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

Illustrations may show optional equipment not supplied with standard unit.
Machine Identification

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

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

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Accessories

Dealer Contact Information

Name: __________________________________________
Street: ________________________________________
City/State: ____________________________________
Telephone: _____________________________________
Email: _________________________________________
Dealer's Customer No.: ___________________________

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

Look for Safety Symbol

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

Be Aware of Signal Words

Signal words designate a degree or level of hazard seriousness.

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

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

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

Prepare for Emergencies

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

Be Familiar with Safety Decals

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

Use A Safety Chain

▲ Use a safety chain to help control drawn machinery should it separate from tractor draw-bar.
▲ Use a chain with a strength rating equal to or greater than the gross weight of towed machinery.
▲ Attach chain to tractor draw-bar 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.

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 assistance from a physician familiar with this type of injury.
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 the NTA907/3007HD 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 ft/30 m 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.

Confined Space

With materials loaded, or once used for hazardous fertilizers, or seeds with hazardous treatments, your hoppers may become “permit-required confined spaces” under applicable statutes, regulations, insurance rules or business policy. The vent tube structure in the hoppers has features to assist escape, and is not for routine entry.

▲ A hopper that is full or merely appears full can be an entrapment hazard. You can sink entirely into the grain, or into an oxygen-deficient void, and suffocate in a matter of seconds. Grain bridges and crusts are especially dangerous.
▲ When hazardous fumes are present, you can be quickly overcome even with the hopper lid open.
▲ Do not enter a hopper for material loading, material unloading, hopper cleaning or meter maintenance.
▲ Clean hopper by power washing from outside hopper top.
▲ Perform meter maintenance by removing meters from bottom of empty hopper.
▲ If obstruction removal or repair requires hopper entry, have the work performed by a team trained in confined space procedures. See “Hopper Entry” on page 109.
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.

Use Safety Lights and Devices

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

▲ Use flashing warning lights and turn signals whenever driving on public roads.

Use lights and devices provided with implement

Keep Riders Off Machinery

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

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

Transport Machinery Safely

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

▲ Do not exceed 30 kph or 20 mph. 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.
▲ Do not tow an implement that, when fully loaded, weighs more than 1.5 times the weight of towing vehicle.
▲ Carry reflectors or flags to mark Air 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 143.
▲ Do not fold or unfold the Air Drill while the tractor is moving.
Shutdown and Storage

▲ Unfold and lower Air Drill.
▲ Block tires or use optional drill parking brakes.
▲ Detach and store Air Drill 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 brake work, see specific safety information beginning on page 117.
▲ Work in a clean, dry area.
▲ Unfold and lower the drill, 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.
▲ Allow drill to cool completely.
▲ Disconnect battery ground cable (-) before servicing or adjusting electrical systems.
▲ Welding: Disconnect battery ground. Protect hydraulic lines. Avoid fumes from heated paint.
▲ Inspect all parts. Make sure parts are in good condition and installed properly.
▲ Remove buildup of grease, oil or debris.
▲ Remove all tools and unused parts from Air Drill before operation.

Safety At All Times

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

▲ Be familiar with all Air Drill functions.
▲ Operate machinery from the driver’s seat only.
▲ Do not leave drill unattended with tractor engine running.
▲ 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 Air Drill. Make sure all persons are clear of working area.
Safety Decals
Safety Reflectors and Decals

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

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

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

**Reflector: Slow Moving Vehicle (SMV)**

<table>
<thead>
<tr>
<th>Model</th>
<th>Decal Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTA907HD</td>
<td>n/a</td>
</tr>
<tr>
<td>NTA3007HD</td>
<td>818-055C</td>
</tr>
</tbody>
</table>

(International models use 833-398C panels and 833-399C reflectors)

on mainframe below fan; 1 total
See “Transport Safety Information” on page 40.

**Reflectors: Fluorescent Panels**

<table>
<thead>
<tr>
<th>Model</th>
<th>Decal Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTA907HD</td>
<td>833-398C</td>
</tr>
<tr>
<td>NTA3007HD</td>
<td>n/a</td>
</tr>
</tbody>
</table>

(North American models use 818-055C SMV reflectors, 838-266C red reflectors & 838-267C amber reflectors.)

**Reflectors: Red Triangle**

<table>
<thead>
<tr>
<th>Model</th>
<th>Decal Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTA907HD</td>
<td>833-399C</td>
</tr>
<tr>
<td>NTA3007HD</td>
<td>n/a</td>
</tr>
</tbody>
</table>

(North American models use 818-055C SMV reflectors, 838-266C red reflectors & 838-267C amber reflectors.)

panels: one each tongue draw bar, panels and triangles: one each corner, rear mainframe; 4 panels and 2 triangles total
See “Transport Safety Information” on page 40.
Reflectors: Red
NTA907HD: n/a  NTA3007HD: 838-266C
(International models use 833-398C panels and 833-399C reflectors)
On upper rear corners of mainframe (below Daytime); 2 total
See “Transport Safety Information” on page 40.

Reflectors: Daytime
NTA907HD: n/a  NTA3007HD: 838-267C
(International models use 833-398C panels and 833-399C reflectors)
On upper rear corners of mainframe (above Red); 2 total
See “Transport Safety Information” on page 40.

Reflectors: Amber
NTA907HD: 838-265C  NTA3007HD: 838-265C
On outside face, each wing gauge wheel mount, on rear face, each wing main tool bar, on outside face, mainframe sides ahead of ladder, on outside face, rear caster mount weldment; 8 total.
See “Transport Safety Information” on page 40.

Danger: Electrocution, Auger (Option)
NTA907HD: 848-409C  NTA3007HD: 818-627C
On auger tube near lower handles; 1 total
See “Auger Safety Information” on page 48.
Danger: Electrocution, Marker (Option)

One each side of marker upright arm, each side; 4 total
See “Marker Safety Information” on page 60.

Danger: Missing Guard (Option)

On auger tube nearest inlet; 1 total
See “Auger Safety Information” on page 48.

Danger: Read Manual

On side of tongue; one total

Danger: Rotating Auger (Option)

On auger tube near Missing Guard decal; 1 total
See “Auger Safety Information” on page 48.
Warning: Confined Space

NTA907HD: 848-412C  NTA3007HD: 818-628C

On each hopper lid near walkboard; 2 total


Warning: Falling Hazard

NTA907HD: 848-400C  NTA3007HD: 848-400C

On side of mainframe near ladder; 1 total

See “Ladder Safety Information” on page 44.

Warning: Fan Hazard

NTA907HD: 838-364C  NTA3007HD: 818-632C

On rear main frame below fan screen cage; one total

See “Fan Safety Information” on page 58.

Warning: High Pressure Fluid (Large)

NTA907HD: 838-359C  NTA3007HD: 818-437C

On side of tongue at hitch; one total

Warning: High Pressure Fluid (Small)
NTA907HD: 838-359C  NTA3007HD: 818-339C

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGH PRESSURE FLUID HAZARD</td>
</tr>
<tr>
<td>To prevent serious injury or death, do not spray or use high pressure fluid.</td>
</tr>
<tr>
<td>See &quot;Auger Safety Information&quot; on page 48.</td>
</tr>
<tr>
<td>See &quot;Fan Safety Information&quot; on page 58.</td>
</tr>
<tr>
<td>See &quot;Down-Force Safety Information&quot; on page 84.</td>
</tr>
<tr>
<td>See &quot;Weight Transfer Safety Information&quot; on page 90.</td>
</tr>
</tbody>
</table>

On left wing tool bar near down-pressure valve, on (optional) auger near lower operating control; 1 or 2 total

Warning: Moving Chain
NTA907HD: 838-363C  NTA3007HD: 818-860C

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOVING PARTS HAZARD</td>
</tr>
<tr>
<td>To prevent serious injury or death, do not stand on or near moving parts.</td>
</tr>
<tr>
<td>See &quot;Calibration Crank Safety Information&quot; on page 56.</td>
</tr>
</tbody>
</table>

On outside center face of main frame side tubes;

Warning: Overhead Auger (Option)
NTA907HD: 848-413C  NTA3007HD: 818-622C

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>OVERHEAD AUGER HAZARD</td>
</tr>
<tr>
<td>To prevent serious injury or death, do not stand on or near overhead auger.</td>
</tr>
<tr>
<td>See &quot;Auger Safety Information&quot; on page 48.</td>
</tr>
</tbody>
</table>

On outside face of auger arm, on each end of auger tube; 3 total

On each side of inner marker arm; 4 total

See "Marker Safety Information" on page 60.
Warning: Pinch Point/Crush

NTA3007HD: 818-045C

On side of tongue ahead of transport hooks; one total
See “Hitching Tractor to Air Drill” on page 18.
See “Unfolding Safety Information” on page 25.
See “Lowering/Raising Safety Information” on page 32.
See “Folding Safety Information” on page 34.
See “Down-Force Safety Information” on page 84.
See “Weight Transfer Safety Information” on page 90.

Warning: Pinch Point (Standard)

NTA907HD: 838-368C  NTA3007HD: 818-798C

On outside faces of wing gauge wheel mounts; 2 total
See “Unfolding Safety Information” on page 25.
See “Lowering/Raising Safety Information” on page 32.
See “Folding Safety Information” on page 34.

Warning: Pinch Point, Auger (Option)

NTA907HD: 838-368C  NTA3007HD: 818-623C

On outside face of auger arm, on auger tube near operating controls; 2 total
See “Auger Safety Information” on page 48.
Warning: Pinch Point, Marker (Option)
NTA907HD: 838-365C  NTA3007HD: 818-798C

On each side of inner marker arm; 4 total
See “Marker Safety Information” on page 60.

Warning: Speed
NTA907HD: n/a  NTA3007HD: 818-188C
(see 848-398C 30kph)

On side of tongue near hitch; one total
See “Transport Safety Information” on page 40.

Warning: Speed
NTA907HD: 848-398C  NTA3007HD: n/a
(see 818-188C 20mph)

On rear main frame; total
See “Transport Safety Information” on page 40.

Caution: Read Operator Manual
NTA907HD: 838-358C  NTA3007HD: 818-587C

On side of tongue near hitch; one total
Caution: Auger General

On auger tube near lower operating controls; 1 total

See “Auger Safety Information” on page 48.

Caution: Wear Eye Protection

On side of tongue at hitch; one total

See “Hydraulic Hose Hookup” on page 19.
See “Hydraulic Maintenance Safety Information” on page 111.

Caution: Tires Not A Step

On rear face of caster weldments, on front face of front transport axles, on front face of tool bar near wing gauge wheels, on outside face of wing gauge wheel weldments; 8 total

See “Unfolding Safety Information” on page 25.
See “Folding Safety Information” on page 34.
See “Down-Force Safety Information” on page 84.
See “Weight Transfer Safety Information” on page 90.
Caution: Tire Pressure and Torque

NTA907HD: 848-406C  NTA3007HD: 838-092C

![CAUTION]

To avoid injury or machine damage from improper tire inflation or tightening of wheel bolts:
- Maximum inflation pressure of tires is 60 psi.
- Torque wheel bolts to 50 – 100 ft. lb.

On outside of each wing gauge tire; 8 total
See “Transport Safety Information” on page 40.

Caution: Tire Pressure and Torque

NTA907HD: 848-407C  NTA3007HD: 838-426C

![CAUTION]

To avoid injury or machine damage from improper tire inflation or tightening of wheel bolts:
- Maximum inflation pressure of tires is 60 psi.
- Torque wheel bolts to 50 – 100 ft. lb.

On outside of each transport wheel tire; 4 total
See “Transport Safety Information” on page 40.

Caution: Towing

NTA907HD: 838-358C  NTA3007HD: 848-394C

![CAUTION]

To prevent injury or equipment damage:
- Use vehicle with adequate means to control machine when towing.
- Maximum towing vehicle weight of 20 mpg maximum 20,000 pounds with loaded drill
  20,000 pounds with empty drill
- Maximum towing vehicle weight of 10 mpg maximum 10,000 pounds with loaded drill
  10,000 pounds with empty drill

On outside of each wing gauge wheel tire; 4 total
See “Transport Safety Information” on page 40.
Introduction

Great Plains welcomes you to its growing family of new product owners. Your 9m/30ft No-Till Heavy Duty Air Drill has been designed with care and built by skilled workers using quality materials. Proper setup, maintenance, and safe operating practices will help you get years of satisfactory use from the machine.

Models Covered

- NTA907HD-3610 9m, 36-row, 25.4cm (10in) spacing
- NTA907HD-4875 9m, 48-row, 19.1cm (7.5in) spacing
- NTA907HD-6006 9m, 60-row, 15.0cm (5.9in) spacing
- NTA3007HD-3610 30ft, 36-row, 10in spacing
- NTA3007HD-4875 30ft, 48-row, 7.5in spacing
- NTA3007HD-6006 30ft, 60-row, 6in spacing

See “Specifications and Capacities” on page 143 for precise swath information.

Description of Unit

The NTA907/3007HD Drill is a pull-type integrated air drill. It has dual 3500 liter (100 bu) hoppers for separate or simultaneous delivery of seed and/or granulated dry fertilizer. Each hopper has an independent metering system with infinite ratio gearboxes. The NTA907/3007HD Drill folds for narrow transport.

The NTA907/3007HD has double-disk Series 07HD heavy duty openers, and is suitable for conventional till and, minimum-till conditions. With optional coulters, the drill is suitable for moderate no-till conditions.

The NTA907/3007HD may optionally be equipped with brakes, which work in conjunction with the tractor brakes. Other options include coulters, markers and auger.

Intended Usage

Use the NTA907/3007HD Drill to seed and fertilize production-agriculture crops only. Do not modify the Air Drill for use with attachments other than Great Plains options and accessories specified for use with the NTA907/3007HD Drill.

Document Family

- 166-207M Owner's Manual (this document)
- 167-085B Seed Rate Charts
- 166-207P Parts Manual
- 110011516 DICKEY-john Quick Start Guide
- 110011375 DICKEY-john Air Cart Control manual
- 110011440 DICKEY-john 10in Virtual Terminal manual

Using This Manual

This manual will familiarize you with safety, hitching, 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.

**NOTICE**

A crucial point of information related to the preceding topic. Read and follow the directions to remain safe, avoid serious damage to equipment and ensure desired field results.

Useful information related to the preceding topic.

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. An orientation rose in some line art illustrations shows the directions of: Up, Back, Left, Down, Front, Right.
Owner Assistance

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

Refer to Figure 2

Your machine's parts were specially designed and should only be replaced with Great Plains parts. Always use the serial and model number when ordering parts from your Great Plains dealer. The serial-number plate is located on the left side main frame, below crank.

Record your NTA907/3007HD Drill model and serial number here for quick reference:

Model Number: __________________________
Serial Number: __________________________

Further Assistance

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

1. Discuss the matter with your dealership service manager. Make sure they are aware of any problems so they can assist you.

2. If you are still unsatisfied, seek out the owner or general manager of the dealership.

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

Great Plains Service Department

1525 E. North St.

P.O. Box 5060

Salina, KS 67402-5060

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

This section helps you prepare your tractor and NTA907/3007HD Drill for use, and covers seasonal tasks, and task when the tractor/Air Drill configuration changes.

Before using the NTA907/3007HD Drill in the field, you must hitch the Air Drill to a suitable tractor, inspect systems and level the Air Drill. Before using the Air Drill for the first time, and periodically thereafter, certain adjustments and calibrations are required.

Initial Setup

See “Appendix B - Initial Setup” on page 162 and “Appendix C - Option Installation” on page 164 for pre-delivery items (normally completed by dealer), and first-time/infrequent setup tasks, including:

• Install seed monitor console in tractor (page 162).
• Set marker extension (page 162) and speed.

Seasonal Setup

On initial delivery, use with a new tractor, and seasonally, check and as necessary, complete these items before continuing to the routine setup items:

• Bleed hydraulic system (page 111).
• Wing leveling and alignment (page 127).
• Speed sensor calibration (DICKEY-john Air Cart Control manual).
• Blow out entire air system to remove condensation. Check air flow at each row, for evidence of plugging.
• De-grease exposed cylinder rods if so protected at last storage.

Pre-Planting Setup

Complete this checklist before routine setup:

☐ Read and understand “Important Safety Information” on page 1.
☐ Check that all working parts are moving freely, bolts are tight, and cotter pins are spread.
☐ Check that all grease fittings are in place and lubricated. See “Lubrication” on page 132.
☐ Check that all safety decals and reflectors are correctly located and legible. Replace if damaged. See “Safety Decals” on page 6.
☐ Inflate tires to pressure recommended and tighten wheel bolts as specified. See “Tire Inflation Chart” on page 144.
Hitching Tractor to Air Drill

**DANGER**

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

1. Move the tractor to near hitching position.
2. Put the tractor in Park and shut down the tractor.
   Refer to Figure 3
3. Adjust the NTA907/3007HD drill hitch to match your tractor draw bar height, using crank of tongue jack on side of tongue.

The precise height is not critical, as the NTA907/3007HD drill leveling is set at the mainframe and is independent of tongue level.

**NOTICE**

Hitch Failure Risk:
The hitch may be mounted inverted if necessary, but always have two (2) bolts in two holes of both tongue and hitch.

4. Securely attach safety chain to an anchor on a tractor capable of pulling the NTA907/3007HD drill.
5. Use crank to raise jack foot. Remove pin and jack.
   Refer to Figure 4
6. Store jack on side of left rear mainframe.
7. Connect hydraulic hoses (page 19).
10. Remove and store main tongue parking stand.

Figure 3
NTA907/3007HD Drill Hitched

Figure 4
Jack in Storage Location
Hydraulic Hose Hookup

**WARNING**

*High Pressure Fluid Hazard:*
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 assistance from a physician familiar with this type of injury.

*Only trained personnel should work on system hydraulics!*

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.

The fan pressure hose (orange) must be connected to a circuit capable of continuous flow at high volume.

The lift/down-pressure hose (blue) must be connected to a circuit capable of continuous pressure.

This implement is compatible only with tractors having Closed Center hydraulics.

Refer to Figure 5

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.

For hydraulic fan and auger drive motors, connect the hose under the retracted cylinder symbol to the pressure side of the motor. Connect the hose under the extended cylinder symbol to the return side of the motor.

The fan motor further requires hookup of a (third) case drain line, which returns lubricating/cooling fluid.

### Protecting Fan Hydraulic Motor Seals

**Low Pressure (Case) Drain Connection:**

11. Attach case drain hose to low pressure drain connection.

   *Case drain hose must be hooked up first and unhooked last to prevent damage to hydraulic motor seals. It has the smaller \( \frac{3}{4} \)in I.D. hose and small, flat-face, low seep connector.*

12. Connect low pressure motor return hose to high volume low pressure return connector. It is distinguished by a large (1.06in/2.7cm diameter) quick coupler.

13. Connect hydraulic hoses to tractor remotes.

### Hose Label

<table>
<thead>
<tr>
<th>Color</th>
<th>Hydraulic Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>Fold / Tilt / Marker (Option)</td>
</tr>
<tr>
<td>Blue</td>
<td>Opener Lift / Down-Pressure</td>
</tr>
<tr>
<td>Black</td>
<td>Fan / Auger (Option)</td>
</tr>
<tr>
<td>Yellow</td>
<td>Transport Hook</td>
</tr>
<tr>
<td>“BRAKES”</td>
<td>Hydraulic trailer brakes (Option)</td>
</tr>
</tbody>
</table>

**NOTICE**

*Case Drain Hose must be attached first, prior to inlet and return hoses being connected.*

*Case Drain Hose must be detached last, to prevent damage to the fan motor.*

**NOTICE**

DO NOT connect the case drain line to a power-beyond-port.
Brake Hookup (Option)

Two Air Drill braking (trailer braking) systems are available:

- Dual-line air system (Figure 6) with independent cable-operated parking brake (Figure 8), and
- Single-line hydraulic (Figure 7) with independent cable-operated parking brake (Figure 8).

In both systems, the tractor's trailer brake remote port(s) operate a hydraulic slave cylinder on the drill.

Tractor trailer braking systems are normally integrated with the tractor brakes, and operate the trailer brakes when tractor brakes are used during tractor movement.

The trailer braking system may or may not be integrated with the tractor parking brake system.

Trailer brakes typically are not automatically engaged when the tractor transmission is in Park, and may not be engaged by any tractor Emergency Brake.

Both drill systems include an independent cable-operated parking brake on the drill. The tractor cannot engage or release the drill's parking brake system.

CAUTION

Braking Hazards:
Make sure the operator understands when drill brakes are engaged and when they are released (record tractor behavior on page 43).

Also understand and implement tractor operational restrictions when trailer brakes are used. For example, it is generally necessary to inter-tie split brakes, and avoid differential (steering braking) if trailer brakes are used.

Air Brake Hookup

Refer to Figure 8

Refer to Figure 9

16. Connect the “Brake”, “Service” or “Control” line first. This line is Blue-coded.

This line operates the drill brakes.
17. Connect the “Provision” or “Supply” line. This line is Red-coded.

The Provision line charges a reservoir tank on the drill. The Brake line operates a valve system which meters tank air to the master cylinder on the drill.

**CAUTION**

**Braking Hazard:**
Do not use the NTA907HD with a “single-line” air brake system. This drill is designed for transport speeds that require an air brake system to be “dual-line”. A single-line tractor system cannot charge the tank that powers the drill brakes.

**CAUTION**

**Roll-Away Hazard:**
When unhitching, disconnect the red (control) line first. This sets the brakes on the drill.

**Hydraulic Brake Hookup**

Refer to Figure 11

This is a single hydraulic line, connected to the tractor “Brake” outlet.

The factory default connector is a $\frac{3}{4}\text{in}$ poppet-style QD (Quick Disconnect). If this is incompatible with your tractor, it may be replaced by a connector that mates to, or can be adapted to:

- $\frac{3}{4}\text{in}$ male ORB (O-Ring Boss), or
- $\frac{3}{4}\text{in}$ female JIC (Joint Industry Conference, $37^\circ$ flare).
Electrical Hookup
Refer to Figure 10
Make sure tractor is shut down with accessory power off before making connections.
18. Mate lighting connector to tractor outlet.
19. Mate monitor connector to tractor harness.
20. Mate any optional or aftermarket electrical connectors.

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

Heights and Leveling
All frame sections must be at the correct height and level to maintain even planting depth.
Periodic frame-leveling adjustments should not be necessary. If you are having problems with uneven depth, check Air Drill levelness and follow these procedures.
1. Complete “Bleeding Hydraulics” on page 111.
2. Unfold the Air Drill fully (page 25).

Set Tongue Height
Drill must be unfolded for this procedure.
Refer to Figure 11
Set the initial tongue height, tractor hitch, and changing implement hitch configuration as necessary. Distance is measured at top of tongue to ground level.
If desired height cannot be attained with normal range of hitch, hitch may be relocated in tongue bolt holes. Always have two bolts in use, through two sets of hitch holes and two sets of tongue holes.
Checking Air Drill Height

The Air Drill is designed to operate with all sections of the main tool bar nominally 76.2cm (30in) above the planting surface. The height of the center section is not routinely adjustable. Set planting depth with row unit adjustments.

When lowering the Air Drill for the first time on the planting ground:

1. Completely lower the main tool bar. If necessary, first lift off transport locks, remove and stow locks.
2. Set hitch to planting height.
3. Pull forward a meter or so (a few feet).

**NOTICE**

Drill must be fully lowered to field position (with openers into ground) and hitch height must be set before making side-to-side adjustments.

Refer to Figure 12

4. Check tool bar height across Air Drill. See page 127 for further detail and adjustment.

Marker Setup

Prior to first use, check and adjust:

- "Initial Marker Setup" on page 162.

Prior to each planting session, check and adjust:

- "Marker Disk Adjustment" on page 98.
Operating Instructions

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

Pre-Start Checklist

Perform the following steps before transporting the NTA907/3007HD Air Drill to the field.

**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 assistance from a physician familiar with this type of injury.

- Review “Important Safety Information” on page 1.
- Lubricate as indicated at “Lubrication” on page 132.
- Check all tires for proper inflation. See “Tire Inflation Chart” on page 144.
- Check all bolts, pins, and fasteners. Torque as shown in “Torque Values Chart” on page 153.
- Check Air Drill for worn or damaged parts. Repair or replace parts before going to the field.
- Check hydraulic hoses, fittings, and cylinders for leaks. Repair or replace before going to the field.

CFM Overview

The Control Function Module (CFM) is located below the DICKEY-john console terminal. The CFM controls a bank of solenoid valves on the drill, in the Fold/Tilt/Marker circuit.

On/Up opens the solenoid valve for the function. Off/Down closes the solenoid valve for the function.

**NOTICE**

When MASTER is On, turn On only one function switch at a time. To avoid unexpected movement of unintended drill hydraulic components, no more than one of the Fold, Tilt or Marker switches should ever be On at the same time.

The CFM “MASTER” switch is the master for the CFM only. It does not affect power to the monitor terminal or other drill functions.
Unfolding the Air Drill

Unfolding Safety Information

⚠️ DANGER

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

⚠️ WARNING

Pinch Point and Crushing Hazards:
Keep people away from the drill and tractor during unfolding. The distance between the tractor and the seed structure decreases by 3.2m (7.5ft) during unfolding. Drill, tractor, or both will move during this operation. Wings will tilt down and swing out. Risks include:

▲ Pinching or crushing at pivot points and at multiple sites in pivoting assemblies. Stay clear of the wing sweep arcs. Coulters and row openers are sharp.

▲ Crushing under lowering/moving wing wheels, under moving transport wheels, under lowering wings or under lowering openers.

⚠️ CAUTION

Falling Hazard - Tires Not a Step:
Do not use tires as steps or platforms. Wing gauge wheel tires are off the ground in transport lift. Front and rear main transport tires can be lifted and free to spin on unlevel ground and at some weight-transfer and row down-force settings.

⚠️ CAUTION

General Cautions:

▲ Unfold only with markers resting in transport cradles.

▲ Unfold only if hydraulics are bled free of air and fully charged with hydraulic oil.

⚠️ NOTICE

Do not unfold with openers lowered, or machine damage will result.
Unfolding: Summary of Steps
Follow the detailed instructions in step 1 through step 22 until this is a familiar operation.
- Check marker, auger and ladder stowed (below).
- Release transport hook (page 26).
- Release transport locks (page 27).
- Tilt down wings (page 28).
- Check openers raised (page 29).
- Set tractor for unfold (page 30).
- Unfold wings (page 30).

Unfolding: Check Drill Configuration
Wings can collide with a deployed auger or ladder.
1. Make sure auger (page 52) and ladder (page 44) are secured in their transport positions before unfolding.

Unfolding: Release Transport Hook
2. Set/check that CFM switches (see page 24) are all Off and hydraulic circuits are all in Neutral.
3. Move to level ground.
4. Relieve any weight on the Transport Hooks. Transport hook is on a dedicated circuit.

**NOTICE**
*Do not tilt down or lower openers while any Air Drill folding operations are underway or partially complete.*

Refer to Figure 14
5. Disengage the transport hook lock channel.

6. Retract the transport hook cylinder:
Refer to Figure 15

7. Observe wings and gauge wheels lowering during unhook.

Figure 15
Wing Movement During Unhook

8. When cylinder is fully retracted, set circuit to Neutral.

Unfolding: Release Transport Locks

Refer to Figure 16 (shown after tilt-down and unfold for clarity - these lock changes must be performed prior to tilt-down and unfold)

At wing tip 1, and side of mainframe 2, on each side (4 locations total), reconfigure the locks from:
ROAD to FIELD

Decals at each lock, and the illustrations on the next page, depict the handle operations.

The mid-wing locks 3 reset to FIELD automatically during tilt-up, and do not require changes.

Free Wing Transport Locks

9. Relieve any weight on the wing tip locks.

Select Tilt operation:
Briefly perform a tilt-up.

Figure 16
Transport Lock Locations

Tilt Un-Weight: Hydraulic Circuit Operation

<table>
<thead>
<tr>
<th>Lift</th>
<th>Fan, Auger</th>
<th>Fold, Tilt, Marker</th>
<th>Transport Hooks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neutral</td>
<td>Neutral</td>
<td>Retract then Neutral</td>
<td>Neutral</td>
</tr>
</tbody>
</table>
Mainframe Locks: ROAD to FIELD
Refer to Figure 18
10. Pull the wire handle outward and move to rear slot.
   This allows a hook (not shown) to move forward and
   allow the center section openers to lower.

Wing End Locks: ROAD to FIELD
Refer to Figure 19 (shown tilted down for clarity - perform
this lock change while the openers are tilted up)
11. Reverse the catching direction of the wing end locks.
   Pull the wire handle outward. Rotate the pin 180
   degrees, placing the angled surface forward and the
   longer side of the tip to the rear. This allows the plate
   to push the pin aside during tilt-down, and catches
   the plate for down-pressure regulation in the field.

Unfolding: Tilt-Down
The transport hook and transport locks must be released
(step 4 through step 9 starting on page 26) before
performing the next steps.

**NOTICE**

*Tilt-Down After Unhook and Before Unfold*
For smoothest operation, and to reduce risk of machine
damage, perform the tilt-down after transport unhook and
before unfold.

Refer to Figure 20
12. On the CFM switch, enable Tilt with MASTER and
    Tilt on.

<table>
<thead>
<tr>
<th>Tilt-Down: Hydraulic Circuit Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lift</td>
</tr>
<tr>
<td>Neutral</td>
</tr>
</tbody>
</table>
Refer to Figure 21

13. Observe the wings during tilt down.

14. When the wings are fully tilted out and down, set circuit to Neutral.

**NOTICE**

*Always have hydraulic levers in neutral when operating CFM switches.*

**Unfolding: Check That Openers are Raised**

Refer to Figure 22

15. When tilt-down is complete, check that no wing openers are too close to, or touching the ground.

**CAUTION**

Review “Lowering/Raising Safety Information” on page 32.

**NOTICE**

*Openers must be in the raised position before unfolding. If the Air Drill has been stored on a hillside for an extended period, there is some chance that openers on one wing may not be fully raised.*

16. If wing openers are too low on one or both sides, raise them before unfolding, by extending the lift cylinders.

17. When vertical movement has stopped (and the center section may stop last), hold the openers in the raised position by setting circuit to Neutral.
Unfolding: Set Tractor
18. To allow tractor movement:
   set steering straight ahead,
   put tractor transmission in neutral and
   release tractor parking brake.

   If tractor movement is not desired:
   put tractor transmission in Park,
   set tractor parking brake\(^a\), and
   release drill parking brake (if brake-equipped).

Unfolding: Unfold Wings
Unlock, tilt-down and tractor setup (step 4 through step 18 starting on page 26) must be completed before performing the next steps.
Refer to Figure 23
19. On the CFM switch, enabled unfolding with MASTER and Fold set on.

20. Unfold the wings (now tilted down) by retracting the fold cylinders.

Refer to Figure 24
Observe the unfolding. It is not complete until the tongue lock at the hitch engages the roller on the telescoping center tongue tube.

---

\(^a\) Do not set tractor parking brake if tractor parking brake activates trailer (“service”) brake system.
Refer to Figure 25

21. Continue unfolding until tongue lock hook engages roller on telescoping tongue tube. It may be necessary to back up the tractor for full engagement.

**NOTICE**

Do not operate Air Drill when unfolded unless tongue lock is engaged.

22. When the wings are fully unfolded, stop fold cylinder retraction, and hold wings open with Neutral.

23. Disable the Fold solenoid valve.

If no markers are installed, you may also set the MASTER switch to off.
Lowering and Raising Air Drill

Lowering/Raising Safety Information

**WARNING**

**Crushing Hazard During Lowering:**
Stay clear of wings and openers during raising and lowering. Opener sections, in addition to being extremely heavy, are forced down with hydraulic pressure. Coulter and opener disks are sharp. During lowering, openers will cut or crush anything beneath them, and can cause death or serious injury.

**CAUTION**

**Crushing Hazard While Raised:**
Fully lower openers when working above or beside them. Use blocking or stands when working under openers. Raised wing openers are held up only by hydraulic pressure. With wings tilted down, openers will slowly lower over time. They may lower more rapidly if the hydraulic system is damaged. They will lower suddenly if the hydraulics fail, or the circuit is set to Float or Retract.

**NOTICE**

Do not lower while any Air Drill folding operations are underway or partially complete.

The lift (raise/lower) circuit is also the hydraulic down-pressure circuit. Hydraulic down-pressure only functions as intended if the transport locks are set to FIELD (page 27).

**Lowering**

1. Unfold drill before lowering (page 25).
2. Make sure all persons are clear of opener sections.
3. Activate dedicated lift circuit (normally Extend).
4. If down-pressure has been adjusted (page 84), leave the circuit in Extend.

If down-pressure has not been adjusted, or if not planting immediately, set the circuit to Neutral.
Raising

**NOTICE**
The Air Drill must be raised for folding and unfolding.

**NOTICE**
Always raise the Air Drill for any reverse/backing operations.

1. Check that ladder is stowed.
2. Make sure all persons are clear of opener sections.
3. Activate dedicated lift circuit (normally Retract).
4. Retract until all sections are raised. Center section tends to lift later than wings.
5. Set circuit to Neutral to temporarily hold openers raised.

### Lift: Hydraulic Circuit Operation

<table>
<thead>
<tr>
<th>Lift</th>
<th>Fan, Auger</th>
<th>Fold, Tilt, Marker</th>
<th>Transport Hooks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retract</td>
<td>-</td>
<td>Neutral</td>
<td>Neutral</td>
</tr>
</tbody>
</table>

**NOTICE**
On tractors with electronic timer controls for hydraulic circuits, lift timers must be set to no more than 2 seconds longer than needed to fully raise Air Drill.

*Do Not Set for Continuous Mode.*

### End Lift: Hydraulic Circuit Operation

<table>
<thead>
<tr>
<th>Lift</th>
<th>Fan, Auger</th>
<th>Fold, Tilt, Marker</th>
<th>Transport Hooks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neutral</td>
<td>-</td>
<td>Neutral</td>
<td>Neutral</td>
</tr>
</tbody>
</table>
Folding the Air Drill

Fold the NTA907/3007HD Air Drill for moves between fields and over public roads, and for storage.

Folding Safety Information

⚠️ **DANGER**

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

⚠️ **WARNING**

**Pinch Point and Crushing Hazards:**
Keep people away from the drill and tractor during folding. The distance between the tractor and the seed structure increases by 3.2m (7.5ft) during folding. Drill, tractor, or both will move during this operation. Wings will swing forward. Risks include:

▲ Pinching or crushing at pivot points and at multiple sites in pivoting assemblies. Stay clear of the wing sweep arcs. Coulters and row openers are sharp.

▲ Anything in between pull-bars and tongue, or in between wing tool bar and tongue, will be crushed.

⚠️ **CAUTION**

**Transport and Overhead Hazard:**
Use wing locks (FIELD to ROAD). Use the transport hook cylinder lock channel. If a hydraulic failure occurs, or hydraulic levers are moved, unlocked wings could fall suddenly causing a major road accident, or crushing anything near the wings, resulting in death or serious injury, and property damage.

⚠️ **CAUTION**

**Falling Hazard - Tires Not a Step:**
Do not use tires as steps or platforms. Wing gauge wheel tires are off the ground in transport lift.

⚠️ **CAUTION**

General Cautions:

▲ Fold only with markers resting in transport cradles.

▲ Fold only if hydraulics are bled free of air and fully charged with hydraulic oil.

⚠️ **NOTICE**

Do not fold with openers lowered, or machine damage will result.
Folding: Summary of Steps
Follow the detailed instructions in step 1 through step 22 until this is a familiar operation.
- Check marker, auger and ladder stowed (below).
- Check openers raised (page 33).
- Engage transport locks (page 35).
- Set tractor for fold (page 36).
- Fold wings (page 37).
- Tilt up wings (page 38).
- Engage transport hook (page 39).

Folding: Check Drill Configuration
1. Make sure markers (page 60), auger (page 52) and ladder (page 44) are secured in transport positions before unfolding.
2. Raise openers (page 33).
Refer to Figure 27
3. Check that transport hooks are fully lowered (cylinder fully retracted). If not, Retract hook circuit as needed.
4. Move to level ground.

Folding: Engage Transport Locks
Refer to Figure 28
At wing end ①, mid wing ②, and side of mainframe ③, on each side (6 locations total), reconfigure locks from: FIELD to ROAD
Folding: Frame Lock to ROAD
Refer to Figure 29
5. Pull the wire handle outward and move to forward slot. This moves a hook (not shown) into engagement, preventing the openers from lowering.

Folding: Mid-Wing Lock to ROAD
Refer to Figure 30
6. Pull the pin outward. Swing the pivoting foot inward and use it to prop the pin in the retracted position. This allows the edge of the plate to pass the pin during tilt-up.

A weldment on the plate resets the pin for automatic FIELD configuration at next tilt-down.

Folding: Wing End Lock to ROAD
Refer to Figure 31
7. Reverse the catching direction of the wing end locks. Pull the handle outward. Rotate the pin 180 degrees, placing the angled surface to the rear and the longer side of the tip to the front.

This allows the plate to push the pin aside during tilt-up, and catches the plate to hold the wing up in transport.

Folding: Set Tractor for Fold
8. To allow tractor movement:
set steering straight ahead,
put tractor transmission in neutral,
release tractor parking brake, and
set optional drill parking brakes to prevent drill movement.

If tractor movement is not desired:
put tractor transmission in Park,
set tractor parking brakea, and
release optional drill parking brakes.

Some tractor movement may be required to release the tongue hook and/or bring the folded wings within reach of the transport hook.

a. Do not set tractor parking brake if tractor parking brake activates trailer ("service") brakes.
Folding: Fold Wings

Configuration checking, opener lift and FIELD-to-ROAD (step 1 through step 8 starting on page 35) must be completed before performing the next steps. Refer to Figure 32

9. On the CFM switch, enable fold.

10. Activate the fold/tilt/marker circuit to extend the fold cylinders.

Refer to Figure 33

11. Watch for tongue lock unhook.

   This is the first event in the folding sequence, and must occur for the balance of the sequence to complete.

   If the unhook does not occur, reverse the lever briefly, set the circuit to neutral, and back the tractor up slightly to relieve tension at the hook.

Refer to Figure 25

12. Continue folding until wing locks are above the transport hooks.
13. When the wings are fully folded, stop cylinder extension and hold wings at folded.

14. Disable the fold solenoid valve by setting CFM switch Fold to off.

Folding: Tilt Wings Up

Wing folding must be complete (step 9 through step 14 starting on page 37) before performing the next steps.

**NOTICE**

_Tilt-Up After Fold and Before Hook_

_For smoothest operation, and to reduce risk of machine damage, perform the tilt-up after fold, and before transport hook._

Refer to Figure 37

15. On the CFM switch, enable the Tilt solenoid valve by setting switch Tilt on.

16. Initiate tilt-up by extending the tilt cylinders.

17. Observe the tilt-up operation. When movement stops, end cylinder extension.
18. Disable the Tilt solenoid valve.

![Figure 38 CFM Tilt-Up Complete](image)

Folding: Engage Transport Hook

19. Extend the transport hook cylinder:

Refer to Figure 15

20. Observe wings and gauge wheels raising during hook.

![Figure 39 Wing Movement During Hook](image)

21. When cylinder is fully extended, set circuit to Neutral.

Refer to Figure 14

22. Engage the transport hook lock channel.

![Figure 40 Transport Hook Lock Channel](image)
Transporting the Air Drill
Transport Safety Information

**DANGER**

**Inadequate Tractor Hazard:**
Tractor must weight at least 67% of the drill as towed. Ensure that the towing vehicle is adequate for the task. Using an inadequate tow vehicle is extremely unsafe, and can result in loss of control, serious injury and death. See table on next page. Do not tow if Air Drill exceeds the load rating of the vehicle.

**Check Bridge Loads:**
A loaded Air Drill can exceed the load ratings of bridges you must cross.

**WARNING**

**Excessive Speed Hazard:**
Maximum transport speed is 30 kph or 20 mph at all times. Excess speed can result in loss of control or inability to stop. Reduce speeds with materials loaded, or if road conditions are less than ideal.

**CAUTION**

**Unexpected Wing Tilt-Down or Unfold Hazard:**
Use transport locks (wing and center section “ROAD” locks, and hook cylinder lock channel). Failure to use these safety features can cause a major accident resulting in death, injury and equipment damage. If locks are not engaged, and a hydraulic failure occurs, or a circuit is unintentionally set to Float, wings can tilt down or unfold.

**CAUTION**

**Loss of Control Hazard, Tires:**
Inflate tires to factory specifications. Tighten wheel nuts to specifications. Under-inflated tires or loose nuts can cause loss of control. Over-inflated tires or overtightened nuts can fail suddenly and cause loss of control. Loss of control can cause a major accident resulting in death, injury and equipment damage.

**CAUTION**

**Collision Hazard:**
Check lights and reflector regularly. Replace bulbs and faded/worn/missing decals as required. Use lights in transport. These features are critical to visibility, particularly with other drivers unfamiliar with farm equipment or not expecting to encounter a slow-moving vehicle.

- An installation of optional brakes on the drill does not reduce tractor capability requirements or increase maximum transport speed.
Tractor Requirements

The figures in the table below represent a limited number of configurations. The weight of your Air Drill can vary by thousands of pounds, even if it is the same base model, due to installed options and/or aftermarket equipment.

If your tractor weight or capability is near its limits, take your empty Air Drill to a scale and get a precise weight.

Transport Checklist

- Plan the route. Avoid steep hills. Keep Clearances in mind. Folded, your NTA907/3007HD Drill is just under 4.1m (13.5ft) high and just under 3m (10ft) wide.
- Close hopper lids (page 45).
- Check that ladder (page 44), auger (page 52) and markers (page 60) are stowed.
- If unfolded, raise, fold, tilt and hook Air Drill. See “Folding the Air Drill” on page 34.
- If drill is equipped with optional brakes: With tractor in Park, and with tractor parking brake set, release drill parking brakes (page 42).
- Always have lights on for highway operation.
- Comply with all national, regional and local safety laws when traveling on public roads.
- Release all brakes and travel with caution.

Typical NTA907/3007HD Drill Weights

<table>
<thead>
<tr>
<th></th>
<th>NTA907HD -3610 (36 rows)</th>
<th>NTA907HD -4875 (48 rows)</th>
<th>NTA3007HD -6006 (60 rows)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Drill Weight</td>
<td>9 851 kg</td>
<td>10 749 kg</td>
<td>11 648 kg</td>
</tr>
<tr>
<td>Add for Auger</td>
<td>606 kg</td>
<td>808 kg</td>
<td>1 010 kg</td>
</tr>
<tr>
<td>Add for Markers</td>
<td>295 kg</td>
<td>295 kg</td>
<td>295 kg</td>
</tr>
<tr>
<td>Add for Brakes</td>
<td>655 kg</td>
<td>655 kg</td>
<td>655 kg</td>
</tr>
<tr>
<td>Add for Coulters</td>
<td>101 kg</td>
<td>101 kg</td>
<td>101 kg</td>
</tr>
<tr>
<td>Maximum Empty Drill</td>
<td>11 508 kg</td>
<td>12 608 kg</td>
<td>13 709 kg</td>
</tr>
<tr>
<td>Add for Maximum Load</td>
<td>8 467 kg</td>
<td>8 467 kg</td>
<td>8 467 kg</td>
</tr>
<tr>
<td>Maximum Loaded Drill</td>
<td>19 975 kg</td>
<td>21 076 kg</td>
<td>22 176 kg</td>
</tr>
</tbody>
</table>
Brake Operation (option)

Main transport wheel brakes are standard on model NTA907HD. Brakes are not standard on model NTA3007HD. There are brake shoe pairs on each of the four forward main transport wheels. The shoe pairs are operated by two independent systems:

1. The “service” or “trailer brake” system is controlled by the tractor. It is connected to the tractor with a single hydraulic line or two air lines.
2. The “parking” or “emergency" brake system is controlled by latching handles on either side, connected by cables to the brake shoes for that drill side.

See also:
- page 20 - “Brake Hookup (Option)"
- page 103 - “Brake Troubleshooting (Option)"
- page 117 - “Brake Maintenance (Option)"

Parking Brakes

Cable-operated parking brakes engage and release independently of the service brake system. There is one operating handle on each side frame of the drill, at the rear of the front hopper.

The parking brakes themselves are independent systems for each side of the drill. None of these three braking systems can engage or release any of the others.

Refer to Figure 41

To engage drill parking brakes, pull each handle, on each side, to the rear, until the over-center action holds the brake engaged.

To release drill parking brakes, pull each handle, on each side, outward from drill, and release forward.

If the handle fails to remain in the engaged position, there is insufficient tension on the brake cable. If the handle requires excess effort, or cannot be pushed into the engaged position, there is too much tension. Rotate the grip end of the handle to adjust cable tension.

**NOTICE**

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

---

a. The parking brake system is not a true emergency brake system, as there is no safe way to set the cable-operated brakes when the drill is in motion. This manual therefore refers to it only as a Parking brake system.
Service Brake Operation

If optional brakes are installed and connected, the hydraulic/hydraulic or air/hydraulic systems automatically work in conjunction with the tractor’s own brakes.

Application and release of tractor brakes during tractor motion applies and releases the service brake system on the drill.

**CAUTION**

Know Your Tractor Systems:
Application of tractor Parking and/or Emergency brakes may or may not operate the drill service brake system, depending on the design of the tractor systems.

Consult your tractor manual for details on when remote brake ports are engaged and released. Note any variance from general behavior in the table at right. Make sure the tractor operator knows when drill brakes are engaged and released.

Single-Line Hydraulic Brake Operation

In this system, a single hydraulic line 1 from the tractor operates a de-intensifier 2 cylinder on the drill, which is coupled to the drill master cylinder 3. The drill brake hydraulic lines are separate from the tractor's line.

With the hydraulic/hydraulic system, braking is immediately available when the tractor hydraulic system is active.

Dual-Line Air/Hydraulic Brake Operation

In this system, the “supply” (yellow or blue coded) line 4 charges a reservoir air tank 5 on the drill. The “service” (red coded) line 6 meters air from the reservoir 5 to a booster cylinder 7, which operates the drill's hydraulic brake lines 8.

**CAUTION**

Service Air Brakes Not Instantly Available:
Prior to movement, wait for the tractor air system to reach full charge after drill hookup. Tractor and drill reservoir tanks must be pressurized. Drill service braking may not be immediately available upon tractor hookup with the air/hydraulic system.
Ladder Operations

Ladder Safety Information

**CAUTION**

*Pivoting Ladder Falling Hazard:*
Make sure horizontal pin at right pivot is fully engaged when ladder is in the down position. If the ladder is not pinned in the down position, the top step can pivot inward and down when stepped on. This can cause a fall resulting in death or serious injury. Always check the horizontal capture pin if you did not personally set it just before use. Always use the hand rails. Always face the drill when on the ladder.

**NOTICE**

Avoid equipment damage. Make sure vertical pin at right pivot is fully engaged when ladder is raised to storage position. Ladder must be securely stored for transport.

Ladder use is easiest and least obstructed when drill wings are folded (page 34). Ladder may be lowered, used and raised with wings unfolded, as shown at right, but lowest ladder step may strike lowered openers, and will strike raised openers. The lowest step is mounted with rubber straps to prevent serious damage to openers.

Ladder General Information

The ladder on the left side of the mainframe provides access to the walkboard for material loading and routine lid/hopper maintenance. This ladder pivots diagonally, and is held in position by one of two spring-loaded pins.

Refer to Figure 44

**Deploying Ladder**

1. Fold the wings for easiest ladder use. See page 34.
2. Use one hand to hold the ladder up, while pulling vertical pin down.

Refer to Figure 45

3. Carefully swing ladder forward and down, until you hear and see the horizontal pin seat itself with the ladder down. If an opener is in the way, it may be necessary to push on the ladder to achieve lock.

**Using Ladder**

1. Pull outward on the ladder to check that the horizontal pivot pin is holding it.
2. Ascend and descend the ladder while facing the drill.
3. Use the handrails when on the higher steps.

**Storing Ladder**

1. Pull the horizontal pivot pin to the rear.

2. While holding the pin out, carefully swing the ladder up to the rear, until you hear and see the vertical pin seat itself with the ladder up and locked.
Hopper Lids

Hopper Lid Safety Information

⚠️ DANGER

**Entrapment and Rapid Suffocation Hazard:**

Never enter a hopper for loading, unloading or routine maintenance. Leave strainer in place except when instructed to remove it. Keep lid tightly closed during operations. Keep lid locked closed or, during storage, locked slightly open. Store ladder to discourage access to lid area. Keep children away from drill.

▲ A hopper that is full, or merely appears full, can be an entrapment hazard. You can sink entirely into the grain, or into an oxygen-deficient void, and suffocate in a matter of seconds. Grain bridges and crusts are especially dangerous.

▲ When hazardous fumes or low oxygen levels are present, you can be quickly overcome even in an empty hopper with the lid open. There may be no odors to alert you to the hazard.

⚠️ NOTICE

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

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

Related Topics

“Loading Materials” on page 53
“Unloading Materials” on page 64
“Material Clean-Outs” on page 107

Lid Opening

Refer to Figure 46

1. Lift handle ①.

Refer to Figure 47 and Figure 48

2. Swing handle ① out until hook ② releases from U-bolt.

3. Move hook ② clear of U-bolt and re-close handle.
Refer to Figure 48
4. Lift lid slightly at pivot end to clear strainer (shown on next page).
5. Swing lid away from walkboard. Open only enough to accomplish the present task.

Lid Closing
Refer to Figure 48, Figure 47 and Figure 46
1. Swing lid over opening until capture hook 2 is centered on U-bolt 3.
2. Open handle 1 and engage hook 2 on U-bolt 3.
3. Close handle 1 for operations or short-term parking. For long-term storage, do not engage hook or latch handle, to avoid deforming the seal.
4. For storage, particularly unlatched, a padlock through both U-bolts deters unauthorized entry by persons unaware of possible confined space risks, and prevents entry of pests, debris and precipitation.

Strainer
Each hopper is equipped with a strainer intended to:
• capture large foreign matter in seed and materials,
• prevent entry by animals if lid left open, and;
• discourage hopper entry by children.
Leave the strainer in place except during strainer and hopper cleaning.
Check the strainer for residue prior to each loading operation. Remove, empty and return it to the hopper.
For strainer or hopper cleaning, the strainer lifts out when the lid is fully open.

Meter Doors
Refer to Figure 50 and Figure 51
Each meter box has two distinct access doors on the bottom:
• 1 Under DRIVING Gear: Clean-Out (for emptying hopper)
• 2 Under DRIVEN Gear: Calibration (for meter sampling and meter clean-out)
The doors are closed during transport, loading and planting. They may be open slightly in storage if the hopper was not completely dry at clean-out.
The doors need to close and seal tightly during planting. Periodically inspect the lever clamps 3 for proper tension, and inspect the elastomer seals for integrity and resiliency.
Meter Door Opening

**NOTICE**

*Do not open the clean-out door (the door under the upper DRIVING gear) until preparations have been made to capture any material to be re-used. Any material present will flow immediately, possibly in large volume, as soon as the door is open.*

1. Pull out on a clamp handle 3 just until it is loose.
2. Pull out on the other clamp handle. The door normally will swing down on its own. If not, pull it open by hand.

Meter Door Closing

Make sure the clamp handles are out or down (not up), or it will not be possible to close the door.

1. Use a clean rag to wipe any residual material from the face of the elastomer seals on the door, and from the bottom face of the meter box.
2. Swing the door up into closed position.
3. While holding the door closed, swing one clamp handle up, past vertical.
4. Swing the other clamp handle up past vertical.
5. Inspect the door closure for possible air leaks. Replace any deformed elastomer seal or damaged latch clamp.
Auger Operations (Option)

Auger Safety Information

⚠️ DANGER ⚠️

Electrocution Hazard, Auger:
Keep clear of overhead power lines when positioning auger. The auger can reach 5.3m (17.5ft) above ground level during positioning operations. If the auger gets too close to, or contacts a power line, nearly all metal parts of the tractor and drill will have lethal voltage present, and anyone touching them can complete the circuit to ground, resulting in serious injury or death. With very high voltages, electrocution can occur without direct contact.

⚠️ DANGER ⚠️

Rotating Auger:
To prevent serious injury or death, read instructions and safety information before operation. Keep hands, feet, hair and clothing away from rotating auger. Do not remove or modify any guards. Keep children well clear of work area.

⚠️ WARNING ⚠️

Overhead Auger Injury Hazard:
Allow only operators near auger during use. Keep both ends of auger under control when tube contains material. Auger is balanced and fully supported by springs only when empty. If tube contains material, auger can move down suddenly when released. If one end of auger contains more material, auger can tip suddenly. Empty auger tube before storage. Use all provided pins and latches.

⚠️ WARNING ⚠️

High Pressure Fluid Hazard, Auger Hydraulic Motor:
Escaping fluid under pressure can have sufficient pressure to penetrate the skin causing serious injury. Use a piece of paper or cardboard, NOT BODY PARTS, to check for leaks. Wear protective gloves and safety glasses or goggles when working with hydraulic systems. If an accident occurs, seek immediate medical assistance from a physician familiar with this type of injury.

Set FAN/AUGER selector valve to AUGER after auger deployment. Set FAN/AUGER selector valve to FAN before auger storage.

⚠️ WARNING ⚠️

Pinch Point Hazard, Auger Support Linkage:
Allow only operators near auger during use. Keep hands away from auger support linkage during deployment and storage. If there is difficulty storing the auger, check that hydraulic hoses are not being pinched.
This section covers only basic auger operations. For specific tasks, see: "Loading Materials" on page 53, and "Unloading Materials" on page 64.

Latch the auger into its cradles and pin the arm pivots, whenever the auger is not in use. There are several items that require attention during auger deployment and storage:

Refer to Figure 52

1. Front latching strap
2. Rear latching strap
3. Arm pin (not visible in Figure)
4. Inlet hopper swivel pin (not visible in Figure)
5. Auger tube swivel pin
6. Parallel arm height pin
7. Auger outlet oriented for transport and tilt/fold
8. Auger hydraulic motor control handles

**NOTICE**

*To avoid auger damage during drill movement, use all provided latches and pins, and orient auger tube/inlet correctly when stowing.*

**Deploying Auger**

The back (inlet) end of the auger has grasp handles. When empty of material this end of the auger also tends to be heavier. Start unlatching at the front end.

Refer to Figure 53

1. Squeeze the lock lever 3. Pull out on the clamp latch 2 and free the strap from the U-bolt.
2. Remove the rear arm pin 3. Pull the auger free of the rests.

Refer to Figure 54

3. Set either interconnected auger hydraulic motor direction control handle 8 to OFF (the center of handle travel). This prevents unexpected auger operation when the circuit is selected and energized.
4. Pull the auger tube swivel pin 5 forward.
5. Rotate the top of the auger tube outward, so that the auger outlet faces down.
6. If deploying the auger for material loading, push in on the arm height pin 6, lift the arm, and re-seat the pin in the alternate plate cut-out, holding arm elevated above the storage height.

![Figure 52](29406)
**Auger Latched for Movement**

![Figure 53](29407)
**Strap Closed, Unlocked, Clear**

![Figure 54](29410)
**Arm Lift & Tube Swivel Pins**

For material unloading, leave the arm pinned at the storage height unless it needs to be lowered for the unloading operation.
Refer to Figure 55

7. Pull the auger inlet hopper swivel pin ④, and rotate the inlet hopper on the auger tube until it faces in the desired direction. Release pin - a second pin hole can hold the hopper oriented facing straight up.

Refer to Figure 55

The auger arm is fully articulating. The middle pivot may fold backward or forward. The outer pivot allows the auger tube to incline inward or outward.

The standard auger fits beneath the rear seed meter for unloading, as depicted in the Figure.

See “Unloading Materials” on page 64 for further information regarding unloading hoppers.

Auger Hydraulic Controls

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

Tractor Lever for Auger

1. Before operating the auger/fan selector valve, shut down the auger/fan circuit. Shut off hydraulics entirely, or set circuit lever to Neutral or Float.
2. Check that the auger direction control valve is still OFF (as set at step 3 on page 49).

⚠️ DANGER

Rotating Auger:
To prevent serious injury or death:
▲ Read instructions and safety information before operation.
▲ Keep hands, feet, hair and clothing away from rotating auger.
▲ Do not remove or modify any guards.
▲ Keep children well clear of work area.
Selector Valve
Refer to Figure 57
This valve is located inside the right rear corner of the mainframe. It selects between auger and fan.
3. Move selector valve handle from Fan to Auger.

**CAUTION**

*Do not operate this valve with the hydraulic circuit energized. Unexpected auger or fan operation can result.*

*Do not use this valve as the Start-Stop control for the auger.*

Operate the valve with the tractor hydraulic circuit off, or set to neutral or float. The handle has two positions.

Auger Selector Valve Positions

- Handle Forward: Auger (make sure Auger control is in center-off position before moving handle to A).
- Handle Rear: Fan-enable (make sure circuit is off before moving handle to F).

Auger Direction Valve
Refer to Figure 58
A valve toward the inlet end of the auger tube controls the direction of auger helicoid screw rotation. This valve is “center off”.

To allow flow control by an operator at the outlet end, the control handle for the valve has an extension and second handle 2.

Use this valve as the Start-Stop and Forward-Reverse control for the auger. Set the valve to center-Off when not moving material at the moment.

4. With the direction control valve OFF, and the selector valve to AUGER, activate the tractor auger/fan hydraulic circuit by setting the lever to Extend.

The auger circuit is reversing. The tractor circuit may be placed into Extend or Retract. However, if the tractor circuit placed into Extend, this provides a consistent experience for the auger operator, and reduces the risk of reverse fan operation.

5. Gradually move the handle away from center-OFF. Note the direction of auger helicoid movement. When moving material, adjust speed as needed.

When auger operations are completed:

- Set the auger direction control valve to center-OFF.
- Shut down tractor hydraulics, or set the auger/fan circuit to Neutral or Float.
- Set the auger/fan selector valve to FAN.
Storing Auger

Make sure auger operations are shut down (step 6 through step 8 above) before storing auger.

Orient Inlet and Outlet

Refer to Figure 59

Only one inlet and outlet orientation is correct for storage. Although the auger can fully seat in the cradles in several orientations, there is risk of outlet damage during tilt/fold, and inlet debris collection during transport and precipitation if not stored correctly.

1. Orient auger arm pivot.

If the arm is folded with the mid-arm pivot forward, pull the auger away from the drill and fold the mid-arm pivot back.

2. Rotate auger inlet-rear/outlet-forward.

Rotate in the direction that results in the most slack in the hoses.

3. Lock parallel arms at level.

Press on the parallel arm lock pin lever \( \textcircled{6} \). Raise or lower the auger until the arms are level with the mainframe. Release the pin.

4. Swivel auger tube to outlet-facing-right.

Pull pin \( \textcircled{5} \) forward and rotate auger tube so that valves are on top. Outlet tube \( \textcircled{7} \) must face right (horizontally away from drill) to provide maximum clearance during fold and tilt.

5. Swivel inlet hopper to horizontal.

Pull pin \( \textcircled{4} \) at inlet. Rotate hopper to horizontal, inlet facing to drill left.

6. Remove rear arm pin \( \textcircled{3} \) from clevis on frame.

7. Seat auger tube in cradles. Secure arm with pin \( \textcircled{3} \).

Refer to Figure 60

8. Close clamping straps \( \textcircled{1}, \textcircled{2} \) at cradles.

9. Secure latches. Make sure latch locks engage, leaving a gap between lock lever and latch handle.
Loading Materials

Loading Material Safely

**CAUTION**

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

▲ Do not use liquid treatments with the NTA907/3007HD 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.
▲ 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.

1. Take appropriate precautions for handling materials. Whether using auger or hand-loading, dust is likely. Review Materials Safety Data Sheets (MSDS).
2. Review hopper lid safety information on page 45.

Loading: Do Not Enter Hoppers

With material present, and once used for hazardous fertilizers, or seeds with hazardous treatments, your hoppers may become “permit-required confined spaces” under applicable statutes, regulations, insurance rules or business policy. The venting tube structure in the hoppers has rungs for escape, and is not an entry ladder.

**DANGER**

**Entrapment and Rapid Suffocation Hazard:**

Never enter a hopper for loading or unloading.

▲ A hopper that is full or merely appears full can be an entrapment hazard. You can sink entirely into the grain, or into an oxygen-deficient void, and suffocate in a matter of seconds. Grain bridges and crusts are especially dangerous.
▲ When hazardous fumes or low oxygen levels are present, you can be quickly overcome even in an empty hopper with the hopper lid open.
Loading: Use a Tractor

3. Securely hitch drill to a tractor with adequate weight and power. Park drill on solid, level ground. See Tractor Requirements, “Specifications and Capacities” on page 143. If a suitable tractor is not available, block multiple tires.

4. Raise openers (page 33) and fold drill (page 38). Tilt-up and hook may be necessary for later transport, but fold suffices for provide easy access for material loading.

5. Lower and latch ladder (page 44).

Loading: Select Hoppers to Use

6. Favor the rear hopper. The rear hopper is easier to load, and to unload if materials are expected to remain upon completion of application.

If applying the same material from both hoppers, consume the front hopper first, rather than both at once. Remove a final drive gear to shut off a hopper.

Loading: Air-Out System

Refer to Figure 61

7. At each empty hopper to be loaded, if meter box clean-out door was completely closed, open it. See “Meter Doors” on page 46.

8. If any doors were opened, wipe seals and meter bottom flanges clean. Close and latch clean-out doors.

9. If the drill has been parked for more than a day, condensation may have caused moisture to accumulate. Whether or not meter doors are opened, run the fan system for several minutes to blow moisture out of the meters, primary and secondary seed hoses.

10. With the fan running, check hopper-lid and meter-box seals carefully for air leaks. Adjust bin latch or replace seals to prevent leakage.

Loading: Prepare Hopper(s)

11. Shut off all hydraulic power to the drill.

12. Open lid of hopper to be loaded (page 45).

13. Check that the strainer basket is in place in the top of the bin. Remove any foreign material from basket.

Static tongue weight of a loaded drill is about 2180 kg (4800 pounds) on level ground and more when facing downhill.

<table>
<thead>
<tr>
<th>Suggest Hopper Allocations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front Hopper</td>
</tr>
<tr>
<td>Empty</td>
</tr>
<tr>
<td>Seed</td>
</tr>
<tr>
<td>Seed (use first)</td>
</tr>
</tbody>
</table>

**NOTICE**

Before filling the drill for the first time, and at the beginning of each season, check the entire bin for leaks. A small air leak can cause large variations in seeding rates.
Loading: with Auger
Refer to Figure 62
If the auger is not used for material load, skip to step 26.
15. Deploy auger (page 48).
16. Configure hydraulics from fan to auger (page 50).
17. Before loading material in auger inlet hopper, operate auger to establish correspondence between control handle direction and auger screw direction.
18. Swing the auger so the spout is centered over the hopper opening. Position your grain container for unloading into the auger hopper.
19. Energize tractor hydraulics for auger. You may need to tie the control lever in place or adjust the detent pressure on your tractor.

⚠️ DANGER
Rotating auger. To prevent serious injury or death:
- Read instructions and safety information before operation.
- Keep hands, feet, hair and clothing away from rotating auger.
- Do not remove or modify any guards.
- Keep children well clear of work area.
20. Slowly turn on material flow and fill hopper.
21. When hopper is full, turn off the auger by moving the auger direction control to the center position.
22. Shut off tractor hydraulics, or set auger/fan circuit to neutral or float.
23. When hopper is full, or material supply consumed, reverse direction of auger to return any residual materials to inlet for recovery.
24. Return auger to storage/transport configuration (page 52).
25. When circuit is off, set diverter to up (pass-through to markers or fan). See “Auger Hydraulic Controls” on page 50

Loading: Close-Out
26. Remove any foreign matter from the strainer basket.
27. Wipe any grain or foreign matter from lid-seal area on top of hopper bin. Close lids and latch securely.
28. Return ladder to storage/transport position (page 44).
Calibration Crank

Calibration Crank Safety Information

**WARNING**

**Moving Chain Hazard:**
Keep all persons except operator away from drill mainframe during crank operations. Body parts and clothing can get caught in chains, sprockets and gears, causing serious injury. When operating the crank from either side of the drill, all parts of the contact drive system are in motion, including parts out of sight of the crank operator.

**NOTICE**

Rotate the hand crank only in the:
clockwise direction on the left side, or
counter-clockwise direction on right side.
Operating in reverse can damage meter gear box.

If a variable rate gearbox is set to “0”, operating the hand crank may fail to clear the meters of seed.

Crank General Information

Refer to Figure 63

A hand crank is provided on the left side of the drill for manual operation of the meters (the meters otherwise turn only when the drill is lowered and in motion). The crank is used for two common tasks:

- calibration of the meter setting for planting, and
- clean-out of the meter flute chamber.
Operating the Hand Crank

Refer to Figure 64 or Refer to Figure 65

1. Raise drill (page 33). Contact drive tires cannot be turned by hand with drill lowered.
2. Fold wings (page 37) for more convenient access to cranking location.
3. For clean-out, set both meters 80 or higher (LOW range), or 10 or higher (HIGH RANGE).

   For calibration, set the meter under test per the instructions in the Seed Rate Manual, and remove a DRIVER or DRIVEN final gear on the other meter.
4. Open calibration door on meter(s) being cleaned-out or tested.
5. For calibration, record weight of calibration bag. Hook bag to meter under test.
6. Move crank handle from storage stob to shaft of left or right outside contact drive wheel.
7. Turn the hand crank to simulate meter operation during planting.
8. Return crank to storage stob at task completion.

Specific recommendations may be made in applicable manual sections. See:
see “Meter Calibration” in the Seed Rate manual,
see “Unloading Materials” on page 64, and
see “Storage” on page 69.

In general, you may operate the crank as fast as is comfortable. For reference, at a field speed of 10 kph (6.2 mph), the jackshaft rotates at 120 rpm (2 turns per second).

For clean-out, make sure the variable rate gearboxes are set:
- above “10” if the final drive range gears are in High Range mode, or
- above “80” if the final drive range gears are in Low Range mode.

To change variable rate gearbox and final drive range gearing see “Setting Material Rates” on page 71.
Fan Operation

Fan Safety Information

⚠️ DANGER ⚠️

**Rotating Fan Blade Hazard:**
Do not operate fan with guard screen removed. Fan accelerates instantly and with high torque. Body parts and clothing can be drawn into fan, resulting in death or serious injury. Disconnect fan circuit at hitch when working on fan.

⚠️ WARNING ⚠️

**High Pressure Fluid Hazard, Fan Hydraulic Motor:**
Escaping fluid under pressure can have sufficient pressure to penetrate the skin causing serious injury. Use a piece of paper or cardboard, NOT BODY PARTS, to check for leaks. Wear protective gloves and safety glasses or goggles when working with hydraulic systems. If an accident occurs, seek immediate medical assistance from a physician familiar with this type of injury.

NOTICE

Avoid unexpected fan operation. Set FAN/AUGER selector valve (if present) to FAN before activating fan hydraulic circuit. If fan does not start when slowly moving circuit lever, set lever to Float or Neutral and check selector valve.

NOTICE

Protect motor seals:

Fan circuit has three hoses. All must be correctly connected. Make sure that “SUMP” line is connected to tractor case drain.

Avoid sudden circuit changes. Motor seals may be damaged by rapid starts and stops, or by circuit reversals. Engage fan circuit lever slowly, while observing fan rpm on seed monitor.

Avoid fan direction reversal. A fan running in reverse cannot generate sufficient airflow for planting. If fan cannot reach target rpm, check for reversed circuit connections or improper drain connection.
Fan General Information

The hydraulic fan supplies the air stream that carries materials from the meters, through the primary hoses to the towers, then to the secondary hoses to the rows.

The fan needs to be running in the correct direction, and within a narrow speed range, to reliably deliver material at your calibrated rates.

Refer to Figure 66

If an auger is installed on the drill, it shares the hydraulic circuit with the fan.

1. Turn on the seed monitor. Configure it for the materials and rates planned. Set reasonable alarm levels for low flow rate alerts.
2. If no auger is installed, skip to step 5.
3. Set the fan/auger hydraulic circuit to neutral for setup.
4. Check the fan/auger selector valve is set to FAN. This valve is located inside the right rear of the mainframe.
5. With the tractor engine at low rpm, slowly Extend the lever for the circuit. Bring the fan up to recommended speed (page 82). Let the fan warm up for 15 minutes before planting.
6. Lower the drill 1.5 - 3m (5-10ft) before planting is to begin. It takes a few seconds for seed to travel from the meters to the rows.

**NOTICE**

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.

7. Mind the seed monitor console for seed rate alerts. An apparent blockage, or irregular or no flow across the drill, may be an indication that the fan is running backwards.
8. Leave the fan running during field turns. Material flow is shut off when the openers are raised.
9. At the end of application, raise openers. Stop material flow before shutting off the fan.
10. Shut off the fan by carefully moving the circuit lever to Float or Neutral. Avoid moving the lever into Retract.

If the fan plumbing or hitch hookup is reversed, air flow rate will be very low or zero. If you are unable to reach 3000 rpm, check hose connections.

Fan speed is monitored and reported by the seed monitor, but is manually controlled. The optimum rate depends on the seed type, any treatments. “Fan Speed Adjustments” on page 82 for further information.
Marker Operation (Option)

Dual markers are optional on the NTA907/3007HD. See “Markers” on page 140 for ordering information.

Marker Safety Information

⚠️ DANGER

Electrocution Hazard:
Keep clear of overhead power lines when operating markers. The markers can reach 7.3m (24ft) above ground level during folding and unfolding. If a marker gets too close to, or contacts a power line, nearly all metal parts of the tractor and drill will have lethal voltage present, and anyone touching them can complete the circuit to ground, resulting in serious injury or death. With very high voltages, electrocution can occur without direct contact.

⚠️ WARNING

Overhead Marker Hazard:
To prevent serious injury or death, do not allow anyone to stand near or beyond the end of the wings during marker operations. You may be injured if hit by a folding or unfolding marker. Markers may fall quickly and unexpectedly if the hydraulics fail. Marker arms are heavy and marker disks may be sharp.

⚠️ WARNING

Marker Pinch Point/Shear Hazard:
To prevent serious injury or death, do not allow anyone to stand near the end of the wings or and part of the markers during marker operations. The marker mechanism has numerous points where crushing or shearing injury can occur.

⚠️ NOTICE

To prevent unexpected marker operation, leave CFM Marker switch off (down) when markers are not in use.

⚠️ NOTICE

Operate markers only with drill completely unfolded. Extending a marker when tilted up may damage drill systems. Extending a marker when folded may damage the tractor.

Additional Marker Topics

See also:
“Initial Marker Setup” on page 162,
“Marker Adjustments” on page 97, and;
“Marker Maintenance” on page 130.
Before Operating Markers
Marker circuits must be fully charged with oil and free of air before operation. Prior to first use, or after maintenance, perform “Marker Hydraulic Bleeding” on page 130.

Dual Marker Operation
Dual markers are on circuit which contains an adjustable automatic sequence valve. This valve is on a hydraulic circuit shared with Fold and Tilt cylinders.

1. To prevent unexpected marker movement when enabling the marker solenoid valve, set the shared circuit to Neutral or Float before operating the switches.
2. Enable markers at the CFM switch. Set Fold and Tilt off, then Marker on.
3. Clear the area within 5m (15ft) of marker arms on both sides of the drill.

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

4. Carefully move the circuit lever to extend and observe which marker side is extending.
5. If the marker extending is not on the desired side, reverse the lever (to retract) until the marker returns to the cradle. Set the control to Neutral briefly, then to Extend again. This cycles the sequence valve and extends the alternate marker.
6. When marker is fully extended, set circuit to Neutral.
7. To fold marker, set circuit to Retract until marker is in cradle.
8. To extend other side, Extend once more, as at step 5.

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
Final Field Checklists
Use the following tables to develop a final checklist for your tractor/Air Drill configuration. Additional or fewer steps may be necessary depending on tractor features, Air Drill options and planting accessories.
### Mechanical Checklist

| q Check transport and gauge wheel tire pressure | Page 144 |
| q Tongue height preset | 22 |
| q Air Drill unfolded | 25 |
| q Tongue front latch hook engaged | 31 |
| q Transport locks moved to FIELD | 27 |
| q Wings aligned at unfold | 127 |
| q Marker initial length set | 162 |
| q Marker disk angle set | 98 |
| q Check auger stowed. | 52 |
| q Check ladder stowed. | 44 |

### Electrical Checklist

| q Verify electrical hookups solid | Page 22 |
| q Check seed monitor terminal and observe any diagnostic messages | a |
| q Configure seed monitor for crop | a |
| q Set CFM MASTER off, and Marker switch on (if markers will be used). | 60 |

a. Refer to DICKEY-john Air Cart Control manual.

### Hydraulic System Checklist

| q Check tractor hydraulic reservoir full | Page - |
| q Inspect connections for leaks | - |
| q Perform a raise and lower operation | 32 |
| q If auger-equipped, set selector valve to FAN. | 59 |
| q Check fan operation | 58 |
| q Set CFM switch “Marker” on if markers used | 60 |

### Hopper and Air System Checklist

| q Meter doors closed | Page 46 |
| q Manifold to hopper seal | |
| q Materials loaded | 53 |
| q No air leaks (except from seed box) | - |
| q Hose routings - no sags, no pinches (check wing-folded & field positions) | - |
| q Hoses fully connected to meters, towers and openers | - |

### Frame Mounted Coulter Checklist

| q Coulter to row alignment | Page 91 |
| q Coulter down-force | 92 |

### Row Units Checklist

| q Preset depth handles alike. | Page 97 |
| q Preset down force springs alike, except in tracks. | 94 |
| q Check wheel scraper gaps (if installed) | 95 |

### Meters and Drive Checklist

| q Unused meter disabled by removing gear | Page 75 |
| q Correct DRIVER/DRIVEN rate Range gears installed on meter(s) in use | 75 |
| q Correct optional flutes for rate Range | a |
| q Variable rate gearbox set per calibration | 76 |
| q Check contact tire inflation | 144 |
| q Check chain tension, Re-connect any loose idler tensioning springs. | 154 |

a. Refer to Seed Rate manual.
Field Operation

Perform all steps in “Pre-Start Checklist” on page 24 and “Final Field Checklists” on page 61.

**Seed Monitor**

The seed monitor performs the following functions:

- Drill lift switch monitoring
- Seed flow blockage
- Fan Speed monitoring
- Hopper material level monitoring
- Hopper air pressure monitoring
- Meter rate monitoring
- Ground speed monitoring

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

---

### Table: Hydraulic Circuit Operation

<table>
<thead>
<tr>
<th>First Pass Operation Checklist</th>
<th>Page</th>
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<tbody>
<tr>
<td>1. Drill unfolded and aligned for first pass, with opener disks about 3m (10ft) before field edge.</td>
<td>25</td>
</tr>
<tr>
<td>2. Run fan for at least 15 minutes before planting.</td>
<td></td>
</tr>
<tr>
<td>3. CFM MASTER switch on</td>
<td>24</td>
</tr>
<tr>
<td>4. Unfold marker on next-row side.</td>
<td></td>
</tr>
<tr>
<td>5. Set fan hydraulic circuit to low flow, engage circuit. Gradually adjust fan hydraulic flow to obtain 3800 rpm.</td>
<td>82</td>
</tr>
<tr>
<td>6. Check seed monitor for alerts.</td>
<td>a</td>
</tr>
<tr>
<td>7. Pull forward, lower Air Drill, and begin planting for a short distance.</td>
<td></td>
</tr>
<tr>
<td>8. Stop. Assess:</td>
<td></td>
</tr>
<tr>
<td>• coulter depth</td>
<td></td>
</tr>
<tr>
<td>• planting depth</td>
<td></td>
</tr>
<tr>
<td>• press wheel operation</td>
<td></td>
</tr>
<tr>
<td>9. Make necessary adjustments</td>
<td>70</td>
</tr>
<tr>
<td>10. Refer to Seed Rate manual.</td>
<td></td>
</tr>
</tbody>
</table>

### Table: Sharp Field Turns Checklist

<table>
<thead>
<tr>
<th>Sharp Field Turns Checklist</th>
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</thead>
<tbody>
<tr>
<td>1. Fold marker</td>
<td>60</td>
</tr>
<tr>
<td>2. Raise Air Drill</td>
<td>33</td>
</tr>
<tr>
<td>3. Make turn</td>
<td></td>
</tr>
<tr>
<td>4. Unfold marker on next-row side.</td>
<td>60</td>
</tr>
<tr>
<td>5. Lower Air Drill 3m/10ft before field edge</td>
<td>32</td>
</tr>
<tr>
<td>6. Resume planting.</td>
<td></td>
</tr>
</tbody>
</table>

**NOTICE**

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

---

### Table: Suspending Planting Checklist

<table>
<thead>
<tr>
<th>Suspending Planting Checklist</th>
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<tbody>
<tr>
<td>1. Stop tractor</td>
<td></td>
</tr>
<tr>
<td>2. Fan hydraulic circuit to Float or Neutral</td>
<td>82</td>
</tr>
<tr>
<td>3. Fold Marker</td>
<td>60</td>
</tr>
<tr>
<td>4. Raise Air Drill</td>
<td>33</td>
</tr>
</tbody>
</table>

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

### Table: Ending Planting Checklist

<table>
<thead>
<tr>
<th>Ending Planting Checklist</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Suspend operations as above, then</td>
<td></td>
</tr>
<tr>
<td>2. Set transport locks to ROAD</td>
<td>35</td>
</tr>
<tr>
<td>3. Set tractor for fold</td>
<td>36</td>
</tr>
<tr>
<td>4. Fold wings</td>
<td>37</td>
</tr>
<tr>
<td>5. Tilt wings up</td>
<td>38</td>
</tr>
<tr>
<td>6. Hook wings</td>
<td>39</td>
</tr>
<tr>
<td>7. CFM MASTER off</td>
<td>39</td>
</tr>
<tr>
<td>8. Lights ON for transport</td>
<td></td>
</tr>
</tbody>
</table>
Unloading Materials

Unloading Safety Information

Unloading materials has the same risks as loading material. Review the advisories on page 53.

Unloading Without Auger

1. Raise, fold, tilt and hook drill (page 34).
3. If unloading front hopper, drape a tarp over the openers, to ease clean up.
4. Lower ladder (page 44), and open lid (page 45) on any hopper to be emptied. Unless both hoppers contain the same material, empty only one at a time.
5. If unloading fertilizer or treated seed, take same materials safety protection measures as for loading.

Refer to Figure 70
6. Open Calibration door first. A small amount of material may fall onto the collection area.
7. Open Clean-Out door second. Expect material to flow in significant volume until the hopper is empty.
8. Install the calibration crank (page 56). Rotate it until no material flows from the calibration door.
9. If the drill will not be used again for an extended period, complete the steps at “Material Clean-Outs” on page 107.
10. If unloading front hopper, and openers were not covered with a tarp, brush excess materials from openers.
11. Move drill from collection area and recover materials.
12. Wipe down doors and bottom of meter.
13. Close doors. For temporary parking or transport, fully close doors. For storage, close doors only until elastomer seals begin to touch meter housing, so that condensation can drain. Do not leave doors open wide enough for pest entry.

Auger Unloading: Rear Hopper

1. Position drill well clear of overhead electrical lines.
2. Raise openers (page 33) and fold wings (page 35).
3. Lower openers (page 32) to provide maximum clearance at center section.
4. Shut down hydraulics or set Fan/Auger circuit to Float or Neutral.
5. Open lid slightly on rear hopper.

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

Entrapment and Rapid Suffocation Hazard:
Never enter a hopper for loading or unloading.

Unload Prep.: Hydraulic Circuit Operation

<table>
<thead>
<tr>
<th>Unload Prep.</th>
<th>Fan, Auger</th>
<th>Fold, Tilt, Marker</th>
<th>Transport Hooks</th>
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<tbody>
<tr>
<td>Lift</td>
<td>Neutral</td>
<td>Float or Neutral</td>
<td>Neutral</td>
</tr>
<tr>
<td>Neutral</td>
<td>Float or</td>
<td>Neutral</td>
<td>Neutral</td>
</tr>
<tr>
<td></td>
<td>Neutral</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 70
Meter Doors Open
Refer to Figure 71
7. Swing inlet hopper under rear meter. (see page 64 for additional steps if unloading front hopper)
8. Position collection bin or vehicle under auger outlet.
9. Install the calibration crank (page 56).

Refer to Figure 71
10. Open (front) Calibration door ①. A small amount of seed may fall into auger inlet hopper.
    Do not open (rear) Clean-Out Door ② before auger is operating, or material may flow in large volume and overflow auger inlet hopper.
11. Check that auger controls are at center/off.
Refer to Figure 73

12. At Fan/Auger selector valve, select AUGER.

13. Activate fan/auger hydraulic circuit. The auger does not operate at this time.

**WARNING**

**Rotating Auger Hazard:**
Use two people for the next steps, to avoid requiring a single person to be alone and in close proximity to a rotating auger.

Refer to Figure 73

14. With the meter area clear, briefly operate auger to verify which direction of handle movement lifts material. Have the auger operator stand ready.

15. Have a second person open the Clean-Out door 2 and exit the area.

16. As soon as the door operator is clear of the auger, operate auger control valve for material lift.

17. When flow from meter stops, rotate calibration crank until no material flows from calibration side of meter.

18. When material stops flowing into the collection bin or vehicle, set the auger controls to center/off.

20. If the drill will not be used again for an extended period, complete the steps at “Problem Clean-Outs” on page 108.

21. Wipe down doors and bottom of meter.

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

Auger Unloading: Front Hopper

The on-board auger is not designed for routine use as an unloading aid at the front hopper. With the polymer inlet hopper installed, the inlet end of the auger does not fit under the front meter. Additionally, the outlet end of the auger may be too low for your collection bin or vehicle. Great Plains recommends:

- planning operations to exhaust materials in the front hopper (or use only the rear hopper for single-hopper tasks), or;
- use the non-auger unloading procedure (page 64) for the front hopper.

Removing the polymer inlet hopper from the auger allows the auger to be swung under the front hopper meter. However, without the inlet hopper, the auger inlet will not catch all the falling material.

The loose inlet hopper can be placed under the auger inlet to catch the excess, and divert some of it to the inlet.

Unload the rear hopper first. Then use the same steps as for unloading the rear hopper, with these changes:

7a. Before step 7(b) on page 65, remove the auger inlet hopper.

7c. After step 7(b), maneuver inlet hopper under inlet.

| Auger Unload: Hydraulic Circuit Operation |
| Lift | Fan, Auger | Fold, Tilt, Marker | Transport Hooks |
| Neutral | Float Neutral | Neutral | Neutral |
Parking

Follow 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.
2. Check that hopper lids are latched, and secure the hopper lids with security cable or padlock and chain to prevent entry by children. See “Lid Closing” on page 46.
3. Remove jack from storage position and pin securely to lifting stob on outside of drill tongue. See “Hitching Tractor to Air Drill” on page 18.
4. If ground is soft, place a wide block or plate under the jack to increase contact area.
5. Securely block drill tires to prevent jack from digging or sliding off plate.
6. If drill is equipped with optional brakes, set the parking brake handle on each side of the drill.

For dual line air brakes, disconnect the red (control) gladhand connector first, at the tractor, then the blue supply connector, and store each connector in its matching color-coded gladhand holder on the drill.
7. Unhook electrical lines and protect with any plugs or caps provided.
8. Release pressure on hydraulic system, then disconnect hydraulic lines and pull all lines back onto drill tongue. Store hoses ends in keyholes of hose holder bracket. Large top hole is reserved for fan/ auger case drain line.
9.Disconnect hydraulic brake line (option).
10. Disconnect the safety chain.
11. Unhitch from tractor or leading implement.
Storage

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

1. Unload all material in hoppers. See “Unloading Materials” on page 64.

2. Unlatch the hopper lids so that the seals are not in compression during storage. Route a chain or security cable through the hold-down U-bolt and the latch handle to prevent unauthorized entry, and prevent high winds from opening the lid.

3. Empty the hoppers completely. Hand crank the meters several turns to empty completely. See “Calibration Crank” on page 56. Blow out the meters with air to remove all material.

4. Unless cleaned out at last loading or during unload above, deploy the auger, and run the motor in reverse until auger is completely empty. See “Auger Operations (Option)” on page 48.

5. Return the auger to its cradle with the hopper in the extended storage orientation. See “Storing Auger” on page 52.

6. If equipped with optional air/hydraulic brake system, drain water from reservoir (page 119).

7. Remove the drive chains and store in oil.

8. Lubricate the drill at all points listed under “Lubrication” on page 132.

9. Check all bolts, pins, fittings and hoses. Tighten, repair or replace parts as needed.

10. Check all moving parts for wear or damage. Make notes of any parts needing repair or replacement before the next season.

11. Open the meter-box doors completely to release seal pressure and allow rinse water to exit.

12. Thoroughly wash the hoppers with water to prevent corrosion from fertilizer or seed treatments.

13. Set doors to slightly open, but not wide enough for animals to enter the meters. Wire doors in place if needed. Do not store the drill with seals compressed.

14. Raise and stow the ladder, to discourage climbers.

15. Lubricate all points listed in Maintenance to prevent rust.

16. Clean Air Drill of mud, dirt, excess oil and grease.

17. Grease exposed cylinder rods to prevent rust.

18. Use touch-up paint to cover scratches, chips and worn areas to prevent rust.
To get full performance from your NTA907/3007HD drill, you need an understanding of all component operations, and many provide adjustments for optimal field results. Even if your planting conditions rarely change, some of these items need periodic adjustment due to normal wear.

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<td>Primary source is DICKEY-john manual 110011375</td>
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<tr>
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<td>-</td>
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<td>Correcting chart rate to your specific materials</td>
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<td>Marker Chain Length</td>
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<td>Marking on irregular ground; smooth folding</td>
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<tr>
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</tbody>
</table>
Setting Material Rates

Rate setting details are covered in the Seed Rate manual 167-085B, which also contains seed and fertilizer rate charts. The topic is covered only in summary form in the present manual.

The NTA907/3007HD drill is a volumetric implement. For a given metering configuration, rates will vary for materials with different density and granularity. The rate charts provide starting point, but calibration is essential for accurate application (even if using both meters for the same material at the same rate). Material rates are set independently for each hopper and meter.

Check Contact Tires

Reliable material rates are only achieved if the ground drive system is working properly. The transport tires and contact drive tires must be the correct size, and must be inflated to factory specifications. Check tire pressures, particularly the contact tire pressures, whenever loading seed or fertilizer. See page 144.

Always replace worn tires with the correct size.

Check Flute Shaft Configuration

For some unusual very high rate applications, Great Plains offers optional meter flute shafts (page 140) that can increase rates to 150% or 200% of factory standard.

Refer to Figure 76 (which depicts a single flute “star” with its halves, a single star mated, two stars staggered, and a filler)

Know your “stars” setup. If your drill has never been changed from factory standard, you have meter flute shafts with 2 “stars” (4 halves) per outlet. How many “stars” you have determines which rate chart to use.

Refer to Figure 77 (depicting an inspection from below meter)

If the configuration is not known, inspect the flute shaft from the hopper lid (if hopper empty), or from below the meter, with the calibration door fully open. It is not necessary to remove the shaft. Inspect the flutes ①, and filler rings ② at active outlets.

On a standard “2 star” shaft, each seed drop outlet contains two flute sets (4 halves), each pair staggered slightly from the next. Unused outlets are fully blocked by filler rings ③.

On a “3 star” shaft, each outlet contains 3 flute sets.

On a “4 star” shaft, each outlet contains 4 flute sets, with no fillers between adjacent drops.

To change meter flutes, see “Changing Meter Flutes” on page 164.
Find Your Chart and Rate

Standard “2 star” rates are in the main section of the Seed Rate manual. “3 star” and “4 star” rates are in the Appendix.

If you are planning to operate both hoppers, perform the setup steps separately for each hopper, as the configurations (including stars) may be completely different.

1. Confirm that the chart is for the material and star configuration you have.
2. Find your target population or application rate.

If you have a choice of charts, for most consistent results, pick one that results in a variable rate gearbox value between 30 and 70.

Dual Hopper Considerations

If you are applying the same material from both hoppers, what chart rate to start with depends on whether you will run both meters simultaneously, or sequentially (run one, then the other).

The charts do not account for “twin” hopper operation. If both hoppers are metering the same material, at the same rate, and at the same time, the output is twice the chart rate. If run sequentially, or metering different materials at the same time, treat them as single-hopper operation.

High Rate Flute Considerations

“High Rate” charts are provided for some seeds, but the charts do not cover all possible combinations of high-rate flutes. You can use any standard-rate single-hopper chart.

Adjustment for Dual Metering / High Rate Flutes

To find the initial chart rate for dual hopper and/or alternate flutes:

\[
ChartRate = FieldRate \times LookupFactor
\]

To find the rate to check at calibration:

\[
CalRate = FieldRate \times TwinFactor
\]
Monitor Material Configuration

The DICKEY-john IntelliAG monitor reads meter shaft speeds and can report pounds/acre (or kg/ha) planted.

In order to report accurately, the monitor requires several inputs. Inputs that rarely change were entered during drill setup. Inputs specific to particular materials (seed or fertilizer) need to be entered when those materials are first used, and when changed.

See the DICKEY-john Quick Start guide for more detailed instructions.

Material Configuration Setup Screen for Seeds

“Type” - This must be set to “Gran Seed Monitor” to configure for seeds.

Density Units” - In metric mode this is always kg/liter. If configured for “U.S.” mode (U.S. customary units), this is pounds-per-bushel or pounds-per-cubic-foot.

“Density” - This is the density of seed being planted. Obtain this information from the material container/supplier. If unknown, use the value specified in the rate chart.

“Total Number of Towers” - This is the number of primary hoses coming off the rear meter box (this is always 4 for NTA907HD and NTA3007HD).

“Calibration Constant” - This is the number listed in the seed rate charts for the rate you are planting or the number obtained from running the calibration routine for your specific seed.

Material Configuration Setup Screen for Fertilizer

“Type” - This must be set to “Gran Fert Monitor” to configure for fertilizer.

“Density” - Enter the density of Fertilizer being applied, in kilograms-per-liter (pounds-per-cubic-foot). Obtain this information from the material container/supplier. If unknown, use the value specified in the rate chart.

“Total Number of Towers” - This is the number of primary hoses coming off the rear meter box (this is always 4 for NTA907HD and NTA3007HD).

“Calibration Constant” - This is the number listed in the seed rate charts for the rate you are planting or the number obtained from running the calibration routine for your specific fertilizer.

Always enter Density Units before entering the Density value. Changing the value of Density Units will alter the value of Density.
Channel Setup Screen

Channel 1 setups are for the front hopper. Channel 2 setups are for the rear hopper.

“Type” - Set this to either “Gran Seed Monitor” or “Gran Fert Monitor” based on the type of material in each hopper.

“Material Name” - Choose the name of the material configured for each channel in steps 1 and 2 above.

“Sensor Constant” - [ ]

“Gear Ratio” - [ 1 ]

“Channel Width” - is your Implement Width (swath) in inches (cm). Precise row/swath data is found on page 143 (for NTA907HD) and page 144 (NTA3007HD).

If the monitor inputs are correctly entered, the monitor is a handy tool for fine tuning the variable rate gearbox setting. If the rate reported by the monitor does not match the desired planting rate, rotate the crank to adjust the variable rate gearbox control arm slightly so as to achieve the desired planting rate.

Meter Rate Adjustment

Seed rate is determined by:

- Flute shafts (covered on page 71):
  - standard 2-star/1x rate, or
  - optional 3-star/1.5x or 4-star/2x rates
- Single/twin hopper metering. (covered on page 72)
- Seed meter Final Drive Range gearing
- Variable Rate Gearbox setting

The Seed Rate Manual charts are based on cleaned untreated seed of average size and test weight. Many factors affect meter rates including foreign material, seed treatment, seed size, field conditions, and test weight.

Minor adjustments will be needed to compensate for these factors. Initially set the rates according to the charts, then calibrate for your material and conditions.

Calibration is also required to set up the monitor Calibration Constant. With the correct Calibration Constant and material density the monitor can be used to help fine tune the variable rate gearbox setting.
Seed Meter Final Drive Range
Refer to Figure 78 and Figure 79
The meter flute shaft ① is driven by the agitator shaft ② through a pair of interchangeable gears ③, ④. The positioning of these gears creates two final drive ranges. Each seed rate chart is based on a specific Final Drive Range. The Ranges are:

- “High” range, which is used for larger seeds and higher seeding rates
- “Low” range, which is used for smaller seeds and lower seeding rates

The meter shafts are labeled “DRIVING” and “DRIVEN”. The “DRIVING” shaft is the upper forward shaft. The “DRIVEN” shaft is the lower rear shaft.

Refer to the Seed Rate chart (or Fertilizer Rate chart), the table below, and Figure 78 and Figure 79 for setting the seed meter final drive range.

<table>
<thead>
<tr>
<th>FINAL DRIVE RANGE</th>
<th>DRIVING</th>
<th>DRIVEN</th>
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</thead>
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<tr>
<td>LOW RANGE</td>
<td>17 Tooth Small</td>
<td>54 Tooth Large</td>
</tr>
<tr>
<td>HIGH RANGE</td>
<td>54 Tooth Large</td>
<td>17 Tooth Small</td>
</tr>
</tbody>
</table>

1. Remove the pins ⑤ from the ends of both shafts.
2. Remove and position the gears as shown in the table above.

Disable a Seed Meter
To avoid operating a meter:
1. Remove a final range gear and leave it off.
2. Set the variable rate gearbox to zero.

These steps are recommended even when the unused hopper is empty, to:

- reduce gearbox and meter wear
- during calibration, to avoid clogging air tubes at the meter not under test, and;
- avoid metering undesired material in the field.
Setting Variable Rate Gearbox

The variable rate gearbox lets you infinitely vary meter drive speed to attain a wide range of seeding rates. The ratio of gearbox input speed to output speed is controlled by the position of a gearbox control arm. The control arm has an indicator that points to a scale marked in degrees. The Seed Rate and Fertilizer Rate charts show the rate for each degree of the control arm rotation.

Refer to the seed rate charts and set each variable rate gearbox control arm to its scale setting for the desired seeding rate.

To adjust the Variable Rate Gearbox for each hopper:

Refer to Figure 80

1. Remove the hairpin cotter securing the gearbox adjustment crank.
2. Rotate crank until the control arm indicator points to the scale setting that matches the rate from the Seed Rate chart or determined by calibration.
3. Reinsert the hairpin cotter.

The variable rate gearbox operates optimally between 30 and 70. If a seed has charts for both HIGH Range and LOW Range, the most consistent results are obtained when the gearbox control arm is set between 30 and 70. Settings below 20 degrees are not recommended. When the control arm is set above 70 degrees, large movements of the arm result in small changes in seeding rate.

If you will be metering the same material from both bins at the same time, use the Seed Rate chart entry for half the desired application rate. Do not use a half scale setting - the effect of the variable rate gearbox control arm is not linear.
Meter Calibration

Push \( \text{Push} \) and then \( \text{Push} \) and then \( \text{Push} \) to get to meter calibration.

The Seed Rate charts are based on cleaned untreated seed of average size and test weight. Many factors affect meter rates including foreign material, seed treatment, seed size, field conditions, and test weight. The Fertilizer Rate chart is based on a representative granular fertilizer.

Great Plains recommends calibrating for the exact materials you intend to apply. Calibration determines two very important settings for achieving accurate rates:

- The kilograms per hectare (or pounds per acre) of the meter at the current variable rate gearbox setting for your particular seed or fertilizer.
- The Calibration Constant for the monitor to accurately report the planting rate of your particular seed or fertilizer.

Calibration Procedure

The seed monitor must be correctly set up for both the air drill and the material(s), or the calibration will not result in useful monitor displays. The right column contains an example for the following steps.

1. Set the Final Drive Range gears and Variable Rate Gearbox setting to the values suggested in the Seed Rate Chart (or Fertilizer Rate Chart).
2. Make sure there is enough material in the hopper(s) for at least \( \frac{1}{10} \) hectare (or \( \frac{1}{10} \) acre) plus an extra 35 to 45 kg (75 to 100 lbs.).

Refer to Figure 81

3. Since only one calibration bag is provided, remove one of the final range gears \( 1 \) from the meter that is NOT being tested, to disable it.
4. Open the calibration door \( 2 \) of the meter being calibrated. The calibration door is the rear of the two bottom doors.

**NOTICE**

Do not open the door under the upper DRIVING gear. This is the clean-out door. Opening this door will drain the hopper. Once this door is open it is difficult to stop seed flow until the hopper is empty.

See the Seed Rate manual for an example in U.S. customary units.

| Example: Wheat, High Rate, 2 Stars |
| Target Seed Rate: 200 kg/ha |
| Initial Variable Rate Gearbox setting: 62 |

![Figure 81 Calibration Door Open](image-url)
Refer to Figure 82

5. Insert calibration crank onto contact wheel shaft. See “Calibration Crank” on page 56.

**NOTICE**

Rotate the calibration crank only in the:
CLOCKWISE direction on drill left, or;
COUNTERCLOCKWISE direction on drill right.
Operating in reverse can cause gearbox damage.

6. Turn the calibration crank enough turns to be sure the meter flutes are full and the system is metering.

**CAUTION**

Obey manufacturer or grower recommendations for safety equipment and protective gear when using treated seeds.

7. Wipe all material off the flanges around the meter door.

8. Accurately weigh an empty container large enough to catch material coming out of the meter. The calibration bag supplied with your drill weighs 1.53 kg (3.36 lbs).

Refer to Figure 83

9. Place container under open calibration door. If using the calibration bag, loop bag handles over the door handles and hook the bag to the front of the meter.

10. On the seed monitor terminal, set the monitor to Calibration mode, enter [5] for the “# Meter Revs” and press the Start softkey. This “# Meter Revs” parameter does not affect the monitor calibration because the monitor counts actual meter shaft revolutions and uses that count to compute the Calibration Constant.

The “# Meter Revs” parameter is used for a progress bar displayed during calibration.
11. Turn the calibration crank for the number of turns to simulate \( \frac{1}{10} \) hectare (or \( \frac{1}{10} \) acre).

It is important to turn the calibration crank rapidly. Use a comfortable speed not exceeding 2 revolutions per second, which would simulate 10 kph (6.2 mph) planting speed. A longer calibration is always more accurate, especially for low rates and small seeds. \( \frac{1}{10} \) hectare is easy to calculate and is a minimum calibration run.

See table at right for revolutions per area.

12. Wipe all the material off the flanges around the meter doors and capture that material in the calibration container.

13. Accurately weigh the container plus material.

14. Subtract the empty container weight to determine the application rate for \( \frac{1}{10} \) acre (or \( \frac{1}{10} \) hectare).

\[
SampleWeight = MeasuredWeight - ContainerWeight
\]

15. Press the Stop softkey \( \mathcal{S} \) on the monitor and enter the sample net weight (SampleWeight). The monitor responds with a Calibration Constant. Push the Save softkey \( \mathcal{S} \) to accept this value.

16. Multiply the sample size by 10 to determine application rate per acre (hectare) at the current variable rate gearbox setting.

\[
CalibratedRate = SampleWeight \times 10
\]

If the calibrated rate matches the target rate, skip to step 22. Otherwise...

17. Subtract the calibrated rate per acre (or hectare) from the target rate to determine a rate correction difference.

\[
RateDifference = TargetRate - CalibratedRate
\]

18. Determine a new chart rate, based on the previous chart (not target) rate. To lower for the next rate:

\[
NewChart = OldChart - RateDifference
\]

To raise for the next rate:

\[
NewChart = OldChart + RateDifference
\]

---

**Calibration Crank Revolutions**

<table>
<thead>
<tr>
<th></th>
<th>NTA907HD</th>
<th>NTA3007HD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revs/hectare</td>
<td>1050</td>
<td>425</td>
</tr>
<tr>
<td>Per 1/10th ha</td>
<td>105</td>
<td>42.5</td>
</tr>
</tbody>
</table>

---

**Example:**

- MeasuredWeight is 23.3 kg
- ContainerWeight is 1.52 kg
- SampleWeight = 23.3 - 1.5, which is: 21.7 kg

**Example:**

- TargetRate = 200
- RateDifference = 217 - 200, which is: 17 kg

The calibration run metered 17 kg too much. You must lower the gearbox setting to compensate.
19. Refer to the seed rate chart for Seed Rate gearbox setting values for the new chart rate.

20. Adjust the control arm to the Gearbox Setting closest to the *NewChart* rate.

21. Run the calibration again, starting at step 9, using the new Variable Rate Gearbox scale setting.

   This validates the gearbox adjustment, and establishes a new, more precise Calibration Constant.

22. With the present meter satisfactorily calibrated, re-mount the final drive gear removed from the other hopper.

23. Repeat the calibration procedure for the other hopper, starting at step 1.

24. Remove and store the calibration crank.

Contact Drive Adjustment

Refer to Figure 84 and Figure 85

There are two contact drive tension springs ① on each side of the drill; four total. If there seems to be:

- insufficient traction between the contact drive tires ② and the main transport tires ③;
- excess spring force at contact tires, or
- or a contact drive shaft ④ is below the minimum clearance when raised in the frame slots ⑤,

then follow these steps:

1. Check tire size and inflation (page 144).

   Use tire sizes specified by Great Plains, at recommended pressures. The remaining steps of this section cannot be used to compensate for incorrect sizes and/or inflation.

   | 158.5 | 177.6 | 59 |
   | 163.7 | 173.5 | 59 |
   | 169.0 | 179.4 | 60 |
   | 174.3 | 185.4 | 61 |
   | 179.6 | 201.3 | 62 |
   | 195.0 | 207.4 | 63 |

Example:

NewChart rate to use: 183.5
New Gearbox Setting: 59

The rate of the arm adjusting crank is more than one scale degree per turn, and the crank can only be pinned at quarter turns. Pin it when the indicator is closest to the desired setting.
2. Move drill to a hard surface area, so that openers do not lower below ground level.

**Contact Spring Force**

It may be necessary to loosen and move the jam nuts for this adjustment. Re-check jam nut adjustment in any case, as force adjustment changes up-limit.

3. Raise openers, to fully compress springs.

4. Measure the length of the springs between any two convenient points that encompasses all turns of the spring windings, such as from the centerline of the lower cross-bolt to the top of the casting.

5. Lower openers to ground.

6. Re-measure spring length. Adjust bolt until spring length when lowered is 2.5cm (1in) longer than when fully compressed (as measured at step 4).

7. If reducing force, make sure that at least 7 turns of bolt threads are in spring casting. Check exposed length of bolt between bottom of spring anchor and top of casting (not to top of jam nuts). The maximum length of exposed thread is 91mm (3.6in).

**Contact Shaft Up-Limit**

8. With openers raised, at each ground drive, rotate the shaft and check the gap between the shaft and the top of the slot. There must be at least 10mm (0.4in) clearance.

9. To adjust the shaft up-limit, loosen all four jam nuts in the spring assembly. Rotate the upper jam nut to set the upper limit of shaft travel. Adjust for 12mm (0.47in) or more slot clearance, and equal clearance on both sides of each ground drive arm assembly. Secure upper jam nut with lower.

¶ With openers lowered in the field, spring extension will be more than 2.5cm. The setup procedure accounts for this.
Fan Speed Adjustments

The function of the airbox at the seed meter is to mix seed with turbulent air from the hydraulic fan, which then exits through primary hoses at each meter, to the towers, and via secondary hoses to the rows.

Fan Operation

Refer to Figure 86

All three (3) fan hydraulic lines must be properly connected. "Hydraulic Hose Hookup" on page 19.

Use tractor remote hydraulic valve flow control to set fan speed. Start with a very low speed and verify that fan impeller is spinning in the correct direction by observing fan rpm on the seed monitor.

If the fan cannot reach 3000 rpm, one or more hoses may be mis-connected. Air moves toward the air box in either direction of fan rotation, but reverse spinning airflow is too low to operate the air box.

Start with flow on low setting. 30-45 liters/min (8-12 gpm) is average flow.

Run fan for at least 15 minutes before seeding. Hydraulic fluid must be warm before fan and wing down pressure will operate properly.

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

It only takes a very small air leak to cause large variations in the seeding rate and pattern.

2. Watch the seed monitor and adjust fan speed by increasing or decreasing hydraulic flow from the tractor. Use the following guidelines and the fan speed chart at right to properly adjust fan speed.

- Higher fan speeds improve seed distribution, but high fan speeds also increase the chance of seed damage and bounce.
- At first, adjust fan speed to the high end of the range suggested in the chart at right. Watch for excessive seed cracking and seed bounce from the furrow, then reduce fan speed if necessary.
- Follow the chart at right as a guide. Actual fan speeds vary with implement width, row spacing, seeding rates, seed weights and seed size. Increase fan speed for heavier seeding rates or seed. Reduce fan speed for lighter seeding rates and seed more prone to cracking.

The monitor has a level sensor below the hopper or seed box to warn when seed box is empty. Approximately 530 liters (15bu) of seed remains in the system when the sensor first indicates box empty.
Implement Lift Switch Adjustment

Refer to Figure 87 and Figure 88

An implement lift switch 1 on the drill turns seed metering off when the implement is raised. To adjust the switch activation height, first locate the lift switch on the implement (center section, right parallel arms).

![Figure 87 Lift Switch Location](29475)

**CAUTION**

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

Wings must be tilted down, and may be folded forward to ease access to the switch. Lower the openers until at a height where seeding should start (usually just above ground). Turn off the tractor and remove the key. Securely support center section sub-frame at this height with jack stands or blocks.

Loosen switch pivot screws 2. Adjust switch angle so that toggle 3 is level, or slightly tilted up to the rear.

Loosen bracket bolts 4 and slide switch 1 up or down until the flexible switch toggle 3 is just past the point at which the switch is activated (flexible switch toggle deflected down).

The implement lift switch has three wires (black, red and green). In order for the switch to work properly, the correct two leads must be connected to the lift switch extension cable.

- The extension cable black lead always connects to the switch black wire.
- The extension cable red lead must connect to the switch red wire.

**Planting Depth**

Seed placement depth is affected by:

- soil conditions 1, which can require adjustments to all of the following;
- press wheel T-handle 2 setting (page 97), which controls opener disk depth relative to press wheels;
- (optional) coulter depth 3 (page 91), which prepares the soil ahead of the opener disks;
- hydraulic 2 down-force (page 84) and row unit spring 5 down-force (page 94), which needs to be high enough for disks to open a furrow, but not so high that press wheels run deep or openers tilt forward and run too deep; and,
- opener 6 wear (page 94), which over time can cause established T-handle settings to be too shallow.
Opener Down-Force (Hydraulic)

Down-Force Safety Information

**DANGER**

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

**WARNING**

**High Pressure Fluid Hazard:**
Escaping fluid under pressure can penetrate the skin causing serious injury. Use a piece of paper or cardboard, NOT BODY PARTS, to check for suspected leaks. Wear protective gloves and safety glasses or goggles when working with hydraulic systems. If an accident occurs, seek immediate medical attention from a physician familiar with this type of injury.

**WARNING**

**Crushing Hazard:**
Keep body parts clear of wings and openers while adjusting. Keep all bystanders well away. You will be seriously injured or killed if you are caught between lowering openers and ground, or raising openers and drill frame.

**CAUTION**

**Falling Hazard - Tires Not a Step:**
Do not use tires as steps or platforms. At higher down-pressures, opener frames can lift gauge wheels off the ground, and can lift main wheels sufficiently for them to spin.

Down-Pressure General Information

In moderate to heavy no-till conditions, the openers are normally lowered, as a gang, to full extension of the lift cylinders. To aid penetration, the hydraulic down-pressure system is used primarily to transfer weight to the wings.

The down-pressure is controlled by adjustable valve located inboard on the front of the left wing. Sub-frame cylinders are always at full travel during field operations.

Adjusting Hydraulic Down Pressure

Hydraulic down pressure controls drill-wide opener penetration and press-wheel soil firming. Use only enough down pressure to cut a furrow and maintain proper soil-firming over seed. Excessive opener down force may cause bulldozing of the openers in light soil conditions, and leads to premature wear on opener components.
When higher wing down-pressures are required, an increase in weight transfer is generally also required. Increasing wing down-pressure with insufficient wing weight results in outside rows running shallow. In extreme cases of imbalance between down-pressure and weight transfer, the wing gauge wheels could be lifted off the ground.

Before adjusting down-pressure, observe the drill operating in your field conditions. Check the following table for indications of adjustment needed.

<table>
<thead>
<tr>
<th>Observation</th>
<th>Probable Cause</th>
<th>Adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Press wheels leaving light or no tracks</td>
<td>Insufficient down-force</td>
<td>Increase down-pressure&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Press wheels compressing soil too deeply</td>
<td>Excess down-force</td>
<td>Decrease down-pressure&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Openers not level</td>
<td>Remove sub-frame shims (p 94)</td>
</tr>
<tr>
<td>Openers disks running too deep, despite press wheel setting (“bulldozing”)</td>
<td>Excess down-force</td>
<td>Decrease down-pressure&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Opener sub-frames continuously moving up and down</td>
<td>Insufficient down-force</td>
<td>Increase down-pressure&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Wing end tilted up</td>
<td>Insufficient weight transfer</td>
<td>Increase weight transfer&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Wing ends tilted down</td>
<td>Excess weight transfer</td>
<td>Decrease weight transfer&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Wing gauge wheels leaving light or no tracks</td>
<td>Insufficient weight transfer</td>
<td>Decrease weight transfer&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup> When adjusting wing down-pressure, re-check performance in field, and re-adjust weight transfer as needed.
<sup>b</sup> When adjusting weight transfer, re-check performance in field, and re-adjust down-pressure as needed.
Control Valve Overview

Refer to Figure 91

There is one flow control, and three pressure controls. Each pressure control has a gauge. All of the controls have an adjustment knob and a locking disk to fix the chosen setting.

- **B** Bypass valve (normally closed), adjusted on tractors with "LS closed" hydraulics
- **C** Center section down-pressure, sets the force applied to all center section rows, and may be set higher than wings
- **W** Wing down-pressure, sets the force applied to all wing rows, and may be set lower than the center section.
- **T** Transfer of weight from center to wings, sets the weight available to the wings. At higher wing down-pressures, it is possible for the rows to lift the wings, unless weight is transferred.

These controls must be set and adjusted prior to first field use of the drill. They require re-adjustment when there are significant changes in field conditions.

1. Unfold (page 26) and lower (page 32) drill. Put tractor in Park and set parking brake.
2. Lock hydraulic lever forward during field operation for constant hydraulic flow to openers.

**John Deere tractors with Sound-Gard ® Body:** Use lever lock clip, John Deere part number R52667, to lock lever forward. See your tractor dealer for clip purchase and installation.

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

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

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

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

3. At bypass valve, release locking disk and close bypass valve for no oil flow by turning knob clockwise completely.

**Crushing and High Pressure Fluid Hazards:** This adjustment requires working near the unfolded and lowered drill with the hydraulic system active. Assign two people to this task, one in the tractor cab, ready to shut the tractor down on hand signal from adjuster or any unplanned event.
Refer to Figure 92

4. Release locking disks on transfer \( \mathbb{1} \), center \( \mathbb{2} \) and wing \( \mathbb{w} \) down-pressure valves.

5. Adjust knobs on pressure-control valves \( \mathbb{c} \), \( \mathbb{w} \) for opener down pressure until gauges \( \mathbb{c} \), \( \mathbb{w} \) are at 9.7 bar (1400 psi).

The recommended down-pressure ranges for drilling are:

\( \mathbb{c} \) Center 4.8 to 14.5 bar (700 to 2100 psi)

\( \mathbb{w} \) Wings 5.5 to 15.2 bar (800 to 2200 psi)

\( \mathbb{r} \) Rotate knob clockwise to increase pressure and counterclockwise to decrease pressure.

6. In some applications, pressure on center section is set slightly higher than the wings to account for additional compaction due to tractor and drill transport tires. Do not operate at pressures so high that the wing gauge wheels loose traction, or are off the ground, causing loss of seed depth control.

Setting the Bypass Valve

- **LS Closed:**
  Tractors with load-sensing, Closed-Center hydraulics require the bypass valve \( \mathbb{c} \) to protect the tractor hydraulic system. Continue at “**Bypass with LS or PFC Closed Systems**” on page 88.

- **PFC Closed:**
  Pressure Flow Compensating - same adjustment as LS Closed. Continue at “**Bypass with LS or PFC Closed Systems**” on page 88.

- **PC Closed:**
  Pressure Compensating - no bypass is required. Release locking disk. Close bypass valve \( \mathbb{c} \) for no oil flow by turning knob clockwise completely. Tighten locking disk. Always operate the drill with the bypass valve locked closed.

- **Open Center (OC):**
  The NTA907HD and NTA3007HD drills are not presently compatible with tractors that have Open-Center hydraulics. If you are unsure what type of hydraulic system is on your tractor, contact your tractor manufacturer.
Bypass with LS or PFC Closed Systems

Refer to Figure 93

Turn the adjustment knob counter-clockwise to increase flow.

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

**NOTICE**

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

7. Adjust down-pressure before adjusting bypass.

8. With tractor at half throttle, adjust tractor flow-control valve so that openers raise and lower at a reasonable speed. Keep tractor at one-half throttle for the remaining step.

The faster openers raise and lower, the greater potential for oil heating, premature wear or tractor damage. The higher the bypass pressure, the greater the potential for oil heating and premature tractor damage. At the same time, for proper opener operation the bypass valve must be set at least 20 bar (300 psi) above the opener down-pressure setting when the tractor is at one-half throttle. Therefore, you should set the bypass valve as low as possible while staying at least 20 bar (300 psi) above the opener down pressure setting.

9. Slowly open the bypass valve until the down-pressure gauges just start to decline.

10. Turn the bypass knob one turn in the closing direction.

11. Lock the knob at that setting.

While 140 bar (2100 psi) is a good starting point for setting the bypass valve, if you consistently operate the drill with low opener down pressure you can set the bypass valve below 140 bar (2100 psi). If you consistently operate the drill with very high opener down pressure, you may need a bypass-valve setting above 140 bar (2100 psi).
Opener Sub-Frame Adjustment

Opener bodies must be parallel to the ground for consistent results. At higher down-pressures, openers can tend to tilt forward, resulting in coulters running too deep or at irregular depths, inconsistent planting depth, and inconsistent or light furrow closing by the press wheels.

A mechanical adjustment may be necessary at higher down-pressures (and needs to be undone for later operations in lighter conditions). Shims are removed or re-installed at the interface between the opener sub-frames and the parallel arms of the Lift system.

Two sets of two shim sizes (4 shims total at each site) provides a range of seven thicknesses between 0 and 19.1mm (0-3/4 in) in increments of 3.2mm (1/8 in). Shims are slotted to allow easy removal and insertion.

Refer to Figure 94 and (depicting the center section parallel arms)

Shims are located at the rear of lower parallel arms.

If you observe the rear end of the row units riding higher than the front ends, you can reduce the tilt by removing shims. Remove a shim thickness equal to about half (or less) of the excess height at row rear.

<table>
<thead>
<tr>
<th>Shims</th>
<th>Combinations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thin Count</td>
<td>0</td>
</tr>
<tr>
<td>Thick Count</td>
<td>0</td>
</tr>
<tr>
<td>Total (mm)</td>
<td>0</td>
</tr>
<tr>
<td>Total (in)</td>
<td>0</td>
</tr>
</tbody>
</table>

Center section and wings may require different adjustments. In a section, however, always make the same adjustment to both sites in that section.

1. Partially or completely unfold wings, and lower rows to ground. Shut off tractor.
2. At each shim site, loosen, but do not remove, four nuts ① at shim end of lower parallel arm.
3. Use the top holes in the shim stack to remove or re-insert shims ②.
4. Re-tighten nuts ①.
5. Re-check opener-ground alignment in field conditions.
Adjusting Weight Transfer
Weight Transfer Safety Information

**DANGER**

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

**WARNING**

**High Pressure Fluid Hazard:**
Escaping fluid under pressure can penetrate the skin causing serious injury. Use a piece of paper or cardboard, NOT BODY PARTS, to check for suspected leaks. Wear protective gloves and safety glasses or goggles when working with hydraulic systems. If an accident occurs, seek immediate medical attention from a physician familiar with this type of injury.

**WARNING**

**Crushing Hazard:**
Keep body parts clear of wings and openers while adjusting. Keep all bystanders well away. You will be seriously injured or killed if you are caught between lowering openers and ground, or raising openers and drill frame.

**CAUTION**

**Falling Hazard - Tires Not a Step:**
Do not use tires as steps or platforms. At higher transfers, cylinders can lift main wheels sufficiently for them to spin.

Refer to Figure 96

Two dedicated cylinders at the wing pivots can extend to push the wings down using mainframe/center weight. These cylinders are in the Lift circuit, and controlled by an adjustment ① in the down-pressure valve body.

In conventional till and light no-till conditions, no weight transfer may be required. In more challenging conditions, adjust the weight transfer to achieve consistent furrow preparation, planting depth and furrow closing, while keeping the wings level with the center section.

Observe all warnings, and take all precautions, as noted on page 84.


7. Set bypass valve (B), page 87 and adjust down-pressure (C, ⑤, page 84) before adjusting weight transfer.

8. Lock hydraulic lever forward during field operation for constant hydraulic flow to openers. See step 2 on page 86 for details.

9. Release lock disk ⑦. Adjust knob ⑧ clockwise to increase weight transfer, and counterclockwise to reduce weight transfer.

The recommended weight transfer pressure ranges for drilling are:

- Transfer 70 to 170 bar (1000 to 2400 psi)

10. Once pressure is set, secure knobs with lock disks ⑦.

11. Observe drill operation, and re-adjust down-pressure as necessary.
Frame-Mounted Coulters (Option)

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

The factory setting, with fresh coulter blades, is a coulter depth of 6.4cm (2.5in).

There are several adjustments for frame-mounted coulters:

Refer to Figure 97

1. Frame height:
   If running the openers at less than full extension of the lift cylinders, coulter depth ④ is directly affected by opener height.

   Normally, the opener T-handle is adjusted to set opener depth ⑤, and the coulter is left at the fixed difference between coulter and opener depth.

2. 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 92.

3. Coulter-to-row alignment:
   Coulters are factory aligned so that the coulter disk prepares the furrow directly ahead of the opener disks.

   After any coulter or row maintenance, check that these components are still aligned. Adjust at the coulter mounting clamp at the tool bar. Re-check coulter height if any adjustments are made.

In regular or heavy no-till conditions, adjust opener depth to set:

④ the coulter depth to about 13mm (⅛ 2 in) deeper than ⑤ seeding depth.

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

Replace coulter blades when their diameter is worn to less than 40cm (15 3/4 in).
Frame-Mounted Coulter Force

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.

Coulter springs are set to 181 kg (400 lbs). In normal operation at target running depth, the spring is at full extension. It compresses briefly as obstructions 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 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 98

1. Raise the drill and install transport locks. See “Raising” on page 33.
2. Determine the new spring length desired. See the table at right.
3. Measure the current length of the spring(s) to be changed. If already shorter than 24.8 cm (9.75 in), or longer than 26 cm (10.25 in), do not further adjust them.
4. Loosen the jam nut.
5. Rotate the adjuster nut 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 the drill is already operating at maximum down-pressure, reduce coulter depth.

### Table - Spring Length vs. Force at Blade

<table>
<thead>
<tr>
<th>Spring Length  (cm)</th>
<th>Force at Blade (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>26.0 (10.25 in)</td>
<td>136 (300 lbs)</td>
</tr>
<tr>
<td>25.4 (10.00 in)</td>
<td>181 (400 lbs)</td>
</tr>
<tr>
<td>24.8 (9.75 in)</td>
<td>238 (525 lbs)</td>
</tr>
</tbody>
</table>

**NOTICE**

Do not use spring lengths shorter than 24.8 cm (9.75 in). It may contribute to premature parts failure which will not be covered by warranty.
07HD Row Unit Adjustments

Refer to Figure 99 (which depicts a row unit fully populated with all optional accessories supported for use with the NTA907HD and NTA3007HD, including frame-mounted coulter, which is mounted independently of the row unit)

From front to back, a Great Plains 07HD Series row unit can include the following capabilities (some optional):

1. HD Down Pressure Spring: standard
   Each row unit is mounted on the NTA907/3007HD drill via extended 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. See “Row Unit Spring Adjustment” on page 94.

2. Disk Blades: standard, 2 per row unit
   Double disk blades open a furrow, creating the seed bed. Spacers adjust the blades for a clean furrow. See “Disk Blade Adjustments” on page 94.

3. Seed delivery tube: standard
   No adjustments are necessary.

4. Inside Scraper: optional
   Helps prevent clogging between disk blades. See “Disk Scraper Adjustments” on page 95.

5. 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 96.

   Seed-Lok™ firming wheel (shown)
   Improves seed-soil contact. See “Seed-Lok™ Seed Firmer Lock-Up” on page 96.

6. 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 via the T-handle. See “Opener Depth (Press Wheel Height)” on page 97.

**NOTICE**

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

Row unit springs normally require no adjustment. Row down-force is set and adjusted by the Lift system, using hydraulic down-pressure (page 84). The factory setting for the row unit springs is:

1. Spring length: 32.4 cm (12\(\frac{3}{4}\)in)
2. Assembly length: 56.2 cm (22\(\frac{1}{8}\)in)

In some unusual conditions, rows in tire tracks may need to be set heavier.

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

   For each turn of the adjuster nut, the down force at the opener disk changes by approximately:
   1.7 kg/turn (3.7 lbs/turn)
3. Re-tighten jam nut after setting force.

Disk Blade Adjustments

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

Refer to Figure 101

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

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

---

NOTICE

Do not use spring lengths shorter than 29.8 cm (11\(\frac{3}{4}\)in). It may contribute to premature parts failure which will not be covered by warranty.
Adjusting Disk Contact

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

Refer to Figure 102

1. Unfold the drill (page 25). Leave the row units raised.
2. Place blocking or stands under the opener subframes.
3. Remove the bolt ① retaining the opener disk on one side. Carefully remove the blade ②, noting how many spacers ③ are outside the disk and how many are inside the disk. Do not lose the hub components and spacers.
4. To reduce the spacing between the disks (the normal case), move one spacer washer from the inside to the outside.

When installing new blades, it is generally necessary to move outside spacers back inside after both disks are mounted.

5. Re-assemble and check disk contact.

Disk Scraper Adjustments

Disk scrapers are optional. See page 142 ordering information and page 165 for installation. To keep opener disks turning freely, dirt scrapers are mounted between disks to clean as disks rotate.

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

Refer to Figure 103

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

07HD Series row units include a seed flap, and accept one of two optional seed firmers.

The seed flap requires no adjustment, but may need to be replaced if worn (page 129), and may need to be shortened if an optional seed firmer is added after initial delivery.

**CAUTION**

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 104

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 105

To lock up Seed-Lock wheels:

1. Raise lever ①.
2. Pull up on Seed-Lok arm ②.
Opener Depth (Press Wheel Height)

Refer to Figure 106

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

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

- Each increment of the handle adjusts the seeding depth by approximately 6.3mm (1/4in). The range is approximately 0-8.9cm (0 to 3 1/2in) seeding depth.
- For more shallow seeding, slide T handles forward ⑤ toward implement.
- For deeper seeding, slide T handles backward ⑤ away from implement.

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

Marker Adjustments

Review “Marker Safety Information” on page 60 before adjusting markers. There are four operating adjustments for markers:

- Disk Angle
  Even if your row spacing rarely changes, you may need to adjust disk angle for soil conditions and planting speed.
- Marker Extension
  (in “Appendix B - Initial Setup”, page 162)
  Once set for a specific row spacing, this only needs periodic checking to ensure the clamp is secure.

CAUTION

You may be injured if hit by a folding or unfolding marker. Markers may fall quickly and unexpectedly if the hydraulics fail. Never allow anyone near the drill when folding or unfolding the markers.
• Chain Length  
  (in “Maintenance and Lubrication”, page 131)  
  You may want to adjust the chain length to ensure  
  the markers track uneven ground, and do not drag  
  excessively when markers are folded.  

• Marker Speed  
  (in “Appendix B - Initial Setup”, page 162)  
  Once initially set by your dealer, this rarely needs  
  modification.  

There are also two maintenance items for markers:  
“Marker Hydraulic Bleeding” on page 130  
“Marker Shear Bolt” on page 130  

Marker Disk Adjustment

**CAUTION**

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

Mark Width  
Refer to Figure 107  
① 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 ③, increase the angle of the marker  
with respect to the tube ①. For a narrower mark ④,  
reduce the angle.  
Tighten bolts ②.  
Direction of Cut  
To have the marker throw dirt out, invert the disk on the  
spindle, and invert the disk assembly.
## Troubleshooting

See also:

"Down-Pressure Adjustment Indications" on page 86, and
"Troubleshooting and Alarms" topic in DICKEY-john Air Cart Control manual.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Causes</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No material flow</strong> (all rows)</td>
<td>Contact drive not engaged - center section locks still in ROAD</td>
<td>Raise opener sub-frames. Move center frame locks from ROAD to FIELD.</td>
</tr>
<tr>
<td></td>
<td>Tire problems at contact drive</td>
<td>Check transport and contact tire sizes and inflation (page 144).</td>
</tr>
<tr>
<td></td>
<td>Broken or removed chain(s) in drive system</td>
<td>Check chains against &quot;Chain Routing&quot; on page 154.</td>
</tr>
<tr>
<td></td>
<td>Removed final rate Range gear(s); for example, single hopper operation with incorrect meter disabled</td>
<td>Re-install gear(s) per chart and calibration for affected meter.</td>
</tr>
<tr>
<td></td>
<td>Variable rate gearbox set to zero, or too low</td>
<td>Re-set gearbox per calibration.</td>
</tr>
<tr>
<td></td>
<td>Empty hopper</td>
<td>Load material.</td>
</tr>
<tr>
<td></td>
<td>Meter in use clogged</td>
<td>Clean-out meter (page 107).</td>
</tr>
<tr>
<td></td>
<td>Rear meter in use, but front meter box (not in use) is clogged.</td>
<td>Clean-out meter (page 107).</td>
</tr>
<tr>
<td></td>
<td>Fan speed too low</td>
<td>Check pulses-per-rev setting for fan in seed monitor (page 152). Increase fan speed to recommended range (page 82).</td>
</tr>
<tr>
<td></td>
<td>Fan running backward</td>
<td>Reverse fan circuit hoses at hitch.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Problem</th>
<th>Causes</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No material flow</strong> (multiple rows)</td>
<td>Primary seed hose blocked</td>
<td>Check seed hoses for kinks, congealed materials at low spots, nests and pests.</td>
</tr>
<tr>
<td></td>
<td>Tower inlet or turret blocked</td>
<td></td>
</tr>
<tr>
<td><strong>No material flow</strong> (one or two rows)</td>
<td>Seed tube blocked at row</td>
<td>Inspect and clear seed tube.</td>
</tr>
<tr>
<td></td>
<td>Tower port blocked for affected row</td>
<td>Disassemble distribution ring and clear blockage.</td>
</tr>
<tr>
<td></td>
<td>False alarm - seed tube sensor disconnected or failed</td>
<td>Run monitor self-test. Swap sensor with a working row to verify failure. Replace sensor.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Problem</th>
<th>Causes</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Material is flowing, but is not detected by seed monitor</strong></td>
<td>This is normal during the first few meters/feet of planting, as it takes some time for material to reach rows.</td>
<td>Lower openers 3m/10ft before planting is to begin. Monitor does not check for blockage during first 5 seconds.</td>
</tr>
<tr>
<td></td>
<td>Lift switch mis-adjusted, failed or mis-wired.</td>
<td>Check, adjust or replace switch (page 83).</td>
</tr>
<tr>
<td></td>
<td>Seed monitor disconnected at hitch</td>
<td>Connect seed monitor.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Problem</th>
<th>Causes</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Planting too little</strong> (some rows)</td>
<td>Partial blockage in meter chamber, seed hoses, towers, seed tubes</td>
<td>Treat as blockage. See &quot;No material flow (multiple rows)&quot; on page 99 and &quot;No material flow (one or two rows)&quot; on page 99.</td>
</tr>
<tr>
<td>Problem</td>
<td>Causes</td>
<td>Solutions</td>
</tr>
<tr>
<td>-------------------------</td>
<td>------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Planting too little</td>
<td>Incorrect seed rate, meter flutes, rate range or gearbox setting.</td>
<td>Check seed rate information beginning on page 71.</td>
</tr>
<tr>
<td>(all rows)</td>
<td>Excessive field speed. Excessive field speed: chart rates were developed at 10.5 kph (6.5 mph)</td>
<td>Reduce field speed.</td>
</tr>
<tr>
<td></td>
<td>Air system leaks retarding material flow above meters</td>
<td>Check hopper lids, meter seals, manifold caps and seed hose connections. Adjust latch and/or replace seals as needed.</td>
</tr>
<tr>
<td></td>
<td>Seed size and weight or fertilizer density and granularity vary from chart</td>
<td>Calibrate. Adjust rate to compensate.</td>
</tr>
<tr>
<td></td>
<td>Seed or fertilizer density and granularity may vary from season to season, batch to batch and between different suppliers.</td>
<td>Re-calibrate if materials might have changed since last calibration.</td>
</tr>
<tr>
<td></td>
<td>Low material level in hopper</td>
<td>Re-fill hopper.</td>
</tr>
<tr>
<td></td>
<td>Undersize contact drive tire, or low air pressure in contact or front transport tires, can decrease rates.</td>
<td>Correct tire size and air pressure, page 144.</td>
</tr>
<tr>
<td></td>
<td>Contact tire slipping. If due to moisture, conditions may be too wet to plant.</td>
<td>Check tire sizes, condition and inflation. Replace incorrect tires and worn tires. Inflate low tires.</td>
</tr>
<tr>
<td></td>
<td>Fan speed too low</td>
<td>Increase fan speed (page 82).</td>
</tr>
<tr>
<td></td>
<td>Fan won’t run fast enough</td>
<td>Tractor must be able to supply 18 gallons/minute at 200 psi.</td>
</tr>
<tr>
<td></td>
<td>Fan won’t run fast enough</td>
<td>Check that hydraulic fan check valve is not installed backward.</td>
</tr>
<tr>
<td></td>
<td>Actual field size is different.</td>
<td>Verify field size.</td>
</tr>
<tr>
<td></td>
<td>Excessive bout/pass gaps. Irregular shaped field.</td>
<td>Adjust marker, page 162.</td>
</tr>
<tr>
<td></td>
<td>Build-up of treatment or debris in seed meter.</td>
<td>Clean out seed meter, page 107.</td>
</tr>
<tr>
<td></td>
<td>Plugged opener seed tube.</td>
<td>Lift drill, expose bottom of seed tube and clean out.</td>
</tr>
<tr>
<td></td>
<td>Thrown or worn drive chains skipping.</td>
<td>Check drive chains, sprockets and idlers.</td>
</tr>
<tr>
<td></td>
<td>Meter sprocket damaged</td>
<td>Replace worn or damaged “stars” on meter shaft</td>
</tr>
<tr>
<td>Planting too much</td>
<td>Incorrect seed rate, meter flutes, rate range or gearbox setting.</td>
<td>Check seed rate information beginning on page 71.</td>
</tr>
<tr>
<td>(all rows)</td>
<td>Seed size and weight or fertilizer density and granularity vary from chart</td>
<td>Calibrate. Adjust rate to compensate.</td>
</tr>
<tr>
<td></td>
<td>Seed or fertilizer density and granularity may vary from season to season, batch to batch and between different suppliers.</td>
<td>Re-calibrate if materials might have changed since last calibration (page 77).</td>
</tr>
<tr>
<td></td>
<td>Actual field size is different.</td>
<td>Verify field size.</td>
</tr>
<tr>
<td></td>
<td>Excessive bout/pass overlap. Irregular shaped field.</td>
<td>Adjust marker, page 162.</td>
</tr>
<tr>
<td></td>
<td>Oversize contact drive tire, or excess air pressure, can increase rates.</td>
<td>Use correct tire size and air pressure, page 144.</td>
</tr>
<tr>
<td>Problem</td>
<td>Causes</td>
<td>Solutions</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-------------------------------------------------</td>
<td>----------------------------------------------------</td>
</tr>
<tr>
<td>Planting too much (some rows)</td>
<td>Dividers damaged or missing in towers.</td>
<td>Disassemble tower turrets. Replaced damaged or worn parts.</td>
</tr>
<tr>
<td></td>
<td>Worn/damaged flute “stars” in meter.</td>
<td>Inspect empty meter from above. Remove meter from below and repair.</td>
</tr>
<tr>
<td>Uneven seed depth</td>
<td>Excessive field speed</td>
<td>Slow down. Check Seeding Rate Chart for correct maximum field speed.</td>
</tr>
<tr>
<td>see also “Down-Pressure Adjustment Indications” on page 86</td>
<td>Air drill not level</td>
<td>Check leveling instructions, page 127.</td>
</tr>
<tr>
<td></td>
<td>Planting conditions too wet</td>
<td>Wait until drier weather.</td>
</tr>
<tr>
<td>Uneven seed spacing</td>
<td>Excessive field speed</td>
<td>Reduce field speed.</td>
</tr>
<tr>
<td></td>
<td>Drill not level</td>
<td>Check level (page 127), down-pressure (page 84) and weight transfer (page 90).</td>
</tr>
<tr>
<td></td>
<td>Planting conditions too wet</td>
<td>Wait until drier weather.</td>
</tr>
<tr>
<td></td>
<td>Seed-Lok building up with dirt</td>
<td>Lock up Seed-Lok, page 96.</td>
</tr>
<tr>
<td></td>
<td>Damaged or missing seed flaps.</td>
<td>Replace seed flaps.</td>
</tr>
<tr>
<td></td>
<td>Partially plugged opener seed tube.</td>
<td>Expose bottom of seed tube and clean out.</td>
</tr>
<tr>
<td>Opener disks not turning freely</td>
<td>Opener plugged with dirt.</td>
<td>Clean opener.</td>
</tr>
<tr>
<td></td>
<td>Planting conditions too wet</td>
<td>Wait until drier weather.</td>
</tr>
<tr>
<td></td>
<td>Seed-Lok is plugging opener.</td>
<td>Lock up Seed-Lok, page 96.</td>
</tr>
<tr>
<td></td>
<td>Failed disk bearings.</td>
<td>Replace disk bearings.</td>
</tr>
<tr>
<td></td>
<td>Bent or twisted opener frame.</td>
<td>Replace opener frame.</td>
</tr>
<tr>
<td></td>
<td>Partially plugged opener seed tube.</td>
<td>Lift up drill, expose bottom of seed tube and clean out.</td>
</tr>
<tr>
<td>Hectares or acres planted not correctly reported</td>
<td>Incorrect tire size or air pressure.</td>
<td>Correct tire size or air pressure, page 144.</td>
</tr>
<tr>
<td>Area tally is most accurate when seeding back and forth with markers with few headlands and curves.</td>
<td>Excessive overlap or gaps between passes.</td>
<td>Avoid overlap or gaps. Adjust marker.</td>
</tr>
<tr>
<td></td>
<td>Soil conditions.</td>
<td>Loose soil and slippage will cause variations in acres registered.</td>
</tr>
<tr>
<td></td>
<td>Actual field size different.</td>
<td>Verify field size.</td>
</tr>
<tr>
<td>Press wheels not compacting the soil as desired</td>
<td>Too wet or cloudy.</td>
<td>Wait until drier weather or rework ground.</td>
</tr>
<tr>
<td></td>
<td>Not enough hydraulic down pressure, and row unit is not level.</td>
<td>Increase hydraulic down pressure, see instructions beginning on page 84.</td>
</tr>
<tr>
<td>Excessive seed cracking</td>
<td>Excessive field speed</td>
<td>Reduce field speed.</td>
</tr>
<tr>
<td></td>
<td>Unclean seed.</td>
<td>Use clean seed.</td>
</tr>
<tr>
<td></td>
<td>Damaged, old or dry seed.</td>
<td>Use clean, new seed.</td>
</tr>
<tr>
<td></td>
<td>Fan speed too high</td>
<td>Use only enough speed for accurate delivery to all rows.</td>
</tr>
<tr>
<td>Press wheel or openers plugging</td>
<td>Planting conditions too wet.</td>
<td>Wait until drier weather.</td>
</tr>
<tr>
<td></td>
<td>Too much hydraulic pressure on openers.</td>
<td>Reduce hydraulic down pressure on openers.</td>
</tr>
<tr>
<td></td>
<td>Backed up with drill in the ground.</td>
<td>Clean out and check for damage.</td>
</tr>
<tr>
<td></td>
<td>Failed disk bearings.</td>
<td>Replace disk bearings.</td>
</tr>
<tr>
<td></td>
<td>Disk blades worn.</td>
<td>Replace disk blades.</td>
</tr>
<tr>
<td></td>
<td>Scraper worn or damaged.</td>
<td>Replace scraper.</td>
</tr>
<tr>
<td>Openers drill too deep (Bulldozing)</td>
<td>Too much hydraulic down pressure on openers.</td>
<td>Reduce hydraulic down pressure on openers.</td>
</tr>
<tr>
<td>Problem</td>
<td>Causes</td>
<td>Solutions</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Front of openers dropping too low in hard or minimum-till conditions</td>
<td>Incorrect opener frame setting.</td>
<td>Remove shims, page 89.</td>
</tr>
<tr>
<td></td>
<td>Too much hydraulic down pressure on openers.</td>
<td>Reduce hydraulic down pressure on openers.</td>
</tr>
<tr>
<td>Opener frames do not float over uneven terrain</td>
<td>Hydraulic lever not locked forward.</td>
<td>Lock hydraulic lever forward.</td>
</tr>
<tr>
<td></td>
<td>Openers not connected to circuit designed for hydraulic motor control.</td>
<td>Refer to page 19.</td>
</tr>
<tr>
<td>Pressure gauges read zero when openers are lowered and tractor hydraulic lever is held forward</td>
<td>Hydraulic hoses not routed correctly between pressure control valves and opener lift cylinders.</td>
<td>See hose routing diagrams beginning on page 156.</td>
</tr>
<tr>
<td>Pressure gauges show pressure when openers are raised</td>
<td>Hydraulic hoses not routed correctly between pressure control valves and opener lift cylinders.</td>
<td>See hose routing diagrams beginning on page 156.</td>
</tr>
<tr>
<td>Hydraulic marker functioning improperly</td>
<td>Air or oil leaks in hose fittings or connections.</td>
<td>Check all hose fittings and connections for air or oil leaks.</td>
</tr>
<tr>
<td></td>
<td>Low tractor hydraulic oil level.</td>
<td>Check tractor hydraulic oil level.</td>
</tr>
<tr>
<td></td>
<td>Loose or missing bolts or fasteners.</td>
<td>Check all bolts and fasteners.</td>
</tr>
<tr>
<td></td>
<td>Chain length incorrect</td>
<td></td>
</tr>
<tr>
<td>Marker disk does not mark</td>
<td>Marker folding linkage does not have enough slack to allow marker disk to drop into field depressions.</td>
<td>Maximum down float should be limited by the slot at the rod end of marker cylinder.</td>
</tr>
<tr>
<td></td>
<td>Disk orientation not ideal for conditions</td>
<td>Reverse marker disk to pull or throw dirt.</td>
</tr>
<tr>
<td>Chain Skipping or Excess Wear</td>
<td>Debris/no retainer clip</td>
<td>Be sure retainer clip is facing in opposite direction of chain travel (page 106).</td>
</tr>
<tr>
<td></td>
<td>Excess slack</td>
<td>Adjust chain slack (page 106)</td>
</tr>
<tr>
<td></td>
<td>Sprockets not aligned</td>
<td>Adjust sprockets on shafts.</td>
</tr>
</tbody>
</table>
## Brake Troubleshooting (Option)

<table>
<thead>
<tr>
<th>Problem</th>
<th>Causes</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoke or odd burning odor from axle area</td>
<td>Overheated brakes, typically on long steep hills</td>
<td>Stop immediately. Wait for brakes to cool completely. Moderate downhill speed by using lower gear and frequent full stops. Check brake components for heat distortion.</td>
</tr>
<tr>
<td></td>
<td>New brakes may exhibit slight smoking or odors until linings seat on drums.</td>
<td>Check brakes if problem persists, or braking action is insufficient.</td>
</tr>
<tr>
<td>Braking insufficient, one wheel</td>
<td>Tire under-inflated.</td>
<td>Inflate all tires to specification.</td>
</tr>
<tr>
<td></td>
<td>Worn brake linings and/or drum</td>
<td>Service brakes.</td>
</tr>
<tr>
<td></td>
<td>Worn or leaking brake cylinder</td>
<td>Rebuild or replace cylinder.</td>
</tr>
<tr>
<td></td>
<td>Grease or oil on linings</td>
<td>Correct problem causing contamination. Service brakes.</td>
</tr>
<tr>
<td></td>
<td>Brake adjuster not adjusting</td>
<td>Ice or dried mud can freeze mechanism.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check for damage seizing movement. Check for worn and inoperative pawl, or weak/damaged/missing pawl spring.</td>
</tr>
<tr>
<td>Braking insufficient, all wheels</td>
<td>Air in drill brake lines</td>
<td>Check for loose fittings. Check for damaged fittings and lines. Check for damage or worn operating components. Correct source of leak. Recharge and bleed system.</td>
</tr>
<tr>
<td></td>
<td>Air/Hydraulic system: damaged diaphragm in booster chamber</td>
<td>Replace booster.</td>
</tr>
<tr>
<td></td>
<td>Air/Hydraulic system: leaks in air system</td>
<td>Repair leaks.</td>
</tr>
<tr>
<td></td>
<td>Air/Hydraulic system: clogged filters</td>
<td>Clean filters (page 119).</td>
</tr>
<tr>
<td></td>
<td>Air/Hydraulic system: valve open</td>
<td>Close dump valve (page 121).</td>
</tr>
<tr>
<td></td>
<td>Hydraulic/Hydraulic system: air in brake line from tractor</td>
<td>Close petcock (page 20).</td>
</tr>
<tr>
<td></td>
<td>Brake linings and/or drums worn</td>
<td>Service brakes.</td>
</tr>
<tr>
<td></td>
<td>Brake linings replaced with unapproved parts having inadequate friction rating</td>
<td>Replace shoes with approved parts.</td>
</tr>
<tr>
<td></td>
<td>Pressure supplied by tractor insufficient</td>
<td>80 psi / 55 kPa minimum for air system.</td>
</tr>
<tr>
<td>No braking, one wheel</td>
<td>Bleed port open</td>
<td>Close port. Re-charge and bleed system.</td>
</tr>
<tr>
<td></td>
<td>Brake lining worn or missing</td>
<td>Inspect and repair as needed.</td>
</tr>
<tr>
<td></td>
<td>Brake cylinder frozen</td>
<td>Inspect and repair as needed.</td>
</tr>
<tr>
<td></td>
<td>Brake parts broken or missing</td>
<td>Inspect and repair as needed.</td>
</tr>
<tr>
<td>No braking, all wheels</td>
<td>Rule out problems at brake assemblies</td>
<td>Check parking brake system. If doesn’t work either, the problem is likely in the hubs. If parking brakes do work, the problem is likely above the hubs.</td>
</tr>
<tr>
<td></td>
<td>Loss of fluid in drill brake lines</td>
<td>Check for fluid loss at all fittings and bleed ports. Close/repair, recharge and bleed.</td>
</tr>
<tr>
<td></td>
<td>Line(s) to tractor improperly connected</td>
<td>Check connections.</td>
</tr>
<tr>
<td></td>
<td>Trailer brake system disabled or malfunctioning in tractor</td>
<td>Check function with another trailer.</td>
</tr>
<tr>
<td></td>
<td>Tractor line pressure insufficient</td>
<td>Have dealer check pressure at port.</td>
</tr>
<tr>
<td>Problem</td>
<td>Causes</td>
<td>Solutions</td>
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<tr>
<td>---------------------------------</td>
<td>------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Drill pulling to one side</td>
<td>Parking brakes partially or fully engaged on that side</td>
<td>Release parking brakes on both sides prior to movement.</td>
</tr>
<tr>
<td></td>
<td>See &quot;Dragging brake&quot; topic.</td>
<td>Check &quot;wheel lockup&quot; causes before flat spots develop on tires.</td>
</tr>
<tr>
<td>Brakes always engaged, all wheels</td>
<td>Drill parking brakes on during movement</td>
<td>Release parking brakes prior to movement.</td>
</tr>
<tr>
<td></td>
<td>Over-extended adjuster</td>
<td>Reset adjuster pawls and allow system to self-adjust.</td>
</tr>
<tr>
<td></td>
<td>Air/Hydraulic system: Tractor air brake lines reversed, and Supply line is causing brakes to be always on</td>
<td>Reverse air line connections at hitch.</td>
</tr>
<tr>
<td></td>
<td>Hydraulic/Hydraulic system: Drill brake line connected to incorrect always-on remote</td>
<td>Connect drill brake line to correct remote.</td>
</tr>
<tr>
<td></td>
<td>Pressure supplied by tractor brake line is always too high (hydraulic), or too low (air brake)</td>
<td>Maximum allowed hydraulic pressure is: 150 bar / 2175 psi. Minimum required air pressure is: 550 kPa / 80 psi</td>
</tr>
<tr>
<td>Dragging brake</td>
<td>Over-extended adjuster</td>
<td>Reset adjuster. Inspect to discover why it overextended.</td>
</tr>
<tr>
<td></td>
<td>Debris in brakes</td>
<td>Remove brake shoes. Clean and dry.</td>
</tr>
<tr>
<td></td>
<td>Distorted brake parts scraping</td>
<td>Replace damaged parts.</td>
</tr>
<tr>
<td></td>
<td>Weak return spring</td>
<td>Replace all springs.</td>
</tr>
<tr>
<td></td>
<td>Piston seized in brake cylinder</td>
<td>Rebuild or replace cylinder.</td>
</tr>
<tr>
<td></td>
<td>Ice in parking brake lines</td>
<td>Warm and release lines. Check lines for damage. Avoid cold weather movements until cables are replaced.</td>
</tr>
<tr>
<td>Brakes grab, chatter or rattle</td>
<td>Weak return springs</td>
<td>Replace all springs.</td>
</tr>
<tr>
<td></td>
<td>Drum worn, distorted or out of round</td>
<td>Re-surface drum if run-out is within specification, otherwise replace.</td>
</tr>
<tr>
<td></td>
<td>Under-inflated or undersize tire in pair</td>
<td>Replace tire if inflation to specification does not solve unequal contact problem.</td>
</tr>
<tr>
<td></td>
<td>Loose, worn, damaged or missing brake components in hub</td>
<td>Inspect brakes.</td>
</tr>
<tr>
<td></td>
<td>Loose or worn wheel bearings</td>
<td>Replace bearings.</td>
</tr>
<tr>
<td>Flat spots on tires</td>
<td>See “Brakes always engaged, all wheels”</td>
<td></td>
</tr>
<tr>
<td>Squealing from brakes</td>
<td>Worn brake linings</td>
<td>Check brakes. Replace worn linings (page 121).</td>
</tr>
<tr>
<td></td>
<td>Distorted brake parts scraping</td>
<td>Check brakes. Replace damaged parts.</td>
</tr>
</tbody>
</table>
Maintenance and Lubrication

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

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

**WARNING**

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

This implement does not have lift locks for the wings when unfolded and tilted down. Use stands or blocks under wing tool bars.

**WARNING**

**High Pressure Fluid Hazard:**
Escaping fluid under pressure can have sufficient pressure to penetrate the skin. Check all hydraulic lines and fittings before applying pressure. Fluid escaping from a very small hole can be almost invisible. Use paper or cardboard, not body parts, and wear heavy gloves to check for suspected leaks. If injured, seek immediate medical attention from a health care provider 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 132.
3. Adjust idlers to remove excess slack from chains. Clean and use chain lube on all roller chains as needed.
4. Check for air leaks at lids, doors, seals, caps and hose connections.
5. Inflate tires as specified on “Tire Inflation Chart” on page 144.
Chain Maintenance

Initially check the drive chains after the first 10 hours of drill use. The slack of new chains tends to increase during the first few hours of operation due to seating. Thereafter, check the chains every 100 hours.

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

Chain Slack

Refer to Figure 109, which, for clarity, greatly exaggerates slack, and omits the idlers.

1. Measure the span 1 for allowable slack:
   Locate the longest span of each chain (usually the span which does not run through the idlers).

2. Determine the ideal slack:
   - Long chains (over 91cm/36in): 2.1cm/m ($\frac{1}{4}$in per ft)
   - Vertical short chains: 2.1cm/m ($\frac{1}{4}$in per foot)
   - Horizontal short chains: 4.2cm/m ($\frac{1}{2}$in per foot).

3. Measure the current slack 2:
   Acting at a right angle to the chain span at the center of the span, deflect the chain in both directions. The slack is the distance of the movement.

4. Adjust the idlers for ideal slack.

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

Refer to Figure 110 (arrow shows chain direction)
Install clip with open end facing away from direction of chain travel (shown by gray or striped arrows in chain routing diagrams).
Material Clean-Outs

For normal unloading of residual materials at completion of planting, see “Unloading Materials” on page 64.

The present section covers completely cleaning out hopper and air system, when residues need to be minimized.

1. Perform normal material unloading (page 64), then fold the drill in preparation for a move to a site suitable for wash-out. If cleaning out both hoppers, plan to clean out the rear hopper first.

2. Reposition drill to a suitable site with rinse water and hose available. This may be two different sites if each hopper contained different materials.

If no otherwise suitable location is available, perform a fertilizer or treated seed clean-out on an up-hill portion of the field last treated.

3. Leave the tractor hitched, in Park with parking brake set. If tractor cannot be left hitched, block drill tires or set optional parking brakes. Leave the drill folded for transport in either case, as the openers must be raised for cranking, and access to the meters is easier when folded.

4. Lower ladder (page 44). Remove strainer (page 46). Clean strainer. While strainer is removed, inspect hopper for signs of problems that may prevent normal clean-out, such as objects or congealed masses too large to exit through meter (see “Problem Clean-Outs” on page 108).

5. Install the calibration crank. Open both calibration and clean-out doors on the meter of the hopper to be cleaned out.

6. Power wash the interior of the hopper while a second person cranks the meters (page 56).

7. Re-install strainer. Close lid tight and secure handle.

8. After cleaning out the last hopper, close all doors. Run air system for 10 minutes to blow moisture out of meters and lines.

9. Open both front hopper meter doors. Run air for 5 minutes.

10. Leave front meter doors open. Open rear hopper meter doors. Run air for 5 minutes.

11. Shut off air. Clean door seals and meter box faces.

12. Close meter doors. Move drill to parking or storage site.

13. Follow normal Parking (page 68) or Storage (page 69) instructions.

Review Regulations and Policies:
The steps at left apply when there are no specific clean-up requirements provided by national, regional or local regulation, nor by the seed and/or fertilizer supplier. Review any legal requirements, instructions on the material containers, and any Material Safety Data Sheets. Give priority to regulations and supplier instructions. Modify the instructions here as needed to comply.

Confined Space Hazard:
Do not enter hopper. Do not remove strainer (step 4) until ready to clean strainer and wash-out hopper. Do not leave strainer out after wash-out. Return the strainer to the hopper and secure the hopper lid if the drill must be left unattended at any time prior to step 7.
Problem Clean-Outs

For normal unloading of residual materials at completion of planting, see “Unloading Materials” on page 64. For normal clean-out of residue, see “Material Clean-Outs” on page 107.

If, however, parking and storage recommendations have not been followed, it is possible to have hard-to-remove material present.

If the material fails to pass through the clean-out door, take the following steps to remove it. Do not consider entering the hopper until first completing these tasks.

Open the clean-out door.

Remove the strainer and evaluate the problem.

For example:

- If the problem is a single moveable large object, such as a dead animal, fishing out from above may be the solution.
- If the problem is congealed materials, scoop out a sample from above and see if the mass dissolves in water. If so, and there is a small amount of the material involved, rinsing, or rinsing and pumping the hopper from above may be the solution.

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

If poking doesn't produce satisfactory results, and you intend to try wash-out, at least poke one hole down to the meter clean-out, so that water can flow out.

If wash-out is contemplated, start by introducing a small amount of water, and make sure that it appears at the clean-out within 15 minutes. If not, you will just be adding water to the problem. The hopper is not designed to hold water at full capacity. Add no more water, remove meter box instead, and clean out from below.

Removing Meter Box

Removing the meter box exposes 18x18cm (7x7in) holes through which stubborn material may be extracted.

Refer to Figure 111

1. Not shown: Loosen the gearbox-to-meter chain idler and remove the chain. Disconnect inlet and outlet hoses. Disconnect or remove the seed rate sensor.

2. Loosen all the nuts  securing the meter box  to the hopper bottom plate. Unscrew the nuts to the bolt ends, but do not completely remove the nuts.

3. The meter box has a bead of silicone sealant between it and the bottom plate. Use a pry tool to free the meter box from the bottom plate.

4. Once hanging entirely on the loose bolts, remove the nuts and lower the meter box from the hopper.

When re-mounting the meter box, scrape off the old silicone sealant and replace it with fresh sealant.

![Figure 111](image-url)
Hopper Entry

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

▲ A hopper that is full or merely appears full can be an entrapment hazard. You can sink entirely into the grain, or into a void, and suffocate in a matter of seconds. Grain bridges and crusts are especially dangerous.

▲ You can be overcome by hazardous fumes very quickly even in an empty hopper with the lid open.

▲ A partially full hopper, even with no bridging present, is a suffocation risk.

Oxygen levels may be insufficient and/or dust levels may be too high for breathing.

▲ Do not enter a hopper for loading material.

▲ Do not enter a hopper for unloading material.

▲ Do not enter a hopper for routine cleaning.

▲ Do not enter a hopper for any meter maintenance.

▲ Never enter a hopper without at least one trained and equipped attendant present.

▲ Never enter a hopper for any reason unless you fully comply with applicable laws, regulations, rules, agreements, and the instructions in this section. Where applicable laws, regulations, rules, agreements contradict an instruction below, do not follow that instruction.

Depending on their use, the NTA907HD and NTA3007HD material hoppers may be or become “permit-required confined spaces” under U.S. OSHA regulations (29 CFR 1910.146) and similar regulations, statutes, insurance agreements and local business policy. A written policy and permitting process may be required for any hopper entry.

Hopper entry may be necessary in some unusual circumstances, such as:

- hopper level or pressure sensor replacement; or,
- removal of obstructions too difficult to pull out with the meter box removed and not susceptible to fishing or pumping out from the open lid.

Should such a situation arise, observe the following precautions:

1. **Evaluate the hazards**
   Review the material safety data sheets (MSDS) for any treatments and/or fertilizers used in the hopper since it was last thoroughly cleaned, and the most recent materials even if the hopper was subsequently cleaned. Retain the MSDS information for any medical treatment that might be required.

2. **Designate or engage a team**
   Hopper entry is never a single-person activity. At least one attendant/observer is necessary. Give priority to individuals already trained in confined space operations. Designate a leader (who will not be the entrant) with authority to terminate the activity.
3. **Protect the team**  
Obtain the necessary safety equipment specified for confined space exposure to those materials, paying particular attention to harness/line, respiratory support and protection. This may include contaminant detection equipment and positive ventilation to refresh air in the hopper.

4. **Equip the team**  
At least one attendant must be equipped with communications capability, to summon outside aid in the event that the hopper worker is overcome. Equip the entrant with a safety harness and safety line.

5. **Train the team**  
Review the hazards. Review the procedures. Understand the use of the protective equipment. Know the steps to take in emergencies. Practice them. Train the observer to summon aid, and not attempt hopper entry if the entrant is overcome.

6. **Secure the drill**  
Block the drill wheels to prevent movement.

7. **Disrupt crusting or bridging**  
From outside the hopper, break up any hard surfacing on top of the material, or forming layers within the material. Such layers are extremely dangerous to stand on.

8. **Empty the hopper**  
Follow the steps at “Unloading Materials” on page 64. If a blockage makes this impossible, use an external pump line to remove as much material as possible without performing a hopper entry. Pump until at least some material is exiting the clean-out door. Leave the clean-out door open.

9. **Clean the hopper**  
From the outside at the walkboard, power-wash the inside of the hopper. Use a mild detergent sprayer. Rinse thoroughly.

10. **Air the hopper**  
Leave the hopper lid and clean-out door open, and do not commence work until the rinse water has completely evaporated.

11. **Plan the work. Work the plan.**  
Postpone the work if any team members, equipment or other resources are missing, or weather/lighting conditions are not favorable. Terminate and evacuate if any unexpected situations arise.
Hydraulic Maintenance

To function properly, the systems must be free of contaminants, free of air and fully charged with oil.

Hydraulic Maintenance Safety Information

⚠️ WARNING

High Pressure Fluid Hazard:
Do not loosen (“crack”) fittings with circuit engaged. With circuit in Neutral or Float, crack hydraulic lines carefully. There may still be pressure in lines even with the circuit in Float or Neutral. Wear gloves and eye protection. Crack fittings slowly. Supply fluid slowly. When circuit is energized, watch for fluid emergence at a safe distance.

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.

⚠️ CAUTION

Two or More Persons Required:
Bleeding is not a single-person operation. Establish a signalling protocol between the tractor cab operator and the observer at the bleed points. Establish an emergency stop signal. Determine the safest stop mode for each bleed. Where components cannot move down suddenly, setting the circuit to Float can relieve pressure in lines (depending on valve settings). Where components represent a crush or shear hazard, set circuit to Neutral.

Bleeding Hydraulics

If hydraulics have not been bled, they will operate with jerky, uneven motions and could cause wings, openers and markers to drop rapidly during unhook, tilt, fold or lower. If hydraulics were not bled during initial implement setup or if you replace a part in hydraulic system during the life of the drill, complete the bleeding procedures in the next few pages.

See also “Marker Hydraulic Bleeding” on page 130. The fan/auger circuit does not require bleeding.

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

 اذا System capacity for entire drill is about 38 liters (10 U.S. gallons).

NOTICE

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

This bleed is most conveniently performed with the drill fully folded into transport configuration.

If bled while tilted up, all four (4) transport locks must be in ROAD position, and pins must be engaged behind pivoting plates. See “Folding the Air Drill” on page 34.

1. Review safety advisories and operational advice on page 111, and on this page, before performing bleed.

Refer to Figure 112
2. Set transport locks to ROAD.
   Set FTM MASTER and Tilt switches on.
   Tilt wings up.
   Set circuit to Neutral.
3. Verify that transport locks have engaged.
   Set circuit to Float to relieve pressure in lines, and tension at cylinder rod ends.

Refer to Figure 113
4. Un-pin cylinder rod ends. Support rod ends so that they cannot strike drill parts, or ground, during extension.
5. Fully retract circuit.
   Set circuit to Neutral.
6. Carefully loosen JIC fittings @ cylinder rod ends.
7. Slowly retract circuit again, watching for fluid at each cracked fitting.
8. As fluid appears, set circuit to Neutral and secure fitting. Retract again. Repeat until all four rod ends are secured.
   Set circuit to Neutral.
10. Carefully loosen JIC fittings @ cylinder base ends.
11. Slowly extend circuit again, watching for fluid at each cracked fitting.
12. As fluid appears, set circuit to Neutral and secure fitting. Extend again. Repeat until all four rod ends are secured.
13. Use tractor circuit to re-position rod ends and re-pin.

Bleeding Fold Hydraulics

If the systems have sufficient fluid for safe operation, prior to bleeding, perform unfold (page 25), tilt down (page 28) and lower (page 32) operations.

1. Review safety advisories and operational advice on page 111, and on this page, before performing bleed.

Refer to Figure 114
2. With drill unfolded and monitor power on, leave MASTER and Wing Fold ON, and set hydraulic circuit to Float to relieve pressure in lines.

**Crushing Hazard:**
Wings must be fully tilted up, with transport locks engaged, before performing a tilt bleed using this method. Verify that lock pins are engaged behind pivoting arm weldments before setting circuit to Float.
Refer to Figure 115

3. Un-pin three cylinder rod ends. Orient cylinders so that rod ends may extend without striking drill parts.


5. Loosen the JIC fittings ③ at the base end of both fold cylinders, and at the base end of the tongue latch cylinder ⑤.

6. Slowly extend the circuit until fluid appears at a loosened fittings. Set circuit to Neutral and secure fittings. Repeat until all three fittings are secured.

7. Fully extend cylinders. Set circuit to Neutral.

8. Loosen the JIC fittings ④ at the rod end of both fold cylinders, and at the rod end of the tongue latch cylinder ⑥.

9. Slowly retract the circuit until fluid appears at a fitting. Set circuit to Neutral and secure fitting. Repeat until all three fittings are secured.

10. Use tractor circuit to re-position rod ends and re-pin.

Bleeding Hook Hydraulics

Drill must be at least partially unfolded for this bleed, so that wings are not supported on transport hooks.

1. Review safety advisories and operational advice on page 111, and on this page, before performing bleed.

Refer to Figure 116

2. Fully retract hook cylinder. Set hook circuit to Neutral. Loosen base end JIC fitting ⑧.

3. Slowly Extend circuit until fluid appears at cracked fitting. Set circuit to Neutral and secure fitting.


5. Slowly Extend circuit until fluid appears at cracked fitting. Set circuit to Neutral and secure fitting.
Bleeding Down-Pressure Hydraulics

If the systems have sufficient fluid for safe operation, prior to bleeding, perform unfold (page 25), tilt down (page 28) and lower (page 32) operations. Set circuit to Float.

1. Review safety advisories and operational advice on page 111, and on this page, before performing bleed.

Refer to Figure 117

2. Fully close bypass valve ® and Transfer valve ©. Fully open Wing ® and Center © transfer valves.

Refer to Figure 118

3. Un-pin six cylinder rod ends. Orient cylinders so that rod ends may extend without striking drill parts.


5. Loosen the JIC fittings ① at the base end of all down-pressure cylinders.

6. Slowly extend the circuit until fluid appears at a loosened fittings. Set circuit to Neutral and secure fittings. Repeat until all six fittings are secured.

7. Fully extend cylinders. Set circuit to Neutral.

8. Loosen the JIC fittings ② at the rod end of all down-pressure cylinders.

9. Slowly retract the circuit until fluid appears at a fitting. Set circuit to Neutral and secure fitting. Repeat until all six fittings are secured.

10. Use tractor circuit to re-position rod ends and re-pin.

11. If bleeding is complete, restore bypass, down-pressure and weight transfer valve settings per: “Opener Down-Force (Hydraulic)” on page 84.
Bleeding Weight-Transfer Hydraulics

If the systems have sufficient fluid for safe operation, prior to bleeding, perform unfold (page 25), tilt down (page 28) and lower (page 32) operations. Set circuit to Float.

1. Review safety advisories and operational advice on page 111, and on this page, before performing bleed.

Refer to Figure 119

2. Fully close bypass ®, Wing ® and Center ® transfer valves.
   Fully open Transfer valve ①

Refer to Figure 120

Hose lengths do not permit disconnecting base end of cylinder. Bleed in place.

3. Fully retract cylinders. Set circuit to Neutral.

4. Loosen the JIC fittings ③ at the base end of both weight-transfer cylinders.

5. Slowly extend the circuit until fluid appears at a loosened fittings. Set circuit to Neutral and secure fittings. Repeat until both fittings are secured.


7. Loosen the JIC fittings ④ at the rod end of both weight-transfer cylinders.

8. Slowly retract the circuit until fluid appears at a fitting. Set circuit to Neutral and secure fitting. Repeat until both fittings are secured.

9. If bleeding is complete, restore bypass, down-pressure and weight transfer valve settings per: “Opener Down-Force (Hydraulic)” on page 84.
In-Line Filter

If the raising or lowering times of the openers slow noticeably, check the in-line filter and clean if needed. The filter is located at the inlet port of the down-pressure valve block (page 84).

1. Unfold drill (page 25). Lower openers (page 32) as if for planting (down-pressure active).
2. Record the current bar or psi readings on the down-pressure and weight-transfer gauges.
3. Set lift circuit to Float.

4. Completely close the Center, Wing and Transfer valves to minimize fluid loss. The Bypass valve may be left as-is.
5. Shut down tractor and remove key.

Refer to Figure 121

6. Slowly loosen filter and relieve any residual pressure in line. When disconnecting hose, support the end to minimize fluid loss.
7. To disassemble unscrew end cap of filter. Remove top retaining washer and screen.
8. Clean filter screen with solvent and compressed air, or replace if needed.
9. When reassembling put screen into filter. Place retaining washer on top of filter and screw on end cap.
10. Re-install filter.
11. Activate the lift circuit for down-pressure. Cycle the lift system several times. Check for leaks.
12. Restore the Center, Wing and Transfer valves to their former settings.
13. Cycle the lift system several times. If there is any sign of air in the system, perform a bleed operation (page 114).
Brake Maintenance (Option)

Brakes are self-adjusting, but there are several maintenance items:

- page 117 - Brake Line Charge and Bleed
- page 119 - Air Brake Filter Cleaning
- page 119 - Brake Drum and Liner Maintenance

Brake Line Charge and Bleed

Prior to first use, and after replacing any components that carry brake fluid, and during periodic flushing of the brake system, the brake lines need to be bled.

1. Spot the drill on a level surface at a safe distance from any ignition sources (brake fluid is flammable). Unless conditions are dry and calm, use a sheltered area, to keep moisture and contaminants out of brake fluid. Leave the tractor hitched to provide braking action to systems.

2. Unfold the drill and block the drill tires to prevent movement. Do not set the drill's own parking brakes, as this restricts cylinder movement.

3. Put tractor in Park. Do not set tractor parking brake if it also operates trailer brakes.

Refer to Figure 122 (which depicts air brake system - reservoir for hydraulic brake system is similar)

4. Clean and dry top of master cylinder reservoir.

5. Remove cap and keep free of contaminants.

Drain Hydraulic Brake Lines

6. If draining brake system:

   A. Remove drain plug at rear of reservoir and empty reservoir. Re-secure plug.

   B. Start at an outside hub for the following steps.

   C. Connect recovery tubing to the bleeder valve above the brake line. Unscrew valve to open line.

   D. Operate tractor brakes to cycle drill system. Continue until no fluid flows at hub.

   E. Close valve, and repeat step C and step D for the other outside hub, then the inside hubs.

Refer to Figure 124 (which depicts air brake system - tee for hydraulic brake system is similar)

   F. Disconnect center port of brake line tee. Cycle brakes until no fluid flows. Re-secure tee.
Charge and Bleed System

Refer to Figure 125

7. Fill the reservoir ① with brake fluid, grade:
   - DOT3 / SAE J1703, or
   - DOT4 / SAE J1704 / FMVSS 116, or
   - DOT5.1

   System capacity: less than 1 liter

   **NOTICE**

   *Do not use brake fluid:
   DOT5 / SAE J1705*

   DOT5 and DOT5.1 are completely different fluids.
   DOT5.1 is compatible with the braking system.
   DOT5 is not.

   *If there is any chance of confusion in your shop, use DOT3 or DOT4.*


Refer to Figure 126

9. Unscrew bleeder valve ② above brake to open line.

10. Cycle brakes on tractor. Close valve near end of brake pedal stroke to prevent air from entering at valve. Check fluid level at reservoir. Top-off as needed to keep full.

11. When fluid appears at valve, close valve.

12. Repeat step 9 through step 11 for the other outside hub, then the inside hubs.

Refer to Figure 127

13. At brake line tee ③, loosen center port connection just enough to allow air to escape when system is pressurized, but not enough to allow air to enter.


15. Top off master cylinder reservoir.
Air Brake Maintenance

Reservoir Draining
Prior to storage, or daily in humid operations, drain water from the air brake reservoir tank ① to prevent rust inside the tank, and rust contamination of the brake valve system.
1. Set the drill hand brakes.
2. Hold the petcock ② open until no water flows. Close petcock.

Air Brake Filter Cleaning
Refer to Figure 129 and Figure 130
The air brake system includes filters ② on both the supply and service lines, to trap any debris introduced during connection and disconnection.

Clean filters seasonally; more often in dusty conditions.
1. Move the drill to a sheltered area, to prevent unfiltered dust from entering the opened air system.

**NOTICE**

*Do not remove the valve system to clean filters. Caps must be on bottom of filter when removed.*

2. Use a 33mm (1\(\frac{3}{32}\)in) open-end or adjustable wrench to loosen both red filter caps ③.

- There is generally insufficient clearance between the filters for a socket or box-end wrench.
3. Carefully remove the cap from one filter. Be ready to catch the filter screen ④ when it falls free.

**NOTICE**

*Handle the filter screen element very gently. Great Plains offers only complete replacement filters, and not screen elements.*

- The inside diameter of the screen is the inlet side. The screen is entirely welded stainless steel.
4. Using gentle compressed air, or a soft brush and compatible cleaning fluid, remove debris from the screen. Dry thoroughly.
5. The cap is a debris sump. Clean it with air, or water and mild detergent. Clean and inspect the O-ring ⑤. Dry the cap if wetted.
6. Center the filter screen on the cap. Carefully re-insert in filter body. Screw cap in, checking for misalignment or binding of filter element. Tighten cap gently with wrench.
7. Repeat step 3 through step 6 for the other filter.

Brake Drum and Liner Maintenance
Great Plains recommends having brakes serviced by trained and fully equipped brake technicians.
Non-Asbestos Fibers Hazard:
Most recently manufactured brake linings are asbestos-free. However, non-asbestos brake linings may contain one or more of a variety of ingredients, including glass fibers, mineral wool, aramid fibers, ceramic fibers and silica that can be health risks if inhaled.

Scientists disagree on the extent of the risks from exposure to these substances. Exposure to silica dust can cause silicosis, a non-cancerous lung disease. Silicosis gradually reduces lung capacity and efficiency and can result in serious breathing difficulty. Some scientists believe other types of non-asbestos fibers, when inhaled, can cause similar diseases of the lung. Silica dust and ceramic fiber dust are known to the State of California to cause lung cancer. U.S. and international agencies have also determined that dust from mineral wool, ceramic fibers and silica are potential causes of cancer.

For silica, OSHA has set a maximum allowable level of exposure of 0.1 mg/m$^3$, 8-hour time-weighted average. Some manufacturers of non-asbestos brake linings recommend that exposures to other ingredients be kept below 1.0 f/cc, 8-hour time-weighted average.

Scientists disagree, however, to what extent adherence to these maximum allowable exposure levels will eliminate the risk of disease that can result from inhaling non-asbestos dust.

The following procedures for servicing brakes are recommended to reduce exposure to non-asbestos fiber dust, a cancer and lung disease hazard. A Material Safety Data Sheet (MSDS) is available from Federal Mogul Friction Products, U.S. telephone (540) 662-3871. Request MSDS WNRE-05-155-4.

Use caution to avoid creating, breathing or ingesting dust when servicing brakes. Check for applicable laws, regulations and insurance/enterprise policies prior to commencing work.

Recommended Work Practices

Separate Work Area - Service brakes in an area where these precautions are always taken for all work. Wear clothes used only for brake work.

Respiratory Protection - Wear a respirator equipped with a high-efficiency (HEPA) filter approved by NIOSH or MSHA for brake work.

Wear respiratory protection at all times during brake servicing (including grinding or machining brake drums), beginning with the removal of the wheels, through shop cleanup after completion of brake work (including emptying vacuums, changing HEPA filters and rag disposal).

Procedures for Servicing Brakes

- Service the removed brake assembly in a negative pressure enclosure. The enclosure should be equipped with a HEPA vacuum and worker arm sleeves. With the enclosure in place, use the HEPA vacuum to loosen and vacuum residue from brake parts.

- Alternatively, use a catch basin with water and a biodegradable, non-phosphate, water-based detergent to wash the brake drum and other brake parts. Apply the solution with low pressure to prevent dust from becoming airborne. Allow the solution to flow between brake drum and brake support. Thoroughly wet the wheel hub and brake assembly components to control dust, prior to removal of brake shoes. Wipe parts clean with a cloth.

Dust Control - Use only HEPA-equipped vacuum cleaners. Never blow dust with an air gun. Do not dry brush parts.

Cleaning Fluids - NEVER use carcinogenic solvents, flammable solvents, or solvents that can damage brake components as wetting agents.

Work Area - Clean work areas with a HEPA-equipped vacuum cleaner or by damp wiping. NEVER use an ordinary shop vac, compressed air or dry sweepers.

When replacing a HEPA filter, wet the used filter with a fine water mist. Bag and carefully dispose of the used filter.

Hygiene - Wash hands immediately after brake work, and before eating, drinking or smoking. Clean clothes with a HEPA-equipped vacuum before removing them. Keep food and drink out of the work area.

Shower after work. Do not wear work clothes home. Use a vacuum equipped with a HEPA filter to vacuum work clothes after they are worn. Launder them separately.

Waste Disposal - Dispose of discarded linings, used rags, cloths and HEPA filters with care, such as in sealed and labeled plastic bags. Consult applicable EPA, national, regional and local regulations on waste disposal.

Regulatory Guidance - OSHA, NIOSH, MSHA, and EPA, are regulatory agencies in the United States. These references are to provide further guidance to employers and workers employed within the United States. Employers and workers employed outside of the United States should consult the regulations that apply to them for further guidance.
Brake Shoe Replacement

Check brakes for wear, contamination and damage seasonally or every 9600 km (6000 miles).

1. Prior to commencing work, review the safety information on page 119. Have necessary safety equipment and tools on hand. Make sure workers understand the hazards and how to avoid them.

2. Review the entire procedure. Great Plains suggests performing a complete operation on one wheel, or one pair of wheels, at a time, so that there are fully-assembled wheels to use as an assembly reference.

3. Spot the drill on a level surface. Unfold the drill.

4. Block the wing and rear drill tires to prevent movement. Do not set the drill’s own parking brakes, as the drums cannot be removed with the brakes set.

Refer to Figure 131

5. If left hitched, put the tractor transmission in Park, release tractor service and parking breaks, and disconnect the trailer brakes at the hitch. Set tractor parking brake only after trailer brake disconnection.

If unhitched, release air brakes by opening dump valve 1. Pull down on cap to release. Push up.

6. Jack up and support one or both drill transport axles.

7. Be wearing and using recommended safety equipment for the remainder of these procedures.

8. Spin the wheels, checking for evidence of excess run-out at the braking surface of the drums.

9. Remove wheels. If you have more than one wheel removed at a time, mark on them where they came from (L/R and inside/outside), as the tire tread pattern is directional.

Refer to Figure 132

10. Remove hub/drum assemblies:
    Remove the dust cap 2.
    Remove the spindle cotter pin 3.
    Remove the spindle nut 4.
    Remove the spindle washer 5.

11. Carefully pull hub and drum 6 assembly from spindle. Outer bearing 7 may fall loose.

12. Inspect inner seal 8, bearings, hub and drum for wear and damage - for drum, see “Brake Drum Maintenance” on page 125).

13. Keep inner and outer bearing components separated. They are different parts.
Refer to Figure 133

14. Inspect brake shoe \( \ominus \) origin. See Warning at right. Great Plains supplied shoes are stamped “AL-KO” on the web face and have bonded linings.

15. Clean brake dust from assembled parts, and from individual parts as removed.

16. Inspect brake linings \( \ominus \). Check for 1.6mm (\( \frac{1}{16} \)in) minimum thickness (exclude thickness of shoe pad), and absence of grease, contamination, deep scores, chipping, or excessive heat fractures. Hairline heat fissures are not unusual and do not require shoe replacement.

17. Inspect brake shoe retaining and operating hardware. Check for wear or damage to holes, pins and springs. Check for weak springs. Springs must completely retract shoes when brakes are released.

\( \square \) Sound practice is to replace springs when replacing brake shoes.

18. Check wheel cylinder for evidence of leaks. If no parts need replacing, skip to step 49. Refer to Figure 134

19. Remove self-adjuster cotter pins \( \circ \). Release self-adjuster pawl \( \odot \) and remove adjuster \( \ominus \).

20. As necessary, disassemble adjuster for cleaning. Inspect adjust pawl and rack for wear and damage. Great Plains recommends replacing the entire adjuster if any parts are worn or damaged.

21. Apply thin film of Lubriplate® 110 or similar to self-adjuster.

**NOTICE**

Do not allow any lubricants to come in contact with new brake linings.

22. Release upper spring \( \odot \) between shoes (was under self-adjuster), and release lower spring \( \odot \) between shoes.

23. Loosen nuts \( \odot \) on lower shoulder bolts. Push brake shoes outward at bottom (to allow removal of hand brake arms).

24. Disconnect hand brake line by uncoupling the brake arm link \( \odot \) at the clevis pin (not shown).

25. Release lower spring \( \odot \) between hand brake arms. If this spring differs from the shoe springs, set the parking brake spring aside.

26. Remove hand brake arm assembly \( \ominus \). Place spring \( \odot \) with it.
Refer to Figure 138

27. Remove five 1/2-13 nuts ① and lock washers ② behind dust shield.

28. Pull backing plate assembly ③ far enough out on spindle, away from dust cover ④, to allow access to nuts ⑤ on the two shoe hold down bolts ⑥.

If you prefer to perform a bench repair on the brakes, and wish to avoid opening the hydraulic system, remove the bolts holding the wheel cylinder. This allows complete removal of the backing plate.

29. Remove hold down cotter pins ⑦ and castellated nuts ⑧.

30. Remove spring washers ⑨.

Note the orientation of these washers. They must be re-installed in the same relationship to each other, and to the nut/washer, in order to provide correct spring force.

31. Remove large flat washer ⑩.

32. Remove hold down bolts ⑪ and brake shoes ⑫.

33. Inspect brake shoes. Check that web is flat and at a right angle to table. Check welds for cracks. Check operating holes for wear and peening. If any defect or damage is noted, replace shoes regardless of lining status.

34. Replace any shoes contaminated with oil.

35. If replacing one shoe set due to normal wear, Great Plains recommends replacing all shoes on the drill.

**WARNING**

**Braking Malfunction Hazard:**
Always replace brake shoes in pairs - both shoes on the same drum. Replacing only one shoe of each set can lead to reduced braking performance, or loss of braking, with the risk of an accident resulting in death, serious injury or property damage.

**Cannot Re-Line:**
Original and replacement brake shoes supplied or recommended by Great Plains have bonded linings. They cannot be re-lined. Replace entire shoes, in pairs.
Install New Brake Shoes

Refer to Figure 136

Brake shoe orientation is with square hold-down bolt hole ② on top, and "L"-shaped adjuster mount lugs ③ facing away from spindle.

36. Engage bottom web notch of shoe with backing plate pivot bolt ①. Apply a thin film of Lubriplate® 110 or similar to that part of the web which is near and under the plate held by the pivot bolts. Engage top web notch of shoe with cylinder rod clevis ④.

37. Loosely secure shoe to backing plate ⑤ with shoe hold down bolt ⑥, large flat washer ⑦, two spring washers ⑧, and castellated nut ⑨. Do not install the cotter pin at this time.

The spring washers ⑧ are slightly cupped. Place them on the bolt with the concave (dished-in) sides facing each other "Φ".

38. Tighten the castle nuts ⑩ until the spring washers ⑧ are flattened. Back the nut off 1/6 turn, plus enough to align the bolt’s hole with notches in the nut. Secure castle nuts with cotter pin ⑪.

39. Insert five backing plate studs through dust cover ⑫ and spindle weldment. Secure with lock washers ⑬ and 1/2-13 nuts ⑭.

Re-Install Springs

Refer to Figure 137

40. With link arm ① toward front of drill, insert parking brake arm assembly ② from spindle side of backing plate, through lower slots in brake shoes.

41. Insert double-bend end of parking brake spring ③ in hole at rear end of parking brake arm. Hook single-bend end at small notch in forward arm.

42. At adjuster lugs ④ (top of shoes), insert the double-bend end of a brake shoe spring ⑤ through the hole closer to the shoe web. Hook the single-bend end through the matching hole on the other shoe.

43. Hook the double-bend end of the remaining spring ⑥ through a lower round hole ⑦ in a shoe web. Hook the single-bend end through the matching hole in the other shoe.

44. Place adjuster assembly ⑧ on adjuster lugs ④. The adjuster pawl ⑨ is up and to the right as you face the spindle. Secure with cotter pins ⑩.

45. Tighten pivot bolts ⑫ to 5/8-18 torque specification.

NOTICE

Leave self-adjuster relaxed. It self-adjusts at first use.
Brake Drum Maintenance

Refer to Figure 138

46. Inspect the shoe surface (the inside rim). Normal appearance is dull gray, with no more than light scoring and light wear.

One or two light score marks are not cause for resurfacing or replacement. If there are any questions concerning the condition of a drum, consult an expert.

Replace or resurface a drum that is heavily scored, worn to more than 0.51mm (0.020in) oversize, or has 0.38mm (0.015in) or greater run-out.

Brake Drum Resurfacing

47. A standard drum lathe is suitable for machining the shoe surface.

When removing surface, do not exceed the maximum diameter cast in the brake drum.

48. Be sure to remove any metallic chips and contamination resulting from drum machining.

Re-Mount Hub and Drum

Refer to Figure 139

49. Repack any bearings removed.

50. If replacing inner bearing seal ①, orient it with the seam side out (away from bearing). Seat the seal so that it is completely inside the narrow diameter of the hub, and close to, but not touching the bearing cup ②.

Seals are hollow metal structures and are somewhat fragile. They are not intended to be in contact with the bearings. When installing them, carefully align them so they are concentric with the shaft hole. Apply insertion force across the entire face, or at least equally along the entire outside diameter (as close to the seal O.D. as possible).

51. Carefully place drum/hub assembly ③ on spindle.

52. Insert re-packed outer bearing ④.

53. Add spindle washer ⑤ and castle nut ⑥.

54. Tighten nut until drum/hub does not turn freely. Loosen nut 1/6 turn, and as much looser as needed to align hole in spindle (not shown) with notches in nut.

55. Secure nut with cotter pin ⑦. Install dust cap ⑧.

WARNING

Heavily scored, worn or oversized drums can reduce brake performance or cause loss of braking. This could result in death, serious personal injury, or property damage.

Failure to remove chips can cause bearing failure, brake failure or wheel/spindle separation. This could result in death, serious personal injury, or property damage.
Mounting Wheels

56. Position a wheel on the hub from which it was dismounted.
Refer to Figure 140

57. Start all lug nuts by hand. Choose a bolt stud to designate position #1.

58. Torque in stages, setting each lug nut to the specified torque in the order shown in the figure:
   Stage 1: 27-33 N-M (20-25 ft-lbs)
   Stage 2: 74-80 N-M (55-60 ft-lbs)
   Stage 3: 114-127 N-M (85-95 ft-lbs)

This staging and ordering of tightening is strongly recommended to ensure that the drum is not driven out-of-round.

59. Repeat step 57 and step 58 for each wheel.

Test and Adjust Brakes

While the drill axle is still elevated, test both the service and the parking brake systems.

60. Hitch a tractor equipped with trailer brake remotes. Connect the braking systems. Put the tractor in Park, but release any brakes that operate the trailer service brakes.

61. Have someone spin one brake-equipped drill wheel, and stand clear.

62. Slowly engage the tractor service brakes. If the wheel does not stop spinning, this may merely indicate that the self-adjusters have not yet seated. Cycle a second time.

63. Check for unusual noises and failure to brake. Check that the wheel spins freely with brakes released.

64. Spin another drill wheel. Stop it with the tractor brakes. Check braking action. The self-adjusters may already be seated for this and the remaining wheels.

65. Release all tractor braking that engages drill braking.

66. Spin the first wheel again. Engage the drill parking brake for that side. With fresh brake linings, it may be necessary to adjust the hand brake handle to achieve over-center brake-set detent with acceptable effort.

67. Spin and test brake the other wheel on that side.

68. Repeat step 66 and step 67 for the other side of the drill.

69. Check tire inflation, set parking brakes, and lower drill onto its own wheels.
Leveling Drill

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

Section Alignment

1. Move the drill to representative field conditions. Unfold and lower.
2. Set hitch height as described at “Heights and Leveling” on page 22.
3. Pull forward with rows in ground. Stop. Leave rows in ground.

Refer to Figure 143

4. Sight along the rear face of the rear opener tool bar. Measure the wing end position (dimension 1) relative to the center section (dimension 2).
5. If the wings are even with the center, or less than 25mm (1in) ahead, no adjustment is necessary.

Refer to Figure 141

6. Loosen wing fold stop bolt jam nuts ③, and fully seat stop bolts ④.

Refer to Figure 142

7. To adjust a wing lead, loosen the jam nut ③ at the pull bar for that side, and rotate the turnbuckle nut ⑥ to move the wing forward or back.

The effect of the turnbuckle is to move the wing tip by about 6mm (3/4in) per full turn.
8. Back out stop bolt ④ until it contacts wing. Secure with jam nut ③. Re-tighten jam nuts and align other side as needed.
Tool Bar Heights

Tool bar heights must be checked and adjusted in representative field conditions, with openers lowered to planting height, and pulled forward in the ground, as for section alignment checking above. New drills are shipped with the wing eye bolts not fully tightened. They must be set before first planting.

9. Check that rows are fully lowered, running level, and that center front and wing gauge wheels are not running light. Adjust down-pressure and weight transfer as needed (page 84).

If rows are not running level, adjust sub-frame shims as needed (page 89).

Refer to Figure 144 (shown with wings folded for clarity)

10. Check opener sub-frame tool bar height at the center section. Measure from the average soil surface level to the bottom of the rear opener tool bar.

The distance should be:
76.2cm (30in).

Refer to Figure 145

11. Check sub-frame tool bar height at the inside and outside ends of the wing rear tool bar. If either end differs from center height by more than about 6mm (¼in), adjust the eyebolt 1 above the parallel arms at that end.

12. To adjust an eyebolt:

Back the upper jam nut 2 up a few turns. Adjust the lower nut 3. The adjustment is about 2.8mm (0.11in) of opener height per turn of the adjuster nut.

Whether adjusted or not, secure the 1-8 jam nut to torque spec (page 153).

13. Check and set all four (4) wing ends and eyebolts.

14. Pull forward and re-check height.
Seed Flap Replacement
NTA907HD(s/n B1006C-)
NTA3007HD(s/n B1006D-)
Refer to Figure 146

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

If replacing with 817-349C:
Push new seed flap ① up through metal bracket ③ until tabs ② on seed flap snap in place.

If replacing with 816-302C:
See seed flap replacement instructions below.

Seed Flap Replacement
NTA907HD(s/n B1007C+)
NTA3007HD(s/n B1007D+)
Refer to Figure 147

To replace an 816-302C seed flap ④ use a needle nose pliers or similar tool to grasp “T” top of flap. Pull upward to pull flap up out of metal bracket ⑤.

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

Review “Marker Safety Information” on page 60 before performing maintenance on markers.

See also: “Marker Operation (Option)” on page 60, “Marker Adjustments” on page 97, and “Initial Marker Setup” on page 162.

Marker Shear Bolt

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

If the shear bolt breaks, replace it with an equivalent 7/16-14x2in Grade 5 bolt (Great Plains part 802-589C). If that size is not available in your local market, substitute an M10x1.5 Class 8.8 metric bolt and nut.

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

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

NOTICE

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

Marker Hydraulic Bleeding

1. Review warnings, bleeding notes and system information on page 111.

Refer to Figure 149

2. With markers unfolded in field position, crack hydraulic-hose JIC fittings at base 1 and rod ends 2 of each marker cylinder.

3. With tractor at idle speed, activate tractor hydraulic valve forward until oil appears at a fitting. When oil begins to seep out around a fitting, tighten that fitting. Reverse the tractor hydraulic valve until oil appears at opposite hose fitting. Tighten that fitting.

4. If you have dual markers, activate tractor hydraulic valve forward again until oil seeps out around a fitting on the other marker cylinder. Tighten that fitting. Reverse tractor hydraulic valve until oil seeps out around remaining hose fitting and tighten it.

5. Fold and unfold markers slowly to work out all air.

Use caution when folding and unfolding markers for the first time, checking for pinching and kinking of hoses.
Marker Chain Length

If marker fails to reach ground when unfolded, or is skipping field depressions, the chain is too short.

If marker drags across ground for more than 30cm (12in) before lifting, the chain length is too long.

Refer to Figure 150

1. Unfold marker.
2. Adjust/set Marker Extension (page 162) before adjusting chain length.
3. Remove take-up bolt 1.
4. Re-insert bolt to obtain an approximate chain length 2 160 cm (63 in)
   Tighten bolt.
5. Fold, unfold and re-fold marker to validate new chain length.
6. Thread bolt in (up) until head is flush with inside jam nut and both are flush with inside of channel.
7. Slowly fold marker while observing disk. If marker disk drags across ground more than 12in (30cm) before lifting, the chain is too long.

Marker Grease Seal

Refer to Figure 151

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

Caster Wheel Pivots

1 zerks per pivot; 2 total
Type of Lubrication: Grease
Quantity: Until grease emerges

Tongue Pivots

1 zerks per pivot; 2 total
Type of Lubrication: Grease
Quantity: Until grease emerges

Coulter Pivots (Option)
(Grease Bank)

3 grease banks, 1 pivot per coulter;
36, 48 or 60 total zerks
Type of Lubrication: Grease
Quantity: Until grease emerges
Grease banks serve only the pivots. Coulter hubs must be greased individually (page 138).
Marker(s) (Option)

3 zerks per marker; 3 or 6 total
Type of Lubrication: Grease
Quantity: Until grease emerges

Wing Flex Pivots

2 zerks each wing pivot; 4 zerks total
Type of Lubrication: Grease
Quantity: Until grease emerges at pivot ends

Wing Fold Pivots

2 zerks each wing pivot; 4 zerks total
Type of Lubrication: Grease
Quantity: Until grease emerges at pivot ends
Opener Wing Frame Tilt Pivots

2 zerks each arm set,
2 arm sets per section,
2 wings; 12 total zerks
Type of Lubrication: Grease
Quantity: Until grease emerges at pivot ends.

Opener Frame Parallel Arms

4 zerks each arm set,
2 arm sets per section,
3 sections; 24 total zerks
Type of Lubrication: Grease
Quantity: Until grease emerges at pivot ends.

Marker Hinges (Option)

1 zerk each end of inner section,
1 zerk at mid-outer hinge,
2 markers per drill; 6 total
Type of Lubrication: Grease
Quantity: Until grease emerges at pivot ends.
Tongue Lock Roller

1 zerk right end of pin.
Type of Lubrication: Grease
Quantity: Until grease emerges at in ends

Transport Hook Pivot

1 zerk inside each end of pivot tube; 2 total
Type of Lubrication: Grease
Quantity: Until grease emerges at ends

Transport Hook Rollers

1 zerk each roller; 2 total
Type of Lubrication: Grease
Quantity: Until grease emerges

Hopper Lid Pivot bar and Clamps

1 pivot and 1 clamp each of 2 lids; 4 sites total
Type of Lubrication: Spray
Quantity: Coat thoroughly
Meter Box Door Clamps

<table>
<thead>
<tr>
<th>50</th>
<th>2 clamps each of 4 doors; 8 total</th>
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<tbody>
<tr>
<td></td>
<td>Type of Lubrication: Spray</td>
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<tr>
<td></td>
<td>Quantity: Coat thoroughly</td>
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Auger Storage Clamps

<table>
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<td></td>
<td>Type of Lubrication: Spray</td>
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<td>Quantity: Coat thoroughly</td>
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Auger Swing Arm: Mount Pivot

<table>
<thead>
<tr>
<th>50</th>
<th>1 zerk</th>
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<td></td>
<td>Type of Lubrication: Grease</td>
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<td></td>
<td>Quantity: Until Grease emerges</td>
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Auger Swing Arm: Mid-Pivot

<table>
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<th>50</th>
<th>1 zerk</th>
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<td>Type of Lubrication: Grease</td>
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<td></td>
<td>Quantity: Until Grease emerges</td>
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</tbody>
</table>
Auger Swing Arm: Outer Pivot

1 zerk
Type of Lubrication: Grease
Quantity: Until Grease emerges

Auger Swing Arm: Tilt Pivot

1 zerk
Type of Lubrication: Grease
Quantity: Until Grease emerges

Ground Drive/Gearbox Input Chains

One chain each meter; 2 total
Type of Lubrication: Chain Lube
Quantity = Coat thoroughly
Lubricate chains any time there is a chance of moisture, and when being stored at the end of the planting season.
Gearbox Output/Meter Input Chains

One chain each meter; 2 total
Type of Lubrication: Chain Lube
Quantity = Coat thoroughly
Lubricate chains any time there is a chance of moisture, and when being stored at the end of the planting season.

Coulter Hubs (Option)

1 zerk per coulter; 48 or 66 total
Type of Lubrication: Grease
Quantity: Until grease emerges

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
Wheel Bearings, Main Transport Wheels

- Seasonal
- 2 bearings each wheel, 8 wheels; 16 total bearings
- Type of Lubrication: Grease
- Quantity: Re-pack

Wheel Bearings, Wing Gauge

- Seasonal
- 2 bearings each wheel, 2 wheels; 4 total
- Type of Lubrication: Grease
- Quantity: Re-pack
### High Rate Flute Sets

The standard NTA907/3007HD Drill meters have two fluted wheels ("stars") and two filler rings in each active meter compartment.

If your seeding rates need to be higher than those listed in the Seed Rate manual, these accessories replace the existing shaft assembly with one having more stars. See "Changing Meter Flutes" on page 164 for installation instructions.

Replacing the standard 2-star shafts with 3-star shafts increases the seeding rate by approximately 50% (150% of standard rate). Replacing standard 2-star shafts with 4-star shafts increases the seeding rate by approximately double (200% of standard rate).

The kit required depends on the number of stars desired. Order one kit per meter (two per drill if changing both meters).

<table>
<thead>
<tr>
<th>Stars per Outlet</th>
<th>Part Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Stars per outlet</td>
<td>168-401S</td>
</tr>
<tr>
<td>4 Stars per outlet</td>
<td>168-402S</td>
</tr>
</tbody>
</table>

### Markers

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

These dual markers mount on both sides, and include an automatic sequence valve for operating alternate sides on each bout/pass.

If ordered with a new NTA907/3007HD drill, markers are factory-installed. They may also be ordered later for field installation. Each kit equips one NTA907/3007HD drill.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>MARKER, NTA3007 &amp; NTA907</td>
<td>113-826A</td>
</tr>
</tbody>
</table>
Row Options

Frame-Mounted Coulters

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

Coulters include tubing and remote zerks for integration with the standard grease bank plates on the drill.

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.

<table>
<thead>
<tr>
<th>Coulter Kit</th>
<th>For NTA907HD and NTA3007HD-3610</th>
<th>-4875</th>
<th>-6006</th>
</tr>
</thead>
<tbody>
<tr>
<td>with Fluted Blade 43.2cm x 80mm (17\times \frac{5}{16}\text{in})</td>
<td>249-178A</td>
<td>249-175A</td>
<td>249-172A</td>
</tr>
<tr>
<td>with Wavy Blade 43.2cm x 190mm (17\times \frac{3}{4}\text{in})</td>
<td>249-179A</td>
<td>249-176A</td>
<td>249-173A</td>
</tr>
<tr>
<td>with Turbo Blade 43.2cm x 160mm (17\times \frac{5}{8}\text{in})</td>
<td>249-180A</td>
<td>249-177A</td>
<td>249-174A</td>
</tr>
</tbody>
</table>

See “Frame-Mounted Coulters (Option)” on page 91 for adjustments.

Coulter Tines

The coulters on your drill can be equipped with optional trash tines. The tines mount at every other row, and help guide the residue under the coulters and openers to prevent plugging.

Order one kit per drill.

<table>
<thead>
<tr>
<th>Row Spacing</th>
<th>Part Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>3N-30NT 7 1/2IN CLT TINE KIT</td>
<td>249-028A</td>
</tr>
<tr>
<td>3N-30NT 10IN CLT TINE KIT</td>
<td>249-029A</td>
</tr>
</tbody>
</table>

17in Coulter Blades

Part ordering number includes one blade.

<table>
<thead>
<tr>
<th>Blade</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>17x\frac{5}{16}\text{in Fluted Blade}</td>
<td>820-018C</td>
</tr>
<tr>
<td>17x\frac{3}{4}\text{in Wavy Blade}</td>
<td>820-082C</td>
</tr>
<tr>
<td>17x\frac{5}{8}\text{in Turbo Blade}</td>
<td>820-156C</td>
</tr>
</tbody>
</table>
Opener Disk Scraper

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

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>00HD Scraper Assembly (Order one per row)</td>
<td>122-015A</td>
</tr>
</tbody>
</table>

See “Scraper Installation” on page 165, and “Disk Scraper Adjustments” on page 95.

Seed Firmers

The standard NTA907/3007HD drill includes seed flaps. A choice of firmers is an option in the product bundles, or may be field-installed as kits. Only one type of seed firmer may be installed at the same time. Order one firmer kit per opener.

Seed-Lok® Seed Firmer

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Series Seed-Lok® kit</td>
<td>122-009K</td>
</tr>
</tbody>
</table>

For operations, see “Seed Firmer Adjustments” on page 96.

Keeton Seed Firmer

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keeton seed firmer (per opener)</td>
<td>890-902C</td>
</tr>
</tbody>
</table>

For operations, see “Seed Firmer Adjustments” on page 96.

Press Wheels

A variety of single and dual press wheels are available, as bundle options at the time of initial NTA907/3007HD drill order. Kits are not presently available to convert these in the field. Parts may be ordered to do so.
### Specifications and Capacities

#### NTA907HD Export Models

<table>
<thead>
<tr>
<th>Specifications</th>
<th>NTA907HD-3610</th>
<th>NTA907HD-4875</th>
<th>NTA907HD-6006</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Export Model</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Row Count</strong></td>
<td>36</td>
<td>48</td>
<td>60</td>
</tr>
<tr>
<td><strong>Nominal Row Spacing</strong></td>
<td>25.4 cm</td>
<td>19 cm</td>
<td>15 cm</td>
</tr>
<tr>
<td><strong>Span (width between end rows)</strong></td>
<td>889.0 cm</td>
<td>908.1 cm</td>
<td>893.7 cm</td>
</tr>
<tr>
<td><strong>Swath (span + nominal spacing)</strong></td>
<td>914.4 cm</td>
<td>927.1 cm</td>
<td>908.7 cm</td>
</tr>
<tr>
<td><strong>Swath-Averaged Row Spacing</strong></td>
<td>25.4 cm</td>
<td>19.3 cm</td>
<td>15.1 cm</td>
</tr>
<tr>
<td><strong>Seedbox Capacity</strong></td>
<td></td>
<td></td>
<td>3500 liters x2</td>
</tr>
<tr>
<td><strong>Tractor Requirements</strong></td>
<td>155 to 235 kW</td>
<td>185 to 280 kW</td>
<td>210 to 310 kW</td>
</tr>
<tr>
<td><strong>Hydraulics Requirements</strong></td>
<td>Closed-Center, 4 Remotes, 165 bar, 68 liters/min (fan circuit)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Weight (empty, base configuration)</strong></td>
<td>9 851 kg</td>
<td>10 749 kg</td>
<td>11 648 kg</td>
</tr>
<tr>
<td><strong>Weight (full, max. configuration)</strong></td>
<td>19 975 kg</td>
<td>21 076 kg</td>
<td>22 176 kg</td>
</tr>
<tr>
<td><strong>Static Tongue Weight (w/coulters)</strong></td>
<td>1950 kg</td>
<td>2040 kg</td>
<td>2180 kg</td>
</tr>
<tr>
<td><strong>Working Width</strong></td>
<td>9.14m without Markers, 9.53m with Markers (folded)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Transport Width</strong></td>
<td></td>
<td>2.96 m</td>
<td></td>
</tr>
<tr>
<td><strong>Working Length</strong></td>
<td></td>
<td>9.45 m</td>
<td></td>
</tr>
<tr>
<td><strong>Transport Length</strong></td>
<td></td>
<td>11.28 m</td>
<td></td>
</tr>
<tr>
<td><strong>Working Height</strong></td>
<td></td>
<td>3.81 m</td>
<td></td>
</tr>
<tr>
<td><strong>Transport Height</strong></td>
<td></td>
<td>3.96 m</td>
<td></td>
</tr>
<tr>
<td><strong>Transport Tire Size</strong></td>
<td></td>
<td>265/70B16.5 (10-16.5) 8-ply skid steer NHS</td>
<td></td>
</tr>
<tr>
<td><strong>Wing Gauge Wheel Tire Size</strong></td>
<td></td>
<td>15-19.5 12-ply skid steer NHS</td>
<td></td>
</tr>
<tr>
<td><strong>Contact Drive Tire Size</strong></td>
<td></td>
<td>13-5x6 4-ply turf saver</td>
<td></td>
</tr>
<tr>
<td><strong>Hydraulic Brake Operating Pressure</strong></td>
<td>150 bar maximum</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Air Brake Operating Pressure</strong></td>
<td>550 kPa min. Provision to 1035 kPa max. Operating</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Transport Clearance</strong></td>
<td></td>
<td>34 cm</td>
<td></td>
</tr>
<tr>
<td><strong>Opener Travel (Up - Down)</strong></td>
<td></td>
<td>+17.8 cm - 5.1 cm</td>
<td></td>
</tr>
<tr>
<td><strong>Opener Down Force</strong></td>
<td></td>
<td>0 to 110 kg</td>
<td></td>
</tr>
</tbody>
</table>
NTA3007HD North America Models

<table>
<thead>
<tr>
<th>North America Model</th>
<th>NTA3007HD-3610</th>
<th>NTA3007HD-4875</th>
<th>NTA3007HD-6006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Row Count</td>
<td>36</td>
<td>48</td>
<td>60</td>
</tr>
<tr>
<td>Nominal Row Spacing</td>
<td>10 in</td>
<td>7.5 in</td>
<td>6 in</td>
</tr>
<tr>
<td>Span (width between end rows)</td>
<td>350.0 in</td>
<td>357.5 in</td>
<td>351.9 in</td>
</tr>
<tr>
<td>Swath (span + nominal spacing)</td>
<td>360.0 in</td>
<td>365.0 in</td>
<td>357.9 in</td>
</tr>
<tr>
<td>Swath-Averaged Row Spacing</td>
<td>10.00 in</td>
<td>7.60 in</td>
<td>5.96 in</td>
</tr>
<tr>
<td>Seedbox Capacity</td>
<td></td>
<td></td>
<td>100 bu x2</td>
</tr>
<tr>
<td>Tractor Requirements</td>
<td>205 to 310 hp</td>
<td>245 to 370 hp</td>
<td>275 to 415 hp</td>
</tr>
<tr>
<td>Hydraulics Requirements</td>
<td>Closed-Center, 4 Remotes, 2400 psi, 18 gpm (fan circuit)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight (empty, base configuration)</td>
<td>21,718 lb</td>
<td>23,698 lb</td>
<td>25,678 lb</td>
</tr>
<tr>
<td>Weight (full, max. configuration)</td>
<td>44,038 lb</td>
<td>46,464 lb</td>
<td>48,889 lb</td>
</tr>
<tr>
<td>Static Tongue Weight (w/coulters)</td>
<td>4300 lb</td>
<td>4500 lb</td>
<td>4800 lb</td>
</tr>
<tr>
<td>Working Width</td>
<td>30ft without Markers, 31ft 3in with Markers (folded)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport Width</td>
<td>9.71 ft</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working Length</td>
<td>31 ft</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport Length</td>
<td>37 ft</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working Height</td>
<td>12ft 6in</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport Height</td>
<td>13ft 0in</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport Tire Size</td>
<td>265/70B16.5 (10-16.5) 8-ply skid steer NHS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wing Gauge Wheel Tire Size</td>
<td>15-19.5 12-ply skid steer NHS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contact Drive Tire Size</td>
<td>13-5x6 4-ply turf saver</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydraulic Brake Operating Pressure</td>
<td>2175 psi maximum.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air Brake Operating Pressure</td>
<td>80 psi min. Supply to 150 psi max. Operating</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport Clearance</td>
<td>13.5in</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opener Travel (Up - Down)</td>
<td>+7in - 2in</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opener Down Force</td>
<td>0 to 240 lbs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Tire Inflation Chart

<table>
<thead>
<tr>
<th>Tire Size</th>
<th>Inflation</th>
</tr>
</thead>
<tbody>
<tr>
<td>265/70B16.5 (10-16.5) 8-Ply SKID STEER NHS</td>
<td>414 kPa 60 psi</td>
</tr>
<tr>
<td>15-19.5 12-Ply SKID STEER NHS</td>
<td>414 kPa 60 psi</td>
</tr>
<tr>
<td>13-5x6 4-Ply TURF SAVER</td>
<td>275 kPa 40 psi</td>
</tr>
</tbody>
</table>

Tire Warranty Information

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

Manufacturer |
-------------|
Firestone    |
Gleason      |
Titan        |

Web site
- www.firestoneag.com
- www.gleasonwheel.com
- www.titan-intl.com
Dimensions (Transport) NTA907HD Export Model

Transport Width
117.54in (2.99m)

Transport Height
143.52in (3.65m)

Transport Clearance
18.44in (0.468m)

Hitch to Front Wheel Length:

Hitch to Rear Wheel Length:

Transport Length:
Seed Hose Port Maps
36-Row Port Map, Left

Models NTA907HD-3610 and NTA3007HD-3610

<table>
<thead>
<tr>
<th>Drill Section</th>
<th>Meter Outlet</th>
<th>Tower Number</th>
<th>Tower Port</th>
<th>Row Unit</th>
<th>Hose Length</th>
<th>WSMB Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left Wing</td>
<td>M2</td>
<td>T1</td>
<td>P03</td>
<td>R01</td>
<td>Inches</td>
<td>W1-01</td>
</tr>
<tr>
<td>Left Wing</td>
<td>M2</td>
<td>T1</td>
<td>P04</td>
<td>R02</td>
<td>Inches</td>
<td>W1-02</td>
</tr>
<tr>
<td>Left Wing</td>
<td>M2</td>
<td>T1</td>
<td>P02</td>
<td>R03</td>
<td>Inches</td>
<td>W1-03</td>
</tr>
<tr>
<td>Left Wing</td>
<td>M2</td>
<td>T1</td>
<td>P05</td>
<td>R04</td>
<td>Inches</td>
<td>W1-04</td>
</tr>
<tr>
<td>Left Wing</td>
<td>M2</td>
<td>T1</td>
<td>P01</td>
<td>R05</td>
<td>Inches</td>
<td>W1-05</td>
</tr>
<tr>
<td>Left Wing</td>
<td>M2</td>
<td>T1</td>
<td>P06</td>
<td>R06</td>
<td>Inches</td>
<td>W1-06</td>
</tr>
<tr>
<td>Left Wing</td>
<td>M2</td>
<td>T1</td>
<td>P09</td>
<td>R07</td>
<td>Inches</td>
<td>W1-07</td>
</tr>
<tr>
<td>Left Wing</td>
<td>M2</td>
<td>T1</td>
<td>P07</td>
<td>R08</td>
<td>Inches</td>
<td>W1-08</td>
</tr>
<tr>
<td>Left Wing</td>
<td>M2</td>
<td>T1</td>
<td>P08</td>
<td>R09</td>
<td>Inches</td>
<td>W1-09</td>
</tr>
<tr>
<td>Left Wing</td>
<td>M3</td>
<td>T2</td>
<td>P09</td>
<td>R10</td>
<td>Inches</td>
<td>W2-01</td>
</tr>
<tr>
<td>Left Wing</td>
<td>M3</td>
<td>T2</td>
<td>P01</td>
<td>R11</td>
<td>Inches</td>
<td>W2-02</td>
</tr>
<tr>
<td>Left Wing</td>
<td>M3</td>
<td>T2</td>
<td>P02</td>
<td>R12</td>
<td>Inches</td>
<td>W2-03</td>
</tr>
<tr>
<td>Center</td>
<td>M3</td>
<td>T2</td>
<td>P03</td>
<td>R13</td>
<td>Inches</td>
<td>W2-04</td>
</tr>
<tr>
<td>Center</td>
<td>M3</td>
<td>T2</td>
<td>P04</td>
<td>R14</td>
<td>Inches</td>
<td>W2-05</td>
</tr>
<tr>
<td>Center</td>
<td>M3</td>
<td>T2</td>
<td>P05</td>
<td>R15</td>
<td>Inches</td>
<td>W2-06</td>
</tr>
<tr>
<td>Center</td>
<td>M3</td>
<td>T2</td>
<td>P06</td>
<td>R16</td>
<td>Inches</td>
<td>W2-07</td>
</tr>
<tr>
<td>Center</td>
<td>M3</td>
<td>T2</td>
<td>P07</td>
<td>R17</td>
<td>Inches</td>
<td>W2-08</td>
</tr>
<tr>
<td>Center</td>
<td>M3</td>
<td>T2</td>
<td>P08</td>
<td>R18</td>
<td>Inches</td>
<td>W2-09</td>
</tr>
</tbody>
</table>
36-Row Port Map, Right

Models NTA907HD-3610 and NTA3007HD-3610

<table>
<thead>
<tr>
<th>Drill Section</th>
<th>Meter Outlet</th>
<th>Tower Number</th>
<th>Tower Port</th>
<th>Row Unit</th>
<th>Hose Length</th>
<th>WSMB Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>Center</td>
<td>M4</td>
<td>T3</td>
<td>P08</td>
<td>R19</td>
<td>W3</td>
<td>W3-01</td>
</tr>
<tr>
<td>Center</td>
<td>M4</td>
<td>T3</td>
<td>P09</td>
<td>R20</td>
<td>W3</td>
<td>W3-02</td>
</tr>
<tr>
<td>Center</td>
<td>M4</td>
<td>T3</td>
<td>P01</td>
<td>R21</td>
<td>W3</td>
<td>W3-03</td>
</tr>
<tr>
<td>Center</td>
<td>M4</td>
<td>T3</td>
<td>P02</td>
<td>R22</td>
<td>W3</td>
<td>W3-04</td>
</tr>
<tr>
<td>Center</td>
<td>M4</td>
<td>T3</td>
<td>P03</td>
<td>R23</td>
<td>W3</td>
<td>W3-05</td>
</tr>
<tr>
<td>Center</td>
<td>M4</td>
<td>T3</td>
<td>P04</td>
<td>R24</td>
<td>W3</td>
<td>W3-06</td>
</tr>
<tr>
<td>Right Wing</td>
<td>M4</td>
<td>T3</td>
<td>P05</td>
<td>R25</td>
<td>W3</td>
<td>W3-07</td>
</tr>
<tr>
<td>Right Wing</td>
<td>M4</td>
<td>T3</td>
<td>P06</td>
<td>R26</td>
<td>W3</td>
<td>W3-08</td>
</tr>
<tr>
<td>Right Wing</td>
<td>M4</td>
<td>T3</td>
<td>P07</td>
<td>R27</td>
<td>W3</td>
<td>W3-09</td>
</tr>
<tr>
<td>Right Wing</td>
<td>M5</td>
<td>T4</td>
<td>P02</td>
<td>R29</td>
<td>W4</td>
<td>W4-02</td>
</tr>
<tr>
<td>Right Wing</td>
<td>M5</td>
<td>T4</td>
<td>P03</td>
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### NTA907HD-4875 and NTA3007HD-4875 Port Map

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### 48-Row Port Map, Right

![Diagram of 48-row port map]

#### NTA907HD-4875 and NTA3007HD-4875 Port Map

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### 60-Row Port Map, Left

![Diagram of 60-Row Port Map, Left]

### NTA907HD-6006 and NTA3007HD-6006 Port Map

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# 60-Row Port Map, Right

## NTA907HD-6006 and NTA3007HD-6006 Port Map

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<td>W4-15</td>
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</table>
Monitor Setup Data
Seed monitor setup is normally performed using the Quick Start Guide (QSG, part number 110011516). If the QSG is not available, the table at right, plus the Specifications and Capacities data starting on page 143, provide the required and key factory default settings.

Notes:
- **a** Required Value: Do not change.
- **b** Factory Default: An approximate initial value. Refine with material data and/or calibration.
- **c** Type: Change to “GRAN...CONTROL” if optional variable rate seeding is installed.

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<tr>
<th></th>
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<th>NTA3007HD</th>
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</tr>
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## Torque Values Chart

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<td>ft-lb</td>
<td>N-m</td>
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<td>150</td>
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<td>mm x pitch</td>
<td>N-m</td>
<td>ft-lb</td>
<td>N-m</td>
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<td>3</td>
<td>6</td>
</tr>
<tr>
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<td>5</td>
<td>11</td>
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<td>M10 X 1.5</td>
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<td>M10 X 0.75</td>
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<td>61</td>
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<tr>
<td>M12 X 1.75</td>
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<td>81</td>
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<td>95</td>
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<td>90</td>
<td>66</td>
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<td>M14 X 2</td>
<td>92</td>
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<td>M18 X 1.5</td>
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<td>440</td>
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<td>650</td>
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<td>1380</td>
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---

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
Chain Routing
Contact Drive Chains
Gearbox and Meter Chains

Figure 153
Gearbox Chain Routing
Hydraulic Diagrams
Transport Hook and Fold Hydraulics

Figure 154
Transport Hook and Fold Hydraulics
Wing Opener / Tilt Hydraulics

Figure 155
Wing Tilt Hydraulics

29476
Marker Hydraulics (Option)

Figure 156
Marker (Option) Hydraulics
Opener Lift / Down-Pressure Hydraulics

Figure 157
Opener Down-Pressure Hydraulics
Weight Transfer Hydraulics

Figure 158
Weight Transfer Hydraulics
Fan (std.) and Auger (opt.) Hydraulics

Figure 159
Auger Hydraulics
Appendix B - Initial Setup

Console Installation

The Air Drill’s standard seed monitor system includes a virtual terminal and switch panel that must be mounted in the tractor cab. As supplied by DICKEY-john, the kit includes a flat bracket for the modules, and a ball swivel for mounting the bracket in the tractor.

**NOTICE**

Mount the modules so that they are easy to monitor 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.

Refer to the included DICKEY-john manual for harness connections.

Initial Marker Setup

Marker extension is factory preset for drill shipping, not planting, and needs to be set prior to first use. When making this adjustment, also check chain length and marker speed. Watch for signs that the marker hydraulic system needs to be bled (page 130).

Review “Marker Safety Information” on page 60 before operating or working on markers.

Marker Extension

Marker extension depends on drill size and row spacing. Refer to table at right.

In the table above, the extension values are measured from the center-line of the outside wing rows, to the mark left by the marker disk.

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<th>Drill Model</th>
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<th>Marker Extension</th>
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<tr>
<td>NTA907HD-3610</td>
<td>25.4 cm</td>
<td>469.9 cm</td>
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<tr>
<td>NTA907HD-4875</td>
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<td>473.0 cm</td>
</tr>
<tr>
<td>NTA907HD-6006</td>
<td>15 cm</td>
<td>461.9 cm</td>
</tr>
<tr>
<td>NTA3007HD-3610</td>
<td>10 in</td>
<td>185.0 in</td>
</tr>
<tr>
<td>NTA3007HD-4875</td>
<td>7.5 in</td>
<td>186.3 in</td>
</tr>
<tr>
<td>NTA3007HD-6006</td>
<td>6 in</td>
<td>181.9 in</td>
</tr>
</tbody>
</table>
Refer to Figure 161

1. To adjust marker extension, loosen two U-bolt nuts ① and slide arm tube ② in or out. Re-secure U-bolts.
2. Re-check chain length (page 131).
3. Re-check marker extension when changing disk angle or direction of throw (page 98).

**Marker 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 (S: slower) to decrease [un]folding speed and counterclockwise (F: faster) to increase [un]folding speed.

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

After adjusting the folding speed, tighten jam nuts on hex adjustment screws to hold settings.
Appendix C - Option Installation

Changing Meter Flutes

To order high rate flute shafts, see “High Rate Flute Sets” on page 140. To install a set of these shafts (or re-install the standard shafts), start with the front meter, as the task is a bit easier there. Save all parts for re-use.

Hopper must be empty for this procedure. see “Unloading Materials” on page 64.

Refer to Figure 163

1. On the right end of the meter box, remove and save the pins 1 from the final range gears 2, and then remove and save the gears. Note which size gear was on the agitator output and flute input shaft.

Refer to Figure 164

2. Remove and save the outer ring of six (6) self-tapping hex head bolts 3, that secure the outer flange to the meter box.

Do not remove the six bolts 4 that secure the bearing flangette to the outer flange. The shaft to be installed includes its own flange.

Refer to Figure 165 (Shown with meter box off and various components removed for clarity. It is not necessary to dismount or further disassemble meters to swap flute shafts).

3. From the right end of the meter box, carefully withdraw the current flute shaft 5. It is likely that the flange has a bead of silicone gasket. You may need to carefully pry the flange loose from the box.

4. Store the old shaft in the carton in which the new shaft was supplied. Mark the carton with the number of active hoses (towers) and the number of stars (factory standard is 2). This will reduce the risk of mistaking the carton/contents in the future.

5. Apply a bead of silicone sealant to the inside face of the outer flange, just inside the bolt hole pattern.

6. Carefully insert the new shaft 6 in the meter box.

7. When the flange on the right end is fully seated against the box, secure it with the 6 saved bolts. Give the shaft a few turns.

8. Re-mount the gears. Refer to the Seed Rate manual for the gear assignments for the agitator and flute shafts. Note the pin hole orientation on the shaft and on the gears. The gears can only be pinned in 2 of the 6 possible ways they can be placed on the shafts.
Scraper Installation

Optional disk scrapers (page 142) are not factory installed. To install them in the field:

1. Remove one or both disk blades to gain safe access to the mount. Note the position of bushings and spacers for correct re-assembly (page 94).

Refer to Figure 166

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

Secure it with two HHCS 3/8-16x1in hex head bolts, lock washers and nuts. Insert the bolts from the front.

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

Secure it loosely with one RHSNB 3/8-16x1 round head square neck bolt, flat washer, lock washer and nut.

4. Re-mount the removed disk blade.

5. Adjust the scraper blade per “Disk Scraper Adjustments” on page 95.
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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