base.

Before installing a new shear bolt, tighten the $\frac{5}{8}$ -11x5 in pivot and clamp bolts (①, ③) just enough so the marker shear arm moves with some resistance when pushed by hand.

 Repeat the above bolt adjustment step at the beginning of each season.

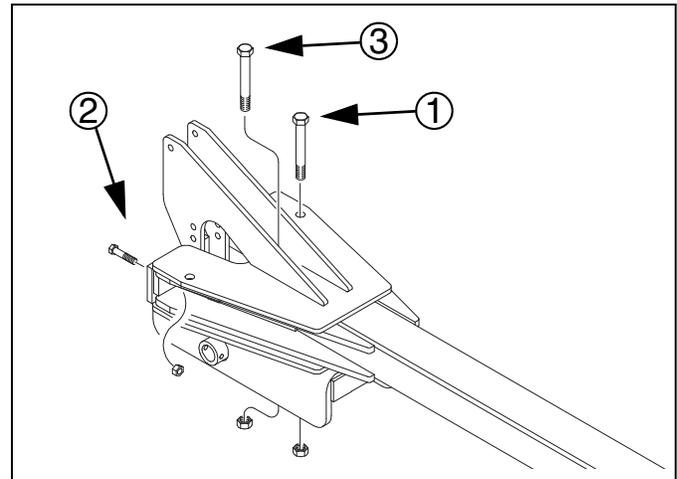


Figure 64
Marker Shear Base

22514

Lubrication

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

Caster Wheel Pivot (Rear)

	 8
---	---

1 zerk each of 2 casters; 2 total

Type of Lubrication: Grease

Quantity: Until grease emerges



Caster Wheel Pivot (Wing)

	 8
---	---

1 zerk each of 2 casters;
2 total

Zerk is partially obscured behind lock cylinder mechanism.

Type of Lubrication: Grease

Quantity: Until grease emerges



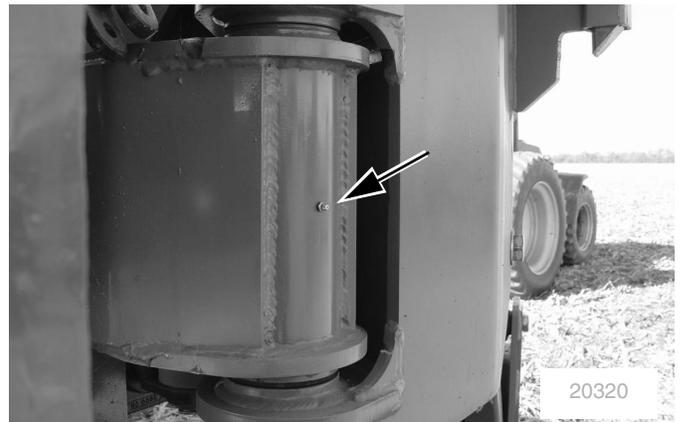
Gauge Wheel Assy Pivot

	 8
---	---

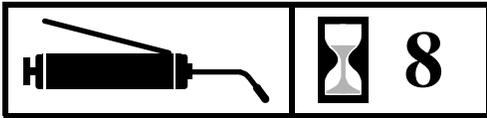
1 zerk each of 2 pivots; 2 total

Type of Lubrication: Grease

Quantity: Until grease emerges



Parallel Arm Pivots



4 zerks each of 4 arm sets; 16 total

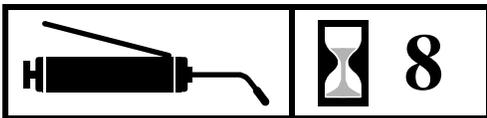
Zerks are on inside faces of cross-tubes between arms.

Type of Lubrication: Grease

Quantity: Until grease emerges



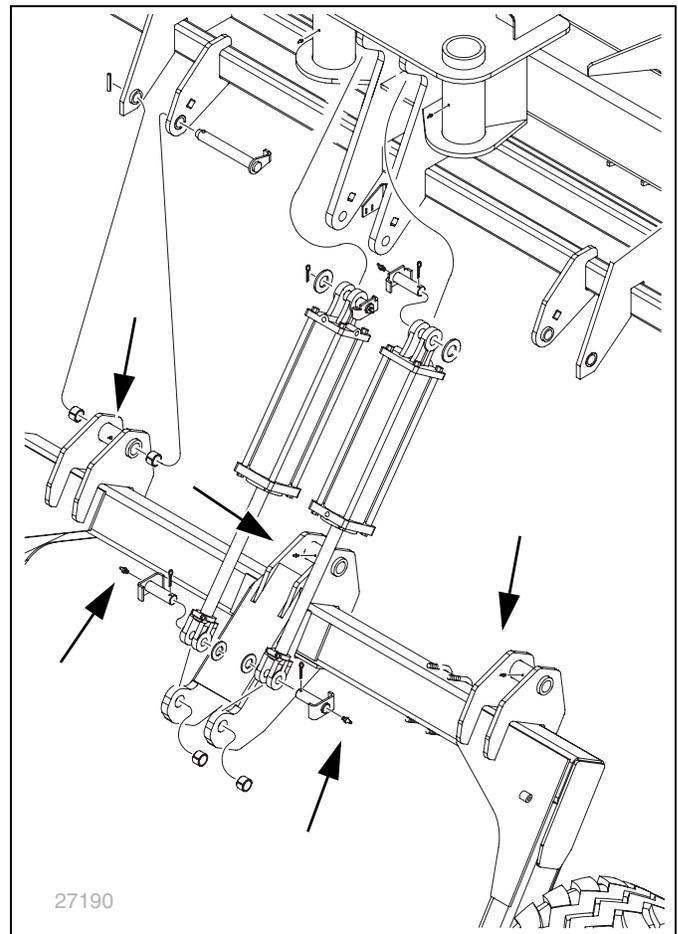
Rockshaft



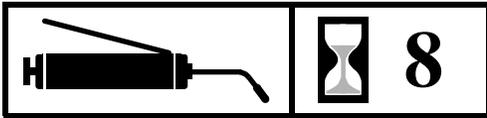
1 zerk each of 3 pivots,
1 zerk each lower cylinder pin;
5 total

Type of Lubrication: Grease

Quantity: Until grease emerges

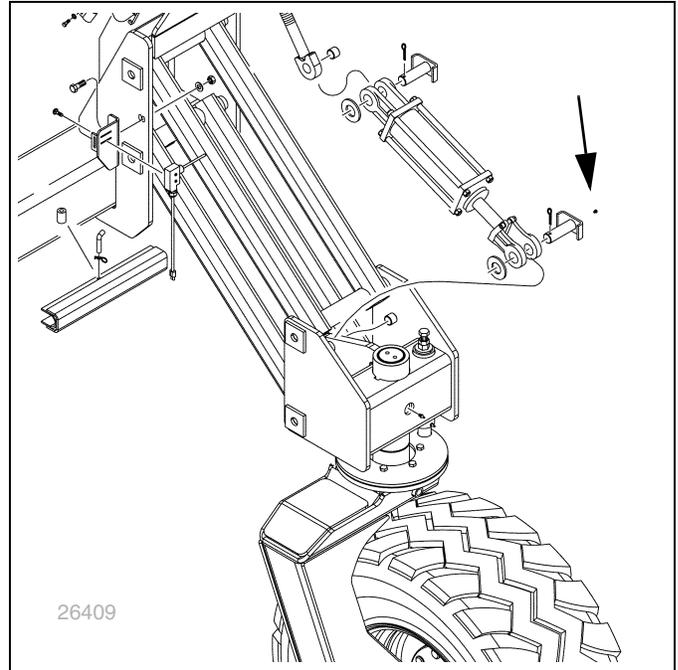


Parallel Arm Lift Cylinder Pins

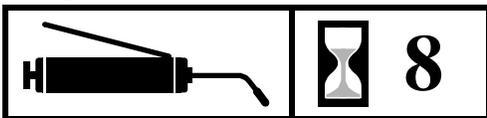


1 zerk each rod-end cylinder pin;
4 total

Type of Lubrication: Grease
Quantity: Until grease emerges

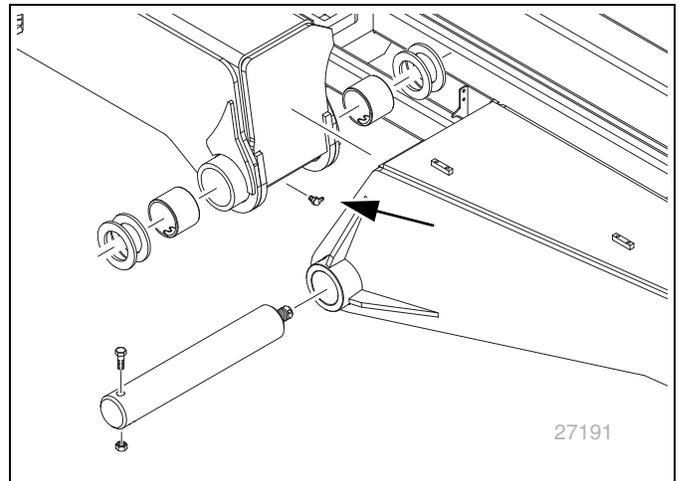


Wing Flex Pivots

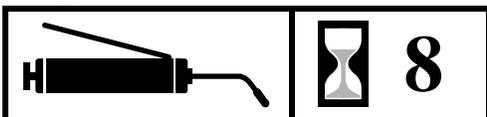


1 zerk each of 2 pivots; 2 total

Type of Lubrication: Grease
Quantity: Until grease emerges

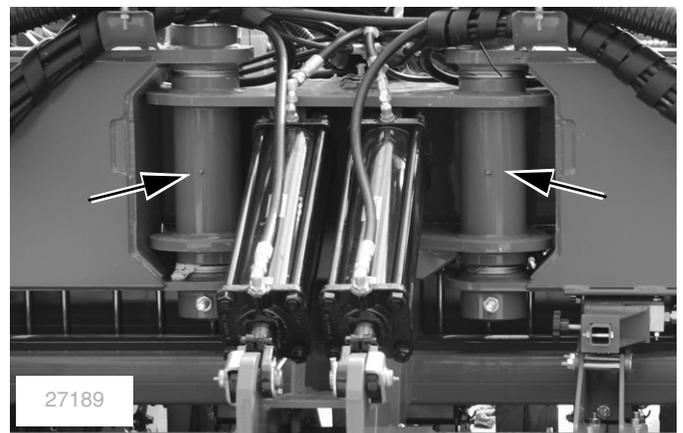


Wing Frame Vertical Pivots

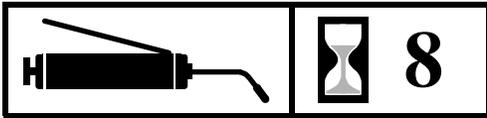


1 zerk each of 2 pivots; 2 total

Type of Lubrication: Grease
Quantity: Until grease emerges



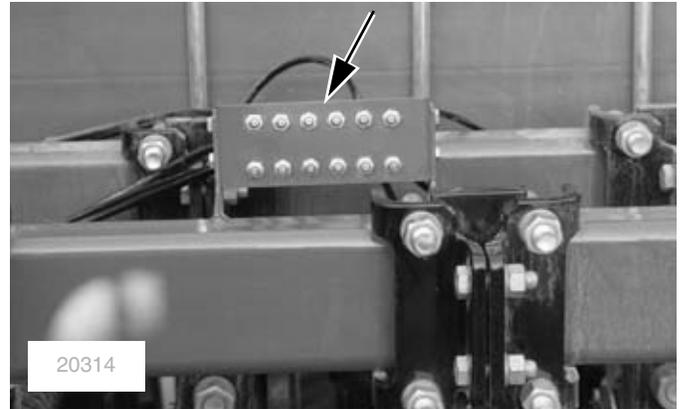
Grease Bank



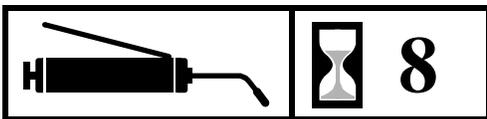
Up to 14 zerks each bank, 2 banks each of 3 sections;
6 banks total;
1 zerk per opener; 48 or 66 zerks total

Type of Lubrication: Grease
Quantity: 5 pumps

These zerks are only present if the drill has frame-mounted coulters. These zerks only serve the coulter arm pivots. Coulter hub zerks must be serviced at the hubs.

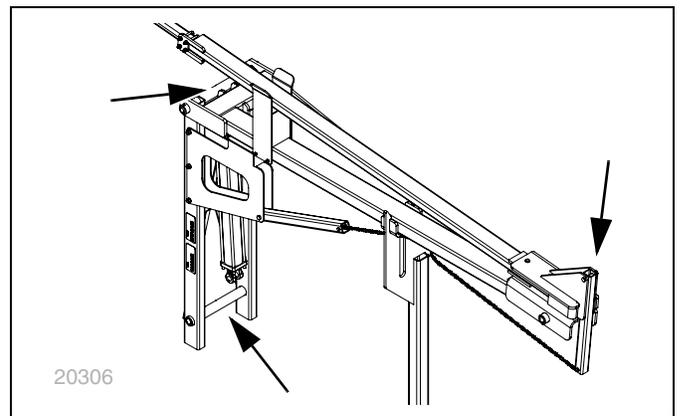


Marker(s) (Option)

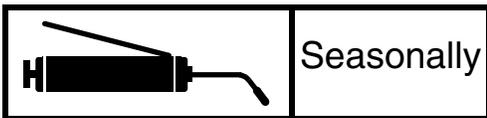


3 zerks per marker; 3 or 6 total

Type of Lubrication: Grease
Quantity: Until grease emerges



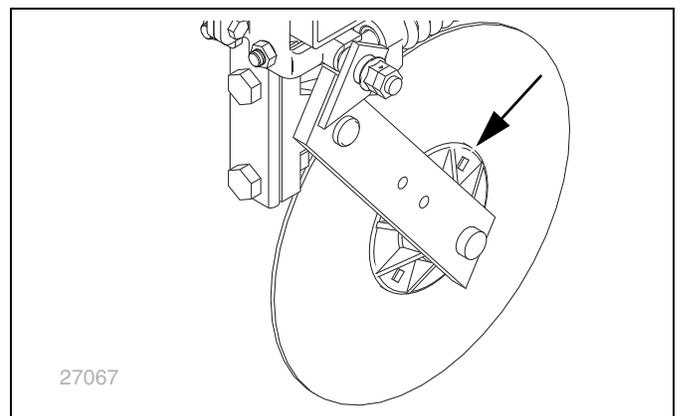
Frame-Mounted Coulter Hubs (Option)



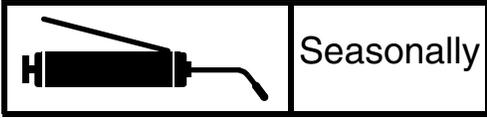
1 zerk per coulter; 48 or 66 total

Type of Lubrication: Grease
Quantity: Until grease emerges

These zerks are only present if the drill has frame-mounted coulters. These zerks only serve the coulter hubs. Coulter arm pivots are lubricated from the grease banks.



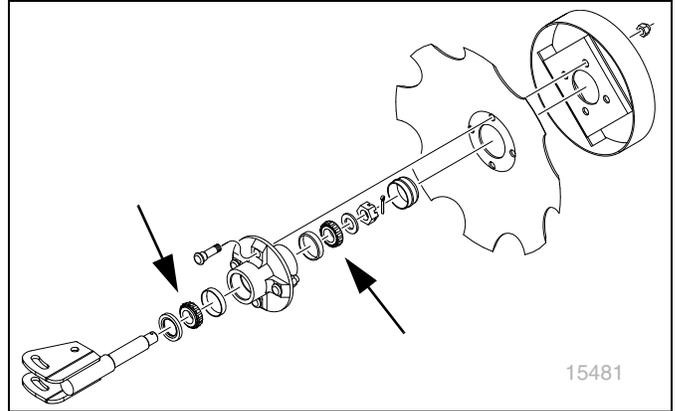
Marker Disk Bearings (Option)



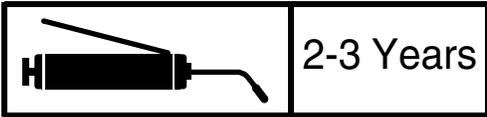
2 races each marker; 2 or 4 total

Type of Lubrication: Grease

Quantity: Repack



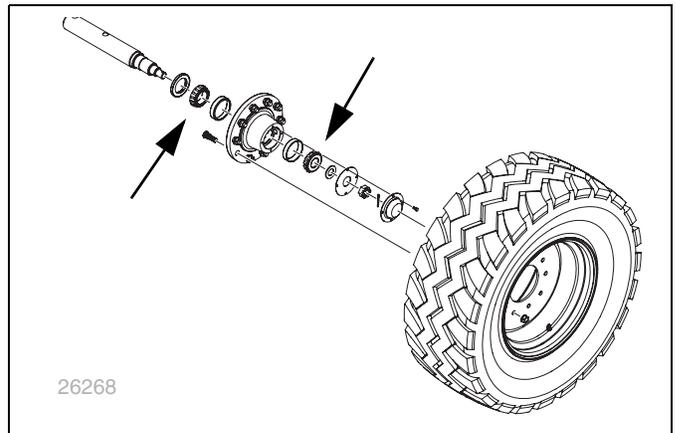
Main Wheel Bearings



2 races each of 6 wheels; 12 total

Type of Lubrication: Grease

Quantity: Repack





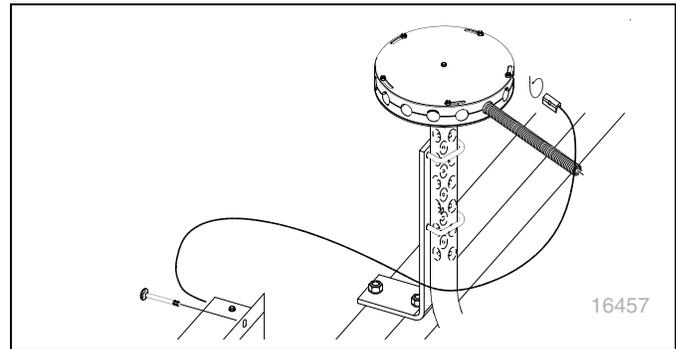
Options

Blockage Detector

The seed monitor supports sensors that monitor for plugging in the one-inch, secondary hoses. The package includes programmable blockage modules for each tower and flow sensors for each secondary seed hose. The blockage modules signal the monitor when flow stops at a sensor. The monitor then sounds an alarm and identifies the problem hose.

To order blockage sensors, contact your Great Plains dealer.

Drill, Row Spacing	Part Number
3N40HD-6675 DICKEY JOHN BLOCK	168-411A
3N40HD-4810 DICKEY JOHN BLOCK	168-412A



Coulters

The 3N-4010HDA supports either frame-mounted or unit-mounted coulters. It is not possible to install both types on the same drill.

Unit-Mounted Coulters

Unit-mount coulters (UMCs) attach directly to the 10HD row unit, and the coulters blade maintains a precise relationship to the opener disk (seeding) depth.

UMCs are suitable for lighter no-till and conventional tillage conditions. Their down-force is limited to what the 10HD row unit can provide. In challenging conditions, weight kits may be required.

UMCs are dealer-installed. Order one kit part number per row. Weight is 40 lbs (18 kg) per row.

Coulter Kit	Part Number
GP25S UMC 15 in FLUTED BLD	204-616L
GP25S UMC 15 in TURBO BLD	204-617L

For operation, see “Unit-Mounted Coulter Adjustments” on page 41.

15in Coulter Blades

Blade	Part Number
COULTER BLADE (FLUTED) 15 in OD	820-331C
COULTER BLADE (TURBO) 15 in OD	820-327C

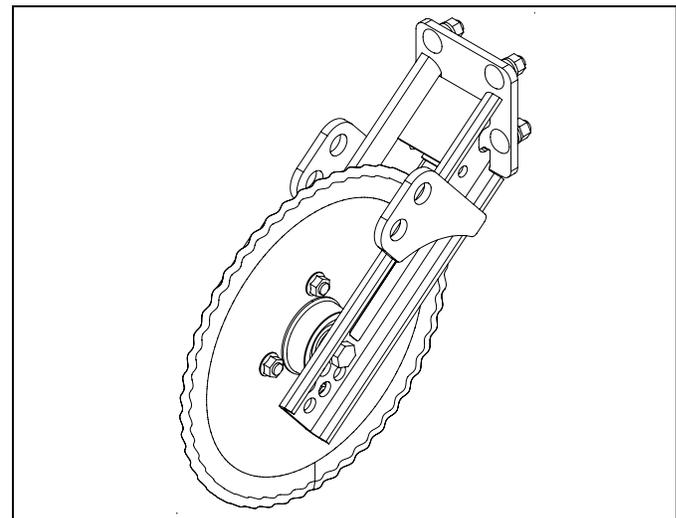


Figure 65
10HD Series Unit-Mounted Coulter

22817

Frame-Mounted Coulters

Frame-mounted coulters are recommended for heavier no-till conditions and rocky soil. They are independent of row-unit down-force and may be set to different (usually higher) force levels.

Because the weight of the drill is used to deliver both frame-mounted coulters and row-unit opener/press-wheel down-force, extra weights are almost always required with frame-mounted coulters. Each coulters itself adds 61 lbs (28 kg) to the drill. See page 39 for information on calculating requirements.

When ordered with a new drill, frame-mounted coulters are factory-installed. They may also be ordered for field installation. Each kit equips an entire drill.

Coulters Kit	For 3N-4010HDA-	
	-4810	-6675
with 17x ⁵ / ₁₆ in Fluted Blade	249-081A	249-085A
with 17x ³ / ₄ in Wavy Blade	249-083A	249-087A
with 17x ⁵ / ₈ in Turbo Blade	249-084A	249-088A

See “Opener Frame Height” on page 33 for adjustments.

17 in Coulters Blades

Part ordering number includes one blade.

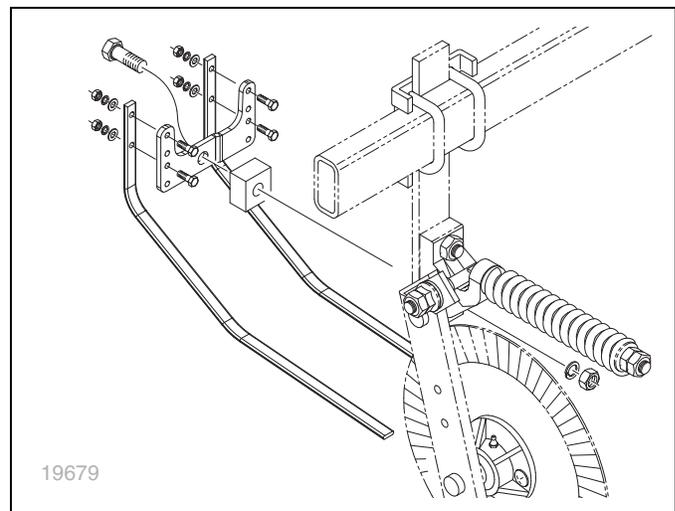
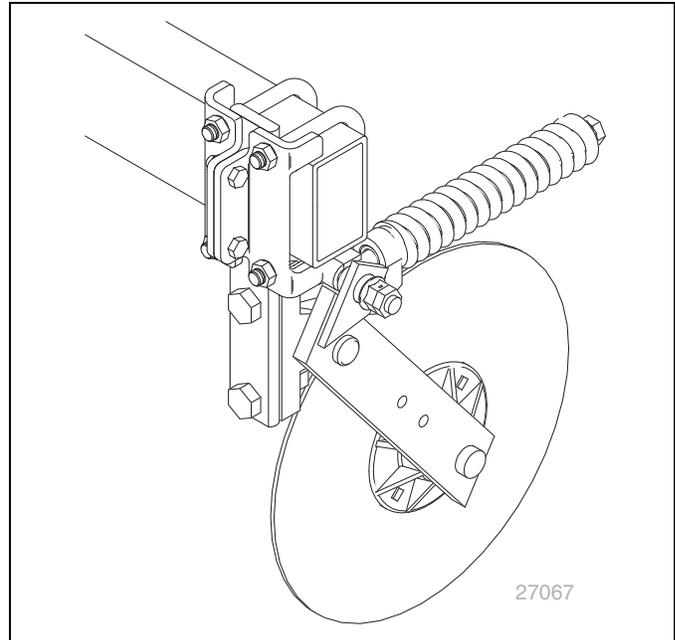
Blade	Part Number
17x ⁵ / ₁₆ in Fluted Blade	820-018C
17x ³ / ₄ in Wavy Blade	820-082C
17x ⁵ / ₈ in Turbo Blade	820-156C

Coulters Tines

The coulters on your drill can be equipped with optional trash tines. The tines help guide the residue under the coulters and openers to prevent plugging.

Order one kit per row.

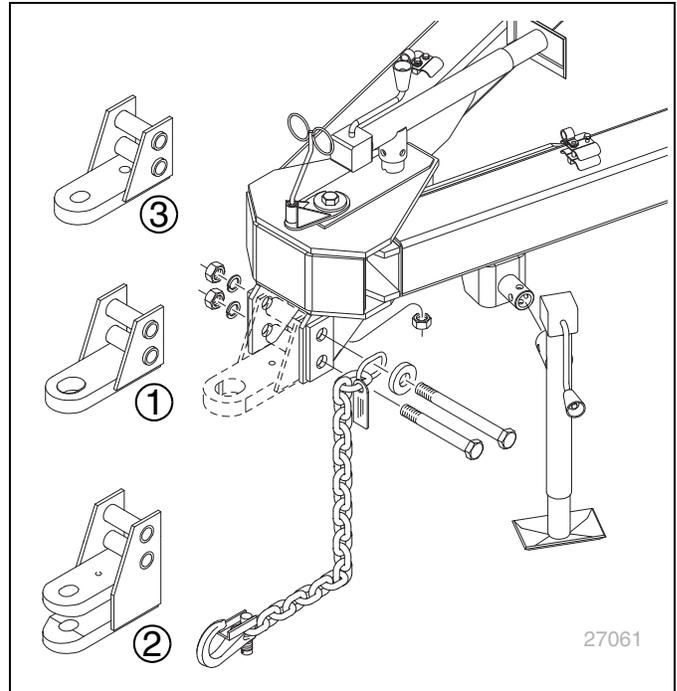
Row Spacing	Part Numbers
7.5 Inch Rows, Coulters Tine Update Kit	149-925A
10 Inch Rows, Coulters Tine Update Kit	149-926A



Hitches

One hitch is selected upon initial order of an 3N-4010HDA Drill, and includes the spring wire loop, safety chain, and all fasteners. Additional hitches may be ordered for conversion in the field, and include extra hitch mounting bolts, lock washers and nuts.

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



Flat Fold Markers

Hydraulically-operated markers leave a visible groove to use as centerline for the next pass.

The single marker mounts on the left side of the drill. The dual markers mount on both sides, and include an automatic sequence valve for operating alternate sides on each pass.

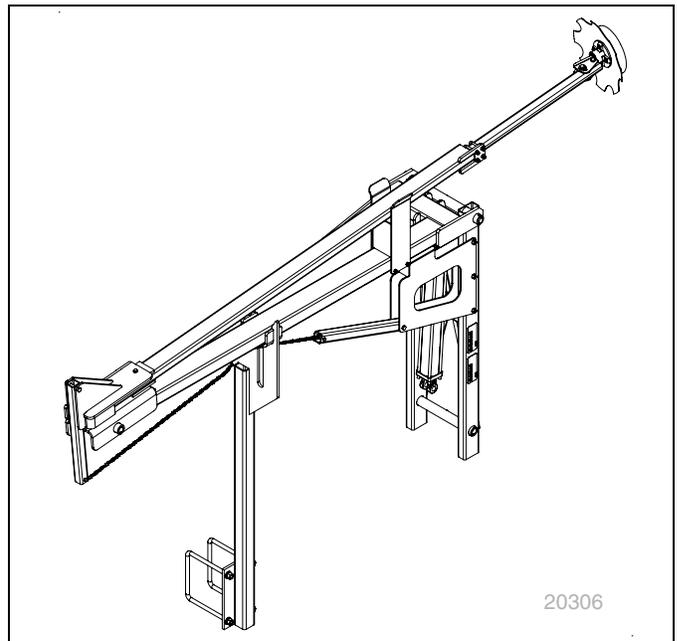
Both marker include speed adjustments.

If ordered with a new drill, markers are factory-installed. They may also be ordered later for field installation. Each kit equips one drill.

Marker Kit	Part Number
Single	113-814A
Dual	113-815A

Markers add weight to the drill, but only to the wing section(s). The dual kit adds 1860 lbs (844 kg). The single kit adds 930 lbs (422 kg). See page 39 for the contribution to available down-pressure.

To maintain equal available force when a single marker is installed, add one entire weight kit to the right wing, populated with eight 100 pound (45 kg) weights.



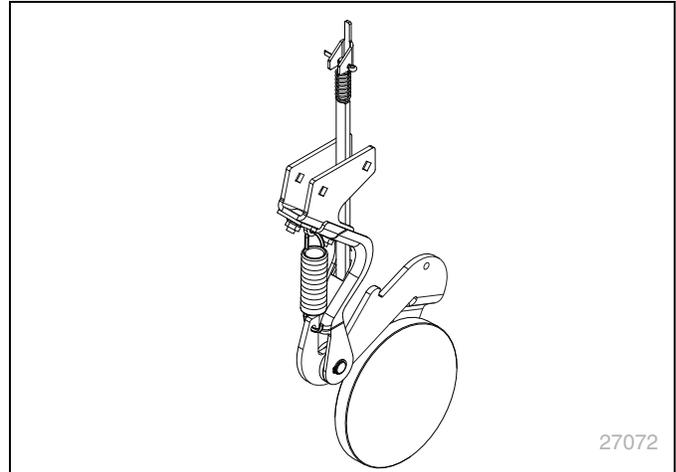
Seed Firmers

The standard 3N-4010HDA includes seed flaps. A choice of firmers is an option in the product bundles, or may be field-installed as kits. Only one type of seed firmer may be installed at the same time.

Seed-Lok® Seed Firmer

Description	Part Number
SEED LOK 98 ROW UNIT	404-093K

For operations, see “Seed Firmer Adjustments” on page 46.

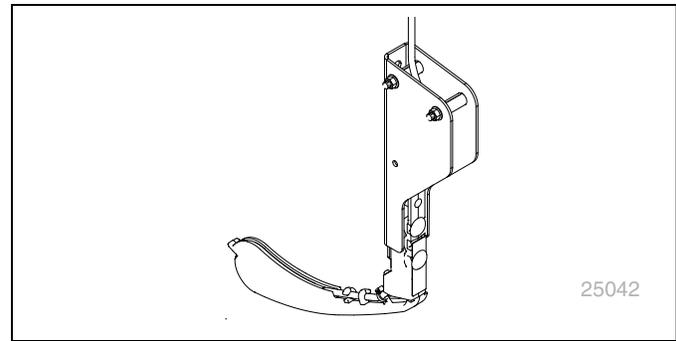


27072

Keeton Seed Firmer

Description	Part Number
25 SER SEED FIRMER W/FERT	890-840C

For operations, see “Seed Firmer Adjustments” on page 46.



25042

Dual Weight Kit

Transport Hazard. Adding more than the recommend weight to the drill frame could cause a tire to blow during transport, leading to a serious road accident and personal injury. Do not add more than 3000 pounds to the drill frame.

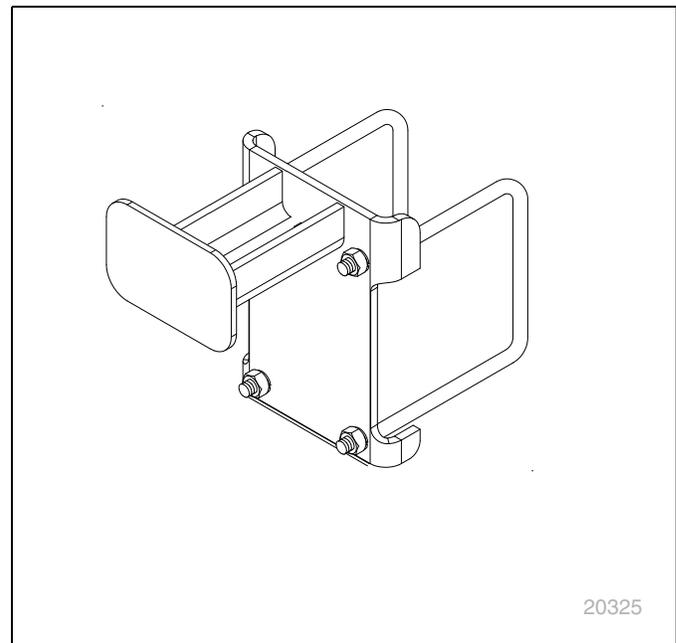
Two of these are standard on the model 3N-4010HDA. If unusual soil conditions require more weight for coulter penetration, a third weight bracket kit are available. The brackets attach to the wing mainframe, and accept up to five standard “suitcase” tractor weights, approximately 500 lbs (227 kg) per bracket or 1000 lbs (454 kg) per kit.

The empty weight of the kit itself is 121 lbs (55 kg), or 61 lbs (28 kg) per bracket.

The weight kit is field-installed, and does not include weights. See “Frame Weights” on page 39 for installation and use.

Great Plains suggests using no more than 3 kits (6 brackets, 3000 lbs (1361 kg) on the 3N-4010HDA.

Kit Description	Part Number
40P DUAL WEIGHT BRACKET PKG	196-332A



20325

Press Wheels

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



Specifications and Capacities

“Implement” refers to the 3N-4010HDA Air Drill alone.

“Assembly” refers to the 3N-4010HDA Air Drill hitched to an ADC2350B Air Cart.

	3N-4010HDA-4810	3N-4010HDA-6675
Operating Width	40 ft (12.2 m)	
Swath	480 in (1219 cm)	499 in (1267 cm)
Number of Rows	48	66
Nominal Row Spacing	10 Inch (25.4 cm)	7.5 Inch (19.1 cm)
Swath Averaged Row Spacing	10.0 in (25.4 cm)	7.56 in (19.2 cm)
Tractor Requirements	350 hp (power requirements will vary with tractor size, soil type, terrain and tillage practices)	
Weight ^a	Implement: 28736 lbs (13034 kg) Assembly: 38536 lbs (17480 kg)	Implement: 30896 lbs (14014 kg) Assembly: 40696 lbs (18549 kg)
Maximum Additional Weight	3 fully populated weight brackets ^b : 3121 lbs (1416 kg)	
Hydraulic Circuits	4 circuits required: load-sensitive or closed-center 15 to 30 gpm at 2000 psi	
Hitch	strap or clevis hitch to leading tractor, pintle hitch to trailing ADC3250B air cart	
Transport Width	Implement or Assembly: 14 ft (4.28 m)	
Transport Heights	Implement without Markers: 8 ft 7 in (2.62 m) Assembly without Markers: 11 ft 11 in (3.63 m) Implement or Assembly, with Markers: 12 ft 9 in (3.89 m)	
Operating Height	Assembly, with or without Markers: 11 ft 11 in (3.63 m)	
Length	Implement: 45 ft 4 in (13.8 m) Assembly: 70 ft (21.3 m)	
Wing Flexibility	12 degrees down, 12 degrees up	
Tire Size	18-22.5 NHS 16 Ply	

a. Does not include seed load in air cart, markers, coulters or extra weights.

See “**Transport**” on page 26 for additional data.

b. Two weight brackets on each wing are standard. A third set is optional.

Tire Information Chart		
Tire Size	Inflation	Torque
18-22.5 NHS 16-Ply	85 psi (586 kPa)	265 lb ft (360 Nm)

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.	
<u>Manufacturer</u>	<u>Web site</u>
Firestone	www.firestoneag.com
Titan	www.titan-intl.com
Goodyear	www.goodyearag.com
BKT	www.bkt-tire.com/en
Gleason	www.gleasonwheel.com

Torque Values Chart

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

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

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

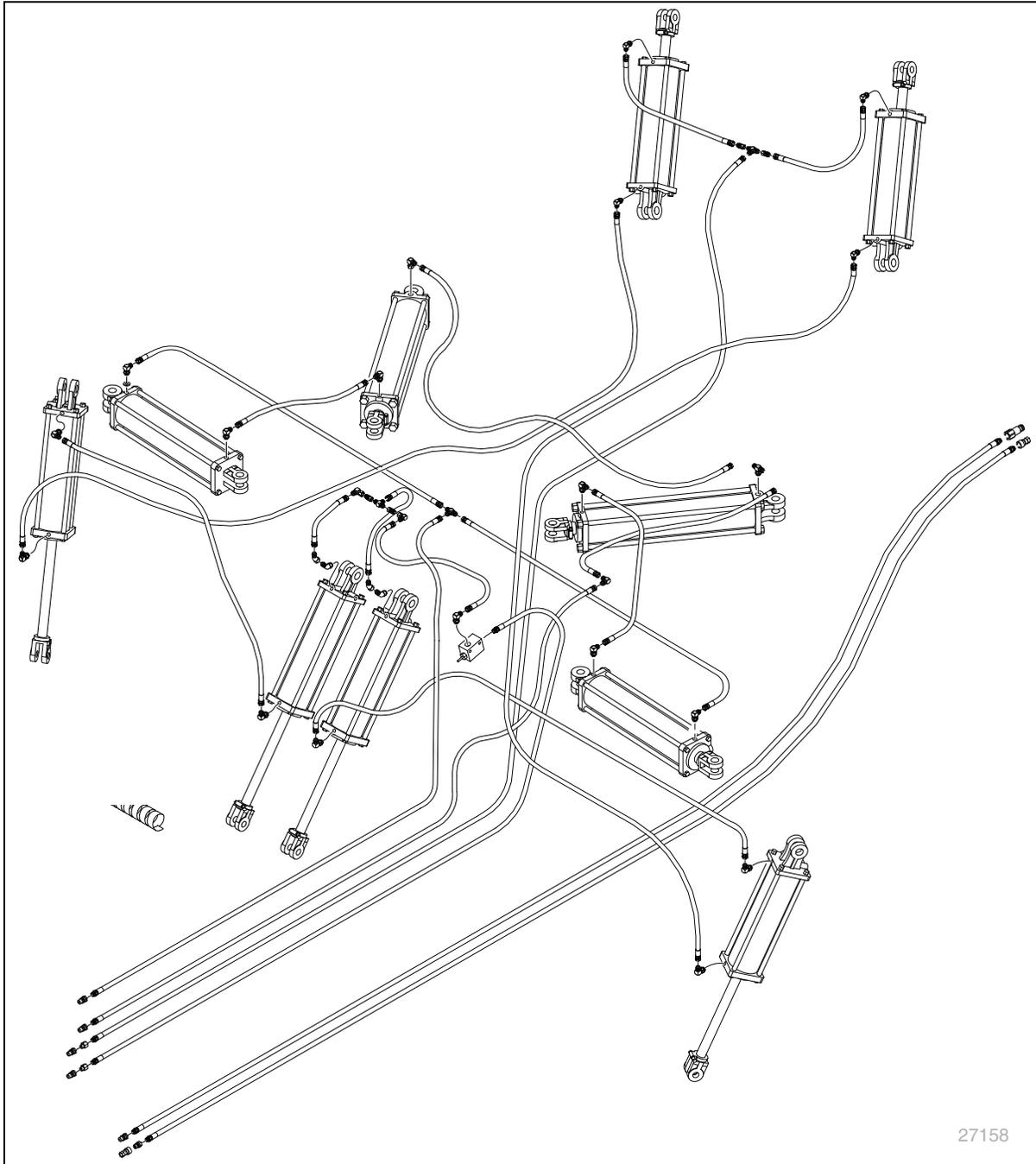
Torque tolerance + 0%, -15% of torquing values. Unless otherwise specified use torque values listed above.

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Hydraulic Diagrams

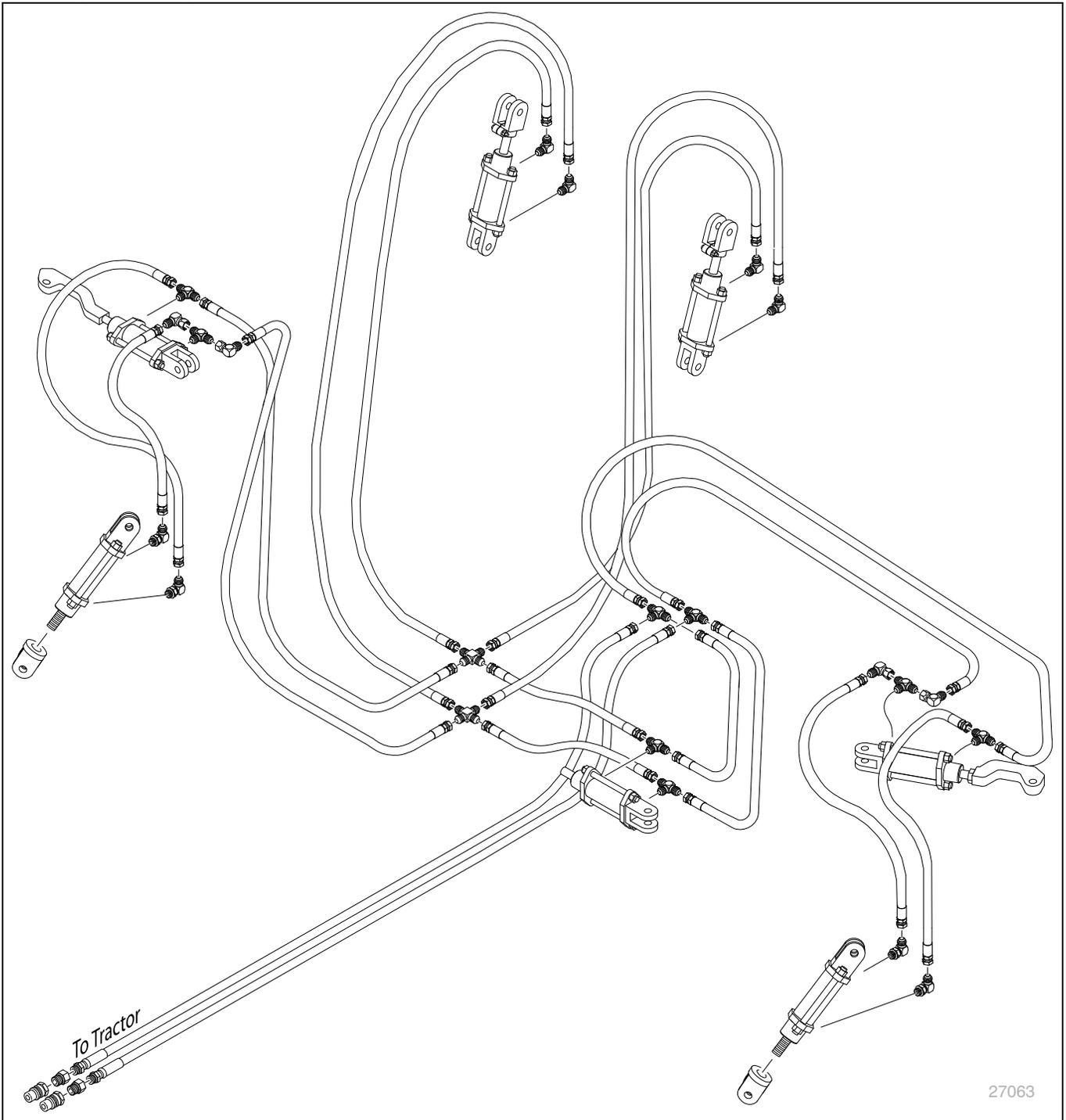
Hose Color	Blue	White	Yellow	Orange	<no color>
Drill Function	Lift Cylinders	Fold Cylinders (via selector w/ Optional Markers)	<pass-through to cart>	Lock Cylinders	<pass-through to cart>
Cart Function	<not present>	<not present>	Fan and Auger	<not present>	Sump Return

Lift and Fold Hydraulics

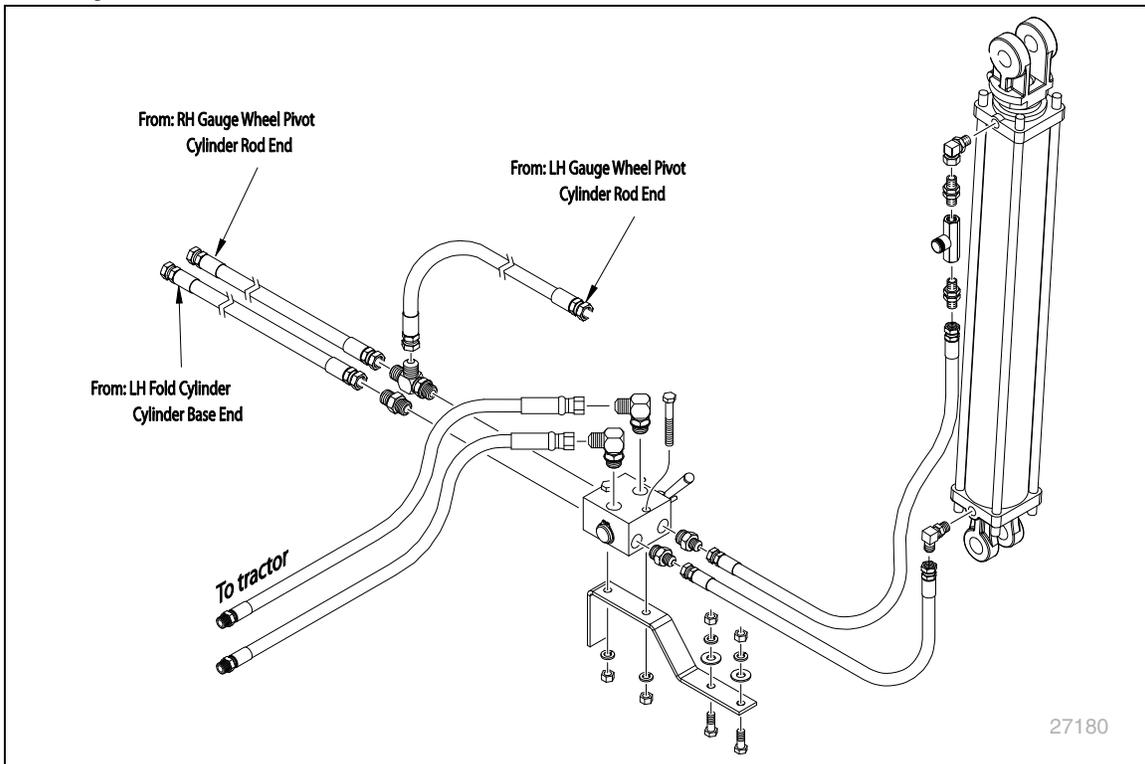


27158

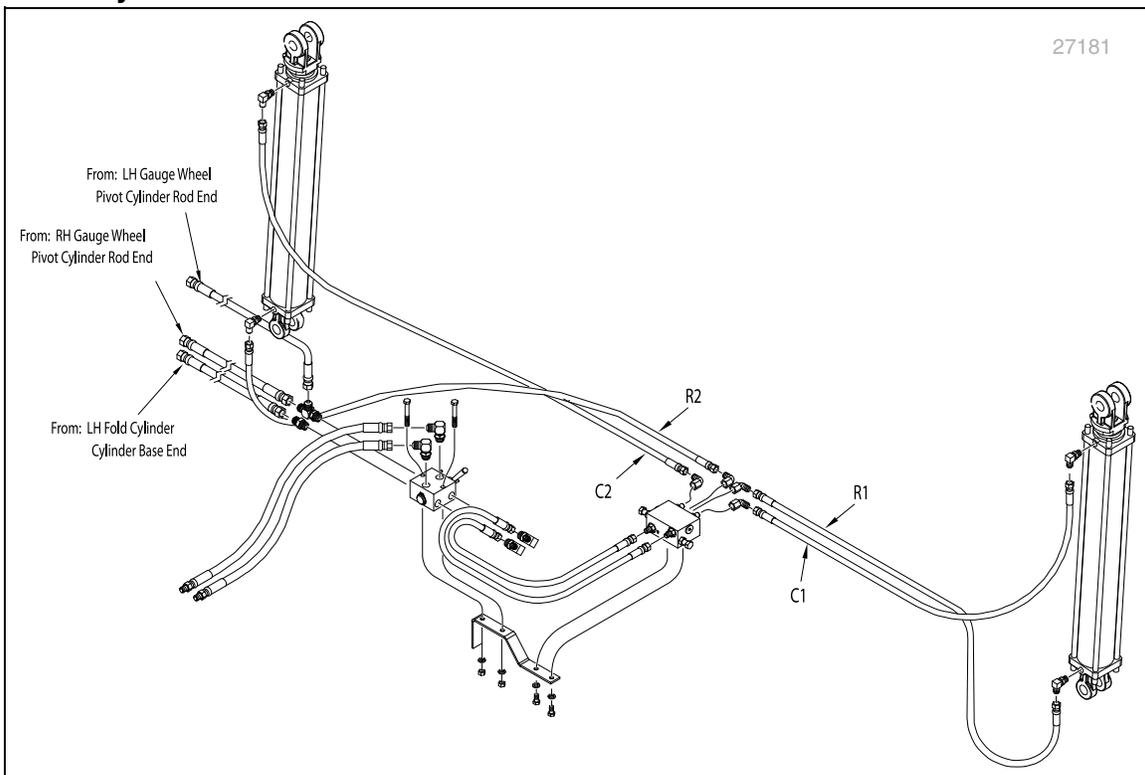
Lock Cylinder Hydraulics



Left Marker Hydraulics



Right Marker Hydraulics



Opener Hose Routing

Port Assignments, 10in (25.4cm) Drill

Drill Model: 3N-4010HDA-4810

Towers are numbered from drill left (Tower 1).

Harness connectors are numbered on the cable: "Row 1" through "Row 12" (some are not connected [n/c]).

Tower Ports are numbered Clockwise from mount center (Port 1) to Port 8.

Openers are numbered from drill left (Row 1).

Tower	Harness	Port	Opener	Hose Length
Tower 1	ROW 3	Port 1	3	69 in (175 cm)
	ROW 1	Port 2	1	75 in (191 cm)
	ROW 2	Port 3	2	72 in (183 cm)
	ROW 4	Port 4	4	70 in (178 cm)
	ROW 6	Port 5	6	71 in (180 cm)
	ROW 8	Port 6	8	75 in (191 cm)
	ROW 7	Port 7	7	71 in (180 cm)
	ROW 5	Port 8	5	70 in (178 cm)
	ROW 9-12	n/c	-	-
Tower 2	ROW 3	Port 1	11	72 in (193 cm)
	ROW 1	Port 2	9	75 in (191 cm)
	ROW 2	Port 3	10	72 in (183 cm)
	ROW 4	Port 4	12	72 in (183 cm)
	ROW 6	Port 5	14	73 in (185 cm)
	ROW 8	Port 6	16	77 in (196 cm)
	ROW 7	Port 7	15	76 in (193 cm)
	ROW 5	Port 8	13	70 in (178 cm)
	9-12	n/c	-	-
Tower 3	ROW 7	Port 1	23	70 in (178 cm)
	ROW 5	Port 2	21	69 in (175 cm)
	ROW 3	Port 3	19	72 in (183 cm)
	ROW 1	Port 4	17	79 in (201 cm)
	ROW 2	Port 5	18	73 in (185 cm)
	ROW 4	Port 6	20	70 in (178 cm)
	ROW 6	Port 7	22	70 in (178 cm)
	ROW 8	Port 8	24	76 in (193 cm)
	ROW 9-12	n/c		

Tower	Harness	Port	Opener	Hose Length
Tower 4	ROW 2	Port 1	26	70 in (178 cm)
	ROW 4	Port 2	28	70 in (178 cm)
	ROW 6	Port 3	30	74 in (188 cm)
	ROW 8	Port 4	32	80 in (203 cm)
	ROW 7	Port 5	31	74 in (188 cm)
	ROW 5	Port 6	29	70 in (178 cm)
	ROW 3	Port 7	27	70 in (178 cm)
	ROW 1	Port 8	25	73 in (185 cm)
	ROW 9-12	n/c	-	-
	Tower 5	ROW 5	Port 1	37
ROW 3		Port 2	35	72 in (183 cm)
ROW 1		Port 3	33	78 in (198 cm)
ROW 2		Port 4	34	73 in (185 cm)
ROW 4		Port 5	36	73 in (185 cm)
ROW 6		Port 6	38	70 in (178 cm)
ROW 8		Port 7	40	75 in (191 cm)
ROW 7		Port 8	39	73 in (185 cm)
9-12		n/c	-	-
Tower 6		ROW 3	Port 1	43
	ROW 1	Port 2	41	75 in (191 cm)
	ROW 2	Port 3	42	73 in (185 cm)
	ROW 4	Port 4	44	71 in (180 cm)
	ROW 6	Port 5	46	70 in (178 cm)
	ROW 8	Port 6	48	76 in (193 cm)
	ROW 7	Port 7	47	73 in (185 cm)
	ROW 5	Port 8	45	71 in (180 cm)
	ROW 9-12	n/c		

Port Assignments, 7.5in (19.2cm) Drill

5. Drill Model: 3N-4010HDA-6675

Towers are numbered from drill left (Tower 1).

Harness connectors are numbered on the cable: "ROW 1" through "ROW 12" (some are not connected [n/c]).

Ports are numbered Clockwise from mount center (Port 1) to Port 11.

Openers are numbered from drill left (Row 1).

Tower	Harness	Port	Opener	Hose Length
Tower 1	ROW 6	Port 1	6	69 in (175 cm)
	ROW 4	Port 2	4	70 in (178 cm)
	ROW 2	Port 3	2	74 in (188 cm)
	ROW 1	Port 4	1	75 in (191 cm)
	ROW 3	Port 5	3	71 in (180 cm)
	ROW 5	Port 6	5	70 in (178 cm)
	ROW 7	Port 7	7	70 in (178 cm)
	ROW 9	Port 8	9	74 in (188 cm)
	ROW 11	Port 9	11	78 in (198 cm)
	ROW 10	Port 10	10	73 in (185 cm)
	ROW 8	Port 11	8	70 in (178 cm)
	ROW 12	n/c	-	-
Tower 2	ROW 5	Port 1	16	71 in (180 cm)
	ROW 3	Port 2	14	73 in (185 cm)
	ROW 1	Port 3	12	78 in (198 cm)
	ROW 2	Port 4	13	74 in (188 cm)
	ROW 4	Port 5	15	70 in (178 cm)
	ROW 6	Port 6	17	70 in (178 cm)
	ROW 8	Port 7	19	72 in (183 cm)
	ROW 10	Port 8	21	75 in (191 cm)
	ROW 11	Port 9	22	76 in (193 cm)
	ROW 9	Port 10	20	72 in (183 cm)
	ROW 7	Port 11	18	70 in (178 cm)
	ROW 12	n/c	-	-
Tower 3	ROW 11	Port 1	33	76 in (193 cm)
	ROW 10	Port 2	32	72 in (183 cm)
	ROW 8	Port 3	30	72 in (183 cm)
	ROW 6	Port 4	28	71 in (180 cm)
	ROW 4	Port 5	26	73 in (185 cm)
	ROW 2	Port 6	24	77 in (196 cm)
	ROW 1	Port 7	23	83 in (211 cm)
	ROW 3	Port 8	25	77 in (196 cm)
	ROW 5	Port 9	27	72 in (183 cm)
	ROW 7	Port 10	29	71 in (180 cm)
	ROW 9	Port 11	31	72 in (183 cm)
	ROW 12	n/c	-	-

Tower	Harness	Port	Opener	Hose Length
Tower 4	ROW 2	Port 1	35	73 in (185 cm)
	ROW 4	Port 2	37	72 in (183 cm)
	ROW 6	Port 3	39	71 in (180 cm)
	ROW 8	Port 4	41	76 in (193 cm)
	ROW 10	Port 5	43	81 in (206 cm)
	ROW 11	Port 6	44	83 in (211 cm)
	ROW 9	Port 7	42	76 in (193 cm)
	ROW 7	Port 8	40	74 in (188 cm)
	ROW 5	Port 9	38	73 in (185 cm)
	ROW 3	Port 10	36	73 in (185 cm)
	ROW 1	Port 11	34	77 in (196 cm)
	ROW 12	n/c	-	-
Tower 5	ROW 6	Port 1	50	71 in (180 cm)
	ROW 4	Port 2	48	72 in (183 cm)
	ROW 2	Port 3	46	74 in (188 cm)
	ROW 1	Port 4	45	75 in (191 cm)
	ROW 3	Port 5	47	72 in (183 cm)
	ROW 5	Port 6	49	72 in (183 cm)
	ROW 7	Port 7	51	72 in (183 cm)
	ROW 9	Port 8	53	73 in (185 cm)
	ROW 11	Port 9	55	78 in (198 cm)
	ROW 10	Port 10	54	76 in (193 cm)
	ROW 8	Port 11	52	73 in (185 cm)
	ROW 12	n/c	-	-
Tower 6	ROW 5	Port 1	60	71 in (180 cm)
	ROW 3	Port 2	58	73 in (185 cm)
	ROW 1	Port 3	56	78 in (198 cm)
	ROW 2	Port 4	57	74 in (188 cm)
	ROW 4	Port 5	59	71 in (180 cm)
	ROW 6	Port 6	61	71 in (180 cm)
	ROW 8	Port 7	63	72 in (183 cm)
	ROW 10	Port 8	65	75 in (191 cm)
	ROW 11	Port 9	66	77 in (196 cm)
	ROW 9	Port 10	64	71 in (180 cm)
	ROW 7	Port 11	62	69 in (175 cm)
	ROW 12	n/c	-	-

Warranty

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

The following items and/or conditions are **not covered under warranty**: failures resulting from abuse or misuse of the equipment, failures occurring as a result of accidental damage or acts of God, 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), repeat repair due to improper diagnosis or repair by the dealer, temporary repairs, service calls and/or mileage to and from customer location, overtime premium, or unit hauling expenses. The warranty may be voided if the unit is towed at speeds in excess of 20 miles per hour (32 kilometers per hour), or is used in soils with rocks, stumps, or other obstructions.

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

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

This warranty is not valid unless the unit is registered with Great Plains within 10 days from the date of the original purchase.

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