Pre-Delivery

3PYPA
3-Point 40-Foot Yield-Pro® Planter
with Air-Pro® Seed Meters

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 show similar 3PYP models and their options.
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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.

Use Adequate Lifting Means

The main section of this planter is extremely heavy. If using multiple lifters, make sure each is rated for at least its share of the load.

Unless using a crane, do not lift and move the planter. Lift it off the delivery truck, pull the truck away, and lower the planter to the ground.

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” in the Operator manual.
▲ 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 assembling or 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.

Tire Safety
Tire changing can be dangerous and should be performed by trained personnel using correct tools and equipment.
▲ When inflating tires, use a clip-on chuck and extension hose long enough for you to stand to one side—not in front of or over tire assembly. Use a safety cage if available.
▲ When removing and installing wheels, use wheel-handling equipment adequate for weight involved.
Practice Safe Maintenance

▲ Understand procedure before doing work. Use proper tools and equipment. Refer to this manual 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.

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), 13 mph (22 km/h) in turns. Some rough terrains require a slower speed. Sudden braking can cause a towed load to swerve and upset.
▲ Do not exceed 20 mph. Never travel at a speed which does not allow adequate control of steering and stopping. Reduce speed if towed load is not equipped with brakes.
▲ Comply with state and local laws.
▲ Do not tow an implement that, when fully loaded, weighs more than 1.5 times the weight of towing vehicle.
▲ Carry reflectors or flags to mark planter in case of breakdown on the road.
▲ Keep clear of overhead power lines and other obstructions when transporting. Refer to transport dimensions in Appendix, starting on page 64.
▲ 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.

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.
Introduction

The 3-Point 40-Foot Yield-Pro® Planter (3PYPA) has been designed with care and built by skilled workers using quality materials. Proper setup, maintenance, and safe operating practices will help the customer get years of satisfactory use from the machine.

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Description of Unit

The 3PYPA planter is a semi-mounted implement for use in conventional till, minimum-till, or light no-till conditions. The 3PYPA accepts optional unit mounted coulters. The unit mounted coulters 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.

Compatible Tractors

3PYPA planters include hydraulic steering, which requires mounting a sensor in the tractor steering gear. Brackets and instructions are included for the following tractor brands and models.

**Case IH®**
- MX or Magnum™ Series
- 225 through 385

**John Deere®**
- 8000 and 8000R Series with rigid front suspension
- 8000 Series ILS (Independent Live Suspension)
- 8000RT Series tracked

The tractor must otherwise also meet the requirements listed under Specifications and Capacities in Appendix A of the Operator Manual (401-647M).

If the customer does not have one of the brands and models listed above, contact the factory.

At time of publication, this 3PYPA steering system was not compatible with articulated tractors.
Using This Manual
This manual will familiarize you with planning, unloading, assembly, and some calibration of the planter. Most operating information is contained in the Operator manual (401-647M). It is essential that the Operator manual be available during assembly and checkout.

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.

Note: Useful information related to the preceding topic.

What’s On The Truck
Refer to Figure 2
The 3PYPA planter is delivered from the factory on a flatbed semi-trailer. It needs to be unloaded from the truck at the spot where final assembly takes place.

It is expected that final delivery to the customer will be done using the planter’s own transport wheels, after final assembly.

Figure 2
Planter Arriving on Truck
Shipment Inventory

The planter is shipped as the following 5 subassemblies or kits:

Refer to Figure 3
1. **Main frame** consisting of:
   - the complete tool bar with all the row units,
   - press wheels (two center units strapped on top),
   - air delivery system,
   - markers (if ordered),
   - parallel arms, and
   - gauge wheels (except on planters with 15 inch row spacing).

Refer to Figure 4 (which depicts an optional seed hopper on the seed structure)
2. **Rear Seed support structure** consisting of
   - the frame, with
   - hydraulic steering components,
   - air distribution box,
   - caster mounts,
   - walkboard, and;
   - 82 bushel hopper (if ordered).

Note: The optional hopper is mounted on the frame at 90 degrees from its operating orientation.

Refer to Figure 5
3. **Right and left caster assemblies** including the
   - wheel hub and spindle assemblies. See "Caster Arms" on page 23.
4. **Rear lift assist wheels and tires** (not shown).
5. A crate containing the hardware to final assemble the planter, seed monitor console, tractor-side steering equipment, and seed disks (if ordered).

Assembly and Setup Assistance
To order additional copies of pre-delivery instructions or operator's and parts manuals, write to the following address. Include model numbers in all correspondence. If you do not understand any part of this manual or have other assembly or setup questions, assistance is available. Contact:

Product Support
Great Plains Mfg. Inc., Service Department
PO Box 5060
Salina, KS 67402-5060

gp_web_cs@greatplainsmfg.com
785-823-3276
Plan The Mainframe Unload

Unloading the main frame can be a safe, smooth operation if it is properly planned in advance.

▲ Scope the lift equipment and team size required.
▲ Review the steps with all lift team members.
▲ For multiple lifters, gather lifters and practice simultaneous lift. Learn control operations for equal lift rates.
▲ Designate an observer to be lift leader.
▲ Have an agreed signalling or command for simultaneous halting of the lift if any team member detects a problem.
▲ Move the trailer, not the planter.

Use a Hoist or One to Four Lifters

Use lifter(s) with a combined capacity greater than the weight of the planter main frame.

Do not use more than 4 lifters. There are no safe rear lift points for more than one lifter.

When using N (2 to 4) lifters, do not assume that each is getting $\frac{1}{N}$th of the load. Plan excess capacity. Monitor load indicators and overload indications or alarms.

Location Requirements

Until assembled, the planter mainframe is impractical to move. It needs to be unloaded directly above the spot where final assembly takes place.

This location needs to be:

• firm level ground or pavement - the parking stand loads can approach 100 psi
• there must be adequate space to pull the trailer out from under the lifted mainframe, without turns,
• there must be adequate open space behind the mainframe to attach the seed substructure,
• there must be adequate space all around to easily maneuver fork lifts on both sides, and later behind the seed frame, and
• there must be adequate space in front of the planter to attach a tractor and move forward for delivery.

Mark the parking location with traffic cones or pavement markers.

Note: Unless it is certain that the assembled planter will only be moved with the tractor on which the steering sensor is installed, allow ample room in front of the planter, so that non-sensor tractors need only make forward moves.
Wings: No Lift - No Hoist

Refer to Figure 8

DANGER

Lift Failure Hazard:
Do no lifting on the wings beyond the lock-down pins. There is significant risk of hinge failure and lift collapse, with possible serious injury or death, and major damage to both planter and lift equipment.

The folding/stacking wings of the 3PYPA planter must not be used for lifting. Although they are shipped in the pinned-down configuration, the hinge/arm system is designed only to carry the weight of the wings, and not the center section.

Lift only by the center section.

Hoist Lifting

Three Hoist Points

Refer to Figure 9

Attach two hoist lines to the center section tool bar 1, outboard of the forward parking stands 2, but inboard of the wing joints 3.

Attach the third hoist line to the center of the rear box frame 4 and secure that line against side-slip.
**Four Hoist Points**

*Refer to Figure 10*

Attach two hoist lines to the center section tool bar ⑤, outboard of the forward parking stands ⑥, but inboard of the wing joints ⑦.

Attach two hoist lines to the rear corners of the rear box frame ⑧.

---

**Fork Lifting**

**Single-Lift Points**

*Refer to Figure 11 and Figure 12*

If a fork lift is available rated for 14,000 pounds or higher, the planter may be lifted from the front using 4 chains or straps.

Note: The center of gravity is generally within 12 inches ahead or behind the row unit springs.

If using 4 hoist lines, attach two lines to the rear corners of the rear box frame ①. If using 3 lines, attach one to the center of the rear tool bar, and secure it so that it cannot slide side-to-side.

If using 4 lines, you may attach the front lines to the lower two points of the 3-point hitch ②.

If using 3 lines, attach the front lines to the front tool bar ③ outboard of the hitch, but inboard of the wing joints ⑦.

---

**DANGER**

*Unstable Load Hazard:*

*Do not attach to the hitch using 3 lines.*
**CAUTION**

*Tipping Hazard:*
Do not attempt single-lift from planter rear. The center of gravity is too far forward for safety.

---

**Two Lift Points**

*Refer to Figure 13 and Figure 14*

Using two lifters, position the lifter with the lowest capacity at center frame rear, and lift via center frame side tubes, as for single-lift.

Position the lifter with the highest capacity at the hitch, and lift via the cross-tube of the hitch.

Note: The observer/lift leader needs to pay close attention to planter front-to-back level, and signal each lift operator how to compensate if imbalance is detected.
Three Lift Points

Refer to Figure 13, Figure 15 and Figure 16
Using three lifters, position one (with the highest capacity) at center frame rear, and lift via center frame side tubes, as for single-lift (ref).

Position the other two lifters near, but not beyond, the center-to-wing connection. Make sure both forks are inboard, and lifting only the center section.

NOTICE

Unbalanced Load Risk:
Two observers are needed, one for front-back level, and the other for side-to-side.

The observers need to pay close attention to planter level, and signal each lift operator how to compensate if imbalance is detected.
Four Lift Points

Refer to Figure 13, Figure 15, Figure 16 and Figure 18

Using four lifters, position one (with the highest capacity) at center frame rear, and lift via center frame side tubes, as for single-lift.

Position one lifter at the hitch, and lift via the cross-tube of the hitch, as for 2-lift.

Position the other two lifters near, but not beyond, the center-to-wing connection, as for 3-lift. Make sure both forks are inboard, and lifting only the center section.

**NOTICE**

**Unbalanced Load Risk:**

Two observers are needed, one for front-back level, and the other for side-to-side.

The observers need to pay close attention to planter level, and signal each lift operator how to compensate if imbalance is detected.
Unloading

Have the driver spot the truck as marked during
See “Plan The Mainframe Unload” on page 9.

Unload Smaller Items First

Unloading the mainframe is a potentially dangerous operation.
Reduce risk and complication by first unloading
1. the caster components,
2. the miscellaneous crate and
3. the seed frame
   (described below)
Place these components well out of the maneuvering area needed for unloading the mainframe.

Unload the Seed Frame

Although relatively light compared to the main frame, the seed frame is tall and an awkward shape for fork-lifting.
It is easiest to approach it from what will later be the front. If you fork-lift from its back (not recommended), first swing open and secure the walkboard.
Refer to Figure 20 (which depicts an earlier revision frame)
If the planter was delivered with a hopper, lift via the side fork lift holes on the diagonal braces.
If the planter did not include a hopper, use chains, and be sure to check load balance.
4. Remove the seed structure from the trailer.
Unload The Mainframe

Refer to Figure 21 and Figure 22 (which depict a three fork lift)

5. Double-check that all chains and tie-down straps have been released and stowed.
6. Make sure that all team members are fully briefed and ready.
7. Set parking brake on trailer tractor.
8. Attach crane hoist lines at planned points or move fork lifts into planned positions.

**NOTICE**

Lifter-Trailer Contact Risk:
Do not move lifters or crane so far in that trailer wheels will not be able to clear them when pulling trailer out from under planter.

**NOTICE**

Load “Wedging” Risk:
If using multiple lifters, do not drive the lifts fully forward into the planter, unless the lifts are known to have precisely vertical motion. If the load moves forward while lowering, the planter will tend to push the lifters backward.

Refer to Figure 22 (which depicts a threefork lift)
9. Slowly lift the planter off the trailer bed.
10. Stop lifting about 12in above the bed.
Refer to Figure 23 (which depicts a three fork lift)
11. Have the truck driver slowly pull the trailer straight out from under the planter.

Refer to Figure 24 (which depicts a three fork lift)
12. Making sure to keep level from front to back and side to side, slowly lower the planter.
13. If the planter has the gauge wheels swung back under for shipment, stop lowering about 18 inches above the ground.

If the planter does not have the gauge wheels mounted, skip to step 20.
Refer to Figure 25
14. Swing the gauge wheels most of the way out in front of the planter.

Refer to Figure 26
15. Remove and save one set (not all shown):
   - 803-006C NUT HEX 1/4-20 PLT
   - 804-006C WASHER LOCK SPRING 1/4 PLT
   - 802-167C HHCS 1/4-20X1 1/2 GR5
   and remove the pin:
   - 402-209H PIN 1 X 4 5/8 NONROTATE

16. Orient the cross-tube of the adjustment rod weldment ➊ so that the grease zerk is facing forward.

17. Continue swinging wheel forward until cross-tube aligns with pin hole.

18. Re-insert pin. Secure with saved bolt ➋, washer ➌ and nut ➍.

19. Repeat this for the other gauge wheel assembly.
Refer to Figure 27

20. Making sure to keep level from front to back and side to side, slowly complete lowering the planter to the ground.

21. Uncouple hoist lines, or lower forks and withdraw lifters.
Planter Assembly

Press Wheel Shipping

Refer to Figure 28
Depending on machine configuration, two or more press wheel assemblies may have been shipped dismounted. If only two were dismounted, they will have been shipped bolted to the rear corners of the main frame. If none or all were dismounted, skip to step 24.

22. Remove the bolt, nut, and any washers that secure the press wheel assemblies to the main frame. These fasteners are not reused.

23. Set the press wheel assemblies aside. They are installed at step 102. Leaving them off now eases access to this part of the planter.

Shipping Stands

As delivered from the factory, the planter includes:

• 2 parking stands intended to remain on the planter (front tool bar just inboard of wing joints)

Refer to Figure 29 (which depicts an earlier 3PYP parallel arm configuration - the shipping stand has not changed)

• 1 main frame shipping stand that is removed after assembly, but needs to remain with the customer, as it eases changing caster tires
• 4 seed frame shipping stands that are not needed after final assembly.

• Do not remove any of these stands until instructed.

During assembly, let the planter main frame rest on the two parking stands on front of the tool bar and the shipping stand under the rear tube of the frame. Do not let any of the supports sink into the ground.
Prepare Parallel Arms

The seed frame is attached to the main frame’s parallel arms, after releasing the arms from their shipping configuration.

Refer to Figure 30

24. Remove and save the 32 sets of:
   - 47 803-021C NUT HEX 5/8-11 PLT
   - 58 804-022C WASHER LOCK SPRING 5/8 PLT
   - 36 802-057C HHCS 5/8-11X2 1/4 GR5

25. Remove and save the extra pin and cotter pin 3 stored near the spare shear bolts.

Refer to Figure 32

The parallel arms are shipped mounted to the rear of the main frame and each is held in the vertical down position by a 1 1/4 inch diameter pin 4.

26. Remove both arm locking pins 4. These pins are not re-used.

27. Remove and save the cotter pins, washers and cross-pins 5 in the free ends of the lift-assist cylinder clevises.

Refer to Figure 32 (which depicts elevating with a strap and forklift, and depicts the clevis attached [step 31])

28. Using a hoist, elevate each parallel arm until roughly horizontal. Parallel arms can be supported by re-inserting pins 4 from step 27.
Refer to Figure 33
29. Insert the pin saved at step 25 into the lower lug hole ⑥.

Refer to Figure 34
30. Use the hoist to adjust the height of the parallel arms until the lift-assist cylinder rod clevis can be aligned with forward hole of the lug.
31. Secure with pin & hardware removed and saved at step 27.
32. Carefully lower the hoist. The lift-assist cylinders may or may not fully extend, depending on how much air is in the hoses and cylinders.

Mount Seed Box Frame

Refer to Figure 35
Note: If no hopper is included, leave walkboard closed, and lift structure using 3 adequately sized chains so it lifts evenly side-to-side and front-to-back.
33. Open the walkboard by removing the pin ④, swinging it open to the right. Secure with keeper.
34. Lift the seed support structure from the rear using the fork holes ⑤ in the hopper support.

Refer to Figure 36
Have the Grade 5 bolts ⑦, washers ⑧ and nuts ⑨ saved in step 24 at hand.
35. Position the flanges ⑩ on the front of the structure to mate up with the corresponding flanges on the rear of one of the two parallel arms. Secure with 16 bolts, washers and nuts.
36. Use the lift or hoist to align the flanges on the other side. Secure with 16 bolts, washers and nuts.
Seed Cart Self-Lift

If only one hoist or fork lift is available (the one presently supporting the seed cart structure), it will be needed for hoisting casters. The lift-assist cylinders are capable of supporting the entire weight of the seed structure if the mainframe is hitched to a 3-point tractor, and the lift hoses (blue) are connected to a tractor remote.

If you need to free the hoist/lift:

37. Lower the seed structure onto its shipping stands.
38. Hitch a 3-point tractor and connect the lift-assist circuit.
39. Raise the seed structure until the parallel arms are slightly above level at the rear.
40. Put blocks or jack stands under the rear shipping strands of the seed structure.

Remove Cart Shipping Stands

41. Remove the four shipping stands from the seed structure. These are not re-used.

Install Casters

Determine how to lift move and align the caster arms with the available lifting equipment.

Note: Recommend securing caster arm by clamping to fork of lift.

Caster Arms

*Refer to Figure 37*

42. The left and right caster arms are identical.
Install Left and Right Caster Arms

Refer to Figure 38 and Figure 39

43. Carefully secure one caster arm to a lift or hoist capable of holding the arm with the pivot hole vertical, and remaining clear of the seed structure while positioning the arm.

44. At the cart, remove and save one set of:
   - 803-026C NUT LOCK 3/4-10 PLT (not shown)
   - 802-360C HHCS 3/4-10X6 1/2 GR5
   - 804-102C PIVOT THRUST WASHER
   Coat the spindle with anti-seize compound.

45. Align the arm under the spindle. Place the thrust washer 61 on the spindle before the spindle contacts the arm.

46. Fully raise the arm on the spindle. If the spindle rises, tap it down with a rubber mallet.

47. Align the holes in the arm and the spindle, and secure the arm to the spindle with the cross-bolt 40 and nut 48.

48. Repeat steps to install other caster arm.

Install Caster Wheels

Refer to Figure 40 (tie rods not installed)

49. Remove and save the lug nuts (not shown)
   - 803-219C NUT LUG 5/8-18 X 90 DEG PLT from the right caster hub.

50. Roll one of the wheel assemblies (they are identical) up to the caster arm. Orient the side with the valve stem away from the hub (toward seed structure center).

51. Adjust the elevation of the seed structure so that the wheel just fits over the threaded studs on the hub. This eases the assembly.

52. Seat the wheel on the hub and secure with saved lug nuts 51.

53. Rotate caster until the 1 1/4 inch diameter alignment pin holes in the caster top plate and the steering arm align. Install the alignment from the bottom and lock in place with 1/2 inch bolt and nut supplied.
Adjust Steering Tie Rod

*Refer to Figure 41*

54. Adjust tie rod to these objectives:

- The rod is installed at the factory but tire alignment needs to be checked and adjusted once final field assembly is complete.

- Pivot both casters until the tires are close to full trailing (straight running) orientation. All measurements must be made with the tires in a position to have the planter traveling straight forward.

- Measure the distance \( D \) from the center of one tire to the center of the other tire both in front of the tires as well as behind the tires.

- The measurements are to be equal. If the measurement across the front of the tires is less than the measurement across the back of the tires then the tie rod needs to be lengthened. If the measurement across the front is more than the measurement across the back then the tie rod needs to be shortened.

- Make the appropriate adjustment then re-center the tires and take another set of dimensions.

- Repeat as necessary until the dimensions are equal.

- Do NOT have any toe in or toe out.

- Tighten the lock nuts on the ends of the tie rod. (Right side has right-hand thread and left side has left-hand thread.)
Lower Seed Box Structure
55. Check tire pressure. See “Tire Inflation Chart” on page 65.
56. Depending on how the structure is being supported, use the lift-assist cylinders, hoist or lift to lower the seed box structure onto the tires.

Remove Hopper (Option)
If no seed hopper was included, skip to step 60.

Refer to Figure 42
57. Remove the bolts holding the hopper shipping bracket ①. The bracket and bolts are not reused.

Refer to Figure 43
58. Remove the U-bolt and bar ② restraining the hopper on the opposite side. The bar and fasteners are not reused.
59. Use a fork lift to remove the hopper and set it out of the way temporarily.

Note: For shipping, the hopper was installed sideways on the seed support structure. It must be removed and correctly remounted before use. Remount is done at step 110.
Connect Steering Hoses

Note: Hose and harness installation consumes cable ties provided in the parts crate. Use the shortest tie length at each point.

60. Locate the two steering hoses coiled up at the rear left end of the center frame. Cut the tie holding the coil.

Refer to Figure 44 and Figure 45

61. Route the hoses:
under the upper cross tube at the mainframe parallel arm pivot weldment,
over the upper forward arm pivot tube,
along the inside of the lower left parallel arm,
over the lower rear arm pivot tube,
beneath the steering tie rods,
down to the rod end of the left steering cylinder.

62. To help in the connecting of the steering hoses, the two hoses have different size connector fittings. Connect each hose to its mating fitting attached to the seed carrier structure just to the inside of the left parallel arm bracket (see photo).

63. Check that all steering hose and fitting connections are tight.

64. Secure the hoses with ties.

Route Steering Sensor Lead

Refer to Figure 46

65. Identify the seed cart steering sensor lead (14). It is a 4-pin circular connector that is part of the harness Find:

14 315-032 HARNESS IMPLEMENT F/FWD STEER
Route this lead along the ST1 and ST2 hoses.

66. Connect the steering sensor lead (14) to the left end of the left steering cylinder (1)
Route Lighting/Seed Box Leads

Refer to Figure 47
67. Uncoil the lighting and seed box sensor harnesses. Route them along the steering hoses, and under the main cart cross tube.

Note: There are two cable clamps attached to the inside of the cart side frames, near the main cross tube, shown as gray “J” shapes in Figure 47.

68. Using a cable tie, loosely secure the harness bundle to the left cable clamp.

69. Identify the Right light harness. Route it along the back side of the main cross tube, to the right side cable clamp. Using a cable tie, loosely secure the harness at that side.

Refer to Figure 48
70. At each tail light assembly, route the lead through the nearby hole in the cart side frame.

71. Route the Right light harness along the inside of the right side frame and connect it to the right tail light lead.

72. Route the Left light harness along the inside of the left side frame and connect it to the left tail light lead.

73. Route the seed box sensor harness along the left light harness, and then to the seed box sensor lead. Use a cable tie to secure the sensor harness to the light harness. Plug sensor harness and cable together.

74. Check that steering hoses, and all cables have adequate slack for parallel arm movement (at both ends or arms). Tighten the other cable ties.

Adjust Air Box Pads

Refer to Figure 49
If the planter was delivered without a hopper, verify pad positions.

If the planter was ordered with a seed hopper, two corner pads will have been lowered to allow transport mounting of the hopper.

75. Loosen two bolts on each corner pad bracket.

76. Raise the pads until their top surfaces are 1 inch higher than the perimeter pad.

77. Tighten the bolts.
Connect Seed Hose Rack

Refer to Figure 51
For shipping, the seed tube hoses and rack (15 or 16) that interconnect the air box and mainframe are strapped to the walkboard. The seed tubes/rack need to be dismounted and connected between the air box manifold and the inner ends of the wing tubes.

Refer to Figure 50
78. Dismount the rack assembly from walkboard. It may have a tag with the part number of the tube rack:
   15 401-367K SEED TUBE RACK ASSY REAR 16
   16 401-368K SEED TUBE RACK ASSY REAR 12

79. Identify rack orientation:

   Ends: The hose lengths and mounting hardware are different for each end of the rack. The end with the longer hoses connects to the wing tubes. The end with the shorter hoses connects to the air box. The air box end also has pivot holes 1 in the frame.

   Bottom: At the front (wing) end of the rack, the bottom side frame has a short rail 2 on each side.

Refer to Figure 51
80. Note the idler spools 3 on each side of the inner rear portion of the parallel arm brackets. The forward end of the rack rests on these and is free to slide during vertical movement of planter components.

Refer to Figure 52
The rear ends of the outside tubes of the seed tube rack have large holes 1 to accept a pivot sleeve for mounting.
Refer to Figure 53 and Figure 54

The hardware for this mount is normally pre-installed on the rear parallel arm flange weldments, but may be in the miscellaneous crate.

81. Select or remove two sets of:
   - 803-020C NUT HEX 1/2-13 PLT
   - 804-015C WASHER LOCK SPRING 1/2 PLT
   - 120-306D TUBE RND 1 OD X 7/32W X 2.13
   - 802-042C HHCS 1/2-13X3 3/4 GR5
   and two (four total):
   - 804-113C WASHER FLAT 1/2 USS HARD PLT

Place the lock washer on the bolt.

82. Place a flat washer, than a spacer tube, on each bolt.

83. From the inside of the rack, pass each bolt assembly through the hole at the lower/rear pivot end of the rack. Add another flat washer.

84. Align the rack holes with the weldment holes. Pass the bolt thread through the weldment holes. Secure each bolt with a lock washer and nut.

The next activities (connecting seed hoses to the air box manifold and wing tubes) require the port mapping tables on the following two pages. Installation steps resume on page 33.
Seed Hose Routing

Port Identification: “12 Port”

![Diagram of Seed Hose Routing]

Port Assignments: 12, 23 and 24-Row

3PYP-1236: 12-Row, 36in
3PYP-1238: 12-Row, 38in
3PYP-1240: 12-Row, 40in

<table>
<thead>
<tr>
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<th>Left Wing</th>
<th>Center Section</th>
<th>Right Wing</th>
</tr>
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<tbody>
<tr>
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<td>P04 P05 P06</td>
<td>P01 P02 P03 P16 P15 P14</td>
<td>P13 P12 P11</td>
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<tr>
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<td>T07 T08 T09</td>
<td>T01 T02 T03 T06 T05 T04</td>
<td>T12 T11 T10</td>
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<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>Row Unit</td>
<td>R01 R02 R03</td>
<td>R04 R05 R06 R07 R08 R09</td>
<td>R10 R11 R12</td>
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</table>

3PYP-2320: 23-Row 20in

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<tr>
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<td>T01 T02 T03 T06 T05 T04</td>
<td>T12 T11 T10</td>
</tr>
<tr>
<td>Splitter</td>
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<tr>
<td>Row Unit</td>
<td>01 02 03 04 05 06</td>
<td>07 08 09 10 11 12 13 14 15 16 17</td>
<td>18 19 20 21 22 23 24</td>
</tr>
</tbody>
</table>

3PYP-24TR36: 24-Row (12 Twin), 36in
3PYP-24TR38: 24-Row (12 Twin), 38in
3PYP-24TR40: 24-Row (12 Twin), 40in

<table>
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<td>Splitter</td>
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<tr>
<td>Row Unit</td>
<td>01 02 03 04 05 06</td>
<td>07 08 09 10 11 12 13 14 15 16 17</td>
<td>19 20 21 22 23 24</td>
</tr>
</tbody>
</table>
### Port Identification: “16 Port”

![Diagram of Port Identification](image)

#### Port Assignments: 16, 31 and 32-Row

**3PYP-1630: 16-Row, 30in**

<table>
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<tr>
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<td>P01 P02 P03 P04</td>
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<td>T01 T02 T03 T04</td>
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<tr>
<td>Splitter</td>
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<tr>
<td>Row Unit</td>
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**3PYP-3115: 31-Row 15in**

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<td>P01 P02 P03 P04</td>
<td>P12 P11 P10 P09</td>
</tr>
<tr>
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<td>T09 T10 T11 T12</td>
<td>T01 T02 T03 T04</td>
<td>T16 T15 T14 T13</td>
</tr>
<tr>
<td>Splitter</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Row Unit</td>
<td>R01 R02 R03 R04</td>
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</table>

**3PYP-32TR30: 32-Row (16 Twin), 30in**

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</tr>
</thead>
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<td>P01 P02 P03 P04</td>
<td>P12 P11 P10 P09</td>
</tr>
<tr>
<td>Rack Tube</td>
<td>T09 T10 T11 T12</td>
<td>T01 T02 T03 T04</td>
<td>T16 T15 T14 T13</td>
</tr>
<tr>
<td>Splitter</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Row Unit</td>
<td>R01 R02 R03 R04</td>
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</tr>
</tbody>
</table>

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**Port Assignments Diagram**

![Diagram of Port Assignments](image)

Figure 56

“16 Port” Seed Hose Connection Stations (Facing Forward)
Connect Seed Hoses

Connect Hoses at Air Box Manifold

Refer to tables on page 31 or page 32
85. To ease the connection process, mark the free end of each hose with its rack Tube number and Port or Row assignment. Check that each hose has a clamp.

Rack Tubes are numbered from T01 (bottom row, planter left) to T12 or T16 (top row, planter right).

Air box manifold ports are numbered from P01 (planter left) to P16 (planter right).

Obtain the Tube-to-Port assignment from the tables on page 31 (12 port) or page 32 (16 port).

86. Remove any slip-on shipping caps on the manifold ports. On a 12 port planter, ports P07-P10 are unused, and have caps secured with clamps. Leave these caps in place.

Refer to Figure 57
The free ends of the flexible seed hoses are guided under the frame tube but above the steering gear.

It is generally easier to start at the center manifold ports (P08 and P09), and work outwards.

87. Slide each hose fully onto its assigned manifold port.

88. Slide the clamp toward the end of the hose and secure it at \( \frac{3}{4} \) inch (1.9 cm) from the face of the air box.

89. Repeat step 87 and step 88 for all hoses.

Connect Hoses at Wing Tubes

Refer to Figure 58 (which depicts wings folded for routing clarity - make these connections prior to first wing fold)
90. Route hoses from lower rack tubes to center section tubes and rows. In general, the outermost rack tube is connected to the rear-most section tube. The center rack tubes connect directly to Y-tube or rows. Secure with clamps.

91. Route hoses from upper rack tubes to wing tubes. The outermost rack tube is connected to the rear-most wing tube. Secure with clamps.
Connect Air Box Inlet Hose
Install Hose Routing Clamp

Refer to Figure 59, Figure 60 and Figure 61

92. Select two (2) each:
   25 403-579D CLAMP, HOSE ROUTE 6 INCH
   64 806-192C U-BOLT 5/16-18X1 1/2X2 1/2 RND
   and four (4) sets:
   59 804-036C WASHER FLAT 5/16 SAE PLT
   49 803-084C NUT HEX NYLOCK 5/16-18 PLT

93. Loosely assemble the clamps to the top side of the top level rack tube that is just right of center. Slide the clamp down the tube, to a position 7 inches (18 cm) from the rear end of the tubes (measured from rear edge of clamps to just beyond hose clamps on tubes).

94. Route the large hose from the lower outlet of the fan manifold, through the fan frame cradles ① and the routing clamp ②.

95. Locate one (not shown):
   31 800-151C CLAMP WRM DRV #96SS (4.75-6.5)
   This may be on the hose or in a crate.

96. Add the clamp ③ to the hose. Slide the hose end ② onto the air box inlet. Secure with hose clamp.

97. Adjust the routing clamps ④ so that they just keep the hose from sliding in the clamps. Tighten the lock nuts ④ just enough to keep the clamps from sliding on the tube. Do not over-tighten the nuts, or the rack tube may be damaged.
Install Lower Walkboard Step

Refer to Figure 62

98. Select two:
   - 816-634C STEP EXTENSION RUBBER
   - and four (4) sets:
     - 802-091C HHCS 1/2-13X1 1/2 GR5
     - 804-016C WASHER FLAT 1/2 SAE PLT
     - 803-019C NUT LOCK 1/2-13 PLT

99. Insert the bolts 38 from the inside of the bottom four holes of the existing ladder 3. Align the rubber extensions 67 to cant out (following the angle of the ladder) and place them over the bolt threads. Loosely secure with washers 67 and lock nuts 45.

100. Select one:
    - 401-591H STEP SINGLE BOLT-ON
    - and four (4) sets:
      - 802-091C HHCS 1/2-13X1 1/2 GR5
      - 804-016C WASHER FLAT 1/2 SAE PLT
      - 803-019C NUT LOCK 1/2-13 PLT

101. Insert the bolts 38 from the inside of the bottom four holes of the new step 18. Align the rubber extensions 67 over the bolt threads. Add washers 57 and lock nuts 45. Secure all nuts (tighten to Grade 2 torque specification).
Install Press Wheel Assemblies

Refer to Figure 63 and Figure 64

If any press wheel assemblies ④ were shipped separately, or removed at step 22, install them now.

Note: With twin row planters, long and short press wheel arm mount boxes ⑧ are alternated every other row. The long box is identified by the notches on its side plate. The long box belongs on the right hand row of a set of twins.

102. Remove and save the ½-13 × 1 inch hex head bolt and washer ⑥ at the back of one of the center row units ⑥.

Avoid Alignment Disturbance:

There are four bolts at this location. Remove only the hex head bolts. Do not loosen or remove the square head bolts forward.

103. Remove and save the ½-13 × 1 ½ inch hex head bolt ⑦, washer, and eccentric adjuster nut.

104. Align the ½in holes in the press wheel assembly with the ½-13 tapped holes in the row unit, loosely assemble with the ½-13 × 1 inch hex head bolt and washer ⑧.

105. Loosely screw in the ½-13 × 1 ½ inch hex head bolt ⑨, washer, and eccentric adjuster nut. Rotate the adjuster to visually align the press wheel assembly with the row unit, and tight the adjust and both bolts.
Install Row Unit Side Wheels

This applies to Model 3PYPA-3115 only. For all other models, skip to step 110.

On 3PYPA planters with 15-inch single row spacings, the side depth gauge wheels are left uninstalled on four rows, to permit the wing gauge wheel to fold under the wing for shipment.

*Refer to Figure 65*

106. Select one of the side depth gauge wheels, which may be one of:
   (69) 814-173C 4 X 16 GAUGE TIRE ASSY-PLASTIC
   (69) 814-257C 2.5X16 SIDE DEPTH WHEEL ASSY
   (69) 814-260C 3X16 SIDE DEPTH WHEEL ASSY

107. Select one each:
   (42) 802-646C HHCS 5/8-11 X 3 GR8
   (58) 804-022C WASHER LOCK SPRING 5/8 PLT
   (63) 804-195C WASHER FLAT 1.31ODX.65IDX.188T
   and six (6) each:
   (60) 804-040C WASHER MACH 1.19 X .63 X 18GA

108. Place the lock washer (58) and three (3) of the machine washers (60) on the bolt (42). Insert the bolt assembly through the outside face of the wheel (69).

109. Add the flat washer (63) and the remaining machine washers (60) to the bolt. Secure the wheel assembly to the arm 26.

Hopper Installation

*Refer to Figure 66*

110. If the 82 bushel hopper is included, set it on the support structure with the slide gate facing to the rear. Secure it in place with the pins. See Operator Manual for mounting instructions.

111. If the standard 833-253C level sensor is installed on the hopper, and a 466820710S3 extension cable is available, route the extension cable along the steering hose/cable bundle to the mainframe. Connect the forward end to the mainframe harness lead “HOPPER 2”. Secure extension cable to existing bundle with tie wraps.

112. Close and secure the walkboard.
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 82 bushel 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.

An optional 466820710S3 extension cable is required to connect the hopper level sensor to the 3PYPA seed monitor harness.

Use of the hopper level 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 68 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.

5. Connect the sensor lead to the harness installed at step 111 on page 37.

Row Unit Options

Optional row unit capabilities that are not factory-installed include their own installation instructions, or rely on instructions in the planter Operator manual.
Planter Closeout

118. Using the lift assist cylinders, lift the planter and remove the rear main frame shipping stand. Save it for customer use.

Emergency Moves Without Steering

To move the planter with a tractor lacking 3PYPA 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. Start tractor.
   c. Make all normal electrical connections, EXCEPT steering.

3. Mechanical Float  
   (for forward travel and for backing up)
   a. Remove 1\(\frac{1}{4}\) 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

Steering Not Yet Set Up:
The planter is now safe to move, forward only, or hitch to any 3-point tractor of sufficient capability. Make no reverse moves until hitched to the tractor on which the steering sensor is installed.

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.
Console Installation

If the tractor to be used with this planter is not available prior to customer delivery, provide this manual to the customer for installation of the console.

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.

![Figure 69 Terminal and Switch Panel](image)

**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.
Tractor Steering

Integration of tractor steering and planter steering is required. The tractor must be a model listed under “Compatible Tractors” on page 5, and must meet the requirements listed under Specifications and Capacities, “Appendix A - Reference Information” on page 64. If the tractor is not have one of the brands and models listed, consult your Great Plains dealer. At time of publication, this 3PYPA planter steering system is not compatible with articulated tractors.

Seed cart steering is hydraulically controlled to match steering of the tractor based on data from a steering sensor. There are five sensor data configurations. All require some optional hardware. See table below.

<table>
<thead>
<tr>
<th>Steering Signal Source</th>
<th>Requires</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Great Plains linear sensor</td>
<td>401-748A</td>
<td>LINEAR STEERING SENSOR OPT</td>
</tr>
<tr>
<td>Tractor ISObus data</td>
<td>401-747A</td>
<td>HARNESS ASY STEER SNSR ADAPTOR</td>
</tr>
<tr>
<td>Case IH tractor steering sensor</td>
<td>401-747A</td>
<td>HARNESS ASY STEER SNSR ADAPTOR</td>
</tr>
<tr>
<td></td>
<td>833-544C</td>
<td>HARNESS CNH WHEEL ANGLE SENSOR WHEEL TYPE</td>
</tr>
<tr>
<td>John Deere tracked tractor steering sensor</td>
<td>401-747A</td>
<td>HARNESS ASY STEER SNSR ADAPTOR</td>
</tr>
<tr>
<td></td>
<td>833-546C</td>
<td>HARNESS JD WHEEL ANGLE SENSOR TRACK TYPE</td>
</tr>
<tr>
<td>John Deere wheeled tractor steering sensor</td>
<td>401-747A</td>
<td>HARNESS ASY STEER SNSR ADAPTOR</td>
</tr>
<tr>
<td></td>
<td>833-548C</td>
<td>HARNESS JD WHEEL ANGLE SENSOR WHEEL TYPE</td>
</tr>
</tbody>
</table>

a. Additional tractor-specific mounting hardware is included with the standard planter.

Install Switchbox

Refer to Figure 70

The switchbox (70) is used in all sensor configurations.

4. Select one:

   70 833-437C SWITCH CAB

   Mount the switchbox (70) in any convenient location that allows easy access to switches in the field, observation of fault indications, and does not obstruct safe operation of the tractor. Set the STEER switch to Off.

5. Connect the battery power leads (70b) to an unswitched 12Vdc source. Red+, Black-.

6. Route the main harness (70h) to the hitch, where it mates with the Steering ECU harness from the planter.

The next step depends on the tractor steering signal source:

- For a Great Plains linear sensor, continue at “Install GP Linear Sensor” on page 42.
- For a tractor ISObus signal source, or native tractor steering sensor, continue at “Install Electronic Module” on page 51.

<table>
<thead>
<tr>
<th>Lead</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>70b</td>
<td>Ring tongue terminals: 12Vdc Battery Power in</td>
</tr>
<tr>
<td>70h</td>
<td>10-pin: Steering Harness to Hitch</td>
</tr>
<tr>
<td>70s</td>
<td>3-pin: normalized PWM steering sensor input</td>
</tr>
<tr>
<td></td>
<td>(from linear sensor or electronic module)</td>
</tr>
<tr>
<td>70p</td>
<td>3-pin (2 used): Power out to harness (74p)</td>
</tr>
</tbody>
</table>
Install GP Linear Sensor

The linear sensor is installed when not using native tractor steering sensor or CANbus steering data.

Major subassemblies to install are:

- tractor steering sensor, with brand-model-specific brackets, which detects tractor wheel pointing; and
- the cab steering switch console which controls operation and calibration of the steering system.

Components are not Universal:
Install only on listed tractors (page 5).
Contact Great Plains if any fitting issues are encountered.

Note: The parts illustrated and listed below are supplied for tractor installation. Only two of the six provided “BRKT SENSOR” brackets are used, depending on tractor brand and model.

Linear Sensor Parts

<table>
<thead>
<tr>
<th>Callout</th>
<th>Part Number</th>
<th>Descriptor</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>81</td>
<td>401-541S</td>
<td>SENSOR LIN</td>
<td></td>
</tr>
<tr>
<td>82</td>
<td>411-575D</td>
<td>BRKT SENSOR JD FIXED</td>
<td>for John Deere® 8000 rigid front suspension (RFS)</td>
</tr>
<tr>
<td>83</td>
<td>411-580D</td>
<td>BRKT SENSOR ROD END CASE MX</td>
<td>for Case IH® MX/Magnum™</td>
</tr>
<tr>
<td>84</td>
<td>411-581D</td>
<td>COLLAR</td>
<td></td>
</tr>
<tr>
<td>85</td>
<td>411-582D</td>
<td>YOKE</td>
<td></td>
</tr>
<tr>
<td>86</td>
<td>802-097C</td>
<td>HHCS 1/4-20X2 1/2 GR5</td>
<td></td>
</tr>
<tr>
<td>87</td>
<td>802-167C</td>
<td>HHCS 1/4-20X1 1/2 GR5</td>
<td></td>
</tr>
<tr>
<td>88</td>
<td>803-255C</td>
<td>NUT HEX NYLOCK 1/4-20</td>
<td></td>
</tr>
<tr>
<td>89</td>
<td>803-305C</td>
<td>NUT HEX NYLOCK 3/8-24 PLT</td>
<td></td>
</tr>
<tr>
<td>90</td>
<td>804-007C</td>
<td>WASHER FLAT 1/4 SAE PLT</td>
<td></td>
</tr>
<tr>
<td>91</td>
<td>833-438C</td>
<td>HARNESS TRACTOR POSITION</td>
<td></td>
</tr>
<tr>
<td>92</td>
<td>411-576D</td>
<td>BRKT SENSOR JD WHL</td>
<td>for John Deere® 8000 rigid front suspension (RFS)</td>
</tr>
<tr>
<td>93</td>
<td>411-577D</td>
<td>BRKT SENSOR JD SUSPEN FIXED</td>
<td>for John Deere® 8000 ILS</td>
</tr>
<tr>
<td>94</td>
<td>411-578D</td>
<td>BRKT SENSOR JD SUSPEN WHL</td>
<td>for John Deere® 8000 ILS</td>
</tr>
<tr>
<td>95</td>
<td>411-579D</td>
<td>BRKT SENSOR BASE TRACTOR</td>
<td>for Case IH® MX/Magnum™</td>
</tr>
</tbody>
</table>

Parts included with planter:

- BRKT SENSOR JD WHL: for John Deere® 8000 rigid front suspension (RFS)
- BRKT SENSOR JD SUSPEN FIXED: for John Deere® 8000 ILS
- BRKT SENSOR JD SUSPEN WHL: for John Deere® 8000 ILS
- BRKT SENSOR BASE TRACTOR: for Case IH® MX/Magnum™
Assemble Tractor Sensor

Refer to Figure 72

If the sensor is pre-assembled, loosen collar bolt [87] and skip to step 13.

7. Select one each:
   - 411-582D YOKE
   - 802-167C HHCS 1/4-20X1 1/2 GR5
   - 804-007C WASHER FLAT 1/4 SAE PLT

8. Insert the shorter bolt [87] into the flat washer [80], and then into the yoke [85] from the lug side.

9. Select one each:
   - 411-581D COLLAR
   - 802-097C HHCS 1/4-20X2 1/2 GR5
   - 803-255C NUT HEX NYLOCK 1/4-20

10. Align yoke [85] side holes with collar [84] base holes and insert bolt [86]. Secure with lock nut [88]. Tighten to allow free pivoting of the yoke with little or no side-to-side slack.

11. Select one each:
    - 401-541S SENSOR LIN
    Gently extend the rod to full length. Measure and record the overall length of the sensor. Gently push the rod fully into the cylinder sleeve. Measure and record the overall length. Add those measurement and divide by 2. Record this [centered] length.

    \[
    \text{CenteredLength} = \frac{\text{MaxLength} + \text{MinLength}}{2}
    \]

12. Select one each:
    - 802-167C HHCS 1/4-20X1 1/2 GR5
    - 803-255C NUT HEX NYLOCK 1/4-20

13. Slide collar [84] about 1 inch (2.5 cm) onto base end of sensor [81], with vent hole near cylinder base pointing down, and loosely secure with bolt [87] and lock nut [88] through collar clamp holes.

Install Tractor Steering Sensor

Instructions for the next step depend on the brand and model of tractor:

- Case IH MX or Magnum Skip to “Case IH® MX/Magnum™ Installation” on page 44.
- John Deere 8000 Series RFS Skip to “John Deere® 8000 (RFS) Installation” on page 46.
- John Deere 8000 Series ILS Skip to “John Deere® 8000 ILS Installation” on page 48.

Equipment Damage Risk:
Handle the linear displacement sensor [81] carefully.
It is a precision instrument.

Note: Final collar position is determined at installation.
Case IH® MX/Magnum™ Installation

Refer to Figure 73 and Figure 74

The sensor [81] is installed at the forward top of the left front axle.

14. Turn the tractor to the left to open room to work.

15. Select one:
   [95] 411-579D BRKT SENSOR BASE TRACTOR

Case IH®: Mount Inside (Base End) Bracket

Refer to Figure 74

16. Remove the existing forward bolt [8].
   Loosen the rear bolt [8].

17. Insert the long tab of the bracket [95] with the short tab facing left. If possible, align the inner hole [8] under the tractor bolt hole. If not possible, use the end hole [8]. Secure with removed bolt [95].

Case IH®: Mount Outside (Rod End) Bracket

Refer to Figure 73 and Figure 75 on page 45

18. Select one:
   [83] 411-580D BRKT SENSOR ROD END CASE MX

19. Remove existing bolt [8]. Using that bolt, secure the short tab (with the larger holes) of the bracket [83] with the long tab facing forward and right. Use the corner large hole [7] for the initial trial mounting.

20. It may be necessary to use the alternate large hole [8] when the sensor is fitted in the next steps.

Case IH®: Check Sensor Extension

21. Turn the tractor front wheels straight ahead. Shut off tractor.

22. Select the sensor assembly [81]. Loosen the gimbal collar [83]. Gently pull the sensor rod to centered extension, as determined at step 11 on page 43, with yoke center bolt down, and rod-end bolt up.

Note: When trial fitting, make sure sensor does not contact any tractor components. Use alternate mount and pivot holes as necessary to obtain clearance.

23. Determine which bracket holes sensor fits. Mark those holes, but do not mount the sensor at this time. At the inboard end, use the left tab hole [5] if possible.

   If sensor is too short, move collar toward connector end (base) of sensor. Do not block vent hole.

   If sensor is too long, move outboard bracket [83] to alternate mounting hole. If sensor is still too long, move collar toward rod end of sensor.

   Note holes and collar position with a marker.
24. Remove the sensor assembly. Check that vent hole is unobstructed and facing down. Tighten bolt [87] at top of collar to Grade 2 torque specification.

25. Turn the tractor front wheels fully to the left. Shut off tractor.

26. Using marked holes and collar position, extend sensor rod until rod end bolts align with marked holes. Measure the overall length of the sensor. It must be at least \(\frac{3}{8}\) inch (1 cm) shorter than the maximum length (and can be substantially less than that).

27. Turn the tractor front wheels fully to the right. Shut off tractor.

28. Using marked holes and collar position, extend sensor rod until rod end bolts align with marked holes. Measure the overall length of the sensor. It must be at least \(\frac{3}{8}\) inch (1 cm) longer than the minimum length (and can be substantially more than that).

**NOTICE**

**Install to Specification Only:**

*If it is not possible to obtain reserve lengths of at least \(\frac{3}{8}\) inch (1 cm) at full left and right turn, have your Great Plains dealer consult the factory. Insufficient reserve will result in sensor damage.*

**Case IH®: Mount Sensor**

Refer to Figure 73 (page 44) and Figure 75

29. Select the sensor assembly [81], and one each:
   - [88] 803-255C NUT HEX NYLOCK 1/4-20
   - [90] 804-007C WASHER FLAT 1/4 SAE PLT

   Place the flat washer [90] on the lower yoke bolt. Insert the bolt, from above, through the marked hole at the inboard bracket. Secure with lock nut [88]. Tighten to allow lateral pivoting but not rocking of gimbal assembly.

30. Select one:
   - [89] 803-305C NUT HEX NYLOCK 3/8-24 PLT

   Insert the threaded rod-end bolt, from below, through the marked hole in the outboard bracket. Secure with lock nut [89] to Grade 2 torque spec.

31. Resume at “**Install Harness for Linear Sensor**” on page 50.
John Deere® 8000 (RFS) Installation

Refer to Figure 76 and Figure 77

The sensor 81 is installed at the forward top of the left front axle.

32. Turn the tractor to the left to open room to work.

JD RFS: Mount Inside (Base End) Bracket

33. Select one:
   82 411-575D BRKT SENSOR JD FIXED

34. Remove the existing bolt 86. With the short tab of the bracket 88 (bracket hole 85) facing to the right and down, insert the removed bolt and re-secure to tractor.

JD RFS: Mount Outside (Rod End) Bracket

35. Select one:
   82 411-576D BRKT SENSOR JD WHL

36. Remove existing bolts 86. Using the same bolts, secure the long tab (with larger holes 84) of the bracket 88 with the short tab facing forward/right.

JD RFS: Check Sensor Extension

37. Turn the tractor front wheels straight forward. Shut off tractor.

38. Select the sensor assembly 81. Loosen the gimbal collar 89. Gently pull the sensor rod to centered extension, as determined at step 11 on page 43, with yoke center bolt down, and rod-end bolt up.

Note: When trial fitting, make sure sensor does not contact any tractor components. Use alternate mount and pivot holes as necessary to obtain clearance.

39. Determine which bracket holes sensor fits. Mark those holes, but do not mount the sensor at this time. At the inboard end, use the left end tab hole 85 if possible. At the outboard end, use center tab hole 88 if possible.

   If sensor is too short, move collar toward connector end (base) of sensor. Do not block vent hole. If sensor is still too short, use an alternate hole 90 at outboard bracket.

   If sensor is too long, move collar toward rod end of sensor.

   Note holes and collar position with a marker.

   Note: Sensor will tilt up slight from inboard to outboard.

40. Remove the sensor assembly. Check that vent hole is unobstructed and facing down. Tighten bolt 87 at top of collar to Grade 2 torque specification.

41. Turn the tractor front wheels fully to the left. Shut off tractor.
42. Using marked holes and collar position, adjust sensor rod until yoke and rod-end bolts align with marked holes. Measure the overall length of the sensor. It must be at least $\frac{3}{8}$ inch (1 cm) shorter than the maximum length (and can be substantially less than that).

43. Turn the tractor front wheels fully to the right. Shut off tractor.

44. Using marked holes and collar position, extend sensor rod until rod end bolts align with marked holes. Measure the overall length of the sensor. It must be at least $\frac{3}{8}$ inch (1 cm) longer than the minimum length (and can be substantially more than that).

**NOTICE**

**Install to Specification Only:**
If it is not possible to obtain reserve lengths of at least $\frac{3}{8}$ inch (1 cm) at full left and right turn, have your Great Plains dealer consult the factory. Insufficient reserve will result in sensor damage.

**JD RFS: Mount Sensor**

Refer to Figure 76 and Figure 77 (both page 46)

45. Select the sensor assembly $\text{[Symbol]}$, and one each:
   - $\text{88} 803-255C$ NUT HEX NYLOCK 1/4-20
   - $\text{89} 804-007C$ WASHER FLAT 1/4 SAE PLT

   Place the flat washer $\text{89}$ on the lower yoke bolt.
   Insert the bolt, from above, through the marked hole at the inboard bracket. Secure with lock nut $\text{88}$. Tighten to allow lateral pivoting but not rocking of gimbal assembly.

46. Select one:
   - $\text{89} 803-305C$ NUT HEX NYLOCK 3/8-24 PLT

   Insert the threaded rod-end bolt, from below, through the marked hole in the outboard bracket. Secure with lock nut $\text{89}$ to Grade 2 torque spec.

47. Resume at “Install Harness for Linear Sensor” on page 50.
John Deere® 8000 ILS Installation

Refer to Figure 78 and Figure 79
The sensor [81] is installed at the rear of the right front axle, close to the drive shaft.

48. Turn the tractor to the left to open room to work.

JD ILS: Mount Inside (Base End) Bracket
49. Select one:
   84 411-578D BRKT SENSOR JD SUSPEN WHL

50. Loosen the existing bolt just aft and lower at the inboard universal joint. Slide the bracket tab with the open slotted hole under the bolt head. Align so the other tab is up and horizontal. Re-secure bolt.

JD ILS: Mount Outside (Rod End) Bracket
Refer to Figure 78 and Figure 80 on page 49
51. Select one:
   83 411-577D BRKT SENSOR JD SUSPEN FIXED

52. Remove the existing bolt. Using the same bolt, secure the long tab (with the larger hole) of the bracket with the short tab facing forward and right.

53. Turn the tractor front wheels straight forward. Shut off tractor.

JD ILS: Check Sensor Extension
54. Select the sensor assembly [83]. Loosen the gimbal collar [84]. Gently pull the sensor rod to centered extension, as determined at step 11 on page 43, with yoke center bolt down, and rod-end bolt up.

Note: When trial fitting, make sure sensor does not contact any tractor components. Use alternate mount and pivot holes as necessary to obtain clearance.

55. Determine which bracket holes sensor fits. Mark those holes, but do not mount the sensor at this time. At the inboard end, use the left end tab hole if possible. At the outboard end, use center tab hole if possible.

If sensor is too short, move collar toward connector end (base) of sensor. Do not block vent hole. If sensor is still too short, use alternate hole at outboard bracket.

If sensor is too long, move collar toward rod end of sensor.

Note holes and collar position with a marker.
Note: Sensor will tilt up slight from inboard to outboard.
56. Remove the sensor assembly. Check that vent hole is unobstructed and facing down. Tighten bolt at top of collar to Grade 2 torque specification.

57. Turn the tractor front wheels fully to the right. Shut off tractor.

58. Using marked holes and collar position, adjust sensor rod until yoke and rod-end bolts align with marked holes. Measure the overall length of the sensor. It must be at least $\frac{3}{8}$ inch (1 cm) shorter than the maximum length (and can be substantially less than that).

59. Turn the tractor front wheels fully to the right. Shut off tractor.

60. Using marked holes and collar position, extend sensor rod until rod end bolts align with marked holes. Measure the overall length of the sensor. It must be at least $\frac{3}{8}$ inch (1 cm) longer than the minimum length (and can be substantially more than that).

 NOTICE

Install to Specification Only:
If it is not possible to obtain reserve lengths of at least $\frac{3}{8}$ inch (1 cm) at full left and right turn, have your Great Plains dealer consult the factory. Insufficient reserve will result in sensor damage.

JD ILS: Mount Sensor

Refer to Figure 78, 79 (page 48) and Figure 80

61. Select the sensor assembly, and one each:

- 88 803-255C NUT HEX NYLOCK 1/4-20
- 90 804-007C WASHER FLAT 1/4 SAE PLT

Place the flat washer on the lower yoke bolt. Insert the bolt, from above, through the marked hole at the inboard bracket. Secure with lock nut 88. Tighten to allow lateral pivoting but not rocking of gimbal assembly.

62. Select one:

- 89 803-305C NUT HEX NYLOCK 3/8-24 PLT

Insert the threaded rod-end bolt, from below, through the marked hole in the outboard bracket. Secure with lock nut 89 to Grade 2 torque spec.
Install Harness for Linear Sensor

Refer to Figure 82 and Figure 81

The harness 91 is only used if the Great Plains linear sensor is used 81. This page does not apply to configurations using the tractor’s own steering sensor, or tractor CANbus steering data.

63. At the tractor steering sensor 81 just installed, remove the plastic cap protecting the connector at the inboard end.

64. Select one:

833-438C HARNESSTRACTOR POSITION

Connect the round connector 91a of the tractor sensor harness 91 to the output 81a of the linear steering sensor 81.

Refer to Figure 82 and Figure 83

65. Route the steering harness 91 to the rear hitch.

Mate the 3-pin weatherpak connector 91s to switchbox harness sensor input connector 70s.

Allow slack at sensor for steering and vertical axle movement (if possible). Keep cable clear of hot parts and moving parts of tractor. Route cable through center-line of any pivot points.

Allow slack at hitch for hitch movement.

Secure harnesses with cable ties.

Continue at “Steering Calibration” on page 59.

<table>
<thead>
<tr>
<th>Lead</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>91a</td>
<td>3-pin round: input from linear sensor 81</td>
</tr>
<tr>
<td>91s</td>
<td>3-pin weatherpak: output to master harness lead 74r</td>
</tr>
</tbody>
</table>

Figure 81
Linear Steering Harness & Sensor

Figure 82
833-438C Linear Harness

Figure 83
Sensor Input Lead
Install Electronic Module

Refer to Figure 84

This module (71) is used in configurations that take ISObus steering data, or native tractor steering sensor data. It is not used with the Great Plains linear sensor.

66. Select one:

| 71 | 833-541C SENSOR MODULE WHEEL ANGL |

The electronic module (71) reads the steering angle information from either the CANbus or from the tractor’s own sensor, and converts the information to a PWM (percent duty cycle) signal that emulates the Great Plains linear sensor, then outputs the signal to the planter steering system.

Place the electronic module in a location in the tractor cab where:

- the front face can be accessed for observation during some diagnostics,
- it will not get damaged, and;
- it is close enough to the System Switch Box (70) to mate the power leads (70i and 70o).

<table>
<thead>
<tr>
<th>Port</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>71i</td>
<td>12-pin Gray: Input</td>
</tr>
<tr>
<td>71o</td>
<td>12-pin Black: Output</td>
</tr>
</tbody>
</table>
Install Gray Module Harness

The gray (input) module harness (74G) is used in configurations that take ISObus steering data, or native tractor steering sensor data. It is not used with the Great Plains linear sensor.

Not all of the leads are connected, and only two are connected at this step.

Refer to Figure 85, and Figure 86

67. From the harness set: 
(74) 833-547C HARNESS CANBUS STEERING MODULE select the cable (74G) with the Gray 12-pin Deutsch connector.

Plug the Gray 12-pin Deutsch (74G) lead into the Gray input port receptacle (71i) of the sensor module (71).

Connect the power input lead (74p) to the switch box power output lead (70p).

Continue at one of:

• If using native CANbus steering data, continue at “ISObus Compatible Connection” on page 53.

• If using the tractor’s existing (native) steering sensor, continue at “Install Harness for Native Steering Sensor” on page 54.
ISObus Compatible Connection

This connection is used only where ISObus steering data is used. It is not used with the Great Plains linear sensor, nor with taking native tractor steering sensor data.

The planter steering system can take CANbus/ISObus steering data on the following tractor models:

- John Deere® R-Series (except tracked)
- John Deere® 8000 Series

This configuration requires no optional sensor or harness.

Refer to Figure 87

In this configuration, the CANbus connector (74c) on the gray master harness (74G) is used, and the sensor input lead (70s) on the switchbox (70) harness is unused.

68. Locate the CANbus connector (74c) on the master harness (74).

John Deere® R-Series ISObus

Refer to Figure 88

69. Locate the ISO 11786 Diagnostics Port (1) on the right side console. Plug the master harness CANbus connector (74c) into this port.

Continue at “Install Module Output Harness” on page 58.

John Deere® 8000 Series ISObus

Refer to Figure 89

70. Locate the ISO 11786 Diagnostics Port (2) on the right side console. Plug the master harness CANbus connector (74c) into this port.

Continue at “Install Module Output Harness” on page 58.
Install Harness for Native Steering Sensor

One of the following harnesses, ordered separately, is used only when the tractor's own (native) wheel angle sensor (raw sensor data) is used for planter steering. These harnesses are not used when the Great Plains linear sensor is used, nor when CANbus steering data is used.

Refer to Figure 90

71. Locate and select one of, and continue at the page indicated:

72. 833-544C  
HARNESS CNH WHEEL ANGLE SENSOR WHEEL TYPE  
for Case/New Holland Wheel Tractors - required for all Case and New Holland tractors that are factory equipped as auto-steer ready or have factory installed auto-steer.  
Continue at “Case or New Holland Native Sensor Harness” on page 55.

73. 833-546C  
HARNESS JD WHEEL ANGLE SENSOR TRACK TYPE  
for John Deere® Track Tractors - required for all John Deere® tracked tractors.  
Continue at “John Deere® Wheeled Native Sensor Harness” on page 57.

75. 833-548C  
HARNESS JD WHEEL ANGLE SENSOR WHEEL TYPE  
Case or New Holland Native Sensor Harness

Optional adaptor harness 72 for Case/New Holland wheeled tractors is necessary when the tractor wheel angle signal cannot be obtained from the CANbus on the tractor.

Refer to Figure 91 and Figure 92

72. Locate the tractor Wheel Angle Sensor harness connectors 1, on the left side of the tractor positioned just behind the axle and wheel kingpin. They are inside a plastic wire protector.
   - Peel back the wire protector.
   - Disconnect the wheel sensor harness (see Figure 91).
   - Reconnect the disconnected leads using the adaptor harness 72.

Refer to Figure 92 and Figure 93

73. Route the sensor input lead 74r of the master module harness 74G from the sensor module 71 in the cab, to the adaptor harness 72 just installed at step 72.

Mate the sensor input lead 74r to the sensor tap lead 72r on the adaptor harness 72.

Refer to Figure 93

74. Dress the sensor leads 72r and 74r along existing harnesses, tubing, hoses and tractor fittings. Allow slack near moving parts, routing through pivot center-lines where possible. Avoid hot parts. Protect the harness against strikes from brush and tall stubble. Secure with cable ties.

Continue at “Install Module Output Harness” on page 58.
John Deere® Tracked Native Sensor Harness

Optional adaptor harness for John Deere® tracked tractors is necessary when the tractor wheel angle signal cannot be obtained from the CANbus on the tractor. Refer to Figure 94.

75. Locate the Steering Angle Sensor. It is mounted on the bottom of the steering column, and is accessible from the right side of the tractor just in front of the cab. Refer to Figure 96.

76. Disconnect the sensor lead (not shown) and tractor harness.

Refer to Figure 95 and Figure 96

77. Reconnect the disconnected leads using the adaptor harness.

Refer to Figure 95

78. Route the sensor input lead of the gray master module harness from the sensor module in the cab, to the adaptor harness just installed at step 77.

Mate the sensor input lead to the sensor tap lead on the adaptor harness.

79. Dress the sensor leads along existing harnesses, tubing, hoses and tractor fittings. Allow slack near moving parts, routing through pivot center-lines where possible. Avoid hot parts. Protect the harness against strikes from brush and tall stubble. Secure with cable ties.

Continue at “Install Module Output Harness” on page 58.
John Deere® Wheeled Native Sensor Harness

Optional adaptor harness 75 for John Deere® tracked tractors is necessary when the tractor wheel angle signal cannot be obtained from the CANbus on the tractor.

Refer to Figure 97

80. The tractor Wheel Angle Sensor lead and harness connection 1 can be found on the left side of the tractor just below the air cleaner canister.
   - Uncouple the connectors at the wheel angle sensor harness leads 2.
   - Insert the 833-548C adaptor harness 75, reconnecting the lead and harness through the adaptor.

Refer to Figure 97 and Figure 98

81. Route the sensor input lead (74F) of the master module harness (74G) from the sensor module (71) in the cab, to the adaptor harness 75 just installed at step 77.

   Mate the sensor input lead (74F) to the sensor tap lead (75r) on the adaptor harness 75.

82. Dress the sensor leads (75r) and (74F) along existing harnesses, tubing, hoses and tractor fittings. Allow slack near moving parts, routing through pivot center-lines where possible. Avoid hot parts. Protect the harness against strikes from brush and tall stubble. Secure with cable ties.

Figure 97
John Deere Wheeled Tractor

Figure 98
John Deere Wheeled Tractors Adaptor Harness
Install Module Output Harness

This harness is only used for configurations taking ISObus steering data, or taking native tractor steering sensor data. It is not used with the Great Plains linear sensor.

Refer to Figure 99, and Figure 100 and Figure 101
The output harness (74K) provides a normalized PWM steering signal (74S) to the planter, via the sensor lead (70S) at the hitch connection. It also provides a USB port for service use.

83. From the harness set:
833-547C HARNESS CANBUS STEERING MODULE select the cable (74K) with the Black 12-pin Deutsch connector.

Plug the Black 12-pin Deutsch (74K) lead into the Black output port receptacle (71O) of the sensor module (71).

Route the PWM signal lead (74S) to the hitch. Mate it to the sensor input lead (70S) of the switchbox harness.

The USB lead (74U) is not used at this time. Leave the connector capped.

### Table

<table>
<thead>
<tr>
<th>Lead</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>74K</td>
<td>12-pin black: data from sensor module output</td>
</tr>
<tr>
<td></td>
<td>(71O)</td>
</tr>
<tr>
<td>74S</td>
<td>3-pin weatherpak: PWM steering data to</td>
</tr>
<tr>
<td></td>
<td>switch harness lead (70S)</td>
</tr>
<tr>
<td>74U</td>
<td>3-pin wedge: USB</td>
</tr>
</tbody>
</table>

![Figure 99](image)

Figure 99
Module Output Harness (74)
Signal Power OUT (Black end)

![Figure 100](image)

Figure 100
Electronic Module Ports

![Figure 101](image)

Figure 101
PWN Lead to Hitch
Steering Calibration

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

Calibration
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 2 switches, 1 button, three indicator lamps and one knob that perform the following functions.

<table>
<thead>
<tr>
<th>Steering Control Module Function</th>
<th>Switch Positions and Indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>① STEER Toggle Switch: System Power</td>
<td>On (up): Steering enabled (casters match or float) Off (down): Steering disabled (casters in Float)</td>
</tr>
<tr>
<td>② LED: Power / Fault</td>
<td>On steady: Steering system active (casters match or float) Blinking: Steering system fault (casters in Float)</td>
</tr>
<tr>
<td>③ FLOAT LED: Float / Caster</td>
<td>Off: Normal operation - steering system active if STEER on On: Casters in Float (if STEER LED is steady)</td>
</tr>
<tr>
<td>④ CALIBRATION Toggle Switch: Calibration Modes</td>
<td>L: Caster aspect sensor (casters in Float) C: Center-off: Calibration mode off (normal transport/field mode) R: Tractor aspect sensor (casters in Float)</td>
</tr>
<tr>
<td>⑥ LED: Calibration</td>
<td>Off: Normal (non-Calibration) operation Dim: Either Calibration mode selected Bright Flash: Button ⑤ press acknowledged</td>
</tr>
<tr>
<td>⑦ Rotary Switch Knob (backside)</td>
<td>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</td>
</tr>
</tbody>
</table>

Figure 102: Calibration Steering Control Module
Front View(top) Rear View(bottom)
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 102 and the table on page 59
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 1).

Caster Right Calibration
3. Put the steering in caster wheel sensor calibration mode, by setting Calibration switch 4 to the “CASTER” position.
Note: Do not move the Calibration toggle switch from the “CASTER” position until step 10, or the new caster calibration is ignored.
4. Make a complete forward right circle, as tight as the rig permits, with all wheels in a hard right turn. Stop.
5. Press and hold the “learn” button 5 on the switch box, until the LEARN indicator 6 flashes. Normally, the illumination response takes less than a second.

Caster Straight Calibration
6. Drive straight forward until the entire rig is running in a straight line. Stop, with all wheels straight ahead.
7. Press and hold the “learn” button 5 on the switch box, until the LEARN indicator 6 flashes.

Caster Left Calibration
8. Make a complete forward left hand circle, as tight as the rig permits, with all wheels in a hard left turn. Stop.
9. Press and hold the “learn” button 5 on the switch box, until the LEARN indicator 6 flashes.
10. Complete the caster wheel sensor calibration mode, by setting Calibration switch 4 to “OFF”.

Wheel Tractors and Alternate Method for Tracked Tractors
Tractor Right Calibration
11. Put the steering in tractor wheel sensor calibration mode, by setting Calibration switch 4 to the “TRACTOR” position.
Note: Do not move the Calibration toggle switch from the “TRACTOR” position until step 18, or the new tractor calibration is ignored.
12. Make a complete forward right turn, as tight as the rig permits, with all wheels in a hard right turn. Stop.
13. Press and hold the “learn” button 5 on the switch box, until the LEARN indicator 6 flashes.

NOTICE
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 re-start the sequence (see “Errors and Re-Tries”).

Tractor Straight Calibration
14. Drive straight forward until the entire rig is running in a straight line. Stop, with all wheels straight ahead.
15. Press and hold the “learn” button 5 on the switch box, until the LEARN indicator 6 flashes.

Tractor Left Calibration
16. Make a complete forward left turn, as tight as the rig permits, with all wheels in a hard left turn. Stop.
17. Press and hold the “learn” button 5 on the switch box, until the LEARN indicator 6 flashes.
18. Complete the tractor wheel sensor calibration mode, by setting Calibration switch 4 to “OFF”.

Errors and Re-Tries
If you are unable to complete a sequence, set the Calibration switch 4 to “OFF”, and restart the calibration sequence from the beginning (step 3 for caster or step 11 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 4 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 re-done.
**Track Tractor Preferred Method of Tractor Steering Sensor Calibration**

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

20. 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.

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

Note: Do not move the Calibration toggle switch from the TRACTOR position until step 28 or the new tractor calibration is ignored.

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

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

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

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

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

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

28. 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.

---

**Steering Troubleshooting**

See Operator manual for general planter troubleshooting.

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

See Operator manual for switch box operations. Then see “Steering Flash Error Codes” on page 63.

The chart below presumes that the switch box is reporting normal operation.

### Steering Troubleshooting (other than flash error codes)

<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, make ONLY careful forward moves unless caster pins are removed (see Operator manual).</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. Note: 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.</td>
</tr>
<tr>
<td></td>
<td>Steering sense line not connected</td>
<td>Correctly connect steering hydraulics.</td>
</tr>
<tr>
<td></td>
<td>Power-Beyond hoses reversed</td>
<td>Correctly connect steering hydraulics.</td>
</tr>
<tr>
<td></td>
<td>Power-Beyond sense line disconnected</td>
<td>Correctly connect steering hydraulics.</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>
</tbody>
</table>
## Steering Troubleshooting (other than flash error codes)

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
</table>
| **ECU does not power up (no lights on switch box)** | Fuse blown                             | 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.  
| Power input disconnected or damaged.         | Check voltage at 70-pin ECU plug, with console on:  
Pins 1 and 2, then Pins 2 and 3 |                                                                 |
| Low battery voltage                          | Check tractor voltage. Must be between 10 and 16Vdc. |                                                                 |
| **Steering doesn’t match tractor**           | Calibration needed                     | Perform a steering calibration (page 59). If calibration does not solve the problem, check for damaged sensor. |  
| **No caster float in transport**             | No radar signal (seen by ECU as 0 mph)  | Check radar Y-cable connection and radar function                      |
|                                              | Disengage speed not set to proper value in ECU setup | Contact Great Plains support. If the ECU firmware was recently updated, there may be other incorrect settings. |
| **Steering reversed**                        | Sensor installed on incorrect tractor side or incorrect location on axle | Re-install sensor at location specified in Pre-Delivery manual 401-647Q. |
|                                              | ST1 and ST2 connections reversed at manifold valve | Check entire hydraulic system against diagrams in Parts manual. Correct connections as necessary. If the mis-connection was not the result of local maintenance, report problem to dealer or Great Plains. |
|                                              | Hoses to steering cylinders reversed at left cylinder | Check entire hydraulic system against diagrams in Parts manual. Correct connections as necessary. If the mis-connection was not the result of local maintenance, report problem to dealer or Great Plains. |
|                                              | Harness connections reversed at valve coils | Swap connections at ST1 and ST2. If the mis-connection was not the result of local maintenance, report problem to dealer or Great Plains. |
Steering Flash Error Codes

Failure and errors detected by the self-diagnostics in the steering ECU are presented to the operator as a series of flashes of the Power LED.

There are 2 to 12 flashes, interrupted by a short pause. Multiple errors are flashed in rotation, with a long pause between each error code. A maximum of five error states are reported in any single rotation.

Any of these errors causes the ECU to default the hydraulic steering to Float.

<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.</td>
</tr>
<tr>
<td>1 - 1</td>
<td>Float valve LS short to battery</td>
<td>ECU is detecting an unexpected voltage in the circuit.</td>
</tr>
<tr>
<td>1 - 2</td>
<td>Float valve HS short to ground</td>
<td>Check float valve coil and cable to ECU.</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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>2 - 1</td>
<td>ST1 valve LS short to battery</td>
<td>ECU is detecting an unexpected voltage in the circuit.</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.</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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>3 - 1</td>
<td>ST2 valve LS short to battery</td>
<td>ECU is detecting an unexpected voltage in the circuit.</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.</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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>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:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A. travel limits of sensor.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B. cable to ECU</td>
</tr>
<tr>
<td></td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check connections to ECU. Check harnesses and switchbox connections.</td>
</tr>
</tbody>
</table>

**NOTICE**

*Certain Machine Damage:*

*Do not back up if ANY of these errors occurs. Steering is disabled.*

*The wheels cannot fully caster and machine damage will result. If the problem cannot be corrected in the field, drive forward to remove the planter from the field.*
### Appendix A - Reference Information

#### 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>12</td>
<td>12</td>
<td>12</td>
<td>16</td>
<td>24 (12 twin)</td>
<td></td>
</tr>
<tr>
<td><strong>Row Spacing</strong></td>
<td>36 in</td>
<td>38 in</td>
<td>40 in</td>
<td>30 in</td>
<td>36 in</td>
<td></td>
</tr>
<tr>
<td><strong>Working Width</strong></td>
<td>40 ft 0 in</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Span (width between end rows)</strong></td>
<td>396 in</td>
<td>418 in</td>
<td>440 in</td>
<td>450 in</td>
<td>396 in</td>
<td></td>
</tr>
<tr>
<td><strong>Swath (Channel Width)</strong></td>
<td>432 in</td>
<td>456 in</td>
<td>480 in</td>
<td>480 in</td>
<td>432 in</td>
<td></td>
</tr>
<tr>
<td><strong>Seed Capacity</strong></td>
<td>Optional 82bu hopper or PROBOX® 50 unit bulk seed box</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Transport Width</strong></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>
<td></td>
</tr>
<tr>
<td><strong>Working Length</strong></td>
<td>16 ft 10 in</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Transport Length</strong></td>
<td>16 ft 10 in</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Working Height</strong></td>
<td>12 ft 4 in</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Transport Height, no Markers</strong></td>
<td>12 ft 6 in</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Transport Height, with Markers</strong></td>
<td>12 ft 8 in</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Transport Clearance</strong></td>
<td>14.00</td>
<td></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>3-Point semi-mounted</td>
<td></td>
<td></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>
<td></td>
</tr>
<tr>
<td><strong>Weight (empty, base)</strong></td>
<td>14500 lbs</td>
<td>14500 lbs</td>
<td>14500 lbs</td>
<td>15300 lbs</td>
<td>17000 lbs</td>
<td></td>
</tr>
<tr>
<td><strong>Weight (maximum, full)</strong></td>
<td>22700 lbs</td>
<td>22700 lbs</td>
<td>22700 lbs</td>
<td>23800 lbs</td>
<td>25900 lbs</td>
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<tr>
<td><strong>Transport Tire Size</strong></td>
<td>16.51-16.1 FI 14 Ply Implement</td>
<td></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>
<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>
<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>
<td></td>
</tr>
<tr>
<td><strong>Opener Travel (Up - Down)</strong></td>
<td>10 in</td>
<td></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>
<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>Model 3PYPA</th>
<th>-24TR38</th>
<th>-24TR40</th>
<th>-3115</th>
<th>-32TR30</th>
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<tbody>
<tr>
<td>Row Count</td>
<td>24 (12 twin)</td>
<td>24 (12 twin)</td>
<td>31</td>
<td>32 (16 twin)</td>
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<tr>
<td>Row Spacing</td>
<td>38 in</td>
<td>40 in</td>
<td>15 in</td>
<td>30 in</td>
</tr>
<tr>
<td>Working Width</td>
<td></td>
<td></td>
<td></td>
<td>40ft 0in</td>
</tr>
<tr>
<td>Span (width between end rows)</td>
<td>418 in</td>
<td>440 in</td>
<td>450 in</td>
<td>458 in</td>
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<tr>
<td>Swath (Channel Width)</td>
<td>456 in</td>
<td>480 in</td>
<td>465 in</td>
<td>480 in</td>
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<tr>
<td>Seed Capacity</td>
<td>Optional 82bu hopper or PROBOX® 50 unit bulk seed box</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport Width</td>
<td>25ft 2in</td>
<td>25ft 2in</td>
<td>25ft 2in</td>
<td>24ft 6in</td>
</tr>
<tr>
<td>Working Length</td>
<td></td>
<td>16ft 10in</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport Length</td>
<td></td>
<td>16ft 10in</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working Height</td>
<td></td>
<td>12ft 4in</td>
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<td></td>
</tr>
<tr>
<td>Transport Height, no Markers</td>
<td>12ft 6in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport Height, with Markers</td>
<td>12ft 8in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport Clearance</td>
<td></td>
<td>14.00</td>
<td></td>
<td></td>
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<tr>
<td>Minimum Tractor HP Requirement¹</td>
<td>260 - 300 hp</td>
<td>260 - 300 hp</td>
<td>290 - 320 hp</td>
<td>290 - 330 hp</td>
</tr>
<tr>
<td>Hitch</td>
<td>3-Point semi-mounted</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>Closed-Center, 5 Remotes (1 Power-Beyond), 2250 psi, 23 gal/min</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight (empty, base)²</td>
<td>17000 lbs</td>
<td>17000 lbs</td>
<td>18400 lbs</td>
<td>18700 lbs</td>
</tr>
<tr>
<td>Weight (maximum, full)³</td>
<td>25900 lbs</td>
<td>25900 lbs</td>
<td>27800 lbs</td>
<td>28100 lbs</td>
</tr>
<tr>
<td>Transport Tire Size</td>
<td>16.51-16.1 Fl 14 Ply Implement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydraulic Drive Tire</td>
<td>9.5L x 15 6 Ply Rib Implement</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Ground Drive Tire</td>
<td>7.60-145 6 Ply Lug</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opener Down Pressure</td>
<td>235 to 475 lbs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opener Travel (Up - Down)</td>
<td>10 in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opener Depth Range</td>
<td>0 to 3.5 in</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</th>
<th>Tire Size</th>
<th>Inflation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport/ Caster Wheel</td>
<td>16.51-16.1 Fl 14-Ply Implement</td>
<td>60 psi (414 kPa)</td>
</tr>
<tr>
<td>Ground Drv. Gauge Wheel</td>
<td>7.60-145 6-Ply Lug</td>
<td>32 psi (221 kPa)</td>
</tr>
<tr>
<td>Hyd. Drive Gauge Wheel</td>
<td>9.5L x 15 6-Ply Rib Implement</td>
<td>35 psi (241 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 web sites listed below. For assistance or information, contact your nearest Authorized Farm Tire Retailer. Manufacturer Web site Firestonewww.firestoneag.com Gleasonwww.gleasonwheel.com Titanwww.titan-intl.com
# Torque Values Chart

<table>
<thead>
<tr>
<th>Bolt Size</th>
<th><strong>Bolt Head Identification</strong></th>
<th><strong>Bolt Size</strong></th>
<th><strong>Bolt Head Identification</strong></th>
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</thead>
<tbody>
<tr>
<td>Grade 2</td>
<td>Grade 5</td>
<td>Grade 8</td>
<td>Class 5.8</td>
</tr>
<tr>
<td>in-tpi³</td>
<td>N·m b ft-lbd d</td>
<td>N·m ft-lbd</td>
<td>N·m ft-lbd</td>
</tr>
<tr>
<td>1/4&quot;-20</td>
<td>7.4 5.6</td>
<td>11 8</td>
<td>16 12</td>
</tr>
<tr>
<td>1/2-28</td>
<td>8.5 6</td>
<td>13 10</td>
<td>18 14</td>
</tr>
<tr>
<td>5/16&quot;-18</td>
<td>15 11</td>
<td>24 17</td>
<td>33 25</td>
</tr>
<tr>
<td>5/16&quot;-24</td>
<td>17 13</td>
<td>26 19</td>
<td>37 27</td>
</tr>
<tr>
<td>3/8&quot;-16</td>
<td>27 20</td>
<td>42 31</td>
<td>59 44</td>
</tr>
<tr>
<td>3/8&quot;-24</td>
<td>31 22</td>
<td>47 35</td>
<td>67 49</td>
</tr>
<tr>
<td>7/16&quot;-14</td>
<td>43 32</td>
<td>67 49</td>
<td>95 70</td>
</tr>
<tr>
<td>7/16&quot;-20</td>
<td>49 36</td>
<td>75 55</td>
<td>105 78</td>
</tr>
<tr>
<td>1/2&quot;-13</td>
<td>66 49</td>
<td>105 76</td>
<td>145 105</td>
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<tr>
<td>1/2&quot;-20</td>
<td>75 55</td>
<td>115 85</td>
<td>165 120</td>
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<tr>
<td>9/16&quot;-12</td>
<td>95 70</td>
<td>150 110</td>
<td>210 155</td>
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<td>9/16&quot;-18</td>
<td>105 79</td>
<td>165 120</td>
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<td>5/8&quot;-11</td>
<td>130 97</td>
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<td>5/8&quot;-18</td>
<td>150 110</td>
<td>230 170</td>
<td>325 240</td>
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<td>3/4&quot;-10</td>
<td>235 170</td>
<td>360 265</td>
<td>510 375</td>
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<td>3/4&quot;-16</td>
<td>260 190</td>
<td>405 295</td>
<td>570 420</td>
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<td>7/8&quot;-9</td>
<td>225 165</td>
<td>585 430</td>
<td>820 605</td>
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<td>7/8&quot;-14</td>
<td>250 185</td>
<td>640 475</td>
<td>905 670</td>
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<tr>
<td>1-8</td>
<td>340 250</td>
<td>875 645</td>
<td>1230 910</td>
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<tr>
<td>1-12</td>
<td>370 275</td>
<td>955 705</td>
<td>1350 995</td>
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<tr>
<td>1½-7</td>
<td>480 355</td>
<td>1080 795</td>
<td>1750 1290</td>
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<tr>
<td>1½-12</td>
<td>540 395</td>
<td>1210 890</td>
<td>1960 1440</td>
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<td>1½-7</td>
<td>680 500</td>
<td>1520 1120</td>
<td>2460 1820</td>
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<td>1½-12</td>
<td>750 555</td>
<td>1680 1240</td>
<td>2730 2010</td>
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<td>1¾-6</td>
<td>890 655</td>
<td>1990 1470</td>
<td>3230 2380</td>
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<td>1¾-12</td>
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<td>2270 1670</td>
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<td>1¾-6</td>
<td>1180 870</td>
<td>2640 1950</td>
<td>4290 3160</td>
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<td>1¾-12</td>
<td>1330 980</td>
<td>2970 2190</td>
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<table>
<thead>
<tr>
<th>Class 8.8</th>
<th>Class 10.9</th>
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<tbody>
<tr>
<td>mm x pitch c</td>
<td>N·m ft-lbd</td>
</tr>
<tr>
<td>M 5 X 0.8</td>
<td>4 3</td>
</tr>
<tr>
<td>M 6 X 1</td>
<td>7 5</td>
</tr>
<tr>
<td>M 8 X 1.25</td>
<td>17 12</td>
</tr>
<tr>
<td>M 8 X 1</td>
<td>18 13</td>
</tr>
<tr>
<td>M10 X 1.5</td>
<td>33 24</td>
</tr>
<tr>
<td>M10 X 0.75</td>
<td>39 29</td>
</tr>
<tr>
<td>M12 X 1.75</td>
<td>58 42</td>
</tr>
<tr>
<td>M12 X 1.5</td>
<td>60 44</td>
</tr>
<tr>
<td>M12 X 1</td>
<td>90 66</td>
</tr>
<tr>
<td>M14 X 2</td>
<td>92 68</td>
</tr>
<tr>
<td>M14 X 1.5</td>
<td>99 73</td>
</tr>
<tr>
<td>M16 X 2</td>
<td>145 105</td>
</tr>
<tr>
<td>M16 X 1.5</td>
<td>155 115</td>
</tr>
<tr>
<td>M18 X 2.5</td>
<td>195 145</td>
</tr>
<tr>
<td>M18 X 1.5</td>
<td>220 165</td>
</tr>
<tr>
<td>M20 X 2.5</td>
<td>280 205</td>
</tr>
<tr>
<td>M20 X 1.5</td>
<td>310 230</td>
</tr>
<tr>
<td>M24 X 3</td>
<td>480 355</td>
</tr>
<tr>
<td>M24 X 2</td>
<td>525 390</td>
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<tr>
<td>M30 X 3.5</td>
<td>960 705</td>
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<tr>
<td>M30 X 2</td>
<td>1060 785</td>
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<tr>
<td>M36 X 3.5</td>
<td>1730 1270</td>
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<tr>
<td>M36 X 2</td>
<td>1880 1380</td>
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</tbody>
</table>

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
Fan and Steering Hydraulics
Hydraulic Drive (Option)
Chain Routing

Legend:

- **34T** Sprocket or idler Tooth count
- **56P** Chain Pitch count
- **120** Direction of chain in motion

Gauge Wheel (Ground Drive) Chains

<table>
<thead>
<tr>
<th>A</th>
<th>Range Sprockets: 15T, 18T, 19T, 20T, 30T, 38T</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Transmission Sprockets: 17T, 19T, 2@23T, 24T, 25T, 26T, 27T, 28T</td>
</tr>
</tbody>
</table>

![Diagram of Gauge Wheel (Ground Drive) Chains]
Transmission (Ground Drive) Chains

Right side shown

<table>
<thead>
<tr>
<th></th>
<th>Range Sprockets:</th>
</tr>
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<tbody>
<tr>
<td>A</td>
<td>15T, 18T, 19T, 20T, 30T, 38T</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Transmission Sprockets:</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>17T, 19T, 2@23T, 24T, 25T, 26T, 27T, 28T</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Upper Drive Sprockets:</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>18T or 36T, captive</td>
</tr>
</tbody>
</table>
Ground Drive Chain

Left side shown
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)

Note: ① No idlers on mount.
① top chain passes over single idler on shank
② be sure to reconnect idler spring

25P: Meter Drive (Mid type)

Note: ② be sure to reconnect idler spring
③ top chain passes between 2 idlers at mount
④ top chain passes between 2 idlers at shank

25P: Meter Drive (Rear type)

Note: ② be sure to reconnect idler spring
③ top chain passes between 2 idlers at mount
④ top chain passes between 2 idlers at shank
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