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

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

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

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

<table>
<thead>
<tr>
<th>Model Number</th>
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<tbody>
<tr>
<td>Serial Number</td>
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<tr>
<td>Machine Height</td>
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<td>Machine Weight</td>
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<td>Year of Construction</td>
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<td>Delivery Date</td>
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<td>First Operation</td>
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<td>Accessories</td>
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</tbody>
</table>

Dealer Contact Information

Name: ____________________________
Street: __________________________
City/State: _______________________
Telephone: _______________________ 
Email: __________________________
Dealer's Customer No.: ____________

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

Look for Safety Symbol

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

Be Aware of Signal Words

Signal words designate a degree or level of hazard seriousness.

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

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

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

Prepare for Emergencies

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

Be Familiar with Safety Decals

▲ Read and understand “Safety Decals” on page 5, thoroughly.
▲ Read all instructions noted on the decals.
▲ Keep decals clean. Replace damaged, faded and illegible decals.
Wear Protective Equipment

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

Avoid High Pressure Fluids

Escaping fluid under pressure can penetrate the skin, causing serious injury. This planter requires a Power-Beyond port, which is always under pressure when the tractor is running.

▲ Avoid the hazard by relieving pressure at other remotes, and shutting down tractor before connecting, disconnecting or inspecting 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.

▲ 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.

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.
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

Transport Machinery Safely

Maximum transport speed for implement is 20 mph (32 km/h).

Maximum speed in turns is 13 mph (22 km/h).

Some rough terrains require a slower speed. Sudden braking can cause a towed load to swerve and upset.

▲ Do not exceed 20 mph (32km/h). 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 planter 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, 1 of 2” on page 141.

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

Shutdown and Storage

▲ Lower planter, put tractor in park, turn off engine, and remove the key.

▲ Secure planter using blocks and supports provided.

▲ Detach and store planter in an area where children normally do not play.
Practice Safe Maintenance

▲ Understand procedure before doing work. Use proper tools and equipment. Refer to this manual for additional information.
▲ Work in a clean, dry area.
▲ Lower the planter, put tractor in park, turn off engine, and remove key before performing maintenance.
▲ Make sure all moving parts have stopped and all system pressure is relieved.
▲ Allow planter to cool completely.
▲ Disconnect battery ground cable (−) before servicing or adjusting electrical systems or before welding on planter.
▲ 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 planter 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 planter functions.
▲ Operate machinery from the driver’s seat only.
▲ Do not leave planter unattended with tractor engine running.
▲ Do not stand between the tractor and planter 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 planter. Make sure all persons are clear of working area.
Safety Decals

Safety Reflectors and Decals

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

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

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

Slow Moving Vehicle Reflector

818-055C

On the back of the walkboard platform; one total

Red Reflector

838-266C

On the back of seed box support structure each end (above wheels) and on the back of the wing tool bars, each end: four total
### Amber Reflectors

#### 838-265C

- **(S/N B1128J-)**
  - On the front of the center section front lower tool bars, on the front end of each wing; four total.

- **(S/N B1129J+)**
  - On a bracket on the outside of each parking stand, on outside of each caster wheel support; four total.

### Daytime Reflectors

#### 838-267C

On the back of seed box support structure each end (above wheels) and on the back of the wing tool bars, each end; four total.
Read Manual
848-512C

On front of center section; 1 total

Danger: Crushing Hazard
818-590C

On tool bar next to parking stand, each side, two total

Danger: Electrocution Hazard
838-599C

On marker section each end; two total
Warning: Pinch/Crush
818-045C

On marker base, inside face, each end,
On wing arm link, each side
On wing rest, each side;
six total

Warning: Speed
818-188C

On front of center section;
one total

Warning: Pinch/Shear Hazard
818-579C

Front face of marker base bracket;
two total
Warning: Overhead Hazard
818-580C

On marker section each end; two total

Warning: Moving Parts
818-860C

Option: On tool bar inboard of ground drive gauge wheel each side, two total

Warning: High Pressure Fluid Hazard
818-339C

On front of center section, on each side of rear mainframe at parallel arms; three total
Caution: Read Operator’s Manual  
818-078C

On center tool bar; 
one total

Caution: Tires Not A Step  
818-398C

Above all four tires; 
four (4) total

Caution: Tire Pressure  
858-781C

On side of caster gauge wheel for ground drive; 
two total
Caution: Tire Pressure
858-669C

To avoid injury or machine damage from improper tire inflation or torquing of wheel bolts:
* Maximum inflation pressure for tires is 44 psi.
* Torque wheel bolts to 90 - 100 ft-lb.

On side of caster gauge wheel for hydraulic drive; two total

Caution: Tire Pressure
844-071C

To avoid injury or machine damage from improper tire inflation or torquing of wheel bolts:
* Maximum inflation pressure of tires is 60 psi.
* Torque wheel bolts to 170 ft-lb.

On side of caster wheel, single and dual (shown); two total
Introduction

Great Plains welcomes you to its growing family of new product owners. The 3-Point 40 Foot Yield-Pro® Planter with Air-Pro® Seed Meters (3PYPA Planter) has been designed with care and built by skilled workers using quality materials. Proper setup, maintenance, and safe operating practices will help you get years of satisfactory use from the machine.

Models Covered

- 3PYPA-1236: 12-Row, 36-Inch Spacing
- 3PYPA-1238: 12-Row, 38-Inch Spacing
- 3PYPA-1240: 12-Row, 40-Inch Spacing
- 3PYPA-1630: 16-Row, 30-Inch Spacing
- 3PYPA-24TR36: 24-Row (12 Twin), 36-Inch Spacing
- 3PYPA-24TR38: 24-Row (12 Twin), 38-Inch Spacing
- 3PYPA-24TR40: 24-Row (12 Twin), 40-Inch Spacing
- 3PYPA-3115: 31-Row, 15-Inch Spacing
- 3PYPA-32TR30: 32-Row (16 Twin), 30-Inch Spacing

Description of Unit

The 3PYPA Planter is a semi-mounted implement with optional unit mounted coulter. The unit mounted coulter make it suitable for light to moderate no-till conditions only. The 3PYPA includes 25 Series openers with Air-Pro Meters supporting a wide choice of seed disks. The planter stack-folds for transport.

Intended Usage

Use the 3PYPA Planter to seed production-agriculture crops only. It is suitable for conventional till, min-till and moderate no-till conditions. Do not modify the planter for use with attachments other than Great Plains options and accessories specified for use with the 3PYPA.

Document Family

- 401-647M: Operator Manual (this document)
- 401-647B: Seed Rate Charts
- 401-647P: Parts
- 401-647Q: Pre-Delivery Manual
- DICKEY-john® IntellAg® Manuals:
  - 11001-1662: Planter/Drill Control, User Level 1
  - 11001-1501A: Planter/Drill Control, User Level 2&3
  - 110011531: 3PYPA-1236, -1238, -1240 Quick-Start Guide
  - 110011530: 3PYPA-1630 Quick-Start Guide
  - 110011528: 3PYPA-24TR36, -24TR38, -24TR40 Quick-Start Guide

Note

- 3PYPA-3115 Quick-Start Guide
- 110011529: 3PYPA-32TR30 Quick-Start Guide
- 110011126: DICKEY-john® Hopper Level Sensor Install
- 110011561A: DICKEY-john® Auto Section Control
- 110011572: DICKEY-john® Down Pressure Control

a. Part number was pending at time of publication. Have your dealer obtain the QSG for your planter.
Using This Manual

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

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

Definitions

The following terms are used throughout this manual.

NOTICE

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

Useful information related to the preceding topic.

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

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

Owner Assistance

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

Refer to Figure 2

Your machine’s parts were specially designed and should only be replaced with Great Plains parts. Always use the serial and model number when ordering parts from your Great Plains dealer. The serial-number plate is located on the left end of the seed cart tool bar.

Record your 3PYPA Planter model and serial number here for quick reference:

Model Number: __________________________
Serial Number: __________________________

Figure 2
Serial Number Plate
Further Assistance

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

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

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

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

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

This section helps you prepare your tractor and 3PYPA Planter for use, and covers tasks that need to be done seasonally, or when the tractor/planter configuration changes.

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

Initial Setup

See "Appendix B - Initial and Option Setup" on page 163 for pre-delivery items (normally completed by dealer), and first-time/infrequent setup tasks, including:

- Install seed monitor console in tractor (page 163).
- Set initial down-pressure (option, page 171).
- Install Options not factory- or dealer-installed.

Post-Delivery/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:

- Install seed monitor console in tractor (page 163).
- Bleed hydraulic system (page 115).
- Check center section and wing level (page 168).
- Radar calibration (page 167).
- De-grease exposed cylinder rods if so protected at last storage.

Pre-Planting Setup

Complete this checklist before routine setup:

- Read and understand "Important Safety Information" on page 1.
- Check that all working parts are moving freely, bolts are tight, and cotter pins are spread.
- Check that all zerks are in place and lubricated. See "Lubrication" on page 126.
- Check that all safety decals and reflectors are correctly located and legible. Replace if damaged. See "Safety Decals" on page 5.
- Inflate tires to pressure recommended and tighten wheel bolts as specified. See "Tire Inflation Chart" on page 142.
Hitching Tractor to Planter

**DANGER**

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

**3-Point Hitching**

Refer to Figure 3

The left arm 1 of the tractor 3-point hitch is secured and prevented from shifting laterally. The right arm 2 is allowed to float on the pin.

The objective is to align the planter center-line with the tractor center-line.

1. The planter includes several spacers to position and secure the left arm of the 3-point hitch:
   1  401-630H SPACER 3 PT 1 1/2 X 2
   5  411-442D LOWER 3PT PIN SPACER 1/2 THK
   2  411-448D LOWER 3PT PIN SPACER 1/4 THK
   1  411-449D TUBE 3" X 1 1/2" X 1/2" LONG

2. The tube spacers (11 and 14) are always used, and are typically positioned on the right and left of the tractor hitch arm.

3. Insert open-end spacers (12 and 13) to the left of the smaller tube spacer 11 to achieve center-line alignment. The following table has recommendations for specific tractors.

<table>
<thead>
<tr>
<th>Tractor Model</th>
<th>Spacers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tube (14)</td>
</tr>
<tr>
<td>Case Magnum/MX</td>
<td>to Left</td>
</tr>
<tr>
<td>Deere 8000</td>
<td>to Left</td>
</tr>
</tbody>
</table>

4. Add a combination of the remaining spacers to eliminate any slack space on the pin, and minimize side-to-side play during operations.
5. Secure both sets of spacers with the provided \(\frac{3}{8}-13\) bolts, lock washers and nuts.

**NOTICE**

**Load Shift and Field Tracking Risks:**
Adjust 3-point hitch arms and sway blocks to minimize any side-to-side sway to assure proper tracking in the field and safe road travel.

Refer to Figure 4

6. Connect your lower tractor 3-point arms 2 to the planter 3-point hitch. If using quick hitch be sure planter locks into hitch securely.

This is a semi-mounted implement.
- The flexible top link 3, 4 may be used, with care, in certain situations.
- If the top link is not used, you may optionally use lift-assist weight transfer to apply some of the cart weight to the openers during planting.

**WARNING**

**Excess 3-point Weight and Steering Hazard:**
Do not use the top-link and weight-transfer capabilities at the same time. Planter caster wheels may lift off ground. Tractor steering wheels may lose effectiveness. An accident is possible, resulting in serious injury or death, and planter damage.

Refer to Figure 5

If using lift-assist weight-transfer (and not using the 3-point top link), make sure the parallel arms are configured as follows:

7. Install the lift-assist weight-transfer pins 5. The pins are stored in a plate behind the cart parallel arm pivot weldment. Install them in the large holes at the bottom of the rod-end lug in the frame-to-cart parallel arms.

8. Remove the lift-assist shear bolts from the small holes 6 below the lift-assist rod-end lug upper pivot pin. Store the bolts in the plates behind the cart parallel arm pivot weldments.

If using the 3-point top link, make sure the parallel arms are configured as follows:

9. Install the lift-assist shear bolts. Spare bolts are stored in a plate behind the cart parallel arm pivot weldment. Secure the bolt in the small hole 6 below the lift-assist rod-end lug upper pivot pin.

10. Remove the lift-assist weight-transfer pins 5. These are located at the bottom of the rod-end lug in the frame-to-cart parallel arms. The pin is stored in a plate behind the cart parallel arm pivot weldment.
Refer to Figure 4 on page 16

11. Connect the flexible top link ③ only for field operations and maintenance (never for transport).

Adjust the top link with the tractor turnbuckle and the sliding link ④.

For field operations, adjust the top link so that it is slack with the planter lowered, and taut near the top of hitch travel with the planter raised. The goal is to reduce the weight borne by the rear lift assist cylinders, and reduce any tendency for the tires to dig on end-of-pass turns and during backing.

12. Raise tractor 3-point just enough to relieve pressure from the bases of the parking stands.

**Electrical Hookup**

Refer to Figure 6

Your planter is equipped with several standard and optional devices that require separate electrical connections. For future reference, note any optional connectors on this checklist.

- ① Lighting connector (standard)
- ② Monitor connector (standard)
- ③ Steering connector (standard)

Make sure tractor is shut down with accessory power off before making connections.

These connections may be made in any order. The key requirement is that all connections be made prior to planter movement.

Consoles and switch control boxes should be mounted in your tractor cab in a location with easy access. Route wiring harnesses with enough slack to allow for tractor movement, especially on articulating tractors.
Hydraulic Hose Hookup

**WARNING**

*High Pressure Fluid Hazard:*
Shut down tractor before making hydraulic connections. The planter requires a power-beyond connection. Power-beyond ports are always under pressure when the tractor is running. Attempting a connection is likely to result in injury. Only trained personnel should work with system hydraulics.

Escaping fluid under pressure can have sufficient pressure to penetrate the skin causing serious injury. If an accident occurs, seek immediate medical assistance from a physician familiar with this type of injury.

Use paper or cardboard, NOT BODY PARTS, to check for leaks. Wear protective gloves and safety glasses or goggles when working with hydraulic systems.

*Refer to Figure 7*

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

**Current Style Color Coded Hose Handles**

<table>
<thead>
<tr>
<th>Color</th>
<th>Hydraulic Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steering (no color code)</td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>Fan</td>
</tr>
<tr>
<td>Gray</td>
<td>Wing Fold / Marker Tilt/Fold</td>
</tr>
<tr>
<td>Blue</td>
<td>Lift / Down Pressure</td>
</tr>
<tr>
<td>Yellow</td>
<td>Hydraulic Drive</td>
</tr>
</tbody>
</table>

To distinguish hoses on the same hydraulic circuit, refer to the symbol molded into the handle grip. Hoses with an extended-cylinder symbol feed cylinder base ends. Hoses with a retracted-cylinder symbol feed cylinder rod ends.

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

The fan motor further requires hookup of a third line, which returns hydraulic fluid from the fan motor case.
Older Style Hoses with Color Ties

Refer to Figure 8 and Figure 9 on page 20

Hydraulic hoses, for all circuits except steering, are color coded to help you hookup hoses to your tractor outlets. Hoses that go to the same remote valve are marked with the same color tie.

<table>
<thead>
<tr>
<th>Color</th>
<th>Hydraulic Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steering</td>
<td>(no color code)</td>
</tr>
<tr>
<td>Orange</td>
<td>Fan</td>
</tr>
<tr>
<td>White</td>
<td>Wing Fold / Marker Tilt/Fold</td>
</tr>
<tr>
<td>Blue</td>
<td>Lift / Down Pressure</td>
</tr>
<tr>
<td>Yellow</td>
<td>Hydraulic Drive</td>
</tr>
</tbody>
</table>

Refer to Figure 8

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

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

Secure hoses and cables so that they have sufficient slack for hitch movements, but cannot get caught between moving parts of planter. Failure to safely route and secure hoses and cables could result in damage requiring component repair/replacement, and lost field time.
1. Shut down tractor before making any hydraulic connections. A Power-Beyond connection cannot be made while hydraulics are live.

2. Connect the steering/fan case drain line first, before making any other connections. Connect this line to a low pressure drain port.

   Case drain hose has the smaller $\frac{1}{4}$ inch I.D. hose and small, flat-face, connector.

**NOTICE**

**Machine Damage Risk:**

DO NOT connect the fan/steering case drain line to a power-beyond-port. Case Drain Hose must be attached first, prior to inlet and return hoses being connected. Case Drain Hose must be detached last, to prevent damage to the fan motor.

3. Connect the load-sense line second. Connect this to the load-sense port associated with the power-beyond port pair to be used for steering. This line is provisioned with a very small QD-style connector.

4. Connect the steering/fan circuit low pressure return hose third. This hose is connected to a tee at the control valve. Connect this hose to a low pressure return connector.

   Steering/fan pressure return hose has a large (1.06 inch / 2.7 cm diameter) quick coupler.

5. Connect the steering circuit high pressure hose fourth. Connect this hose to the pressure side of the Power-Beyond port.

6. Connect the fan motor pressure hose fifth. If the tractor has a priority remote, use it for the fan connection.

7. Connect the remaining circuits to tractor remotes:

   - Lift (Standard) / Down Pressure (Option)
   - Wing (Standard) / Marker (Option)
   - Hydraulic Drive (Option)

**NOTICE**

**Machine Damage Risk:**

Steering system hoses must be connected, or casters may remain locked at their last used orientation. If casters cannot steer or float, any attempt at movement may cause damage. If steering hoses cannot be connected, also leave the steering system off, and make only careful forward moves.
Raise Parking Stands

Refer to Figure 10

1. If not already at minimum length, remove lower pin ① of parking stand, fully retract the inner leg ②, and reinsert pin.
2. Remove upper (holding) pin ③ of parking stand (at bottom of hinge bracket).

Refer to Figure 11

CAUTION

Crushing or Impact Injury Hazard:
Do not stand directly in front of the stand while raising it. You need to have one hand free to insert the pin, and if you lose your grip on the stand, it can swing down and inflict injury.

3. Swing the parking stand forward and up until it is above the rear hole. Place the holding pin ① in the rear-most top hole ④ of the hinge plate. This is the parking stand position for transport and field operation.
4. If planter is equipped with row cleaners, the stand may not be able to get fully vertical. It may be necessary to use front top hole ⑤.
Frame Height and Leveling

All frame sections must be at the correct height and level to maintain even planting depth.

Periodic frame-leveling adjustments should not be necessary unless the depth control stop has changed since last leveling. If you are having problems with uneven depth, check planter levelness and follow these procedures.

1. Complete the steps under “Bleeding Hydraulics” on page 115, before proceeding.
2. Before first use, and as necessary thereafter, complete or check: “Center Section Leveling” on page 168, “Wing Leveling” on page 168, and “Hydraulic Down Pressure Calibration (Option)” on page 171.
3. Unfold the planter fully. “Unfolding the Planter” on page 36.

Set Initial Planter Height

Refer to Figure 12

The planter is designed to operate with the main tool bar 26 inch (66 cm) above the planting surface (level ground or bed peaks).

Tractor 3-point control must be in Depth Control mode, and not Draft Control mode.

When lowering the planter for the first time on the planting ground:

4. Completely lower the 3-point.
5. Completely lower the Lift Assist. If necessary, first raise lift off transport locks, remove and stow locks.
6. Raise the 3-point until the tool bar is 26 inches (66 cm) above the planting surface.
7. Set the cab 3-point lever stop to capture this "lowered" height.

On beds, it will further be necessary to use customer-supplied blocks to raise the down-stop position of the lift assist cylinders. One way to accomplish this is:

Refer to Figure 13

8. Place a carpenter's level on a side tube of the center frame. Have an assistant stand a safe distance away and observe it.
9. With the 3-point lowered to the 26 inch stop, incrementally raise the lift assist until the frame is level.
10. Check that the front tool bar is at 26 inches above planting surface. If not, adjust stop and repeat step 9.
11. Measure the length of exposed rod on the lift cylinders. Provision two (sets of) blocks in that length (or stacked to that length).
12. Fully raise the lift assist and insert the blocks.

NOTICE

Planting Depth/Uniformity Risk:
Level frame in planting conditions. Failure to do so may result in machinery not producing desired results.
Marker Setup
Prior to first use, check and adjust:

- **"Marker Speed Adjustment"** on page 169.

Prior to first use, and whenever changing row spacings, set or reset:

- **"Marker Extension"** on page 170.

Each season, check and adjust:

- **"Marker Chain Length Adjustment"** on page 119 and

Prior to each planting session, check and adjust:

- **"Marker Disk Adjustment"** on page 64.
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 planter to the field.

- Carefully read “Important Safety Information” on page 1.
- Install seed disks appropriate for crop. See “Air-Pro Meter Disk Installation” on page 81.
- Lubricate planter as indicated under “Lubrication” on page 126.
- Check all tires for proper inflation. See “Tire Inflation Chart” on page 142.
- Check all bolts, pins, and fasteners. Torque as shown in “Torque Values Chart” on page 143.
- Check planter 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.

Monitor Operation

Refer to Figure 14

The monitor system includes two cab components:

1. IntelliAg® seed monitor console, and
2. IntelliAg® clutch-folding module (switch panel)

Clutch Folding Module (CFM) switch panel operations are described in this section.

Monitor console operation is described in separate manuals supplied with your planter. Operations covered in those manuals (and therefore not in this manual) include:

- hydraulic drive control (option)
- setting rate limits and detecting out-of-limits
- seed rate calibration
- GPS integration
- planting rate
- Swath Command™ section control
- fertilizer rate
- Row-Pro™

High Pressure Fluid Hazard:

Relieve pressure and shut down tractor before connecting, disconnecting or checking 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. Escaping fluid under pressure can have sufficient pressure to penetrate the skin causing serious injury. If an accident occurs, seek immediate medical attention.

Figure 14
A1 / A100 Console & CFM Panel
Raising/Lowering Planter

*Refer to Figure 15 (which depicts the planter both raised and unfolded)*

Planter raising relies on the 3-point hitch in front, and the Lift Assist cylinders in back. To raise or lower the planter, move the levers for both the Lift circuit and the 3-point hitch.

Great Plains recommends this sequence (to prevent lateral dragging of wing components):

- in Raising, operate the planter Lift circuit first, and
- in Lowering, operate the hitch circuit first.

The planter may be raised or lowered in either the folded or unfolded configuration.

The lift assist circuit may also include the optional down pressure system. This system engages and disengages automatically.

**NOTICE**

*Machine Damage Risk:*

Do not raise or lower while any planter folding operations are underway or partially complete.

Always raise planter for reverse/backing operations.
Folding the Planter

Fold the planter for moves between fields and over public roads. Fold the planter on level ground with the tractor in Park.

**NOTICE**

**Machine Damage Risk:**
Machine damage will occur if wing flex and lock pins are not properly configured for folding. Follow the instructions on the following pages carefully.

**WARNING**

**Pinch Point and Crushing Hazard:**
To prevent serious injury or death:

▲ Do not allow anyone to be on or near the planter, or beyond the ends of the planter during unfolding. Numerous pinch and crush points exist in the mechanism. The wings are massive. Coulters and row openers are sharp.

▲ Fold only with markers resting in transport cradles.

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

▲ Stay away from frame sections when they are being raised.

▲ Keep away and keep others away when folding planter.
Locking Pins

Refer to Figure 17

Each wing has two removable pins, stored in the parking stand 3 when not in use:

• Wing Flex Lock Pin 1
  Required to stabilize pivot during folding and unfolding. Used during planting to prevent wing flex.

• Wing Lock Pin 2
  Used to connect the wing tool bar to the center section tool bar during planting operations, and keep the wing tool bar at the same height as the mainframe tool bar. When this pin is installed at the coupling, the outer wing is either rigid, or can flex (depending on the planter “flex” configuration)

The following table summarizes pin use.

**NOTICE**

Machine Damage Risk:
The INNER pins 1 must be IN and the OUTER pins 2 must be OUT during folding and unfolding, or machine damage will result.

<table>
<thead>
<tr>
<th>Pin Location</th>
<th>During</th>
<th>Comments</th>
</tr>
</thead>
</table>
| Wing Lock 2 | Stowed | • Planter Folded  
  Must be removed from coupling during folding and unfolding or machine damage will result. |
| Wing Lock 2 | Tool bar Coupling | • Planting  
  Must be removed from coupling during folding and unfolding or machine damage will result. |
| Flex Lock 1 | Stowed | • Planting  
  Must be present in pivot during folding and unfolding or machine damage will result. |
| Flex Lock 1 | Wing Arm Pivot | • Folding/Unfolding  
  At all times on “Flex Lock” planters  
  Must be present in pivot during folding and unfolding or machine damage will result. |
Wing Fold Steps
1. Put tractor in Park.
2. Make sure the inner wing flex lock pins are in place in the pivot (page 27).
3. Make sure the outer wing lock pins are out of the tool bar coupling (page 27).

**NOTICE**

Machine Damage Risk:
*Wing pins must be inner-in and outer-out during wing folding and unfolding, or machine damage will occur.*

No pins are required to lock the planter in the folded configuration.

Refer to Figure 19
4. Set all DICKEY-john® CFM FRAME switches off (down).
5. Raise planter (see “Raising/Lowering Planter” on page 25).

Refer to Figure 20
6. Set CFM FRAME switch “Wing Fold” to on (up).
7. Activate (normally Extend) tractor hydraulic circuit to unfold wings.
8. When fully folded, set hydraulic circuit to off.

Refer to Figure 21
9. Set “Wing Fold” switch to off.

Wing Fold switch has priority over Marker switches. If Wing Fold switch is left on, marker operations are disabled.

**Lift Assist Cylinder Lock-Up**

When moving the raised planter more than a short distance, or over any paved surface, do not rely solely on the lift cylinders to keep it raised. Install transport locks.

Refer to Figure 22
1. Remove the transport locks ① from their storage positions. Do not store the locking pins on the empty storage tabs.
2. Fully raise the planter (using both 3-point and lift assist).
3. Remove any height adjusting blocks from the lift assist cylinders.
4. Install the transport locks on the cylinder rods ②, securing them with the same pins used for storage.
5. Lower the lift assist cylinders onto the locks. Leave the 3-point raised.
Steering with Control Monitor
(APPLIES TO ALL PLANTERS S/N B1127J+)

Steering System Modes of Operation
There are two modes of operation for the steering system on the 3PYP and 3PYPA Planters. Which mode of operation to use is based on whether the tractor is manually steered or has an auto-steer system.

If the tractor is manually steered then the Planter steering system should be set to “Steer While Planting” mode. In this mode the Planter steering system is always active.

Steering System Selection
Tap the ‘3PYP’ soft key to open the 3PYP Steering System screen. In order to enable steering, tap the ON soft key for ‘Master Steering System.’ Your machine now has the steering system enabled. In order to use the steering system for planting, tap the ON soft key for ‘Steer While Planting.’

Tap the OFF soft key to disable any of these selections.

Steering Calibration
The hydraulic steering system has calibration modes for caster and tractor wheel sensors. To perform one of these calibrations, first fully connect your planter to the tractor, level the machine, and set it on a reasonably flat surface large enough for simple operation. Then select Yes and proceed to the calibration instructions screen.

Machine calibration requires you make three separate movements with the machine: left, center, and right. After each of these movements, click the ‘Press to Save’ button followed by ‘Next’ to proceed to the next calibrations step. Once all three movements are performed and saved, machine calibration is complete.

Hydraulic-powered planter hydraulic steering is standard on the planter planter.

Figure 23
Steering System Screen

Figure 24
Steering Calibration Screen
Advanced Setup

Advanced Setup grants access to more factory settings. Many of these should only be changed by a certified Great Plains dealer. However, if you need to alter your settings for either tractor, CANBus, or ISOBus steering, you can make that change in your terminal's advanced setup page.

To access the advanced setup screen, go to the initial steering calibration screen and tap on ‘Advanced Setup’. A number pad will prompt you for the level 2 access code. Tap in ‘344787’ and you should see the ‘Advanced Setup’ screen appear. Now you can tap on a box next to the steering you want to select it for use. Tap on the home icon to exit when finished.

**NOTE: Unavailable Steering**

If a steering system is unavailable, its name will have a line struck through it on your screen. Check your onboard CPU if your system appears unavailable.

Diagnostics

Tap on the diagnostics icon to analyze machine sensor feedback and check for any problems your planter may be experiencing.

An unfilled circle indicates the machine’s function is normal. If a circle is filled red, then the sensors have either detected an open (disconnected) circuit or a short circuit has occurred. Check the appropriate area of the machine to assess the problem.

If a circle is filled gray, then the sensors detected an error has occurred but was cleared.
Steering with Module Control
(APPLIES TO ALL PLANTERS
S/N B1026J- through B1027J+)

Hydraulic-powered planter steering is standard on planters. Before using the system for transport or field operations, calibrate the ECU\(^a\) (page 109).

Steering controls caster position. When the hydraulic steering system is active, the casters steer to match the turning radius of the tractor. This prevents wheel digging in soft soils, and minimizes field damage when backing and turning on beds.

Refer to Figure 27, Figure 28, and Figure 29
When engaged (via switch \(1\)), the system functions automatically, and is active for all forward and reverse movements up to 8.0 mph (12.9 km/h). Casters float during any movement above 8.0 mph (12.9 km/h).

**NOTICE**

*Equipment Damage Risk:*
All reverse planter movements require the tractor for which the planter steering is calibrated. The casters match steering only with that tractor, and only with steering engaged. See “Emergency Moves Without Steering” on page 113.

**NOTICE**

*Equipment Damage Risk:*
If the Power LED \(\oplus\) is not on and steady, do not move the planter or make only careful forward moves. If the LED is blinking, there is a steering malfunction, and steering is NOT engaged. See “Steering Troubleshooting” on page 99.

---

a. Electronic Control Unit - Steering match relies on sensors mounted on both planter and tractor, and calibration of the ECU (page 109). The tractor sensor is normally dealer-installed, a topic covered in the planter Pre-Delivery Manual, publication 401-647Q.
Steering Configuration Switch

This cab-mounted switch box controls both normal operation and field calibration of the steering system. It has 4 switches and 3 indicator lamps. See page 109 for calibration details. In normal operations, only the STEER switch ① and indicators ② and ③ are employed.

<table>
<thead>
<tr>
<th>Steering Control Module Function</th>
<th>Switch Positions and Indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>① STEER Toggle Switch:</td>
<td>On (up): Steering enabled (casters match or float)</td>
</tr>
<tr>
<td>② LED:</td>
<td>Off (down): Steering disabled (casters in Float)</td>
</tr>
<tr>
<td>③ FLOAT LED:</td>
<td>On steady: Steering system active (casters match or float)</td>
</tr>
<tr>
<td>⑤ CALIBRATION Toggle Switch:</td>
<td>Blinking: Steering system fault (casters in Float)</td>
</tr>
<tr>
<td>⑥ LEARN Button:</td>
<td>Off: Normal operation - steering system active if STEER on</td>
</tr>
<tr>
<td>⑦ Rotary Switch Knob</td>
<td>On: Casters in Float (if STEER LED is steady)</td>
</tr>
</tbody>
</table>

1. STEER Toggle Switch: Steering System Power
   - On (up): Steering enabled (casters match or float)
   - Off (down): Steering disabled (casters in Float)
2. LED: Power / Fault
   - On steady: Steering system active (casters match or float)
   - Blinking: Steering system fault (casters in Float)
3. FLOAT LED: Float / Caster
   - Off: Normal operation - steering system active if STEER on
   - On: Casters in Float (if STEER LED is steady)
4. CALIBRATION Toggle Switch: Calibration Modes
   - L: Caster aspect sensor (casters in Float)
   - C: Calibration mode off (normal transport/field mode)
   - R: Tractor aspect sensor (casters in Float)
5. LEARN Button: Calibration (Learn)
   - First press: Learn tight Right turn
   - Next press: Learn Straight ahead
   - Next press: Learn tight Left turn
6. LED: Calibration
   - Off: Normal (non-Calibration) operation
   - Dim: Either Calibration mode selected
   - Bright Flash: Button ⑥ press acknowledged
7. Rotary Switch Knob (ONLY APPLIES TO s/n B1027J+)
   - Vertical position: Normal operation - steering system active while planting as well as raised
   - Horizontal position: Used when tractor is utilizing auto-steer - steering system floats while planting - active only when planter is raised
**Steering Operation**

**CAUTION**

**Tire Shoving/Cart Shift Risk:**
Keep everyone off and away from the seed cart when starting up steering system. Casters move rapidly to match current tractor steering once the steering system is engaged and tractor hydraulics are active. This could be a large motion, possibly a full left-to-right pivot operation, resulting in a shove or fall, and minor to moderate injury.

**Refer to Figure 30**

1. Verify that steering circuit hydraulic hoses are connected to a power-beyond port.
2. Set steering CALIBRATION switch to center-off.
3. Set STEER switch to on.
4. Check that main indicator LED is on steady.

The system operates automatically after this point. Keep in mind:

- Casters transition from active steering to Float mode above 8.0 mph (12.9 km/h). This state change is indicated by Float LED illumination.
- The steering hydraulics can consume up to 4 gpm during turns. If the tractor hydraulic flow is marginal, commence turns after completing marker fold and planter lift operations. Complete turns before lowering planter and unfolding marker.
- When the steering system is off, or any fault occurs, the casters are set to Float mode. Make only careful forward moves in these cases.

**NOTICE**

**Machine Damage Risk:**
Reverse only with properly functioning steering.
If the casters are in Float due to:
- a fault,
- because the steering system is shut off, or
- during operations with a non-steering-equipped tractor, make only careful FORWARD moves. In any reverse moves in Float, the casters quickly pivot in a random direction until they hit their stops. The planter attempts to turn the tractor in that direction. Planter damage is likely.
Transport

⚠️ DANGER

Loss of Control Hazard:
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.

The planter can weigh up to 28,000 pounds (12800 kg), depending on configuration and seed load. The tractor MUST be rated for the load. If the tractor is not rated for at least 28,000 pounds, calculate or obtain a scale weight of the planter and cart. See chart below for typical configuration weights. Do not tow if planter exceeds the load rating of the vehicle.

⚠️ DANGER

Loss of Steering Control Hazard:
Never transport with top link of 3-point link connected. When the top link is adjusted for field work, some planter mainframe weight is carried by the top link, which can dangerously reduce tractor front wheel traction and steering control.

⚠️ CAUTION

Do not exceed 3 mph (5 km/h) in reverse. At 8.0 mph (12.9 km/h) in reverse the planter steering disengages, resulting in a sudden sharp turn. Major equipment damage is certain.

NOTICE

Loss of Control Hazard / Major Damage Risks:
Do not exceed 20 mph (32 km/h) when driving straight and forward.

The planter is extremely heavy, and can cause “over-steer” with most tractors. Do not exceed 13 mph (22 km/h) in turns.

NOTICE

Reduction of Control Risk:
Seed may be loaded prior to travel, but increases stopping distance, increases the need for caution in turns and braking, and increases tire wear.
Typical 3PYPA Planter Weights
Approximate Weights of

<table>
<thead>
<tr>
<th>Representative Configurations</th>
<th>3PYPA-1236</th>
<th>3PYPA-1238</th>
<th>3PYPA-1240</th>
<th>3PYPA-1630</th>
<th>3PYPA-24TR36</th>
<th>3PYPA-24TR38</th>
<th>3PYPA-24TR40</th>
<th>3PYPA-3115</th>
<th>3PYPA-32TR30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base¹ Planter</td>
<td>14500 lb</td>
<td>14500 lb</td>
<td>14500 lb</td>
<td>15300 lb</td>
<td>17000 lb</td>
<td>17000 lb</td>
<td>17000 lb</td>
<td>18400 lb</td>
<td>18700 lb</td>
</tr>
<tr>
<td>Typical² Empty</td>
<td>15300 lb</td>
<td>15300 lb</td>
<td>15300 lb</td>
<td>16200 lb</td>
<td>17800 lb</td>
<td>17800 lb</td>
<td>17800 lb</td>
<td>19300 lb</td>
<td>19500 lb</td>
</tr>
<tr>
<td>Typical² Full</td>
<td>20200 lb</td>
<td>20200 lb</td>
<td>20200 lb</td>
<td>21100 lb</td>
<td>22800 lb</td>
<td>22800 lb</td>
<td>22800 lb</td>
<td>24200 lb</td>
<td>24400 lb</td>
</tr>
<tr>
<td>Maximum³ Empty</td>
<td>17800 lb</td>
<td>17800 lb</td>
<td>17800 lb</td>
<td>18900 lb</td>
<td>21000 lb</td>
<td>21000 lb</td>
<td>21000 lb</td>
<td>22900 lb</td>
<td>23200 lb</td>
</tr>
<tr>
<td>Maximum³ Full</td>
<td>22700 lb</td>
<td>22700 lb</td>
<td>22700 lb</td>
<td>23800 lb</td>
<td>25900 lb</td>
<td>25900 lb</td>
<td>25900 lb</td>
<td>27800 lb</td>
<td>28100 lb</td>
</tr>
</tbody>
</table>

¹ Base: No hopper/PROBOX, markers, coulters, or row cleaners
² Typical: with 82bu hopper. No markers, coulters, or row cleaners
³ Maximum: with 82bu hopper, markers, coulters, and row cleaners

Note: Weight of a specific planter can vary by a thousand pounds or more, depending on installed options and material loaded.

Transport Steps
Transport only with wings folded (page 26) and markers stowed (page 53).
2. Close slide gate on hopper or seed box (page 42).
3. If any seed is in delivery hoses, close seed inlet shutters at meters (page 82).

**NOTICE**

**Increased Hazards and Wear Risks:**
*Seed may be loaded prior to travel, but increases stopping distance, increases the need for caution in turns and braking, and increases tire wear.*

4. Fold markers (page 53), if presently unfolded.
5. Raise planter (page 25).
6. Fold wings (page 26) if presently unfolded.
7. Install cylinder lock channels (page 28).
8. Disconnect 3-point top link.
9. Before departing, ensure that opener depth and seed rate have been determined, or that the necessary data is with you.
10. Plan the route.
    Avoid steep hills.
    Keep Clearances in mind. Folded, your planter may be over 25 feet (7.6 m) wide and over 12’/3 feet (3.8 m) high. Check bridge loads. The tractor plus planter may exceed the load ratings of bridges you must cross.
11. Always have lights on for highway operation.
12. Comply with all national, regional and local safety laws when traveling on public roads.
13. Travel with caution.
    Do not exceed 20 mph (32 km/h) when driving straight. Do not exceed 13 mph (22 km/h) in turns.

**NOTICE**

**Steering**
*Never exceed 13 mph (22 km/h) in turns. The planter is extremely heavy, and can cause “over-steer” with most tractors. Above 8 mph (12.9 km/h), the rear wheels caster in forward motion, and provide only modest resistance to side sway by the planter. Steering must be engaged during all movements. Never exceed 3 mph (5 km/h) in reverse.*

**Machine Damage Risk:**
*Never back up with the planter lowered. Row unit plugging is certain. Damage to seed tube and seed firmers is likely. Damage to row unit shanks is possible.*

Figure 31
CFM for Transport
29869
Unfolding the Planter

WARNING

Crushing, Pinch-Point and Overhead Hazards:
To prevent serious injury or death:

▲ Do not allow anyone to be on or near the planter, or beyond the ends of the planter during unfolding. Numerous pinch and crush points exist in the mechanism. The wings are massive. Coulters and row openers are sharp.

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

▲ Unfold only with markers resting in transport cradles.
Wing Unfold Steps

1. Move planter to an area of level ground. Put tractor in Park.
2. Unless rechecked recently, level the planter per “Frame Height and Leveling” on page 22.

Refer to Figure 34

3. Make sure wing flex lock pins ① are in place.
4. Verify that the wing lock pins ② are available, and are not in the wing lock-down holes. Normally, in storage, transport and set-up, these pins are stored in dedicated holes ③ in the parking stand bracket.

**NOTICE**

Machine Damage Risk:
The INNER pins ① must be IN and the OUTER pins ② must be OUT during folding and unfolding, or machine damage will result.

Refer to Figure 33

5. Set all CFM FRAME switches off (down).
6. Raise planter.

Refer to Figure 35

7. Set CFM FRAME switch “Wing Fold” to on (up).
8. Activate (normally Extend) tractor hydraulic circuit to unfold wings.
9. When fully unfolded, set hydraulic circuit to off.

Refer to Figure 36

10. Set “Wing Fold” switch to off (or marker operations are disabled).

Refer to Figure 37

11. Insert wing lock pins ②.

Refer to Figure 34

If operation will be over uneven ground, remove wing flex lock pins ①, and store in parking stand bracket holes ③.
Walkboard and Ladder Operations

Refer to Figure 38, 39 and 40

The walkboard provides a convenient platform for hopper inspection, and bag- or auger-loading of seed into the hopper. The walkboard also swings open for seed container exchanges, and stores a row-unit tool.

**WARNING**

_Falling Hazards:_
Check that the walkboard pin ① is in place before climbing.
Check that both railing pins ④ are fully seated before leaning on rear center railing. There is no center railing on the seed side of the walkboard. If latch pins are not seated in swing-down railing segment, it could swing to the rear. If the walkboard or railing swing open you could fall, resulting in serious injury or death.

▲ Always face ladder when climbing.

The walkboard has five key features:

1. Walkboard pin - keeps walkboard closed.
   With left end of walkboard fully forward in channel at ladder top, insert pin, and secure lowered end of pin with wire bail.

2. Walkboard keeper - holds walkboard open when hooked into...

   Swing walkboard to near fully open. Engage wide end of keeper in narrow slot of keyhole.

4. Swing-down railing - eases auger tube access.
   Pull wire cross-pin towards implement center-line. If not pulling both at once, rotate pin one quarter turn and release into shallow detents. Swing railing section down. When returning railing to normal position, release both pins into deeper detents, and check that both pins are fully seated.

5. Walkboard tool - adjusts opener down-force cam.
   See page 72.

Only the 1\(\frac{1}{8}\) inch open-end wrench feature of this tool is used on Air-Pro implements.
Loading Materials

The 3PYPA 3-Point 40 Foot Yield-Pro® Planter with Air-Pro® Seed Meters accepts only the Great Plains 82 bu hopper or bulk seed boxes that meet the Pioneer® PROBOX® specification.

Prepare Air Box

These steps assume no seed container is mounted. If leftover seed is present, perform a Material Clean-Out (page 102). Dismount prior seed container as needed.

Refer to Figure 41

1. Position the planter on level ground with sufficient rear clearance for maneuvering any tractor, forklift or auger to be used for loading seed.
2. If leaving the tractor hitched, put it in Park, set the parking brake, shut it off and remove the key. Otherwise, prepare the planter as for Parking (page 57).
3. If the air box is capped for shipping or storage, remove the protective wrap or cover.
4. Inspect the elastomer seals for damage and excess pre-compression. Check that corner pads are 1 inch (2.5 cm) higher than main pad.
5. Inspect the airbox for residual seed or foreign matter. Perform any clean-out necessary.

Refer to Figure 42 (showing door slightly ajar)

6. Close clean-out door. If the clean-out door is partly or completely open, wipe the seal clean, inspect for damage/wear, and close the door. Push levers fully forward into detent.
7. At the start of planting season:
   a. Pour 2 cups (0.6 liter) Ezee Glide Plus seed lubricant into the air box (this is before mounting the seed container).
   b. Open all Y-tubes (page 83).
   c. Close all seed inlet shutters (page 79). Seed disks may be installed or not.
   d. Start tractor and seed monitor. Refer to Figure 43
      Set MASTER and FRAME CFM switches to Off.
   e. Start fan, and set to 2000 rpm.
   f. Command monitor to perform a “FILL METER” operation (see DICKEY-john® Planter/Drill Control Level 1 manual).
8. Shut off fan, monitor, and tractor.
9. Remove pins at corners of seed structure.
10. Swing the walkboard ladder open and secure it with the keeper (page 38).

---

a. PROBOX® is a registered trademark of Pioneer Hi-Bred International, Inc.
Prepare Hopper (if used)

The hopper includes a level sensor which is not factory-installed. If you desire to use the sensor, install it prior to first use of the hopper. See page 167.

Refer to Figure 44
1. Open hopper lid and inspect hopper:
   - Rubber latch ☰ must be intact. If hopper is not closed securely during operations, air leaks cause irregular seed delivery.
   - Make sure seed strainer ☰ basket is present and clean.
   - Check that hopper is clear of residual seed and foreign matter. See page 102 if any clean-out is required.
   - Check lid ☰ for holes, cracks and excessive warping. Close lid. It must seat flat when latched.

Refer to Figure 45
2. Briefly open slide gate to drain off any condensed moisture.

Prepare Bulk Seed Box
Due to the difficulty of mixing seed lubricant down to the base of the bulk box, Great Plains suggests:

- Mix lubricant into the seed prior to transport of the bulk box to the field.
- Pour 2 cups (0.6 liter) of lubricant into the air box before mounting the bulk box.
1. Determine the amount of seed lubricant required. See page 133 for recommendations.
2. Open the lid of the bulk box.
3. Mix in all but 2 cups of the lubricant, stirring as deeply as possible without damaging seed.
4. Close the lid.
Mount Hopper or Bulk Seed Box

1. Prepare the air box, walkboard, and seed structure per the steps at “Prepare Air Box” on page 39.

**CAUTION**

Tip-Over Hazard:
Place or remove an 82 bushel hopper only when empty. A full hopper can weigh over 5000 pounds (2270 kg), which is above the lifting and balance capability of most tractors and farm forklifts.

2. If mounting a bulk seed box, it may be easier to add seed lubricant while the box is still at ground level. See page 133 for amount to add.

3. If mounting a hopper, make sure slide gate is closed.

Fork lift height capability required is:
5 feet (1.5 m)

4. Determine the container and lifter orientation.

Although containers fit the seed structure at any orientation, they can deliver seed only if the slide gate is to planter-rear.

Although side placement is possible, Great Plains recommends lifting from the rear of the seed container, using the lower side tubes 8. For side lifting (typically for hopper storage), use the side fork holes 9. Do not lift from below the side tubes.

**CAUTION**

Tip-Over Hazard:
A full bulk seed box can weigh over 2500 pounds (1130 kg). Make sure your tractor or fork lift is rated for and configured to lift this weight. Do not let anyone stand under or in front of the elevated seed hopper or bulk seed box.

5. Place the hopper or bulk seed box in the seed structure.

6. Check the seal between the container and the air box. The elastomer seal should be compressed by approximately 3/8 inch (13 mm). It may be necessary to make a one-time adjustment to eliminate any air gaps and achieve the recommended compression.

7. Secure the seed container to the frame using the pins removed at step 9 on page 39. Placing these pins at opposing corners provides the most stability.

8. Close the walkboard and secure with pin (page 38).
Load Seed in Hopper (if used)

**NOTICE**

**System Plugging Risk:**
Do not use liquid seed treatments.

*Refer to Figure 48*
1. Check that slide gate is closed.
2. Determine the amount of seed lubricant required.
   See page 133 for recommendations.

**NOTICE**

**Inconsistent Population/Blockage Risks:**
Ezee Glide Plus seed lubricant is required for all seeds. Thorough mixing of seed and lubricant is required for lubricant to be effective.

3. Check that walkboard is pinned closed (page 38).
   Fold down railing if needed for auger.

**CAUTION**

**Falling, Chemical and Auger Hazards:**
Face ladder when climbing walkboard. Make sure walkboard is securely latched. Make sure swing-down railing is securely latched for hand-loading. Observe seed supplier precautions for handling treated seed. Follow all safety procedures for auger operations.

Auger lift height capability required is:
12 feet (3.7 m)

4. Open hopper lid (page 40).
   Load seed while mixing in seed lubricant.

**CAUTION**

**Irritation and Chronic Exposure Hazard:**
DO NOT use hands or any part of your body to mix seed lubricant. Wear gloves. Wear a respirator when transferring and mixing. Avoid breathing lubricant dust. Not an acute hazard. May cause mechanical eye or skin irritation in high concentrations. As with all mineral spills, minimize dusting during cleanup. Prolonged inhalation may cause lung injury. Product can become slippery when wet.
Dismounting a Seed Container

**CAUTION**

**Tip-Over Hazard:**
Place or remove an 82 bushel hopper only when empty. A full hopper can weigh over 5000 pounds (2270 kg), which is above the lifting and balance capability of most tractors and farm forklifts.

**CAUTION**

**Tip-Over Hazard:**
A full bulk seed box can weigh over 2500 pounds (1130 kg). Make sure your tractor or fork lift is rated for and configured to lift this weight. Do not let anyone stand under or in front of the elevated seed hopper or bulk seed box.

1. Park the planter in an area with level ground and sufficient room to maneuver a tractor or fork-loader.
2. Turn off the seed box fan.

**Refer to Figure 50**

4. Close the slide gate at the base of the hopper or seed box.
5. Open the walkboard and secure with keeper (page 38).
6. Remove two pins securing seed container to seed structure (page 39).
7. Align the lifting forks with the lower tubes of the hopper, or slots at base of bulk seed box.
8. Slowly move forks forward until completely under the container.
9. Slowly lift the seed container above the bracket. Back away from the planter.
10. Lower the container to the ground.
11. If not mounting another seed container, close and pin the walkboard. Return the corner pins to the seed structure. Cap the air box inlet if a cover is available.
Fertilizer Operation (Option)

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

A fertilizer distribution system is optional on the planter. The Great Plains provisioned components include:

- the lines to the row units (connected to Keeton® seed firmers if present),
- orifice fittings for each row
- distribution lines
- manifold
- pressure gauge
- relief valve
- inlet (1 inch female NPT) from pump system on tractor

If installed, there are five points of fertilizer setup and/or adjustment:

1. Pump drive connection and valves
   These are separately provisioned tractor-mounted components, and are not described in this manual.
2. Strainer setup
   This is a separately provisioned tractor-mounted component, but the mesh screen size must be compatible with the orifice plates in the distribution system. See this page and "Fertilizer Orifice Plates" on page 68.
3. Relief valve setting
   See "Fertilizer Row Shut-Off" on page 69.
4. Pump drive rate
   This is a separately provisioned tractor-mounted capability. Rate setting is described in the 401-647B Rate Manual, but system operation is not.
5. Row orifice setup
   See "Fertilizer Rate" in the 401-647B Rate Manual.

Great Plains recommends checking with your local agronomist, as soil conditions vary. Soil conditions in your area may need less or more fertilizer than represented in the charts. Do not exceed 12 gallons per acre in any case.

The liquid fertilizer system is designed to operate (ideally) between 15 and 40 psi, but in no case more than 85 psi. Several system elements affect system pressure, and need initial setup, periodic maintenance, and adjustment when changing seed rates.

Liquid Fertilizer Strainer
A strainer is commonly supplied with a fertilizer pump option and is plumbed between the tank(s) and the pump.

The strainer may have been delivered with a mesh screen. You need to check that it is an appropriate size for the orifice plates you plan to use.

The standard orifice plates for the planter are size 48. Sizes 34 and 28 are also provided.

If changing screen sizes, keep in mind the following:

- Generally, select a mesh screen the same or slightly smaller than the orifice size.
- A substantially smaller mesh (e.g. 100) will reduce manifold orifice plates plugging, but the strainer screen will have to be cleaned more often.
- A much larger mesh (e.g. 50 or 30) will pass more material but should only be considered when using large manifold orifice plates.
- A plugged or partially plugged screen will starve the pump and will result in a reduced application rate.
Air System Operation

Figure 52
Yield-Pro Air System for Air-Pro Seed Metering

<table>
<thead>
<tr>
<th>Meter Pressurization System Elements (→ shows air direction)</th>
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<tbody>
<tr>
<td>11 Hydraulic Fan</td>
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<tr>
<td>12 Split-Air Manifold</td>
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<tr>
<td>13 Servo-Controlled Vane</td>
</tr>
<tr>
<td>14 WSMT Servo Programming</td>
</tr>
<tr>
<td>15 Priority Meter Pressurization Air</td>
</tr>
<tr>
<td>16 Excess Air to Air Box</td>
</tr>
</tbody>
</table>

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Air System Overview

The hydraulic fan (11) supplies air for both seed delivery and meter operation. Fan rpm is operator-adjusted (page 48) via the tractor’s hydraulic flow control, and reported by the seed monitor system. The rest of the system is fully automatic.

At the split air manifold (12), a rotary actuator (13) operates a vane, under the control of software in the WSMT (14), which regulates the air diverted to the meter pressurization system (15).

Air not used for metering (typically just under half of it) flows to the air box (16) for bulk seed delivery. The meter pressurization air has priority, and can take all the air.

Several rows have lines (17) to sample metering air pressure, which is measured in a sensor chamber (18). The sensor reading is fed back (19) to the WSMT (14) for closed-loop pressure control. No operator adjustment is required for the metering air system.

At the air box (20), air is mixed with seed from the bulk hopper or ProBox, and flows out of the air box manifold ports into primary seed hoses (21) to the rows. Y-tubes (not shown) may split primary hoses into secondary hoses to rows.

An air release screen (22) above each Air-Pro meter (23) vents the delivery air. The vent has two functions:
1. It releases delivery air while retaining the delivered seeds.
2. It is a passive control gate for bulk seed delivery. 

It takes about a minute to initially fill the meters.

Separate pressurization tubes (24) provide the air to the meters that holds the seed in disk cells until released to the seed tubes (25).

A detector in each seed tube reports seed passage to the seed monitor system, which reports counts and rates on the console (29).

There is a butterfly valve (27) for the center section meter pressurization air. This valve is calibrated at the factory for your planter, and locked. Do not adjust it.
**Fan Circuit Operation**

See also “Fan and Adjustment” on page 65.

**Refer to Figure 54**

Three hydraulic hoses serve the fan, and must be properly connected for the fan to operate in the correct direction, at recommended speeds, and without damage. See “Hydraulic Hose Hookup” on page 18.

1. Always connect the case drain line first.

   This line protects the outer shaft seal of the hydraulic motor. The case drain is a small line to the hitch, provisioned with a specialized low-seep flat-face case drain Quick Disconnect. Pressure spikes during motor operation, and pressure cycles due to temperature change are bled off by the case drain.

**NOTICE**

**Motor Seal Damage Hazard**

*Do not apply pressure to the case drain line. Do not change the special QD connector. A restricted or sealed case drain line will promptly result in motor seal damage.*

2. Connect the motor return line second, to sump.

   The planter includes an 1\(\frac{1}{16}\) inch low back-pressure QD coupler set. Install the receptacle on a tractor sump port, and not at a normal remote return port. The unusual size aids in ensuring correct connection, so that the motor return line handles high volume at low back-pressure, ensuring full motor performance.

3. Connect the motor inlet line to a tractor remote capable of the flow rates shown at “Recommended Initial Fan Speeds” on page 48.

4. The fan hydraulic circuit includes a check valve, which provides a relief path for oil at motor shutoff. The resulting low fan rpm provides strong indication reversed connection.

   Correct fan direction is shown at Fig. If reversed fan is suspected, observe it during shutoff, as the direction of motion is easier to see at lower rpms as it slows to a stop (initial startup is virtually instantaneous, making observation at start difficult).

   Fan speed is controlled by the tractor circuit (and not the seed monitor). Fan rpm is reported by the seed monitor console.

   You may stop the fan by setting the circuit to neutral or float. The check valve slows the blades to a stop by locally recirculating the oil.

   If the fan is connected in reverse, it may not run at all (due to no oil source at the return connection). If oil is present, oil bypass at the check valve prevents the fan from reaching operating rpms. A reversed fan is incapable of providing sufficient air flow for planting.
**Fan General Operating Information**

Use tractor remote hydraulic valve flow control to set fan speed. Always start the fan with a low flow setting.

Monitor fan rpm with the seed monitor.

Gradually bring fan up to the recommended initial rpm. The split-air servo vane engages only above 50 rpm. Do not run the fan over 3900 rpm or at speeds under 2000 rpm.

At excessive rpm, too much air flow can cause:

- seed to plug the air box
- seed suspension in a bulk seed box
- oil heating
- slow lift times

If the rpm is too low, the split-air system may divert nearly all the air to meter pressurization, leaving none for seed transport (or just enough to plug low spots in seed hoses).

The monitor console can report meter pressurization. There is also a Magnehelic® air pressure gauge. These two readings should not disagree by more than a few tenths of an inch.

If at suggested fan rpm, desired pressure cannot be reached, chances are the fan is running backwards. If the rpm and meter pressurization readings are correct, but the meters are starved of seed, the fan may be running backwards and the meter pressurization system is taking all the air, leaving little or none for seed delivery. Reverse the inlet/return lines at the hitch.

If air system does not operate suitably with fan speeds between 2000 and 3900 rpm, see "Population Troubleshooting Charts" on page 92.

When starting empty you must blow seed out to the meters for two to four minutes to fill meters.

The monitor has a level sensor below the hopper or seed box to warn when seed box is empty. There are three to four acres of seed in the system when the sensor first indicates box empty, depending on seeding rate.

Steps for setting and adjusting the air system are found at "Fan and Adjustment" on page 65.

---

**Recommended Fan Speeds**

<table>
<thead>
<tr>
<th>3PYPA</th>
<th>Seed Hopper*</th>
<th>Bulk Box</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Fan Speed</td>
<td>2900 rpm</td>
<td>2500 rpm</td>
</tr>
<tr>
<td>Fan Speed Range</td>
<td>2000 - 3900 rpm</td>
<td>2000 - 3300 rpm</td>
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<tr>
<td>Oil Consumption</td>
<td></td>
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<tr>
<td>Ground Drive No Markers</td>
<td>16 - 24 gpm</td>
<td>16 - 22 gpm</td>
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<tr>
<td>Ground Drive With Markers</td>
<td>23 - 31 gpm</td>
<td>23 - 28 gpm</td>
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<tr>
<td>Hydraulic Drive No Markers</td>
<td>21 - 29 gpm</td>
<td>21 - 26 gpm</td>
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<tr>
<td>Hydraulic Drive With Markers</td>
<td>28 - 36 gpm</td>
<td>28 - 34 gpm</td>
</tr>
<tr>
<td>Maximum Config. Maximum Turns</td>
<td>34 - 42 gpm</td>
<td>34 - 40 gpm</td>
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<tr>
<td>Maximum Turns</td>
<td>129 - 160 lpm</td>
<td>129 - 150 lpm</td>
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</tbody>
</table>

* This assumes a 2007+ Great Plains hopper, or older hopper with the vent line update. For an older unvented hopper, use the rpms recommended for Bulk Box.

---

**NOTICE**

**Low Population Risk at Turns:**

The figures assume a 6 second lift and 15 second marker fold, and do not include oil consumed by the tractor itself. Aggressive lift/lower operations, and simultaneous lift/marker operations, can reduce fan rpm below that needed to pressurize meter disks. If seeds fall out of pockets, low population bands will occur after turns.

Unless the tractor has generous oil flow capacity, raise/fold markers before lift, and lift slowly. Watch manifold pressure and tune operations to keep it at planting levels in turns.

The Seed Rate manual provides initial values for meter pressurization. Normal readings are in the 0.8 inch to 4.0 inch water range, and vary considerably with crop.

During “FILL METER”, all air is routed to the air box, and none to the meter pressurization system.
Electric Clutch Operation

The 3PYP A Planter has two or three clutches in the seed meter drive system:

- Hydraulic drive planters have 2 clutches.
- Ground drive planters have 3 clutches.

A clutch enables or disables groups of row units. The information in the table on the next page is normally preset at the factory for your planter configuration.

Refer to Figure 55 (depicting the left group shut off)

The switches Left / Center / Right correspond to the left wing row units, center section row units and right wing row units respectively. The Center switch has no function on hydraulic drive planters.

The Master switch controls all row units, regardless of drive type. For all switches, “OFF” (down) removes power from the clutch, disengaging that set of row units. When any switch (plus Master) is ON, the LED for that switch illuminates steadily.

Electric Clutch Lock-Up

In case of electric clutch failure, an electric clutch can be mechanically engaged.

Refer to Figure 56 and Figure 57

1. Remove the rubber plugs from the oil shield disc to allow access to the lock-up holes. Plugs simply push out away from the clutch side.
2. Align the cutouts with the holes.
3. Insert the M8-1.25 x 14mm long metric bolts.

If you observe half the hole obstructed by a metal disc, you are not at a cutout.

If the entire hole is obstructed by a metal disc, you are not at a cutout.

When at a cutout, the bolt will screw in with minimal resistance until the bolt head reaches the clutch face.

4. Reinstall the plugs so they are not lost.

Use only the provided 14 mm length bolts. Longer bolts will damage the clutch. Shorter bolts may not effect a lock-up.
### Clutch Switch Coverage

#### 12-row Ground Drive (36 inch Single, 38 inch Single, 40 inch Single)

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#### 12-Row Hydraulic Drive (36 inch Single, 38 inch Single, 40 inch Single)

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#### 16-row Ground Drive (30 inch Single)

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#### 16-Row Hydraulic Drive (30 inch Single)

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#### 23-Row Ground Drive (20 inch Single)

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#### 23-Row Hydraulic Drive (20 inch Single)

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#### 24-Row (12 Twin) Ground Drive (36 inch Twin, 38 inch Twin, 40 inch Twin)

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#### 24-Row (12 Twin) Hydraulic Drive (36 inch Twin, 38 inch Twin, 40 inch Twin)

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#### 31-Row Ground Drive (15 inch Single)

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#### 31-Row Hydraulic Drive (15 inch Single)

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#### 32-Row (16-Twin) Ground Drive (30 inch Twin)

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#### 32-Row (16-Twin) Hydraulic Drive (30 inch Twin)

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</table>
Air-Pro Meter Operation

Refer to Figure 58

The meter disk is driven, top forward, by a chain drive (not shown) always connected to the section drive shaft. At non-planting rows, use a blank disk (page 139).

Seed is air-delivered to the inlet above the air release screen ①. Seed customarily fills to the top of the screen, blocking further air flow from the seed delivery system, until the seed level falls below the screen.

Seed enters the meter at the seed inlet shutter ② (if open), and forms a seed pool ③ at the base of the meter. Seed pool size is controlled by the shutter handle ④ setting (which is the only user adjustment at the meter). Initial shutter settings are given in the seed rate charts.

Meter pressurization air enters the meter at ⑤, and exits the meter primarily at the seed pockets in the seed disk. The pressure differential holds seed in the disk pockets ⑥ rising from the seed pool. Excess seed at a pocket is picked off by the tickler brushes ⑦.

The strip and drop brushes block meter pressurization air. Seeds passing the drop brush ⑧ are free to fall into the seed tube, and are detected by the seed sensor ⑨.

Meter Operation

1. Install disks for your crop/population range per the Seed Rate manual and the instructions beginning on page 81 of this manual.
2. Open shutters at planting rows to the recommended initial setting (from the Seed Rate charts). At unused rows, close Y-tube leg (page 103), install a blank disk (page 139) and close shutter.
3. Set sprocket indexing if staggering a twin-row crop (see Seed Rate manual for details).
4. Operate the fan at normal field rpm.
5. On the seed monitor, perform a “FILL METER” operation.
6. With all rows primed, rotate meters one turn to fill pockets to edge of drop brush.

For hydraulic drive, engage all clutches, and use a “FILL DISK” seed monitor operation.

For ground drive, either disengage all clutches and rotate the section drive shafts (top forward) with a 7/8 inch (23 mm) wrench, or raise planter, engage clutches and rotate ground drive tires (top forward).

Meter operation is automatic from this point on.

For hydraulic drive planters, an optional Remote Test Switch is available from DICKEY-john® which allows at-row control of meter rotation for meter fill and seed pool recovery operations.

See also:
“Seed Pool Troubleshooting” on page 90,
“Seed Pool Recovery” on page 91,
“Meter Clean-Out” on page 103, and
“Meter Brush Maintenance” on page 105.
Marker Operation (Option)

⚠️ WARNING

Overhead, Crushing and Shearing Hazards:
Do not allow anyone to stand near or beyond the end of the wings during marker operations. There is risk of serious injury or death for anyone in the path of a marker. Marker arms are heavy, are under tremendous hydraulic power, and may move suddenly if the hydraulic system is damaged or needs bleeding. Marker discs may be sharp.

The planter markers have two operations, which are only performed when the wings are unfolded (page 36):

1. **Tilt** (forward/up and backward/down)
   Markers are tilted up prior to marker unfold/fold.
   Markers are left tilted up for field operations.
   Markers are tilted down prior, to wing fold, for transport and storage.

2. **Fold** (down/out and up/in)
   Markers are unfolded for marking.
   Markers are folded for turns and prior to alternate side unfolding.

If markers are installed, but not required for the next field operations, they may be left folded and tilted up or down.

CFM and Marker Switch Priority

*Refer to Figure 60*

The Wing Fold switch 🅱️ must be OFF during all marker operations. When the Wing Fold switch is ON, marker switches (悒 / Ⓐ) are disabled.

The Tilt operation is performed before the unfold operation. The Tilt switch 🅱️ must be OFF during marker fold operations.

When the Marker Tilt switch 🌀 is ON, the Marker Fold switch 🅷️ is disabled.

Before Operating Markers

- Make sure cylinders are properly bled. See “Marker Maintenance (Option)” on page 119.
- This section presumes correct marker extension for your pass spacing. If this has not been set, or needs to be changed, see “Marker Extension” on page 170.
- This section presumes a factory marker chain configuration.
- If your chain has been replaced, or stretched, adjust the links to the correct slack length. See “Marker Chain Length Adjustment” on page 119.
- Markers are equipped with an automatic sequence valve that controls which side activates, as well as marker deployment speed. Marker folding speed is adjusted via set screws on the sequence valve body. Excessive folding speed may damage markers. Set speed prior to first field operations. See “Marker Speed Adjustment” on page 169.
Marker Tilt-Up

Refer to Figure 61
1. On the CFM, set all FRAME switches off (down).
2. Set Marker Tilt switch 1 to on (up).
3. Move tractor hydraulic control (lever or switch) for the marker circuit (typically to Retract). Hold until marker is raised. Do not leave control in detent.
4. Set Marker Tilt switch to off (down), and leave it in off position during normal field operations.

Marker Tilt-Down
With both markers in the upright and folded configuration, and the tractor circuit control off/neutral:
1. Set CFM switch Marker Fold to off (down).
2. Set CFM switch Marker Tilt to on (up).
3. Move tractor circuit control to Extend. Hold until markers are resting in transport cradles.

Marker Unfold (one side)
Refer to Figure 63
1. Tilt markers up.
2. Set CFM switch Marker Fold 2 to on (up).
3. Move tractor hydraulic control (lever or switch) for the marker circuit (typically to Extend). Hold until marker is completely unfolded. Do not leave tractor control in detent.
4. If the marker side operating is not the desired side, let it unfold part way, and move the tractor’s circuit control to Retract. When the marker is folded, move the circuit control to Extend to activate the other side.

During normal field operations, leave CFM switch Marker Fold on. Other FRAME switches must be OFF.

Both Sides Unfolded
With both markers in the upright/tilted positions:
1. Unfold either side, and when completely deployed:
2. Move lever/switch to Retract momentarily, and return to Extend to deploy other side.

Row Marker Operation
To alternate which side is marked:
1. CFM switch Marker Fold must be on, and all other FRAME switches must be off.
2. Move the tractor’s circuit control to Retract. Hold until marker is folded.
3. Move the tractor’s circuit control to Extend. Hold until the new side’s marker is fully unfolded.
4. Return tractor control to neutral/off.

Folding The Markers
If your planter has markers, they must be folded and secured before folding the wings.
Field Set-Up Checklists

Use the following tables to develop a final checklist for your tractor/planter configuration. Additional or fewer steps may be necessary depending on tractor features, planter options and planting accessories.

### Mechanical Checklist (Hitching)

<table>
<thead>
<tr>
<th>Item</th>
<th>Page</th>
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</thead>
<tbody>
<tr>
<td>Planter centered at hitch</td>
<td>15</td>
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<tr>
<td>Left hitch spacers installed</td>
<td>15</td>
</tr>
<tr>
<td>Tongue height preset on 3-point</td>
<td>22</td>
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</tbody>
</table>

### Electrical Checklist

<table>
<thead>
<tr>
<th>Item</th>
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<tbody>
<tr>
<td>Verify electrical hookups solid</td>
<td>17</td>
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<tr>
<td>Check seed monitor terminal and observe any diagnostic messages</td>
<td>a</td>
</tr>
<tr>
<td>With hydraulic circuits in Neutral, check switches and indicator lights on Clutch Folding Module switch panel. Confirm Master OFF.</td>
<td>-</td>
</tr>
<tr>
<td>Verify that, when planter is lowered, radar speed sensor is pointed at ground, at an angle approximately 35° below horizontal.</td>
<td>b</td>
</tr>
</tbody>
</table>

- a. Refer to monitor manual.
- b. Refer to sensor documentation.

### Mechanical Checklist (post-Hitching)

<table>
<thead>
<tr>
<th>Item</th>
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<tbody>
<tr>
<td>Transport locks moved to storage</td>
<td>28</td>
</tr>
<tr>
<td>Front-to-rear level</td>
<td>22</td>
</tr>
<tr>
<td>Planter unfolded</td>
<td>36</td>
</tr>
<tr>
<td>Wings level</td>
<td>168</td>
</tr>
<tr>
<td>3-point top link adjusted (if used)</td>
<td>-</td>
</tr>
<tr>
<td>Marker tilt complete</td>
<td>53</td>
</tr>
<tr>
<td>Marker extension set</td>
<td>170</td>
</tr>
<tr>
<td>Marker disc angle set</td>
<td>64</td>
</tr>
<tr>
<td>Markers folded (unless already at start of first planting row)</td>
<td>53</td>
</tr>
<tr>
<td>Walkboard closed and pinned</td>
<td>38</td>
</tr>
</tbody>
</table>

### Hydraulic System Checklist

- Check tractor hydraulic reservoir full
- Steering: case drain (shared with fan)
- Steering: sensor line
- Steering: pressure return (shared w/fan)
- Steering: pressure side to power-beyond

### Air System Checklist

- Manifold to seed box or hopper seal
- Add 2 cups of seed lubricant to air box, prior to first use, and prior to loading seed
- Seed loaded. Lids closed and latched.
- Y-tubes turned on for active rows
- No air leaks (except from seed box)
- Hose routings - no sags, no pinches (check wing-folded & field positions)
- Hoses fully connected to meters and locked

### Planter Hydraulic Drive Checklist

- Check chain lubrication and slack
- Input initial values for desired population
- Calibrate radar speed sensor pulses with planter lowered.
- Lubricate slider joints on drive shafts
- Check clutch operation

- a. Refer to monitor manual and Seed Rate manual.
- b. Refer to seed monitor manual.
### Planter Ground Drive Checklist

<table>
<thead>
<tr>
<th>Item</th>
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<tbody>
<tr>
<td>Check chain lubrication and slack</td>
<td>121</td>
</tr>
<tr>
<td>Set/check Range, Transmission and Upper Drive sprockets against rate chart</td>
<td>a</td>
</tr>
<tr>
<td>Calibrate radar speed sensor pulses with planter lowered.</td>
<td>b</td>
</tr>
<tr>
<td>Lubricate slider joints on drive shafts</td>
<td>128</td>
</tr>
<tr>
<td>Check clutch operation</td>
<td>49</td>
</tr>
</tbody>
</table>

a. Refer to Seed Rate manual.
b. Refer to seed monitor manual.

### Row Units Checklist

<table>
<thead>
<tr>
<th>Item</th>
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<tbody>
<tr>
<td>Preset depth handles alike.</td>
<td>76</td>
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<tr>
<td>Preset down force springs alike, except in tracks.</td>
<td>71</td>
</tr>
<tr>
<td>Set all unit-mounted coulters to 1¼ inch shallower than opener blades.</td>
<td>74</td>
</tr>
<tr>
<td>Check coulter alignment to row</td>
<td>75</td>
</tr>
<tr>
<td>Check closing wheel alignment</td>
<td>86</td>
</tr>
<tr>
<td>Set press wheels alike, except in tracks.</td>
<td>86</td>
</tr>
<tr>
<td>Check action and contact of side depth wheels</td>
<td>77</td>
</tr>
<tr>
<td>Check wheel scraper gaps (if installed)</td>
<td>78</td>
</tr>
</tbody>
</table>

### Treatments (Options) Checklist

<table>
<thead>
<tr>
<th>Item</th>
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<tbody>
<tr>
<td>Check tractor-mounted components</td>
<td>a</td>
</tr>
<tr>
<td>Check for correct orifice plates</td>
<td>b</td>
</tr>
<tr>
<td>Check relief valve setting</td>
<td>69</td>
</tr>
<tr>
<td>Fill system with 100 gallons of water, and check for leaks</td>
<td>-</td>
</tr>
<tr>
<td>Check all row unit lines connected, free of kinks, and discharge tube/nozzles clear</td>
<td>-</td>
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<tr>
<td>Inlet and hose valves open</td>
<td>-</td>
</tr>
</tbody>
</table>

b. Check Seed Rate manual, and manual for fertilizer pump system.

### Meters Checklist

<table>
<thead>
<tr>
<th>Item</th>
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<tbody>
<tr>
<td>Corn? Check timing of meters for twin-row</td>
<td>a</td>
</tr>
<tr>
<td>Check chain tension. Reconnect any loose idler tensioning springs.</td>
<td>-</td>
</tr>
<tr>
<td>Correct disks for seed</td>
<td>a</td>
</tr>
<tr>
<td>Start fan. Operate at field rpms.</td>
<td>47</td>
</tr>
<tr>
<td>Rotate meter drive shafts one turn disks with seed.</td>
<td>51^b</td>
</tr>
</tbody>
</table>

a. Refer to Seed Rate manual.
b. With optional hydraulic drive, speed this process by performing a “FILL METER” operation.
Field Operation

Perform all steps in "Pre-Start Checklist" on page 24 and "Field Set-Up Checklists" on page 54.

<table>
<thead>
<tr>
<th>First Pass Operation Checklist</th>
<th>Page</th>
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<tbody>
<tr>
<td>1. Check that steering is engaged</td>
<td>31</td>
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<tr>
<td>2. Raise planter and line up at start of first planting row.</td>
<td>25</td>
</tr>
<tr>
<td>3. Set tractor 3-point hitch to &quot;depth control&quot; operation (and not load control).</td>
<td>45</td>
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<tr>
<td>If tractor hitch is set for &quot;load control&quot;, planting depth will be uneven.</td>
<td></td>
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<tr>
<td>4. Prime meters with seed. Leave fan running.</td>
<td>51</td>
</tr>
<tr>
<td>5. Engage marker on next-row side.</td>
<td>52</td>
</tr>
<tr>
<td>6. Engage hydraulic seed drive via seed monitor. Refer to seed monitor manual.</td>
<td>-</td>
</tr>
<tr>
<td>7. If planter has a fertilizer system integrated with the DICKEY-john® seed monitor, set the &quot;Fert.Pump&quot; switch on the Clutch Folding Module to ON.</td>
<td>45</td>
</tr>
<tr>
<td>8. In the CLUTCH cluster of the CFM, set Master and section switches ON.</td>
<td>49</td>
</tr>
<tr>
<td>9. Pull forward, lower planter, and begin planting for a short distance.</td>
<td>25</td>
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<tr>
<td>10. Stop. Assess:</td>
<td>-</td>
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<tr>
<td>• planting depth</td>
<td></td>
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<tr>
<td>• seed spacing</td>
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<td>• press wheel operation</td>
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<tr>
<td>• fertilizer application (if in use)</td>
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<tr>
<td>11. Make necessary adjustments</td>
<td>59</td>
</tr>
<tr>
<td>12. Resume planting.</td>
<td>-</td>
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</tbody>
</table>

Consult seed monitor for alarms during planting. Check that reported rates are consistent with your plan.

When reloading seed and fertilizer, check consumption against anticipated use to that point.

<table>
<thead>
<tr>
<th>Sharp Field Turns® Checklist</th>
<th>Page</th>
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<tbody>
<tr>
<td>1. Fold marker</td>
<td>52</td>
</tr>
<tr>
<td>2. Raise planter when fold is complete</td>
<td>25</td>
</tr>
<tr>
<td>3. Make turn</td>
<td></td>
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Short-Term Parking

1. Fold markers (page 53). Tilt them down (page 53).
2. Choose a location with level firm ground. Do not unhitch on a steep slope.
3. Unfold the planter. With ample space, Great Plains recommends parking the planter unfolded. This allows easiest access for routine maintenance, particularly on the folding mechanism. Do not insert wing lock pins.

Refer to Figure 65 and Figure 66

4. Remove pin 1 holding each parking stand 2 up. Swing stands down. They may not be fully vertical at this point.
5. Fully raise planter.
6. The load on the parking stands is as much as 5700 pounds each (or 116 psi). If the ground is soft or uncertain, place boards or concrete pads under the parking stand locations.
7. Insert pin 1 in the lower hole pin 2, locking the stand in the parking position.
8. Remove pin 3 and extend inner parking leg 4 to the ground.
9. Slowly raise the leg until the hole in the outer leg aligns with a hole in the inner leg. Reinsert pin 3.
10. Install lift assist locks (page 28) if not already present.
11. Lower planter until hitch is not resting on tractor 3-point.
12. Shut down tractor. This step is essential to permit disconnection of the steering lines.

**WARNING**

**High pressure Fluid Hazard:**

Do not attempt disconnection of hydraulic lines with the tractor running. The steering pressure line is active at all times when the tractor is running. Set other remotes to Float and shut down tractor to allow safe disconnections.

12. Disconnect hydraulic lines. Secure them so that they do not touch the ground.
13. Disconnect electrical cables, capping where provisioned.
Long-Term Storage

1. If a fertilizer boom system is installed, see “Fertilizer System Maintenance” on page 125.

2. Complete Parking steps (page 57). Park the planter indoors if possible. Great Plains recommends parking/storing in the raised position, unfolded, on extended parking stands and with lift-assist cylinder locks in place.

3. If no hopper or seed box is mounted, cap the air box.

4. If empty seed box or hopper is mounted, close the seed gate and the lid.

5. If partially-loaded seed box or hopper is mounted, close seed gate, and remove seed box. Store planter only without seed.

6. See “Material Clean-Out” on page 102. Clear all seed from seed container, air box, seed delivery system and meters.

7. Open air box clean-out door and leave slightly ajar so that condensed moisture can drain, but pests cannot enter.

8. Remove seed disks from meters (this is primarily to relieve pressure on brushes). Clean disks of residue build-up (see Caution at right). Use mild soap, non-abrasive scrubbers, and hot or warm water. If using sealed storage, dry disks prior to storage.

9. Tie or tape a small plastic bag over ends of all seed delivery tubes to prevent insects from entering or nesting.

10. Close seed inlet shutters at meters (to prevent pest entry to seed hoses). Thoroughly clean seed and seed treatment residue from seed meters. See “Meter Clean-Out” on page 103, for more information.

11. Shut off all Y-tubes.

12. Clean planter of mud, dirt, excess oil and grease.

13. Lubricate all points listed in Maintenance.

14. Apply grease to exposed cylinder rods to prevent rust.

15. Inspect planter for worn or damaged parts. Make repairs and service during off season.

16. Use spray paint to cover scratches, chips, and worn areas on the planter to protect the metal.

17. Cover planter with a tarp if stored outside.

Possible Chemical Hazard:
Seed disks will have talc and graphite residue, and may have residues of hazardous seed treatments. Do not wash disks where food is prepared, or where cookware or dinnerware is washed. Wear gloves when washing disks. Avoid spray. Although the disks are dishwasher-safe, do not wash them in an appliance also used for food cookware or dinnerware.
## Adjustments

To get full performance from your 3PYPA planter, you need an understanding of all component operations, and many provide adjustments for optimal field results. Some of these have been covered earlier in this manual. Even if your planting conditions rarely change, some of these items need periodic adjustment due to normal wear.

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a. SRM: Seed Rate Manual (401-647B)
b. PDC: DICKEY-john<sup>®</sup> Planter/Drill Control manuals
Setting Material Rates

Planting Rate

Adjusting the planting rate requires the following:

1. Preparing rows:
   Correct seed disk selection is required for correct rate. Meter shutter setting and meter pressurization adjustments assure the rate. See the SRM.

2. Monitor configuration:
   The seed monitor must be set up with the correct row count, row spacing and disk cell count. See the Seed Rate Manual (SRM) and the DICKEY-john® Planter/Drill Control (PDC) manual.

3. Ground speed calibration:
   Seed monitor rate control and reporting is only as accurate as the speed reported by the radar. See the PDC manual.

4. Setting seed rate, based on drive type:
   - **Hydraulic Drive:**
     Check, in the Seed Rate manual, that the intended population and planting speed are within range for the seed disk. Enter the rate on the console.
   - **Ground Drive:**
     Check, in the Seed Rate manual, that the intended population and planting speed are within range for the seed disk. Per the Seed Rate manual, select and install the Range, Transmission and Upper drive sprockets that provide that rate.

5. Checking planting rate:
   Although the seed monitor reports a computed population based on seeds sensed, only an actual furrow check provides certainty about the actual seeding rate. See the SRM.

**Hydraulic Drive Rate**

Entering a specific rate, and increment/decrement limits, is done via the Material Setup screens, which require User Level 2 privileges. See the PDC User Level 2/3 manual.

Area-specific mapped rates may be loaded via SD card from compatible third-party farm prescription software applications. Consult the software supplier documents.

Once set, an operator at User Level 1 may adjust the rate from the main work screen. See the PDC User Level 1 manual.

### Notice

**Population and Equipment Wear Risks:**
For ground drive, perform identical setups on each of the two gauge wheel drives. Any differences can cause unpredictable seed rate and excess clutch wear.

---

**Figure 68**

Seed Monitor Rate Screen

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Hitch Shims

Refer to Figure 69
(an exploded view - remove only specified parts)

If the planter tends to pull to the right or left, inserting, moving or stacking hitch shims may correct the problem. The standard planter has one shim installed on the left. A spare hitch shim was shipped with the planter.

To remove or insert a shim:
1. Loosen the eight nuts ① and bolts ② on the lower hitch, only on the side to be changed.
2. At the four set screws ③, loosen the four jam nuts. Drive the set screws in until the existing shim ⑫ is free, or the gap is large enough to insert a shim.
3. From the top, insert or remove:
   ⑫ 401-943D SHIM HITCH FLANGE
4. Back out the four set screws. Tighten the eight nuts and bolts. Turn the set screws in until they make contact. Secure them with the four jam nuts.

Height Switch Adjustment

Refer to Figure 70

The planter includes a sensing switch ① that signals the seed monitor (and activates the optional hydraulic drive), when the planter is lowered for planting.

Although factory-preset for typical planting conditions, Great Plains recommends adjusting this switch for your exact field conditions and planting depth. Check the switch seasonally thereafter, or when planting conditions change. Also perform this adjustment if the switch is replaced or dislodged.

The switch is located on the parallel arms connecting the planter mainframe to the air cart.

Refer to Figure 71

1. Lower the planter to the height at which seed delivery is to begin.
2. Loosen bolts ② holding switch bracket ③ to frame.
3. Move bracket and switch up or down so switch toggle arm ④ makes contact with upper parallel arm ⑤.

It may be necessary to loosen the screws ⑥ holding the switch to the bracket and rotate the switch slightly on the bracket.

If the switch is ever completely removed, be sure to replace it with the cable exit at the bottom. If the cable is at the top, switch operation is reversed, and moisture will accumulate in the switch, causing eventual switch failure.
Gauge Wheel Adjustments

The gauge wheels, which may also be contact drive wheels, serve three functions:

Refer to Figure 72

1. Regardless of meter drive type, the gauge wheels each establish the heights of their respective wings. A spring-loaded yoke \( \circ \) assembly provides some flexibility over rocks and uneven ground. See “Gauge Wheel Tension” to set this spring.

2. In ground-drive (contact-drive), the gauge wheels mutually contribute drive power for the row unit mechanisms.

3. In ground-drive, the gauge wheels control the planting rate at the meters, via three sprocket setup positions. See “Setting Material Rates” on page 60.

Gauge Wheel Tension

Refer to Figure 73

Before performing this step, the planter center section and wings must be level and aligned, and the tool bar height must be set to 26 inches. If these steps have not been performed, See “Frame Height and Leveling” on page 22 and “Planter Leveling” on page 168.

As the gauge wheel tire wears, this adjustment may need periodic attention.

The planter must be on firm, level ground for this step (which may be performed when the planter leveling is done). The planter must be unfolded.

1. Raise the planter so that the gauge wheels are just off the ground.
2. Loosen the top nut \( \circ \) above the yoke block \( \circ \).
3. Raise or lower the planter so that the base of the tool bar is 26 inches from the ground.
4. Using an open-end or adjustable wrench at the integral hex nut \( \circ \) of the adjustment link \( \circ \), rotate the link until the spring is just touching the yoke block \( \circ \), with neither gap nor compression.
5. Tighten the top nut \( \circ \).

Ground Drive Adjustments

When planting, if the monitor indicates under-seeding, check for slippage of the gauge wheels. If they are slippage:

1. Raise the planter so that the gauge wheels are just off the ground.

Refer to Figure 73

2. Loosen the top nut \( \circ \) above the yoke block \( \circ \).
3. Using an open-end or adjustable wrench at the integral hex nut \( \circ \) of the adjustment link \( \circ \), rotate the link to adjust the gauge wheel tension. Using the base of the link flange, and the pivot zerk \( \circ \) as reference points, increase this distance to increase down-force on the wheel.
4. Tighten the top nut \( \circ \).
Hydraulic Down Pressure

Refer to Figure 74

If desired opener depth cannot be consistently achieved using cam adjustment (page 72), or gauge wheels are slipping at the force required, the optional hydraulic down pressure system may remedy the problem. Cylinders transfer some center section weight to wings, controlled by valves at the front of the center section.

**NOTICE**

**Oil Heating / Tractor Wear Risks:**

*The current hydraulic down pressure option is compatible only with “closed center” tractor hydraulics.*

1. Before making depth adjustments with valve ①, make sure the system (valve ②) has been calibrated (page 171), and review how the system behaves as hydraulics are cycled.

To adjust hydraulic down pressure:

2. At all rows, set the cam (mechanical spring) down pressure to notch 3 (page 72).

3. The lever for the down pressure circuit remote must be LOCKED OPEN to provide constant pressure/flow to the down-pressure cylinders. See operations tips in sidebar for specific tractor models.

4. With the tractor hydraulic lever locked forward, release the lock disk ③, turn the knob ④ on the pressure control valve ①.

5. Watch the pressure gauge ⑤ and set the desired pressure. Clockwise increases the pressure and counterclockwise decreases pressure. The recommended pressure range for planting is between 400 psi and 600 psi.

6. Once the pressure is set, lock the knob ④ with the lock disk ③.

The row down-force setting controls the soil firming pressure on the press wheel as well as the disk penetrating force. **DO NOT** use more down-force than necessary to obtain the desired opener penetration and to maintain the proper firming action over the seed. Excessive opener force leads to excessive wear and damage of the opener components.

**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 lift assist to circuit #2 and the markers to circuit #3.

**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 providing constant flow to openers.

On some tractors with very positive remote hydraulic checks, a slight increase in the reading on the pressure gauges may occur after the tractor remote lever is returned to neutral. This is caused by back pressure on the opener cylinders and may be ignored.

The NET OPERATING PRESSURE on the opener cylinders is maintained at the pressure you selected while the tractor remote lever was held forward—not at the “apparently increased” pressure. Reactivating the tractor lever forward confirms this.
Cart Weight Transfer

Some of the cart weight can be transferred to the mainframe by retraction of the lift-assist cylinders, with a weight-transfer pin in place. This operating mode is compatible with wing-lock, wing-flex and hydraulic down-pressure planters.

1. Disconnect the 3-point top link.

Refer to Figure 75

2. Install the lift-assist weight-transfer pins ⑩. The pins are stored in a plate behind the cart parallel arm pivot weldment. Install them in the large holes at the bottom of the rod-end lug in the frame-to-cart parallel arms.

3. Remove the lift-assist shear bolts from the small holes ⑩ below the lift-assist rod-end lug upper pivot pins. Store the bolts in the plates behind the cart parallel arm pivot weldments.

4. Fully retract the lift-assist cylinders when lowering the planter in the field.

Marker Adjustments (Option)

See also:

• “Initial Marker Setup (Option)” on page 169 for marker speed and marker extension
• “Marker Operation (Option)” on page 52; and,
• “Marker Maintenance (Option)” on page 119 for marker shear bolt, marker chain length, and marker hydraulic bleeding

Marker Disk Adjustment

CAUTION

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

Refer to Figure 76

1. To change angle of cut, and the width of the mark, loosen 3/8 inch bolts ⑩ holding the disk assembly.

   For a wider mark ⑩, increase the angle of the marker with respect to the tube ⑩. For a narrower mark ⑩, reduce the angle.

   Do not set a marker angle wider than need to make a useful mark. Excess angle increases wear on all marker components.

2. Tighten bolts ⑩.

   Direction of travel ⑩ tends to drive the disk angle to Wide. If bolts are not tight enough, or loosen over time, disk slips into the Wide mark configuration.
Fan and Adjustment

1. These steps presume that correct seed disks are installed (Seed Rate Charts), and the seed inlet shutters are set for the seed (page 79).

2. With fan off, check meter pressurization reported by seed monitor. Re-zero as needed (see Seed Monitor manual).

3. Determine recommended fan rpm based on your own notes in the Seed Rate Charts, or the table on page 48.

4. Determine the recommended meter pressurization based on your own notes or the published value in the Seed Rate Charts.

5. Start the fan. Gradually increase fan rpm using the tractor’s hydraulic flow control for the circuit. Adjust to the developed or suggested value from step 3.

6. Check that at least a small amount of pressure is being sensed at the meters and meter pressurization is near suggested value.

7. Perform a “FILL METER” operation for at least one minute (see DICKEY-john® Planter/Drill Control user level 1 manual).

8. Check for meter fill:
   With fan running, put the tractor in Park and set the brakes. Walk behind the wings, remove several rain covers, and check for seed in meters by looking through the clear disks. Rows to check are those with longer hoses or sharper hose bends.

9. Fill the disk pockets with seed:
   Run a “FILL DISK” operation.

10. Check control air system pressure. With meters and disks filled, meter pressurization should be at target value.


12. During the first pass, take note of the average populations reported on the seed monitor.

   Typical Location: Screen 1, first row above graphs
   Item: Average Overall Population
If the reported population varies from your intentions by a significant amount, it is imperative to perform a furrow check. For serious rate variances, for which the source of the problem and the solution are not quickly determined, see “Population Troubleshooting Charts” on page 92.

If the population is only slightly low, the problem can be skips (periodic empty disk pockets). If slightly high, the problem can be doubles (period pockets with double seed). An adjustment to the meter pressurization may correct either condition (see step 14).

13. Resume planting. During the next pass, note the following two readouts on the seed monitor:

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<th>Typical Location</th>
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<tr>
<td>Screen 1, 2nd row above graphs</td>
<td>Minimum Row Population</td>
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<tr>
<td>Screen 1, 3rd row above graphs</td>
<td>Maximum Row Population</td>
</tr>
</tbody>
</table>

14. Skips:
If all else is correct, and the overall average population is running low (or there are gaps upon furrow check), the cause may be seeds falling out of disk pockets before delivery to the seed tube. Increase meter pressurization to correct this. You can adjust meter pressurization with the planter in motion.

Press the “SPLIT AIR +” softkey on the seed monitor console. Wait 5 to 10 seconds for the system to update, while you continue planting. Continue making small increase adjustments until the reported population levels out at the target value.

15. Doubles:
If all else is correct, but overall average population is running high (or there are double seeds upon furrow check), the cause may be two seeds in some disk pockets at delivery to the seed tube. Decrease meter pressurization to correct this. You can adjust meter pressurization with the planter in motion.

Press the “SPLIT AIR -” softkey on the seed monitor console. Wait 5 to 10 seconds for the system to update, while you continue planting. Continue making small decrease adjustments until the reported population levels out at the target value.

Small seeds, such as Milo, may be under-reported. Use the “Alternate Skip/Double Check” below to verify seed status at the disc pockets.

Furrow Check:
Expose several seeds in each of several rows, being careful not to disturb their relative positions. Measure and average the distance between seeds. Compare this to the predicted seed spacing for the population in the Seed Rate manual.

Any instances of no seed where expected may be a sign of “skips”. Finding two seeds at the same spot is clear indication of “doubles”

A small varying population deviation between rows is normal; however, if a row is consistently running lower or higher than the other rows, it could indicate a meter or seed sensor problem that needs attention.

“Population Troubleshooting Charts” on page 92.

Insufficient meter pressurization, or unusually rough fields, can increase the incidence of empty pockets. Be sure to rule out other causes (such as skipping chains, meter starvation, incorrect meter disks) before adjusting meter pressurization to reduce apparent skips.

The suggested increment of change is two presses of the “SPLIT AIR” softkey, at the factory default value for change increments.

Excess meter pressurization can increase the incidence of doubles. Be sure to rule out other causes (such as incorrect meter disks) before adjusting meter pressurization to reduce doubles.
Fine-Tuning
After several passes, and you are comfortable with the planter’s operation, you can optimize meter pressurization. Use this method during longer passes, so there are fewer distractions (and see sidebar regarding Milo).

1. Observe the current overall average population reported by the monitor.
2. Adjust the meter pressurization down, in discrete steps, waiting 5 to 10 seconds between adjustments, until skips occur (actual population begins falling below target). Note the pressure at which skips begin.
3. Restore pressure to the initial value at step 1.
4. Adjust the meter pressurization up, by periodic small increments, until doubles occur (actual population begins rising above target). Note the pressure at which doubles begin.

If unable to adjust up to doubles (or skips happen instead), seed delivery is probably being starved of air. Increase fan rpm and repeat limit search.

5. Adjust meter pressurization to a value halfway between the limits established at step 2 and step 4. This is the ideal value for your crop, disk and population, providing equal margin against skips and doubles. Record this value for future use.

Seed Delivery Fan Adjustments
Refer to Figure 77

The primary control for seed delivery air is fan rpm. The servo vane (not shown), under the control of the split air system, takes whatever is needed to maintain meter pressurization (the top three manifold outlets (Ω)). Remaining air is sent to the bottom outlet for seed delivery.

Adjust the basic fan rate with the tractor hydraulic system and the fan rpm display of the seed monitor. Do not run at speeds over 3000 rpm or speeds under 2000 rpm.

Alternate Skip/Double Check
Small seeds, particularly Milo, are less reliably sensed as skips or doubles by the seed tube sensors, and watching monitor population is unlikely to locate the pressure limits. This test can also be quicker for all seeds.

A. After planting a few passes with initial settings, remove the rain covers from several rows (use rows with a variety of seed hose lengths and routes).
B. Make a meter pressurization adjustment. Resume planting for a pass or less.
C. Stop planter motion but leave fan running.
D. Inspect the seed disks closely. Look for empty seed cells (skips) and cells with multiple seeds (doubles).
E. Repeat step B-step D until limits are established. Record limits. Reinstall rain covers. Plant with median settings.
Liquid Fertilizer Adjustments (Option)

If installed there are two adjustments for the Great Plains-provisioned components:

1. Row orifice setup
   Orifice plate sizes are chosen to assure consistent pressure at all nozzles. Refer to the Seed Rate manual.

2. Relief valve setting
   See "Fertilizer Row Shut-Off" on page 69.

Great Plains recommends checking with your local agronomist as soil conditions vary. Soil conditions in your area may need less or more fertilizer than represented in these charts. In furrow, do not exceed 12 gallons per acre in any case.

The liquid fertilizer system is designed to operate (ideally) between 15 and 40 psi, but in no case more than 65 psi. Several system elements affect system pressure, and need initial setup, periodic maintenance, and adjustment when changing fertilizer rates.

**Fertilizer Orifice Plates**

*Refer to Figure 78*

To install, insert the plate inside the gasket supplied with the nozzle. Insert the gasketed plate with the legend side facing out the nozzle outlet (typically up).

In general, the orifice needs to be small enough to create at least 15 psi of pressure in the manifold to operate the check valves but large enough to prevent the manifold pressure from exceeding 65 psi.

The minimum pressure is required to even out the flow of fertilizer between rows. To reduce orifice plugging and pump wear, use the largest orifice practical for your fertilizer application rate. Alternate orifice plates are listed in the Seed Rate manual.

The best pressure range to maintain is 20 to 40 psi to ensure optimum distribution while minimizing leakage. Built-in check valves at the row units prevent flow below 15 psi.

The Seed Rate Chart book for this planter (manual part number 401-647B) contains a table of orifice sizes in gallons per acre.

**NOTICE**

*System Damage/Uneven Application Risks:*
Select orifice plates to balance flow. Sizes too small can result in system rupture. Sizes too large can result in unbalanced flow. Orifice plates do not set fertilizer rate. Rate is set at the pump. Plates only create back-pressure to balance flow.

**DANGER**

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

*Agricultural Chemical Hazard:*
Wear protective gloves when exchanging nozzles and...
Fertilizer Row Shut-Off

Refer to Figure 79

Fertilizer booms for twin-row planter include caps for shutting off flow at unused rows. If switching from twin-row to single-row operation, and applying fertilizer, replace the drop line nozzles with 832-042C caps at unused rows.

The orifice plates may be removed or left in place. Adjust pump for new rate. Review orifice size selection for the new rate. Keep in mind that the row spacing has changed.

**NOTICE**

**Material Loss Risk:**
Do not apply materials without first reviewing setup. Shutting off rows does not change the application rate. Unless the pump is reset, it operates at the prior rate, doubling the flow at each nozzle. This can result in excess pressure, and material loss at the relief valve.

---

Fertilizer Relief Valve

Refer to Figure 80

When a fertilizer system is installed, a relief valve and pressure gauge are mounted near the fertilizer inlet at the hitch and provides the fertilizer feed to the manifold (manifold not shown). The relief valve protects the manifold, lines and fittings from excessive pressure. Any product that dumps over the relief valve will discharge from the dump line in relative safety.

To set relief valve:

1. Unlock plastic jam nut from relief valve knob.
2. Unscrew knob clockwise (looking down) until it loses contact with internal spring.
3. Screw knob counterclockwise two turns. Start at this setting.
4. Observe manifold gauge and watch for relief valve dump line discharge while operating in the field.
5. If valve is dumping product and gauge reads under 65 psi, stop tractor and turn knob clockwise 1/4 turn. Continue operating at normal field speed. Repeat this step as needed until no product is discharged from relief valve dump line.
6. If the pressure gauge reads above 65 psi, change to a larger orifice. Go to step 2 and repeat.
25 Series Row Unit Adjustments

Refer to Figure 81 (which depicts a row unit populated with most optional accessories supported for use with the Planter)

From front to back, a Great Plains 25 Series Air-Pro row unit can include the following capabilities (some optional):

1. **Lock-Up Pin Storage Hole** (Hole Standard)
   
   See “Row Unit Shut-Off” on page 82.

2. **Down-Pressure Cam** (Standard)
   
   Row units are mounted on parallel arms. This parallel-action mounting allows the row-unit to move up and down while staying horizontal. Springs add an adjustable force, set by the cam, to the row weight. See “Row Unit Down Pressure” on page 71.

3. **Air Inlet** (Standard)
   
   Pressure-regulated air enters the meter here and holds seed in the disk pockets. See “Fan and Adjustment” on page 65.

4. **Seed Delivery Hose Inlet** (Standard)
   
   Air carrying the bulk seed is vented at the bottom of the air release cone. Gravity then carries the seed into the meter at the shutter ©. The hose is easily removed for inspection. There are no adjustments.

5. **Air-Pro Seed Meter** (Standard, Choice of Disks)
   
   See “Air-Pro Meter Disk Installation” on page 81.

6. **Seed Inlet Shutter** (Standard)
   
   This controls the level of bulk seed at the disk. There are four operating settings, plus fully open (clean-out) and fully closed (shut-off or storage). See “Seed Inlet Shutter Adjustment” on page 79.

7. **Side Gauge Wheel Depth** (Standard)
   
   The T-handle sets planting depth by controlling the height of the side gauge wheels relative to the opener discs. See “Side Gauge Wheel Adjustment” on page 77.

8. **Press Wheel Force, Angle, Stagger** (Standard)
   
   The press wheels close the furrow, gently pressing the soil over the seed to ensure good seed to soil contact for even emergence. See “Press Wheel Adjustment” on page 86.

9. **Row Unit Lock-Up Hole** (Hole Standard)
   
   Pins are standard on some models. With the row unit raised above level, the lock-up pin is inserted here. See “Row Unit Shut-Off” on page 82.

10. **Row Cleaner** (Option)
    
    Row cleaners clear trash from the row, to a depth set by an adjustment on the arms. See “Unit-Mount Cleaner Adjustments” on page 73.

11. **Unit-Mount Coulter** (Option)
    
    Coulters cut remaining trash and begin opening the seed furrow. Working depth is set by row depth and a mounting hole selection. See “Coulter Adjustments” on page 74.

12. **Opener Discs** (Standard)
    
    Row-unit double disc openers create the seedbed furrow. They have adjustments for angle and spacing. See “Row-Unit Opener Disk Adjustments” on page 76.

13. **Seed Tube with Sensor** (Standard)
    
    Requires no adjustment.

14. **Scrapers** (Optional, not shown)
    
    Inside scrapers require no adjustment. For gauge wheel scrapers, see “Adjusting Gauge Wheel Scrapers” on page 78.

15. **Seed Firmers** (Seed Flap Standard, not shown)
    
    An optional seed firmer (Keeton® shown) minimizes seed bounce and improves soil contact. It may also deliver fertilizer. See “Seed Firmer Adjustments” on page 85.

16. **Press Wheel Type** (Choice)
    
    A variety of single and dual press wheel assemblies are available, some region-specific. Consult your Great Plains dealer.

**NOTICE**

**Equipment Damage Risk:**

Do not back up with row units in the ground. To do so will cause row unit plugging and may result in severe damage.
Row Unit Down Pressure

Refer to Figure 82

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

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

At several row units, inspect the furrow created by the opener discs, but prior to furrow closing by the press wheels.

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

Refer to Figure 83

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

Adjusting Down-Force

Refer to Figure 84

Row unit springs ① provide the primary down pressure necessary for row unit disks to open a seed trench. The weight of the row units themselves contributes about 130 pounds (59 kg) of the total force.

The springs allow the row units to float down into depressions and up over obstructions. Springs also provide down force on coulters when using optional row mounted coulters, and provide the primary down force on row cleaners (optional), seed firmers (optional), and press wheels.
An adjuster cam 🔄 sets down pressure individually for each row unit. This is useful for penetrating hard soil and planting in tire tracks. For best results always adjust tractor tires so they are not ahead of 30 inch or 70 cm rows.

**Refer to Figure 86**

<table>
<thead>
<tr>
<th>Cam Notch</th>
<th>Pounds</th>
<th>Kilograms</th>
</tr>
</thead>
<tbody>
<tr>
<td>zero (out of notch)</td>
<td>Lock-Up &amp; Maintenance</td>
<td></td>
</tr>
<tr>
<td>one</td>
<td>235</td>
<td>105</td>
</tr>
<tr>
<td>two</td>
<td>260</td>
<td>120</td>
</tr>
<tr>
<td>three</td>
<td>295</td>
<td>135</td>
</tr>
<tr>
<td>four</td>
<td>355</td>
<td>160</td>
</tr>
<tr>
<td>five</td>
<td>415</td>
<td>190</td>
</tr>
<tr>
<td>six</td>
<td>475</td>
<td>215</td>
</tr>
<tr>
<td>tip</td>
<td>Do Not Use</td>
<td></td>
</tr>
</tbody>
</table>

Use only enough down pressure to cut the seed trench and maintain proper soil-firming over seed. Excessive row unit down force will lead to premature wear on row unit components, uneven seed depth and gauge wheel slippage.

**Refer to Figure 85 (shown at cam setting 2), Figure 86 and Figure 87**

To adjust down pressure, use a $1^{1/8}$ inch (29 mm) open end wrench or the tool 🔄 stored under the walkboard.

1. Raise the planter. Although this adjustment can be made with the planter lowered, the springs will be in tension, and will require more effort. The extra force required may also damage tools.
2. Install lift cylinder locks.
3. Put tractor in Park and shut it off.
4. Position wrench on the fixed nut 🔄 near or slightly forward of vertical.
5. Pull upper spring link 🔄 back.
6. Move the adjustment cam 🔄 to the new setting on the spring adjust bar 🔄.

⚠️ Do not set all rows higher than notch four. Using high settings across all rows causes uneven planting. Individual rows may be set higher if running in tire tracks.
Unit-Mount Cleaner Adjustments

Refer to Figure 88 and Figure 89

Optional Martin row cleaners are unit-mounted, using:
UMRC: Unit-Mount Row Cleaner (stand-alone), or
UMC-RC: Unit-Mount Coulter RC (on coulter bracket, with or without a coulter disk present).

There are two adjustments:

1. Wheel placement (forward or aft mounting hole, for more or less aggressive cleaning), and
2. Wheel height, adjusted by a stop. Cleaner arms float. The stop only sets the lowest position.

In UMRC mount, a pinned cross-tube on the mount adjusts the depth. In UMC-RC (coulter) mount, a sliding down-stop block adjusts how close to the ground the row cleaners operate.

The row cleaner needs to be adjusted for your conditions, crop changes, and as coulters and openers wear. Ideally, cleaners contact only the trash, and do not disturb the soil. If allowed to "dig", row cleaners can reduce seed coverage.

Suggested initial depth is tine tips at ground level.

Make the adjustment with the planter raised. Install lift-assist cylinder locks. Also check bolt tightness prior to each planting session, to avoid down-stop slippage.

To adjust the row cleaner:

1. Determine the height adjustment required. Measure from the lowest tine to the ground. Determine the desired new measurement.
2. Support most or all of the weight of the arm to prevent injury and ease the adjustment. Loosen bolts on UMC-RC. Remove bent pin on UMRC.
3. Support arm at desired height.
4. UMRC: Slide adjustment tube until cross-tube contacts arm at target height. Insert bent pin in whichever hole pair is most in alignment.
5. UMC-RC: Slide the down-stop on the arm:
   - back toward the pivot for shallower cleaning, or
   - forward toward the tines for deeper cleaning.
   Tighten the bolts. Each possible hole pairing adjusts the tine height by about \( \frac{3}{4} \) inch (19 mm).
6. Check the new height measurement.

Refer to Row Cleaner Manual 204-085M-A for further information on use, adjustment, and maintenance of row cleaners.
Coulter Adjustments

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

Coulter Depth Adjustment

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

Adjusting the coulter depth is accomplished by remounting the coulter blade in one of the six mounting holes arranged in a staggered pattern in the coulter bracket.

Refer to Figure 90 and Figure 91

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

To adjust coulter depth:

1. Determine the present opener and coulter depths.
2. Note which bracket hole the coulter is presently using.
3. Determine which new hole will position the coulter closer to the 1/4 inch-above depth. See the table below.
4. Remove the 5/8-11 x 4 inch bolt, lock washer and nut (7 in Figure 90).
5. Move the blade to the new position. Insert the bolt, and tighten on the lock washer and nut.
6. Readjust row cleaners, if installed.

If a worn coulter cannot be adjusted to satisfactory operating depth, replace coulter.

<table>
<thead>
<tr>
<th>Hole Number</th>
<th>Depth of (new) coulter blade relative to (new) opener blades</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>5/8 inch (16 mm) above</td>
</tr>
<tr>
<td>4</td>
<td>1/4 inch (6 mm) above</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>3/8 inch (9.5 mm) below</td>
</tr>
<tr>
<td>7</td>
<td>3/4 inch (19 mm) below</td>
</tr>
</tbody>
</table>

Figure 90
25 Series Unit-Mounted Coulter

Figure 91
Coulter Blade Mounting Holes
Coulter Row Alignment

Refer to Figure 92

For unit-mounted coulers, the ideal alignment is for the blade to open a furrow directly ahead of the opener discs.

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

The exacting test of correct alignment is field results. Operate the planter on some test ground (no seed required), and verify that the opener blades are in the groove opened by the coulter, and that the press wheels are centered over the furrow. See “Press Wheel Adjustment” on page 86 for press wheel alignment.

Refer to Figure 93

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

Keep the coulter blade vertical while adjusting.

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

25 Series openers have three adjustments:
1. planting/seed depth
2. opener disc to disc clearance
3. gauge wheel/opener disk clearance (page 77)

Setting Planting Depth

Refer to Figure 94

The “T” handle ① sets planting depth by limiting the how high the side depth gauge wheels ride relative to the opener disks. The position of the seed tube itself is fixed relative to the disks, and is not adjusted.

To adjust seed depth, pull the “T” handle ① up and back, move it forward or aft, and set it back in a different pair of holes in the scale.

• For shallower planting, move the “T” handle ① forward.
• For deeper planting, move the “T” handle ① back.

Opener Disc Contact Region

Refer to Figure 95

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.

The ideal spacing causes the blades to be in contact for about one inch ④. If you insert two pieces of paper between the blades, they should slide to within zero (touching) to 1.5 inch (3.8 cm) of each other. If zero, the gap between the blades should not be significantly greater than the thickness of two sheets of paper.

If the contact region is significantly larger or there is a large gap, it needs to be adjusted by moving one or more spacer washers.

Adjusting Disc Contact

Refer to Figure 96

1. Raise the planter and install lift cylinder locks.
2. Remove the side gauge wheels ⑤ on the row unit in need of adjustment.
3. Remove the bolt ⑥ retaining the opener disc ⑦ on one side. Carefully remove the disc. Do not lose the hub components and spacer washers ⑧, ⑨.
4. To reduce the spacing between the discs (the normal case), move one spacer washer from the inside ⑧ to the outside ⑨ of the disc.
5. Reassemble and check disk contact.
Side Gauge Wheel Adjustment

*Refer to Figure 97 and Figure 98*

Disc-to-wheel angle and clearance ideally has the wheel just touching the disk when the wheel is raised to planting depth (is up against the stop set by the “T” handle. The goal is to have both disks and wheels turn freely, but keep soil and trash from getting between them.

These two adjustments interact with each other. Changing one requires at least checking the other.

In addition to changing the disk angle due to changing depth or new field conditions, these two settings may need attention over time as the disk and wheels wear from normal use. This adjustment will also need to be made if any opener components are replaced.

*Refer to Figure 98*

For 2 inch (5.1 cm) planting depth, adjust side gauge wheel angle so wheels contact row unit disks at the bottom of wheel. Check with row units in soil so wheels are held up.

At the same time, keep side gauge wheels close to opener disks so openers do not plug with soil or trash.

- Wheels should be out far enough so disks and wheels turn freely.

*Refer to Figure 100 on page 78*

To adjust side gauge wheels:

1. Raise the planter and install lift cylinder locks.
2. Loosen hex-head bolt ①. Move wheel and arm out on O-ring bushing.
3. Loosen pivot bolt ② Turn hex adjuster ② so indicator notch ④ is at 5 o’clock to 7 o’clock.
   - Use this as the starting point for adjustment.
4. Move wheel arm in so side gauge wheel contacts row unit disk. Tighten hex-head bolt ① to clamp arm around bushing and shank.

*Refer to Figure 99*

5. Check wheel-to-disk contact at 2 inch (5.2 cm) planting depth. Lift wheel 2 inches, check contact and release. When let go, wheel should fall freely.

- *If wheel does not contact disk at bottom to area where blade leaves contact with soil*, move hex adjuster until wheel is angled for proper contact with disk.
• **If wheel does not fall freely**, loosen hex-head bolt ① and slide wheel arm out just until wheel and arm move freely. Tighten hex-head bolt ① according to grade:
  3/8 inch Grade 5 bolt on 25 series:
  75 foot-pounds (102 N•m).
  3/8 inch Grade 8 bolt on 25 series:
  110 foot-pounds (149 N•m).

  *Use “Torque Values Chart” on page 143 for reference.*

6. Keep turning hex adjuster and moving wheel arm until the wheel is adjusted properly. When satisfied, tighten pivot bolt ② to 110 foot-pounds (149 N•m).

**Adjusting Gauge Wheel Scrapers**

*Refer to Figure 101*

Scrapers are optional, and may be useful in moist or sticky soils that tend to accumulate on gauge wheels and reduce intended planting depth.

To adjust scrapers:
1. Loosen nut ⑤.
2. Slide scraper ⑥ toward gauge wheel ③ until scraper touches tire.
3. Slide scraper ⑥ away from wheel ③ leaving a 1/8 inch (3 mm) gap at ⑦.
4. Rotate scraper left and right around bolt, making sure it cannot touch tire if bumped in field. If it can touch tire, back scraper away from wheel until it cannot.
5. Center scraper angle on bolt ⑤ until gap ⑦ is constant.
6. Tighten nut ⑤.
Seed Meter Setup and Adjustment

There are adjustments for seed inlet, and choice of disks. There are no other adjustments, in particular no brush adjustments, at the meter.

Meter Rain Cover

The rain cover keeps side winds from unseating seed in disk pockets. It also keeps precipitation, sunlight and field debris out of the meters.

Refer to Figure 102

To remove the rain cover, peel the flexible snap latches, at top ① and rear ②, away from the meter housing. Pivot the cover forward and down at tab ③ in slot.

When removing a cover, inspect it for damage and missing parts. If a cover does not have both latches, and an intact edge seal under the latches, the cover is apt to be lost during transport or field operations.

To replace a latch, temporarily remove the seal near the latch. Slide the replacement latch onto the cover lugs from the meter side, then snap the other end down over the lugs. Reinstall the seal.

Seed Inlet Shutter Adjustment

Refer to Figure 103 (showing the shutter at setting 3)

The seed inlet shutter regulates the volume of bulk seed presented to the seed disk. The operating settings vary with crop, seed size and treatments. The shutter also has settings for row shut-off (completely closed), and clean-out (wide open).

The Seed Rate Charts include suggested initial shutter settings. Refine these settings based on experience, and on inspection of the slope of the seed pool at the bottom of the seed disk.

The shutter is operated by a handle. Lift the handle away from the meter plate. Move the handle to half a setting higher than the new setting, then back to the new setting, and lower the pawl into that slot.

The table at right is a general summary of shutter settings.

<table>
<thead>
<tr>
<th>Setting</th>
<th>Setting Typically Used For</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top (0)</td>
<td>Closed: Row Shut-Off, Meter Re-Fill</td>
</tr>
<tr>
<td>(1)</td>
<td>Small seeds, such as Milo, with little or no treatments</td>
</tr>
<tr>
<td>(2)</td>
<td>Small treated seeds and edible beans (such as Soybeans)</td>
</tr>
<tr>
<td>(3)</td>
<td>Corn, round popcorn</td>
</tr>
<tr>
<td>(4)</td>
<td>Large corn, or heavily treated corn</td>
</tr>
<tr>
<td>Bottom (5)</td>
<td>Wide Open: Clean-Out</td>
</tr>
</tbody>
</table>
Optimal Seed Pool Slopes

The optimal seed slope is one that results in the most consistent seeding, with minimal skips and doubles. The column at right has photographs of pool slopes found to be optimal for representative seeds.

If the suggested initial shutter settings do not seem to be working for your seed, adjust the shutter to achieve specific reserve slope targets.

Refer to Figure 104

For medium size and smaller seeds that flow easily, the slope runs from just above the 8:00 (o’clock) position on the housing wall, forward and down to one or two seeds deep at the base of the rear strip brush ①.

Refer to Figure 105 and Figure 106

For medium size and larger, or heavily treated smaller seeds that flow less easily, the slope runs from at or slightly above the 8:30 (o’clock) position on the housing wall, forward and down to 3-6 seeds deep at the base of the rear strip brush ①.

In general, the seeds at the base of the strip brush need to be deep enough that no air escapes there, and so that just enough seeds are present to begin populating cells.

Keep the top left/rear end of the pool below the 9:00 o’clock position (meter horizontal center-line).

Meter Refill

Once planting is underway with the seed pools set, it is infrequently possible for bridging at or above the inlet to starve the meter of seed.

An empty meter causes seed monitor “Row Failure” alarm, with a report of the row number. Row numbers are counted from the left wing (outside row is row 1).

Stop, and put the tractor in Park. Leave the fan running. Locate the failed row, remove the rain cover, and verify that the meter is empty. Note the shutter setting. Temporarily open the shutter one of two notches wider. If the problem was inlet bridging, seed should flow into the meter immediately.

If inlet bridging is not the problem, little or no seed flows into the meter with the shutter open wider. In this case, the problem is further upstream in the seed flow, and may be bridging at the air release screen at the top of the meter. Close the shutter completely for about 15 seconds. This prevents meter pressurization air from opposing seed delivery air. The delivery air pressure usually collapses the bridge. Re-open the shutter and see if seed now fills the meter.

If no obvious foreign object was the cause of the bridging, the shutter setting may have been too small for the seed. Verify that this and other operating rows were at the correct initial shutter setting. If so, re-set the shutters to the next higher opening.

**NOTICE**

**Foreign Object Risk:**

After clearing a bridge, or a delivery blockage upstream, check the seed pool at the meter for any debris that might have been the original cause. Remove such debris from the meter before planting. Don’t run the risk of an object lodging in a seed pocket and causing on-going skips.
Air-Pro Meter Disk Installation

1. Cross-check Seed Rate Chart data against part number/description molded into disks to be used.

**NOTICE**

*Population Risk:*

*Use the same disk in all active rows.*

2. Inspect disks to be installed. Do not install damaged or excessively worn disks. Either can cause irregular seeding. Chips and cracks accelerate brush wear.

3. Remove meter rain cover (page 79).

**Refer to Figure 107 (depicting an empty meter)**

4. Inspect meter (see page 105 for details).

5. Make sure clamp ① is aligned with seat ②.

**Refer to Figure 108**

6. With the seed pocket side facing the meter housing, place the new seed disk on the disk seat.

7. Rotate disk clamp ① clockwise 45° to clamp disk. Clamp seats into detents ③ in disk hub.

☆ On a new meter, or with new brushes installed, force the disk into the brushes to allow the disk clamp to rotate. This condition eases as the brush fibers are trained during initial rotations.

☆ With slightly used brushes, when a disk is first clamped, it is normal for the disk hub to be flat with the face of the disk seat only on the inlet (rear) side. The disk fully seats as it first turns. This condition eases as the brush fibers receive further use.

**NOTICE**

*Brush Mis-Seating Risk:*

*Rotate disks forward shortly after disk installation. If planting is not anticipated within an hour or two of disk installation, rotate the drive system a few turns to ensure that meter brushes lean in the correct direction. Correct lean improves meter performance and reduces air consumption. This step is particularly important for new brushes.*

Brush seating may be accomplished with or without seed present, and may be combined with “FILL DISK”. An alternate method, which avoids running the tractor, monitor and fan, is to rotate the section’s meter drive shaft, top forward, with a 7/8 inch open-end wrench.

8. Reset seed inlet shutter ④ to setting recommended by Seed Rate Chart, or to your own developed value.

9. On the seed monitor console, select the new Material, seed disk Cell Count, and target population.

10. Reinstall rain cover (page 79).
Removing a Seed Disk

Refer to Figure 110

1. Remove rain cover. If seed is present, close shutter ④ to prevent more seed from entering meter. Attach funnel (page 103).
2. Hold seed disk in meter. Rotate disk clamp ① counterclockwise 45° to release disk.
3. Tilting top of disk toward meter, slowly remove disk, allowing seed to collect in funnel. Open shutter to release remaining seed up to wing tube.
4. Clean seed from all brushes. Clean disk seat (② in Figure 107 page 81), so that new disks can seat fully. Inspect brushes for excess wear and damage. See “Meter Brush Maintenance” on page 105.
5. Inspect removed disks for excess wear and damage. Set aside any disks requiring replacement. Clean other removed disks and place in storage. See “Seed Disk Maintenance” on page 107.
6. Reinstall the rain cover (page 79).

Row Unit Shut-Off

Skip-row operations, such as planting from every other row when switching from 30 inch twin-row to 30 inch single-row, requires shutting down unused rows. Shutting off seeding at a row involves 4 to 7 steps:
1. Identify the rows to shut off.
2. Fully close seed inlet shutter (always done).
3. Replace seed disk with blank disk (always done).
4. Close seed flow to row at Y-tube (if present).
5. Lock up row unit to reduce wear (optional).
6. Reset marker extension (if used, page 170).
7. Reset monitor active row pattern and row spacing to avoid nuisance alarms (always done).
8. Shut off fertilizer drop lines (Option, see Seed and Fertilizer Rate manual 401-647B for details).

Meter drive is not disabled on 25AP row units during shut-off.

1. Identify Rows to Shut Off. On twin-row planters, openers are installed with short and long opener mounts. If locking up unused rows of a twin-row planter, shut off the rear (long mount) rows.
   On single-row planters with mid-length mounts, any rows may be locked up.
2. Close Seed Shutter

Refer to Figure 111 on page 82

Lift the handle ② away from the plate. Move it to the top position, and release the handle into the notch.

Closing the shutter ① prevents meter pressurization air from leaking into the bulk seed air system, resulting in lower pressures in adjacent rows, with risk of skips.

The shutter also stops seed flow from a row as soon as the meter is empty. Bulk seed flow to the row falls to nil as soon as the seed backs up to the air release vent at the top of the meter. If the row is served by a Y-tube, the Y-tube also needs to be shut off for the row (step 4).

3. Install Blank Disk

Refer to Figure 112

Clean out meter. See “Meter Clean-Out” on page 103. Remove seed disk and install blank disk. See “Air-Pro Meter Disk Installation” on page 81.

Blank disks (part number 817-841C) are essential in row shut-off, both to maintain consistent meter back-pressure to meter pressurization and to prevent wear on a seed disk.

Blank disks are engineered to simulate a seed disk with seed in all pockets. Blanks are particularly important on the rows with sensor lines to the pressure chamber.

4. Close Y-Tubes

Refer to Figure 113

If any shut-off rows are served by a Y-tube, close the valve for the branch to that row. Rotate the valve cap until the indicator/handle is perpendicular to the tubes.

Closing the Y-tube prevents seed from entering an unused hose, reducing waste and simplifying clean-out.

5. Lock-Up Row

Alternate twin-row units (the rear units) can be pinned in the up position to accommodate single-row spacing.

Refer to Figure 114

The lock-up pins ① for each front row unit are located in a storage hole ② in the row unit mount. To lock up a unit, the unit must be raised, and the pin moved to the lock-up hole ③ in the row unit shank.

WARNING

Crushing and Sharp Object Hazards:
Do not attempt to lift a row unit by hand. The weight of the unit, plus the force of the springs (even at minimum) is too great (plus, a free hand is needed for pin insertion). Even with multiple people lifting, hand-lifting is unsafe - there are numerous sharp edges, and the row unit snaps down violently if a grip is lost.

Irregular Seeding Risk:
Always use a blank disk in a shut-off row. Operating with no disk, or with a seed disk but no seed, destabilizes the regulated airflow, particularly at rows with pressure.
If you lose a pin, the replacement part number is 805-033C

1. Raise the planter. Although this adjustment can be made with the planter lowered, the springs will be in tension, and will require more effort. The extra force may also damage tools.

2. Install lift assist cylinder locks. Lower parking stands.

3. Set the down pressure spring cam to zero, per the instructions on page 72.

4. Raise the row unit high enough that the hole for the pin is above the lower parallel arm. This can be done in several ways, including:
   a. use a hoist at the rear of the shank
   b. use a jack under the shank extension

**WARNING**

**Crushing Hazard:**
Use a jack or hoist. Raising a row unit on a block by lowering the planter is risky. The potential for hydraulic failure creates a safety hazard. Full lowering can damage components.

Refer to Figure 115

5. Remove the pin from the storage hole and insert and secure it in the lock-up hole.

6. Lower row unit until lock-up pin rests on lower parallel arm.

**Sprocket Indexing (Stagger)**

Indexed - deliberate pair spacing provides maximum plant separation

Non-Indexed - arbitrary pair spacing

If you are planting:
- finger-metered,
- twin-row crops,
- at seed interval spacings above 6\(\frac{3}{8}\) inches (16.5 cm),
you can synchronize each pair of adjacent meters in a twin row so that you achieve the maximum seed-to-seed spacing between the units of the pair.

Refer to the Seed Rate Manual (401-647B) for instructions and charts.
Seed Firmer Adjustments

Series 25 row units include a standard seed flap, and accept one of two optional seed firmers (which may be included in your selected opener bundle).

**CAUTION**

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

**Keeton® Seed Firmer Adjustment**

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

*Refer to Figure 116*

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 117 (which depicts a row unit with discs, side depth wheels/arms and press wheels removed for illustrative purposes - removal is not necessary for lock/unlock)*

To lock up Seed-Lok® wheels:

1. Raise planter. Insert lift assist cylinder locks.
2. Lift Seed-Lok® lock-up handle 1 until lever stop 2 is free to rotate.
4. Push up on Seed-Lok® wheel 4 until wheel arm latches up 5.

To release a locked-up Seed-Lok®:

1. Insert a ¹/₄in tool drive tip in the tool hole 6 of the handle 1. Alternatively, lift up on the wheel 4.
2. Rotate the handle clockwise (handle arm up) until the Seed-Lok® wheel releases at the latch point 5 and falls free.

*Engage the lever stop under the handle 2 when Seed-Lok® is in use. If left disengaged 3, a furrow obstruction could cause unintended lock-up.*
3. While holding the handle up, rotate the raised portion of the lever stop under both sides of the handle at the arm end. Remove the tool.

**Seed-Lok® Seed Firmer Lock-Up (older style)**

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 118*

To lock up Seed-Lok® wheels:
1. Raise planter. Insert lift assist cylinder locks.
2. Rotate Seed-Lok® lock-up handle 90 degrees down on top of row unit body.
3. Push up on Seed-Lok® wheel until wheel arm latches up.

**Press Wheel Adjustment**

The press wheels close the furrow which gently presses the soil over the seed to ensure good seed-to-soil contact for even emergence.

To provide consistent seed firming, the press wheels are free to move downward from their normal operating position. This system maintains closing/pressing action even if the row unit arm is lifted when the disks encounter obstructions.

There are three adjustments available on the press wheel assembly and a fourth option on press wheel assemblies with cast wheels:

*Refer to Figure 119*

1. Down pressure (shown at maximum)
2. Wheel stagger (shown staggered)
3. Centering (see Figure 121 on page 87)
4. Cast Wheel Plow Angle (see Figure 122 on page 88)

**Press Wheel Down Pressure**

Handle 1 sets down pressure, which may need adjustment for different soil types and field conditions.

- Relax the handle forward (in the direction of travel) for decreased down pressure.
- Pull the handle 1 back for increased down pressure.

Higher press wheel down pressures reduce the down force on the main row unit shank components, such as the openers. High press wheel settings may require an increase in overall row unit down force. See page 71.
Press Wheel Stagger

The factory stagger setting has been found optimal for residue flow. If your conditions appear to require even press wheels, you might try one row before reconfiguring the entire planter. To change the stagger:

Refer to Figure 120

1. Raise the planter and install the lift assist cylinder locks. See “Lift Assist Cylinder Lock-Up” on page 28.
2. Remove the bolt ①, nut ② and lock-washer ③ for the left press wheel ④.
3. Move the spacer ⑤ and wheel ⑥ to the forward of the two mounting holes at ⑦.
4. Reinstall the bolt, lock washer and nut. Tighten.

Press Wheel Centering

If one press wheel is running in the seed trench, or the wheels are not centered over the trench, the angle of the press wheel assembly can be adjusted as follows:

Refer to Figure 121

1. Determine how far, and in which direction, the press wheel assembly needs to move to center the wheels.
3. Loosen the 3/8 inch hex-head bolts ② and ③.
   Do not loosen the square-head bolts forward of the hex-head bolts.
4. Turn the hex head cam ④ under the forward hex head jam bolt ⑤, and move the required amount.
5. Tighten both hex head bolts ② and ③.
Press Wheel Assembly with Cast Wheels

Tight soil may require the need to drag/plow the trench closed. The factory setting on press wheel assemblies with cast wheels is 4° (maximum plow). If the conditions in your region appear to require less plow, there are two additional settings: 2° (less plow) and 0° (no plow). To change the plow setting:

Refer to Figure 122

2. Remove the bolt ①, lock-washer ② and spacers ③ for the press wheel ⑨.
3. Remove bolt ④, flat washer ⑤ and hex nut ⑥ for casting ⑦.
4. Place a 3/4 inch (19 mm) open end wrench on tab ⑦ of casting. Rotate casting until the desired angle setting (4°, 2° or 0°) hole lines up with a hole on the press wheel mount weldment ⑧ (only one set of holes will line up for each setting).
5. With holes lined up replace casting bolt ④ and flat washer ⑤. Secure with hex nut ⑥.

If press wheel adjustments do not provide satisfactory furrow closing, your conditions may require alternate press wheels. A variety of wheel assemblies are available. Consult your Great Plains dealer.
Planting Rate Problems
When starting up with a new planter, a new crop or a new population it is important to physically double check what the monitor is reporting in the cab by digging seeds. This is to verify that you are set up correctly to plant the desired population. Do not rely solely on the population reported by the DICKEY-john® monitor.

Also during start up it is common to encounter alarms and readouts on the DICKEY-john® console that don’t seem to make sense. It is critical to troubleshoot these alarms not only to make sure the planter drive is set properly to hit the target population, but also to fix incorrect entries in the DICKEY-john® monitor to eliminate nuisance alarms.

Before entering the troubleshooting charts to remedy a monitor or population problem, it is helpful to use the following flowchart to get a handle on what may be wrong. The basis for finding what is wrong comes from knowing exactly what the planter is actually doing in the soil. Always dig or observe seed on the ground when checking populations.

<table>
<thead>
<tr>
<th>Step</th>
<th>Question</th>
<th>Action</th>
</tr>
</thead>
</table>
| 1.   | Is the spacing on the ground correct? | No: Check the ground drive transmission and range sprocket selections, or the population settings on a hydraulic drive unit. See also “Population Too Low” or “Population Too High” in the troubleshooting charts.  
Yes: Go to step 2. |
| 2.   | Is the reported population 3/8 the actual or is the reported population too high by a factor of 2? | No: Go to step 3.  
Yes: An incorrect row spacing value entered in the seed monitor can cause this. Example: 15 inches instead of 30 inches. Correct the row spacing error on the DICKEY-john® console.  
The system can also be off by a large factor if incorrect range sprockets are installed. Check seed rate charts against range and transmission sprockets on the planter. |
| 3.   | Is the population on the screen close to the target population? | No: Check seed rate charts against transmission sprockets selected. See “Population Too Low” or “Population Too High” in the troubleshooting charts.  
Yes: If slightly under, see “Population Too Low” if slightly over, see “Population Too High”. |

For seed monitor issues, see also the DICKEY-john® Planter/Drill Control User Manuals, “TROUBLESHOOTING & ALARMS” section.

Suggested Furrow Check:  
Plant a short distance and dig seeds, or run with the closing wheels wired up to leave an open seed trench.  
Based on seeds found, determine an average distance between seeds. Compare the distance between seeds to the seed spacing listed in the charts for your population. This is listed as “inches per seed”.

Suggested Furrow Check:
Plant a short distance and dig seeds, or run with the closing wheels wired up to leave an open seed trench.
Based on seeds found, determine an average distance between seeds. Compare the distance between seeds to the seed spacing listed in the charts for your population. This is listed as “inches per seed”.

For seed monitor issues, see also the DICKEY-john® Planter/Drill Control User Manuals, “TROUBLESHOOTING & ALARMS” section.

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Suggested Furrow Check:
Plant a short distance and dig seeds, or run with the closing wheels wired up to leave an open seed trench.
Based on seeds found, determine an average distance between seeds. Compare the distance between seeds to the seed spacing listed in the charts for your population. This is listed as “inches per seed”.

For seed monitor issues, see also the DICKEY-john® Planter/Drill Control User Manuals, “TROUBLESHOOTING & ALARMS” section.
## Seed Pool Troubleshooting

<table>
<thead>
<tr>
<th>Normal: Filling</th>
<th>Normal: Filled</th>
<th>Delivery Blockage or Back-flow Starvation</th>
<th>Bridging: Screen</th>
<th>Bridging: Shutter</th>
</tr>
</thead>
</table>
| Seed pool at shutter prevents back-flow of air, allowing seed to flow from delivery system, filling inlet to prevent backlog at the inlet. | Once inlet is filled to top of air release screen, air flow from delivery system is blocked. No further seed arrives until planting reduces the backlog at the inlet. | No seed arriving from manifold. Air back-flow is occurring. Causes may include:  
- Low fan speed  
- Seed hose blockage  
- No seed available  
- Y-tube closed  
- Meter never primed | Oversize matter in seed has caused air back-flow to occur. When the bridge is released, the seed pool will be insufficient to prevent back-flow. | A bridge at the shutter is blocking flow. Causes may include:  
- Oversize seed  
- Shutter setting too low  
- Oversize matter in seed |

### Actions:
- No action required. Continue Planting.
- No action required. Continue Planting.
- 1. Correct cause of blockage.  
   2. Perform a one-row seed pool recovery (page 91).  
   3. Resume planting.
- Actions:
  1. Close shutter.  
  2. Disconnect hose at meter.  
  3. Tap on screen cone and inspect.  
  4. Check seed pool for foreign matter.  
  5. Perform a one-row seed pool recovery (page 91).  
  6. Resume planting.
- 1. If shutter was at suggested opening, increase one notch.  
  2. Check seed pool for foreign matter.  
  3. Resume planting.
Seed Pool Recovery

When a meter has been starved of seed, back-flow of air through the open shutter reduces delivery air flow. This causes seed delivery to be slow. If you start or resume planting with an empty seed pool, the delivery flow may be too low to keep the meter supplied. The steps below quickly “prime” the meter by rebuilding the seed pool.

Refer to Figure 124 (which depicts a recovery after an incidence of bridging at air release screen)

1. Close the shutter ①. This stops the air back-flow.
2. Clear the bridge ② or blockage that caused the meter to run empty.
3. With the fan running, listen for seed ③ to fall into the inlet.
4. Wait for seed fall ④ to taper off and stop.
5. Open the shutter ⑤ to the operating setting.
6. Start or resume planting.

Magnehelic\textsuperscript{a} Gauge Troubleshooting

If the Magnehelic\textsuperscript{®} gauge does not read zero with the fan off, or the reading disagrees with the seed monitor sensor reading by more than a few tenths of an inch of water pressure, inspect the gauge, and re-zero as needed.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-zero with fan off</td>
<td>Zero drift</td>
<td>Re-zero per instructions below</td>
</tr>
<tr>
<td>Gauge reading lower than</td>
<td>Relief port plug</td>
<td>Replace plug</td>
</tr>
<tr>
<td>sensor</td>
<td>missing/damaged</td>
<td></td>
</tr>
<tr>
<td>Breather line blocked or</td>
<td>Clear breather line</td>
<td></td>
</tr>
<tr>
<td>kinked</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leak in sensing line</td>
<td>Check line to chamber</td>
<td></td>
</tr>
<tr>
<td>Gauge damaged</td>
<td>Check for loose cover,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>damaged O-ring</td>
<td></td>
</tr>
</tbody>
</table>

Check for chamber and breather line problems before re-zero. Re-zero cannot accurately compensate for leaks and blockages.

Re-zero the Magnehelic\textsuperscript{®} gauge on level ground with the fan off, and if possible, under no-wind conditions. Turn the set screw ① on the meter face until it reads zero from the tractor driver’s viewing position.

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\textsuperscript{a} Magnehelic\textsuperscript{®} is a registered trademark of Dwyer Instruments, Inc.
## Population Troubleshooting Charts

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overall Low Population</strong></td>
<td>Incorrect seed rate</td>
<td>Check seed rate charts</td>
</tr>
<tr>
<td></td>
<td>Empty pockets on disk (skips) due to insufficient air pressure.</td>
<td>Methodically increase the controlled air to the meter. See “Fan and Adjustment” on page 65.</td>
</tr>
<tr>
<td></td>
<td>Empty pockets on disk (skips) due to sticky seed treatments not allowing seed to rapidly fill the pockets.</td>
<td>Increase seed lubricant.</td>
</tr>
<tr>
<td></td>
<td>Empty pockets on disk (skips) due to rough field conditions causing seeds to fall from the disks.</td>
<td>Decrease field speed or increase the air pressure in the meter.</td>
</tr>
<tr>
<td></td>
<td>Empty pockets on disk (skips) due to seed pool too low, and seeds are not filling every pocket on the disk.</td>
<td>Open shutter one notch.</td>
</tr>
<tr>
<td></td>
<td>Empty pockets on disk (skips) due to disk speed too high, and pockets are not filling.</td>
<td>Decrease field speed or change to a higher cell count disc.</td>
</tr>
<tr>
<td></td>
<td>Empty pockets on disk (skips) due to singulation (4 tufted) brush too aggressive.</td>
<td>Check for matted, stuck together fibers. Wash, scrape clean, or replace as needed.</td>
</tr>
<tr>
<td></td>
<td>Empty pockets on disk (skips) due to seed too big for pocket.</td>
<td>Select the correct disk for the seed size.</td>
</tr>
<tr>
<td></td>
<td>Seeds are not falling from disk, and get carried past drop zone. Static electricity can cause small, lightweight seeds to cling to the pocket and not fall out.</td>
<td>The graphite component of Ezee Glide Plus addresses this issue. Increase the amount of Easy Glide Plus and/or more thoroughly mix the lubricant into the seed.</td>
</tr>
</tbody>
</table>
| | Air pressure too low, false information driving the DICKEY-john® software. | Compare the air pressure reported on the monitor console to the mechanical gage. If they do not match:  
  • Inspect the $\frac{1}{4}$ inch sample lines from the row units up to the sensor chamber for leaks.  
  • Make sure all non-planting rows have blank disks.  
  • Re-zero the air pressure with the fan off. |
| | Low fan speed: meter starvation due to meter pressurization, leaving insufficient air for seed delivery | Increase fan speed. |
| | Leaking meters in split row: meter starvation due to meter pressurization leaving insufficient air for seed delivery | Install blank disks and close shutters on unused rows. |
| | Excess field speed | Plant within speed ranges recommended in seed rate charts. |
| | Incorrect speed sensor constant. | Perform speed radar calibration per DICKEY-john® monitor manual. |
| | Speed sensor angle. | With planter lowered, check radar speed sensor angle per DICKEY-john® recommendations. |
| | Pass gaps too large | Check marker extension (page 170). For GPS, check planter size programmed. |
| | Actual field size is different | Population may be correct, and calculations are not. |
| | Clutch slipping, due to contaminants in clutch, or wear | Lock-up clutch (page 49) until it can be overhauled or replaced |
| | Skipping chain from drive to section | Check chain slack. Replace worn chain. |

---

**Low Population, One Section**

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Clutch slipping, due to contaminants in clutch, or wear</td>
<td>Lock-up clutch (page 49) until it can be overhauled or replaced</td>
</tr>
<tr>
<td></td>
<td>Skipping chain from drive to section</td>
<td>Check chain slack. Replace worn chain.</td>
</tr>
<tr>
<td>Problem</td>
<td>Cause</td>
<td>Solution</td>
</tr>
<tr>
<td>---------</td>
<td>-------</td>
<td>----------</td>
</tr>
<tr>
<td>Low Population, Single Row</td>
<td>Shutter opening too wide - interfering with meter pressurization</td>
<td>Adjust shutter to lower setting.</td>
</tr>
<tr>
<td></td>
<td>Shutter opening too narrow - starving meter of seed (low seed pool)</td>
<td>Adjust shutter to higher setting.</td>
</tr>
<tr>
<td></td>
<td>Y-tube partially or completely closed, reducing bulk flow to meter or causing bridging</td>
<td>Open Y-tube for row</td>
</tr>
<tr>
<td></td>
<td>Meter starvation due to bridging at shutter</td>
<td>Readjust for shutter bridging (page 80). If seed is treated, increase seed lubricant.</td>
</tr>
<tr>
<td></td>
<td>Meter starvation due to bridging above inlet, caused by low seed delivery air flow</td>
<td>Clear bridge (page 80). Check that seed delivery system is getting sufficient fan air, and that there are no other obstructions upstream.</td>
</tr>
<tr>
<td></td>
<td>Meter starvation due to bridging above inlet, caused by high levels of seed treatment</td>
<td>Clear bridge (page 80). Increase seed lubricant.</td>
</tr>
<tr>
<td></td>
<td>Skips due to low meter pressurization at one or several rows</td>
<td>Check shutter setting. Check for excess wear on seed drop brush. Check for loose or leaking pressure hose.</td>
</tr>
<tr>
<td></td>
<td>Skips due to skipping chain</td>
<td>Check for worn chain, worn idlers, and low chain slack (page 121).</td>
</tr>
<tr>
<td></td>
<td>Skips due to debris in disk pockets</td>
<td>Remove rain covers. Inspect and clean out disks.</td>
</tr>
<tr>
<td></td>
<td>Row has blank disk installed</td>
<td>Replace with seeding disk.</td>
</tr>
<tr>
<td></td>
<td>Seed sensor obscured</td>
<td>Clean out seed tube (see page 105).</td>
</tr>
<tr>
<td></td>
<td>Seed tube plugged</td>
<td>Raise planter, expose bottom of seed tube and clean out.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall High Population</td>
<td>Incorrect seed rate</td>
<td>Check seed rate charts</td>
</tr>
<tr>
<td></td>
<td>Two seeds per pocket on the disk (doubles), due to excess meter pressurization</td>
<td>Methodically decrease the controlled air to the meter. See &quot;Fan and Adjustment&quot; on page 65.</td>
</tr>
<tr>
<td></td>
<td>Two seeds per pocket on the disk (doubles), due to pockets too large for the seed</td>
<td>Select a disk with smaller pockets.</td>
</tr>
<tr>
<td></td>
<td>Air meter pressure too high due to pressure sensor not zeroed properly.</td>
<td>Re-zero the air pressure with the fan off. Make sure the displayed pressure reads 0.00.</td>
</tr>
<tr>
<td></td>
<td>Air pressure too high, false information driving the DICKEY-john® software.</td>
<td>Compare the air pressure reported on the monitor console to the mechanical gage. If they do not match: • Inspect the 1/4 inch sample lines from the row units up to the sensor chamber for leaks. • Make sure all non-planting rows have blank disks. • Re-zero the air pressure with the fan off.</td>
</tr>
<tr>
<td></td>
<td>False alarms or actual seed rate errors due to monitor setup with incorrect row count, spacing or active rows</td>
<td>When troubleshooting population issues, always first rule out seed monitor setup. Review planter configuration and monitor setup.</td>
</tr>
<tr>
<td></td>
<td>Incorrect cell count</td>
<td>Replace seed disks with correct disks, or reset rate for current disks (if within range).</td>
</tr>
<tr>
<td></td>
<td>Incorrect speed sensor constant</td>
<td>Perform speed calibration per DICKEY-john® monitor manual.</td>
</tr>
<tr>
<td></td>
<td>Doubles due to incorrect disk for crop or seed size</td>
<td>Use recommended disk for crop and seed size.</td>
</tr>
<tr>
<td>Problem</td>
<td>Cause</td>
<td>Solution</td>
</tr>
<tr>
<td>---------</td>
<td>-------</td>
<td>----------</td>
</tr>
<tr>
<td><strong>Overall High Population, cont.</strong></td>
<td>Sticky seeds: excess seed treatment</td>
<td>Increase seed lubricant.</td>
</tr>
<tr>
<td></td>
<td>Speed sensor angle.</td>
<td>With planter lowered, check radar speed sensor angle per DICKEY-john® recommendations.</td>
</tr>
<tr>
<td></td>
<td>Incorrect speed sensor constant</td>
<td>Perform speed calibration per DICKEY-john® monitor manual.</td>
</tr>
<tr>
<td></td>
<td>Overlapping passes</td>
<td>Check marker extension (page 170). For GPS, check planter size programmed.</td>
</tr>
<tr>
<td></td>
<td>Actual field size is different</td>
<td>Population may be correct, and calculations are not.</td>
</tr>
<tr>
<td><strong>High Population, Single Row</strong></td>
<td>Excess meter pressurization causing doubles</td>
<td>Check shutter.</td>
</tr>
<tr>
<td></td>
<td>Worn seed-drop brush and/or strip brushes allowing excess seed to pass</td>
<td>Replace worn brushes.</td>
</tr>
<tr>
<td></td>
<td>Incorrect seed disk with higher cell count.</td>
<td>Install correct disk.</td>
</tr>
<tr>
<td><strong>Overall Population Alarms</strong></td>
<td>False alarms or actual rate errors due to monitor setup with incorrect [active] row count or spacing</td>
<td>When troubleshooting population issues, always first rule out seed monitor setup. Review planter configuration and monitor setup.</td>
</tr>
<tr>
<td></td>
<td>Incorrect cell count</td>
<td>Replace seed disks with correct disks, or reset rate for current disks (if within range).</td>
</tr>
<tr>
<td></td>
<td>Improper gap on speed sensor.</td>
<td>Check speed sensor on planter for 1/16 inch to 1/8 inch (1.6 to 3.2 mm) gap from wheel. Improper gap can cause erratic speed signal causing monitor to falsely report improper planting rate.</td>
</tr>
<tr>
<td></td>
<td>Incorrect speed sensor constant</td>
<td>Perform speed calibration per DICKEY-john® monitor manual.</td>
</tr>
<tr>
<td><strong>Mismatch Between Reported and Furrow Population</strong></td>
<td>Small seeds (example milo) are not reliably sensed in the seed tube</td>
<td>Run with rain covers in place to minimize ambient light intrusion. Use the population adjustment factor in the Dickey John monitor system to compensate for missed seeds. For example, change the DICKEY-john® Population Adjustment values from 100% to 130% or 140% as needed. Remember to set this back to 100% for large seeds.</td>
</tr>
<tr>
<td></td>
<td>Seed tube sensor is not counting all seeds</td>
<td>Clean the seed tube of graphite and dust buildup with long narrow seed tube brush. Replace sensors that malfunction.</td>
</tr>
<tr>
<td></td>
<td>Seeds / revolution value in the DICKEY-john® setup does not match the disk cell count.</td>
<td>Correct the value in a setup screen or install the correct cell count disc.</td>
</tr>
<tr>
<td><strong>Excessive Seed Cracking</strong></td>
<td>Incorrect seed pocket size</td>
<td>Use correct disk for seed.</td>
</tr>
<tr>
<td></td>
<td>Damaged, old or dried-out seed</td>
<td>Use new seed.</td>
</tr>
<tr>
<td></td>
<td>Unclean seed</td>
<td>Use clean seed.</td>
</tr>
<tr>
<td><strong>Skips and Bare Spots After Turns</strong></td>
<td>Fan was turned off at turns</td>
<td>Leave fan running. Meter Pressurization must be maintained during turns, or seed will fall out of disk pockets.</td>
</tr>
<tr>
<td></td>
<td>Insufficient hydraulic flow to keep fan running at speed required to maintain meter pressurization</td>
<td>Check tractor capability against requirements (page 141). If sufficient: • Fold markers before engaging lift. • Use a less aggressive lift rate. • Monitor fan rpm during end-of-pass operations.</td>
</tr>
<tr>
<td><strong>Unable to adjust air pressure low enough.</strong></td>
<td>Lower limit reached in DICKEY-john® software.</td>
<td>At User Level 2, reduce the controlled air lower limit in the software.</td>
</tr>
<tr>
<td></td>
<td>Fan speed too high, vane rotated to maximum.</td>
<td>Reduce the fan speed.</td>
</tr>
<tr>
<td>Problem</td>
<td>Cause</td>
<td>Solution</td>
</tr>
<tr>
<td>---------</td>
<td>-------</td>
<td>----------</td>
</tr>
<tr>
<td>Seed too shallow or scattered on ground from a single row</td>
<td>Bottom of seed tube damaged.</td>
<td>Replace seed tube. Avoid setting planter straight down. Use forward motion when lowering.</td>
</tr>
<tr>
<td></td>
<td>Row not penetrating in tire tracks.</td>
<td>Increase down force on parallel arm springs.</td>
</tr>
<tr>
<td></td>
<td>Opener depth too shallow.</td>
<td>Change side depth wheel setting.</td>
</tr>
<tr>
<td>Twin Rows were timed but became out of time.</td>
<td>Timing will change when a population change has been made.</td>
<td>Re-time meters from the population based timing chart.</td>
</tr>
<tr>
<td></td>
<td>Chain has jumped.</td>
<td>Check sprockets and chain for excessive wear or rusty stuck links.</td>
</tr>
<tr>
<td>System is unable to automatically control air meter pressure.</td>
<td>Signal from air pressure sensor lost. (failed sensor or wiring)</td>
<td>Air pressure may be controlled manually, consult DICKEY-john® Planter/Drill Control manual, User Level 2/3.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single row doesn't fill or keep up with other rows.</td>
<td>Y tube is bent/angled off feed pipe.</td>
<td>Loosen pipe and spin so the bend is straight down and Y-tube is not pointing to front or rear of air pipe.</td>
</tr>
<tr>
<td></td>
<td>Drop tube to meter is too long, causing seed to pool and plug hose or Y-tube.</td>
<td>Shorten hose (with planter raised, but row units lowered, to ensure hose is not too short).</td>
</tr>
<tr>
<td></td>
<td>Air release vent plugged</td>
<td>Remove the seed delivery hose and clamp from the two halves of the screen cone and remove the air release screen for inspection. Wash or blow out the screen as needed.</td>
</tr>
<tr>
<td>Both rows on one meter outlet low or not keeping up with other rows.</td>
<td>Blockage in air slot in top of airbox.</td>
<td>Clear by using a long skinny tool and taking hose off through hose outlet. It may be necessary to take top off airbox or use side access doors to clear junk from slot.</td>
</tr>
<tr>
<td></td>
<td>Bad hose routing between delivery hose and airbox on wing.</td>
<td>Correct hose routing.</td>
</tr>
<tr>
<td>Multiple rows fail for lack of seed.</td>
<td>Fan speed too high/too low.</td>
<td>Check/adjust fan speed.</td>
</tr>
<tr>
<td></td>
<td>Out of seed.</td>
<td>Add seed.</td>
</tr>
<tr>
<td>Single or multiple hoses plugging just ahead of airbox.</td>
<td>Fan speed too high/too low.</td>
<td>Check/adjust fan speed.</td>
</tr>
<tr>
<td></td>
<td>Possible air leak.</td>
<td>Check for air leak downstream between box and top of meter.</td>
</tr>
<tr>
<td>All rows fail.</td>
<td>Lack of seed.</td>
<td>Fan speed too high. Adjust fan speed.</td>
</tr>
<tr>
<td>1, 2, 3, or more outlets fail.</td>
<td>Foreign matter in seed chamber in bottom of airbox.</td>
<td>Clean out seed chamber.</td>
</tr>
<tr>
<td>Outlets can be side-by-side or random. Plugging may also move from one outlet to another.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Little or no seed to a lot of rows with heavily treated seed.</td>
<td>Seed treatment sticky.</td>
<td>Add Ezee Glide Plus to seed to dry out seed treatment.</td>
</tr>
<tr>
<td></td>
<td>Treatment mixed unevenly and plugging outlets.</td>
<td>Clean out seed. Re-mix.</td>
</tr>
<tr>
<td>Problem</td>
<td>Cause</td>
<td>Solution</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>--------------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Population Alarms</td>
<td>See “Population Troubleshooting Charts” on page 92.</td>
<td></td>
</tr>
<tr>
<td>Excess Seed Remaining</td>
<td>See “Population Troubleshooting Charts” on page 92.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Field size different.</td>
<td>After ruling out population problems, re-check geography.</td>
</tr>
<tr>
<td></td>
<td>Excessive gaps between planter passes.</td>
<td>Adjust marker, page 170.</td>
</tr>
<tr>
<td>Seed Consumption Too High</td>
<td>See “Population Troubleshooting Charts” on page 92.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Field size different.</td>
<td>After ruling out population problems, re-check geography.</td>
</tr>
<tr>
<td>Rows Not Planted</td>
<td>If not detected by seed monitor, check for plugged row-unit seed tube</td>
<td>Lift planter, expose bottom of seed tube and clean out.</td>
</tr>
<tr>
<td>Uneven seed spacing</td>
<td>See “Population Troubleshooting Charts” on page 92.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hydraulic meter drive motor rpm too low for reliable control by proportional valve.</td>
<td>1. Increase field speed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Use a seed wheel with lower cell count.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Install a low speed kit (page 132).</td>
</tr>
<tr>
<td></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 seed tube.</td>
<td>Inspect; repair or replace.</td>
</tr>
<tr>
<td></td>
<td>Seed-Lok® plugging.</td>
<td>Lock up Seed-Lok®, page 86.</td>
</tr>
<tr>
<td></td>
<td>Row-unit discs not turning.</td>
<td>See “Row-unit discs not turning freely” in this Troubleshooting chart.</td>
</tr>
<tr>
<td></td>
<td>Worn/rusted sprockets and/or chain idler or bearings.</td>
<td>Check and replace any worn/rusted sprockets or chain idlers.</td>
</tr>
<tr>
<td></td>
<td>Partially plugged row-unit seed tube.</td>
<td>Lift up planter, expose bottom of seed tube and clean out.</td>
</tr>
<tr>
<td></td>
<td>Lack of proper seed lubrication on seed.</td>
<td>See “Seed Lubricant” on page 134.</td>
</tr>
<tr>
<td>Planter does not fold or unfold fully</td>
<td>Fold cylinders out of phase</td>
<td>Rephase cylinders, refer to page 115</td>
</tr>
<tr>
<td></td>
<td>Air in lines</td>
<td>Bleed fold circuit, refer to page 115</td>
</tr>
<tr>
<td>Uneven seed depth</td>
<td>Excessive field speed.</td>
<td>Reduce field speed.</td>
</tr>
<tr>
<td></td>
<td>Planting conditions too wet.</td>
<td>Wait until drier weather.</td>
</tr>
<tr>
<td></td>
<td>Incorrect coulter depth setting.</td>
<td>See coulter manual or set unit mounted coulter.</td>
</tr>
<tr>
<td></td>
<td>Excessive or improper row unit down pressure spring setting.</td>
<td>See 25 series row-units, page 71.</td>
</tr>
<tr>
<td></td>
<td>Damaged seed tubes.</td>
<td>Check seed tubes for damage.</td>
</tr>
<tr>
<td></td>
<td>Seed-Lok® building up with dirt.</td>
<td>Lock up Seed-Lok®, page 86.</td>
</tr>
<tr>
<td></td>
<td>Row-unit not penetrating low spots.</td>
<td>Adjust row-unit, see instructions beginning on page 71.</td>
</tr>
<tr>
<td></td>
<td>Rough planting conditions.</td>
<td>Rework the field.</td>
</tr>
<tr>
<td></td>
<td>Seed firmer not in place and set to correct tension.</td>
<td>See “Seed Firmer Adjustments” on page 85.</td>
</tr>
<tr>
<td>Problem</td>
<td>Cause</td>
<td>Solution</td>
</tr>
<tr>
<td>---------</td>
<td>-------</td>
<td>----------</td>
</tr>
<tr>
<td><strong>Press wheel or row-units plugging</strong></td>
<td>Planting conditions too wet.</td>
<td>Wait until drier weather.</td>
</tr>
<tr>
<td></td>
<td>Too much pressure on row-units.</td>
<td>Reduce down pressure on row-units.</td>
</tr>
<tr>
<td></td>
<td>Coulters set too deep, bring up excess dirt and moisture.</td>
<td>Check coulter adjustment.</td>
</tr>
<tr>
<td></td>
<td>Planter not set to run level from front to rear.</td>
<td>Check tongue height page 22</td>
</tr>
<tr>
<td></td>
<td>Backed up with planter 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. Side depth wheels not set correctly.</td>
<td>Adjust side depth wheels page.</td>
</tr>
<tr>
<td><strong>Row-unit discs not turning freely</strong></td>
<td>Row-unit plugged with dirt.</td>
<td>Clean row-unit.</td>
</tr>
<tr>
<td></td>
<td>Planting conditions too wet.</td>
<td>Wait until drier weather.</td>
</tr>
<tr>
<td></td>
<td>Incorrect side depth wheel adjustment</td>
<td>See “Side Gauge Wheel Adjustment” on page 77.</td>
</tr>
<tr>
<td></td>
<td>Seed-Lok® is plugging row-unit.</td>
<td>Lock up Seed-Lok®, page 86.</td>
</tr>
<tr>
<td></td>
<td>Failed disc bearings.</td>
<td>Replace disc bearings.</td>
</tr>
<tr>
<td></td>
<td>Bent or twisted row-unit frame.</td>
<td>Replace row-unit frame.</td>
</tr>
<tr>
<td></td>
<td>Partially plugged row-unit seed tube.</td>
<td>Lift up planter, expose bottom of seed tube and clean out.</td>
</tr>
<tr>
<td><strong>Press wheels not compacting the soil as desired.</strong></td>
<td>Incorrect spring handle setting</td>
<td>See “Press Wheel Adjustment” on page 86.</td>
</tr>
<tr>
<td></td>
<td>Insufficient row unit down-force</td>
<td>See “Row Unit Down Pressure” on page 71.</td>
</tr>
<tr>
<td></td>
<td>Use of incorrectly shaped tire for your conditions.</td>
<td>Wedge shaped wheels work best on narrow spacings and in wet conditions. Round edge wheels work best in wider row spacings and drier conditions.</td>
</tr>
<tr>
<td></td>
<td>Not level front to rear.</td>
<td>Check tongue height.</td>
</tr>
<tr>
<td></td>
<td>Wheel stagger needs adjustment for conditions</td>
<td>See “Press Wheel Adjustment” on page 86.</td>
</tr>
<tr>
<td></td>
<td>Too wet or cloddy</td>
<td>Wait until drier weather or rework ground.</td>
</tr>
<tr>
<td><strong>Seed blowing out of bulk box door area</strong></td>
<td>Fan too fast.</td>
<td>Slow down fan.</td>
</tr>
<tr>
<td></td>
<td>Seal from airbox to hopper damaged or not adjusted.</td>
<td>Inspect and adjust seal. Seal should be intact, and compress to about 3/8 inch (13 mm) under seed container.</td>
</tr>
<tr>
<td><strong>Air lines plugging between air box and Y tubes</strong></td>
<td>Fan too slow.</td>
<td>Speed up fan.</td>
</tr>
<tr>
<td></td>
<td>Air leaks between air box manifold and splitters</td>
<td>Check for leaks and correct as needed.</td>
</tr>
<tr>
<td></td>
<td>Improper hose routing, sags or kinks</td>
<td>With planter unfolded, hoses should for a gentle “S” shape through the holders, with no deep sags.</td>
</tr>
<tr>
<td></td>
<td>Sag or kink in air hose.</td>
<td>Check air tube placement in tube mount weldment. If correct, shorten any hose that has stretched due to age.</td>
</tr>
<tr>
<td></td>
<td>Meter is shut off but Y-tube is open.</td>
<td>Shut off Y-tube.</td>
</tr>
<tr>
<td></td>
<td>Air tube assembly not positioned on correct tab</td>
<td>Move assembly to properly position Y-tubes over row meters.</td>
</tr>
<tr>
<td></td>
<td>Sag in air hose due to incorrect frame height</td>
<td>Raise or lower the tongue so center portion of frame is level with gauge wheel area.</td>
</tr>
<tr>
<td>Problem</td>
<td>Cause</td>
<td>Solution</td>
</tr>
<tr>
<td>--------------------------------------------------</td>
<td>-----------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Hydraulic marker functioning improperly, or not at all</td>
<td>Marker/Fold switch set to Fold.</td>
<td>CFM Switch must be set to “Marker”. Set tractor remote circuit to Neutral or Float before operating switch.</td>
</tr>
<tr>
<td></td>
<td>Marker/Aux valve set to Aux</td>
<td>On a planter with optional Auxiliary Hydraulics, selector valve must be set to Marker for markers to function. Set tractor remote circuit to Neutral or Float before changing valve.</td>
</tr>
<tr>
<td></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>Needle valve(s) in sequence valve plugged.</td>
<td>Open needle valves, cycle markers slowly and reset needle valves, refer to page 169.</td>
</tr>
<tr>
<td>Marker disk does not mark</td>
<td>Marker folding linkage does not have enough slack to allow marker disk to drop into field depressions.</td>
<td>Maximum down float should be limited by the slot at the rod end of the marker cylinder, refer to page 170.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reverse marker disk to pull or throw dirt.</td>
</tr>
<tr>
<td>Hydraulic Hitch Won't Stay Raised</td>
<td>Bypass valve is open at hitch</td>
<td>Close valve.</td>
</tr>
<tr>
<td>Speed Reading Doesn't Match Tractor</td>
<td>Monitor speed reading will only match tractor with planter lowered</td>
<td>If speeds don’t agree during planting (with planter lowered), re-calibrate radar speed sensor with planter lowered.</td>
</tr>
</tbody>
</table>
# Steering Troubleshooting

Always check any steering switch box flash error codes before searching for other causes of problems.

See “Steering with Module Control” on page 31 for switch box operations. Then see “Steering Flash Error Codes” on page 100.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any</td>
<td>Most that cannot be corrected in place</td>
<td>If the planter must be moved for repairs, or planting must continue without steering, see “Emergency Moves Without Steering” on page 113. Make ONLY careful forward moves unless tie rods and caster stops are removed.</td>
</tr>
<tr>
<td>Casters turn abruptly at system power-up</td>
<td>This is normal if the tractor steering at hitching is substantially different from that at unhitching</td>
<td>Keep all persons away from casters at power-up. Allow no one on the walkboard at power-up. To minimize caster movement at power-up, unhitch and re-hitch with the tractor steering in a consistent orientation, usually straight ahead.</td>
</tr>
<tr>
<td>No steering</td>
<td>Hydraulic hoses not connected</td>
<td>Correctly connect steering hydraulics (page 20).</td>
</tr>
<tr>
<td></td>
<td>Steering sense line not connected</td>
<td>Correctly connect steering hydraulics (page 20).</td>
</tr>
<tr>
<td></td>
<td>Power-Beyond hoses reversed</td>
<td>Correctly connect steering hydraulics (page 20).</td>
</tr>
<tr>
<td></td>
<td>Power-Beyond sense line disconnected</td>
<td>Correctly connect steering hydraulics (page 20).</td>
</tr>
<tr>
<td></td>
<td>No pressure at Power-Beyond port</td>
<td>Unless there is a valve for the port, that is shut off, this is a tractor system malfunction</td>
</tr>
<tr>
<td></td>
<td>Steering manifold valve malfunction</td>
<td>Have dealer check solenoid coils and plungers.</td>
</tr>
<tr>
<td></td>
<td>Tractor sensor failed (other than open circuit or short to ground)</td>
<td>Check for obvious mechanical problems (such as loose fasteners). Replace failed or damaged sensor.</td>
</tr>
<tr>
<td></td>
<td>Caster sensor failed (other than open circuit or short to ground)</td>
<td>Check for obvious mechanical problems (such as loose fasteners). Replace failed or damaged sensor.</td>
</tr>
<tr>
<td>ECU does not power up (no lights on switch box)</td>
<td>Fuse blown</td>
<td>Check fuse, located at + battery terminal. If blown, check for underlying problem before using system: 1. Set STEER switch off on console. 2. Disconnect harness to ECU (ECU has standby power, even with console off). 3. Replace fuse. 4. Switch on console - check fuse. If OK, switch off console and continue. 5. Connect ECU harness. Check fuse. If OK, continue. 6. Switch on console and check fuse.</td>
</tr>
<tr>
<td></td>
<td>Power input disconnected or damaged.</td>
<td>Check voltage at 70-pin ECU plug, with console on: Pins 1 and 2, then Pins 2 and 3</td>
</tr>
<tr>
<td></td>
<td>Low battery voltage</td>
<td>Check tractor voltage. Must be between 10 and 16Vdc.</td>
</tr>
<tr>
<td>Steering doesn’t match tractor</td>
<td>Calibration needed</td>
<td>Perform a steering calibration (page 109). If calibration does not solve the problem, check for damaged sensor.</td>
</tr>
<tr>
<td>No caster float in transport</td>
<td>No radar signal (seen by ECU as 0 mph)</td>
<td>Check radar Y-cable connection and radar function</td>
</tr>
<tr>
<td></td>
<td>Disengage speed not set to proper value in ECU setup</td>
<td>Contact Great Plains support. If the ECU firmware was recently updated, there may be other incorrect settings.</td>
</tr>
</tbody>
</table>
## Troubleshooting

### Steering Flash Error Codes

<table>
<thead>
<tr>
<th>Code</th>
<th>Diagnostic</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 1</td>
<td>Float valve HS short to battery</td>
<td>Check float valve coil and cable to ECU. ECU is detecting an unexpected voltage in the circuit.</td>
</tr>
<tr>
<td>1 - 1</td>
<td>Float valve LS short to battery</td>
<td>ECU is detecting a short to ground.</td>
</tr>
<tr>
<td>1 - 2</td>
<td>Float valve HS short to ground</td>
<td>Check float valve coil and cable to ECU. ECU is failing to detect presence of coil - no circuit continuity.</td>
</tr>
<tr>
<td>1 - 2</td>
<td>Float valve LS short to ground</td>
<td>ECU is detecting a short to ground.</td>
</tr>
<tr>
<td>1 - 3</td>
<td>Float valve open circuit</td>
<td>Check float valve coil and cable to ECU. ECU is failing to detect presence of coil - no circuit continuity.</td>
</tr>
<tr>
<td>2 - 1</td>
<td>ST1 valve HS short to battery</td>
<td>Check ST-1 valve coil and cable to ECU. ECU is detecting an unexpected voltage in the circuit.</td>
</tr>
<tr>
<td>2 - 1</td>
<td>ST1 valve LS short to battery</td>
<td>ECU is detecting a short to ground.</td>
</tr>
<tr>
<td>2 - 2</td>
<td>ST1 valve HS short to ground</td>
<td>Check ST-1 valve coil and cable to ECU. ECU is failing to detect presence of coil - no circuit continuity.</td>
</tr>
<tr>
<td>2 - 2</td>
<td>ST1 valve LS short to ground</td>
<td>ECU is detecting a short to ground.</td>
</tr>
<tr>
<td>2 - 3</td>
<td>ST1 valve open circuit</td>
<td>Check ST-1 valve coil and cable to ECU. ECU is failing to detect presence of coil - no circuit continuity.</td>
</tr>
<tr>
<td>3 - 1</td>
<td>ST2 valve HS short to battery</td>
<td>Check ST-2 valve coil and cable to ECU. ECU is detecting an unexpected voltage in the circuit.</td>
</tr>
<tr>
<td>3 - 1</td>
<td>ST2 valve LS short to battery</td>
<td>ECU is detecting a short to ground.</td>
</tr>
<tr>
<td>3 - 2</td>
<td>ST2 valve HS short to ground</td>
<td>Check ST-2 valve coil and cable to ECU. ECU is failing to detect presence of coil - no circuit continuity.</td>
</tr>
<tr>
<td>3 - 2</td>
<td>ST2 valve LS short to ground</td>
<td>ECU is detecting a short to ground.</td>
</tr>
<tr>
<td>3 - 3</td>
<td>ST2 valve open circuit</td>
<td>Check ST-2 valve coil and cable to ECU. ECU is failing to detect presence of coil - no circuit continuity.</td>
</tr>
<tr>
<td>5 - 1</td>
<td>Tractor sensor short to ground</td>
<td>Check tractor wheel sensor for: A. travel limits of sensor. B. cable to ECU C. function of sensor</td>
</tr>
<tr>
<td>5 - 2</td>
<td>Tractor sensor open circuit</td>
<td>ECU not detecting tractor sensor. Use same steps as for 5 - 1.</td>
</tr>
<tr>
<td>6 - 1</td>
<td>Caster sensor short to ground</td>
<td>Check caster wheel sensor, using same steps as for 5 - 1.</td>
</tr>
<tr>
<td>6 - 2</td>
<td>Caster sensor open circuit</td>
<td>ECU not detecting caster sensor. Use same steps as for 5 - 1.</td>
</tr>
<tr>
<td>8 - 1</td>
<td>ECU low voltage</td>
<td>Check tractor voltage above 10Vdc. Check connections to ECU. Check harnesses and switchbox connections.</td>
</tr>
</tbody>
</table>
Maintenance

Proper servicing and maintenance is the key to long implement life. With careful and systematic inspection, you can avoid costly maintenance, downtime, and repair. Always turn off and remove the tractor key before making any adjustments or performing any maintenance.

**WARNING**

**Crushing Hazard:**
Always have parking stands and lift-assist locks in place when working on implement. You may be severely injured or killed by being crushed under the falling implement.

**WARNING**

**High Pressure Fluid Hazard:**
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. Escaping fluid under pressure can have sufficient pressure to penetrate the skin. If an accident occurs, seek immediate medical assistance from a physician familiar with this type of injury.

1. After using your planter for several hours, check all bolts to be sure they are tight.
2. Remove excess slack from chains. Clean and use chain lube on all roller chains as needed.
3. Maintain proper air pressure in planter tires.
4. Keep disk scrapers properly adjusted.
5. Clean planter on a regular basis. Regular and thorough cleaning will lengthen equipment life and reduce maintenance and repair.
6. Lubricate areas listed under “Lubrication” on page 126.
7. Replace any worn, damaged, or illegible safety labels by obtaining new labels from your Great Plains dealer.
Material Clean-Out

When planting is completed, it is commonly the case that some seed remains. There may be seed in the hopper or bulk box, airbox, hose lines, and meters. Some meters may be filled up to the air release vent (which prevents additional seed from reaching that meter).

A complete system clean-out is a 3 step process.
A. Empty airbox (and hopper, if desired).
B. Blow residual seed to meters.
C. Clean out meters with fan running.

**CAUTION**

**Possible Dust and Chemical Fume Hazard:**
Wear a respirator, and any other protective equipment specified by the seed and/or seed treatment supplier. Expect dust and fumes during hopper clean-out.

Air Box Clean-Out

1. Place a tarp or large container under the air box clean-out doors.

**Refer to Figure 126**

2. Close the slide gate 1 on the hopper or bulk box.
3. Open air box clean-out door. This empties the air box.
4. If a hopper is mounted, gradually open the hopper slide gate. Leave a bulk seed box gate closed, unless the box actually needs to be emptied.

Use slide gate to regulate seed flow while recovering seed from hopper.
5. As flow subsides, rapidly open and close the slide gate to dislodge seed in the tracks. Tap on the sides of the hopper to dislodge residual seed.

Air System Clean-Out

**Refer to Figure 127 (which also depicts the meter with the rain cover and disk removed - do not remove disk until step 14)**

6. Close slide gate.
Close air box clean-out door.
7. Set all seed inlet shutters to closed (handle 2 fully raised to the position above setting “I”).

This step prevents meter pressurization air from leaking back against seed delivery air at meters that have low seed pools or are empty.

**WARNING**

**Entrapment and Rapid Suffocation Hazard:**
Never enter a hopper for any reason. Keep strainer in place at all times.

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

▲ When hazardous fumes are present, you can be quickly overcome even with the hopper lid open.

▲ Do not enter a hopper for material loading, material unloading, hopper cleaning or meter maintenance.

▲ Clean hopper by power washing from outside hopper top.

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Refer to Figure 128
8. If the planter has Y-tubes, shut off the gates at all of the Y-tubes.
9. Turn on the air fan and let it run. Use the “SPLIT AIR -” softkey\textsuperscript{a} to reduce the regulated air pressure to a low value, 1 inch water pressure or less - this diverts most of the air to the bulk seed delivery system.

Reduce fan speed as necessary to obtain a low meter pressurization.

Clean out meters with fan running. Work from one side of the planter to the other.

Meter Clean-Out
When planting is completed, it is commonly the case that some seed remains. There may be seed in the hoppers, hose lines, and meters.

Refer to Figure 129
The planter includes an 817-811C container \textsuperscript{c} for meter clean-out, stored in a spring-loaded holder at the right rear of the air manifold. The container can hold all the seed in the meter and inlet (up to a closed slide gate).

The container can be converted into a true funnel for complete system clean-out.

The hoppers are connected to the rows with clamped hose, and are not intended to be routinely unlatched and tipped for clean-out.

Funnel Conversion
Materials and tools needed:
- \textsuperscript{d} a length of 1\(\frac{3}{8}\) inch I.D. hose
- \textsuperscript{e} a worm drive clamp with a working diameter of approximately 1\(\frac{3}{8}\) to 2\(\frac{1}{4}\) inches
- \textsuperscript{f} a hacksaw with fine-toothed blade

Trim the sump \textsuperscript{g} from the funnel. Slide the hose \textsuperscript{h} fully onto the funnel tip. Secure with clamp \textsuperscript{i} (do not over-tighten clamp, the funnel wall be crushed).

The choice of complete system clean-out process depends on whether you are using the 817-811C as a container or funnel.

---
\textsuperscript{a} The “FILL METER” function can divert all the air to seed delivery, but only does so for a short period of time (~90 seconds).
\textsuperscript{b} The funnel wall is thin ABS. Scissor-type pipe-cutting tools may fracture it. Rotary-type pipe cutting tools may slip off.
Refer to Figure 130

The 817-811C seed collection accessory (funnel ①) provided with the planter can be used in one of two ways:

- As provided, the 817-811C is a container that can hold the entire seed volume present from the meter up to a Y-tube (or, if no Y-tube, to where the row hose connects to the wing tubes).
- The 817-811C can also be used as a true funnel. For this use, cut the end off the sump ②, and attach a hose or tube with $\frac{3}{8}$ inch (3.8 cm) inside diameter.

The funnel may be attached to the housing of the seed meter, freeing your hands for other tasks during clean-out. Normal use of the funnel is:

10. Close the seed inlet shutter on the meter (page 79). This minimizes the seed volume at disk removal.
11. Remove the rain cover (page 79). The funnel cannot be snapped in place with the cover installed.
12. Align the left (rear) end of the funnel lip ③ with the top of the lower (rear) cover latch ear. Place the right (front) end of the funnel lip ④ between the meter housing and the seed tube.
13. Rotate the funnel forward until the slot at lip center engages a tab on the bottom center of the meter housing.
14. Remove the seed disk (page 82).
15. Slowly open the seed shutter (page 79) to empty the seed up to the Y-tube or wing tube.
16. If the air system is running (and Y-tube open), there may be more seed than the container can hold. Use the shutter to turn seed flow off, and empty container.

Refer to Figure 131

17. Clean seed from all brushes (shop vac recommended).
18. Inspect brushes (page 105).
19. Rotate funnel clockwise, remove and empty.
20. For imminent operations:
   Install next seed wheel or blank disk (page 139) for operations. Set inlet shutter for next seed (page 79).
21. For storage:
   Close seed inlet shutter. Leave disk out.
   Close Y-tube (if any).
22. Reinstall rain cover (page 79).

At end-of-season clean-out, inspect a few seed meter air release screens. If they require cleaning, consider cleaning all rows.

Alternate Meter Clean-Out

To use a shop vacuum cleaner, with narrow hose nozzle, to clean out a meter:

- Close the seed shutter.
- Release the meter clamp, hold the disk against the meter.
- Tip the top of the disk away from the meter.
- Insert hose nozzle and remove seed.
- Open shutter to allow seeds in inlet and drop hose to flow to vac nozzle.
Seed Tube Clean-Out

The seed sensor in the seed tube can be obscured by build-up of dust, dirt and seed treatments. This can cause false low population alarms.

The planter includes a seed tube brush (Great Plains part number 891-259C). If the seed meter is empty, remove the seed disc and insert the brush into the seed tube from above. With the planter raised, you can also insert the brush from below, whether the meter is empty or not.

Meter Brush Maintenance

**CAUTION**

Possible Chemical Hazard:
Wear a respirator for brush cleaning. Brushes will have talc and graphite residue, and may have residues of hazardous seed treatments.

Refer to Figure 132

A HEPA vacuum cleaner is recommended for brush cleaning. Washing brushes is not recommended and may cause matting. Do not scrape them with sharp instruments.

The first indications of excess brush or damage wear are normally observed on the seed monitor or in air system operation.

- If the tufted brushes are worn/damaged, the seed “double” rate rises, increasing population.

  Finding an occasional cracked seed “hung up” on a tuft fiber is not uncommon, and is not an indicator that brush maintenance is required. Merely remove the seed.

- If the strip brushes are worn/damaged, air pressure regulation may become unstable, or require increasing fan speed over time.

  If you find you need to exceed recommended fan rpm ranges, the regulated air system may be taking too much air due to meter leakage.

  In severe cases, seed may leak past the strip brushes, causing spikes in population. If you frequently observe seed in between the strip brushes, one or both may need replacement.

- If the seed drop brush is worn/damaged, its anti-static effect may fade, which can result in “skips” due to smaller seeds failing to release, and lower populations.

  If an obvious groove is worn in the drop brush, replace it.
**Meter Brush Replacement**

Consult the Parts manual (401-647P) for current replacement part numbers.

*Refer to Figure 133*

**Tufted Brush Replacement**

1. Remove and save both 10-24 hex head cap screws 11 and Nylock nuts (not shown).
2. Remove the tufted brush assembly 12, and replace with new assembly.
3. Reinsert the 10-24 screws, and restart the Nylock nuts. Carefully tighten each nut just until plate has no play under the screw heads.
4. Add a half turn to the nuts. Do not tighten fasteners to normal 10-24 torque, or the plate may fracture.

**Strip Brush Replacement**

Do not loosen or remove any of the three 5/16-18 cap screws 15 retaining the brush holder.

1. Insert the flat blade of a large screwdriver into the slots of the brush holder snaps 13. Turn each snap clockwise to release brush holder 14.
2. Prepare to catch drop brush 16 (which will fall lose). Slide brush holder left and up to free front edge from under washer 17. Remove brush holder.
3. Remove used strip brushes from the holder by sliding them downward out of the grooves.

*Refer to Figure 134*

4. Insert replacement strip brushes into grooves at holder bottom so that notched ends 18 are at the bottom.

*Refer to Figure 133*

5. Check strip brush positioning with a trial reinsertion of the brush holder. The ends of the long brush must fit snugly into meter housing grooves at top 19 and lower rear 20. The bottom end of the short brush must fit snugly in the lower front housing groove 20. If any significant force is require to re-seat the brush holder, a strip brush is likely too high or too low.
6. Relax the position of the brush holder, reposition the drop brush (see below), and re-seat the brush holder.
7. Starting with the bottom snap, swing snaps 13 back into engagement.
Seed Disk Maintenance

Refer to Figure 135

When removing seed disks, inspect them for wear and damage. If there is any seed dust or treatment build-up in the cell pockets 1, or along the raised wiper ridges 2, clean the disks and reinspect.

Replace disks for conditions including:

- Chips at circumference 3. These will leak air.
- Chips at edges or in sculpted surfaces of cell pockets 1. These can leak air and/or adversely affect singulation.
- Cracks over 2 inch (5 cm) long in the working face 3 of the disk, or any cracks in support webs or to an edge.
- Warping - if any part of the disk does not press firmly on the seed drop brushes (page 81) in operation, replace the disk.
- Wear - if a wiper ridge is worn away, replace the disk. If the seed pockets are worn through, or the air ports 5 have enlarged, replace the disk.

Cleaning and Storing Seed Disks

⚠️ CAUTION

Possible Chemical Hazard:
Wear gloves when washing disks. Avoid spray. Do not wash disks where food is prepared, or where cookware or dinnerware is washed. Seed disks will have talc and graphite residue, and may have residues of hazardous seed treatments. Although the disks are dishwasher-safe, do not wash them in an appliance also used for food preparation or food serving items.

Use warm or hot water, mild soap, and a sponge or soft brush to remove build-up.

If disks are washed, allow them to dry completely prior to storage.

Retain original shipping cartons for disk storage. Otherwise, store them on edge (and not leaning), or stacked horizontally on a spindle, to eliminate any risk of warps. Any seed residue on disks may attract pests. Fully enclose dry disks to prevent rodent damage.
Air Box Residue Clean-Out

Planting in extremely dusty conditions, particularly dusty and humid conditions, or otherwise sticky soils, can lead to air residue build-up inside the airbox. This residue can cause seed delivery blockages.

Refer to Figure 136 and Figure 137 (Figure 136 depicts a partially and a completely plugged agitation port, and build-up in the RH plenum chamber)

Whenever opening the airbox clean-out door ‡, inspect the agitation ports 2. If any are partially or completely blocked, follow the clean-out instructions on this page.

Seasonally, remove the inspection ports on each of the airbox, and inspect plenum chambers 1 (LH) and 16 (RH). If any build-up is observed, follow the more comprehensive inspection steps and clean-out instructions on this page.

1. Spot the Planter at a suitable location for clean-out and follow the parking instructions (page 57).

2. If seed is loaded, close the slide gate for the hopper or bulk seed box (page 102).

3. Set out a tarp for recovery of any expected seed still in the airbox. Open the airbox clean-out door ‡.

4. Remove the inspection port covers from each end of the airbox (not shown in figures).

5. Use an indelible marker to identify the hoses on seed hose ports 1 through 16. Disconnect the clamps and hoses.

‡ Further disassembly of the airbox is not recommended, as joints are sealed with silicone adhesive, and would need to be cleaned and resealed.

6. Inspect the agitation ports 2. Break up any build-up. Use a hooked tool or wire to pull smaller fragments down through the ports. For larger fragments, reach in through the inspection ports or vacuum them out via those ports.

7. Inspect the entire plenum area 3 for build-up. Break up any deposits. Vacuum them out through the inspection ports.

8. From the seed hose ports 4, inspect the seed air ports 5. Break up any deposits. Vacuum out from clean-out door.

9. With all ports and doors still open, operate the Planter fan to blow up any remaining loose residues.

10. Reconnect the seed hoses. Reinstall the inspection port doors. Close the clean-out door.

Flush the airbox with water is not recommended. If done, operate the fan for an extended period to completely remove any moisture prior to storage or field operations.
Steering Maintenance

Steering System Hydraulic Bleeding

The steering system is self-purging and never requires bleeding if operated with all four hoses correctly connected.

Steering System Modes of Operation

(APPLIES ONLY TO PLANTERS s/n B1027J+)

Refer to Figure 140

There are two modes of operation for the steering system on the 3PYPA planters. Which mode of operation to use is based on whether the tractor is manually steered or has an auto-steer system.

If the tractor is manually steered then the planter steering system should be set to “Steer While Planting” mode. In this mode the planter steering system is always active.

If the tractor is steered with an auto-steer system then the planter steering system should be set to the “Float While Planting” mode. In this mode the steering system is active only when the planter is in the raised position. When the planter is in the down (planting position) the planter steering system is in the float mode.

Steering Calibration

Hydraulic-powered planter hydraulic steering is standard on the planter.

The hydraulic steering system has two calibration modes:

a. one for caster wheel sensor calibration
b. one for tractor wheel sensor calibration.

After initial wheel calibration at delivery of the planter, periodic re-calibration is necessary in the following circumstances:

• Re-calibrate for use with a different tractor.
• Re-calibrate if maintenance required dismounting any steering sensor, tire size or tractor tire size and/or wheel arrangement has changed.
• Great Plains recommends seasonal re-calibration.
• Re-calibrate if steering software is updated.
Steering Configuration Switch

This cab-mounted switch box controls both normal and field calibration of the hydraulic steering system. It has 4 switches and 3 indicator lamps, that perform the following functions.

<table>
<thead>
<tr>
<th>Steering Control Module Function</th>
<th>Switch Positions and Indications</th>
</tr>
</thead>
</table>
| 1. STEER Toggle Switch: Steering System Power           | On (up): Steering enabled (casters match or float)  
|                                                         | Off (down): Steering disabled (casters in Float)                                                |
| 2. LED: Power / Fault                                   | On steady: Steering system active (casters match or float)  
|                                                          | Blinking: Steering system fault (casters in Float)                                               |
| 3. FLOAT LED: Float / Caster                            | Off: Normal operation - steering system active if STEER on  
|                                                          | On: Casters in Float (if STEER LED is steady)                                                    |
| 4. CALIBRATION Toggle Switch: Calibration Modes          | L: Caster aspect sensor (casters in Float)  
|                                                          | C: Calibration mode off (normal transport/field mode)  
|                                                          | R: Tractor aspect sensor (casters in Float)                                                      |
| 5. LEARN Button: Calibration (Learn)                     | First press: Learn tight Right turn  
|                                                          | Next press: Learn Straight ahead  
|                                                          | Next press: Learn tight Left turn                                                              |
| 6. LED: Calibration                                     | Off: Normal (non-Calibration) operation  
|                                                          | Dim: Either Calibration mode selected  
|                                                          | Bright Flash: Button press acknowledged                                                          |
| 7. Rotary Switch Knob (ONLY APPLIES TO PLANTERS WITH     | Vertical position: Normal operation - steering system active while planting as well as when raised  
| s/n B1027J+)                                            | Horizontal position: Used when tractor is utilizing auto-steer - planter steering system floats while planting - active only when planter is raised |
Wheel Sensor Calibration
The planter must be completely connected to the tractor, and leveled, before beginning the procedure. You need a reasonably level area large enough for completely turning and straightening the rig.

Refer to Figure 138 and the table on page 110
1. Raise the planter. Folding is also suggested if the test area is small, or uneven enough to cause wing openers to touch the ground.
2. Ensure the hydraulic steering ECU is connected to the cab switch box, and powered-up (switch ).

Caster Right Calibration
1. Put the steering in caster wheel sensor calibration mode, by setting Calibration switch  to the “CASTER” position.

Do not move the Calibration toggle switch from the “CASTER” position until step 3, or the new caster calibration is ignored.
2. Make a complete forward right circle, as tight as the rig permits, with all wheels in a hard right turn.
   Stop.
3. Press and hold the “learn” button  on the switch box, until the LEARN indicator  flashes. Normally, the illumination response takes less than a second.

Steering Mismatch Risk:
Do not press the LEARN button more than once for each orientation (right, straight, left). If pressed more than once, invalid steering data is stored. You must restart the sequence (see “Errors and Re-Tries”).

Caster Straight Calibration
1. Drive straight forward until the entire rig is running in a straight line. Stop, with all wheels straight ahead.
2. Press and hold the “learn” button  on the switch box, until the LEARN indicator  flashes.

Caster Left Calibration
1. Make a complete forward left hand circle, as tight as the rig permits, with all wheels in a hard left turn.
   Stop.
2. Press and hold the “learn” button  on the switch box, until the LEARN indicator  flashes.
3. Complete the caster wheel sensor calibration mode, by setting Calibration switch  to “OFF”.

Tractor Right Calibration
1. Put the steering in tractor wheel sensor calibration mode, by setting Calibration switch  to the “TRACTOR” position.

Do not move the Calibration toggle switch from the “TRACTOR” position until step 3, or the new tractor calibration is ignored.
2. Make a complete forward right turn, as tight as the rig permits, with all wheel in a hard right turn.
   Stop.
3. Press and hold the “learn” button  on the switch box, until the LEARN indicator  flashes.

Tractor Straight Calibration
1. Drive straight forward until the entire rig is running in a straight line. Stop, with all wheels straight ahead.
2. Press and hold the “learn” button on the switch box, until the LEARN indicator flashes.

Tractor Left Calibration
1. Make a complete forward left turn, as tight as the rig permits, with all wheels in a hard left turn.
   Stop.
2. Press and hold the “learn” button  on the switch box, until the LEARN indicator  flashes.
3. Complete the tractor wheel sensor calibration mode, by setting Calibration switch  to “OFF”.

Errors and Re-Tries
If you are unable to complete a sequence, set the Calibration switch  to “OFF”, and restart the calibration sequence from the beginning (step 1 for caster or step 1 for tractor). Do not attempt to start from where you left off.

If you need to re-try a sequence (for example, you run out of room to complete a circle or straight run), set the Calibration switch  to “OFF”, reposition the rig and begin again.

It is not necessary to re-calibrate caster steering, if only the tractor steering needs to be redone.
Track Tractor Preferred Method of Tractor Steering Sensor Calibration (APPLIES ONLY TO PLANTERS WITH s/n B1027J+*)

1. Turn the Ignition Switch to the ON position. DO NOT START the ENGINE.

2. Put the Steer Toggle switch to the ON position. The power light on the steering switch box and the LED’s on the electronic steering module should all be illuminated.

3. Put the steering in the tractor sensor calibration mode by setting Calibration switch to the TRACTOR position.

Do not move the Calibration toggle switch from the TRACTOR position until step 10 or the new tractor calibration is ignored.

4. Turn the steering wheel all the way to the right and hold in this position to simulate a hard right hand turn.

5. Press and hold the LEARN button on the switch box until the LEARN indicator flashes.

6. Release the steering wheel. It should return to the center position.

7. Press and hold the LEARN button on the switch box until the LEARN indicator flashes.

8. Turn the steering wheel all the way to the left and hold in this position to simulate a hard left hand turn.

9. Press and hold the LEARN button on the switch box until the LEARN indicator flashes.

10. Complete the tractor sensor calibration mode by setting Calibration switch to OFF. Only at this point are the new calibration values accepted by the system.
Emergency Moves Without Steering

To move the planter with a tractor lacking planter steering components, or to move a planter with a steering system malfunction, the casters must be in Float. Steps below describe methods for several situations.

**Force Caster Float**

Any of these configurations will float the casters.

1. **Normal Caster Float**
   (for forward travel only - *do not back up*)
   a. Shut off tractor. Power-Beyond cannot be connected with tractor running.
   b. Make all normal hydraulic and electrical connections, including steering. Start tractor.
   c. Set “STEER” switch on steering switch box OFF.
   d. If casters do not float, try step 2.

2. **ECU-Disconnected Caster Float**
   (for forward travel only - *do not back up*)
   a. Shut off tractor. Power-Beyond cannot be connected with tractor running.
   b. Make all normal hydraulic connections, including steering (see page 18). Start tractor.
   c. Make all normal electrical connections, EXCEPT steering (see page 17).

3. **Mechanical Float**
   (for forward travel only)
   **(APPLIES ONLY TO PLANTERS WITH s/n B1027J+)**
   a. Remove 1 1/4 inch pin locking the caster weldment and steering arm weldment together.
   b. Make all normal hydraulic and electrical connections EXCEPT power beyond pressure line.

---

**NOTICE**

**Equipment Damage Risk:**
Make no planter moves of any kind with casters in hydraulic lock. Damage to both planter and tractor is likely. Take all steps necessary on this page to enter Float state.

**NOTICE**

**Equipment Damage Risk:**
Make only careful forward moves with casters in Float. With options 1-3, do not make reverse moves. The casters immediately swivel to a hard turn state, usually opposite to any tractor turn. Damage to planter and tractor is likely.
Hydraulic Maintenance

Hydraulic Drive Maintenance (Option)

As with any hydraulic system, contamination is the most common cause of performance problems and premature wear. Make a special effort to properly clean quick couplers prior to attaching the hoses to tractor, and never let them fall to the ground.

**WARNING**

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

If your planter has the optional hydraulic drive, it is also equipped with a high-pressure filter to protect the system. With attention to clean connections, the consumable element in this filter rarely needs replacing.

The filter has a pop-out indicator to alert you that the filter must be replaced before next use. The element cannot be cleaned and re-used; it must be replaced.

If you keep a spare filter on hand, replace the element when the indicator pops. If you don’t keep a spare, plan on seasonal element replacement.

**Replacing Hydraulic Filter**

Have cleaning rag, plus a pail ready to catch excess hydraulic fluid. Even with the system depressurized back to the tractor, there will be some spillage.

*Refer to Figure 141*

1. Set tractor hydraulic controls for the drive circuit to “float” and shutdown tractor. Allow oil to cool.
2. Set the pail under the filter.
3. Unscrew lower canister housing and empty it into the pail.
4. Remove the filter element and safely discard it.
6. Clean canister threads, and lubricate O-ring with clean hydraulic fluid.
7. Reinstall canister housing.
8. Re-set pop-out indicator (as necessary).
9. Activate tractor hydraulic circuit and check for leaks with paper or cardboard.
Bleeding Hydraulics

Bleeding Lift Hydraulics

Normally the lift hydraulics are bled at the factory before shipping, and bleeding should not be required other than to raise fully and hold lever on for one minute or until all cylinders extend fully.

If it is necessary to further bleed lift system, see "Lift Cylinder Bleeding" on page 116.

Bleeding Fold Cylinder Hydraulics

Normally the fold hydraulics are bled at the factory before shipping, and bleeding should not be required other than to fold fully and hold lever on for one minute or until all cylinders reach the end of their stroke.

If it is necessary to further bleed fold system, see "Wing Fold Cylinder Bleeding" on page 117.

Bleeding Marker Hydraulics

To fold properly, the marker hydraulics must be free of air. If the markers fold in jerky, uneven motions, see "Marker Tilt Cylinder Bleeding" on page 120 and see "Marker Fold Cylinder Bleeding" on page 121.

**WARNING**

**High Pressure Fluid Hazard:**
Relieve pressure before disconnecting hydraulic lines. Wear protective gloves and safety glasses or goggles when working with hydraulic systems. 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. If an accident occurs, seek immediate medical attention from a physician familiar with this type of injury.

Only trained personnel should work on system hydraulics!

**NOTICE**

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

**DANGER**

**Crushing and Equipment Damage Hazards:**
If the planter is folded, and it is suspected that the fold system has air in it, DO NOT attempt to unfold before accomplishing the full fold bleed procedure at “Wing Fold Cylinder Bleeding” on page 117.

If the fold system has air in it, the wings can descend too fast.

**DANGER**

**Crushing and Equipment Damage Hazards:**
Do not bleed marker cylinders with wings folded. Avoid bleeding wing fold cylinders with wings folded. The cylinders are difficult to access when folded, and bleeding complications could lead to an unsafe or unserviceable machine configuration.

**JIC Torque Chart**

<table>
<thead>
<tr>
<th>Size</th>
<th>Foot-Pounds</th>
<th>N-m</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/16-20</td>
<td>11-12</td>
<td>15-16</td>
</tr>
<tr>
<td>3/8-20</td>
<td>15-16</td>
<td>20-22</td>
</tr>
<tr>
<td>9/16-18</td>
<td>18-20</td>
<td>24-28</td>
</tr>
<tr>
<td>3/4-16</td>
<td>38-42</td>
<td>52-58</td>
</tr>
<tr>
<td>7/8-14</td>
<td>57-62</td>
<td>77-85</td>
</tr>
<tr>
<td>11/16-12</td>
<td>79-87</td>
<td>108-119</td>
</tr>
</tbody>
</table>

**NOTICE**

**Over-Torque Leak Risk:**
JIC (Joint Industry Conference 37- Flare) fittings do not require high torque. Excess torque causes leaks. JIC and ORB (O-Ring Boss) fittings do not require sealant.

Never try to bleed a QD (Quick Disconnect) fitting. Avoid bleeding at ORB fittings. The O-ring is likely to be torn if any pressure remains in the circuit.
Lift Cylinder Bleeding

Refer to Figure 142 and Figure 143. Figure 142 depicts the parallel arms disconnected from the seed support structure (on an earlier 3PYP model). Disconnect only the cylinder rod end for bleeding.

Normally the lift hydraulics are bled at the factory before shipping, and bleeding should not be required other than to raise fully and hold lever on for one minute or until all cylinders extend fully.

If the planter has wing flex cylinders or hydraulic down pressure, bleed the small cylinders at the wing/center coupling before bleeding the lift circuit. See “Wing Flex Cylinder Bleeding” on page 117.

If necessary to further bleed system, follow these steps.

1. Consult the lift circuit hydraulic diagram for your planter:
   “Lift Hydraulics (Wing Lock)”, page 144,
   “Lift Hydraulics (Wing Flex)”, page 145, or
   “Lift Hydraulics (Weight Transfer)”, page 146.
   (some partially repeated here for reference)
2. Check that tractor hydraulic reservoir is full. Set hydraulics for low flow rate.
3. Lower planter.
4. Disconnect and lower rod ends of lift assist cylinders.
5. Extend the lift circuit until rods are fully extended. Set circuit to Neutral.
6. Loosen the JIC fitting at the base end (top) of the left lift cylinder.
7. Extend the lift circuit until fluid appears at the loosened fitting. Set control lever to Neutral and secure the fitting.
8. Loosen JIC fitting at base end 2 of right lift cylinder.
9. Extend the lift circuit until fluid appears at the loosened fitting. Set lever to neutral. Secure the fitting.
10. Retract the cylinders. Set circuit to Neutral. Elevate both cylinders until the rod ends are higher than the base ends.
11. Loosen JIC fitting at rod end 3 of the left lift cylinder.
12. Retract the lift circuit until fluid appears at the loosened fitting. Set control lever to neutral and secure the fitting.
13. Loosen JIC fitting at rod end 4 of right lift cylinder.
14. Retract the lift circuit again until fluid appears at the loosened fitting. Set control lever to neutral and secure the fitting.
15. Pin cylinders to seed cart lugs.
Wing Flex Cylinder Bleeding

Refer to Figure 144 and Figure 145

1. Consult the appropriate flex circuit hydraulic diagram:
   “Lift Hydraulics (Wing Flex)” on page 145, or
   “Lift Hydraulics (Weight Transfer)” on page 146
   (partially repeated here for reference).
2. Check that tractor hydraulic reservoir is full.
   Set hydraulics for low flow rate.
3. Set circuit to Retract and retract cylinders until they stop.
4. Set circuit to neutral.
5. Loosen JIC fitting at right cylinder, base end 🅰️:
6. Set circuit to Extend until fluid appears.
7. Neutralize circuit and secure JIC fitting.
8. Set circuit to Extend until rods extend to stop.
9. Neutralize circuit and loosen JIC fitting at left cylinder, rod end 🅱️:
10. Set circuit to Retract until fluid appears.
11. Neutralize circuit and secure JIC fitting.
12. Extend and retract circuit several times.

Wing Fold Cylinder Bleeding

Normally the fold hydraulics are bled at the factory before shipping, and bleeding should not be required other than to fold fully and hold lever on for one minute or until all cylinders reach the end of their stroke.

⚠️ CAUTION ⚠️

Crushing and Equipment Damage Hazards:
Do not unfold planter if significant bleeding is necessary.
It is not safe to unfold with air in the fold system.
If significant air is suspected, skip step 5.

1. Consult appropriate flex circuit hydraulic diagram for your planter:
   “Wing Fold Hydraulics (no Markers)”, page 147, or
   “Wing Fold and Marker Hydraulics”, page 148
   (partially repeated here for reference)
2. If a leak or component failure is suspected, correct it before proceeding.
3. Check that tractor hydraulic reservoir is full.
4. If the planter wings are folded, safety chain the wings together before proceeding.
5. If safe, unfold the wings (page 36). If the planter has markers, leave the marker switch Off during this bleed.

**Refer to Figure 146 or Figure 147**

6. Set hydraulics for low flow rate. Disconnect the rod ends 🔄 of both wing fold cylinders, so that they may extend without moving the wings.
7. Retract the wing fold circuit.
8. Loosen the JIC fittings at both wing fold cylinder base ends 🌱.
9. Set wing fold circuit to Extend until fluid emerges.
10. Neutralize the circuit and secure the fittings.
11. Fully extend the wing fold cylinder rods.
12. Loosen the JIC fittings at both wing fold cylinder rod ends 🌱.
13. Set wing fold circuit to Retract until fluid emerges.
14. Neutralize the circuit and secure the fittings.
15. Fully retract the wing fold cylinder rods.
16. Cycle the circuit to fully extend then fully retract both cylinders. Repeat this two times.
17. Reattach the rod ends to the wings.
18. Unchain as needed and fold and unfold wings several times.
Marker Maintenance (Option)

See also:
"Initial Marker Setup (Option)" on page 169,
"Marker Operation (Option)" on page 52, and
"Marker Disk Adjustment" on page 64

Marker Shear Bolt Replacement

Refer to Figure 148

If a marker gets caught or hits an obstruction, it is designed to fail a shear bolt at the fold, pivot on a second bolt, and swing back.

The shear bolt is a hex head cap screw, $\frac{7}{16}$-14 x 2 inch Grade 5, Great Plains part number 802-589C, plus a $\frac{7}{16}$-14 lock nut, Great Plains part number 803-200C.

Install a replacement shear bolt on the vertical faces on the side opposite from the pivot bolt. Do not use a higher grade bolt, or marker hang-ups may result in machine damage. Do not use a lower grade bolt, or you may experience nuisance shears.

Refer to Figure 149

If your planting frequently encounters shear hazards, you can store 6 spare shear bolts/nuts per marker side, in storage holes at the fold point.

Marker Chain Length Adjustment

Great Plains suggests checking marker chain slack every few years. If any maintenance or repairs cause the chain to be disconnected, correct slack needs to be set on installation.

Perform any checks and adjustments with the marker folded and tilted down into its cradle.

Refer to Figure 150

At the mid-point in the exposed chain, pull it toward the front of the planter.

Measure the distance between that mid-point and the nearest point on either of the two parallel tubes of the marker intermediate arm. The target value is: 18 inches (46 cm).

If the slack is more than one inch different, remove the bolt and nut at the lower end of the chain and adjust the length.

**NOTICE**

Equipment Damage Risk:
Keep chain slack within range. A chain length too short or too long can result in marker damage.
Marker Tilt Cylinder Bleeding

**CAUTION**

**Crush, Pinch and Equipment Damage Hazards:**
Markers must be folded and tilted down for this bleed. If tilted up, markers would tilt down rapidly during bleed.

Normally the tilt hydraulics are bled at the factory before shipping, and bleeding should not be required other than to fold fully and hold lever on for one minute or until all cylinders reach the end of their stroke.

1. Consult complete tilt circuit hydraulic diagram: "Wing Fold and Marker Hydraulics", page 148 (partially repeated here for reference)
2. Check that tractor hydraulic reservoir is full.
3. Unfold the wings (page 36). Turn the CFM Wing switch Off and leave it (and the Marker Fold switch) Off during this bleed.

Refer to Figure 151 and Figure 152

4. Leave the markers tilted down.
5. Disconnect the rod ends ① of both tilt cylinders.
6. Retract the tilt circuit.
7. Loosen the JIC fittings at both tilt cylinder base ends ②.
8. Set wing fold circuit to Extend until fluid emerges.
9. Neutralize the circuit and secure the fittings.
10. Extend the tilt rods.
11. Loosen the JIC fittings at both tilt cylinder rod ends ③.
12. Set tilt circuit to Retract until fluid emerges.
13. Neutralize the circuit and secure the fittings.
14. Reattach the rod ends to the markers.
Marker Fold Cylinder Bleeding

Refer to Figure 153 and Figure 154

Normally the marker hydraulics are bled at the factory before shipping, and bleeding should not be required other than to fold fully and hold lever on for one minute or until all cylinders reach the end of their stroke.

1. Consult complete tilt circuit hydraulic diagram: "Wing Fold and Marker Hydraulics", page 148 (partially repeated here for reference)
2. Check that tractor hydraulic reservoir is full.
3. Unfold the wings (page 36). Turn the CFM Wing Fold switch Off and leave it (and the Marker Tilt switch) Off during this bleed.
4. Leave the markers tilted down for safer access to the marker fold cylinders.
5. Disconnect rod ends of both marker fold cylinders.
6. Retract the marker fold circuit.
7. Loosen the JIC fittings at both marker fold cylinder base ends.
8. Set marker fold circuit to Extend until fluid emerges.
9. Neutralize the circuit and secure the fittings.
10. Extend the tilt rods.
11. Loosen the JIC fittings at both marker fold cylinder rod ends.
12. Set tilt circuit to Retract until fluid emerges.
13. Neutralize the circuit and secure the fittings.
14. Reattach the rod ends to the markers.

Marker Grease Seal Cap

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

Chain Maintenance

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

See also “Chain Routing” on page 153.

Chain Slack

Check slack at fixed idlers within the first 8 hours of operation and tighten idlers as necessary. Check slack at spring-operated idlers seasonally.

Refer to Figure 155, which, for clarity, greatly exaggerates slack, and omits the idlers.

1. Measure the span 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 36 inch / 91 cm):
   \( \frac{1}{4} \) inch per foot (2.1 cm per meter)
   Vertical short chains:
   \( \frac{1}{4} \) in per foot (2.1 cm/m)
   Horizontal short chains:
   \( \frac{3}{8} \) in per foot (4.2 cm/m).
3. Measure the current slack:
   Acting at a right angle to the chain span at the center of the span, deflect the chain in both directions. The slack is the distance of the movement.
4. Adjust the idlers for ideal slack.

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

*Refer to Figure 156 (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).

**Meter Drive Chain**
*Refer to Figure 157 (which depicts planter raised)*
When performing periodic lubrication, check chain condition. Replace chain if any frozen kinks are not corrected by lubrication.
When performing seasonal checks, lower planter to put chain at minimum idler spring tension.
Check that idler spring length 3, measured from outside of pin to outside of pin, is not shorter than:
7.0 inch (17.8 cm)
Lift spring off idler assembly 4. Check that idler assembly pivots freely. Reattach spring.
Check chain clip orientation. Check chain routing at shank idler(s) 5 (see page 157).
Spreaders and Scrapers

Appplies to all row unit Series.

Refer to Figure 158

1. Remove side gauge wheels from arms to access row-unit disks and scrapers.
2. With the unit raised, check blade spreader for wear. Replace spreader if it is \( \frac{3}{8} \) inch (13 mm) wide or narrower. To replace, remove disk blades, drive out roll pins, and install new spreader.
3. When reinstalling disk blades, put two shims between bearing and shank on each blade. Tighten bolts.
4. Check amount of contact between blades, and adjust number of shims as needed. Store extra shims on outside of blade. See “Opener Disc Contact Region” on page 76.
5. Check that outside disk scrapers are formed to disk blades to help remove any mud. Bend/twist scrapers to fit blades as needed. Every 200 acres of operation, check outside scrapers for adjustment and wear. Replace outside scrapers as necessary.

Row-Unit Side Wheels

Refer to Figure 159

1. Lift opener side wheel off the ground. Move tire in and out to check for end play. Check for roughness in bearing by rotating wheel. If bearings are rough, inspect and replace if necessary.
2. Side wheels are preset at the factory. Due to normal wear it may become necessary to make adjustments so the wheel remains close to the disk. To prevent plugging, loosen clamp bolt and slide arm inward to take up gap between side wheel and disk blade. If more adjustment is needed, go to step 3.
3. Remove bolt and wheel. Remove shims from the inside of wheel and place them on the outside of wheel. Always place removed shims from the inside to the outside. When installed, wheel should turn freely and not hit the arm at the curve. Do not add any more shims than necessary.
4. Disassemble side gauge wheel arm from unit. Remove bushing from sleeve and check for wear. If necessary, replace bushing.
5. When reinstalling side gauge wheels, align tab on hex adjustment with notch in bushing. Replace bolt and tighten.
6. Adjust side gauge wheels. Refer to see “Side Gauge Wheel Adjustment” on page 77.

It is normal for the blade spreader to have some looseness in the holder and between the blades. Some looseness is required for proper operation.

You may need fewer washers under worn disks.
Seed Flap Replacement

Seed Flaps on S/N B1016J+

Refer to Figure 160

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

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

Seed Flaps on S/N B1015J-

Refer to Figure 161

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

If replacing with 817-349C:
Push new seed flap ① up through metal bracket ③ until tabs ② on seed flap snap in place.

If replacing with 816-302C:
See seed flap replacement instructions above.
Fertilizer System Maintenance

With proper attention to maintenance, end of day clean-out, end of season clean-out and winterization, you can substantially increase the life and reliability of your fertilizer system. Protect the pump, clean the tanks, strainers, lines and nozzles, and you can avoid costly and time-consuming repairs at the next season.

Fertilizers are usually highly corrosive to metals other than stainless steel. Suspension fertilizers can clog system components in storage.

1. Flush entire system with clean water. Do this at the field last treated, or other location complaint with chemical supplier cleanup instructions.
2. Remove end caps from booms and flush booms out with water. Drain and replace end caps.
3. Remove strainer and drain it out. Drain all lines and tanks completely to prevent freezing damage.
4. Cap or plug inlet line to tractor.
5. Flush pump per pump supplier manual. Fill pump with RV antifreeze and cap off.
6. Wash all spilled fertilizer off the planter.

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

**Opener Side Wheel Bushing**
- **8**
- On both sides of each row-unit
- Type of Lubrication: Grease
- Quantity: Until grease emerges

**Meter Drive Chains**
- **As Required**
- 1 chain each meter
- Type of Lubrication: Chain Lube
- Quantity = Coat thoroughly
- Lubricate chains any time there is a chance of moisture, and when being stored at the end of the planting season.

**Frame to Frame Parallel Arms**
- **50**
- 8 zerks, 4 each side
- Type of lubrication: Grease
- Quantity: Until grease emerges.
Marker Arms (Option)

8 zerks, 4 each side:
1. Tilt base pivot
2. Fold base pivot
3. Inner arm pivot
4. Outer arm pivot
Type of lubrication: Grease
Quantity: Until grease emerges

Row Cleaner Bearings (Option)

1 zerk each wheel, 1 or 2 wheels per row
Type of lubrication: Grease
Quantity = Until resistance is felt
To avoid damaging the seal, do not add grease at high pressure.
Wing Link Arms

14 zerks, 7 each side:
1. Lower link inner pivot
2. Lower link outer pivot
3. Flex pivot (zerk not visible in figures)
4. Upper link inner pivot
5. Upper link outer pivot
6. Cylinder base
7. Cylinder rod
Type of lubrication: Grease
Quantity: Until grease emerges

Wing Transfer Drive Shafts

8 zerks, 4 each side:
2 two each outer shaft sleeve
2 on each of 2 universal joints
Type of lubrication: Grease
Quantity = Until grease emerges (joints)
Quantity = 6 pumps (shafts)
Caster Pivots (S/N B1026J-)

1 zerk each spindle; 2 total
Type of Lubrication: Grease
Quantity: Until grease emerges

Caster Pivots (S/N B1027J+)

3 zerk each spindle; 6 total
Type of Lubrication: Grease
Quantity: Until grease emerges

Caster Steering Tie Rods (S/N B1026J-)

1 zerk each tie rod; 4 total
Type of Lubrication: Grease
Quantity: Until grease emerges
Caster Steering Tie Rod (S/N B1027J+)

1 zerk, tie rod; 2 total
Type of Lubrication: Grease
Quantity: Until grease emerges

Caster Steering Spindle (S/N B1026J-)

2 bearing races
Type of Lubrication: Grease
Quantity: Repack

Caster Wheel Bearings

2 races each spindle; 4 total
Type of Lubrication: Grease
Quantity: Repack
**Gauge Wheel Bearings (Ground Drive)**

2 races each spindle;
4 total
Type of Lubrication: Grease
Quantity: Repack

**Gauge Wheel Bearings (Hydraulic Drive)**

2 races each spindle;
4 total
Type of Lubrication: Grease
Quantity: Repack

**Gauge Wheel Yokes (Hydraulic Drive)**

6 zerks, 3 each side:
1. on adjustment rod lower pivot (to front)
2. on yoke pivot (on top, not visible)
Type of lubrication: Grease
Quantity: Until grease emerges
Markers: Disk Hub

<table>
<thead>
<tr>
<th>Seasonal</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 bearings; 2 each marker</td>
</tr>
<tr>
<td>Type of Lubrication: Grease</td>
</tr>
<tr>
<td>Quantity: Repack</td>
</tr>
</tbody>
</table>

Walkboard Pivot

<table>
<thead>
<tr>
<th>Seasonal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 zerk</td>
</tr>
<tr>
<td>Type of lubrication: Grease</td>
</tr>
<tr>
<td>Quantity: Until grease emerges</td>
</tr>
</tbody>
</table>
Seed Lubricants

To maximize performance of Great Plains metering systems, it is imperative to use "Ezee Glide Plus" or Bayer Seed Fluency Agent.

Ezee Glide Plus Talc+Graphite Mix

821-069C  bucket, 5 gallon (19 liter)

Ezee Glide Plus Lubricant

"Ezee Glide Plus"is suitable for all seeds, especially treated or inoculated seed, except where talc and graphite mixes are prohibited. Thorough mixing of seed and added lubricant is required.

Recommended usage:

For clean seeds other than milo, cotton, and sunflowers sprinkle one cup of Ezee Glide Plus Talc per 4 bushels or units (170 ml per 100 liters) of seed.

For milo, cotton, and sunflowers double the application to one cup (or more) per 2 bushels or units (335 ml per 100 liters) of seed.

For canola or mustard, 1 cup (240 ml) per 30 pound (13.6 kg) bag is a minimum starting value. Mix the seed lubricant early during the seed loading. Use more lubricant in extremely dry conditions.

Adjust this rate as necessary so all seeds become coated while avoiding an accumulation of lubricant in the bottom of the hopper.

For seed with excessive treatment, or for humid planting environments, increase the rate as needed for smooth meter operation.

⚠️ CAUTION

Irritation and Chronic Exposure Hazard:

Wear gloves. DO NOT use hands or any part of your body to mix seed lubricant. Wear a respirator when transferring and mixing. Avoid breathing lubricant dust. Not an acute hazard. May cause mechanical eye or skin irritation in high concentrations. As with all mineral spills, minimize dusting during cleanup. Prolonged inhalation may cause lung injury. Product can become slippery when wet.

Bayer Seed Fluency Agent

821-074C  Fluency Powder, case quantity
821-075C  Fluency Powder, single 4.4 pound bucket

This agent is required by regulation for certain crops in certain regions (such as corn and soybean in Canada). It is an alternative to Ezee Glide Plus in other locales, for large seeds. It is not recommended for smaller seeds such as canola and milo.

Refer to the booklet affixed to the bucket for recommended usage. Do not exceed those recommendations, as excess amounts adversely affect accurate metering.

⚠️ CAUTION

Dust and Explosion Hazard:

Avoid exposure to dust when mixing this powder into seed. Avoid creating dust in any confined space with ignition sources present, as specific concentrations can be explosive. Consult the instruction booklet and SDSa for further cautions.

---

a. SDS: Safety Data Sheet.
PTO Pump Kits

For tractors lacking a sufficient number of remotes with adequate continuous oil flow capability, kits are available to operate the fan(s) optionally the hydraulic seed drive motor, via mechanical Power Take-Off (PTO).

A 1000 rpm PTO is required with either:
1¾ inch (44.5 mm) 20-spline shaft, or
1¾₁₈ inch (35 mm) 21-spline shaft.

Order one kit and one coupler.

<table>
<thead>
<tr>
<th>Kits and Couplers</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>YP24 OTI KIT</td>
<td>401-942A</td>
</tr>
<tr>
<td>For model 3PYPA</td>
<td></td>
</tr>
<tr>
<td>YP24F PTO HYDRAULIC PUMP KIT</td>
<td>401-940A</td>
</tr>
<tr>
<td>For model 3PYPAF</td>
<td></td>
</tr>
<tr>
<td>1 ¾/4-20 PTO COUPLER</td>
<td>826-777C</td>
</tr>
<tr>
<td>1 ¾/8-21 PTO COUPLER</td>
<td>826-778C</td>
</tr>
</tbody>
</table>

Operation and installation of the PTO kits is described in manual 411-015M included with each kit.

82 Bushel Seed Hopper

The 82 bushel (2890 liter) hopper may be purchased with the 3PYPA planter or added later. Only the 82 bu. size is supported on the 3PYPA planter.

<table>
<thead>
<tr>
<th>Description</th>
<th>Order Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>82 bu. Bulk Hopper</td>
<td>403-143K</td>
</tr>
<tr>
<td>Air Release Field Kit</td>
<td>401-508A</td>
</tr>
</tbody>
</table>

The 82 bu. hopper has no prerequisites on the planter, but you will need a means of top-loading seed when the hopper is mounted on the seed box. This hopper is usually too heavy too be safely fork-lifted onto the planter if already pre-loaded with seed.

The 401-508A kit adds an internal venting system to older hoppers, permitting consistent seed flow at higher fan speeds. This kit is not required for 2007 and later 403-143K hoppers.

For operations, see: “Loading Materials” on page 39.

Seed Lubricant

<table>
<thead>
<tr>
<th>Description</th>
<th>Order Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ezee Glide Plus Talc + Graphite Mix</td>
<td>821-069C</td>
</tr>
<tr>
<td>(5 gallon / 18.9 liter container)</td>
<td></td>
</tr>
</tbody>
</table>

For use, see “Seed Lubricants” on page 133.
Clean-Out Container
One container is provided with the planter. Order the following part for additional or replacement containers.

<table>
<thead>
<tr>
<th>Description</th>
<th>Order Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIR METER CLEAN OUT FUNNEL</td>
<td>817-811C</td>
</tr>
</tbody>
</table>

See “Funnel Conversion” on page 103.
See “Meter Clean-Out” on page 103.

Fertilizer Manifold
The planter supports an optional “wet” fertilizer distribution system that relies on a tank/pump/filter system separately provisioned and tractor-mounted. This system is required if the optional Keeton® seed firmers are to be used for fertilizing.

<table>
<thead>
<tr>
<th>Description</th>
<th>Initial Order Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starter Fertilizer Manifold Kit</td>
<td>401-425A</td>
</tr>
</tbody>
</table>

For operations, see:
“Fertilizer Operation (Option)” on page 43, and the Seed Rate manual.

Fertilizer Orifice Plates
The manifold systems include size 28, 34 and 48 plates. To order alternate plates, use the following part numbers. Order one per row unit.

<table>
<thead>
<tr>
<th>Orifice Size</th>
<th>Part Number</th>
<th>Port Diameter</th>
<th>Port Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>832-052C</td>
<td>0.020 in</td>
<td>0.20 mm²</td>
</tr>
<tr>
<td>28*</td>
<td>832-056C</td>
<td>0.028 in</td>
<td>0.40 mm²</td>
</tr>
<tr>
<td>34*</td>
<td>832-053C</td>
<td>0.034 in</td>
<td>0.59 mm²</td>
</tr>
<tr>
<td>48*</td>
<td>832-054C</td>
<td>0.048 in</td>
<td>1.17 mm²</td>
</tr>
<tr>
<td>59</td>
<td>832-057C</td>
<td>0.059 in</td>
<td>1.76 mm²</td>
</tr>
<tr>
<td>80</td>
<td>832-055C</td>
<td>0.080 in</td>
<td>3.24 mm²</td>
</tr>
<tr>
<td>98</td>
<td>832-059C</td>
<td>0.098 in</td>
<td>4.87 mm²</td>
</tr>
</tbody>
</table>

* Sizes standard in many fertilizer bundles.

Check your accessories before ordering.

832-052C 832-056C 832-053C 832-054C 832-057C 832-055C 832-059C
High-Rate Dribblers

Dribblers apply liquid fertilizer slightly to the side of the closed furrow behind the press wheel. Dribblers are available in left and right hand offsets, for use on twin rows. Order one dribbler per row.

<table>
<thead>
<tr>
<th>Option Packages</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fertilizer Dribbler Assembly, RH</td>
<td>204-131A</td>
</tr>
<tr>
<td>Fertilizer Dribbler Assembly, LH</td>
<td>204-132A</td>
</tr>
</tbody>
</table>

Unit-Mounted Row Options

Lock-Up Pins

If rows are shut off, you can reduce unnecessary wear on the unused row units by locking them up. Twin-row planters include, as standard, one lock-pin per rear row. For replacement pins, or for other planter models, order one per row unit locked-up.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>PIN HITCH 1 X 6 W/HAIRPIN</td>
<td>805-033C</td>
</tr>
</tbody>
</table>

See “Row Unit Shut-Off” on page 82.
Row Cleaners

Optional Martin row cleaners are unit-mounted, either:

- “stand-alone”, using a unit-mount assembly (①), or;
- added to a UMC coulter disk mounting bracket (②, with or without a disk).

Twin-Row planters and narrow row spacings support only single-wheel unit-mounted row cleaners, in alternating left/right cleaner hub orientations.

Row cleaners are not recommended for row spacings of 10 inch (25.4 cm) or less.

Coulter-mounted (requires coulter):

<table>
<thead>
<tr>
<th>Description</th>
<th>Order Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single-wheel, 16 pair of left/right</td>
<td>207-107A</td>
</tr>
<tr>
<td>Single-wheel, 12 pair of left/right</td>
<td>207-108A</td>
</tr>
<tr>
<td>Double-wheel, 16 rows</td>
<td>207-113A</td>
</tr>
<tr>
<td>Double-arm, 12 rows</td>
<td>207-126A</td>
</tr>
<tr>
<td>Single-wheel, 12 pair of left/right</td>
<td>207-301A</td>
</tr>
</tbody>
</table>

Stand-alone (includes mount):

<table>
<thead>
<tr>
<th>Description</th>
<th>Order Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single-wheel, 16 pair of left/right</td>
<td>207-111A</td>
</tr>
<tr>
<td>Single-wheel, 12 pair of left/right</td>
<td>207-112A</td>
</tr>
<tr>
<td>Double-wheel, 16 rows</td>
<td>207-117A</td>
</tr>
<tr>
<td>Double-wheel, 12 rows</td>
<td>207-130A</td>
</tr>
<tr>
<td>Single-wheel, 12 pair of left/right</td>
<td>207-302A</td>
</tr>
</tbody>
</table>

For operations, see:
“Unit-Mount Cleaner Adjustments” on page 73.
Unit-Mounted Disk Coulters

Optional unit-mount disk coulters are available with 15 inch fluted blades, 15 inch turbo blades or 14 inch straight blades. If you need complete coulters, with unit mount and blade the selection includes:

<table>
<thead>
<tr>
<th>Description</th>
<th>Order Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>32 mounts w/15 inch fluted blades</td>
<td>204-527A</td>
</tr>
<tr>
<td>24 mounts w/15 inch fluted blades</td>
<td>204-528A</td>
</tr>
<tr>
<td>32 mounts w/15 inch turbo blades</td>
<td>204-529A</td>
</tr>
<tr>
<td>24 mounts w/15 inch turbo blades</td>
<td>204-530A</td>
</tr>
<tr>
<td>32 mounts w/14 inch straight blades</td>
<td>204-531A</td>
</tr>
<tr>
<td>24 mounts w/14 inch straight blades</td>
<td>204-532A</td>
</tr>
<tr>
<td>31 mounts w/15 inch fluted blades</td>
<td>204-533A</td>
</tr>
<tr>
<td>31 mounts w/15 inch turbo blades</td>
<td>204-535A</td>
</tr>
<tr>
<td>16 mounts w/15 inch fluted blades</td>
<td>204-539A</td>
</tr>
<tr>
<td>16 mounts w/15 inch turbo blades</td>
<td>204-541A</td>
</tr>
<tr>
<td>16 mounts w/14 inch straight blades</td>
<td>204-543A</td>
</tr>
<tr>
<td>16 mounts w/15 inch fluted blades</td>
<td>204-551A</td>
</tr>
<tr>
<td>12 mounts w/15 inch fluted blades</td>
<td>204-552A</td>
</tr>
<tr>
<td>16 mounts w/15 inch turbo blades</td>
<td>204-553A</td>
</tr>
<tr>
<td>16 mounts w/15 inch turbo blades</td>
<td>204-554A</td>
</tr>
<tr>
<td>16 mounts w/14 inch straight blades</td>
<td>204-555A</td>
</tr>
<tr>
<td>12 mounts w/14 inch straight blades</td>
<td>204-556A</td>
</tr>
</tbody>
</table>

Coulter Blades

Replacement and alternate coulter blades include (qty. 1 per row unit):

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 inch Turbo Packages</td>
<td></td>
</tr>
<tr>
<td>Fluted, 15 inch (50 flutes)</td>
<td>820-331C</td>
</tr>
<tr>
<td>Turbo, 15 inch (20 flutes)</td>
<td>820-327C</td>
</tr>
<tr>
<td>Straight, 14 in</td>
<td>820-259C</td>
</tr>
</tbody>
</table>

For operations, see: “Coulter Adjustments” on page 74.

Seed Tube Brush

One brush is provided with the planter. Order the following part for additional or replacement brushes.

<table>
<thead>
<tr>
<th>Description</th>
<th>Order Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEED TUBE CLEANER BRUSH</td>
<td>891-259C</td>
</tr>
</tbody>
</table>

See “Seed Tube Clean-Out” on page 105.
## Seed Meter Disks

Air-Pro Meters accept a variety of seed disks, each optimized for specific seeds, plus a special blank disk for row shut-off. Disks are simple to change. Choices include:

<table>
<thead>
<tr>
<th>Meter Disks</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blank, 0 Cell</td>
<td>817-841C</td>
</tr>
<tr>
<td>Canola, 150 Cells</td>
<td>837-148C</td>
</tr>
<tr>
<td>Canola, 250 Cell</td>
<td>817-991C</td>
</tr>
<tr>
<td>Corn, 24 Cell (Large, Flat)</td>
<td>817-836C</td>
</tr>
<tr>
<td>Corn, 24 Cell (Large, Round)</td>
<td>817-794C</td>
</tr>
<tr>
<td>Corn, 24 Cell (Medium)</td>
<td>837-126C</td>
</tr>
<tr>
<td>Corn, 24 Cell (Small, Round, or Flat)</td>
<td>817-795C</td>
</tr>
<tr>
<td>Corn, 40 Cell (Large, Flat)</td>
<td>817-838C</td>
</tr>
<tr>
<td>Corn, 40 Cell (Large, Round)</td>
<td>817-796C</td>
</tr>
<tr>
<td>Corn, 40 Cell (Medium)</td>
<td>837-127C</td>
</tr>
<tr>
<td>Corn, 40 Cell (Small, Round, or Flat)</td>
<td>817-797C</td>
</tr>
<tr>
<td>Cotton, 60 Cell</td>
<td>817-857C</td>
</tr>
<tr>
<td>Cotton, Hill Drop, 12 Cell</td>
<td>837-186C</td>
</tr>
<tr>
<td>Edible Bean, 60 Cell (Medium)</td>
<td>837-065C</td>
</tr>
<tr>
<td>Edible Bean, 56 Cell (Large)</td>
<td>817-967C</td>
</tr>
<tr>
<td>Industrial Hemp, 5 Cell</td>
<td>837-364C</td>
</tr>
<tr>
<td>Industrial Hemp, 30 Cell</td>
<td>837-386C</td>
</tr>
<tr>
<td>Milo, Pelletized Sugar Beet 30 Cell</td>
<td>837-057C</td>
</tr>
<tr>
<td>Milo, 65 Cell</td>
<td>817-849C</td>
</tr>
<tr>
<td>Milo, 130 Cell</td>
<td>817-800C</td>
</tr>
<tr>
<td>Soybeans, 84 Cell</td>
<td>817-798C</td>
</tr>
<tr>
<td>Soybeans, 168 Cell</td>
<td>403-551D</td>
</tr>
<tr>
<td>Sunflower, 60 Cell (Small)</td>
<td>837-234C</td>
</tr>
<tr>
<td>Sunflower, 60 Cell (Medium)</td>
<td>837-235C</td>
</tr>
<tr>
<td>Sunflower, 24 Cell (Large)</td>
<td>817-851C</td>
</tr>
<tr>
<td>Volumetric No. 1, 84 Cell</td>
<td>817-867C</td>
</tr>
</tbody>
</table>

For operations, see:

**“Seed Meter Setup and Adjustment”** on page 79.
Inside Disk Scrapers
When planting in moist or sticky soils, these scrapers are useful in preventing build-up that might otherwise impair opener disc performance.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inside Scraper</td>
<td>122-278S</td>
</tr>
</tbody>
</table>

This scraper cannot be used with Seed-Lok® seed firmers installed. It is compatible with seed flaps and optional Keeton® seed firmers. See page 173 for scraper installation. The spring-loaded carbide scraper requires no adjustment.

Gauge Wheel Scrapers
When planting in moist or sticky soils, these scrapers are useful in preventing build-up that might otherwise result in shallow planting.

Order one part per wheel (2 per opener).

<table>
<thead>
<tr>
<th>Wheel Scrapers</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 3/8 inch (6.4 cm) scraper</td>
<td>404-194D</td>
</tr>
<tr>
<td>3 inch (7.6 cm) scraper</td>
<td>404-195D</td>
</tr>
<tr>
<td>4 inch (10.2 cm) scraper</td>
<td>404-196D</td>
</tr>
</tbody>
</table>

The scrapers mount on the bottom rear of the depth wheel arm, using existing hardware. The slot in the scraper is long enough to clear the lower zerk, and allow adjustment as wheel and scraper wear.

For operations, see: “Adjusting Gauge Wheel Scrapers” on page 78.

Seed Firmers
The base 3PYPA planter requires a choice of row unit bundles which include one of three firmers: seed flap, Keeton®, or Seed-Lok®. Only one type of seed firmer may be installed at the same time. Order one per row.

Seed-Lok® Seed Firmer

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 Series Seed-Lok® kit (per opener)</td>
<td>404-093K</td>
</tr>
</tbody>
</table>

For operations, see: “Seed Firmer Adjustments” on page 85.
Keeton® Seed Firmer

The Keeton® Seed Firmer supports low-rate fertilizer delivery. For this use, an optional liquid fertilizer system (page 135) must also be installed.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keeton® seed firmer (per opener)</td>
<td>890-840C</td>
</tr>
</tbody>
</table>

For operations, see: "Seed Firmer Adjustments" on page 85.

Row Unit Press Wheels

The base Yield Pro planter includes a choice of press wheels. Additional wheels are available, and all may be field-installed.

This manual does not list kit part numbers as the available wheels are often region-specific. Consult your Great Plains dealer.

For operations, see: "Press Wheel Adjustment" on page 86.
### Specifications and Capacities, 1 of 2

<table>
<thead>
<tr>
<th></th>
<th>Model 3PYPA</th>
<th>-1236</th>
<th>-1238</th>
<th>-1240</th>
<th>-1630</th>
<th>-24TR36</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Row Count</strong></td>
<td></td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>16</td>
<td>24 (12 twin)</td>
</tr>
<tr>
<td><strong>Row Spacing</strong></td>
<td></td>
<td>36 in</td>
<td>38 in</td>
<td>40 in</td>
<td>30 in</td>
<td>36 in</td>
</tr>
<tr>
<td><strong>Working Width</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>40 ft 0 in</td>
<td></td>
</tr>
<tr>
<td><strong>Span (width between end rows)</strong></td>
<td></td>
<td>396 in</td>
<td>418 in</td>
<td>440 in</td>
<td>450 in</td>
<td>396 in</td>
</tr>
<tr>
<td><strong>Swath (Channel Width)</strong></td>
<td></td>
<td>432 in</td>
<td>456 in</td>
<td>480 in</td>
<td>480 in</td>
<td>432 in</td>
</tr>
<tr>
<td><strong>Seed Capacity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Optional 82bu hopper or PROBOX® 50 unit bulk seed box</td>
</tr>
<tr>
<td><strong>Transport Width</strong></td>
<td></td>
<td>25 ft 2 in</td>
<td>25 ft 2 in</td>
<td>25 ft 2 in</td>
<td>25 ft 2 in</td>
<td></td>
</tr>
<tr>
<td><strong>Transport Length</strong></td>
<td></td>
<td>16 ft 10 in</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Transport Height</strong></td>
<td></td>
<td>12 ft 2 in</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Transport Clearance</strong></td>
<td></td>
<td>14.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Minimum Tractor HP Requirement</strong></td>
<td>220 - 240 hp</td>
<td>220 - 250 hp</td>
<td>220 - 250 hp</td>
<td>230 - 260 hp</td>
<td>260 - 300 hp</td>
<td></td>
</tr>
<tr>
<td><strong>Hitch</strong></td>
<td></td>
<td>3-Point semi-mounted</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hydraulic Circuits Required</strong></td>
<td></td>
<td>Closed-Center, 5 Remotes (1 Power-Beyond), 2250 psi, 23 gal/min</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Weight (empty, base)</strong></td>
<td></td>
<td>14500 lbs</td>
<td>14500 lbs</td>
<td>14500 lbs</td>
<td>15300 lbs</td>
<td>17000 lbs</td>
</tr>
<tr>
<td><strong>Weight (maximum, full)</strong></td>
<td></td>
<td>22700 lbs</td>
<td>22700 lbs</td>
<td>22700 lbs</td>
<td>23800 lbs</td>
<td>25900 lbs</td>
</tr>
<tr>
<td><strong>Transport Tire Size</strong></td>
<td></td>
<td>16.51-16.1 Fl 14 Ply Implement</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hydraulic Drive Tire</strong></td>
<td></td>
<td>9.5L x 15 6 Ply Rib Implement</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ground Drive Tire</strong></td>
<td></td>
<td>7.60-145 6 Ply Lug</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Opener Down Pressure</strong></td>
<td></td>
<td>235 to 475 lbs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Opener Travel (Up - Down)</strong></td>
<td></td>
<td>10 in</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Opener Depth Range</strong></td>
<td></td>
<td>0 to 3.5 in</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Power requirements vary significantly with conditions and practices.
2. No seed container, markers, coulters or row cleaners
3. Weight can vary by thousands of pounds depending on options installed.
## Specifications and Capacities, 2 of 2

<table>
<thead>
<tr>
<th></th>
<th>Model 3PYPA</th>
<th>-24TR38</th>
<th>-24TR40</th>
<th>-3115</th>
<th>-32TR30</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Row Count</strong></td>
<td></td>
<td>24 (12 twin)</td>
<td>24 (12 twin)</td>
<td>31</td>
<td>32 (16 twin)</td>
</tr>
<tr>
<td><strong>Row Spacing</strong></td>
<td></td>
<td>38 in</td>
<td>40 in</td>
<td>15 in</td>
<td>30 in</td>
</tr>
<tr>
<td><strong>Working Width</strong></td>
<td></td>
<td>40ft 0in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Span</strong> (width between end rows)</td>
<td></td>
<td>418 in</td>
<td>440 in</td>
<td>450 in</td>
<td>458 in</td>
</tr>
<tr>
<td><strong>Swath</strong> (Channel Width)</td>
<td></td>
<td>456 in</td>
<td>480 in</td>
<td>465 in</td>
<td>480 in</td>
</tr>
<tr>
<td><strong>Seed Capacity</strong></td>
<td></td>
<td>Optional 82bu hopper or PROBOX® 50 unit bulk seed box</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Transport Width</strong></td>
<td></td>
<td>25ft 2in</td>
<td>25ft 2in</td>
<td>25ft 2in</td>
<td>24ft 6in</td>
</tr>
<tr>
<td><strong>Working Length</strong></td>
<td></td>
<td>16ft 10in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Transport Length</strong></td>
<td></td>
<td>16ft 10in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Working Height</strong></td>
<td></td>
<td>12ft 4in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Transport Height, no Markers</strong></td>
<td></td>
<td>12ft 6in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Transport Height, with Markers</strong></td>
<td></td>
<td>12ft 8in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Transport Clearance</strong></td>
<td></td>
<td>14.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Minimum Tractor HP Requirement¹</strong></td>
<td>260 - 300 hp</td>
<td>260 - 300 hp</td>
<td>290 - 320 hp</td>
<td>290 - 330 hp</td>
<td></td>
</tr>
<tr>
<td><strong>Hitch</strong></td>
<td></td>
<td>3-Point semi-mounted</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hydraulic Circuits Required</strong></td>
<td>Closed-Center, 5 Remotes (1 Power-Beyond), 2250 psi, 23 gal/min</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Weight (empty, base)²</strong></td>
<td>17000 lbs</td>
<td>17000 lbs</td>
<td>18400 lbs</td>
<td>18700 lbs</td>
<td></td>
</tr>
<tr>
<td><strong>Weight (maximum, full)³</strong></td>
<td>25900 lbs</td>
<td>25900 lbs</td>
<td>27800 lbs</td>
<td>28100 lbs</td>
<td></td>
</tr>
<tr>
<td><strong>Transport Tire Size</strong></td>
<td>16.51-16.1 Fl 14 Ply Implement</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hydraulic Drive Tire</strong></td>
<td>9.5L x 15 6 Ply Rib Implement</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ground Drive Tire</strong></td>
<td>7.60-145 6 Ply Lug</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Opener Down Pressure</strong></td>
<td>235 to 475 lbs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Opener Travel (Up - Down)</strong></td>
<td>10 in</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Opener Depth Range</strong></td>
<td>0 to 3.5 in</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Power requirements vary significantly with conditions and practices.
2. No seed container, markers, coulters or row cleaners
3. Weight can vary by thousands of pounds depending on options installed.

### Tire Inflation Chart

<table>
<thead>
<tr>
<th>Wheel Type</th>
<th>Tire Size</th>
<th>Inflation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport/ Caster</td>
<td>16.51-16.1 Fl 14-Ply Implement</td>
<td>60 psi (414 kPa)</td>
</tr>
<tr>
<td>Ground Drive Gauge Wheel</td>
<td>7.60-145 6-Ply Lug</td>
<td>40 psi (276 kPa)</td>
</tr>
<tr>
<td>Hydraulic Drive Gauge Wheel</td>
<td>9.5L x 15 6-Ply Rib Implement</td>
<td>44 psi (303 kPa)</td>
</tr>
</tbody>
</table>

### Tire Warranty Information

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

- Manufacturer Website
  - Firestone: [www.firestoneag.com](http://www.firestoneag.com)
  - Goodyear: [www.goodyearag.com](http://www.goodyearag.com)
  - Titan: [www.titan-intl.com](http://www.titan-intl.com)
  - Gleason: [www.gleasonwheel.com](http://www.gleasonwheel.com)
## Torque Values Chart

<table>
<thead>
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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.
Hydraulic Diagrams
Lift Hydraulics (Wing Lock)
Lift Hydraulics (Wing Flex)
Lift Hydraulics (Weight Transfer)
Wing Fold Hydraulics (no Markers)
Wing Fold and Marker Hydraulics

TP-71320
Fan and Steering Hydraulics (S/N B1026J-)

[Diagram of Fan and Steering Hydraulics]
Fan and Steering Hydraulics (S/N B1027J through B1108J)
Fan and Steering Hydraulics (S/N B1109J+)
Hydraulic Drive (Option)
Chain Routing
See also “Chain Maintenance” on page 121.

Gauge Wheel (Ground Drive) Chains

Legend:

- **34T**
  - Sprocket or idler Tooth count
- **56P**
  - Chain Pitch count
- **120**
  - Direction of chain in motion

<table>
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<tr>
<th>A</th>
<th>Range Sprockets: 15T, 18T, 19T, 20T, 30T, 38T</th>
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<tr>
<td>B</td>
<td>Transmission Sprockets: 17T, 19T, 2@23T, 24T, 25T, 26T, 27T, 28T</td>
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25061
Transmission (Ground Drive) Chains

Range Sprockets:
15T, 18T, 19T, 20T, 30T, 38T

Transmission Sprockets:
17T, 19T, 2@23T, 24T, 25T, 26T, 27T, 28T

Upper Drive Sprockets:
18T or 36T, captive
Ground Drive Chain

Left side shown

25T

109

25229
Hydraulic Drive Chain (Option)
25AP Final Meter Drive

Legend:
- **34T**: Sprocket or idler Tooth count
- **56P**: Chain Pitch count
- **Direction of chain in motion**

25P: Meter Drive (Front type)
- No idlers on mount.
- Top chain passes over single idler on shank
- Be sure to reconnect idler spring

25P: Meter Drive (Mid type)
- Be sure to reconnect idler spring
- Top chain passes between 2 idlers at mount
- Top chain passes between 2 idlers at shank

25P: Meter Drive (Rear type)
- Be sure to reconnect idler spring
- Top chain passes between 2 idlers at mount
- Top chain passes between 2 idlers at shank
Row Unit Placement

15 inch Single Row Spacing

20 inch Single Row Spacing
30 inch Single Row Spacing

30 inch Twin Row Spacing
36 inch Single Row Spacing

36 inch Twin Row Spacing
3PYPA Table of Contents  
Index  
Appendix A - Reference Information

38 inch Single Row Spacing

38 inch Twin Row Spacing

40 inch Single
Row Spacing

40 inch Twin Row Spacing
Appendix B - Initial and Option Setup

This Appendix covers setup tasks performed only once, or at infrequent intervals. Routine setup tasks are covered in “Preparation and Setup” on page 14. Perform Appendix B tasks first. Some of these items may already have been done by your Great Plains dealer.

Post-Delivery Checklist

1. Make sure the tractor is compatible (see list below).
2. Read and understand “Important Safety Information” on page 1.
3. Check that all working parts are moving freely, bolts are tight, and cotter pins are spread.
4. Check that all zerks are in place and lubricated. See “Lubrication” on page 126.
5. Check that all safety decals and reflectors are correctly located and legible. Replace if damaged. See “Safety Decals” on page 5.
6. Inflate tires to pressure recommended and tighten wheel bolts as specified. See “Tire Inflation Chart” on page 142.

Seed Monitor Console Installation

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

⚠️ CAUTION

Transport and Field Safety Risk:
Mount the modules so that they are easy to monitor during planting, but do not interfere with safe operation of the tractor in the field or on public roads.

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

Refer to the included DICKEY-john® manual for harness connections.
Steering with Control Monitor
(S/N B1127J+)

Steering System Modes of Operation
There are two modes of operation for the steering system on the 3PYP and 3PYPA Planters. Which mode of operation to use is based on whether the tractor is manually steered or has an auto-steer system.

If the tractor is manually steered then the Planter steering system should be set to "Steer While Planting" mode. In this mode the Planter steering system is always active.

Steering System Selection
Tap the '3PYP' soft key to open the 3PYP Steering System screen. In order to enable steering, tap the soft key for 'Master Steering System.' Your machine now has the steering system enabled. In order to use the steering system for planting, tap the soft key for 'Steer While Planting.'

Tap the soft key to disable any of these selections.

Steering Calibration
The hydraulic steering system has calibration modes for caster and tractor wheel sensors. To perform one of these calibrations, first fully connect your planter to the tractor, level the machine, and set it on a reasonably flat surface large enough for simple operation. Then select and proceed to the calibration instructions screen.

Machine calibration requires you make three separate movements with the machine: left, center, and right. After each of these movements, click the 'Press to Save' button followed by 'Next' to proceed to the next calibrations step. Once all three movements are performed and saved, machine calibration is complete.

Hydraulic-powered planter hydraulic steering is standard on the planter planter.
Advanced Setup

Advanced Setup grants access to more factory settings. Many of these should only be changed by a certified Great Plains dealer. However, if you need to alter your settings for either tractor, CANBus, or ISOBus steering, you can make that change in your terminal’s advanced setup page.

To access the advanced setup screen, go to the initial steering calibration screen and tap on ‘Advanced Setup’ . A number pad will prompt you for the level 2 access code. Tap in ‘344787’ and you should see the ‘Advanced Setup’ screen appear. Now you can tap on a box next to the steering you want to select it for use. Tap on the home icon to exit when finished.

**NOTE: Unavailable Steering**

If a steering system is unavailable, its name will have a line struck through it on your screen. Check your onboard CPU if your system appears unavailable.

Diagnostics

Tap on the diagnostics icon to analyze machine sensor feedback and check for any problems your planter may be experiencing.

An unfilled circle indicates the machine’s function is normal. If a circle is filled red , then the sensors have either detected an open (disconnected) circuit or a short circuit has occurred. Check the appropriate area of the machine to assess the problem.

If a circle is filled gray , then the sensors detected an error has occurred but was cleared.
Steering with Control Module
(S/N A1056S through B1126J)

Install Tractor Steering Components

Compatible Tractors

New planters include hydraulic steering, which requires mounting a sensor in the tractor steering gear or if available, using existing tractor sensors. ISO compatible wheel tractors and track tractors with factory installed (not after-market) auto-steer ready components use the electronic steering sensor module and harnessing. Non ISO compatible and those tractors without factory installed auto-steer components require the linear sensor in the steering gear.

Brackets and instructions are included for the tractor brands and models listed at right.

The tractor must otherwise also meet the requirements listed under Specifications and Capacities in Appendix A of this Operator Manual.

If you do not have one of the brands and models listed above, consult your Great Plains dealer.

At time of publication, this planter steering system is not compatible with articulated tractors.

Seed cart steering is hydraulically controlled to match steering of the tractor based on one of the following:

- the extension of a linear displacement sensor at the tractor steering gear
- the value of the steering angle signal on the CANbus,
- the value of the signal as transmitted from the steering sensor.

You will find one of the following three major sub-assemblies installed on your tractor:

1. the electronic steering module connected to the tractor’s implement CAN network
2. the electronic steering module connected directly to the tractor, factory installed steering angle sensor
3. a tractor steering sensor, with brand-model-specific brackets, which detects tractor wheel pointing.

Sensor installation is normally completed by the Great Plains dealer prior to delivery. If it was not, obtain the Pre-Delivery Manual (part number 401-647Q) from the dealer. Only the Pre-Delivery manual includes tractor steering sensor installation instructions.

Refer to Figure 167

Do the following to setup the cab steering switch console which controls operation and calibration of the steering system:

Mount the switch box in any convenient location that allows observation of fault indications, and does not obstruct safe operation of the tractor.

Route the main harness to the hitch, where it mates with the Steering ECU harness.

Connect the steering module or tractor sensor lead to the 3-pin connector.

Connect the power leads to a 12Vdc source (red +, black -).

Steering Setup

Perform a steering calibration, per “Steering Calibration” on page 109.
Hopper Level Sensor Installation

Regardless of hopper/seed box used, the 3PYPA planter includes a factory-installed seed level sensor in the airbox.

If a 403-143K 82bu hopper was ordered with the planter, it includes an 833-235C hopper level sensor which is not factory-installed. This sensor can provide a second, earlier, low seed level alarm.

Use of this sensor is optional, and level placement is at your discretion. To install:

1. Perform the installation before first use of the hopper. The sensor body is mounted inside the hopper. It can be dangerous to enter a hopper if it contains any seed, or has ever been used with treated seed.

2. Refer to Figure 49 on page 42 for placement elevations based on remaining hopper capacity. Great Plains suggests mounting the sensor on the lower front wall of the hopper.

3. Follow the steps in DICKEY-john® instruction sheet 110011126 to install the sensor.

4. Use silicone to seal the cable at the grommet, and around the grommet, to prevent air leaks which can interfere with consistent seed delivery.

After the hopper is mounted on the planter, the leads connect to the “HOPPER 2” harness lead located below the hydraulic drive in the planter center section.

Radar Calibration

At the first opportunity to operate the planter in the field (with or without planting), the radar component of the seed monitor needs to be calibrated. The seed monitor manual describes the procedure.

The planter must be in the lowered/field position for this calibration. The angle of the sensor changes when the planter is raised, and readings during planting will be incorrect if calibrated in the raised configuration.

Due to this angle change, seed monitor speed readings will not match tractor speedometer reading during transport.
Planter Leveling

Center Section Leveling

Refer to Figure 170 (which depicts the planter on pavement - perform this adjustment in the field)

1. Put planter in field position by lowering and pulling forward.

**NOTICE**

Leveling Mis-adjustment Risk:
Planter must be fully lowered to field position and hitch height must be set before making side-to-side adjustments.

2. Measure the elevation of both left and right sides of the planter, near the wing pivot location. If they are not the same, adjust the tractor 3-point arm linkage to equalize, while keeping center height at desired value (nominally 26 inch / 66 cm).

Wing Leveling

Wing leveling check/adjustment is required prior to first use of the planter, and periodically thereafter, such as when using a different tractor, or when the tractor set-up has been modified for use with another implement.

Before performing this operation:

- Planter must be hitched and all connections made.
- See “Hitching Tractor to Planter” on page 15.
- Planter must be unfolded on firm level ground.
- See “Unfolding the Planter” on page 36.
- Planter must be lowered.
- Center section must be leveled.
- See “Frame Height and Leveling” on page 22, and “Center Section Leveling” on page 168.
- Wing Flex Lock pin must be installed. Wing (down) lock pin must be removed and wing flex lock pins must be removed and in storage (Refer to Figure 37 on page 37).

Refer to Figure 171 and Figure 172 (which depict the planter on pavement - perform this adjustment in the field)

1. Measure from the bottom of the wing tool bar to the ground at the outer end of each wing.
2. Compare to the measurement at the outer end of the center tool bar, at the wing pivot location. All measurements should be identical, and nominally 26 in.
3. If measurements do not match, loosen upper wing link arm lock nut (1), and adjust link length.
4. If adjustments are needed on either side, re-check the other side after each adjustment, and readjust it as needed.
5. Once level, tighten the wing link arm lock nut ①.

**Initial Marker Setup (Option)**

### Marker Speed Adjustment

⚠️ **CAUTION**

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

*Refer to Figure 173 and Figure 174*

Adjust folding speed for dual markers with hex adjustment screws on the sequence valve body. The valve sequence body is top left center section, near front. Loosen jam nuts before making adjustments.

There is one adjustment screw for fold-out speed ① and one for fold-down speed ②. You can identify adjustment screws by markings stamped in valve body.

Turn adjustment screws clockwise (S: slower) to decrease folding speed and counterclockwise (F: faster) to increase folding speed.

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

After adjusting the folding speed, tighten jam nuts on hex adjustment screws to hold settings.
Marker Extension
Marker extension needs to be adjusted once for the initial 3PYPA planter setup, and later only if changing row spacing (including locking up row units for single-row operation on a twin-capable planter).

1. If changing between single- and twin-row operation, first re-center the planter at the hitch. See page 15.
2. Move the planter to a location where both markers may be safely unfolded. Unfold the planter. Lower the planter. Tilt up and unfold one marker.

Find the suggested initial marker Extension in the following tables.

Refer to Figure 175 and Figure 176

3. Measure out the Extension distance from each outside end row unit (whether in use or not). Do not measure to center of row pair.
4. Mark the ground at this point.
5. To adjust marker width, loosen nuts on U-bolts. Move marker disk tube in or out to get the proper adjustment. Tighten nuts.
6. Repeat steps 3 and 5 for the other side.
7. With the planter still lowered, drive forward a few feet for each side.
8. Check the mark locations. Adjust to obtain the table value.

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<th>Spacing Used</th>
<th>Marker Extension Left</th>
<th>Marker Extension Right</th>
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<td>36in Single</td>
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<td>3PYPA -1238</td>
<td>38in Single</td>
<td>247.0 in (627.4 cm)</td>
<td></td>
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<td>40in Single</td>
<td>260.0 in (660.4 cm)</td>
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<tr>
<td>3PYPA -1630</td>
<td>30in Single</td>
<td>255.0 in (647.7 cm)</td>
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<tr>
<td>3PYPA -24TR36</td>
<td>36in Twin</td>
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<td>234.0 in (594.4 cm)</td>
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<td>243.0 in (617.2 cm)</td>
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<th>Spacing Used</th>
<th>Marker Extension Left</th>
<th>Marker Extension Right</th>
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<td>3PYPA -32TR30</td>
<td>30in Single</td>
<td>247.0 in (627.4 cm)</td>
<td>255.0 in (647.7 cm)</td>
</tr>
</tbody>
</table>
Hydraulic Down Pressure Calibration
(Option)

If your planter is equipped with the optional hydraulic down pressure system, it needs an initial/seasonal setup.

**NOTICE**

**Equipment Damage Risk:**
If your tractor has Open Center hydraulics, do not engage the down pressure hydraulics. The current hydraulic down pressure option is compatible only with tractors having Closed Center systems.

The hydraulic down pressure kit is integrated with the lift assist system. When the down pressure system cycles, the planter raises and lowers.

**Refer to Figure 177**

There are two adjustable valves in the system:

1. Bypass valve:
   - located near parallel arms
2. Adjustment valve:
   - located near hitch

**PC Closed Down Pressure Calibration**

Tractors with Pressure Compensating Closed Center Hydraulics (PC Closed)

1. Release locking disk ④.
2. Close bypass valve ① for no oil flow by turning knob on valve clockwise completely.
3. Tighten locking disk ④. Always operate the planter with the bypass valve closed.

No further adjustments are made at this time. See “Hydraulic Down Pressure” on page 63 for field operations.
LS Closed/PFC Down Pressure Calibration

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

Refer to Figure 178

1. Release locking disk ①.
2. Close bypass valve ② for no oil flow by turning knob ③ on valve clockwise completely.
3. Tighten locking disk ③.
4. With tractor at half throttle, adjust flow-control valve on tractor so openers raise and lower at a reasonable speed. Keep tractor at one-half throttle for remaining steps.

- Faster opener raise/lower increases potential for oil overheating, wear and tractor damage.
5. Engage tractor hydraulics and lower openers. Lock hydraulic lever on tractor for continuous operation.
6. Release locking disks ④ and ⑤. Adjust pressure-control valve ⑥ knob ⑦ for opener down pressure so gauge ⑧ is at 600 psi.
7. While watching gauge ⑧, slowly turn knob ⑩ on bypass valve ⑨ counterclockwise. Adjust bypass valve ⑨ just until needle on gauge ⑧ begins to move down from 600 psi. Use locking disk ⑩ to lock bypass valve at this setting.

- The higher the bypass pressure, the greater the potential for oil overheating and tractor damage. However, for proper opener operation the bypass valve must be set at least 300 psi above the opener down-pressure setting when the tractor is at one-half throttle. Therefore, you should set the bypass valve as low as possible while staying at least 300 psi above the opener down pressure setting.
8. Adjust pressure-control valve ⑥ to desired opener down pressure per “Hydraulic Down Pressure” on page 63. Tighten locking disks ④ and ⑤.
9. While 600 psi is a good starting point for setting the bypass valve, if you consistently operate the planter with low opener down pressure you can set the bypass valve below 600 psi. If you consistently operate the planter with very high opener down pressure, you may need a bypass-valve setting above 600 psi.

NOTICE

Equipment Damage Risk: Use bypass valve on load-sensing tractors. Failure to use the bypass valve on load-sensing tractors may cause major tractor damage.
Scraper Installation (122-278S)

Optional carbide disc scrapers are not factory installed. Start with row 1 (left-most row unit).

- If a Keeton® seed firmer is also installed, see the Parts Manual for assembly details.
- This scraper is not compatible with Seed-Lok®.

Refer to Figure 179 and Figure 180

1. Remove one or both opener disc blades to gain safe access to the mount 1. Note the position of bushings and spacers for correct re-assembly (page 76).

2. Select one each:
   - 122-902C HHCS 3/8-16X3 GR5
   - 129BXT824 BRACKET FOR 890-929C FIRMER
   - 122-177D 10HD25 INSIDE SCRAPER MNT TUBE
   Insert the bolt 22, from the rear, through the lowest hole of the bracket 21. Place the tube 20 over the bolt.

3. Select one scraper set:
   - 890-928C 25 SER AIR DESIGN IN SCRAPER
   Place the shoulder washer 3 on bolt 22 with the larger diameter to the rear (toward bolt head). Place the left scraper blade 4 on the washer, followed by the right scraper blade 5.

4. Select one each:
   - 802-070C WASHER FLAT 3/8 USS PLT
   - 803-013C WASHER LOCK SPRING 3/8 PLT
   - 803-014C NUT HEX 3/8-16 PLT
   Place the flat washer 23 on the bolt 22, followed by the lock washer 24 and nut 25. Tighten bolt and nut to 3/8-16GR5 torque spec. Make sure blades pivot freely.

5. Select the scraper spring 5. Connect the spring between the blades, using the small top holes.

6. Select two sets:
   - 802-172C HHCS 5/16-18X2 1/2 GR5
   - 803-043C NUT HEX WHIZ 5/16-18 PLT
   Insert the scraper assembly 5 between the middle four lower square holes 7 of the opener frame. Secure with bolts 23 and whiz nuts 25.

7. Re-mount the removed disc blade.

Callout, Part, and Description cross-references are drawn from a Reference Page.
Appendix R - Row-Pro™

Preparation and Setup

Row-Pro™ Setup (Option)

The factory default setting for down-force is likely to differ from that required by your next field conditions.

Before modifying the monitor setting for down-force, determine what actual down force is ideal for the initial use of the planter. One method of determining an initial setting involves operating in the field (without seeding).

1. Set planting depth at T-handles (page 76).
2. Review unit-mount coulter depth relative to opener disc. Adjust as needed (page 74).
3. Start with the row unit down pressure springs in the lowest, or second-lowest notch (page 72).

Adjustment to the spring pressure may need to be made if the depth is reset or the closing wheel down pressure is adjusted.

4. Operate in the field for a short distance.
5. Evaluate the seed trench (page 71).
6. Adjust the springs until depth and closure are ideal. If the ideal setting seems to be in between two notch values, use the higher setting. Rows in wheel tracks may be higher still.

7. Engage the Row-Pro™ system. Set the initial target weight at 80 pounds.
8. Operate in the field. Evaluate furrow and closing. Adjust Row-Pro™ force setting for optimal results.
9. When verifying the final setting, and when planting, watch for Unable to Control alarms, which may indicate that the cams are a notch or more too high or too low.

If the IntelliAg® alarm indicates a value too high, reduce spring pressure. If the IntelliAg® alarm indicates a value too low, increase spring pressure.

The actual target rate is going to be different depending on the field conditions, soil type and other factors. The best way to gauge where you want the setting is to operate the system for a short time then go behind the planter and check the furrow.

---

a. Optionally operate the Row-Pro™ system in Monitor Only mode, and note the forces reported.
Operating Instructions

Refer to Figure 181

Row-Pro™ is a factory installed option for implements with 25-series openers that are equipped with DICKEY-john® IntelliAg®. It helps the spring down force system to maintain a user-determined, ideal weight for the side depth gauge wheels. Once the springs are set, Row-Pro™ pneumatically increases/decreases pressure on the openers.

The row units are already getting their down pressure from the springs on the parallel arms. Row-Pro only acts to vary that pressure as needed to maintain consistency in different soil conditions.

There is one cylinder 1 for each row located between the parallel arms. Based on loading on the side depth wheels, Row-Pro™ adjusts air pressure in the air cylinders.

Refer to Figure 182

There is one valve set per opener section, located in the center of the section. It allows each section to be controlled independently.

For twin row there are two valve sets 2 per section: one for the front openers and one for the rear openers.
Row-Pro™ Components

Refer to Figure 183 and Figure 184

The main systems of Row-Pro™ consist of:

1. **An air compressor system**: one 12VDC air compressor (11) with air tank (12), two extension cables (13), and one fuse assembly (14).

2. **A load sensing system**: DPLCM (Down Pressure Load Cell Module) (15) and the load cells (16).

3. **An adjusting system**: valves (17) and air cylinders (18).

Load Cell, DPLCM and Valves

The DPLCM (15) and valves (17) are mounted together on a plate and are connected to the DICKEY-john® Row-Pro™ wiring harness (19).

Two leads on the Row-Pro™ harness each connect to a load cell (16) which is located in the opener body (see fig.162). Four leads connect to the valve sets. There is one pair (one air intake, one exhaust) for each valve.

- **For single row planters**: There is one load cell and one valve set per each opener section located at mid section.

- **For twin row planters**: There are two load cells and two valve sets per each opener section located on the long and short center row unit of the section.

The Row-Pro™ harness connects to the Planter’s CANbus at connector ends (19).

The load cell provides feedback so the system can maintain the target pressures.

The DPLCM uses the readings from the load cell to regulate the air valves in order to increase or decrease pressure in the air cylinders.
Row-Pro™ Air Compressor System

Row-Pro™ Air Compressor

Refer to Figure 185

The 12VDC compressor requires both an electrical connection and a mounting location. It should be mounted in a location on the tractor or planter where most convenient. Mount where cool clean air can get to it. The battery connection is equipped with one large 60 amp spade fuse (automotive type).

If your tractor has an on-board engine driven compressor capable of 150 psi, it can be used instead of the one supplied with the planter. Hook the on-board compressor to the air tank with lines provided.

The air filter should be placed in the tractor cab where it can pull clean air from the cab. The remote air filter line should be as short as possible.

The air compressor pressurizes the air tank reservoir.

Row-Pro™ Air Tank

Refer to Figure 186

An air tank is provided and mounted on the wing. Open the air tank petcock once daily to drain water accumulation.

The air tank is used in conjunction with the air valves to maintain a set pressure value for the air cylinders.

Air valves are used to increase or decrease the amount of air provided to the air cylinders.

Row-Pro™ Air Tank Lines

Refer to Figure 187

The air tank has two lines. A 3/8 inch line attaches the compressor to the air tank. A 1/4 inch line splits at a T-junction and goes to the valves while the remaining end attaches to the compressor plate where it activates the pressure switches.

If an on-board compressor is used, plug/bypass the pressure switch branch.
Row-Pro™ Air Pressure Gauge

Refer to Figure 188

Row-Pro™ is designed to run at 150 psi. When the psi drops to 135 the compressor engages and builds back up to 150 psi. Duty cycle varies based on air usage.

Check for Air Leaks

Before going to the field check for air leaks.

1. Turn the compressor on to pressure up the primary system until it automatically shuts off. If the system loses pressure, check for leaks.

2. Use the Leak Test mode to cycle through the sections and check for leaks.
Row-Pro™ Adjustments

Refer to Figure 189

Load Cell Reading

These readings are displayed and adjusted from the IntelliAg® seed monitor console.

Control Mode: Auto is the normal running mode. Manual is used to control the valves only when the operator touches the increase or decrease icon on the work screen.

Monitor Only: This screen disables control, but still reports sensor feedback. From there, press the Down Pressure Diagnostic key and then press the Float Mode ON button to release all of the air from the system. Next, press the Float Mode OFF button. Stay on the Diagnostic screen and make a planting pass. Note the pressure displayed on the Diagnostic screen and then evaluate the seed trench. If the seed trench results are acceptable, use the displayed pressure as your target rate.

Front-Rear Linked: “Enabled” links the front and rear row units so that the same amount of pressure increase/decrease set at the screen is applied to front/rear row units. When “Disabled” the front/rear row units are not linked. Two sets of buttons appear on the screen that allow for adjustments of front and rear rates independently.

Target Rate: This is the desired down pressure on the side depth wheels. The target rate to be entered is the set rate (pounds) of the down force to determine how much pressure is applied. The system monitors and adjusts pressure to meet the defined rate set at this screen.

Pressure displayed on screen and target pressure both refer to the amount of weight carried by the side depth gauge wheels, and not overall row unit down pressure.

Inc/Dec: Sets the amount that the Target Rate is changed with each key press during planting operations.
**Sensitivity Adjust**: Determines how responsive the Controller is to input from the DPLCM. The range is from -10 to +10. Zero (0) is the average setting. Going below 0 decreases the reaction time. Going above 0 increases the reaction time.

**Disable Down Pressure Modules**: Modules interfacing with feedback sensors can be independently disabled so that down pressure to rear and/or front row units are not monitored or controlled. Modules that have been disabled are ignored by the system and will not report down pressure data or react to soil conditions.

(The IntelliAg® screen shows both row modules enabled . An unchecked box indicates disabled.)

If a section fails, that individual section can be turned on and off to locate the problem.

---

**Refer to Figure 192**

**Reset Offset Value**: Resetting Offset Values clears previous down pressure readings and resets values to zero.

1. At Main WORK SCRN press NEXT PAGE button.
2. Press MODULE CFG button.
3. At Module Configuration screen, press DPRESS SET.
4. At the Down Pressure Setting screen press OK to clear values.

**IMPORTANT**: The implement must be lifted and the implement lift switch in the up state before the OK button appears and values can be cleared.

Make sure side depth wheels are all in the lowered position so there is no tension on the load cell. Values other than OFF or 1-6 mV may indicate stuck side depth wheels. If the reading is 0 mV, there may be a problem with load cell grounding. See “Row-Pro™ Troubleshooting”, page 178.

**Initial Setup**: Zero out the load cell reading.
## Row-Pro™ Troubleshooting

<table>
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<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
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<td>Compressor won’t turn on</td>
<td>Switch turned “off”.</td>
<td>Turn switch “on”.</td>
</tr>
<tr>
<td></td>
<td>Poor electrical connection.</td>
<td>Clean connections and reassemble.</td>
</tr>
<tr>
<td></td>
<td>Fuse blown.</td>
<td>Replace fuse (60A).</td>
</tr>
<tr>
<td>Compressor won’t turn off (runs continuously)</td>
<td>Section opener valves are installed in reverse.</td>
<td>Install opener valves correctly.</td>
</tr>
<tr>
<td></td>
<td>Stuck pressure switch(es).</td>
<td>Replace pressure switch(es).</td>
</tr>
<tr>
<td>Compressor cycles more than normal</td>
<td>Water build-up in air tank.</td>
<td>Drain tank to keep reserve volume at proper size.</td>
</tr>
<tr>
<td>Erratic down pressure reading</td>
<td>Poor electrical connection to load cell.</td>
<td>Clean connection and reassemble.</td>
</tr>
<tr>
<td></td>
<td>Load cell malfunction.</td>
<td>Replace load cell.</td>
</tr>
<tr>
<td>Persistent “high” alarm</td>
<td>Row unit spring tension too high.</td>
<td>Lower spring tension.</td>
</tr>
<tr>
<td></td>
<td>Air leak preventing cylinders from holding pressure.</td>
<td>Fix leak.</td>
</tr>
<tr>
<td>Persistent “low” alarm</td>
<td>Row unit spring tension too low.</td>
<td>Raise spring tension.</td>
</tr>
<tr>
<td></td>
<td>Air leak preventing cylinders from holding pressure.</td>
<td>Fix leak.</td>
</tr>
<tr>
<td>System won’t hold air pressure</td>
<td>Pinched/torn hose.</td>
<td>Replace hose.</td>
</tr>
<tr>
<td></td>
<td>Hose not pushed into quick connect fitting far enough.</td>
<td>Push hose in until fully seated.</td>
</tr>
<tr>
<td>Voltage reads “0” on monitor, or is unaffected by load on load cell</td>
<td>Signal wire grounded to frame.</td>
<td>Inspect for pinched or broken wiring harness between the load cell and DPLCM. Replace damaged wiring.</td>
</tr>
</tbody>
</table>

## PROBOX® Maintenance

Check the tractor cab air filter as per manufacturer recommendation.
Yield-Pro® Planter Warranty

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

A Second year limited warranty covers units utilizing Yield-Pro (YP) planter frames with 25 series row units and singulating type meters. The second year limited warranty covers parts only (personal usage only excluding and wear items) on the following: hitch main frame, gauge wheels, and markers, air box/manifold, Y-splitter tubes, and fan and housing, row unit weldments, unit mounted attachments, and frame mounted attachments.

This Warranty is limited to the replacement of any defective part by Great Plains and the installation by the dealer of any such replacement part. Great Plains reserves the right to inspect any equipment or part which are claimed to have been defective in material or workmanship.

The following items and/or conditions are not covered under warranty: failures resulting from abuse or misuse of the equipment, failures occurring as a result of accidental damage or acts of God, failures resulting from alterations or modifications, failures caused by lack of normal maintenance as outlined in the operator’s manual, repairs made by non-authorized personnel, items replaced or repaired due to normal wear (such as wear items and ground engaging components), repeat repair due to improper diagnosis or repair by the dealer, temporary repairs, service calls and/or mileage to and from customer location, overtime premium, or unit hauling expenses. The warranty may be voided if the unit is towed at speeds in excess of 20 miles per hour (32 kilometers per hour), or is used in soils with rocks, stumps, or other obstructions.

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

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

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