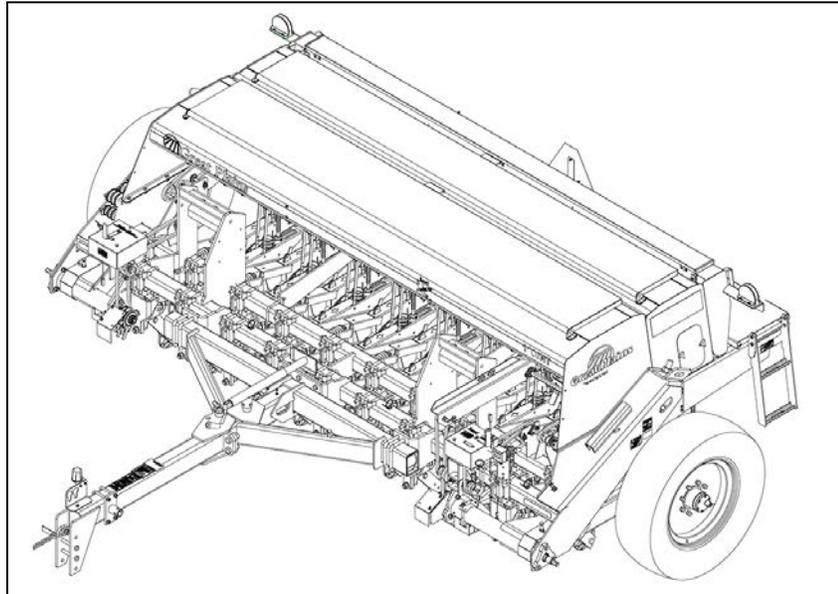


Pre-Delivery Instructions

1206NT
End-Wheel, No-Till Drill



Read this 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.

ORIGINAL INSTRUCTIONS



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150-166Q

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Important Safety Information

Look for Safety Symbol

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



Be Aware of Signal Words

Signal words designate a degree or level of hazard seriousness.

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



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



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



Prepare for Emergencies

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



000
112
911
999



Be Familiar with Safety Decals

- ▲ *Read and understand "Safety Decals" on page 5, thoroughly.*
- ▲ *Read all instructions noted on the decals.*
- ▲ *Keep decals clean. Replace damaged, faded and illegible decals.*



Wear Protective Equipment

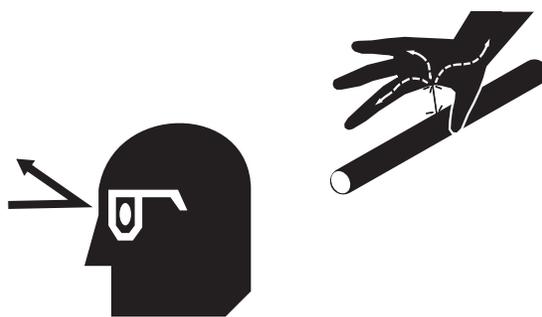
- ▲ *Wear protective clothing and equipment.*
- ▲ *Wear clothing and equipment appropriate for the job. Avoid loose-fitting clothing.*
- ▲ *Because prolonged exposure to loud noise can cause hearing impairment or hearing loss, wear suitable hearing protection such as earmuffs or earplugs.*
- ▲ *Because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



Avoid High Pressure Fluids

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

- ▲ *Avoid the hazard by relieving pressure before disconnecting hydraulic lines.*
- ▲ *Use a piece of paper or cardboard, NOT BODY PARTS, to check for suspected leaks.*
- ▲ *Wear protective gloves and safety glasses or goggles when working with hydraulic systems.*
- ▲ *If an accident occurs, seek immediate medical assistance from a physician familiar with this type of injury.*
- ▲ *If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene can result.*



Handle Chemicals Properly

- ▲ *Read and follow chemical manufacturer's instructions.*
- ▲ *Wear protective clothing.*
- ▲ *Handle all chemicals with care.*
- ▲ *Agricultural chemicals can be dangerous. Improper use can seriously injure persons, animals, plants, soil and property.*
- ▲ *Inhaling smoke from any type of chemical fire is a serious health hazard.*
- ▲ *Store or dispose of unused chemicals as specified by the chemical manufacturer.*
- ▲ *Immediately and thoroughly flush any area of the body that is contaminated by chemicals.*
- ▲ *If chemical is swallowed, carefully follow the chemical manufacturer's recommendations and consult with a doctor.*
- ▲ *If persons are exposed to a chemical in a way that could affect their health, consult a doctor immediately with the chemical label or container in hand. Any delay could cause serious illness or death.*
- ▲ *Dispose of empty chemical containers properly. By law rinsing of the used chemical container must be repeated three times. Puncture the container to prevent future use. An alternative is to jet-rinse or pressure rinse the container.*
- ▲ *After working with chemicals, wash hands and face before eating. Shower when application is completed for the day.*



- ▲ *Never wash out the tanks within 100 feet (30m) of any freshwater source or in a car wash.*
- ▲ *Rinse out the tank. Apply rinse water on last field treated.*

Keep Riders Off Machinery

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

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



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

- ▲ *Do not exceed 20 mph (32 km/h). Never travel speeds which do not allow adequate control of steering and stopping. Reduce speed if towed load is not equipped with brakes.*
- ▲ *Comply with state and local laws.*
- ▲ *Do not tow an implement that, when fully loaded, weighs more than 1.5 times the weight of towing vehicle.*
- ▲ *Carry reflectors or flags to mark drill in case of breakdown on the road.*
- ▲ *Keep clear of overhead power lines and other obstructions when transporting. Refer to transport dimensions in the Operator's Manual.*



Shutdown and Storage

- ▲ Lower drill, put tractor in park, turn off engine, and remove the key.
- ▲ Secure drill using blocks and supports provided.
- ▲ Detach and store drill in an area where children normally do not play. Use A Safety Chain
- ▲ Use a safety chain to help control drawn machinery should it separate from tractor drawbar.
- ▲ Use a chain with a strength rating equal to or greater than the gross weight of towed machinery.
- ▲ Attach chain to tractor drawbar support or other specified anchor location. Allow only enough slack in chain to permit turning.
- ▲ Replace chain if any links or end fittings are broken, stretched or damaged.
- ▲ Do not use safety chain for towing.

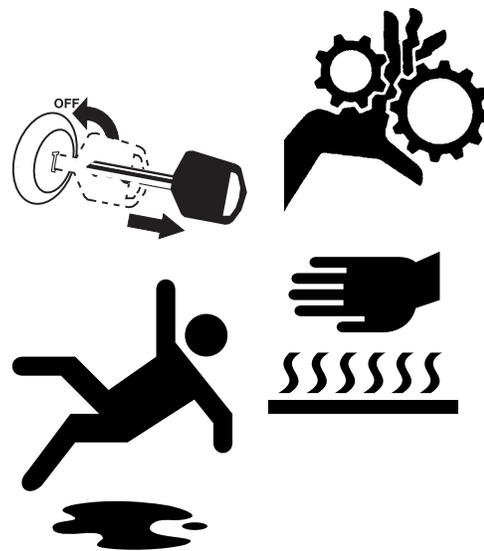
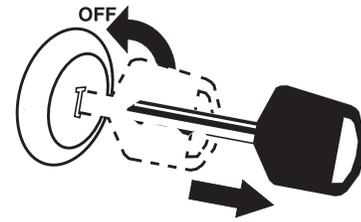
Tire Safety

Tire changing can be dangerous and must 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

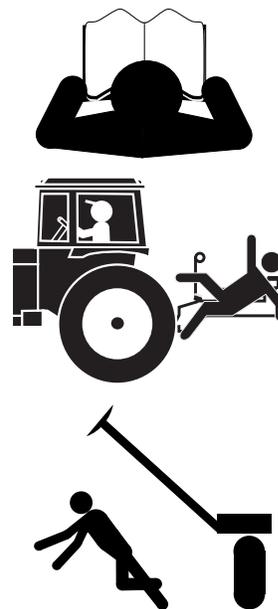
- ▲ Understand procedure before doing work. Use proper tools and equipment. Refer to this manual for additional information.
- ▲ Work in a clean, dry area.
- ▲ Lower the drill, put tractor in park, turn off engine, and remove key before performing maintenance.
- ▲ Make sure all moving parts have stopped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



Safety At All Times

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

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



Safety Decals

Safety Reflectors and Decals

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

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

To install new decals:

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



Introduction

Great Plains Manufacturing wants you to be satisfied with any new machine delivered by the Great Plains Trucking network. To ease the assembly task and produce a properly working machine, read this entire manual before assembling or setting up new equipment.

Description of Unit

The 1206NT No-Till Drill is a 12' grain drill of end wheel design which couples Great Plains spring mounted coulters with a straight arm design of our solid stand opener to achieve no-till drilling capabilities. The end wheel design keeps the ground-working components in line with the end wheels for accurate coulters depth and seed placement over uneven terrain and allows the unit to follow field curves without side-loading the openers.

Models covered

1206NT-1410	End Wheel No-Till 12 ft. 10 in.
1206NT-1808	End Wheel No-Till 12 ft. 8 in.
1206NT-1975	End Wheel No-Till 12 ft. 7-1/2 in.
1206NT-2007	End Wheel No-Till 12 ft. 7 in.

Document Family

150-166Q	Pre-Delivery Manual (this document)
150-166M	Operator Manual
150-166P	1206NT Parts Manual
150-166B	Seed Rate Manual

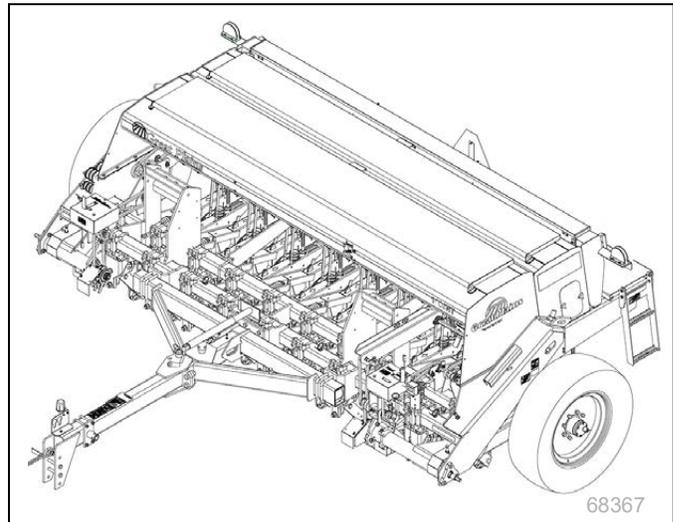


Figure 1
1206NT No-Till Drill

Using This Manual

This manual was written to help you assemble and prepare the new machine for the customer. The manual includes instructions for assembly and setup. Read this manual and follow the recommendations for safe, efficient and proper assembly and setup.

An operator's manual is also provided with the new machine. Read and understand "Important Safety Information" and "Operating Instructions" in the operator's manual before assembling the machine. As a reference, keep the operator's manual on hand while assembling.

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

Definitions

The following terms are used throughout this manual.

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

NOTICE

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

Read and follow the directions to:

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

NOTE:

Useful information about the preceding topic.

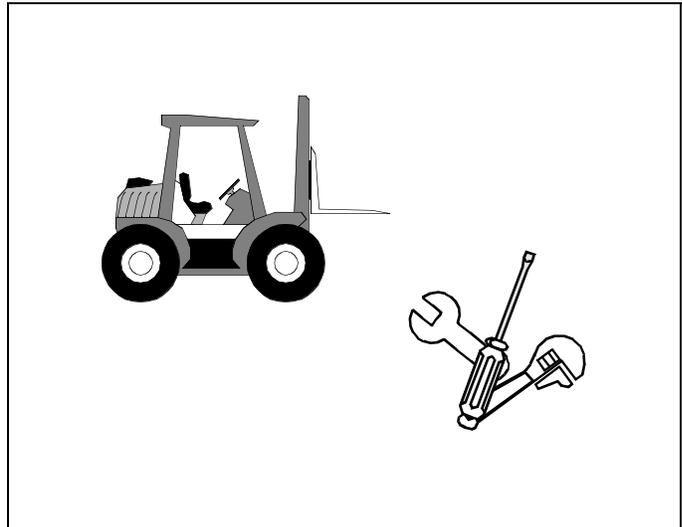
Further Assistance

For additional help with understanding these assembly instructions or for any other assembly or setup related questions, please contact our service department at the following address:

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

Or call us at **(800) 270-9302** to speak over the phone with a service representative.

Copies of this machine's operator manual are available by mail or online. Please visit **www.greatplainsag.com** and follow the product link for information on your machine.





Preparation

Step-by-step instructions for assembling the drill begin in the next section of the manual. Before commencing work, review the Tools Required and Pre-Assembly Checklist to make sure you have all necessary parts and equipment.

The drill is shipped via flat bed truck. It is the dealer's responsibility to unload the new machine. Unload all equipment before beginning assembly.

The general sequence of work is:

Assembly

- Unload frame, tongue and accessories from truck.
- Assemble tongue to mainframe.
- Route hoses and harness.

Setup

- Adjust hitch height.
- Hitch to tractor.
- Level drill.
- Bleed hydraulics.
- Install accessories and Options.
- Set coultter depth control. (**Do not skip this step!**)

Tools Required

- Lift or overhead hoist with a minimum lifting capacity of 8000 pounds (3628 kg).
- A tractor of sufficient size and horsepower with remote hydraulics. Refer to "**Specifications and Capacities**" in the Operator's Manual.

If the tractor to be used with the drill is not available during setup, obtain a measurement of its hitch height.

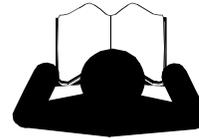
- General hand tools
- Jack stands or blocks and safety chain.

NOTE:

You need about 1 gallon (3.8 liters) of hydraulic oil to refill the tractor hydraulic reservoir after initial bleeding and cycling of the hydraulic system.

Assembly and Setup Assistance

To order additional copies of predelivery instructions or operator's and parts manuals, write to the following address. Include model numbers in all correspondence.



NOTICE

Do not attempt any assembly work while the drill is on the truck.



Unloading the Truck

NOTICE

Hoist drill from above.

*Do not fork-lift from beneath drill.
There are no suitable lift points.*

Do not hoist via lugs after tongue is installed in the working position.

Drill is not balanced at lugs with tongue installed.

1. If the tongue is shipped separate from the machine, use hoist or lift to remove the tongue from truck.
2. Use hoist or lift to remove any accessories from truck.

NOTICE

Do not install accessories while the machine is on the truck.

3. Secure lifting lines to the lugs above the lift cylinder eyebolts. Prior to tongue installation, these lugs permit nearly level lifting of the drill. The lugs are marked with lift point decals.
4. Lift drill from truck and lower at assembly point.
5. Remove small parts from main seed box.

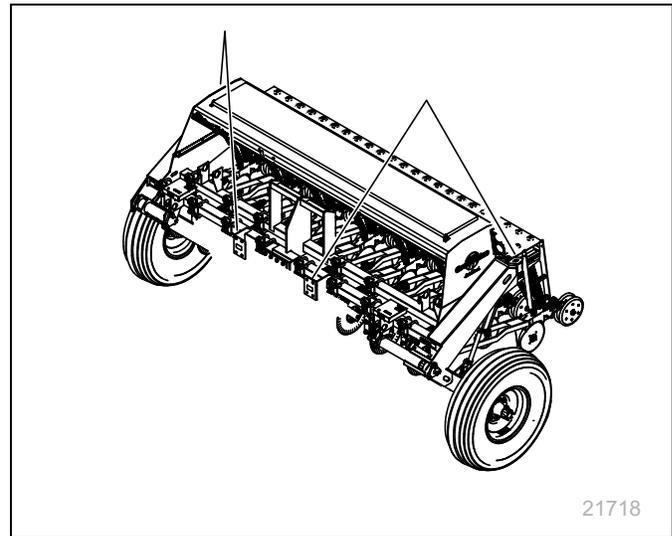


Figure 2
Hoisting Lines





Assembly

The following headings are step-by-step instructions for assembling the drill. Begin with “Tools Required” and “Pre-Assembly Checklist” to make sure you have all necessary parts and equipment. Follow each step to make the job as quick and safe as possible and produce a properly working machine.

The drill is shipped via flat bed truck. It is the dealer’s responsibility to unload the new machine. Unload all equipment before beginning assembly.

NOTICE

Do not attempt any assembly work while the machine is on the truck.

Tools Required

- Fork lift, overhead hoist, or loader
- General hand tools.

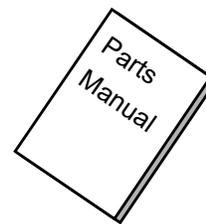
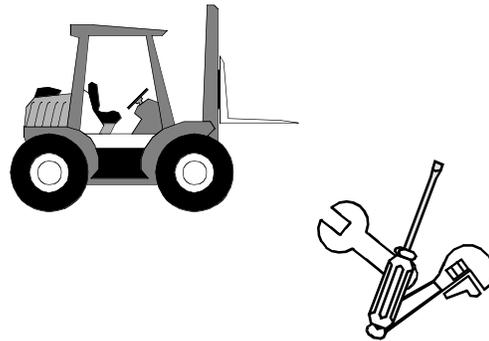
Pre-Assembly Checklist

1. Before assembling, read and understand the safety information in this book.
2. Have at least two people on hand while assembling.
3. Make sure assembly area is level and free of obstructions (preferably an open concrete area).
4. Have all major components.
5. Have all fasteners and pins shipped with the drill.

NOTICE

If a pre-assembled part or fastener is temporarily removed, remember where it goes. Keep the parts separated.

6. Have a copy of the parts manual on hand. If unsure of proper placement or use of any part or fastener, refer to the parts manual.
7. Check that all working parts are moving freely, bolts are tight, and cotter pins are spread.
8. Check for proper tension and alignment on all drive chains.
9. Check that all safety decals and reflectors are located correctly and legible. Replace if improperly located or damaged. Refer to “Safety Decals” in the operator’s manual.
10. Inflate tires to recommended pressure as listed in the “**Appendix**” on page 22. Tighten wheel bolts as specified on “**Torque Values Chart**” on page 22.



Removing Tongue, if Shipped Attached

1. Use hoist or lift to support the front of the drill while the tongue is being removed and installed.
2. Use hoist or lift to support the tongue (1).
3. A shipping bracket (2) is used to hold the tongue to the mainframe during shipping. Carefully remove and discard the shipping bracket and the mounting hardware (3).
4. Lower the tongue to the floor so the rear jack mounting tube (4) is on the top of the tongue.

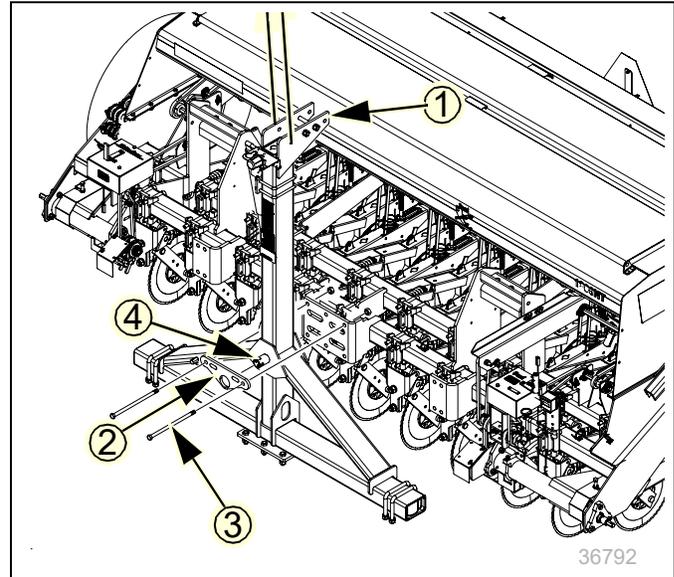


Figure 3
Removing Tongue from Mainframe

Prepare Folding Tongue

1. If tongue is already unfolded, continue at **Install Tongue**.
2. Support the forward end of the rear tongue weldment (1) off the ground by at least 6 in. (15cm). Use a hoist line or place a block under it.
3. Remove the locking pin (2) from the folding tongue.
4. Swing the folding tongue forward and secure with bolts (3), lock washers (4), and nuts (5).
5. Install the locking pin in front half of the tongue and the lock tube (6) on rear tongue weldment. Install the hair pin.

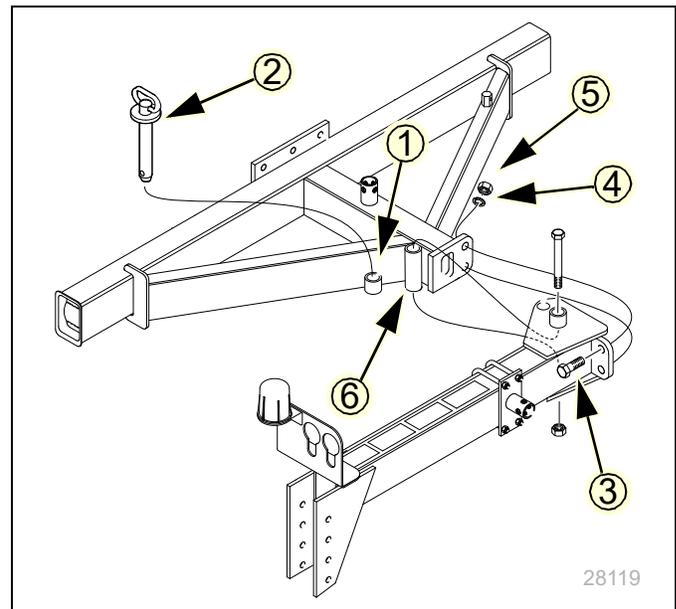


Figure 4
Unfolding Tongue

Install Tongue

The following instruction apply to both the standard and the folding tongue.

1. Remove the six mounting bolts and four U-bolts from the tongue.
2. Connect hoist lines (1) at available hitch holes (2), and around rear tongue tube (3), behind brace tubes (4).

WARNING

Crushing hazard. You may be severely injured by frames if they fall. Always support frame sections with jack stands or blocks before working under frames raised off ground.

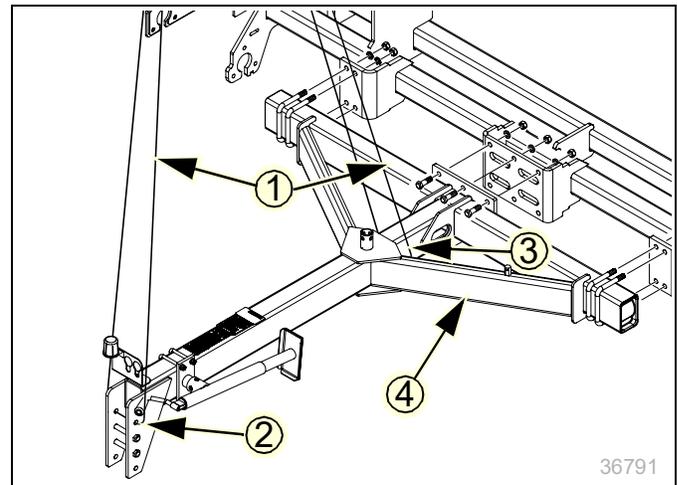


Figure 5
Installing Tongue

3. Align the mounting plate (5) on the tongue with the mounting plate (6) on the mainframe. Insert a bolt (7) at the top center hole and secure finger tight with lock washer and nut.
4. Level tongue from side to side relative to mainframe. Install the remainder of the hardware in the center mounting plate. Fasten finger tight.
5. Insert all four U-bolts (8), and install lock washers, and nuts. Fasten finger tight.
6. Tighten the all of the nuts the on the bolts and U-bolts to 265 ft-lb (350 Nm).

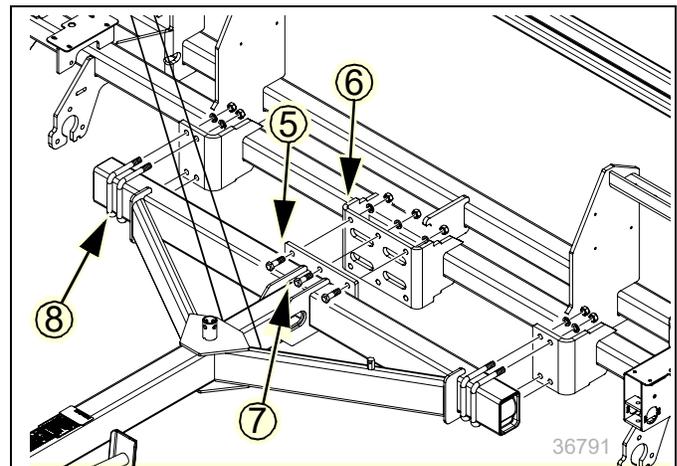


Figure 6
Fastening Tongue

7. Remove hair pin and clevis pin from the jack (9). Install the jack on the front jack mounting tube (10). Put the jack in the vertical position and install the clevis pin and hair pin.
8. Crank the jack down just until the weight of the forward end of the tongue is supported by the jack.
9. Remove all lifting equipment and any blocks.

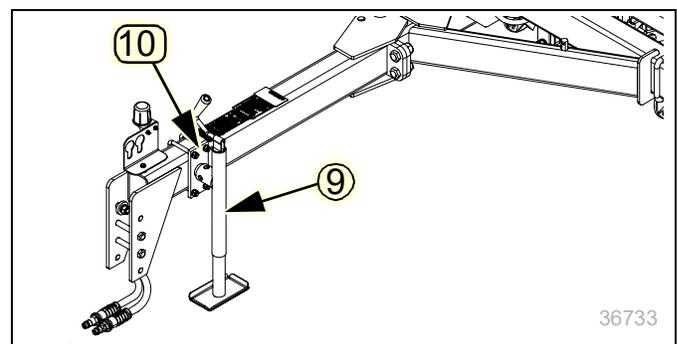


Figure 7
Secure Tongue

Lighting and Hydraulic Hoses

The hydraulic hoses are pre-installed on the drill and are tied to the hitch mounting plate.

The lights may be assembled or may be shipped in the seed box or separately to prevent damage to the lighting system during transport and loading.

NOTICE

*If the drill is delivered with the lights not assembled, the dealer **must** assemble the lights on the drill prior to selling the drill.*

1. At one end of the drill, install a spacer (1), lamp bracket (2), and handle (3) using two 1/2-13 x 1 inch bolts (4) and two flange lock nuts (5).

NOTE:

Make sure the horizontal flange of the lamp bracket is toward the front of the drill.

2. Install an amber lamp (6) to the bracket with two 1/4-20x3/4 inch self tapping screws (7).
3. Install a hose clip (8) to the lamp bracket with a 3/8-16x3/4 bolt (9), lock washer (10), and nut (11).
4. Secure the wiring harness to the hose clip.
5. Place a red reflector (12) to the lamp bracket facing rearward.
6. Repeat the procedure for the other amber lamp.

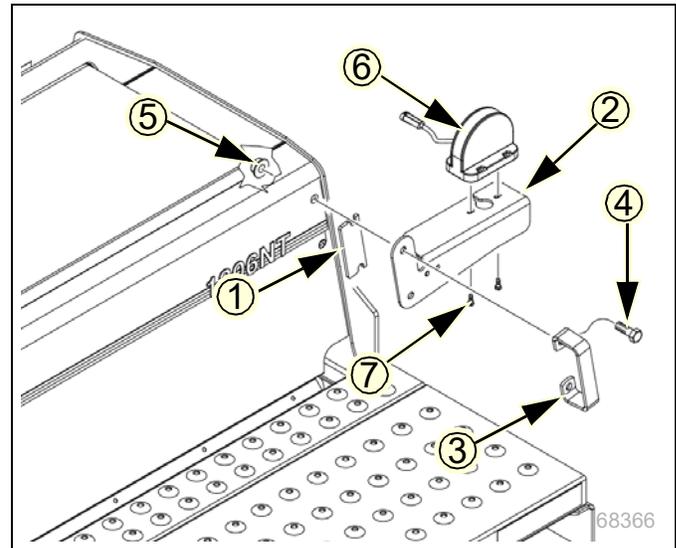


Figure 8
Amber Lamp Installation

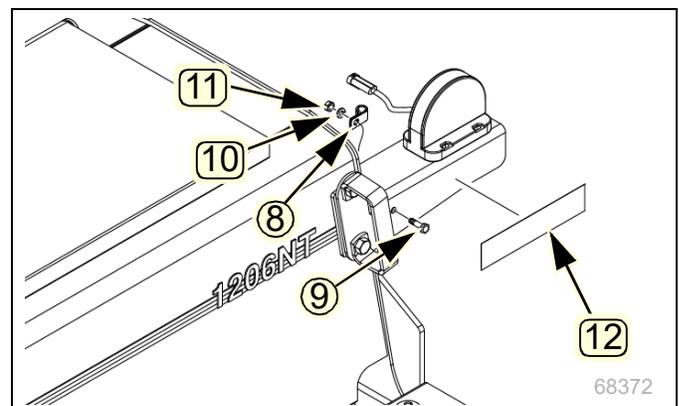


Figure 9
Reflector Installation

Route Hoses and Harnesses

1. Connect the rear lighting harness (1) to the red lamps under the walkboard and amber lamps.
2. Fasten the module (2) of the middle lighting harness (3) to the tongue with 1/4-20x1 inch bolts (4) and nuts (5). Connect the middle lighting harness to the rear wiring harness.
3. Connect the front lighting harness (6) to the middle lighting harness. Use wire ties (7) to fasten the wiring harnesses to the drill.
4. Tape or tie the tractor connector (8) on the front lighting harness to the hose bundle at the quick-disconnect fittings.
5. Remove the color-coded hose grips before attempting to route the hydraulic hoses through the tongue.

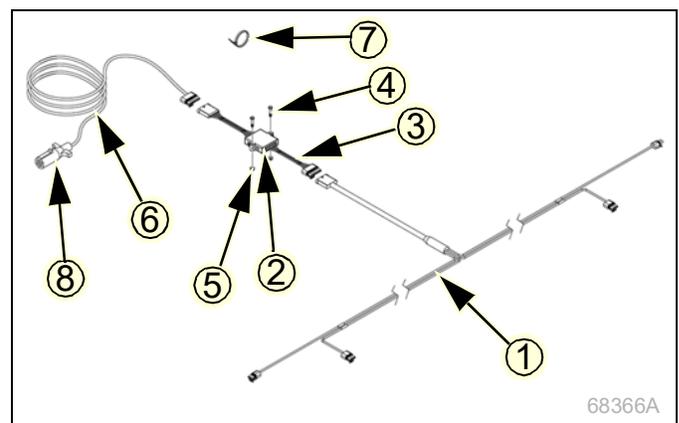


Figure 10
Connect Light Harnesses

6. Once hydraulic hoses are routed through the tongue, attach color-coded grips to the correct hydraulic hose. Retract grip and hose go to the rod end of the cylinder. Extend grip and hose go to the base end of the cylinder.
7. Route the hose and lighting harness bundle (9) under the rear cross-tube of the tongue, into the access hole (10), and out the front of the tongue tube near the hitch.
8. Un-tape/tie the lighting harness. Fasten the lighting connector and hydraulic quick disconnect fittings to the holder plate (11).

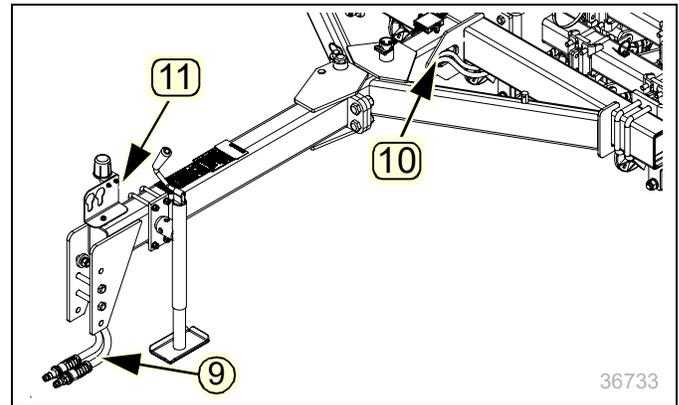


Figure 11
Route Hoses and Harness



Deferred Option Assembly

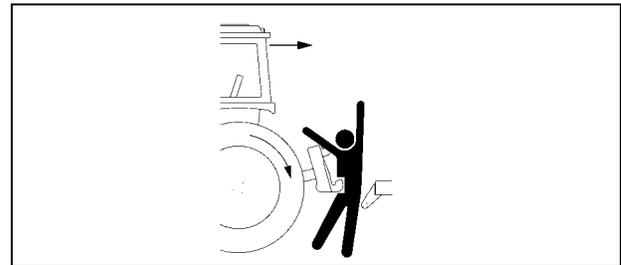
Some optional drill features are not factory-installed, or may have been ordered for field installation. Although they are “assembly” items, they may require a hitched tractor, and/or that drill hydraulics be functioning (for drill lift/lower). Do not install optional features until the setup procedure is complete. These options include their own Installation Instructions.

Hitching Tractor to Drill

⚠ DANGER

Crushing Hazard:

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



Clevis Hitch Assembly

1. Insert upper hitch plate (1) into clevis hitch (2) with a spacer tube (3) on each side of ball swivel.
2. Bolt in place with 1 x 5-1/2 inch bolt (4), flat washer (5) and Nylock nut (6).

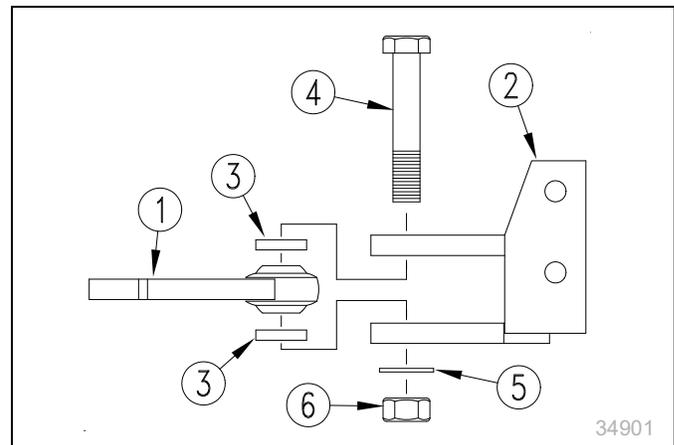


Figure 12
Hitch Assembly

Adjust Hitch Height

Although the specified hitch option (clevis or pintle) is factory-installed, it may not be at ideal tractor height.

If a clevis hitch was specified, it needs to be assembled on the tractor drawbar.

Hitch Heights

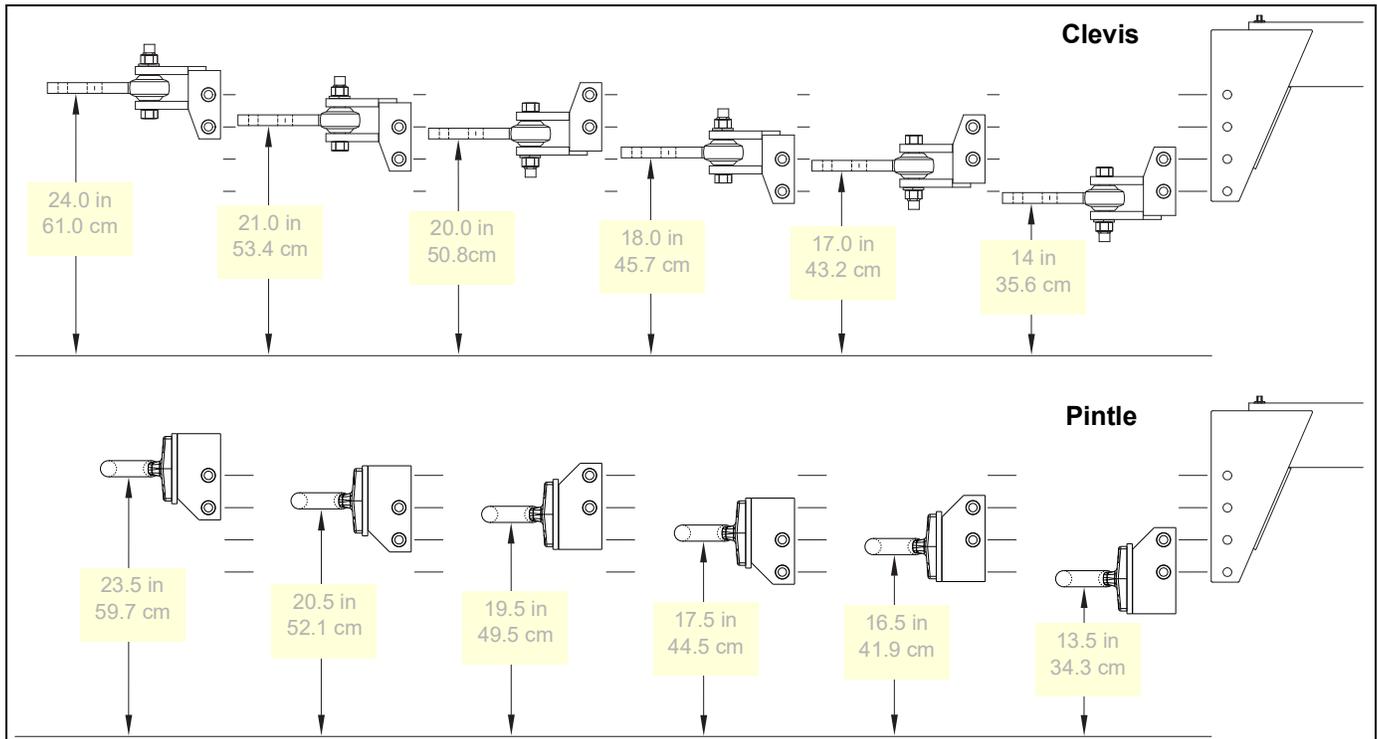


Figure 13
Hitch Heights (Tongue Level in Field Position)

28115

The drill operates more effectively if the tongue is level in field position.

The drill needs to be lowered (in field position) for the following measurements and any adjustments.

1. If the intended tractor is available, and has an adjustable or invertible drawbar, set the drawbar to the operator's preferred height. If the tractor is not available, obtain a measurement of the height:
 - clevis hitch: to the bottom surface of the drawbar
 - pintle hitch: to the top surface of the lower claw.
2. Use the parking jack to adjust the tongue until it is level from front to back. If the work surface itself is level, use a carpenter's level on top of the tongue tube. When level, the top of the tube is approximately 26 $\frac{3}{4}$ in. (68cm) above ground at the hitch.
3. Measure from ground to:
 - clevis hitch: to the top surface of lower lug
 - pintle hitch: to the bottom of ring.

Adjusting Either Hitch

If the proposed hitch adjustment does not involve the hole used for the safety chain, skip step 2 and step 7.

1. Determine which tongue mounting holes and which hitch orientation provide the necessary height. See "Adjust Hitch Height" on page 14.
2. If chain is presently using either new hole pair, remove and save one each:
 - (1) 802-212C HHCS 3/4-10X2 1/2 GR5
 - (2) 890-182C SAFETY CHAIN 10000 LB
 - (3) 177-587D SAFETY CHAIN WASHER
 - (4) 804-023C WASHER LOCK SPRING 3/4 PLT
 - (5) 803-027C NUT HEX 3/4-10 PLT

Adjusting Clevis Ball Hitch

3. If new position requires inverting hitch, remove:
 - (6) 802-205C HHCS 1-8X5 1/2 GR5
 - (7) 804-028C WASHER FLAT 1 USS PLT
 - (8) 803-038C NUT HEX 1-8 NYLON INSERT PLT
 Insert bolt (6) from other side of hitch and secure with flat washer (7) and lock nut (8). Bolt must always be inserted from top in final position.
4. Remove:
 - (9) 802-070C HHCS 3/4-10X6 GR5
 - (10) 804-023C WASHER LOCK SPRING 3/4 PLT
 - (11) 803-027C NUT HEX 3/4-10 PLT
 Adjust hitch to new position and secure with bolts (9), lock washers (10), and nuts (11).
5. If ball swivel mount bottom plate (12) is present, make sure it is under mount weldment (13) and the bolts are inserted from top. Refer to page 15 for details.

Adjusting Pintle Hitch

6. Remove two sets:
 - (14) 802-070C HHCS 3/4-10X6 GR5
 - (15) 804-023C WASHER LOCK SPRING 3/4 PLT
 - (16) 803-027C NUT HEX 3/4-10 PLT
 Adjust pintle hitch (17) to new position and secure with bolts (14), lock washers (15), and nuts (16).

Install Safety Chain

7. Secure the safety chain at the highest available mounting hole. Insert the bolt (1) from the outside of the hitch. Add the safety chain (2), then add the chain washer (3), lock washer (4), and nut (5).

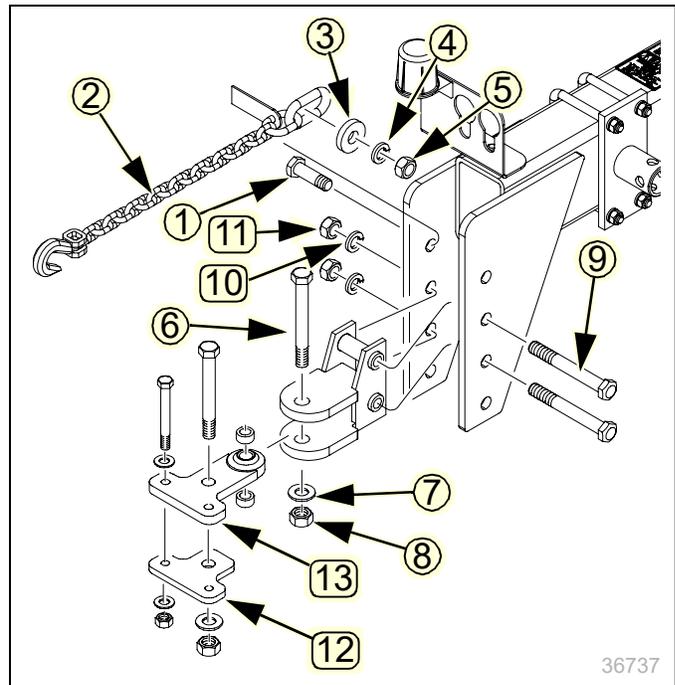


Figure 14
Clevis Hitch and Chain Detail

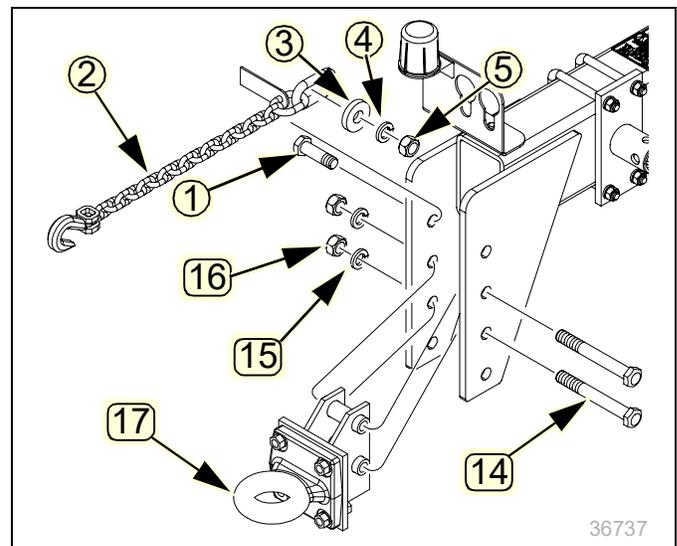
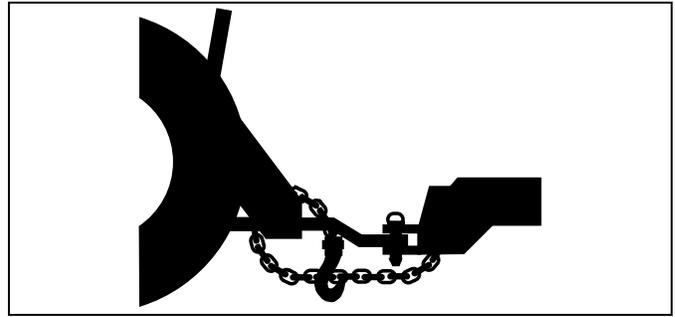


Figure 15
Pintle Hitch Detail

Safety Chain

Connect the safety chain around a suitable anchor location on the tractor. Take up enough chain slack so that no part of the safety chain touches the ground. Make sure there is enough chain slack for turning the tractor and the drill.



Jack Storage

Retract the foot of the jack (1). Remove the jack from the side of the tongue. Install the jack on the mounting tube (2) on the top of the tongue.

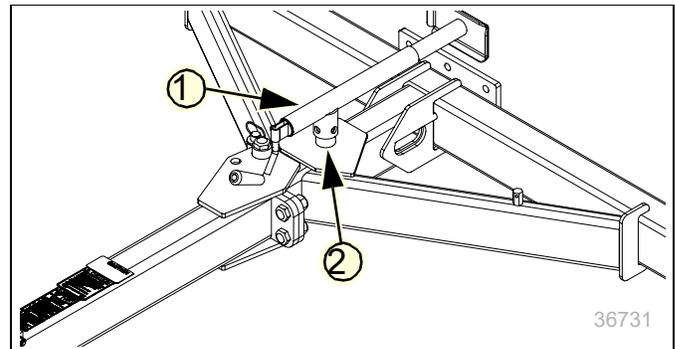


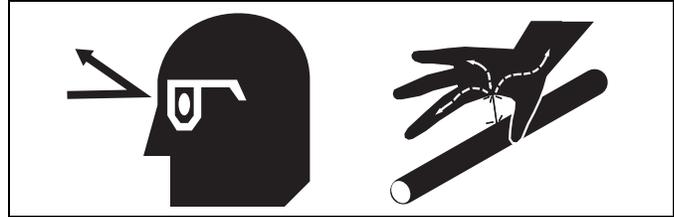
Figure 16
Jack Storage Position

Hydraulic Hookup

⚠ WARNING

High Pressure Fluid Hazard:

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



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

Color	Hydraulic Function
Blue	Transport Lift Cylinders
Orange	Marker Cylinders

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

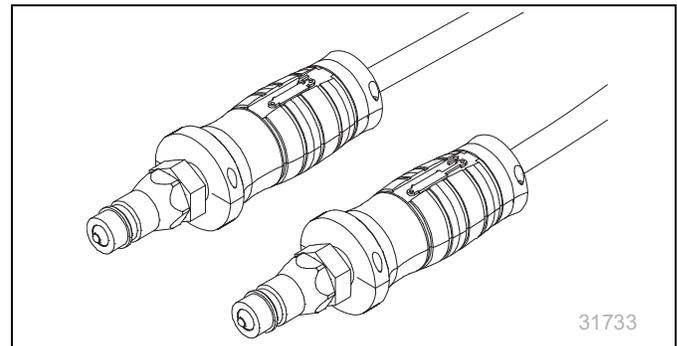


Figure 17
Color-Coded Hose Grips

Transport Lift Cylinder Flow Setting

Set the flow for the transport lift cylinders at the tractor to no more than 9 gpm (34.07 lpm). Hoses with an extended-cylinder symbol feed cylinder base ends. Hoses with a retracted-cylinder symbol feed cylinder rod ends.

Bleeding Hydraulics

⚠ WARNING

High Pressure Fluid Hazard:

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

Only trained personnel should work on system hydraulics!

The drill lifting system is equipped with rephasing type hydraulic cylinders that require a special procedure for bleeding air from the hydraulic circuits. Read and follow this procedure carefully. Rephasing type cylinders will not function properly with air in hydraulic circuit.

1. Check hydraulic fluid in tractor reservoir and fill reservoir to proper level. Drill-system capacity is about 1 gallon. Add fluid to system as needed. A low reservoir level may draw air back into the system, causing jerky or uneven cylinder movements.
2. With drill attached to tractor, jack drill up and support frame at ends near gauge wheels.
3. With drill raised and supported, unpin cylinders from gauge wheel arms and frame. Turn cylinders "rod end up". Wire or otherwise safely support rod ends higher than base ends.

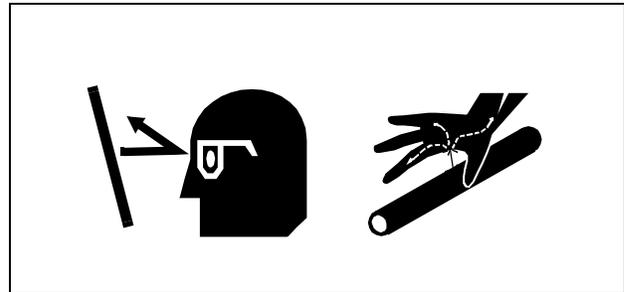
📖 NOTE:

In order to prevent trapped air pockets, rod end must be higher than any other part of cylinder during bleeding operation.

4. With tractor engine idling, engage tractor hydraulics to extend cylinder rods. When cylinder rods are completely extended, hold remote lever on for one minute.
5. Retract cylinders. Extend cylinders again and hold remote lever on for one more minute. Repeat this step two more times to completely bleed system.
6. Pin cylinders to drill frame and gauge wheel arm with transport cylinder locks in place. If any air still is trapped in either cylinder, the cylinder will have a spongy, erratic movement and drill will not raise evenly. If necessary, repeat bleeding process.
7. Fill tractor hydraulic fluid reservoir to its proper level.

📖 NOTE:

After the drill is raised, a slight settling will occur due to the action of the rephasing cylinders.



Rephasing Cylinders

The lift cylinders may, after a period of time, get out of time or phase. The effects of this can be seen when one side of the drill is running too low or too high because its lift cylinder is either over extended or not retracted compared to the other lift cylinder.

To rephase the cylinders, raise drill completely and hold tractor hydraulic lever on for a few seconds to give cylinders time to rephase.

Each time drill is raised out of ground momentarily reverse hydraulic lever immediately after rephasing to allow cylinders to retract approximately $\frac{1}{2}$ inch (12.5 mm). This will help in maintaining a level drill.

NOTE:

Understand that having cylinders become gradually out of time is different than having air trapped in the system from improper bleeding. Each condition is corrected differently.

Leveling Drill

1. Loosen locknuts (2) and adjust cylinder eyebolts (1) so there is initially about $3 \frac{1}{16}$ inch of threads above mounting plate.
2. Raise drill with hydraulics until openers and coulters are 1 to 2 inches off the ground.
3. Measure height of coulters from ground on both ends of drill.
4. Adjust eyebolt to level drill from end to end.
5. Tighten nuts on eyebolts when drill is level.

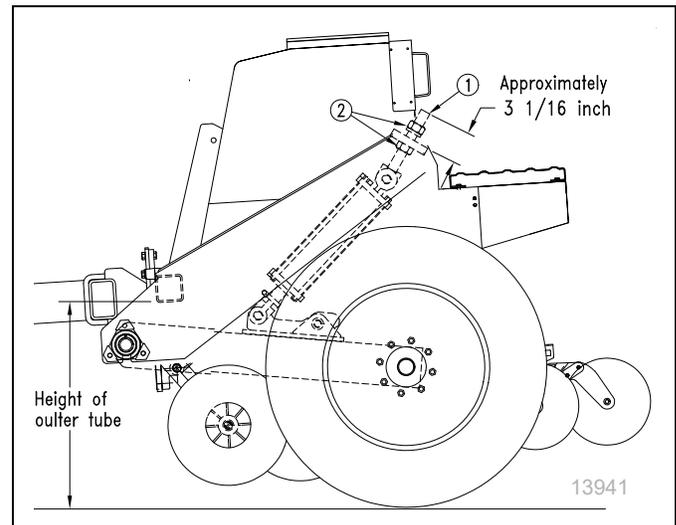


Figure 18
Leveling Drill



Appendix

Tire Size and Pressure

295/75/R x 22.5", 65 psi (4.5 bar)

Torque Values Chart

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

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

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

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

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Hydraulic Connectors and Torque

Refer to Figure 127 (a hypothetical fitting)

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

NPT - National Pipe Thread

- (1) Note tapered threads, no cone/flare, and no O-ring. Apply liquid pipe sealant for hydraulic applications (do not use tape sealant, which can foul filters).

JIC - Joint Industry Conference (SAE J514)

- (2) Note straight threads (4) and the 37° cone (5) on "M" fittings (or 37° flare on "F" fittings). Use no sealants (tape or liquid) on JIC fittings.

ORB - O-Ring Boss (SAE J514)

Note straight threads (5) and elastomer O-Ring (7). Prior to installation, to prevent abrasion during tightening, lubricate O-Ring with clean hydraulic fluid. Use no sealants (tape or liquid) on JIC fittings.

- (3) ORB fittings that need orientation, such as the ell depicted, also have a washer (8) and jam nut (9) ("adjustable thread port stud"). Back jam nut away from washer. Thread fitting into receptacle until O-Ring contacts seat. Unscrew fitting to desired orientation. Tighten jam nut to torque specification.

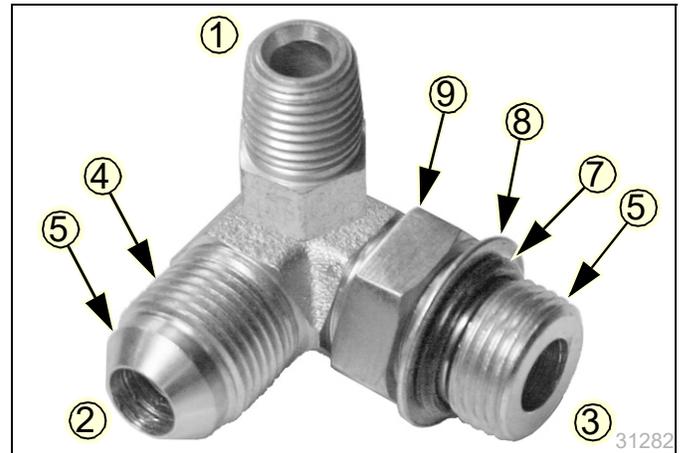


Figure 19
Hydraulic Connector

Fitting Torque Values		
Fitting	Ft•lbs	N•m
1/4 NPT	1.5-3.0 turns past finger tight	
9/16 JIC	18-20	24-27
9/16 ORB w/jam nut	12-16	16-22
9/16 ORB straight	18-24	24-32
3/4 JIC	27-39	37-53
3/4 ORB w/jam nut	20-30	27-41
3/4 ORB straight	27-43	37-58

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Great Plains, Mfg.
1525 E. North St.
P.O. Box 5060
Salina, KS 67402