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!
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Equipment Identification

This Operator manual applies to the following Great Plains pull-type integrated air drill seeders:

- NTA907-3610  9m, 36-row, 25.4cm (10in) spacing
- NTA907-4875  9m, 48-row, 19.1cm (7.5in) spacing
- NTA907-6006  9m, 60-row, 15.0cm (5.9in) spacing
- NTA3007-3610 30 foot, 36-row, 10 inch spacing
- NTA3007-4875 30 foot, 48-row, 7.5 inch spacing
- NTA3007-6006 30 foot, 60-row, 6 (5.9) inch spacing

See “Specifications and Capacities” on page 163 for precise swath information.

Refer to Figure 1
For positive equipment identification, consult the serial number plate located on the rear frame cross-member below and left of fan.

Note: The present manual does not apply to “HD” models NTA907HD or NTA3007HD. See manual 166-207M for HD drills.

North American Models NTA3007

Models NTA3007 are built to North American highway transport standards.

Refer to Figure 2 (which is NOT from an actual machine)
The serial number plate provides the model number and serial number specific to your machine.

See “Transporting the Air Drill” on page 50 and “Specifications and Capacities” on page 163 for additional weights and measurements.

Export Models NTA907

Models NTA907 are built to European highway transport standards.

Refer to Figure 3 (which is NOT from an actual machine)
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 no longer are accurate for your machine. Update the Record on the next page upon modifications.
## Machine Record

### Machine Details

Record your machine details in the Log at right. If you replace this manual, be sure to transfer this information to the similar page of the new manual. If you add or remove Options, update the Log. If the page cannot be legibly updated, request or print a new Operator manual.

### Dealer Information

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<th>Dealer Name</th>
<th>Street</th>
<th>Place</th>
<th>Post Code</th>
<th>Country</th>
<th>Voice</th>
<th>Fax</th>
<th>Web</th>
<th>Email</th>
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</table>

### Great Plains Regional Agent

(If different than those on page 4)

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<th>Agent</th>
<th>Street</th>
<th>Place</th>
<th>Post Code</th>
<th>Country</th>
<th>Voice</th>
<th>Fax</th>
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### Machine Log

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<th>Date of Delivery</th>
<th>Date in Service</th>
<th>Options</th>
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Introduction

Great Plains welcomes you to its growing family of new product owners. Your 9m/30ft No-Till 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.

Before placing the machine into service for the first time, read and understand this manual, in particular the “Important Safety Information”, pages 5 to 25. Have all operators read this manual before allowing them to work with the machine.

Description of Unit

The NTA907 or NTA3007 is a pull-type integrated air drill seeder. The implement folds for narrow 3 m (9 ft. 8 1/2 in.) transport.

A hydraulic fan supplies the material delivery system. Ground-driven fluted shafts below the hoppers meter the seed or fertilizer (the materials) into the air flow. Meter chambers and tower manifolds evenly divide the material flow, and deliver equal volumes to each opener row.

The cart has dual 3500 litre (100 bu) hoppers for separate or simultaneous delivery of seed and/or granulated dry fertilizer. Each hopper has an independent metering system with user-preset infinite ratio gearboxes. Console-controlled variable rate meter servos are optional.

The NTA907 or NTA3007 has double-disc Series 07 openers, suitable for conventional till and, minimum-till conditions. With optional coulters, the air drill is suitable for moderate no-till conditions.

Brakes are standard on model NTA907 and optional on model NTA3007. Service brakes are operated by air or hydraulic lines to the tractor.

Hydraulic weight transfer (of cart weight to implement, and from implement centre section to wings) is standard. Other options include auger, field markers, tramline kits, high rate flutes, and alternate discs, scrapers and firmers.

Do not modify the drill except as instructed by Great Plains. Do not use attachments other than as provided by or authorized by Great Plains.

Intended Usage

Use the NTA907 or NTA3007 to seed and fertilize production-agriculture crops only.

The intended use requires that safety features are unimpaired, that machine systems be in proper working order, and that the material rates have been correctly configured and verified. Use only Great Plains authorized replacement parts.

Faults in safety features, including missing or illegible safety decals, must be remedied prior to machine use.

To keep the machine in proper working order, comply with operating instructions, perform periodic maintenance, and repair or replace worn or damaged parts.

This is a volumetric seeding implement. The provided seed rate charts (manual 167-085B) are based on materials which likely vary from yours. Grain size, grain shape, density, surface texture, foreign matter, treatments, coatings, humidity, field speed, soil conditions and normal wear on tires and meters cause rates to vary from the charts. Calibration is essential for satisfactory results.
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.

Owner Assistance

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

Your machine's parts were specially designed and should only be replaced with Great Plains parts. Always use the serial and model number (page 2) when ordering parts from your Great Plains dealer.

Your Great Plains dealer wants you to be satisfied with your new machine. If you do not understand any part of this manual or are not satisfied with the service received, please take the following actions.

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.

For further assistance contact Great Plains via the Agent recorded on page 2, or at:

For U.K. and Europe

SIMBA Great Plains
Woodbridge Road Ind. East
Sleaford
Lincolnshire NG34 7EW England

Voice: +44 (0) 1529 304654
Fax: +44 (0) 1529 413468
Email: simba.international@simba.co.uk

For Other Regions

Great Plains Manufacturing, Inc.
PO Box 5060
Salina KS 67402-5060 USA

Voice: +1 785-823-3276
Fax: +1 785-822-6722
Email: gp_web_cs@greatplainsmfg.com

Definitions

Safety admonishment signal words are described on page 5.

The following terms are also used throughout this manual.

NOTICE

Identifies an Economic (not a Safety) Risk:

NOTICE provides a crucial point of information related to the current topic. Read and follow the instructions to avoid damage to equipment and ensure desired field results.

Note: This form sets off useful information related to the current topic, or forestalls possible misunderstanding.

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.

a. If you prefer a manual that is metric-only, request a copy of 166-371M-ENG from your dealer or from Great Plains.
Important Safety Information

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

Be Aware of Signal Words
Signal words designate a degree or level of hazard seriousness.

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

WARNING, and the colour Safety Orange, indicate a potential hazard which, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.

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

Prepare for Emergencies
\(^\Delta\) Be prepared if a fire starts
\(^\Delta\) Keep a first aid kit and fire extinguisher handy.
\(^\Delta\) Keep emergency numbers for doctor, ambulance, hospital and fire department near phone.

Be Familiar with Safety Decals
\(^\Delta\) Read and understand “Warning Safety Reflectors and Decals” on page 11, thoroughly.
\(^\Delta\) Read all instructions noted on the decals.
\(^\Delta\) Keep decals clean. Replace damaged, faded and illegible decals.

---

a. Symbols and safety colours in this manual, and on machine model NTA3007, are based on ANSI standard Z535. Pictogram symbols and colours on model NTA907 are based on ISO standard 3864.

b. Pictograms (language-free safety decals), found on models NTA907, are generally on a Safety Yellow background regardless of hazard severity. Rely on the illustrations, and the manual, and not the colour, to classify the severity of the hazard.
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 seed treatments with the NTA907 or NTA3007.
▲ 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 30m (100 feet) 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, a hopper may become “permit-required confined space” under applicable statutes, regulations, insurance rules or business policy. The vent tube structure in the hopper 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 material, or into an oxygen-deficient void, and suffocate in a matter of seconds. 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 126.
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.

Remain Clear of Overhead Lines

▲ If the drill contacts a power line, lethal voltage may be present on all metal parts. At higher voltage, the drill does not need to be in line contact for the hazard to exist. Maintain at least 3 m (10 foot) clearance.

▲ Electrocution can occur without direct contact between the energized drill and a person near the drill.

▲ Watch for sagging, damaged or low electrical lines. The auger could contact lines lower than 5.3 m (17.5 feet). Overhead lines at farm structures are a particular hazard. An auger is at risk from lines lower than 9 m (28 feet).

▲ Watch for all electrical lines during folding, unfolding, marker and most especially auger operations. Use a spotter during these operations. Know the location and height of all lines during loading, transport and in fields.

▲ If an electrical hazard is observed while on the ground near the applicator, hop at least 30 m (100 feet) away with both feet together and summon professional help. At higher voltage, lethal voltage gradients can also be present at the soil surface.

▲ Consult your tractor manual for advice on how to respond to an electrical hazard event while in the cab.
Transport Machinery Safely

Maximum transport speed for implement is 30 km/h 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 km/h 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 state 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 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 163.

▲ Do not fold or unfold the drill while the tractor is moving

Shutdown and Storage

▲ Unfold and lower drill.

▲ Block tires with wheel chocks provided.

▲ Detach and store 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 138.

▲ Work in a clean, dry area.

▲ Unfold and lower the drill, put tractor in park, turn off engine, and remove key before performing maintenance. If work must be performed with implement raised, use centre section lift lock and gauge lock channels provided.

▲ Make sure all moving parts have stopped and all system pressure is relieved.

▲ Allow drill to cool completely.

▲ Disconnect battery grounding cable (-) before servicing or adjusting electrical systems.

▲ Welding: Disconnect battery grounding. 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 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 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 drill. Make sure all persons are clear of working area.
Safety Decals

Warning: 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 decal 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.

Reflector: Slow Moving Vehicle (SMV)
NTA907: n/a  NTA3007: 818-055C
(International models use 833-398C panels and 833-399C reflectors)

At centre of rear caster sub-frame cross-tube; 1 total
See “Transport Safety Information” on page 50.

Reflector: Red Triangle
NTA907: 833-399C  NTA3007: n/a
(North American models use 818-055C SMV reflectors, 838-266C red reflectors & 838-267C amber reflectors.)

Reflectors: Fluorescent Panels
NTA907: 833-398C  NTA3007: n/a
(North American models use 818-055C SMV reflectors, 838-266C red reflectors & 838-267C amber reflectors.)

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.
Reflectors: Amber
NTA907: 838-265C
NTA3007: 838-265C
On outside end face, each wing opener tool bar,
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 50.

Reflectors: Red
NTA907: n/a
NTA3007: 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 50.

Reflectors: Daytime
NTA907: n/a
NTA3007: 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 50.

Transport: Warning: Speed
NTA907: 848-398C
NTA3007: See 818-188C
30 km/h
On front upper face of front hopper, and
on decal plate below rear beacon;
2 total
See “Transport Safety Information” on page 50.
Transport: Warning: Speed
NTA907: 848-828C
NTA3007: 818-188C

![WARNING]

**WARNING**

**EXCESSIVE SPEED HAZARD**

To Prevent Serious Injury or Death:
- Do Not exceed 20 mph maximum transport speed. Loss of vehicle control and/or machine can result.

On side of tongue near hitch; one total
See “Transport Safety Information” on page 50.

Transport: Warning: Clearance
NTA907: 848-828C
NTA3007: n/a

![3.96m]

On front upper face on front hopper; 1 total
See “Transport Safety Information” on page 50.

Transport: Caution: Towing
NTA907: 848-512C
NTA3007: 848-394C

![CAUTION]

**CAUTION**

To prevent injury or equipment damage:
- Use vehicle with adequate mass to control machine when towing.
- Minimum towing vehicle weight at 30 mph maximum:
  - 20,000 pounds with loaded drill
  - 30,000 pounds with empty drill
  - 30,000 pounds with loaded drill
  - 30,000 pounds with empty drill

On left side of tongue at hitch; 4 total
See “Transport Safety Information” on page 50.

Transport: Road/Field
NTA907: 848-393C
NTA3007: 848-393C

![ROAD]

On mid-wing transport locks; 2 total
See “Transport Safety Information” on page 50.
Transport: Road
NTA907: 848-834C  NTA3007: 848-834C
On frame sides at centre section transport locks, and on wing end transport locks; 4 total
See “Transport Safety Information” on page 50.

Transport: Field
NTA907: 848-837C  NTA3007: 848-837C
On frame sides at centre section transport locks, and on wing end transport locks; 4 total
See “Transport Safety Information” on page 50.

Danger: Electrocution, Marker (Option)
NTA907: 848-408C  NTA3007: 848-574C
On marker mount weldment at end of wing; 4 total
See “Marker Safety Information” on page 73.
**Danger: Electrocution, Auger (Option)**

NTA907: 848-409C  
NTA3007: 818-627C

On auger tube near lower handles; one total
See “Auger Safety Information” on page 59.

**Danger: Missing Guard (Option)**

NTA907: 848-410C  
NTA3007: 818-633C

On auger tube nearest inlet; 1 total
See “Auger Safety Information” on page 59.

**Danger: Rotating Auger (Option)**

NTA907: 848-411C  
NTA3007: 818-634C

On auger tube near Missing Guard decal; 1 total
See “Auger Safety Information” on page 59.

**Danger: Do Not Ride**

NTA907: 848-511C  
NTA3007: 848-583C

On cart side frame, left of ladder; 1 total
Danger: Read Manual

**NTA907: 848-512C**

![Warning Sign](image1)

On left side of tongue near hitch; 1 each total

**NTA3007: 818-557C**

![Warning Sign](image2)

*(818-557C Spanish text advises readers to seek translation)*

Danger: Electrocution

**NTA907: 848-516C**

![Warning Sign](image3)

NTA907: front upper face of front hopper, NTA3007: left side of tongue near hitch; 1 total

**NTA3007: 848-574C**

![Warning Sign](image4)

Danger: Chemicals

**NTA907: 848-520C**

![Warning Sign](image5)

On each hopper near lid, walkboard side; 2 total

**NTA3007: 818-323C**

![Warning Sign](image6)

See “Loading Material Safely” on page 65.
Danger: Hitch Crushing
NTA907: 848-523C  NTA3007: 848-581C

On left side of hitch near behind pull bars; 2 total

See “Hitching Tractor to Drill” on page 27.
See “Unfolding Safety Information” on page 34.
See “Lowering/Raising Safety Information” on page 42.
See “Folding Safety Information” on page 44.

Warning: Shock Hazard
NTA907: 833-563C  NTA3007: n/a

On base of strobe beacon; one total

This decal is not separately available. If missing or damaged, replace entire 833-365C beacon unit.

See “Beacon Operation (NTA907 only)” on page 31 and “Beacon Maintenance (NTA907 only)” on page 147.

Warning: Overhead Auger (Option)
NTA907: 848-413C  NTA3007: 818-622C

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

See “Remain Clear of Overhead Lines” on page 8 and “Auger Safety Information” on page 59.
Warning: Fan Hazard
NTA907: 848-508C  NTA3007: 818-632C

On rear main frame below fan screen cage; one total
See “Fan Safety Information” on page 71.

Warning: Moving Chain
NTA907: 848-509C  NTA3007: 818-860C

On guards of contact to jackshaft drive system; 4 total
See “Calibration Crank Safety Information” on page 69.

Warning: Moving Chain
NTA907: 848-509C  NTA3007: 818-860C

On guards of main jackshaft to gearbox, on guards of gearbox output drive systems, and on meter box input guards; 5 total
See “Calibration Crank Safety Information” on page 69.
Warning: Moving Chain (Option)
NTA907: 848-509C  NTA3007: 818-860C

On guard at auger hydraulic motor;
1 total
See “Auger Safety Information” on page 59.

Warning: Wear Eye Protection
NTA907: 848-510  NTA3007: 818-437C

On each hopper near lid, walkboard side;
2 total
See “Hydraulic Hose Hook-Up” on page 28.
See “Hydraulic Maintenance Safety Information” on page 128.

Warning: Pinch Point
NTA907: 848-513C  NTA3007: 818-798C

On each wing weldment above pull bar attach point;
2 total
Warning: Pinch Point
NTA907: 848-514C  NTA3007: 818-798C
On outside faces of wing parallel arm mount weldments; 4 total

Warning: Pinch Point
NTA907: 848-514C  NTA3007: 848-582C
On outside faces transport hook; 2 total

Danger: Marker Pinch/Crush (Option)
NTA907: 848-514C  NTA3007: 848-582C
On each side of inner marker arm or arm pivot; 4 total
See “Marker Safety Information” on page 73.
Warning: Overhead Marker (Option)
NTA907: 848-515C  NTA3007: 818-580C

On each side of inner marker arm or arm pivot; 4 total
See “Marker Safety Information” on page 73.

Warning: High Pressure Fluid (Option)
NTA907: 848-517C  NTA3007: 818-339C

On (optional) auger near lower operating control; 1 total
See “Auger Safety Information” on page 59.
See “Fan Safety Information” on page 71.
See “Weight Transfer Safety Information” on page 107.

Warning: High Pressure Fluid
NTA907: 848-517C  NTA3007: 818-437C

On side of tongue at hitch; one total
See “Hydraulic Hose Hook-Up” on page 28.
See “Hydraulic Maintenance Safety Information” on page 128.
Warning: Confined Space
NTA907: 848-519C  NTA3007: 818-628C

On each hopper near lid, walkboard side;
2 total

See “Hopper Lid Safety Information” on page 55.
See “Loading Material Safely” on page 65.
See “Material Clean-Out” on page 124.

Warning: Moving Gears
NTA907: 848-522C  NTA3007: 848-576C

On bottom of hoppers above final Range gears;
1 or 2 total

See “Seed Meter Final Drive Range” on page 88.

Warning: Falling Hazard
NTA907: 848-527C  NTA3007: 848-575C

On left side of mainframe near ladder;
1 total

See “Ladder Operations” on page 54.
Warning: Pinch Point
NTA907: 848-531C  NTA3007: 818-798C

Under tongue hook near hitch; 1 total
See “Unfolding Safety Information” on page 34.

Warning: Pinch Point, Auger (Option)
NTA907: 848-531C  NTA3007: 818-798C

On rear* faces of auger arms; 4 total
* When arms are fully extended.

Warning: Roll-Away
NTA907: 848-757C  NTA3007: 818-760C

On mainframe side above front transport tires; 2 total
See “Transporting the Air Drill” on page 50.
Warning: Unexpected Movement
NTA907: 848-838C  NTA3007: 848-841C

On mainframe above rear casters; 2 total
See “Transporting the Air Drill” on page 50.

Caution: Tire Pressure and Torque
NTA907: 848-406C  NTA3007: 838-092C

On outside of each wing gauge wheel tire; 4 total
See “Transport Safety Information” on page 50.

Caution: Tire Pressure and Torque
NTA907: 848-407C  NTA3007: 838-426C

On outside of each transport wheel tire; 8 total
See “Transport Safety Information” on page 50.
Caution: Tyre Pressure and Torque
NTA907: 848-499C  
NTA3007: 848-584C

![CAUTION)
To avoid injury to machine damage from improper tire inflation or torquing of wheel bolts.
Maximum inflation pressure of tires is 16 psi.
Torque wheel bolts to 85 ft-lb.

One each contact drive arm; 2 total
See “Transport Safety Information” on page 50.

Caution: Tires Not A Step
NTA907: 848-507C  
NTA3007: 818-398C

![CAUTION)
To avoid injury from decoupled transport tires.
Never stand or sit on transport tires or stand on the platform when it is in contact with the ground without support.

On outside face of caster weldments, on side face of mainframe above transport tires, on outside face of wing gauge wheel weldments; 6 total
See “Unfolding Safety Information” on page 34.
See “Folding Safety Information” on page 44.
See “Weight Transfer Safety Information” on page 107.
Preparation and Setup

This section helps you prepare your tractor and NTA907 or NTA3007 for use, and covers seasonal tasks, and task when the tractor/drill configuration changes.

Before using the NTA907 or NTA3007 in the field, you must hitch the drill to a suitable tractor, inspect systems and level the drill. Before using the drill for the first time, and periodically thereafter, certain adjustments and calibrations are required.

Initial Setup

See “Appendix B - Initial Setup” on page 183 and “Appendix C - Option Installation” on page 185 for pre-delivery items (normally completed by dealer), and first-time/infrequent setup tasks, including:

- Install seed monitor console in tractor (page 183).
- Remove protective film from large highway reflectors.
- Set marker extension (page 183) 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 128).
- Wing levelling and alignment (page 145).
- 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”, pages 5 through 10.
- 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 and Scheduled Maintenance” on page 148.
- Check that all safety decals and reflectors are correctly located and legible. Replace if damaged. See “Safety Decals” on page 11.
- Inflate tires to pressure recommended and tighten wheel bolts as specified. See “Tire Inflation Chart” on page 166.
Hitching Tractor to Drill

**DANGER**

**Crushing Hazard:**
You may be severely injured or killed by being crushed between the tractor and drill. Do not stand or place any part of your body between 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.
   Set the tractor’s parking brake.
   Shut down the tractor.

Refer to Figure 5 (which depicts the parking jack removed, but not yet stored)

3. Adjust the NTA907 or NTA3007 hitch to match your tractor draw bar height, using crank of tongue jack on side of tongue.

Note: The precise height is not critical, as the NTA907 or NTA3007 levelling is set at the mainframe and is independent of tongue level.

**CAUTION**

**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. A hitch failure could result in a serious accident and is likely to result in implement and/or tractor damage.

4. Securely attach the safety chain to an anchor on a tractor capable of pulling the NTA907 or NTA3007.

Refer to Figure 5 and Figure 6

5. Use crank ① to raise parking jack foot ②. Remove pin ③ and jack.

**NOTICE**

**Equipment Damage Risk:**
Store the parking jack on the upper stob in a horizontal orientation, foot to rear. Using the lower stob, or any other orientation, will result in jack and tongue damage.

7. Connect hydraulic hoses (page 28).
10. Remove and store main tongue parking stand.
Hydraulic Hose Hook-Up

**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 colour coded to help you hook-up hoses to your tractor outlets. Hoses that go to the same remote valve have the same colour bands.

The fan pressure hose (black) 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.

Note: This implement is compatible only with tractors having Closed Centre hydraulics.

Refer to Figure 7
To distinguish hoses on the same hydraulic circuit, refer to handle symbols. The hose with an extended-cylinder symbol feeds a cylinder base end. The hose with a retracted-cylinder symbol feeds a cylinder rod end.

For the hydraulic fan, connect the hose with a retracted cylinder symbol to the pressure side of the motor.

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

marker hoses are provided on the cart even if markers are not installed on the implement. See “Console Installation” on page 183 prior to first hitching.

Protecting Fan Hydraulic Motor Seals
Low Pressure (Case) Drain Connection:

1. Attach case drain hose to low pressure drain connection. See Notice at right.

2. Connect low pressure motor return hose, marked “SUMP”, to a high volume low pressure return port. The sump line is distinguished by a large 2.7 cm (1.06 inch) diameter) quick coupler.

3. Connect hydraulic hoses to tractor remotes.

Equipment Damage Risk:
Case Drain Hose must be attached first, prior to inlet and return hoses being connected, to prevent damage to hydraulic motor seals. The case drain has the smaller 6.4 mm (¼ inch) I.D. hose and small, flat-face, low-seep connector. DO NOT connect the case drain line to a power-beyond port.

Case Drain Hose must be detached last, to prevent damage to the fan motor. To allow pressure relief during temperature cycles, it is normal for this line to release small amounts of oil even when stored with the connector elevated.

---

**Colour** | **Hydraulic Function**
---|---
Black | Fan / Auger (Option)
Blue | Opener Lift / Down-Pressure
Gray | Weight Transfer
Green | Fold / Tilt / Bout Marker (Option)
Yellow | Transport Hook
“SUMP” | Sump
“BRAKES” | Hydraulic trailer brakes (Option)
Brake Hook-Up (Option)

Two drill braking (trailer braking) systems are available:

- Dual-line air system (Figure 8), and
- Single-line hydraulic system (Figure 9).

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.

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

⚠️ CAUTION

Braking Hazards:
Make sure the operator understands when drill brakes are engaged and when they are released (record tractor behaviour on page 52).

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 Hook-Up (Option)

Refer to Figure 10
1. Open petcock ① at reservoir tank. Drain any water from tank. Close petcock.

Refer to Figure 11
3. Connect the “Brake”, “Service” or “Control” line first. This line is Blue-coded.

This line operates the drill brakes.
4. 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 NTA907 or NTA3007 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 Hook-Up (Option)**

*Refer to Figure 12*
This is a single hydraulic line, connected to the tractor “Brake” outlet.

The factory default connector is a $\frac{3}{4}$ inch 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:
- $\frac{3}{4}$ inch male ORB (O-Ring Boss), or
- $\frac{3}{4}$ inch female JIC (Joint Industry Conference, 37° flare).

**Electrical Hook-Up**

*Refer to Figure 13*
Make sure tractor is shut down with accessory power off before making connections.

1. Mate lighting connector to tractor outlet.
2. Mate monitor connector to tractor harness.
3. Mate any optional or after-market electrical connectors.

Make connections prior to drill movement. Some drill hydraulic circuits are under monitor control.
Beacon Operation (NTA907 only)

Refer to Figure 14
The flash strobe beacon and rear plate illumination lamp may be disabled for field operations using a switch ① below the beacon.

This switch does not control the brake/turn/running lights at left and right rear.

See also “Beacon Maintenance (NTA907 only)” on page 147.

Stow Wheel Chocks

1. Verify that the tractor transmission is in Park, and that the tractor’s parking brake is set (per step 2).

Refer to Figure 15 and Figure 16
Two sets of wheel chocks ① (4 chocks total) are provided to secure the drill when parked. These provide the most safety when installed ahead and behind the outside front transport tires.

When not in use, the chocks are stored in holders ② mounted on the side frames. The chocks are held in place by gravity when correctly stowed in the holders.

2. Remove the chocks from the wheel on one side.

CAUTION
Roll-Away Hazard:
If one chock is extremely difficult to remove, or the drill moves significantly when the chock is removed, investigate the cause before removing the chocks on the other side. If no tractor is hitched, or the tractor is not securely parked, the drill could roll away after chock removal, and cause an accident resulting in death, serious injury and substantial property damage.

3. Store one chock in the bottom of a holder, upside-right, tall end of chock toward frame.

4. Store the other chock in the top channel guides of the holder, upside-down, short end toward frame.

5. Repeat step 2 through step 4 for the other side.
Heights and Levelling
All frame sections must be at the correct height and level to maintain even planting depth.
Periodic frame-levelling adjustments should not be necessary. If you are having problems with uneven depth, check drill levelness and follow these procedures.
2. Unfold the drill fully (page 34).

Set Tongue Height
Drill must be unfolded for this procedure.
Refer to Figure 17
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 within 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 Drill Height
The drill is designed to operate with all sections of the main tool bar nominally 76.2 cm (30 inch) above the planting surface. The height of the centre section is not routinely adjustable. Set planting depth with row unit adjustments.
When lowering the 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
Mis-Adjustment Risk:
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 18
4. Check tool bar height across drill. See page 145 for further detail and adjustment.

Marker Setup
Prior to first use, check and adjust:
• See “Initial Marker Setup” on page 183.

Prior to each planting session, check and adjust:
• See “Marker Disc Adjustment” on page 115.
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 or NTA3007 drill to the field.

![High Pressure Fluid Hazard]

**WARNING**

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

- Review “Important Safety Information” on page 5.
- Lubricate as indicated at “Lubrication and Scheduled Maintenance” on page 148.
- Check all tires for proper inflation. See “Tire Inflation Chart” on page 166.
- Check all bolts, pins, and fasteners. Torque as shown in “Torque Values Chart” on page 167.
- Check 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.

Note: 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 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.

⚠️ DANGER ⚠️

Electrocution Hazard:
Keep clear of overhead power lines when unfolding, operating, folding or transporting the drill. Machine is not grounded. At higher voltages, electrocution can occur without direct contact. Any line voltage present on implement, cart or tractor can cause severe injury or death.

⚠️ 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 3.2 m (7.5 feet) 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 may 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.
Unfold: Summary of Steps
Follow the detailed instructions in step 1 through step 14 until this is a familiar operation.

- Check markers, auger and ladder stowed (below).
- Set mainframe transport locks to FIELD (below).
- Release transport hook (page 36).
- Set tractor for unfold (page 36).
- Unfold wings (page 37).
- Check openers raised (page 41).
- Set outer wing locks to FIELD (page 39).
- Tilt down wings (page 39).

Unfold: Check Drill Configuration
Wings can collide with a deployed auger or ladder.

1. Make sure:
   - ladder (page 54),
   - auger (page 64) and
   - markers (page 73)
   are secured in their transport positions before unfolding.

2. Move to level ground.

NOTICE

Sudden Implement Movement Risk:
Always have hydraulic levers in Neutral when operating CFM switches.

3. Set/check that CFM switches (see page 33) are all Off and hydraulic circuits are all in Neutral.
   Shut off tractor.

Unfold: Two Mainframe Locks: ROAD to FIELD

Refer to Figure 21

4. On both sides of the mainframe, pull the wire handle outward and move to rear slot. This allows hooks (not shown) to move forward and enables lowering of the centre section openers (after unfold). If the openers are not fully raised, the hooks may not move immediately. Tension in the wire loop handle is expected in that case.

Note: Lowering the openers is not part of the unfold operation, but these locks are easier to reach before the wings are unfolded.
Unfold: Release Transport Hook

5. Extend the Transport Hook circuit.
   Set it to Neutral.
Note: Transport hook is on a dedicated circuit.

Refer to Figure 22 (which depicts the transport hook unlocked and disengaged)
6. Pull the lift lock handle ① forward to disengage the transport hook lock channel ②. Pull the handle until the lock channel rests at fully open.

7. Have everyone move clear of the drill. Retract the transport hook cylinder:

Refer to Figure 23
8. Observe wings and gauge wheels lowering during un-hook.

9. When the cylinder is fully retracted, set the transport hook circuit to Neutral.

Unfold: Set Tractor

10. To allow tractor movement:
    set steering straight ahead,
    put tractor transmission in neutral and release tractor parking brake.

Note: If tractor movement is not desired:
    put tractor transmission in Park,
    set tractor parking brake, and
    release drill brakes (if drill is brake-equipped, and tractor can separately control drill brakes).

Do not set tractor parking brake if tractor parking brake actuates trailer (“service”) brake system.
Unfold: Unfold Wings

Drill check, un-hook and tractor setup (step 1 through step 10 starting on page 45) must be completed before performing the next steps.

Refer to Figure 24
11. On the CFM switch, enabled unfolding with MASTER and Fold set on.

⚠️ CAUTION

Crushing Hazard:
Clear everyone from around the drill and tractor. The drill or the tractor, or both, must move during unfold.

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

Refer to Figure 25 (depicting an unfold with both tractor and drill free to move - notice how the length of the drill shortens, and that it has pulled the tractor toward the drill)
Observe the unfolding. It is not complete until the tongue lock at the hitch engages the roller on the telescoping centre tongue tube.

⚠️ NOTICE

Machine Damage Risk:
Do not tilt down or lower openers while any drill folding operations are under way or partially complete.

Refer to Figure 26
13. 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

Machine Damage Risk:
Do not operate drill when unfolded unless tongue lock is engaged.
14. When the wings are fully unfolded, stop fold cylinder retraction, and hold wings open with Neutral.

15. Disable the Fold solenoid valve.

**Unfold: Free Wing Transport Locks**
Step 16 may not be necessary on a recently folded drill.

16. Relieve any weight on the wing tip locks.
   Select Tilt operation:
   Briefly perform a tilt-up.

17. Shut off tractor.
Unfold: Two Wing End Locks: ROAD to FIELD

Refer to Figure 29 and Figure 30 (Figure 30 is shown tilted down for clarity - perform this lock change while the openers are tilted up)

18. 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.

Note: Mid-Wing Locks: As-Is
The mid-wing locks require no attention during unfold.

Unfold: Tilt-Down

The transport hook and transport locks must be released (step 5 through step 18 starting on page 36) before performing the next steps.

Refer to Figure 31
19. On the CFM switch, enable Tilt with MASTER and Tilt on.

20. Extend the Fold/Tilt/Marker circuit.

<p>| Tilt-Down: Hydraulic Circuit Operation |</p>
<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>Extend</td>
<td>Neutral</td>
</tr>
</tbody>
</table>
Refer to Figure 32
21. Observe the wings during tilt down.

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

<p>| Tilt-Down Complete: Circuit Operation |</p>
<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>Neutral</td>
<td>Neutral</td>
</tr>
</tbody>
</table>
Unfold: Check That Openers are Raised

Refer to Figure 33

23. 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 42.

**NOTICE**

**Ground Contact Risk:**
Openers must be in the raised position before unfolding. If the 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.

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

25. When vertical movement has stopped (and the centre section may stop last), hold the openers in the raised position by setting circuit to Neutral.

26. If no markers are installed, you may also set the MASTER switch to Off. The CFM is not used in the field unless markers are installed.
Lowering and Raising 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 discs 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 rapidly if the hydraulics fail, or if the lift circuit is set to Float or Retract.

**NOTICE**

Ground Contact Risk:
Do not lower openers while any drill folding operations are under way or partially complete.

Note: 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 39).

Lowering

1. Unfold drill before lowering (page 34).
2. Make sure all persons are clear of opener sections.
3. Actuate dedicated lift circuit (normally Extend).
4. If down-pressure has been adjusted (page 101), leave the circuit in Extend.
   
   If down-pressure has not been adjusted, or if not planting immediately, set the circuit to Neutral.

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

Note: After unfolding, the centre section openers may be resting in the transport hooks, despite the lock handle being set to FIELD. You may need to raise the openers before lowering them, to allow the spring-loaded hooks to swing to FIELD position.
Raising

**NOTICE**

*Ground Contact Risk:*
The drill must be raised for folding and unfolding.

**NOTICE**

*Opener Damage Risk:*
Always raise the drill for any reverse/backing operations.

1. Make sure all persons are clear of opener sections.
2. Actuate dedicated lift circuit (normally Retract).
3. Retract until all sections are raised. Centre section tends to lift later than wings.
4. 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>

---

### 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>

---

*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 the drill.*

*Do Not Set for Continuous Mode.*
Folding the Drill

Fold the NTA907 or NTA3007 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.

▲ Anyone or anything in front of or behind tractor or drill could be run over.

**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**

Machine Damage Risk:
Do not fold with openers lowered.
Fold: Summary of Steps
Follow the detailed instructions in step 1 through step 23 until this is a familiar operation.

- Check markers, auger and ladder stowed (below).
- Raise openers (page 43).
- Preset transport hook (below)
- Set wing transport locks to ROAD (below).
- Tilt up wings (page 46).
- Set tractor for fold (page 47).
- Fold wings (page 44).
- Engage transport hook (page 48)
- Set mainframe transport locks to ROAD (page 49).

Fold: Check Drill Configuration
1. Make sure
   - markers (page 73),
   - auger (page 64) and
   - ladder (page 54)
   are secured in transport positions before unfolding.
2. Raise openers (page 43).
3. Move to level ground.

Fold: Preset Transport Hook
Refer to Figure 35
4. Check that transport hooks are fully lowered (cylinder fully retracted). If not, Retract hook circuit as needed.
5. Tilt transport hook look channel rearward until it rests on the hook cylinder. This prepares the lock to engage automatically when the hook is raised.

Fold: Set Wing Locks to ROAD
Fold: Two Mid-Wing Locks to ROAD
Refer to Figure 36
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.

Note: A weldment on the plate resets the pin for automatic FIELD configuration at next tilt-down.
Fold: Two Wing End Locks to ROAD

Refer to Figure 37
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.

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

Fold: Tilt Wings Up

Drill configuration and wing lock setup must be complete (step 1 through step 7 starting on page 45) before performing the next steps.

Refer to Figure 38
8. On the CFM switch, enable the Tilt solenoid valve by setting switch Tilt on.

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

10. Observe the tilt-up operation.

11. When movement stops, end cylinder extension.
12. Disable the Tilt solenoid valve.

**Fold: Set Tractor for Fold**

13. If tractor movement during fold is acceptable: set steering straight ahead, put tractor transmission in neutral, release tractor parking brake. To avoid drill movement during fold, use chocks.

**Fold: Fold Wings**

Configuration checking, opener lift, FIELD-to-ROAD locks and tractor preset (step 1 through step 13 starting on page 45) must be completed before performing the next steps.

*Refer to Figure 41*

14. On the CFM switch, enable fold.

15. Actuate the fold/tilt/marker circuit to extend the fold cylinders.

*Refer to Figure 42*

16. Watch for tongue lock un-hook.

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

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

Note: If tractor movement is not desired: put tractor transmission in Park, set tractor parking brake, and release drill brakes (if drill is brake-equipped, and tractor can separately control drill brakes).

Note: Some tractor movement may be required to release the tongue hook and/or bring the folded wings within reach of the transport hook.
Refer to Figure 26
17. Continue folding until wing locks are above the transport hooks.

18. When the wings are fully folded, stop cylinder extension and hold wings at folded.

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

Fold: Engage Transport Hook
20. Extend the transport hook cylinder:

Refer to Figure 23
21. Observe wings and gauge wheels raising during hook.
22. When cylinder is fully extended, set circuit to Neutral.

Refer to Figure 46
23. Verify that the transport hook lock channel has engaged the cylinder rod. If not, use the handle to pivot the channel onto the rod.

Fold: Two Frame Locks to ROAD

Refer to Figure 47
24. Pull the wire handle outward from FIELD slots and move to forward ROAD slot. This moves a hook (not shown) into engagement, preventing the openers from lowering.

It may be necessary to extend the opener lift circuit to ensure that the centre section transport hooks are engaged. Wing openers are restrained by ROAD locks, and will not move significantly while assuring centre lock-up.
Transporting the Air Drill

Transport Safety Information

**DANGER**

*A. 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 drill exceeds the load rating of the vehicle.

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

**WARNING**

*A. Excessive Speed Hazard:*
Maximum transport speed is 30 km/h 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**

*A. Unexpected Wing Tilt-Down or Unfold Hazard:*
Use transport locks (wing and centre 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**

*A. 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 over-tightened 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**

*A. 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.

*Note:* 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 drill can vary by thousands of pounds, even if it is the same base model, due to installed options and/or after-market equipment.

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

Transport Checklist

- Plan the route. Avoid steep hills. Keep Clearances in mind. Folded, your NTA907 or NTA3007 is just under 4.1 m (13.5 feet) high and just under 3 m (10 feet) wide.

- Hitch.
  Make hydraulic, electrical and optional braking connections. See “Hitching Tractor to Drill” on page 27.

- Close hopper lids (page 55).

- Check that ladder (page 54), auger (page 64) and markers (page 73) are stowed.

- If unfolded, raise, tilt, fold and hook drill. See “Folding the Drill” on page 44.

- Remove wheel chocks.

- Always have lights on for highway operation. Verify that Model NTA907 rear beacon switch is on (page 31).

- Comply with all national, regional and local safety laws when travelling on public roads.

- Release all brakes and travel with caution.

Typical NTA907 or NTA3007 Weights

<table>
<thead>
<tr>
<th></th>
<th>NTA907 -3610 (36 rows)</th>
<th>NTA3007 -4875 (48 rows)</th>
<th>NTA907 -6006 (60 rows)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Drill Weight</td>
<td>9 900 kg</td>
<td>21,900 lb</td>
<td>10 800 kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>23,900 lb</td>
</tr>
<tr>
<td></td>
<td>11 700 kg</td>
<td>25,900 lb</td>
<td></td>
</tr>
<tr>
<td>Add for Augers</td>
<td>600 kg</td>
<td>1,300 lb</td>
<td>800 kg</td>
</tr>
<tr>
<td></td>
<td>1,800 lb</td>
<td>1,800 lb</td>
<td>1 000 kg</td>
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<tr>
<td></td>
<td>2,200 lb</td>
<td>2,200 lb</td>
<td>2,200 lb</td>
</tr>
<tr>
<td>Add for Markers</td>
<td>290 kg</td>
<td>650 lb</td>
<td>290 kg</td>
</tr>
<tr>
<td></td>
<td>650 lb</td>
<td>650 lb</td>
<td>650 lb</td>
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<tr>
<td></td>
<td>700 kg</td>
<td>1,400 lb</td>
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<td></td>
<td>1,400 lb</td>
<td>1,400 lb</td>
<td>1,400 lb</td>
</tr>
<tr>
<td></td>
<td>700 kg</td>
<td>1,400 lb</td>
<td>1,400 lb</td>
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<tr>
<td>Add for Brakes</td>
<td>100 kg</td>
<td>220 lb</td>
<td>100 kg</td>
</tr>
<tr>
<td></td>
<td>220 lb</td>
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<tr>
<td>Maximum Empty Drill</td>
<td>11 600 kg</td>
<td>25,600 lb</td>
<td>12 700 kg</td>
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<tr>
<td></td>
<td>28,000 lb</td>
<td></td>
<td>13 800 kg</td>
</tr>
<tr>
<td></td>
<td>30,400 lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Add for Maximum Load</td>
<td>8 500 kg</td>
<td>18,700 lb</td>
<td>8 500 kg</td>
</tr>
<tr>
<td></td>
<td>18,700 lb</td>
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<td>8 500 kg</td>
</tr>
<tr>
<td></td>
<td>18,700 lb</td>
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<td>18,700 lb</td>
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<tr>
<td>Maximum Loaded Drill</td>
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<td>21 200 kg</td>
</tr>
<tr>
<td></td>
<td>46,700 lb</td>
<td></td>
<td>22 300 kg</td>
</tr>
<tr>
<td></td>
<td>49,100 lb</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Brake Operation (Option)

Main transport wheel brakes are standard on model NTA907. Brakes are not standard on model NTA3007. There are brake shoe pairs on each of the four forward main transport wheels. The shoe pairs are operated by an air system on the drill. 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.

See also:
page 29 - “Brake Hook-Up (Option)”
page 120 - “Brake Troubleshooting (Option)”
page 135 - “Brake Maintenance (Option)”

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 behaviour 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.

Roll-Away Hazard:
Block tires with wheel chocks before unhitching drill. The parking jack is not a sufficient restraint for a drill parked on unlevel ground. An unsecured drill could roll away, causing an accident resulting in death, injury and substantial property damage.

Both versions of the service brake system to the tractor are spring-release on the drill. Drill braking is released shortly after unhitching the drill.

<table>
<thead>
<tr>
<th>Tractor Braking-Related Event</th>
<th>Typical Trailer Brake Port Response</th>
<th>Record How Your Tractor Operates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal tractor braking</td>
<td>Actuates trailer brakes</td>
<td></td>
</tr>
<tr>
<td>Differential tractor braking</td>
<td>Reduced trailer braking</td>
<td></td>
</tr>
<tr>
<td>Tractor Parking Brake</td>
<td>Actuates trailer brakes</td>
<td></td>
</tr>
<tr>
<td>Tractor Emergency Brake</td>
<td>No effect on trailer brakes</td>
<td></td>
</tr>
<tr>
<td>Tractor transmission to Park</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 48
Hydraulic/Hydraulic Brakes
**CAUTION**

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

![Diagram of Air/Hydraulic Brakes]

**Figure 49**
Air/Hydraulic Brakes
Ladder Operations

Ladder Safety Information
Refer to Figure 50 and Figure 51

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 a spring-loaded pin.

Ladder may be lowered, used and raised with wings folded or unfolded, openers raised or lowered.

**CAUTION**

**Falling Ladder Hazard:**
Make sure the pin 1 is fully engaged when ladder is in the raised (folded) position. If the ladder is not pinned, it could slowly unfold during transport, striking other users of the roadway or fixed obstructions. This could result in machine damage, property damage, serious injury or death. The ladder must be securely folded up for transport, and should be securely folded for storage, to discourage climbing by children.

**Deploying Ladder**
Use one hand to support the ladder, while pulling pin 1 to the right. Slowly swing the ladder fully down.

The gas spring provides resistance to ladder motion in both directions. If the ladder swings freely, the spring may be in need of replacement.

**Using Ladder**
Ascend and descend the ladder while facing the drill. Use the handrails when on the higher steps.

**WARNING**

**Falling / Crushing / Overhead Hazards:**
Allow no one to ride on the ladder or walkboard while the machine is in motion. A simple fall could result in serious injury or death. A fall in transport could result in being run over by the cart or other vehicles. Someone standing on the walkboard also becomes the tallest point, higher than the transport clearance required.

**Storing Ladder**
The pin automatically engages the ladder during storage. Carefully swing the ladder up, until you hear and see the pin 1 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 odours to alert you to the hazard.

**CAUTION**

**Blowing Debris and Inhalation Hazards:**
Turn off fan before opening hopper lids. Wear eye protection and dust mask or respirator. Hoppers are mildly pressurized and air is circulating in the hopper when the fan is running. Opening a lid with the fan running can expose you to blowing seed, fertilizer and treatment chemicals. Even with the fan off, adding seed or fertilizer will create a dust cloud. Risks include exposure to hazardous chemicals, lung and eye irritation.

**NOTICE**

**Planting Consistency Risk:**
Check lid seals for damage at frequent intervals. Check that latch closes lid tightly. Check hopper pressure reported by the seed monitor. Avoid metering problems caused by air leaks. Air leaks can cause irregular metering of materials.
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 65
“Unloading Materials” on page 77
“Material Clean-Out” on page 124

Lid Opening
Refer to Figure 52
1. Lift handle ①.

Refer to Figure 53 and Figure 54
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 54
4. Lift lid slightly at pivot end to clear strainer ③.
5. Swing lid away from walkboard. Open only enough to accomplish the present task.

Lid Closing
Refer to Figure 54, Figure 53 and Figure 52
1. Swing lid over opening until capture hook ② is centred 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 lid opening, preventing 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, and bolts are removed.
If the strainer needs to be removed for cleaning, do not perform these steps until immediately ready to clean the strainer and return it to the hopper:
- Wear gloves suitable for protection against recent fertilizers or seed treatments.
- Fully open the hopper lid.
- Remove four restraining bolts.
- Lift the strainer out of the hopper.
- Immediately close and latch the lid (below).
- Clean and dry the strainer.
- Return it to the hopper.
- Re-secure the restraining bolts.

Meter Doors
Refer to Figure 56 and Figure 57 (which depict an earlier version of the meter without the gate handle extension and guards - do not operate without guards installed)
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**

**Material Loss / Air Leak Risks:**
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.

Refer to Figure 57 (which depicts an earlier version of the meter without the gate handle extension and guards - do not operate without guards installed)

1. Pull out on the clamp handle extension (not shown) until the handles are just loose.
2. 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 the handle extensions up until the handles are just past vertical.
4. 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 5.3 m (17.5 feet) above ground level during positioning operations. If the auger gets too close to, or contacts a power line, nearly all metal parts of the drill and tractor 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 65, and
“Unloading Materials” on page 77.

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 58
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

Machine Damage Risk:
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 un-latching at the front end.

Refer to Figure 59
1. Squeeze the lock lever ⑨. 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 60
3. Set either interconnected auger hydraulic motor direction control handle ⑧ to OFF (the centre 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.

Note: For material unloading, leave the arm pinned at the storage height unless it needs to be lowered for the unloading operation.
Refer to Figure 61
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 61
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.

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

See “Unloading Materials” on page 77 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 60).

Selector Valve

Refer to Figure 63

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.

Auger Movement and Sudden Noise Hazards:

- Do not operate the selector 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 centre-off position before moving handle to A).
- Handle Rear: Fan-enable (make sure circuit is off before moving handle to F).

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.

Figure 63

Auger/Fan Selector Valve
Auger Direction Valve

Refer to Figure 64

A valve ① toward the inlet end of the auger tube controls the direction of auger helicoid screw rotation. This valve is “centre 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 centre-Off when not moving material at the moment.

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

Note: 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 centre-OFF. Note the direction of auger helicoid movement. When moving material, adjust speed as needed.

When auger operations are completed:

6. Set the auger direction control valve to centre-OFF.

7. Shut down tractor hydraulics, or set the auger/fan circuit to Neutral or Float.

8. Set the auger/fan selector valve to FAN.

Equipment Damage Risk:

Do not make sudden or full-stroke movements of the tractor hydraulic circuit controls with the auger circuit active. A remote circuit capable of operating the fan has enough hydraulic flow to damage the auger motor.
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 65
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 risk of 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 2. 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 3 forward and rotate auger tube so that valves are on top. Outlet tube 7 must face right (horizontally away from drill) to provide maximum clearance during fold and tilt.

5. Swivel inlet hopper to horizontal.

   Pull pin 4 at inlet. Rotate hopper to horizontal, inlet facing to drill left.

6. Remove rear arm pin 5 from clevis on frame.


Refer to Figure 66
8. Close clamping straps 1, 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**

Possible Agricultural Chemical Hazard:
Treatments on seeds, and components of fertilizers, can be dangerous. Improper use can seriously injure persons, animals, plants, as well as damage soil and property.

▲ Do not use liquid treatments with the NTA907 or NTA3007.
▲ 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 55.

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 enterprise 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 the drill to a tractor with adequate weight and power. Park drill on solid, level ground. See Tractor Requirements, “Specifications and Capacities” on page 163. If a suitable tractor is not available, block multiple tires.

4. Raise openers (page 43) and fold drill (page 46). 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 54).

Loading: Select Hoppers to Use

6. Favour 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 67 (which depicts an earlier meter style without guards or door extension handles - do not operate without guards)

7. At each empty hopper to be loaded, if meter box clean-out door was completely closed, open it. See “Meter Doors” on page 57.

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 55).

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

Note: 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>Suggested Hopper Allocations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Front Hopper</strong></td>
</tr>
<tr>
<td>Empty</td>
</tr>
<tr>
<td>Seed</td>
</tr>
<tr>
<td>Seed (use first)</td>
</tr>
</tbody>
</table>

Material Rate Risk:
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.

Figure 67
Hopper Unloading Door
Loading: with Auger

Refer to Figure 68

If the auger is not used for material load, skip to step 26.

15. Deploy auger (page 59).
16. Configure hydraulics from fan to auger (page 62).
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 centred 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 centre 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 64).
25. When circuit is off, set diverter to up (pass-through to markers or fan). See “Auger Hydraulic Controls” on page 62

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 54).

Note: Hopper fill level indications are moulded into the side of the Hopper.
Collection Chute Operation

Refer to Figure 69 and Figure 70 (Figure 69 shows the location of the storage bracket ① under the front hopper (light gray), and the chute ② after removal or before storage)

Because the front meter has only modest clearance below it to the centre row units, a collection chute ② is provided for calibration and clean-out.

The chute may be used with the front or rear meter, and may be installed to deliver material ahead or behind the meter.

⚠️ CAUTION

Overhead Object Hazard:
Employ two persons to remove and store the chute. It weighs 17 kg (42 pounds) and can fall suddenly if improperly removed.

The chute is stored on four hooks of a bracket ① at the rear of the front hopper.

To remove the chute, have each person support the top with one hand, and lift the mid-point edge ③ just free of the narrow lower bracket hook slots ④. Then raise the chute until the top pivot pins ⑤ are free of the larger upper bracket hooks ⑥.

To store the chute, lift the pivot pins into the upper bracket hooks. Swing the bottom of the chute toward the lower bracket hook slots. Raise the bottom of the chute just enough to engage the mid-point edge in the lower hook slots.

Using the Collection Chute

1. Move the drill to a surface suitable for lowering the row units. The chute cannot be used with the centre openers raised. The drill does not need to be unfolded (and calibration or clean-out may be more convenient with the drill partially or fully folded).

2. Lower the row units (page 42).

3. If the task is calibration:

   Open the calibration door on the meter, and wipe seed off the door and flanges before installing the collection chute. See manual 167-085B for complete details of calibration.

   Close the door. The chute cannot be installed with a door open.

4. Choose a desired orientation for the chute.

5. Slide the chute lips ⑦ fully onto the meter side rails ⑧.

6. For calibration, attach the calibration bag to the hooks ⑨ at the outlet end of the chute.

7. Open the appropriate meter door for calibration or clean-out.

   For calibration, at the end of sample generation, it is likely to be necessary to wipe residual seed out of the chute and into the bag.
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

Machine Damage / Invalid Results Risks:
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 the meter gear box.

Note: 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 71 (which depicts an earlier version of the meter, without handle extensions or guards - do not operate the meter without guards)

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.

NOTICE

Material Loss Risk:
With material loaded, open only the calibration door (front, meter air inlet side). Do not open the clean-out door (rear door, meter air outlet side) or material will flow in large quantities. It is generally not possible to re-close the clean-out door, with sufficient air seal, until the hopper is empty.
Operating the Hand Crank

Refer to Figure 74 or Refer to Figure 75

1. Raise drill (page 43). Contact drive tires cannot be turned by hand with drill lowered.

2. For more convenient cranking at contact drive wheels, fold wings (page 44).

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 front meter, install collection chute (page 68).

6. For calibration, record weight of calibration bag. Hook bag to meter or chute under test.

7. Move crank handle from storage stob to shaft of left or right outside contact drive wheel.

8. Turn the hand crank to simulate meter operation during planting.

9. 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, “Unloading Materials” on page 77, and “Storage” on page 82.

In general, you may operate the crank as fast as is comfortable. For reference, at a field speed of 10 km/h (6.2 mph), the contact drive shaft 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 84.
Fan Operation

Fan Safety Information

**WARNING**

*Rotating Fan Blade Hazard:*
Do not operate the fan with guard screen removed. The 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**

*Sudden Auger or Fan Movement:*
Set FAN/AUGER selector valve (if present) to FAN before activating tractor hydraulic remote for fan hydraulic circuit. If the fan does not start when slowly moving circuit lever, set lever to Float or Neutral and check selector valve.

**NOTICE**

*Machine Damage Risk:*
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.

Note: 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. The fan is running in reverse, the auger material movement direction is also reversed (relative to the decal illustrations).
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 76
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 98). Let the fan warm up for 15 minutes before planting.
6. Lower the drill 1.5 to 3 m (5 to 10 feet) before planting is to begin. It takes a few seconds for seed to travel from the meters to the rows.

**NOTICE**

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

Do not reverse hydraulic flow with the fan running.
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.

**Fan Setup: 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>Extend</td>
<td>Float or Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
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</tbody>
</table>

**Planting: Hydraulic Circuit Operation**

<table>
<thead>
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<th>Transport Hooks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retract</td>
<td>Extend</td>
<td>Neutral</td>
<td>Neutral</td>
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</table>

**End Planting: Hydraulic Circuit Operation**

<table>
<thead>
<tr>
<th>Lift</th>
<th>Fan, Auger</th>
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<tbody>
<tr>
<td>Extend</td>
<td>Float or Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
</tr>
</tbody>
</table>
Marker Operation (Option)
Dual markers are optional on the NTA907 or NTA3007. See “Markers” on page 159 for ordering information.

Marker Safety Information

⚠️ DANGER ⚠️
Electrocution Hazard:
Keep clear of overhead power lines when operating markers. The markers can reach 7.3 m (24 feet) 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 discs 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 part of the markers during marker operations. The marker mechanism has numerous points where crushing or shearing injury can occur.

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

NOTICE
Machine Damage Risk:
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 183,
“Marker Adjustments” on page 115, and;
“Marker Maintenance” on page 133.
**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 133.

**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 5 m (15 feet) of marker arms on both sides of the drill.

Note: Which 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/drill configuration. Additional or fewer steps may be necessary depending on tractor features, drill options and planting accessories.

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<td>Check seed monitor terminal and observe any diagnostic messages</td>
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<tr>
<td>Configure seed monitor for crop</td>
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</tr>
<tr>
<td>Set CFM MASTER off, and Marker switch on (if markers will be used).</td>
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a. Refer to DICKEY-john® Air Cart Control manual.

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<tr>
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<td>Check wheel scraper gaps (if installed)</td>
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<tr>
<td>Check chain tension. Re-connect any loose idler tensioning springs.</td>
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</table>

a. Refer to Seed Rate manual.

Hopper and Air System Checklist

| Material loaded                         | 65   |
| No air leaks (except from seed box)    | -    |
| Hose routings - no sags, no pinches (check wing-folded & field positions) | -    |
| Hoses fully connected to meters, towers and openers | -    |
Field Operation
Perform all steps in See “Pre-Start Checklist” on page 33 and See “Final Field Checklists” on page 75.

**Begin Pass: 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>Extend</td>
<td>Extend then Neutral</td>
<td>Neutral</td>
</tr>
</tbody>
</table>

**First Pass Operation Checklist**

1. Drill unfolded and aligned for first pass, with opener discs about 3 m (10 ft.) before field edge.  
2. Run fan for at least 15 minutes before planting.  
3. CFM MASTER switch on  
4. Unfold marker on next-row side.  
5. Set fan hydraulic circuit to low flow, engage circuit. Gradually adjust fan hydraulic flow to obtain 3800 rpm.  
6. Check seed monitor for alerts.  
7. Pull forward, lower drill, and begin planting for a short distance.  
8. Stop. Assess:  
   • coulter depth  
   • planting depth  
   • press wheel operation  
9. Make necessary adjustments  
   a. Refer to Seed Rate manual.

**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  
  (seed rate control, optional)  
- Ground speed monitoring

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

**Sharp Field Turns Checklist**

1. Fold marker  
2. Raise drill  
3. Make turn  
4. Unfold marker on next-row side.  
5. Lower drill 3 m / 10 feet before field edge  
6. Resume planting.

**Suspending Planting Checklist**

1. Stop tractor  
2. Fan hydraulic circuit to Float or Neutral  
3. Fold marker  
4. Raise drill  

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

**Ending Planting Checklist**

1. Suspend operations as above, then  
2. Set wing transport locks to ROAD  
3. Tilt wings up  
4. Set tractor for fold  
5. Fold wings  
6. Hook wings  
7. Set mainframe transport locks to ROAD  
8. CFM MASTER off  
9. Beacon switch ON (NTA907 only)  
10. Lights ON for transport
Unloading Materials

Unloading Safety Information
Unloading materials has the same risks as loading material. Review the advisories on page 65.

Unloading Without Auger
1. Raise, fold, tilt and hook drill (page 44).
2. Position drill on smooth paved surface, or large tarp. Put tractor in Park and shut off tractor.
3. If unloading front hopper, employ the collection chute (page 68) or drape a tarp over the openers, to ease clean up.
4. Lower ladder (page 54), and open lid (page 56) 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 80 (which depicts an earlier version of the meter without handle extensions or guards - do not operate the meter without guards)
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 69). 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 See “Material Clean-Out” on page 124.
10. If unloading front hopper, and chute was not used, 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. Store collection chute if used. 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.

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 property.

Entrapment and Rapid Suffocation Hazard:
Never enter a hopper for loading or unloading.
Auger Unloading: Rear Hopper

1. Position drill well clear of overhead electrical lines.
2. Raise openers (page 43) and fold wings (page 45).
3. Lower openers (page 42) to provide maximum clearance at centre section.
4. Shut down hydraulics or set Fan/Auger circuit to Float or Neutral.
5. Open lid slightly on rear hopper.
   
   **Refer to Figure 81**
6. Deploy auger (page 60).
7. Swing inlet hopper under rear meter.
   
   (see page 80 for additional steps if unloading front hopper)
8. Position collection bin or vehicle under auger outlet.
9. Install the calibration crank (page 69).

---

**Unload Prep.: 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>Float or Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
</tr>
</tbody>
</table>

---

**Figure 81**

Unload Rear Hopper with Auger
Refer to Figure 81 (which depicts an earlier version of the meter, without door handle extensions or guards - do not operate your meters without guards)

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 centre/off.

Refer to Figure 83

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

13. Actuate 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.

<table>
<thead>
<tr>
<th>Auger Unload: Hydraulic Circuit Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lift</td>
</tr>
<tr>
<td>Neutral</td>
</tr>
</tbody>
</table>
Refer to Figure 83 (which depicts an earlier version of the meter without handle extensions or guards - do not operate the meter without guards)

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 \( \text{\#2} \) 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 centre/off.


20. If the drill will not be used again for an extended period, complete the steps at See “Problem Clean-Out” on page 125.

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 77) 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 78, remove the auger inlet hopper.

- 7c. After step 7(b), manoeuvre inlet hopper under inlet.
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 56.
3. Remove jack from storage position and pin securely to lifting stob on outside of drill tongue. See “Hitching Tractor to Drill” on page 27.
4. If ground is soft, place a wide block or plate under the jack to increase contact area.

Note: Static tongue weight of a folded, tilted and hooked drill can be as much as 2180 kg (4800 pounds).
5. Securely block drill tires with chocks (page 31) to prevent jack from digging or sliding off plate.
6. If drill is equipped with optional brakes, disconnect the brake lines at the hitch.

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 colour-coded gladhand holder on the drill.
7. Un-hook 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.

WARNING

ROLLING HAZARD

1. Use provided chock blocks to chock cart tires in direction of grade when machine is parked.
2. Chock both sides of wheel if grade is unmeasured.
3. Use only after parking brake is applied and tested.
4. Always test chocks to ensure they meet requirements.
5. Do not drive over wheel chocks.

IMPROPER USE MAY RESULT IN PRODUCT FAILURE
SELECT WHEEL CHOCK ACCORDING TO VEHICLE TYPE AND SIZE
ALWAYS USE IN PAIRS AND ON FIRM SURFACES
MULTIPLE PAIRS MAY BE REQUIRED IN EXTREME CONDITIONS
CHOKE IN DIRECTION OF GRADE
CHOKE BOTH SIDES OF WHEEL IF DIRECTION OF GRADE IS UNDETERMINED
USE ONLY AFTER PARKING BRAKE IS APPLIED AND TESTED
CENTER CHOCKS SNUGLY AND SQUARELY AGAINST TREAD OF EACH WHEEL
ALWAYS TEST CHOCKS TO INSURE THEY MEET REQUIREMENTS
DO NOT DRIVE OVER WHEEL CHOCKS

Figure 85
Parking Stand in Use
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 77.

2. Un-latch 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 69. 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 59

5. Return the auger to its cradle with the hopper in the extended storage orientation. See “Storing Auger” on page 64.

6. If equipped with optional air/hydraulic brake system, drain water from reservoir (page 137).

7. Remove the drive chains and store in oil.

8. Lubricate the drill at all points listed under “Lubrication and Scheduled Maintenance” on page 148.

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 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.
Adjustments

Adjustments Summary

To get full performance from your NTA907 or NTA3007, 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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DICKEY-john® manual 110011375
DICKEY-john® manual 167-085B
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 or NTA3007 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 166.

Always replace worn tires with the correct size.

Check Flute Shaft Type

For some unusual very high rate applications and some small seeds, Great Plains offers alternate meter flute shafts (page 158) that change rates to 150%, 200% or ~25% vs. the factory standard shaft.

Refer to Figure 86 (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 standard meter flute shafts with 2 “stars” (4 halves) per outlet. How many and what type of “stars” you have determines which rate chart to use.

Refer to Figure 87 (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 or 2), and filler rings (3) at active outlets.

On a standard “2 star” shaft, each seed drop outlet contains two standard flute sets (4 halves ①), each pair staggered slightly from the next. Unused outlets are fully blocked by filler rings ②.

On a “3 star” shaft, each outlet contains 3 flute ① sets. On a “4 star” shaft, each outlet contains 4 flute ① sets, with no fillers between adjacent drops.

On a small seed shaft, each outlet contains one set of shallow flutes ②.

See also “Changing Meter Flutes” on page 185.
Find Your Chart and Rate

Standard “2 star” rates are in the main section of the Seed Rate Manual. “3 star”, “4 star” and Small Seeds 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.

Note: 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, 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:

\[
\text{Chart Rate} = \text{Field Rate} \times \text{Lookup Factor}
\]

To find the rate to check at calibration:

\[
\text{Cal Rate} = \text{Field Rate} \times \text{Twin Factor}
\]

Adjustment for Small Seeds

Small Seeds rates are provided for some\(^a\), but not all seeds that might be compatible with the optional smaller/shallow flute shaft. If the seed has a chart for the standard shaft, choose a chart rate that is about 500% (5x) the desired field rate. The Small Seeds shaft meters at between 20% and 50% of the standard shaft.

\(^a\) See “Tested Small Seeds” on page 158.

<table>
<thead>
<tr>
<th>Hoppers for this Material</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Single or Sequential</strong></td>
</tr>
<tr>
<td><strong>2 Stars</strong></td>
</tr>
<tr>
<td>Chart would be 1x rate</td>
</tr>
<tr>
<td>LookupFactor = 1.0</td>
</tr>
<tr>
<td>TwinFactor = 1.0</td>
</tr>
<tr>
<td><strong>3 Stars</strong></td>
</tr>
<tr>
<td>Chart would be 1.5x rate</td>
</tr>
<tr>
<td>LookupFactor = 0.67</td>
</tr>
<tr>
<td>TwinFactor = 1.0</td>
</tr>
<tr>
<td><strong>4 Stars</strong></td>
</tr>
<tr>
<td>Chart would be 2x rate</td>
</tr>
<tr>
<td>LookupFactor = 0.5</td>
</tr>
<tr>
<td>TwinFactor = 1.0</td>
</tr>
</tbody>
</table>

For Example:

Drill: NTA907-4875
Crop: Barley (no high rate flute chart available)
Field rate: 500 kg/ha (above 2 flute chart coverage)
Flutes: 3 star
Metering: simultaneous dual hopper
\[165 = 500 \times 0.33\]
Look up the settings for 165 kg/ha

Continuing the example:

Field rate: 500 kg/ha
\[250 = 500 \times 0.5\]
Calibrate each meter to 250 kg/ha
Monitor Material Configuration

The DICKEY-john® IntelliAg® monitor reads meter shaft speeds and can report kg/ha (or pounds/acre) 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/litre. 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 NTA907 or NTA3007).

“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.

Note: Always enter Density Units before entering the Density value. Changing the value of Density Units will alter the value of Density.

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-litre (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 NTA907 or NTA3007).

“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.
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” - [ 360 ]

“Gear Ratio” - [ 1 ]

“Channel Width” - is your Implement Width (swath) in inches (cm). Precise row/swath data is found on page 163 (for NTA907) and page 164 (NTA3007).

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.

If the drill has the optional Variable Rate feature installed, also set up a Controlled Material and an Actuator Channel. See manual 166-263M for details.

Meter Rate Adjustment

Seed rate is determined by:

• Flute shafts (covered on page 84):
  standard 2-star/1x rate, or
  optional 3-star/1.5x or 4-star/2x rates
• Single/twin hopper metering.(covered on page 85)
• 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 88 and Figure 89

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 labelled “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 88 and Figure 89 for setting the seed meter final drive range.

### FINAL DRIVE RANGE

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

**CAUTION**

**Pinch / Crush Hazard:**

Install guards before calibrating or operating. Gears are motion during calibration, even though the implement is stationary. The figures above depict an earlier version of the meter, without guards. Do not operate the current meters without guards.
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.

- Manual: On the standard NTA907 or NTA3007 drill, the control arm is manually positioned with a crank. The initial setting is based on the seed rate chart, and refined via calibration.
- Servo: With the optional Variable Rate Kit, the control arm is positioned by a linear actuator (not shown). The setting is commanded by the seed monitor, based on the rate entered on the seed monitor console, and the current Calibration Constant. The initial “Cal. Const.” is found in the seed rate chart, and refined via calibration.

Refer to Figure 90

Manual Rate Setting
1. Consult the seed rate chart for your crop, flute stars and rate Range. Note the gearbox setting.
2. Remove the hairpin cotter securing the gearbox adjustment crank.
3. 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.
4. Re-insert the hairpin cotter.

Variable Rate (Servo) Rate Setting
1. Consult the seed rate chart for your crop, flute stars and rate Range. Note the “Cal. Const.”
2. Enter the chart Calibration Constant on the seed monitor (for the Channel associated with the hopper and gearbox). If you have calibrated this seed, use the recorded Cal. Const. developed from that calibration.
3. Enter the desired material rate on the seed monitor (for the Channel associated with the hopper and gearbox).

Note: 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.

Note: 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.

Note: The hand crank is present on both manual drills, and (servo) drills with the Variable Rate kit. On servo drills, the crank is disconnected from the control arm. To revert to manual control, move the coupler pin from the servo control arm to the manual control arm.
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 Dry 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 (or control) the planting rate of your particular seed or dry fertilizer.

The seed monitor must be setup for the drill, and if a variable rate kit is installed, there is additional setup for that. See “Monitor Material Configuration” on page 86.

The seed monitor must also be correctly set up for the material(s), or the calibration will not result in useful monitor displays, and may cause incorrect application rates if a variable rate kit is installed.

Calibration: Common First Steps

The calibration is different for manual (crank-adjusted) and servo (variable rate kit) gearboxes. These first steps are common to both gearbox types.

The right column contains an example for the following steps.

1. Raise drill (page 43): This prevents the contact drive wheel from engaging the transport tire.
2. Turn on the seed monitor.
3. Determine the Range and gearbox settings from the rate charts.
4. If your material has a density that is significantly different from that used to generate the chart, you may want to adjust the density before choosing the initial gearbox setting and Range.

\[ \text{Factor} = \frac{\text{ChartDensity}}{\text{MaterialDensity}} \]

\[ \text{Adjusted Rate} = \text{Target Rate} \times \text{Factor} \]

5. Set Range (page 88); Set the Final Drive Range gears per the seed chart or dry fertilizer chart.
6. Load material (page 65): Make sure there is enough material in the hopper(s) for at least \( \frac{1}{40} \) hectare (or \( \frac{1}{10} \) acre) plus an extra 35 to 45 kg (75 to 100 lbs.).

Agricultural Chemical Hazards:

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

<table>
<thead>
<tr>
<th>Seeding Example</th>
<th>Calibration Targets: Metric</th>
<th>U.S. Customary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop: Wheat</td>
<td>Wheat</td>
<td></td>
</tr>
<tr>
<td>Flutes: 2 Stars</td>
<td>2 Stars</td>
<td></td>
</tr>
<tr>
<td>Drill: NTA907-6006</td>
<td>NTA3007-6006</td>
<td></td>
</tr>
<tr>
<td>Target Seed Rate: 200 kg/ha</td>
<td>178 lbs/ac</td>
<td></td>
</tr>
<tr>
<td>Chart Data:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Range: High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Closest Chart Rate: 201.3 kg/ha</td>
<td>179.6 lbs/ac</td>
<td></td>
</tr>
<tr>
<td>Initial Variable Rate: 62 kg/ha</td>
<td>62 lbs/acre</td>
<td></td>
</tr>
<tr>
<td>Gearbox setting:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial Calibration Constant: 79197</td>
<td>79197</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fertilizer Example</th>
<th>Drill: NTA907-6006</th>
<th>NTA3007-6006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material: Dry Fertilizer</td>
<td>Dry Fertilizer</td>
<td></td>
</tr>
<tr>
<td>Material Density: 0.82 kg/litre</td>
<td>51.3 lbs/cu-ft</td>
<td></td>
</tr>
<tr>
<td>Target Rate: 200 kg/ha</td>
<td>178 lbs/ac</td>
<td></td>
</tr>
<tr>
<td>Chart Data Based On:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chart Density: 0.96 kg/litre</td>
<td>60 lbs/cu-ft</td>
<td></td>
</tr>
<tr>
<td>Density Compensation Adjustment Factor: [ \text{Factor} = \frac{0.96 \div 0.82}{60 \div 51.3}, \text{or: } 1.17 ] [ \text{Adjusted Rate} = 200 \times 1.17, \text{or: } 234 \text{ kg/ha, or: } 208.2 \text{ lbs/acre} ]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chart Rate After Density Adjustment:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Range: High</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Closest Chart Rate: 235.5 kg/ha</td>
<td>210.1 lbs/acre</td>
<td></td>
</tr>
<tr>
<td>Initial Variable Rate: 66 kg/ha</td>
<td>66 lbs/acre</td>
<td></td>
</tr>
<tr>
<td>Gearbox setting:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial Calibration Constant: 90509</td>
<td>90509</td>
<td></td>
</tr>
</tbody>
</table>
Refer to Figure 91 (which depicts an earlier version of the meter without the gate handle extension and guards - do not operate without guards installed)

7. Since only one calibration bag is provided, remove one of the final range gears \textsuperscript{1} from the meter that is NOT being tested, to disable it.

8. Open the calibration door \textsuperscript{2} of the meter being calibrated (page 57). The calibration door is the bottom door under the lower (flute) shaft.

\textbf{NOTICE}

\textbf{Material Loss Risk:}
Do not open clean-out door (the door under the upper/agitator) shaft. Opening this door drains the hopper. Once this door is open it is difficult to stop seed flow until the hopper is empty, and it may be impossible to close with an adequate air seal.

Refer to Figure 92

9. Attach crank (page 69): Un-pin crank from storage location, and place over hex shaft at cranking location (jackshaft at left side of frame, ahead of ladder, or either contact drive wheel).

10. Weigh bag: Obtain the calibration sample bag and scale. Zero the scale and weigh the empty bag, or (with the digital scale) set “tare” using the empty bag.

Note: The empty bag weighs 1.53 kg (3.36 pounds) as shipped from the factory.

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

Refer to Figure 93

12. Place container under open calibration door or below exit end of collection chute. If using the calibration bag, loop bag handles over the door handles and hook the bag to the front of the meter.

13. On the seed monitor terminal,

   set the monitor to \textbf{Calibration mode}.

   enter [ 5 ] for the “# Meter Revs”, and

   press the \textbf{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.

For a manual gearbox, continue at step 14 on page 92.

For a servo (variable rate kit) gearbox, continue at step 34 on page 95.
Calibration for Manual Gearbox

Note: For drills with Variable Rate Kit installed, continue at “Variable Rate (Servo) Calibration” on page 95.

Complete step 1 through step 13 beginning on page 90.

14. Set gearbox (page 89): Remove the hairpin cotter securing the gearbox adjustment crank. Rotate crank until the control arm indicator points to the scale setting that matches the rate from the seed rate chart or as determined by any previous calibration of a similar material for the same rate.

15. Re-insert the hairpin cotter.

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

17. Stop cranking. Wipe meter doors. Empty the bag.

18. Push $\rightarrow$ and then $\rightarrow$ and then $\rightarrow$ to get to meter calibration.

19. On the seed monitor terminal, set the monitor to Calibration mode.

   enter [ 5 ] for the “# Meter Revs”, and

   press the Start softkey $\begin{array}{c}
   \text{START}
   \end{array}$

   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.

20. Turn the hand crank to simulate meter operation for $\frac{1}{10}$ ha or $\frac{1}{10}$ ac. See table at right.

   Note: It is important to turn the calibration crank rapidly. Use a comfortable speed not exceeding 2 revolutions per second, which would simulate 10 km/h (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.

   Note: For more accurate results, crank for a full hectare or acre. With two people, the second person can observe the revolution count on the seed monitor.

---

**NOTICE**

Machine Damage / Invalid Results Risks:

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.

Note: 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.

---

<table>
<thead>
<tr>
<th>Calibration Crank Revolutions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NTA907</strong></td>
</tr>
<tr>
<td>Revs/hectare</td>
</tr>
<tr>
<td>Per 1/10th ha</td>
</tr>
</tbody>
</table>

| **NTA3007** | Contact Wheel | Jackshaft |
| Revs/acre     | 425           | 459       |
| Per 1/10th ac | 42.5          | 45.9      |
21. Wipe all the material off the flanges around the meter doors and capture that material in the calibration bag.

22. Accurately weigh the calibration bag plus material. If you have a digital scale, and set a “tare” on the scale, the reading is the sample net weight, so skip step 23.

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

\[ \text{SampleWeight} = \text{TotalWeight} - \text{BagWeight} \]

24. Press the Stop softkey on the monitor and enter the sample net weight (SampleWeight).

The monitor responds with a Calibration Constant.

Push the Save softkey to accept this value.

25. If the sample was based on $\frac{1}{10}$ hectare (or $\frac{1}{10}$ acre), multiply the sample size by 10 to determine application rate per hectare (or acre) at the current variable rate gearbox setting.

\[ \text{CalibratedRate} = \text{SampleWeight} \times 10 \]

If the calibrated rate matches the target rate, skip to step 31. Otherwise...

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

\[ \text{RateDifference} = \text{TargetRate} - \text{CalibratedRate} \]

27. Refer to the seed rate chart for gearbox setting values for the target rate.

---

**Manual Seeding Example; Net Weight (step 23):**

<table>
<thead>
<tr>
<th>Metric</th>
<th>U.S. Customary</th>
</tr>
</thead>
<tbody>
<tr>
<td>TotalWeight is: 23.26 kg gross bag + sample</td>
<td>22.76 lbs. gross bag + sample</td>
</tr>
<tr>
<td>BagWeight is: 1.52 kg</td>
<td>3.36 lbs.</td>
</tr>
<tr>
<td>SampleWeight is: 23.26 - 1.52 = 21.74 kg</td>
<td>22.76 - 3.36 = 19.4</td>
</tr>
</tbody>
</table>

If the calibrated rate turns out to match the desired target rate, record the material details and final Calibration Constant for future reference.

**Manual Seeding Example - Calibrated Rate**

<table>
<thead>
<tr>
<th>Metric</th>
<th>U.S. Customary</th>
</tr>
</thead>
<tbody>
<tr>
<td>CalibratedRate = 21.74 x $10$</td>
<td>19.4 x $10$</td>
</tr>
<tr>
<td>= 217.4 kg/ha</td>
<td>= 194.0 lbs/ac</td>
</tr>
</tbody>
</table>

This is 8% higher than our target rate. However, because the gearbox actuator effect is not linear, we cannot simply adjust the control arm by 4.8%.

**Correction Difference (Seeding Example)**

<table>
<thead>
<tr>
<th>Metric</th>
<th>U.S. Customary</th>
</tr>
</thead>
<tbody>
<tr>
<td>TargetRate = 200 kg/ha</td>
<td>178.4 lbs/ac</td>
</tr>
<tr>
<td>RateDifference = 200 - 217 = -17 kg</td>
<td>178.4 - 194.0 = -15.5 lbs</td>
</tr>
</tbody>
</table>

The calibration run metered too much. You must lower the gearbox setting to compensate.

**Example:**

<table>
<thead>
<tr>
<th>Initial Variable Rate Gearbox Setting: 62</th>
</tr>
</thead>
<tbody>
<tr>
<td>TargetRate</td>
</tr>
<tr>
<td>169.0</td>
</tr>
<tr>
<td>174.3</td>
</tr>
<tr>
<td>179.6</td>
</tr>
</tbody>
</table>

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1. Adjustments 93
28. Determine the amount of rate change for each degree of control arm rotation from the target setting.

    If the calibrated rate was higher than target (as in our example), examine lower gearbox setting values.

    If the calibrated rate was lower than target, examine higher gearbox setting values.

29. Adjust the control arm by the number of degrees needed to adjust for the calibration difference.

    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 corrected setting.

30. To validate the adjustment, run the calibration again, starting at step 14 on page 92, using the new Variable Rate Gearbox scale setting.

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

31. With the present meter satisfactorily calibrated, re-mount the final drive gear removed (if any) from the meter on the other hopper.

32. Repeat the calibration procedure for the other hopper, starting at step 1 on page 90.

Variable Rate (Servo) Calibration

Note: For drills with manual (crank set) gearboxes, use the instructions at “Calibration for Manual Gearbox” on page 92.

Complete step 1 through step 13 beginning on page 90, and “ACC Re-Configuration” from the Variable Rate Kit manual 166-263M. You must have created or selected a Material that matches the material you are about to calibrate.

34. Check that final Range gear pairing is the same on:
   • the chart,
   • the meter, and
   • the Meter gear Range in the Channel Setup.

35. Enter the calibration screen for the Channel assigned to the meter to be calibrated.

   At this time, the linear actuator for that meter’s gearbox becomes active. The scale indicator moves to approximately mid-scale, then stops.

   Pointing to a specific value is not required, but it needs to be in the range 30° to 95°. Great Plains recommends using a scale setting that is close to your expected target rate.

   Use the Inc+/Dec- softkeys on the monitor console to adjust the indicator to the seed rate chart Gearbox Setting value, or at least to within the 30°-95° range.

36. Manually crank the meter for at least the number of turns shown in the table at right for 1⁄10ha or 1⁄10ac.

   The exact number of revolutions, cranking rate, and precise starting and stopping handle angles are not critical, as the system reads meter revolutions accurately, and can compensate for shaft speed, seed size and partial turns.

   What matters is getting a large sample, to reduce errors and increase confidence in the calibration.

Note: By calibrating at or near target rate, and for 1⁄10 ha, you establish a comfort level that the drill is set up correctly, in particular, that you are in the correct gear Range for the desired application rate.

Note: If no “Variable Cal Const” was selected during material setup, crank no more than 2 revolutions per second (120 rpm) for most accurate results.

Servo Seeding Example

<table>
<thead>
<tr>
<th>Calibration Targets:</th>
<th>Metric</th>
<th>U.S. customary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop:</td>
<td>Wheat</td>
<td>Wheat</td>
</tr>
<tr>
<td>Flutes:</td>
<td>2 Stars</td>
<td>2 Stars</td>
</tr>
<tr>
<td>Target Seed Rate:</td>
<td>200 kg/ha</td>
<td>178 lbs/ac</td>
</tr>
</tbody>
</table>

Chart Data:

<table>
<thead>
<tr>
<th>Range:</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closest Chart Rate:</td>
<td>201.3 kg/ha</td>
</tr>
<tr>
<td>Initial Variable Rate Gearbox setting:</td>
<td>62</td>
</tr>
<tr>
<td>Initial Calibration Constant:</td>
<td>79197</td>
</tr>
</tbody>
</table>

Seeding Example; Initial Calibration Screen:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHANNEL 1</td>
<td>1</td>
<td>Example</td>
</tr>
<tr>
<td>Material</td>
<td>Wheat HRW</td>
<td>Example</td>
</tr>
<tr>
<td>Density</td>
<td>0.79 KG/L</td>
<td>61.4 LB/BU</td>
</tr>
<tr>
<td>Calibration Constant</td>
<td>77591</td>
<td>From chart</td>
</tr>
<tr>
<td>Target Meter rpm</td>
<td>20</td>
<td>RPM</td>
</tr>
<tr>
<td># Meter Revs</td>
<td>30</td>
<td>REV</td>
</tr>
<tr>
<td>Pulse Count</td>
<td>0</td>
<td>PUL</td>
</tr>
<tr>
<td>New Calib Const</td>
<td>______</td>
<td></td>
</tr>
<tr>
<td>Total # Towers</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Amount Dispensed</td>
<td>______ KG</td>
<td></td>
</tr>
</tbody>
</table>

Calibration Crank Revolutions

<table>
<thead>
<tr>
<th>NTA907</th>
<th>Contact Wheel</th>
<th>Jackshaft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revs/hectare</td>
<td>1050</td>
<td>1134</td>
</tr>
<tr>
<td>Per 1/10th ha</td>
<td>105</td>
<td>113</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NTA3007</th>
<th>Contact Wheel</th>
<th>Jackshaft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revs/acre</td>
<td>425</td>
<td>459</td>
</tr>
<tr>
<td>Per 1/10th ac</td>
<td>42.5</td>
<td>45.9</td>
</tr>
</tbody>
</table>
37. Wipe all the material off the flanges around the meter doors, on the chute, and capture that material in the calibration bag.

38. Accurately weigh the calibration bag plus material. If you set a “tare” on the scale, the reading is the sample net weight, so skip step 39.

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

\[
Sample\ Weight = Total\ Weight - Bag\ Weight
\]

40. Press the Stop softkey on the monitor and enter the sample net weight (\( Sample\ Weight \)).

The monitor responds with a Calibration Constant.

Push the Save softkey to accept this value.

**Calibration Close-Out**

41. Wipe the calibration door seals. Close the calibration door(s).

42. Re-install any removed final Range gears.

43. Remove and store the calibration crank.

---

**Servo Seeding Example (step 39)**

<table>
<thead>
<tr>
<th>Net Weight</th>
<th>Metric</th>
<th>U.S. customary</th>
</tr>
</thead>
<tbody>
<tr>
<td>TotalWeight</td>
<td>23.26 kg</td>
<td>22.76 lbs.</td>
</tr>
<tr>
<td>BagWeight</td>
<td>1.52 kg</td>
<td>3.36 lbs.</td>
</tr>
<tr>
<td>SampleWeight</td>
<td>23.26 - 1.52</td>
<td>22.76 - 3.36</td>
</tr>
</tbody>
</table>

\[
Sample\ Weight = 23.26 - 1.52 = 21.74 \text{ kg} \quad \text{or} \quad 22.76 - 3.36 = 19.4 \text{ lbs.}
\]
Contact Drive Adjustment

Refer to Figure 94 and Figure 95

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 166). 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.

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 6 for this adjustment. Re-check jam nut adjustment in any case, as force adjustment changes up-limit.

3. Raise openers, to fully compress springs 1.

4. Measure the length 7 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 8 until spring length when lowered is 2.5 cm (1 inch) 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 8 between bottom of spring anchor 9 and top of casting (not to top of jam nuts). The maximum length of exposed thread is 91 mm (3.6 inch).

Contact Shaft Up-Limit

8. With openers raised, at each ground drive, rotate the shaft 4 and check the gap between the shaft and the top of the slot 5. There must be at least 10 mm (0.4 inch) clearance.

9. To adjust the shaft up-limit, loosen all four jam nuts 6 in the spring assembly. Rotate the upper jam nut to set the upper limit of shaft travel. Adjust for 12 mm (0.47 inch) or more slot clearance, and equal clearance on both sides of each ground drive arm assembly. Secure upper jam nut with lower.

Note: With openers lowered in the field, spring extension will be more than 2.5 cm (1 inch). 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 96

All three (3) fan hydraulic lines must be properly connected. See “Hydraulic Hose Hook-Up” on page 28.

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.

Note: 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 to 45 litres per min (8 to 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.

Note: 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 litres (15 bushels) of seed remains in the system when the sensor first indicates box empty.

Recommended Fan Speeds

<table>
<thead>
<tr>
<th>Seeds</th>
<th>Fan RPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunflowers</td>
<td>2250 - 3000</td>
</tr>
<tr>
<td>Wheat</td>
<td>3250 - 4000</td>
</tr>
<tr>
<td>Soybeans</td>
<td>2750 - 3500</td>
</tr>
<tr>
<td>Milo</td>
<td>3250 - 4000</td>
</tr>
</tbody>
</table>
Implement Lift Switch Adjustment

Refer to Figure 97 and Figure 98

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 (centre section, right parallel arms).

⚠️ 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 centre section sub-frame at this height with jack stands or blocks.

Loosen switch pivot screws ②. Adjust switch angle so that toggle ③ ④ is level, or slightly tilted up to the rear.

Loosen bracket bolts ⑤ and slide switch ① up or down until the flexible switch toggle ⑥ is just past the point at which the switch is actuated (flexible switch toggle deflected down).

Note: 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 Adjustments

Planting depth is affected by several adjustments, summarized here:

Refer to Figure 99

1. Soil Conditions:
   Changes in field conditions can require changes to several of the adjustments below.

2. Row Unit Opener Depth: (page 114)
   The T-handle directly controls opener depth by setting the press wheel height.

3. Wing Weight Transfer: (not shown, page 107)
   If the wings are not operating at desired planting depth, more centre section weight may need to be transferred to wings.

4. Row Unit Spring Adjustment: (page 111)
   Several rows (in tire tracks) may need to be set to higher down-force in challenging conditions.

5. Opener Wear: (page 111)
   Over time, opener disc wear can cause established T-handle settings to become too shallow.

6. Coulter Depth: (Option, page 108)
   Optional Coulters prepare the furrow ahead of the openers. Their depth, relative to the openers, is adjusted only by the opener depth. If their discs are too worn, they may run shallow ahead of the openers, and the openers may not operate at the desired depth.

7. Opener Sub-Frame: (page 106)
   Spacer plates at the parallel arms adjust row unit levelling, to keep openers parallel to the ground at higher down-forces.
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 valves located inboard on the front of the left wing. Sub-frame cylinders are always at full travel during field operations.

![Figure 100 Down-Pressure Valve Location](image-url)
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-pressurea</td>
</tr>
<tr>
<td>Press wheels compressing soil too deeply</td>
<td>Excess down-force</td>
<td>Decrease down-pressurea</td>
</tr>
<tr>
<td>Openers discs running too deep, despite press wheel setting (“bulldozing”)</td>
<td>Excess down-force</td>
<td>Decrease down-pressurea</td>
</tr>
<tr>
<td>Openers not level</td>
<td></td>
<td>Remove sub-frame shims (page 106)</td>
</tr>
<tr>
<td>Opener sub-frames continuously moving up and down</td>
<td>Insufficient down-force</td>
<td>Increase down-pressurea</td>
</tr>
<tr>
<td>Wing end tilted up</td>
<td>Insufficient weight transfer</td>
<td>Increase weight transferb</td>
</tr>
<tr>
<td>Wing ends tilted down</td>
<td>Excess weight transfer</td>
<td>Decrease weight transferb</td>
</tr>
<tr>
<td>Wing gauge wheels leaving light or no tracks</td>
<td>Insufficient weight transfer</td>
<td>Decrease weight transferb</td>
</tr>
</tbody>
</table>

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

Refer to Figure 101
There is one flow control, and three pressure controls. Each pressure control has a gauge. All of the controls have an adjustment knob (1) and a locking disc (2) to fix the chosen setting.

B) Bypass valve (normally closed), adjusted on tractors with “LS closed” hydraulics

C), C) Centre section down-pressure, sets the force applied to all centre section rows, and may be set higher than wings

W), W) Wing down-pressure, sets the force applied to all wing rows, and may be set lower than the centre section.

T), T) Transfer of weight from centre 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 34) and lower (page 42) drill. Put tractor in Park and set tractor 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 B), release locking disc 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 a hand signal from the observer or upon any unplanned event.
Refer to Figure 102

4. Release locking discs on transfer \( t \), centre \( c \) and wing \( w \) down-pressure valves.

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

The recommended down-pressure ranges for drilling are:

- Centre 4.8 to 14.5 bar (700 to 2100 psi)
- Wings 5.5 to 15.2 bar (800 to 2200 psi)

Note: Rotate knob clockwise to increase pressure and counter-clockwise to decrease pressure.

6. In some applications, pressure on centre section is set slightly higher than the wings to account for additional soil 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-Centre hydraulics require the bypass valve \( B \) to protect the tractor hydraulic system. Continue at See “\textit{Bypass with LS or PFC Closed Systems}” on page 105.

- **PFC Closed:**
  Pressure Flow Compensating - same adjustment as LS Closed. Continue at See “\textit{Bypass with LS or PFC Closed Systems}” on page 105.

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

- **Open Centre (OC):**
  The NTA907 and NTA3007 drills are not presently compatible with tractors that have Open-Centre 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 103

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.

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.

Note: 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).

Priority Flow Hydraulic Systems

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

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

Machine Damage Risk:
Failure to use the bypass valve on load-sensing tractors may cause major tractor damage.
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 up to 19.1 mm (0 to 3/4 inch) in increments of 3.2 mm (1/8 inch). Shims are slotted to allow easy removal and insertion.

Refer to Figure 104 and (depicting the centre 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 1 2 1 2 1 2</td>
</tr>
<tr>
<td>Thick Count</td>
<td>0 0 0 0 1 1 2 2</td>
</tr>
<tr>
<td>Total (mm)</td>
<td>0 3.2 6.4 9.5 12.7 15.9 19.1</td>
</tr>
<tr>
<td>Total (in)</td>
<td>0 1/8 1/4 3/8 1/2 5/8 3/4</td>
</tr>
</tbody>
</table>

Centre 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 106

Two dedicated cylinders at the wing pivots can extend to push the wings down using mainframe/centre weight. These cylinders are in the Lift circuit, and controlled by an adjustment 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 centre section.

Observe all warnings, and take all precautions, as noted on page 101.

6. Unfold (page 34) and lower drill (page 42). Put tractor in Park and set tractor parking brake.

7. Set bypass valve page 104 and adjust down-pressure page 102 before adjusting weight transfer.

8. Lock hydraulic lever forward during field operation for constant hydraulic flow to openers. See step 2 on page 103 for details.

9. Release lock disc . Adjust knob clockwise to increase weight transfer, and counter-clockwise to reduce weight transfer.

The recommended weight transfer pressure ranges for drilling are:

1. Transfer 70 to 170 bar (1000 to 2400 psi)

10. Once pressure is set, secure knobs with lock discs .

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 6.4 cm (2 1/2 inch). There are several adjustments for frame-mounted coulters:

Refer to Figure 107 (depicting similar 07HD row unit)
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 109.

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

   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 13 mm (1/2 inch) 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 40 cm (15 3/4 inch).

Refer to Figure 108
4. Individual row unit height:
   A few individual rows may be lowered by loosening nuts 7 at tool bar U-bolts, sliding the spring bar 8 down and re-tightening. Do not lower more than about 2.5 cm (1 inch) Keep the top edge of the spring bar at or above the top of the upper bolt holes.

5. Individual coulter down-force (page 109):
   This is a spring adjustment for rows in tracks, or all rows - in unusually light or heavy no-till conditions.
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 pounds). 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 109

1. Raise the drill and install transport locks. See “Raising” on page 43.

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 3/4 inch), or longer than 26 cm (10 1/4 inch), 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.

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

**NOTICE**

**Machine Damage Risk:**
Do not use spring lengths shorter than 24.8 cm (9.75 inch). It may contribute to premature parts failure which will not be covered by warranty.
07 Series Row Unit Adjustments

Refer to Figure 110 (which depicts a row unit fully populated with all optional accessories supported for use with the NTA907 and NTA3007, including frame-mounted coulter, which is mounted independently of the row unit)

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

1. Down Pressure Spring: standard
   Each row unit is mounted on the NTA907 or NTA3007 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 111.

2. Disc Blades: standard, 2 per row unit
   Double disc blades open a furrow, creating the seed bed. Spacers adjust the blades for a clean furrow. See “Disc Blade Adjustments” on page 111.

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

4. Inside Scraper: optional
   Helps prevent clogging between disc blades. See “Disc Scraper Adjustments” on page 111.

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 113.

   Seed-Lok™ firming wheel (shown)
   Improves seed-soil contact. See “Seed-Lok™ Seed Firmer Lock-Up” on page 113.

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 114.

**NOTICE**

**Machine Damage Risk:**

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 102). The factory setting for the row unit springs is:

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

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 ③. Rotate the adjuster nut 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 disc changes by approximately:

1.7 kg/turn (3.7 pounds/turn)

3. Re-tighten jam nut after setting force.

Disc Blade Adjustments

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

Refer to Figure 112

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 4.4 cm (0 to 1 3/4 inch).

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.

Machine Damage Risk:
Do not use spring lengths shorter than 29.8 cm (11 3/4 inch). It may contribute to premature parts failure which will not be covered by warranty.
Adjusting Disk Contact

**CAUTION**

*Sharp Object Hazard:*
Wear gloves. Use caution when making adjustments in this area. Row unit discs may be sharp and contaminated with soil.

**Refer to Figure 113**
1. Unfold the drill (page 34). Leave the row units raised.
2. Place blocking or stands under the opener sub-frames.
3. Remove the bolt ① retaining the opener disc on one side. Carefully remove the blade ②, noting how many spacers ③ are outside the disc and how many are inside the disc. Do not lose the hub components and spacers.
4. To reduce the spacing between the discs (the normal case), move one spacer washer from the inside to the outside.

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

5. Re-assemble and check disc contact.

Disc Scraper Adjustments

To keep opener discs turning freely, dirt scrapers are mounted between discs to clean as discs rotate.

**CAUTION**

*Sharp Object Hazard:*
Wear gloves. Use caution when making adjustments in this area. Row unit discs may be sharp and contaminated with soil.

**Refer to Figure 114**
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

07 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 147), and may need to be shortened if an optional seed firmer is added after initial delivery.

**CAUTION**

*Sharp Object Hazard:*
Wear gloves. Use caution when making adjustments in this area. Row unit discs may be sharp and contaminated with soil.

To adjust the Keeton® Seed Firmer, lower the drill until the discs 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 115*
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 116 (shown with an opener disc removed for clarity - this task can be performed with discs mounted)*
To lock up Seed-Lok™ wheels:
1. Pull catch wire 1 aside.
2. Pull firming-wheel arm 2 up and release wire to catch arm.
Opener Depth (Press Wheel Height)

Refer to Figure 117 (depicting similar 07HD row unit)

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 6.3 mm (1/4 inch). The range is approximately 0 to 8.9 cm (0 to 3 1/2 inch) seeding depth.
- For more shallow seeding, slide T handles forward ② toward implement.
- For deeper seeding, slide T handles backward ② away from implement.

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

Figure 117
Adjusting 07 Opener Depth
Marker Adjustments

Review See “Marker Safety Information” on page 73 before adjusting markers. There are four operating adjustments for markers:

- **Disc Angle**
  Even if your row spacing rarely changes, you may need to adjust disc angle for soil conditions and planting speed.

- **Marker Extension**
  (in “Appendix B - Initial Setup”, page 183)
  Once set for a specific row spacing, this only needs periodic checking to ensure the clamp is secure.

- **Chain Length**
  (in “Maintenance and Lubrication”, page 147)
  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 183)
  Once initially set by your dealer, this rarely needs modification.

There are also two maintenance items for markers:
See “Marker Hydraulic Bleeding” on page 133
See “Marker Shear Bolt” on page 133

### Marker Disc Adjustment

**CAUTION**

*Sharp Object Hazards:*
Wear gloves. Use caution when making adjustments in this area. Marker discs may be sharp and contaminated with soil.

**Mark Width**

① is the direction of travel.
To change angle of cut, and the width of the mark, loosen the ½-inch bolts ② holding the disc assembly.

*Refer to Figure 119*
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 disc on the spindle, and invert the disc assembly.
## Troubleshooting

See also:
See “**Down-Pressure Adjustment Indications**” on page 102, and “**Troubleshooting and Alarms**” topic in the 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 - centre section locks still in ROAD</td>
<td>Raise opener sub-frames. Move centre 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 166).</td>
</tr>
<tr>
<td></td>
<td>Broken or removed chain(s) in drive system</td>
<td>Check chains against See “<strong>Chain Routing</strong>” (page 175).</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 124).</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 124).</td>
</tr>
<tr>
<td></td>
<td>Fan speed too low</td>
<td>Check pulses-per-rev setting for fan in seed monitor (page 174). Increase fan speed to recommended range (page 98).</td>
</tr>
<tr>
<td></td>
<td>Fan running backward</td>
<td>Reverse fan circuit hoses at hitch.</td>
</tr>
<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>
<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 3 m (10 feet) 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 99).</td>
</tr>
<tr>
<td></td>
<td>Seed monitor disconnected at hitch</td>
<td>Connect seed monitor.</td>
</tr>
</tbody>
</table>
| **Planting too little** (some rows) | Partial blockage in meter chamber, seed hoses, towers, seed tubes | Treat as blockage. See “**No material flow (multiple rows)**” and “**No material flow (one or two rows)**” in this table.
<table>
<thead>
<tr>
<th>Problem</th>
<th>Causes</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Planting too little</strong></td>
<td>Incorrect seed rate, meter flutes, rate range or gearbox setting.</td>
<td>Check seed rate information (beginning page 84).</td>
</tr>
<tr>
<td>(all rows)</td>
<td>Excessive field speed. Excessive field speed: chart rates were developed at 10.5 km/h (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 166).</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 98).</td>
</tr>
<tr>
<td></td>
<td>Fan won’t run fast enough</td>
<td>Tractor must be able to supply 64 litres/min at 14 bar (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 pass gaps.</td>
<td>Adjust marker (page 183).</td>
</tr>
<tr>
<td></td>
<td>Irregular shaped field.</td>
<td>Clean out seed meter (page 124).</td>
</tr>
<tr>
<td></td>
<td>Build-up of treatment or debris in seed meter.</td>
<td>Clean out seed meter (page 124).</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><strong>Planting too much</strong></td>
<td>Incorrect seed rate, meter flutes, rate range or gearbox setting.</td>
<td>Check seed rate information (beginning page 84).</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 92).</td>
</tr>
<tr>
<td></td>
<td>Actual field size is different.</td>
<td>Verify field size.</td>
</tr>
<tr>
<td></td>
<td>Excessive pass overlap.</td>
<td>Adjust marker (page 183).</td>
</tr>
<tr>
<td></td>
<td>Irregular shaped field.</td>
<td></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 &quot;stars&quot; 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 See “Down-Pressure Adjustment Indications” on page 102</td>
<td>Drill not level</td>
<td>Check levelling (page 32).</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 32), down-pressure (page 101) and weight transfer (page 107).</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 113).</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 discs 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 113).</td>
</tr>
<tr>
<td></td>
<td>Failed disc bearings.</td>
<td>Replace disc 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</td>
<td>Incorrect tire size or air pressure.</td>
<td>Correct tire size or air pressure (page 166).</td>
</tr>
<tr>
<td>reported</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. Area tally is most accurate when seeding back and forth with markers and with few headlands and curves</td>
</tr>
<tr>
<td>Press wheels not compacting the soil as</td>
<td>Too wet or cloddy.</td>
<td>Wait until drier weather or rework ground.</td>
</tr>
<tr>
<td>desired</td>
<td>Not enough hydraulic down pressure, and row unit is not level.</td>
<td>Increase hydraulic down pressure, see instructions (beginning page 101).</td>
</tr>
<tr>
<td></td>
<td>Incorrect press wheel depth.</td>
<td>Reset press wheel depth (page 114).</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 disc bearings.</td>
<td>Replace disc bearings.</td>
</tr>
<tr>
<td></td>
<td>Disc blades worn.</td>
<td>Replace disc blades.</td>
</tr>
<tr>
<td></td>
<td>Scraper worn or damaged.</td>
<td>Replace scraper.</td>
</tr>
<tr>
<td>Problem</td>
<td>Causes</td>
<td>Solutions</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------</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>Front of openers dropping too low in hard or</td>
<td>Incorrect opener frame setting.</td>
<td>Remove shims (page 106).</td>
</tr>
<tr>
<td>minimum-till conditions</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</td>
<td>Hydraulic lever not locked forward.</td>
<td>Lock hydraulic lever forward.</td>
</tr>
<tr>
<td>terrain</td>
<td>Opener frames not connected to circuit designed for hydraulic motor</td>
<td>See “Hydraulic Hose Hook-Up” (page 28).</td>
</tr>
<tr>
<td></td>
<td>control.</td>
<td></td>
</tr>
<tr>
<td>Pressure gauges read zero when openers are</td>
<td>Hydraulic hoses not routed correctly between pressure control valves</td>
<td>See hose routing diagrams (beginning page 177).</td>
</tr>
<tr>
<td>lowered and tractor hydraulic lever is held</td>
<td>and opener lift cylinders.</td>
<td></td>
</tr>
<tr>
<td>forward</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure gauges show pressure when openers</td>
<td>Hydraulic hoses not routed correctly between pressure control valves</td>
<td>See hose routing diagrams (beginning page 177).</td>
</tr>
<tr>
<td>are raised</td>
<td>and opener lift cylinders.</td>
<td></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 disc does not mark</td>
<td>Marker folding linkage does not have enough slack to allow marker disc</td>
<td>Maximum down float should be limited by the slot at the rod end of</td>
</tr>
<tr>
<td></td>
<td>to drop into field depressions.</td>
<td>marker cylinder.</td>
</tr>
<tr>
<td></td>
<td>Disc orientation not ideal for conditions</td>
<td>Reverse marker disc 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</td>
</tr>
<tr>
<td></td>
<td>Excess slack</td>
<td>Adjust chain slack (page 123).</td>
</tr>
<tr>
<td></td>
<td>Sprockets not aligned</td>
<td>Adjust sprockets on shafts.</td>
</tr>
<tr>
<td>Problem</td>
<td>Causes</td>
<td>Solutions</td>
</tr>
<tr>
<td>---------</td>
<td>--------</td>
<td>-----------</td>
</tr>
<tr>
<td><strong>Smoke or odd burning odour from axle area</strong></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 odours until linings seat on drums.</td>
<td>Check brakes if problem persists, or braking action is insufficient.</td>
</tr>
<tr>
<td><strong>Braking insufficient, one wheel</strong></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. Check for damage seizing movement. Check for worn and inoperative pawl, or weak/damaged/missing pawl spring.</td>
</tr>
<tr>
<td><strong>Braking insufficient, all wheels</strong></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 137).</td>
</tr>
<tr>
<td></td>
<td>Hydraulic/Hydraulic system: air in brake line from tractor</td>
<td>Bleed and recharge brake line.</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 un-approved 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>55 kPa (80 psi) minimum for air system.</td>
</tr>
<tr>
<td><strong>No braking, one wheel</strong></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><strong>No braking, all wheels</strong></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><strong>Drill pulling to one side</strong></td>
<td>See “Dragging brake” topic.</td>
<td>Check “wheel lockup” causes before flat spots develop on tires.</td>
</tr>
<tr>
<td>Problem</td>
<td>Causes</td>
<td>Solutions</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>----------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Brakes always engaged, all wheels</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 over-extended.</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>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 139).</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 use center section and gauge wheel lift locks when working near or under a raised implement.

**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 lock up drill before working on it.
2. Lubricate areas listed under “Lubrication and Scheduled Maintenance” on page 148.
3. Adjust idlers to remove excess slack from chains. Clean and use chain lubricant 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 166.
6. Replace any worn, damaged or illegible safety decals. Order new decals from your Great Plains dealer. See “Safety Decals” on page 11.
Maintenance

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 120, 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 (1/4in per ft)
   Vertical short chains: 2.1cm/m (1/4in per foot)
   Horizontal short chains: 4.2cm/m (1/2in per foot).

3. Measure the current slack 2:
   Acting at a right angle to the chain span at the centre 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 121 (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-Out

For normal unloading of residual materials at completion of planting, see “Unloading Materials” on page 77.

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

1. Perform normal material unloading (page 77), 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 a different material.

   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 tractor parking brake set. If tractor cannot be left hitched, block drill tires. 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 54). Remove strainer (page 57). 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-Out” on page 125).

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 69).

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 instructions (page 81) or Storage instructions (page 82).

---

**NOTICE**

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.

---

**CAUTION**

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-Out**
For normal unloading of residual materials at completion of planting, see “Unloading Materials” on page 77. For normal clean-out of residue, see “Material Clean-Out” on page 124.

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. Add no more water, remove meter box instead, and clean out from below.

**Removing Meter Box**
Removing the meter box exposes 18×18 cm (7×7 inch) holes through which stubborn material may be extracted.

Refer to Figure 122

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 ① securing the meter box ② to the hopper bottom plate ③. 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.
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.

Rapid Suffocation Hazard:
Encrusted grain may be loose and flowing beneath the crust. Any hollow spaces are highly likely to have insufficient oxygen and/or toxic gases from microbial action. Falling through a crust in either case can result in death in a matter of seconds. Never enter a hopper to dislodge a crust or bridge.
Depending on their use, the NTA907 or NTA3007 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 enterprise 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 (not the entrant) who has 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 lung 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 entrant 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 See “Unloading Materials” on page 77. 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 favourable. Terminate and evacuate if any unexpected situations arise.
Hydraulic Maintenance
To function properly, the hydraulic 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 a circuit engaged. With a 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, systems may operate with jerky, uneven motions. Openers and markers could drop rapidly during unfold. 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 “Brake Line Charge and Bleed” on page 135 and “Marker Hydraulic Bleeding” on page 133.

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

Note: System capacity for the entire drill is about 38 litres (10 U.S. gallons).
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 Drill” on page 44.

1. Review safety advisories and operational advice on page 128, and on this page, before performing bleed.

Refer to Figure 123
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 124
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 1 at 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 2 at 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.

**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.
Bleeding Fold Hydraulics
If the systems have sufficient fluid for safe operation, prior to bleeding, perform unfold (page 34), tilt down (page 39) and lower (page 42) operations.

1. Review safety advisories and operational advice on page 128, and on this page, before performing bleed.

Refer to Figure 125
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.

Refer to Figure 126
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 128, and on this page, before performing bleed.

Refer to Figure 127
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 34), tilt down (page 39) and lower (page 42) operations. Set circuit to Float.

1. Review safety advisories and operational advice on page 128, and on this page, before performing bleed.

Refer to Figure 128
2. Fully close bypass valve (B) and Transfer valve (T). Fully open Wing (W) and Centre (C) transfer valves.

Refer to Figure 129
3. Un-pin six cylinder rod ends. Orient cylinders so that rod ends may extend without striking drill parts.
5. Loosen the JIC fittings  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  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:
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 101).

1. Unfold drill (page 34). Lower openers (page 42) 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 Centre, 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 130

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. Actuate the lift circuit for down-pressure. Cycle the lift system several times. Check for leaks.
12. Restore the Centre, 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 131).
Marker Maintenance

Review See “Marker Safety Information” on page 73 before performing maintenance on markers.
See also: “Marker Operation (Option)” on page 73, “Marker Adjustments” on page 115, and “Initial Marker Setup” on page 183.

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 7/16-14×2in Grade 5 bolt (Great Plains part 802-589C). If that size is not immediately available in your local market, temporarily substitute an M10×1.5 Class 8.8 metric bolt and nut.

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

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

Machine Damage Risk:
Using a bolt with a higher grade can result in marker damage.

Marker Hydraulic Bleeding

1. Review warnings, bleeding notes and system information on page 128.

Refer to Figure 132

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, actuate 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, actuate tractor hydraulic valve forward again until oil seeps out around a fitting on the other marker cylinder. Tighten that fitting. Reverse tractor hydraulic valve until oil seeps out around remaining hose fitting and tighten it.

5. Fold and unfold markers slowly to work out all air.

Note: Use caution when folding and unfolding markers for the first time. Check for hose pinching and kinking.

Crushing and Overhead Sharp Object Hazards:
Never allow anyone near the drill when folding or unfolding markers. You may be injured if hit by a folding or unfolding marker. Markers may fall quickly and unexpectedly if the hydraulics fail.
**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 30 cm (12 inches) before lifting, the chain length is too long.

*Refer to Figure 133*

1. Unfold marker.
2. Adjust/set Marker Extension (page 183) before adjusting chain length.
3. Remove take-up bolt ①.
4. Re-insert bolt to obtain an approximate chain length  ② 160 cm (63 inches)
   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 disc. If marker disc drags across ground more than 30 cm (12 in.) before lifting, the chain is too long.

**Marker Grease Seal**

*Refer to Figure 134*

If grease-seal cap ① for marker disc hub bearings is damaged or missing, disassemble and clean hub. Re-pack with grease and install a new seal or grease cap.
Brake Maintenance (Option)

Brakes are self-adjusting, but there are several maintenance items:

- page 135 - Brake Line Charge and Bleed
- page 137 - Air Brake Filter Cleaning
- page 138 - 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.

3. Put tractor in Park. Do not set tractor parking brake if it also operates trailer brakes.

Refer to Figure 135 (which depicts air brake system - reservoir for hydraulic brake system is similar)

4. Clean and dry top of master cylinder reservoir ①.

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 ② 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 137 (which depicts air brake system - tee for hydraulic brake system is similar)

   F. Disconnect centre port of brake line tee ③. Cycle brakes until no fluid flows. Re-secure tee.

NOTICE

Machine Damage Risk:

Never re-use brake fluid. It is hygroscopic (formulated to absorb water. Water can damage system components if not removed). Dispose of brake fluid per supplier instructions.
Charge and Bleed Brake System

Refer to Figure 138
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 litre

![Brake Master Cylinder](image)

**NOTICE**

**Machine Damage Risk:**
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.

8. Screw cap on master cylinder reservoir. Start at an
   outside hub for step 9.

Refer to Figure 139
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.

![Brake Cylinder Bleeder Valve](image)

Refer to Figure 140
13. At brake line tee ③, loosen centre port connection
    just enough to allow air to escape when system is
    pressurized, but not enough to allow air to enter.
14. Cycle tractor brakes until no air bubble appear at
    connection. Tighten connection.
15. Top off master cylinder reservoir.

![Brake Line Tee](image)
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. Chock the wheels.
2. Hold the petcock ② open until no water flows. Close petcock.

Air Brake Filter Cleaning
Refer to Figure 142 and Figure 143
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 un-filtered 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 33 mm (1 9/32 inch) open-end or adjustable wrench to loosen both red filter caps ③.

Note: 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.

Note: 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. Centre the filter screen on the cap. Carefully re-insert in filter body. Screw cap in, checking for mis-alignment 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.

**WARNING**

Non-Asbestos Fibres 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 fibres, mineral wool, aramid fibres, ceramic fibres 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 fibres, when inhaled, can cause similar diseases of the lung. Silica dust and ceramic fibre 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 fibres and silica are potential causes of cancer.

For silica, U.S. OSHA has set a maximum allowable level of exposure of 0.1 mg/m³, 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 fibre 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 U.S. 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.
- If an enclosed vacuum system or brake washing equipment is not available, carefully clean the brake parts in open air. Use a fine mist from a pump spray bottle to wet parts. Use a solution containing water, and, if available, a biodegradable, non-phosphate, water-based detergent. 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 labelled 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 138. 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. Chock the wing and rear drill tires to prevent movement.

Refer to Figure 144
5. If left hitched, put the tractor transmission in Park, release tractor service and parking brakes, 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 145
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 See “Brake Drum Maintenance” on page 143).

13. Keep inner and outer bearing components separated. They are different parts.

Possible Asbestos Hazard:
If you are unable to confirm that you are removing and installing Great Plains approved parts, you may have linings that contain asbestos. Some after market brake shoes may contain asbestos, and require strict, complex and costly safety procedures not covered in this manual.

Notice:
If shoe replacement is indicated, use only parts supplied or recommended by Great Plains. The original brake linings, and Great Plains supplied or approved linings contain no asbestos. Un-approved parts may also appear to fit, but will not function correctly.

Note: Inspection of the brakes may also reveal a need to re-finish drums and/or replace other brake parts. Although not strictly part of brake maintenance, you may need to repack bearings (generally the outer), and it may be necessary to replace a worn or damaged inner seal (and repack the inner bearing).
Refer to Figure 146

14. Inspect brake shoe 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. Check for 1.6 mm (\(\frac{1}{16}\) 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.

Note: 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 48.

Refer to Figure 147


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.

Do not allow any lubricants to come in contact with new brake linings.

22. Release upper spring between shoes (was under self-adjuster), and release lower spring between shoes.

23. Loosen nuts on lower shoulder bolts. Push brake shoes outward at bottom (to allow removal of hand brake arms).

24. Release lower spring between hand brake arms. If this spring differs from the shoe springs, set the hand brake spring aside.

25. Remove hand brake arm assembly. Place spring with it.

Part Failure Hazard:
Do not substitute parts. Incorrect or substandard parts can cause brake malfunction or failure, resulting in death, serious injury or property damage. Always re-assemble brakes with either the removed parts (if serviceable) or Great Plains parts as specified in the Parts Manual (166-371P).

---

a. Hand brakes are not used on these drill models.
Refer to Figure 148

26. Remove five $\frac{1}{2}$-13 nuts 1 and lock washers 2 behind dust shield.

27. 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.

Note: 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.

28. Remove hold down cotter pins 7 and castellated nuts 8.

29. 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.

30. Remove large flat washer 10.

31. Remove hold down bolts 11 and brake shoes 12.

32. Inspect brake shoes. Check that web is flat and at a right angle to table. Check operating holes for wear and peening. If any defect or damage is noted, replace shoes regardless of lining status.

33. Replace any shoes contaminated with oil.

34. 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.

Note: **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 149
Brake shoe orientation is with square hold-down bolt hole ② on top, and "L"-shaped adjuster mount lugs ③ facing away from spindle.

35. 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.

36. 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.

Note: The spring washers ⑧ are slightly cupped. Place them on the bolt with the concave (dished-in) sides facing each other “⑧”.

37. 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.

38. Insert five backing plate studs through dust cover ⑥ and spindle weldment. Secure with lock washers ⑧ and 1/2-13 nuts ⑨.

Re-Install Springs

Refer to Figure 150
39. 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.

40. 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.

41. 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.

42. 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.

43. 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.

44. Tighten pivot bolts ⑤ to 5/8-18 torque specification.

NOTICE

Leave self-adjuster relaxed. It self-adjusts at first use.

a. The parking brake feature of these hubs is not used on Model NTA907 or NTA3007.
Brake Drum Maintenance

Refer to Figure 151
45. 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 0.51 mm (0.020 inch) oversize, or has 0.38 mm (0.015 inch) or greater run-out.

Brake Drum Resurfacing
46. 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.

47. Be sure to remove any metallic chips and contamination resulting from drum machining.

Re-Mount Hub and Drum
Refer to Figure 152
48. Re-pack any bearings removed.

49. 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.

Machine Damage Risk:
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).

50. Carefully place drum/hub assembly ③ on spindle.
51. Insert re-packed outer bearing ④.
52. Add spindle washer ⑤ and castle nut ⑥.
53. 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.
54. Secure nut with cotter pin ⑦. Install dust cap ⑧.

CAUTION
Wear a respirator equipped with a HEPA filter approved by NIOSH or MSHA when grinding or machining brake drums. In addition, do such work in an area with a local exhaust ventilation system equipped with a HEPA filter.

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.

WARNING
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

55. Position a wheel on the hub from which it was dismounted.

Refer to Figure 153

56. Start all lug nuts by hand. Choose a bolt stud to designate position #1.

57. 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 foot-pounds)
   Stage 2: 74-80 N-m (55-60 foot-pounds)
   Stage 3: 114-127 N-m (85-95 foot-pounds)

Note: This staging and ordering of tightening is strongly recommended to ensure that the drum is not driven out-of-round.

58. Repeat step 56 and step 57 for each wheel.

Test and Adjust Brakes

While the drill axle is still elevated, test the service brake system.

59. 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.

60. Have someone spin one brake-equipped drill wheel, and stand clear.

61. 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.

62. Check for unusual noises and failure to brake. Check that the wheel spins freely with brakes released.

63. 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.

64. Release all tractor braking that engages drill braking.

65. Check tire inflation, and lower drill onto its own wheels between chocks.


**Levelling Drill**

Wing alignment and sub-frame heights are adjustable. Frame heights are not adjustable. Centre height is fixed by the front transport wheels. Wing height is fixed by the centre 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 See “Heights and Levelling” on page 32.
3. Pull forward with rows in ground. Stop. Leave rows in ground.

*Refer to Figure 156*

4. Sight along the rear face of the rear opener tool bar. Measure the wing end position (dimension 1) relative to the centre section (dimension 2).
5. If the wings are even with the centre, or less than 25 mm (1 inch) ahead, no adjustment is necessary.

*Refer to Figure 154*

6. Loosen wing fold stop bolt jam nuts (3), and fully seat stop bolts (4).

*Refer to Figure 155*

7. To adjust a wing lead, loosen the jam nut (5) at the pull bar for that side, and rotate the turnbuckle nut (6) to move the wing forward or back.

The effect of the turnbuckle is to move the wing tip by about 6 mm (1/4 inch) per full turn.
8. Back out stop bolt (3) until it contacts wing. Secure with jam nut (5). Re-tighten jam nuts and align other side as needed.

---

**Figure 154**
Wing Stop Bolt

**Figure 155**
Wing Pull-Bar Turnbuckle

**Figure 156**
Section Alignment Check
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 centre front and wing gauge wheels are not running light. Adjust down-pressure and weight transfer as needed (page 101).

If rows are not running level, adjust sub-frame shims as needed (page 106).

Refer to Figure 157 (shown with wings folded for clarity)
10. Check opener sub-frame tool bar height at the centre section. Measure from the average soil surface level to the bottom of the rear opener tool bar.

The distance should be:
76.2 cm (30 inches).

Refer to Figure 158
11. Check sub-frame tool bar height at the inside and outside ends of the wing rear tool bar. If either end differs from centre height by more than about 6 mm (¼ inch), adjust the eye bolt 1 above the parallel arms at that end.

12. To adjust an eye bolt:

Back the upper jam nut 2 up a few turns. Adjust the lower nut 3. The adjustment is about 2.8 mm (0.11 inch) of opener height per turn of the adjuster nut.

Whether adjusted or not, secure the size 1-8 jam nut to torque specification (page 167).

13. Check and set all four (4) wing ends and eye bolts.

14. Pull forward and re-check height.
Seed Flap Replacement

Refer to Figure 159

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

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

If an optional Keeton® or Seed-Lok™ seed firmer is installed, you may need to shorten the exposed end of the flap to maintain clearance from the firmer.

Beacon Maintenance (NTA907 only)

WARNING

Shock Hazard:

Remove power by disconnection and wait five minutes before touching anything under the beacon lens. The strobe circuit internally generates a high voltage that could incapacitate a healthy person or cause death in a susceptible individual.

The lens and flash tube of the beacon are available as replacement parts from Grote Industries, Inc. Verify that the 833-563C luminaire is a Grote 7710 or 77103 before ordering either of the parts below from Grote:

- 92033 Yellow Lens
- 92980 Flash Tube

1. Disconnect a power lead at the beacon or at the hitch. Do not rely solely on the switch.

2. Wait five minutes. Any residual high voltage in the disconnected flash tube circuit bleeds down to harmless levels during this time.

3. Unscrew the lens.

4. If replacing the flash tube, squeeze the side tabs and remove the old tube assembly.

5. Be careful not to touch the glass tube of the new flash tube. Contamination can reduce tube life. Plug the new tube into the socket.

6. Screw on the existing or replacement lens.

7. Reconnect power.
## Lubrication and Scheduled Maintenance

<table>
<thead>
<tr>
<th>Multi-purpose spray lubricant</th>
<th>Multi-purpose grease lubricant</th>
<th>Multi-purpose oil lubricant</th>
<th>Inspection</th>
<th>Intervals (operating hours) at which service is required</th>
<th>50</th>
</tr>
</thead>
</table>

### Caster Wheel Pivots

- **1 zerk per pivot; 2 total**
- **Type of Lubrication:** Grease
- **Quantity:** Until grease emerges

### Tongue Pivots

- **1 zerk 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. Disc hubs must be greased individually (page 155).
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
Tire Pressures

2 contact drive tire
8 main tires
4 wing gauge wheel tires

Check tire pressures more frequently on a new drill, and with new tires. Check tire pressures whenever there are planting problems.

Tongue Lock Roller

1 zerk right end of pin.

Type of Lubrication: Grease
Quantity: Until grease emerges at in 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

2 clamps each of 4 doors; 8 total
Type of Lubrication: Spray
Quantity: Coat thoroughly
Note: Photo at right shows older model meter without guards or extension handles.

Auger Storage Clamps

2 clamps
Type of Lubrication: Spray
Quantity: Coat thoroughly

Auger Swing Arm: Mount Pivot

1 zerk
Type of Lubrication: Grease
Quantity: Until Grease emerges
Auger Swing Arm: Mid-Pivot

1 zerk
Type of Lubrication: Grease
Quantity: Until Grease emerges

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
Contact Drive/Gearbox Input Chains

As Required

One chain each meter; 2 total

Type of Lubrication: Chain Lubricant
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

As Required

One chain each meter; 2 total

Type of Lubrication: Chain Lubricant
Quantity = Coat thoroughly

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

One UHMW brake piston each caster; 2 total.

Replace UHMW piston ① if its length is less than 3.2 cm (1\(\frac{1}{4}\) in). Also replace piston if missing, damaged, tilted, or top of piston is visible.

To set spring tension:

1. Loosen the jam nut ②. Use a 3\(\frac{3}{8}\)in (9.5mm) hex wrench to back the set screw ③ out of contact with spring above the piston ①.

2. Drive the set screw in until it just makes contact with the spring.

3. Measure the set screw reveal (length of exposed set screw) above the hex weldment. Subtract 3\(\frac{3}{4}\)in (19mm).

4. Drive the set screw in until the reveal matches the reduced figure. Tighten jam nut.

Use more tension as needed to eliminate caster vibration during highway transport.

Coulter Hubs (Option)

1 zerk per coulter; 48 or 66 total

Type of Lubrication: Grease
Quantity: Until grease emerges

Note: These zerks only serve the coulter hubs. Coulter arm pivots are lubricated from the grease banks.
Meter Door Seals

Seasonal

1 seal per door, 2 doors per meter; 2 or 4 seals per cart.

Inspect seasonally. Inspect if air leaks are detected. Replace if missing, torn, permanently compressed, or otherwise damaged. Do not tightly close doors for extended periods.

Note: Photo at right shows older model meter without guards or extension handles.

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
Options

Auger

The auger is factory-installed when ordered with the drill. It is not presently offered for field installation. Order one of the following accessory bundles with the drill.

<table>
<thead>
<tr>
<th>Drill Model</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTA907</td>
<td>166-269A</td>
</tr>
<tr>
<td>NTA3007</td>
<td>166-198A</td>
</tr>
</tbody>
</table>

Brakes (NTA907)

Brakes are factory-installed when ordered with the drill. Brakes are not presently offered on model NTA3007, and are not presently offered for field installation. Order one of the following accessory bundles with the drill.

<table>
<thead>
<tr>
<th>Brake Option</th>
<th>Sequence Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>No brakes(^a)</td>
<td>51</td>
</tr>
<tr>
<td>Hydraulic Brakes</td>
<td>52</td>
</tr>
<tr>
<td>Air-Hydraulic(^b) Brakes</td>
<td>53</td>
</tr>
</tbody>
</table>

\(^{a}\) This option is provided only for locales where brakes are not required by law.

\(^{b}\) The braking system is air-controlled at the hitch.

Tire Scrapers

This accessory helps maintain contact drive consistency in damp, sticky and cloddy soil conditions, by removing mud build-up on the forward main transport tires. This field-install kit includes two scrapers (each scraper serving two wheels), and fasteners.

<table>
<thead>
<tr>
<th>Drill Model</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>TIRE SCRAPER ASSY 9 METER</td>
<td>166-354A</td>
</tr>
</tbody>
</table>
Alternate Flute Sets

The NTA907 and NTA3007 seed meters have standard shafts \( \oplus \) with two deep fluted wheels ("stars") and two filler rings in each active meter compartment.

Alternate flute shafts are available for higher (\( \oplus \), \( \oplus \)) rates and for small seeds \( \oplus \). These accessories replace the existing 2-star shaft assembly \( \oplus \) with one having a different star configuration. This provides different seeding rates for the same Range and variable rate gearbox setting. See “Changing Meter Flutes” on page 185 for installation instructions.

If your seeding rates need to be higher than those listed in the Seed Rate Manual, select one of the high rate shafts.

- Replacing the standard 2-star shaft with a 3-star shaft \( \oplus \) increases the seeding rate by approximately 50% (to 150% of standard rate).
- Replacing the standard 2-star shaft with a 4-star shaft \( \oplus \) increases the seeding rate by approximately double (to 200% of standard rate).

For small seeds (see list at right) or other seeds substantially smaller than \( \frac{1}{8} \times \frac{3}{16} \) inch, the standard shaft may not provide sufficient precision and uniform flow at very low rates. A small seeds flute shaft \( \oplus \) is available that provides two half-width shallow flute stars per compartment.

- For compatible seeds, replacing the standard 2-star shaft with the small seeds shaft \( \oplus \) reduces the seeding rate by approximately 80% (to 20% of standard rate).

The kit required depends on the size and 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>( \oplus ) Standard Stars: 3 per outlet</td>
<td>168-401S</td>
</tr>
<tr>
<td>( \oplus ) Standard Stars: 4 per outlet</td>
<td>168-402S</td>
</tr>
<tr>
<td>( \oplus ) Small Seeds Stars: 2 half-width shallow stars per Outlet</td>
<td>168-438S</td>
</tr>
</tbody>
</table>

Tested Small Seeds

The 167-085B Seed Rate Manual includes data for the 168-438S and the following seeds:

- Alfalfa (Medicago sativa)
- Canola (Brassica napus L., Brassica campestris L., Brassica Rapa var.m)
- Millet (Pennisetum glaucum, Setaria italica, Panicum miliaceum, Eleusine coracana)
- Milo (Sorghum)
- Orchard Grass (Dactylis glomerata)
- Timothy (Phleum pratense)
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 pass.

If ordered with a new NTA907 and NTA3007 drill, markers are factory-installed. Each kit equips one 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>

See “Marker Adjustments” on page 115, “Marker Operation (Option)” on page 73, and “Marker Maintenance” on page 133.

Tramline

Tramline kits configure one or more row units to cease seeding during specific passes, creating un-planted rows for transit of equipment post-emergence. Seed intended for an un-planted row is diverted to the adjacent row.

Kits are provided for 2 or 6 rows (6-row kit shown at right). The seed monitor supports a maximum of 8 outputs (rows) that may be controlled. Pre-defined and user-programmable bout patterns are available.

<table>
<thead>
<tr>
<th>Kit Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>3007NT / 907 TRAMLINE KT 2 ACT</td>
<td>168-427A</td>
</tr>
<tr>
<td>3007NT / 907 TRAMLINE KT 6 ACT</td>
<td>168-428A</td>
</tr>
<tr>
<td>3007/907NT TRM LN ADAPT NARROW</td>
<td>168-429A</td>
</tr>
</tbody>
</table>

Due to varying customer requirements, tramline kits are not factory-installed.
Variable Rate Kit

The variable rate actuator kit adds a linear stroke servos to the variable rate gearboxes. This places the material rate under electronic control by the seed monitor. This allows convenient rate setting and adjustment from the tractor cab, as well as geolocation-based (GPS) control of rates. The manual adjuster crank is de-coupled during installation, but left in place.

Each kit updates an entire drill (both meters).

<table>
<thead>
<tr>
<th>Kit Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADC2350 VARIABLE RATE KIT</td>
<td>166-193A</td>
</tr>
</tbody>
</table>

Installation is described in the 166-263M manual included with the kit.

See “Variable Rate (Servo) Calibration” on page 95.

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>Coulters Kit</th>
<th>For NTA907- or NTA3007-</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-3610</td>
</tr>
<tr>
<td>with Fluted Blade</td>
<td></td>
</tr>
<tr>
<td>44 cm × 80 mm (17 × 5/16 inch)</td>
<td>249-178A</td>
</tr>
<tr>
<td>with Wavy Blade</td>
<td></td>
</tr>
<tr>
<td>45.1 cm × 190 mm (17 × 3/4 inch)</td>
<td>249-179A</td>
</tr>
<tr>
<td>with Turbo Blade</td>
<td></td>
</tr>
<tr>
<td>44.8 cm × 160 mm (17 × 5/8 inch)</td>
<td>249-180A</td>
</tr>
</tbody>
</table>

See “Frame-Mounted Coulters (Option)” on page 108 for adjustments.
43 cm (17 inch) Coulter Blades
Part ordering number includes one blade.

<table>
<thead>
<tr>
<th>Blade</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>44 cm (17×7/16 inch) Fluted Blade</td>
<td>820-018C</td>
</tr>
<tr>
<td>45.1 cm (17×3/4 inch) Wavy Blade</td>
<td>820-082C</td>
</tr>
<tr>
<td>44.8 cm (17×5/8 inch) Turbo Blade</td>
<td>820-156C</td>
</tr>
</tbody>
</table>

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>

Carbide Disc Scraper
Slotted scrapers are standard.
Optional carbide disc scrapers are spring-loaded and require no periodic adjustment. Scrapers are compatible with the standard seed flap and Seed-Lok™, but not Keeton®. Each kit equips one opener row.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring Scraper Assembly</td>
<td>121-781A</td>
</tr>
</tbody>
</table>
Seed Firmers

The standard 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>Seed-Lok™ kit</td>
<td>122-266K</td>
</tr>
</tbody>
</table>

For operations, see “Seed Firmer Adjustments” on page 113.

Keeton® Seed Firmer

The Keeton® includes provision for liquid fertilizer delivery, and is the recommended firmer if the drill has liquid fertilizer capability.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keeton® seed firmer (per opener)</td>
<td>890-810C</td>
</tr>
</tbody>
</table>

For operations, see “Seed Firmer Adjustments” on page 113.
## Appendix A - Reference Information

### Specifications and Capacities

#### NTA907 Export Models

<table>
<thead>
<tr>
<th>Specification</th>
<th>NTA907-3610</th>
<th>NTA907-4875</th>
<th>NTA907-6006</th>
</tr>
</thead>
<tbody>
<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>9 900 kg</td>
<td>10 800 kg</td>
<td>11 700 kg</td>
</tr>
<tr>
<td><strong>Weight (full, max. configuration)</strong></td>
<td>20 100 kg</td>
<td>21 200 kg</td>
<td>22 300 kg</td>
</tr>
<tr>
<td><strong>Static Tongue Weight (w/coulters)</strong></td>
<td>2000 kg</td>
<td>2000 kg</td>
<td>2200 kg</td>
</tr>
<tr>
<td><strong>Working Width</strong></td>
<td>9.14 m without Markers, 9.53 m with Markers (folded)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Transport Width</strong></td>
<td>2.96 m</td>
<td></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></td>
<td>550 kPa min. Provision to 1035 kPa max. Operating</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>
### NTA3007 North America Models

<table>
<thead>
<tr>
<th>North America Model</th>
<th>NTA3007-3610</th>
<th>NTA3007-4875</th>
<th>NTA3007-6006</th>
</tr>
</thead>
<tbody>
<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>10 in</td>
<td>7.5 in</td>
<td>6 in</td>
</tr>
<tr>
<td><strong>Span (width between end rows)</strong></td>
<td>350.0 in</td>
<td>357.5 in</td>
<td>351.9 in</td>
</tr>
<tr>
<td><strong>Swath (span + nominal spacing)</strong></td>
<td>360.0 in</td>
<td>365.0 in</td>
<td>357.9 in</td>
</tr>
<tr>
<td><strong>Swath-Averaged Row Spacing</strong></td>
<td>10.00 in</td>
<td>7.60 in</td>
<td>5.96 in</td>
</tr>
<tr>
<td><strong>Seedbox Capacity</strong></td>
<td></td>
<td>100 bu x2</td>
<td></td>
</tr>
<tr>
<td><strong>Tractor Requirements</strong></td>
<td>205 to 310 hp</td>
<td>245 to 370 hp</td>
<td>275 to 415 hp</td>
</tr>
<tr>
<td><strong>Hydraulics Requirements</strong></td>
<td>Closed-Center, 4 Remotes, 2400 psi, 18 gpm (fan circuit)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Weight (empty, base configuration)</strong></td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Weight (full, max. configuration)</strong></td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Static Tongue Weight (w/coulters)</strong></td>
<td>4300 lb</td>
<td>4500 lb</td>
<td>4800 lb</td>
</tr>
<tr>
<td><strong>Working Width</strong></td>
<td>30 ft. without Markers, 31 ft. 3 in. with Markers (folded)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Transport Width</strong></td>
<td>9.71 ft</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Working Length</strong></td>
<td>31 ft</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Transport Length</strong></td>
<td>37 ft</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Working Height</strong></td>
<td>12 ft. 6 in.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Transport Height</strong></td>
<td>13 ft. 0 in.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Transport Tire Size</strong></td>
<td>265/70B16.5 (10-16.5) 8-ply skid steer NHS</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Wing Gauge Wheel Tire Size</strong></td>
<td>15-19.5 12-ply skid steer NHS</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Contact Drive Tire Size</strong></td>
<td>13-5x6 4-ply turf saver</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hydraulic Brake Operating Pressure</strong></td>
<td>2175 psi maximum.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Air Brake Operating Pressure</strong></td>
<td>80 psi min. Supply to 150 psi max. Operating</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Transport Clearance</strong></td>
<td>13.5 in.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Opener Travel (Up - Down)</strong></td>
<td>+7 in. - 2 in.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Opener Down Force</strong></td>
<td>0 to 240 lbs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

See page 51 for weights of representative configurations.
Dimensions (Transport) NTA907 Export Models

- **Transport Width**: 2.99 m (117.5 in.)
- **Transport Height**: 3.65 m (143.5 in.)
- **Hopper Height**: 3.48 m (137 in.)
- **Hitch to Front Wheels Length**: 6.70 m (263.7 in.)
- **Transport Clearance**: 46.8 cm (18.4 in.)
- **Hitch to Rear Wheels Length**: 11.0 m (433.9 in.)
- **Transport Length**: 12.1 m (474.8 in.)
## 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>276 kPa 40 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 websites listed below. For assistance or information, contact your nearest Authorized Farm Tire Retailer.

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Web site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firestone</td>
<td><a href="http://www.firestoneag.com">www.firestoneag.com</a></td>
</tr>
<tr>
<td>Gleason</td>
<td><a href="http://www.gleasonwheel.com">www.gleasonwheel.com</a></td>
</tr>
<tr>
<td>Titan</td>
<td><a href="http://www.titan-intl.com">www.titan-intl.com</a></td>
</tr>
</tbody>
</table>

---

## Hydraulic Connectors and Torque

*Refer to Figure 162 (a hypothetical fitting)*

Leave any protective caps in place until immediately prior to making a connection.

1. **NPT** - National Pipe Thread
   - Note tapered threads, no cone/flare, and no O-ring.
   - Apply liquid pipe sealant for hydraulic applications.
   - Do not use tape sealant, which can clog a filter and/or plug an orifice.

2. **JIC** - Joint Industry Conference (SAE J514)
   - Note straight threads and the 37° cone on “M” fittings (or 37° flare on “F” fittings).
   - Use no sealants (tape or liquid) on JIC fittings.

3. **ORB** - O-Ring Boss (SAE J514)
   - Note straight threads and elastomer O-Ring.
   - Prior to installation, to prevent abrasion during tightening, lubricate O-Ring with clean hydraulic fluid.
   - Use no sealants (tape or liquid) on ORB fittings.

ORB fittings that need orientation, such as the ell depicted, also have a washer and jam nut (“adjustable thread port stud”). Back jam nut away from washer. Thread fitting into receptacle until O-Ring contacts seat. Unscrew fitting to desired orientation. Tighten jam nut to torque specification.

---

### Fittings Torque Values

<table>
<thead>
<tr>
<th>Fitting Call Size</th>
<th>N-m</th>
<th>Ft-Lbs</th>
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<tbody>
<tr>
<td>1/4 NPT</td>
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<tr>
<td>5/16 JIC</td>
<td>24-27</td>
<td>18-20</td>
</tr>
<tr>
<td>5/16 ORB w/jam nut</td>
<td>16-22</td>
<td>12-16</td>
</tr>
<tr>
<td>5/16 ORB straight</td>
<td>24-32</td>
<td>18-24</td>
</tr>
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<td>3/4 JIC</td>
<td>37-53</td>
<td>27-39</td>
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<tr>
<td>3/4 ORB w/jam nut</td>
<td>27-41</td>
<td>20-30</td>
</tr>
<tr>
<td>3/4 ORB straight</td>
<td>37-58</td>
<td>27-43</td>
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## Torque Values Chart

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<th>8.8</th>
<th>10.9</th>
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<td>ft-lb</td>
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<td>76</td>
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<td>7/32-20</td>
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<td>55</td>
<td>115</td>
<td>85</td>
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<td>95</td>
<td>70</td>
<td>150</td>
<td>110</td>
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<td>9/64-18</td>
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<td>165</td>
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<td>5/32-11</td>
<td>130</td>
<td>97</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  

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

36-Row Port Map, Left

![Diagram of 36-Row Port Map, Left]

Model NTA907-3610 and NTA3007-3610

<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 Units</th>
<th>WSMB Input</th>
</tr>
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<tbody>
<tr>
<td>Left Wing</td>
<td>M2</td>
<td>T1</td>
<td>P03</td>
<td>R01</td>
<td></td>
<td>W1-01</td>
</tr>
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<td>Left Wing</td>
<td>M2</td>
<td>T1</td>
<td>P04</td>
<td>R02</td>
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<td>W1-02</td>
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<td>T1</td>
<td>P02</td>
<td>R03</td>
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<td>W1-03</td>
</tr>
<tr>
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<td>T1</td>
<td>P05</td>
<td>R04</td>
<td></td>
<td>W1-04</td>
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<td>T1</td>
<td>P01</td>
<td>R05</td>
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<td>R07</td>
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<td>T1</td>
<td>P07</td>
<td>R08</td>
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<td>T1</td>
<td>P08</td>
<td>R09</td>
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<td>P09</td>
<td>R10</td>
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<td>W2-01</td>
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<td>T2</td>
<td>P03</td>
<td>R13</td>
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<td>T2</td>
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<td>P08</td>
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36-Row Port Map, Right

Model NTA907-3610 and NTA3007-3610

<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 Inches</th>
<th>WSMB Input</th>
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<tbody>
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<td>P09</td>
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<td>M4</td>
<td>T3</td>
<td>P02</td>
<td>R22</td>
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<td>W3-04</td>
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<td>T3</td>
<td>P03</td>
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## 48-Row Port Map, Left

Model NTA907-4875 and NTA3007-4875

<table>
<thead>
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<th>Drill Section</th>
<th>Meter Outlet</th>
<th>Tower Number</th>
<th>Tower Port</th>
<th>Row Unit</th>
<th>Hose Length Inches</th>
<th>Hose Length Metric</th>
<th>WSMB Input</th>
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<tbody>
<tr>
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<td>T1</td>
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<td>63 in.</td>
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<tr>
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<td>T1</td>
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<td>T1</td>
<td>P03</td>
<td>R03</td>
<td>53 in.</td>
<td>135 in.</td>
<td>W1-03</td>
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<tr>
<td>Left Wing</td>
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<td>T1</td>
<td>P06</td>
<td>R04</td>
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<td>124 in.</td>
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<tr>
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<td>T1</td>
<td>P02</td>
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<td>48 in.</td>
<td>122 in.</td>
<td>W1-05</td>
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<tr>
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<td>T1</td>
<td>P07</td>
<td>R06</td>
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<td>109 in.</td>
<td>W1-06</td>
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<td>T1</td>
<td>P01</td>
<td>R07</td>
<td>44 in.</td>
<td>112 in.</td>
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<tr>
<td>Left Wing</td>
<td>M2</td>
<td>T1</td>
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<tr>
<td>Left Wing</td>
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<td>102 in.</td>
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<td>102 in.</td>
<td>W1-11</td>
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<td>T1</td>
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<td>R12</td>
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<td>109 in.</td>
<td>W1-12</td>
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<tr>
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<td>T2</td>
<td>P01</td>
<td>R15</td>
<td>147 in.</td>
<td>373 in.</td>
<td>W2-03</td>
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<tr>
<td>Left Wing</td>
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<td>T2</td>
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<td>356 in.</td>
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<td>T2</td>
<td>P03</td>
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<td>T2</td>
<td>P10</td>
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<td>310 in.</td>
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<td>Center</td>
<td>M3</td>
<td>T2</td>
<td>P09</td>
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<td>320 in.</td>
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<td>333 in.</td>
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<td>T2</td>
<td>P04</td>
<td>R24</td>
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<td>320 in.</td>
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# 48-Row Port Map, Right

Model NTA907-4875 and NTA3007-4875

<table>
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<th>Drill Section</th>
<th>Meter Outlet</th>
<th>Tower Number</th>
<th>Tower Port</th>
<th>Row Unit</th>
<th>Hose Length Inches</th>
<th>Metric</th>
<th>WSMB Input</th>
</tr>
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<tbody>
<tr>
<td>Center</td>
<td>M4</td>
<td>T3</td>
<td>P10</td>
<td>R25</td>
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60-Row Port Map, Left

Model NTA907-6006 and NTA3007-6006

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60-Row Port Map, Right

Model NTA907-6006 and NTA3007-6006

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Monitor Setup Data

Seed monitor setup is normally performed using the Quick Start Guide (QSG, Great Plains part number 110011516). If the QSG is not available, the table at right, plus the Specifications and Capacities data starting on page 163, provide the required and key factory default settings.

Notes:

a Required Value:
   Do not change.

b Factory Default:
   An approximate initial value. Calibration Constants are for standard 2-Star flute sets, Refine with actual material data and/or calibration.

c Type:
   Change to “GRAN...CONTROL” if optional variable rate seeding is installed.

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</tr>
<tr>
<td>Hopper Level Logic</td>
<td>a ACTIVE LO</td>
<td></td>
</tr>
<tr>
<td>Front Hopper is no.</td>
<td>a 1</td>
<td></td>
</tr>
<tr>
<td># of RPM sensors</td>
<td>a 1</td>
<td></td>
</tr>
<tr>
<td>Fan RPM Constant</td>
<td>a 3 pulses/rev</td>
<td></td>
</tr>
<tr>
<td>RPM filter</td>
<td>a 50 %</td>
<td></td>
</tr>
<tr>
<td># of Pressure Sensors</td>
<td>a 2</td>
<td></td>
</tr>
<tr>
<td>High Alarm</td>
<td>b 8.6 kpa</td>
<td>20 oz/in3</td>
</tr>
<tr>
<td>Low Alarm</td>
<td>b 1.7 kpa</td>
<td>4 oz/in3</td>
</tr>
<tr>
<td>Pressure Filter</td>
<td>a 50</td>
<td></td>
</tr>
<tr>
<td>Material Setup</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type (for seeding)</td>
<td>c GRAN SEED MONITOR</td>
<td></td>
</tr>
<tr>
<td>Type (for fertilizer)</td>
<td>c GRAN FERT MONITOR</td>
<td></td>
</tr>
<tr>
<td>Total # of Towers</td>
<td>a 4</td>
<td></td>
</tr>
<tr>
<td>Material Defaults</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seed</td>
<td>b 0.77 kg/l</td>
<td>60 lbs/bu</td>
</tr>
<tr>
<td>Fertilizer</td>
<td>b 0.96 kg/l</td>
<td>60 lbs/ft³</td>
</tr>
<tr>
<td>Calibration Constants</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seeding</td>
<td>b 3031</td>
<td>85831</td>
</tr>
<tr>
<td>Fertilizer</td>
<td>b 2931</td>
<td>82996</td>
</tr>
<tr>
<td>Channel Setup</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input Filter</td>
<td>a 50 %</td>
<td></td>
</tr>
<tr>
<td>Sensor Constant</td>
<td>a 360 pulses/rev</td>
<td></td>
</tr>
<tr>
<td>Gear Ratio</td>
<td>a 1</td>
<td></td>
</tr>
</tbody>
</table>
Chain Routing

Chain Routing Legend:

- **00I**: Idler tooth count
- **00P**: Chain Pitch count
- **00R**: Ratchet sprocket tooth count
- **00T**: Sprocket Tooth count

LH Contact Drive Chains

![Diagram of LH Contact Drive Chains]

Figure 163
LH Contact Drive Chains
Gearbox and Meter Chains

Figure 164
Gearbox Chain Routing
Hydraulic Diagrams

Transport Hook and Fold Hydraulics

Figure 165
Transport Hook and Fold Hydraulics
Wing Opener / Tilt Hydraulics

Figure 166
Wing Tilt Hydraulics
Marker Hydraulics (Option)

Figure 167
Marker (Option) Hydraulics
Opener Lift Hydraulics

Figure 168
Opener Lift Hydraulics
Weight Transfer Hydraulics

Figure 169
Weight Transfer Hydraulics
Fan (std.) and Auger (opt.) Hydraulics

Figure 170
Auger Hydraulics
Appendix B - Initial Setup

Console Installation

The drill’s standard seed monitor system includes a virtual terminal that must be mounted in the tractor cab. As supplied by DICKEY-john®, the kit includes a flat bracket, and ball swivel.

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.

**CAUTION**

Visibility Hazard:
Mount the console so that it is easy to monitor during planting, but does not interfere with safe operation of the tractor in the field or on public roads.

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 133).

Review “Marker Safety Information” on page 73 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, the extension values are measured from the centre-line of the outside wing rows, to the mark left by the marker disc.

<table>
<thead>
<tr>
<th>Drill Model</th>
<th>Row Spacing</th>
<th>Marker Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTA907-3610</td>
<td>25.4 cm</td>
<td>469.9 cm</td>
</tr>
<tr>
<td>NTA907-4875</td>
<td>19 cm</td>
<td>473.0 cm</td>
</tr>
<tr>
<td>NTA907-6006</td>
<td>15 cm</td>
<td>461.9 cm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Drill Model</th>
<th>Row Spacing</th>
<th>Marker Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTA3007-3610</td>
<td>10 in</td>
<td>185.0 in</td>
</tr>
<tr>
<td>NTA3007-4875</td>
<td>7.5 in</td>
<td>186.3 in</td>
</tr>
<tr>
<td>NTA3007-6006</td>
<td>6 in</td>
<td>181.9 in</td>
</tr>
</tbody>
</table>
Refer to Figure 172
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 147).
3. Re-check marker extension when changing disc angle or direction of throw (page 115).

![Figure 172 Marker Extension Adjustment](image)

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 counter clockwise (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.

![Figure 173 Sequence Valve Adjustment](image)
Appendix C - Option Installation

Changing Meter Flutes

To order high rate or small seeds flute shafts, see "Alternate Flute Sets" on page 158. 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 77.

Refer to Figure 174
1. On both ends of the meter box, remove and save the chain guard ① and gear guard ②.

Refer to Figure 175
2. On the right end of the meter box, remove and save the pins ③ from the final range gears ④, and then remove and save the gears. Note which size gear was on the agitator output and flute input shaft.

Refer to Figure 176
3. Remove and save the outer ring of six (6) self-tapping hex head bolts ⑤, that secure the outer flange to the meter box.

Do not remove the six bolts ⑥ that secure the bearing flangette to the outer flange. The shaft to be installed includes its own flange.
Refer to Figure 177 (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).

4. From the right end of the meter box, carefully withdraw the current flute shaft.

5. If present, remove and save the gasket:
   816-693C AIR DRILL METER SHAFT GASKET

6. 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 reduces the risk of mistaking the carton/contents in the future.

7. Select the new shaft.

8. Place the saved (or new) gasket on the shaft.

9. Carefully insert the new shaft in the meter box.

10. When the flange on the right end is fully seated against the box, and aligned with the gasket, secure it with the 6 saved bolts. Give the shaft a few turns.

11. 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.

12. Re-install the guards.
Warranty

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

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

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

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

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

This Warranty is not valid unless registered with Great Plains Manufacturing, Incorporated within 10 days from the date of original purchase.
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