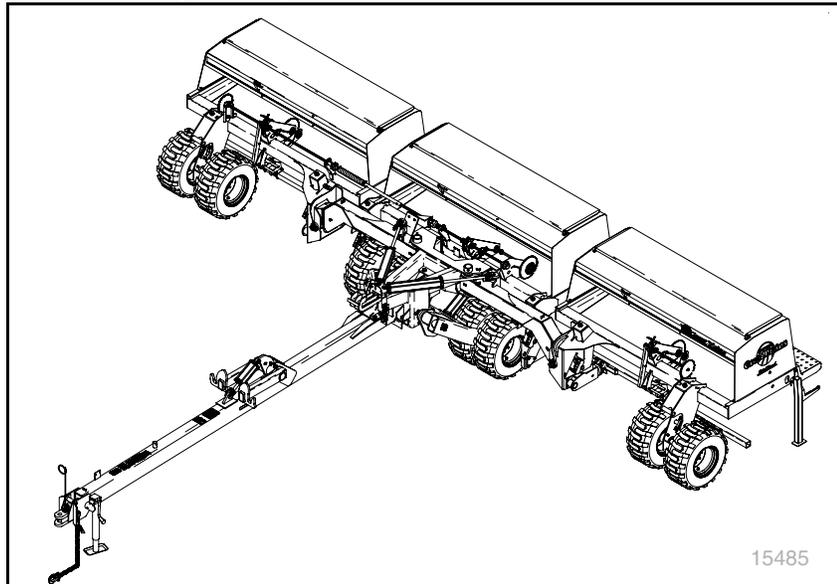


Pre-Delivery Manual

3S-3000HD
Three-Section Folding HD Drill



Read the operator's 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!



Cover illustration may show optional equipment not supplied with standard unit.

ORIGINAL INSTRUCTIONS



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Printed 04/25/2019

195-068Q

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Important Safety Information

For your safety, thoroughly read **Important Safety Information** in the operator's manuals before proceeding.

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.



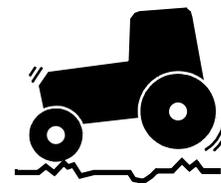
CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.



Transport Machinery Safely

Maximum transport speed for drill is 20 mph (32 kph). Some rough terrains require a slower speed. Sudden braking can cause a towed load to swerve and upset.

- ▲ *Do not exceed 20 mph (32 kph). Never travel at a speed which does not allow adequate control of steering and stopping. Reduce speed if towed load is not equipped with brakes.*
- ▲ *Comply with national, regional and local laws.*
- ▲ *Follow your tractor manual recommendations for maximum hitch loads. Insufficient weight on tractor steering wheels will result in loss of control.*
- ▲ *Carry reflectors or flags to mark drill in case of breakdown on the road.*
- ▲ *Keep clear of overhead power lines and other obstructions when transporting. Refer to transport dimensions under "Specifications and Capacities" on page 36.*



Check for Overhead Lines

Drill markers contacting overhead electrical lines can introduce lethal voltage levels on drill and tractor frames. A person touching almost any metal part can complete the circuit to ground, resulting in serious injury or death.

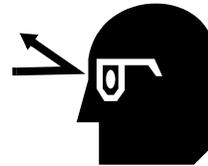
- ▲ *Avoid overhead lines during seed loading/unloading and marker operations.*



Avoid High Pressure Fluids

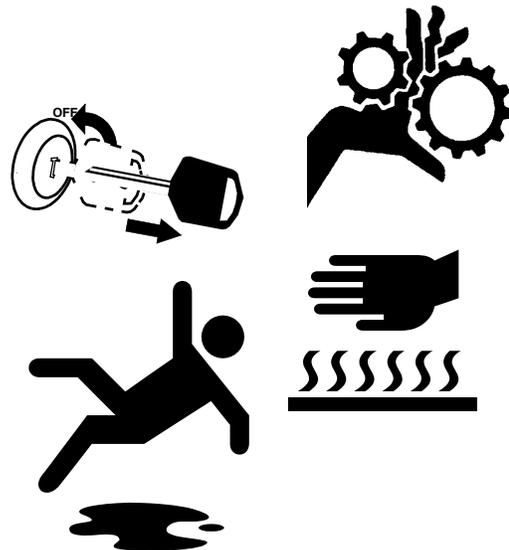
Escaping fluid under pressure can penetrate the skin, causing serious injury.

- ▲ *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, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result.*



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.*
- ▲ *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.*
- ▲ *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.*



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.*



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.*



Safety Decals

Safety Reflectors and Decals

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

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

To install new decals:

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



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.

Document Family

195-068M Owner's Manual
 195-068P 3S-3000HD Parts Manual
 195-068B Seed Rate Manual

Description of Unit

The 3S-3000HD is a towed seeding implement. This three section drill has a working width of 30 feet (12.2m). The drill has straight arm, double disk heavy duty openers. The opener disks make a seed bed, and seed tubes mounted between the disks place seed in the furrow. Press wheels following the opener disks close the furrow and gauge opener seeding depth. A T-handle on the opener body is for seeding depth adjustments. Seeding rates are adjustable with the seed rate adjustment handle and sprocket changes.

The 3S-3000HD features active hydraulic down pressure on the opener frames. When used on a tractor with closed-center hydraulics, constant down pressure ensures even opener penetration in uneven ground. Hydraulic down pressure is adjustable at a single point.

Intended Usage

Use this implement to seed production-agriculture crops in conventional or minimum tillage applications.

Models Covered

3S-3000HD-3610 (10in / 24cm)
 3S-3000HD-4875 (7.5in / 19cm)
 3S-3000HD-6006 (6in / 15cm)

3S-3000HDF-3610 (10in / 24cm)
 3S-3000HDF-4875 (7.5in / 19cm)
 3S-3000HDF-6006 (6in / 15cm)

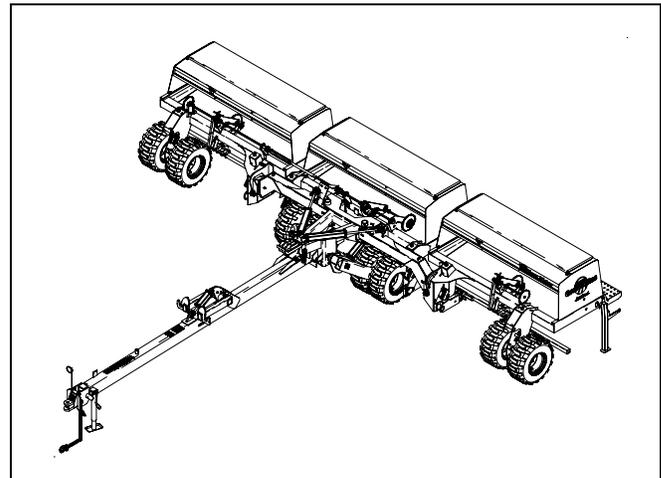
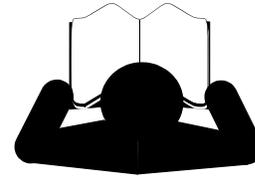


Figure 1
3S-3000HD Drill

15485

Using This Manual

This manual was written to help you assemble and prepare the new machine for the customer. This 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 and Parts manuals on hand while assembling.

Definitions

The following terms are used throughout this manual.

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

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:

Paragraphs in this format provide useful information related to the current 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.

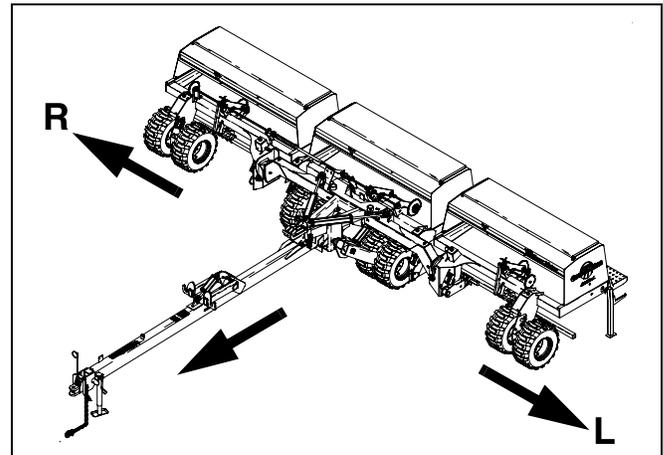


Figure 2
Left/Right Notation

15485



Preparation

Step-by-step instructions for assembling the implement 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 implement is shipped via flat bed truck. It is the dealer's responsibility to unload the new machine. Unload all equipment before beginning assembly.

Scope The Work

Depending on the shipping route and destination, the 3S-3000HD drill may require only light component installation (Wide Load), or it may require assembly of major components (Standard Load).

Wide Load Assembly

The drill is shipped mostly assembled, less walkboards, press wheel arms, press wheels, accessories and some options.

The following items are installed after delivery, in this approximate order:

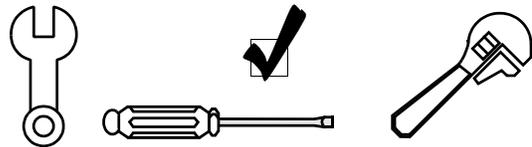
- Walkboards
- Walkboard ladder
- Additional options and accessories not factory-installed, such as acremeter, press wheels, markers, hydraulic kits, shaft monitors and scrapers.

Standard Load Assembly

The drill is shipped substantially disassembled, to keep the trailer under 8.5 feet wide.

The following items are assembled/installed after delivery, in this approximate order:

- Tongue to mainframe assembly
- Center box to Main frame assembly
- Left hand wing box
- Right hand wing box
- Transfer drive shaft
- Additional options and accessories not factory-installed, such as acremeter, press wheels, markers, hydraulic kits, shaft monitors and scrapers.



NOTICE

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

Before Unloading Truck

Before unloading the drill from the truck, connect all opener springs (1) to the opener frames (2).

NOTICE

Opener Damage Risk:

To prevent damage to openers, make sure all openers are connected before unloading the drill.

Overview of Work

All fasteners and miscellaneous components are located in their assembly location, or in bags/cartons inside a drill seed box.

Assembly

1. Unload truck.
2. Assemble major sections (standard load only).
3. Install walkboards, ladders, SMV reflector, and amber lights.
4. Install other standard and optional components that were not factory-installed, but need to be present prior to first hydraulic operations, such as press wheels.

Setup

5. Hitch to suitable tractor.
6. Connect hydraulics.
7. Bleed hydraulics.
8. Level drill.
9. Install any other components or options not factory-installed.

Tools Required

- Forklift, loader or overhead hoist with a capacity of:
Wide Load unload: 13,500 pounds (6124 kg)
Standard Load unload: 3732 pounds (1693 kg)
Standard Load assemble: 2535 pounds (1150 kg)
- A tractor of sufficient size and horsepower with at least two remote hydraulic circuits. Refer to “**Specifications and Capacities**” on page 36.
- General hand tools
- Jack stands or blocks and safety chain

NOTE:

You will need about 4.5 gallons of hydraulic oil to refill the tractor hydraulic reservoir after initial bleeding and cycling of the hydraulic systems.

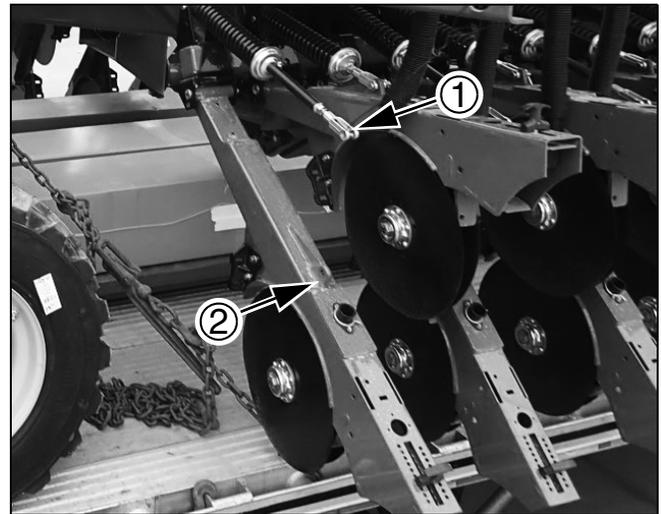


Figure 3
Opener Spring to Opener Frame

71302

Pre-Assembly Checklist

1. Read and understand “**Important Safety Information**” on page 1 before assembling.
 2. Have at least two people on hand while assembling.
 3. Make sure the assembly area is level and free of obstructions (preferably an open concrete area).
Allow room for wing unfolding and any markers (See “**Position for Assembly**” on page 8).
 4. Have all major components accounted for.
 5. Have all fasteners and pins shipped with implement.
 6. Have a copy of the implement Parts Manual (195-068P) 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 that all factory-applied safety labels and reflectors are correctly located and legible. Replace if improperly located or damaged. Refer to **Safety Decals**, in the “**Important Safety Information**” section of the implement Operator’s Manual.
- NOTE:
Some decals may be dealer installed, to prevent decal damage during disassembled shipment.
9. Inflate tires to recommended pressure as listed on the “**Tire Inflation Chart**” in the Operator’s Manual.
 10. Tighten wheel bolts as specified on “**Torque Values Chart**” on page 37.

NOTICE

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



Assembly

Position for Assembly

1. Unload mainframe (standard load) or drill (wide load) from truck and place it in a location that allows for:
 - tow away depth:
28 feet (8.5m) plus
length of tractor plus
turning room
 - wing unfolding:
16 feet (4.9m) either side of centerline, or
32 feet (9.8m) total span), and
 - if markers were ordered:
32 feet (9.8m) either side of centerline, or
64 feet (19.5m) total span.

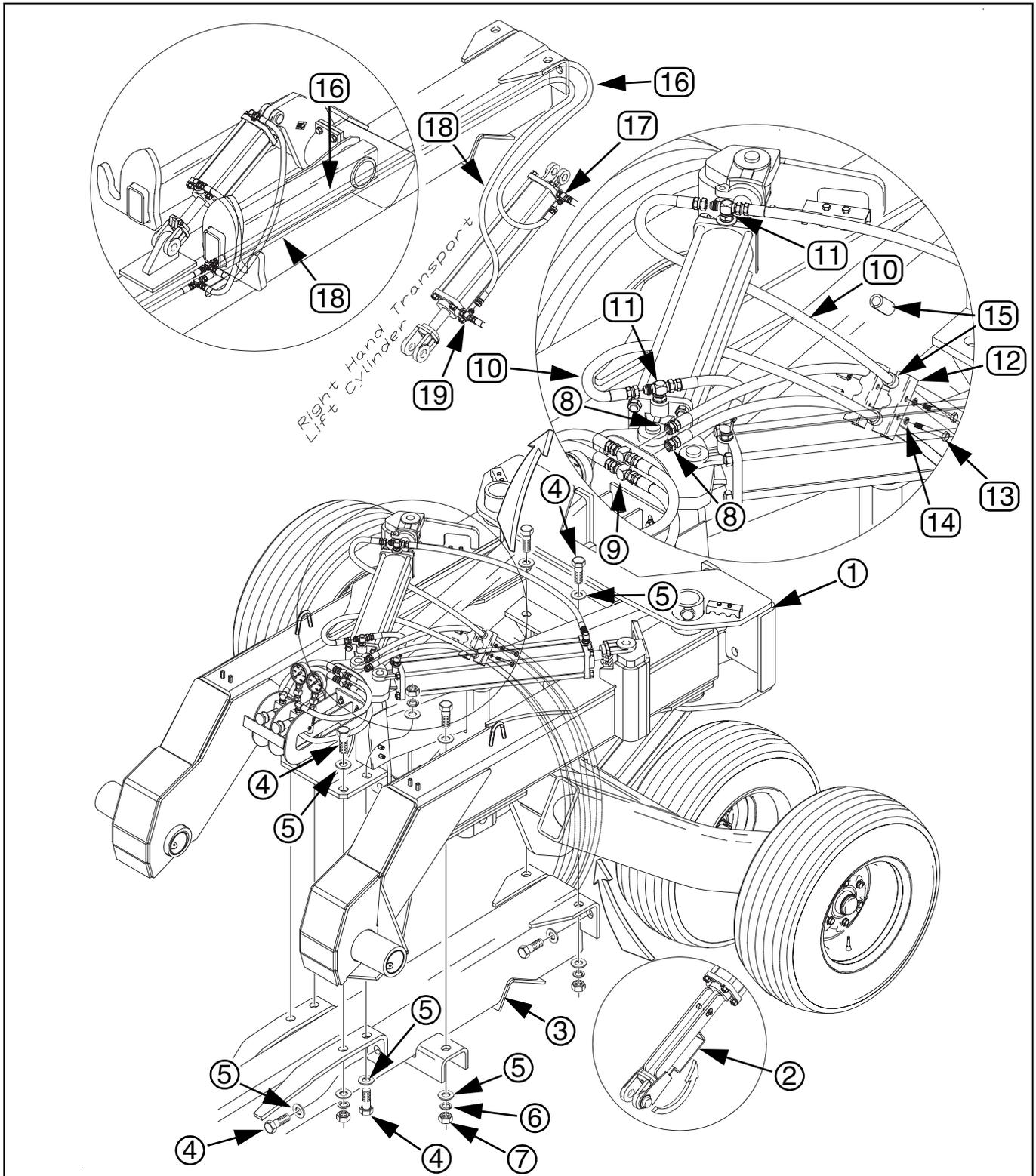
If the drill was shipped as a Wide Load, skip to “**Install Press Wheels**” on page 14.

Assemble Tongue to Mainframe

When space is available on the trailer, the tongue is factory-assembled, in which case skip to “**Install Center Box on Frame**” on page 10.

Refer to Figure 4 on page 9

2. Block the mainframe assembly (1) up in the raised position with the transport cylinders extended and the cylinder lock channels (2) over the cylinder rods.
3. With the aid of a fork-lift, hoist, or loader, position the tongue assembly (3) back under the mainframe assembly (1) and bolt it into place with the twelve 1 x 2 $\frac{3}{4}$ -inch bolts (4), flat washers (5), lock washers (6) and nuts (7).
Lightly tighten all 1-inch bolts before torquing any of them.
4. Once the tongue is assembled, remove the cylinder lock channels (2), completely lower the mainframe assembly and secure it in this position.
5. Route the two long $\frac{3}{8}$ -inch hydraulic hoses (8) from the back of the tongue tube along the right side of the main frame and connect them to the $\frac{9}{16}$ -inch bulkhead tees (9) on the front of the main frame.
6. Route the two long $\frac{1}{4}$ -inch hoses (10) coming out of the back of the tongue to the $\frac{9}{16}$ -inch tees (11) on the rod and base ends of the right fold cylinder.
The fold circuit hoses (10) run the full length of the tongue.
7. Secure the hoses (8) and (10) with a hose clamp bracket (12) and $\frac{5}{16}$ x 2 $\frac{1}{4}$ -inch bolts (13) and lock washers (14).
Use rubber hydraulic hose guards (15) on the $\frac{1}{4}$ -inch hydraulic hoses.
8. Route the long $\frac{1}{4}$ -inch hose (16) coming from the base end of box lift cylinder at the center of the tongue to the $\frac{9}{16}$ -inch base end tee (17) at the right transport lift cylinder on the transport axle.
9. Route the long $\frac{1}{4}$ -inch hose (18) coming from the rod end of box lift cylinder at the center of the tongue to the $\frac{9}{16}$ -inch rod end tee (19) at the right transport lift cylinder on the transport axle.



15608

Install Center Box on Frame

Refer to Figure 5

10. Pin the drill hitch to a tractor with a minimum of 100 horsepower to secure the drill frame for further assembly.
11. Center the center box frame assembly (1) behind the mainframe and bolt it in place with the eight $\frac{7}{8}$ x $2\frac{3}{4}$ -inch bolts (2), $\frac{7}{8}$ -inch flat washers (3), $\frac{7}{8}$ -inch lock washers (4), and $\frac{7}{8}$ -inch nuts (5).

Lightly tighten the bolts at this time, but do not torque them until the box is leveled later in the assembly process. See “**Leveling the Drill**” on page 29.

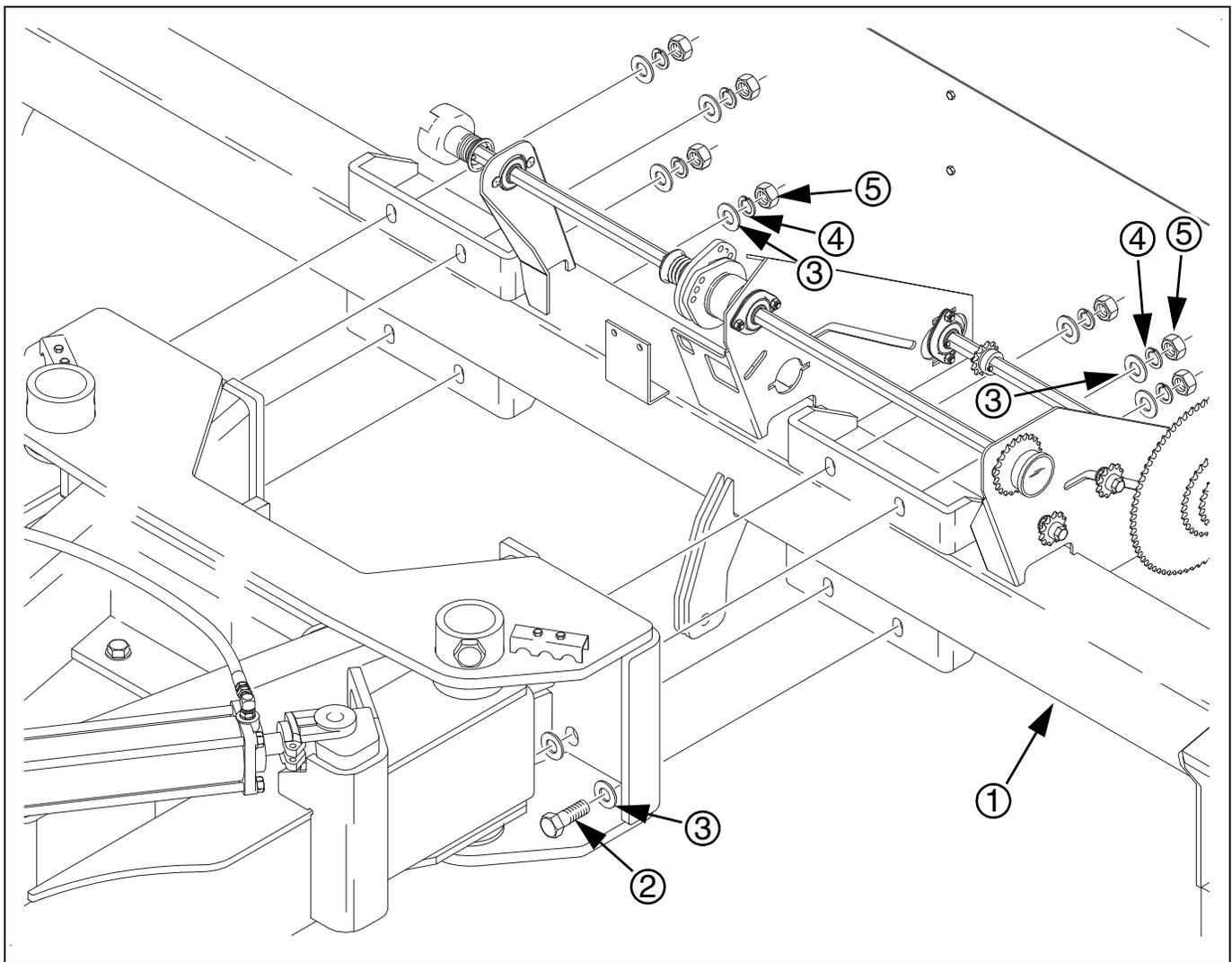


Figure 5
Mount Center Box

15609

Install Wing Box Frames

Refer to Figure 6

12. Unfold the wing toolbars (1) until they contact the center box frame.
 13. Remove the horizontal tool bar pivot pins (2) from the wing box frames. Position a wing box frame pivot to line up with the pivot tube on the wing toolbar.
 14. Install the pivot pin (2) from the front (with the taper pointing back) placing one $\frac{1}{4}$ -inch thick thrust washer (6) on each side of the tool bar pivot.
 15. Assemble a $1\frac{1}{4}$ -inch flat washer (3), and $1\frac{1}{4}$ -inch hex slotted nut (4) on the back side of the pin.
- Torque this rear nut to 600 ft-lbs to properly seat the pin into the taper before proceeding with the assembly. Use the cotter pin hole on the front end of the pin to prevent rotation while you tighten the rear nut.
16. After torquing to 600 ft-lbs, secure the nut with a $\frac{5}{16} \times 2\frac{1}{2}$ -inch cotter pin (5) by rotating the slot in the nut to the next available cotter pin hole in the pin.

There are two cross holes so the slot in the nut should align with a hole with less than $\frac{1}{12}$ additional rotation of the nut.

17. Install the large hinge washer (7), the $1\frac{1}{4}$ -inch flat washer (3), and the $1\frac{1}{4}$ -inch slotted nut (4) on the front side of the pin.
18. Torque the front $1\frac{1}{4}$ -inch slotted nut to 400 ft-lbs and assemble the $\frac{5}{16} \times 2\frac{1}{2}$ -inch cotter pin (5) in the next available cross hole.

NOTE:

Torquing the rear nut (on the tapered end of the pin) is easiest when the opener frames are lowered. Consider waiting until the hydraulics are charged and the openers lowered before torquing the horizontal pin $1\frac{1}{4}$ in nuts. Always torque the rear nuts before drawing up the front nuts.

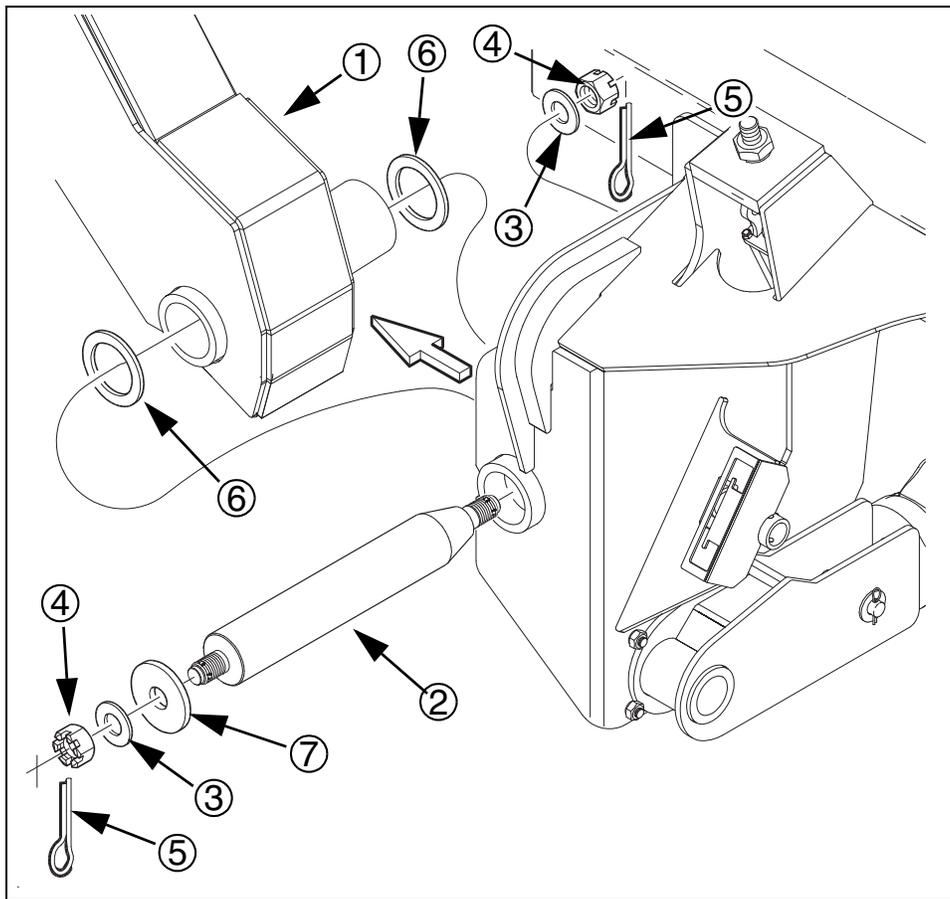


Figure 6
Wing Box Pivot

15610

Install Transfer Driveshaft

Refer to Figure 7

19. Remove the transfer drive subassembly (1) from the drill seed box. The transfer drive assembles to the right side of the drill, and transfers the drive power to the center box assembly.
20. Assemble the U-joint end of the transfer drive assembly (1) to the U-joint yoke (2) on the right wing box. Use $\frac{3}{8} \times 3 \frac{3}{4}$ -inch pin (3) and $\frac{3}{32} \times 1$ -inch cotter pins (4).
21. Clip the shipping wire, and telescope the end of the drive assembly toward the break away-drive assembly at the center of the drill.
22. Engage the jaws of the break-away clutches (5), and fasten the bearing bracket (6) to the plate extending up from the right wing tool bar (7).

Use the two $\frac{1}{2} \times 1 \frac{1}{2}$ -inch round head bolts (8), $\frac{1}{2}$ -inch flat washer (9), $\frac{1}{2}$ -inch lock washers (10) and $\frac{1}{2}$ -inch nuts (11).

NOTE:

DO NOT tighten the $\frac{1}{2}$ -inch bolts (8) yet. The box lead must be adjusted before the drive assembly can be adjusted.

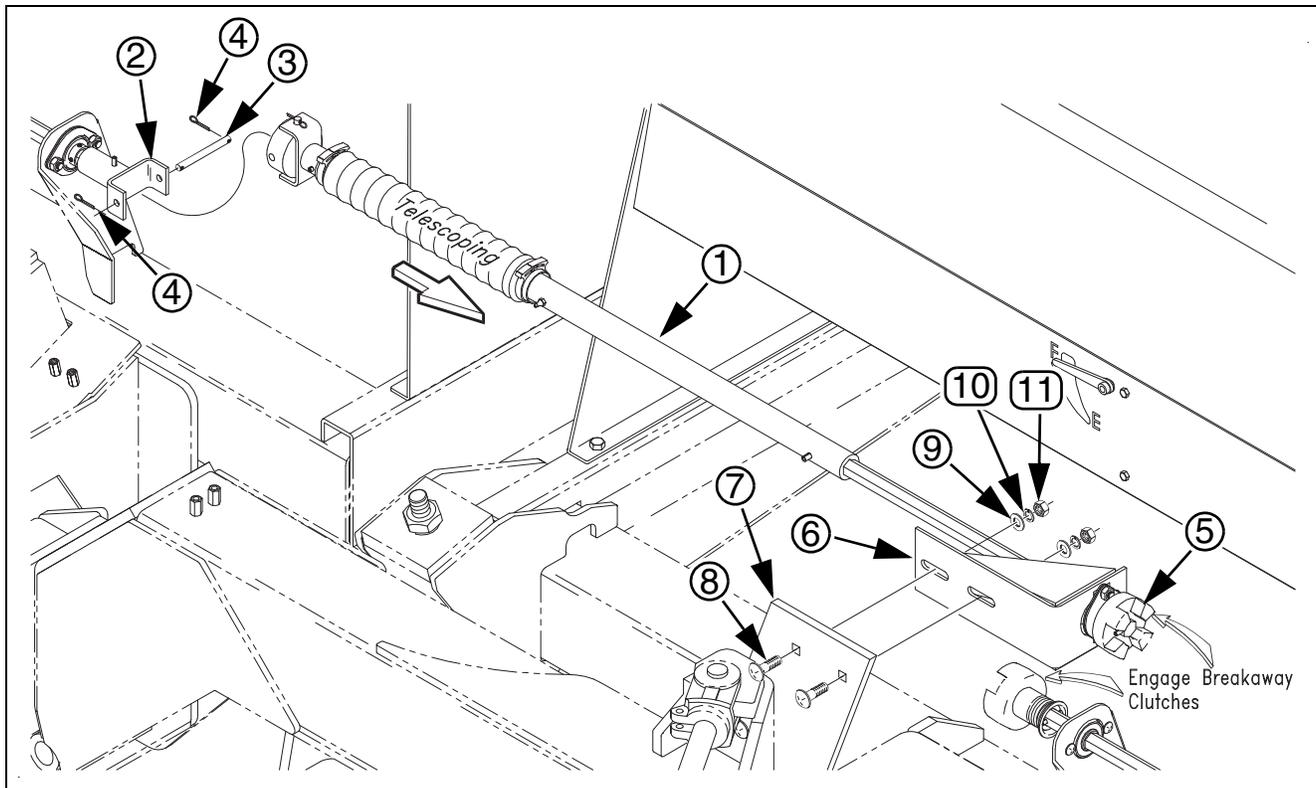


Figure 7
Transfer Drive Shaft

15611

Connect Opener Lift Hoses

Refer to Figure 8

23. Connect the 3/8-inch hydraulic hoses (1) coming from the back side of the wing pressure control valve to the base end tees (2) on the inner opener lift cylinder (3) of each wing frame.

This is the hose which should extend beyond the wing tool bar hose holder (4) by 45 inches (1.1m) (A) as assembled from the factory.

24. Connect the 3/8-inch hydraulic hoses (5) coming from the bottom of the wing pressure control valve, to the tee (6) at the jumper hose (7) coming from the rod

end of the inner opener lift cylinder (3) of each wing frame.

This is the hose which should extend beyond the wing tool bar hose holder (4) by 35 inches (89cm) (B) as assembled from the factory.

25. Disconnect the 3/8-inch hydraulic hoses (1) and (5) where they tee together (8) at the back of the mainframe and reroute them through the hose guide cutouts (9) and through the plastic tie downs on the center box frame.

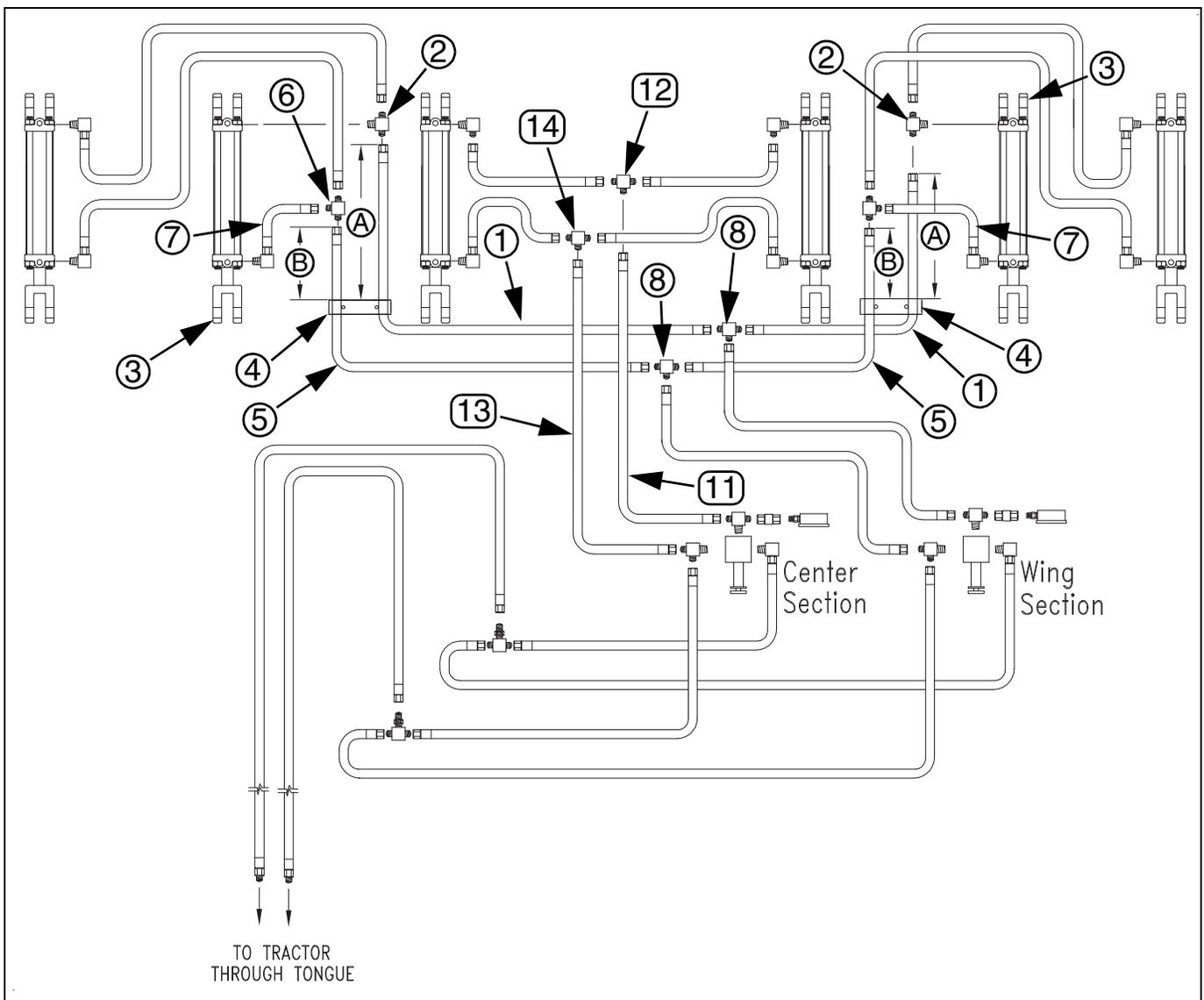


Figure 8
Opener Lift Hydraulic Diagram

15666

Refer to Figure 9

26. Place all tees (8) which rest on the center box frame on the right side of the formed bracket (10) welded to the center of the frame.

This keeps them out of the clutch linkage which is left of center.

27. Connect the $\frac{3}{8}$ -inch hydraulic hose (11) coming from the back side of the center pressure control valve to the tee (12) which branches to the base ends of the center two opener lift cylinders.

28. Connect the $\frac{3}{8}$ -inch hydraulic hose (13) coming from the bottom side of the center pressure control valve to the tee (14) which branches to the rod ends of the center two opener lift cylinders.

29. Tighten the plastic tie down straps to keep the hoses out of the drives.

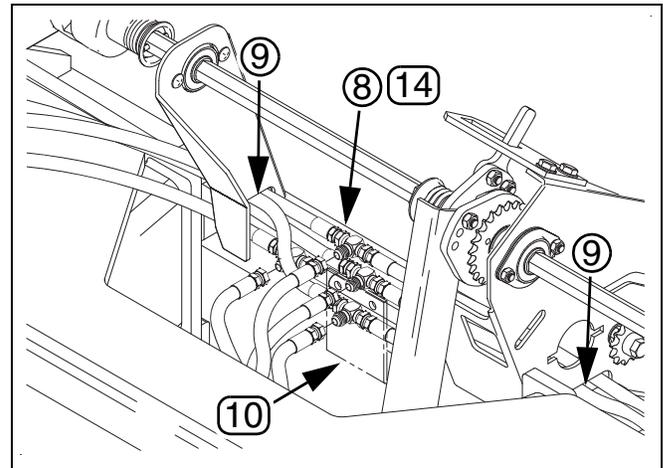


Figure 9
Opener Lift Tees

15656

Install Press Wheels**Refer to Figure 10**

1. Remove $\frac{1}{2} \times 3 \frac{3}{4}$ -inch flange bolt (1) and flange lock nut (2) from each opener body.

2. Leave pivot bushing components (3) in place and bolt press wheel arm (4) to opener with $\frac{1}{2} \times 3 \frac{3}{4}$ -inch flange bolt (1) and lock nut (2). Repeat for all openers.

3. Remove $\frac{5}{8}$ -inch bolt (5) from each press wheel arm (4) and use bolts to assemble press wheels (6) to press wheel arms.

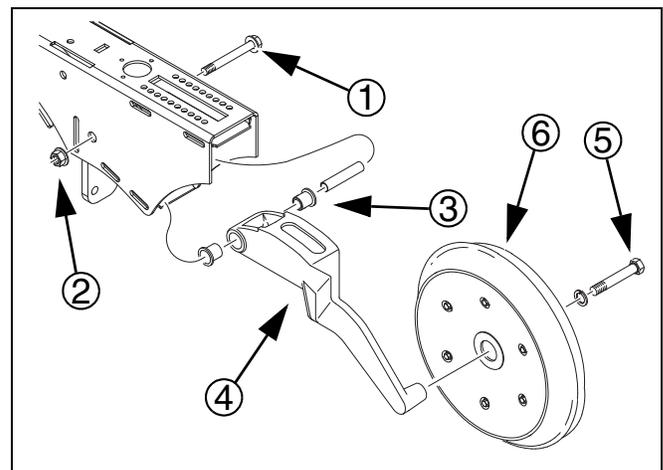


Figure 10
Press Wheel Assembly

24432

Install Walkboards and Ladders**Refer to Figure 11**

1. Remove $\frac{1}{2} \times 1 \frac{1}{4}$ -inch bolts (1) from box support channels (2).

2. Install the walkboard (3) to box support channels with $\frac{1}{2} \times 1 \frac{1}{4}$ -inch bolts (1), lock washers (4), and hex nuts (5).

3. Repeat the procedure for each walkboard.

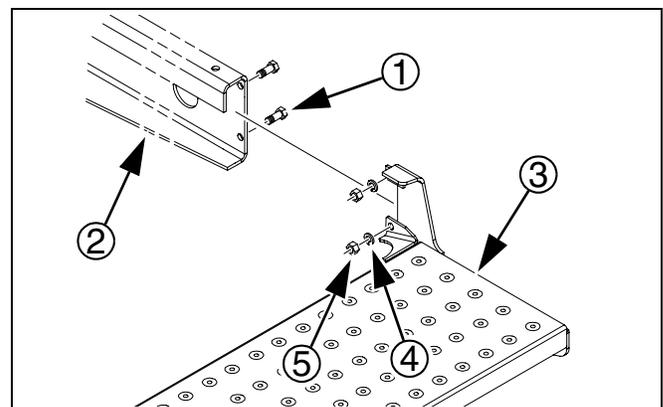


Figure 11
Walkboards Installation

18810

Install Ladder Mounts

Refer to Figure 12 or Figure 13

Location of the ladder mounts depends on whether the drill has the small seeds option.

- For drills without the small seeds option, refer to Figure 12 as a reference.
- For drills with the small seeds option, refer to Figure 13 as a reference.

Top mount weldments are provided in left-side and right-side versions and are not interchangeable. All other parts may be used on either end.

Start with the left wing:

1. Position the left top mount (1) over the appropriate four walkboard holes (2).
2. Insert four $\frac{7}{16} \times 1 \frac{3}{4}$ -inch round head square neck bolts (3) to loosely hold the top mount in place on the walkboard.
3. Position the bottom mount plate (4) under the walkboard and inside the top mount (1). Loosely hold it in place with washers (5) and nuts (6).
4. Insert $\frac{3}{8} \times 1$ -inch bolts (7) through the side holes in both the top mount (1) and bottom plate (4), and secure with lock washers (8) and flange nuts (9).
5. Tighten the four $\frac{7}{16} \times 1$ -inch bolts securing the top mount to the bottom plate.
6. Repeat for right wing section.

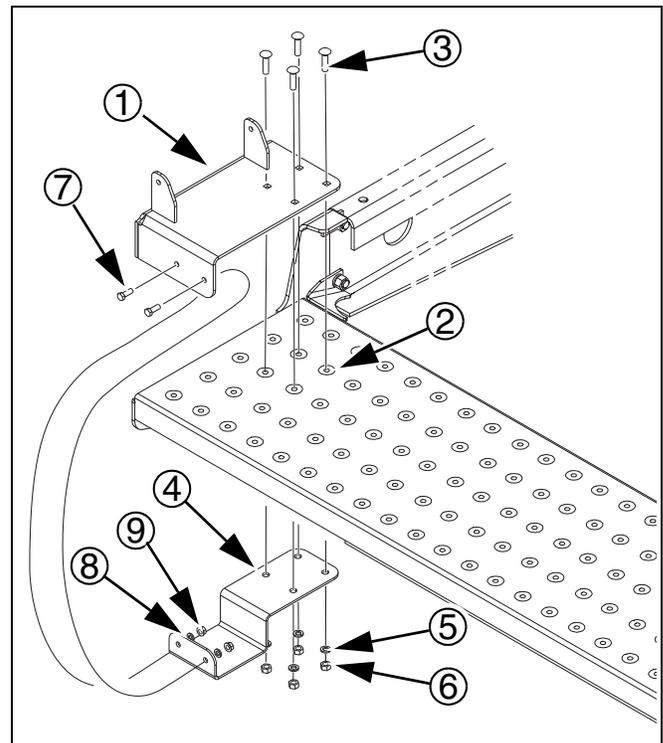


Figure 12
Mount w/o Small Seeds

27013

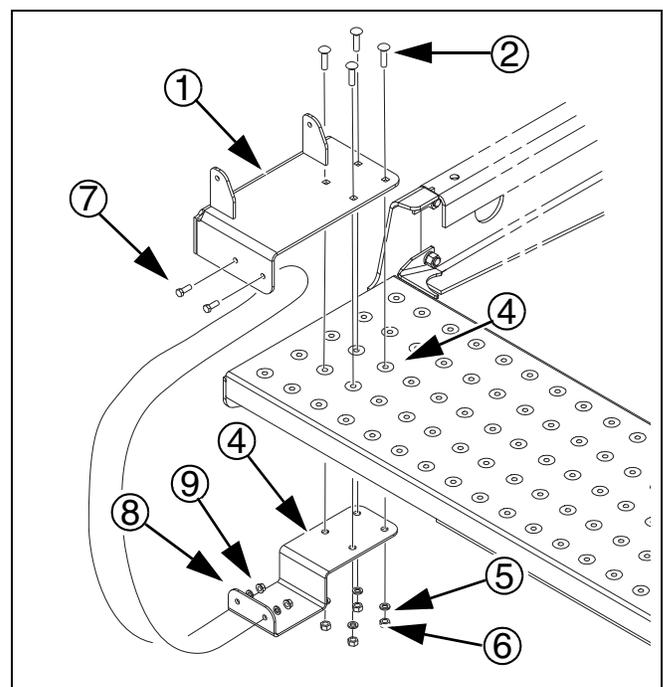


Figure 13
Small Seeds Mounting

27055

Install Ladders

The ladders mount between the lugs (1) of the upper mounts. Flat washers are placed between ladder side frame and the lugs. Hex head bolts install from the inside, to minimize obstructions to foot movement during climbing.

Start with the right walkboard ladder:

1. Lay the ladder (2) on the walkboard with the swing holes up and near the lug holes. Align the holes in the ladder in between the holes in the lugs.
2. Insert $\frac{3}{8} \times 1 \frac{1}{4}$ -inch bolts (3) through (in the following order):
 - a. the ladder (1) side plate
 - b. a washer (4), and
 - c. the mounting lug (2).
 Secure with lock nut (5).
3. Repeat for left wing section.

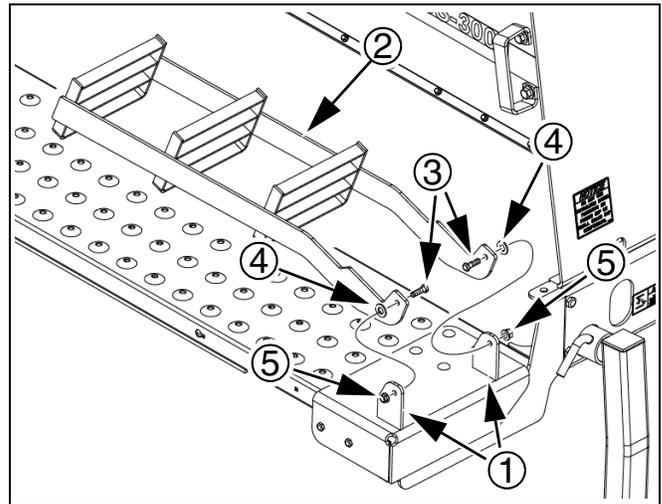


Figure 14
Ladder Installation

68440

Install Slow Moving Vehicle Reflector

The slow moving vehicle (SMV) reflector is mounted in the holes at the rear of the walkboard on the center section.

1. Install the SMV mounting blade (1) and secure with $\frac{5}{16} \times \frac{3}{4}$ -inch round head square neck bolts (2), lock washers (3), and hex nuts (4).
2. Install the SMV reflector (5) on the mounting blade and secure with $\frac{1}{4} \times \frac{5}{8}$ -inch screws (6), lock washers (7), and hex nuts (8).

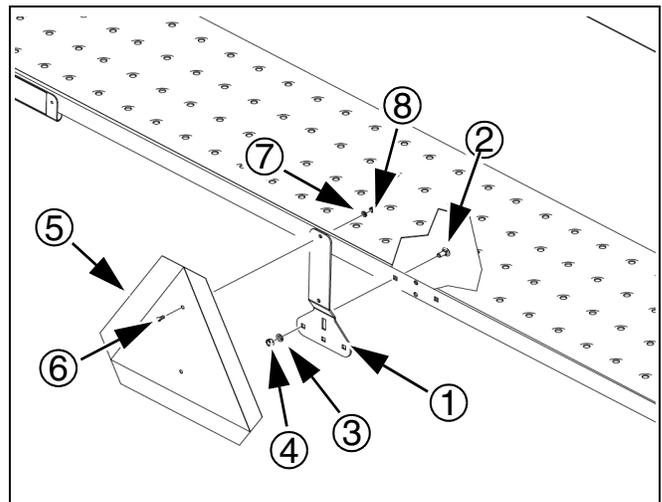


Figure 15
SMV Installation

68447C

Install Handles and Amber Lights

A handle and an amber light will need to be installed at the rear of each wing.

Start with the right wing:

Refer to Figure 16

1. At the ladder end of the right wing, install a handle (1) with two $1\frac{1}{2}$ x $1\frac{1}{2}$ -inch bolts (2), rubber washers (3), and flange lock nuts (4).

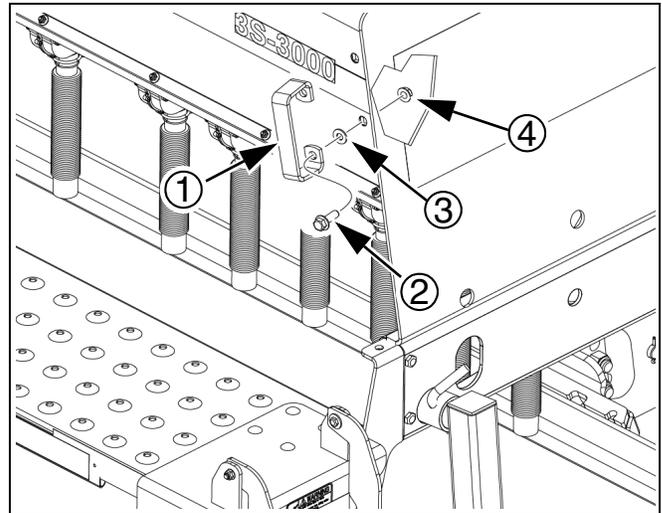


Figure 16
Handle Installation

68464

Refer to Figure 17

2. Install an amber light (1) to the light bracket (2) with two $1\frac{1}{4}$ x $3\frac{3}{4}$ -inch self-tapping screws (3).
3. At the other end of the right wing, install the light bracket (2) with two $1\frac{1}{2}$ x $1\frac{1}{2}$ -inch bolts (4), rubber washers (5), and flange lock nuts (6).
4. Connect the amber light lead (7) to the drill wiring harness.
5. Repeat step 1 through step 4 for the left wing.

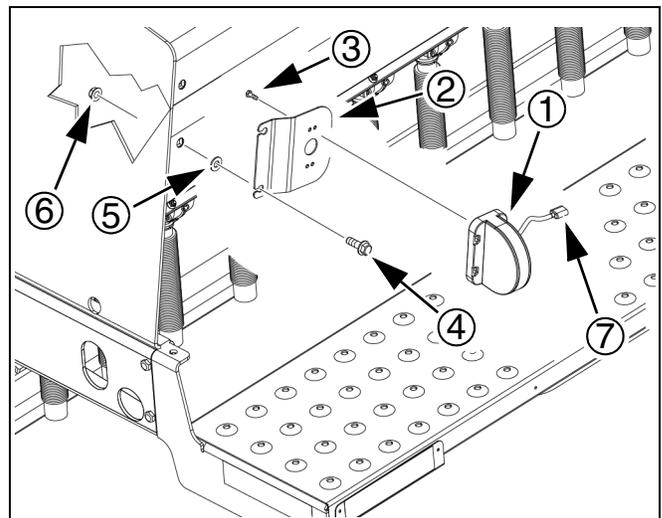


Figure 17
Amber Light Installation

68446A

Other Assembly Items

There are a few additional standard components, and several possible optional items, that are not factory installed. Some of these, which follow in this chapter, need to be installed prior to first hydraulic hookup. Others are installed after hookup, bleeding and leveling. See “**Install Final Accessories**” on page 34.

Two Outlet Kit

If the Two-Outlet Hydraulic Kit was ordered, install it now (before the markers, as this kit contains items needed when both 2-outlet and markers are installed).

Installation instructions are provided in a separate manual with the Two-Outlet kit.

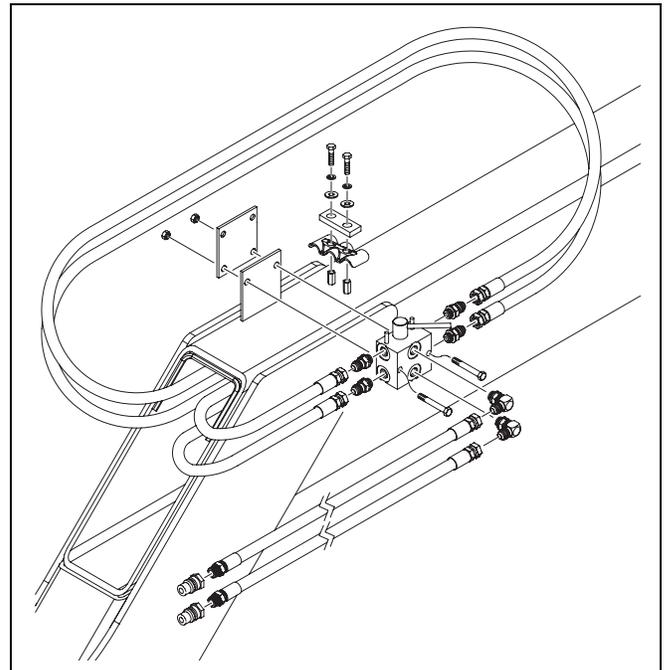


Figure 18
Two-Outlet Selector

27020

Markers

Markers are not factory-installed, due to vertical clearance requirements during shipment. An installation manual is provided, but does not include details for installation where a Two-Outlet Kit is also present. If a Two-Outlet kit is installed, observe these tips:

- The Marker/Fold valve mounts on the second valve bracket.
- Use the longer bolts in the Two-Outlet kit to stack the hose clamps. Place the clamp hold-down on the top clamp.
- For consistency of operation, be sure to plumb the Fold circuit to the forward ports of the Marker/Fold valve, and plumb the Marker circuits to the rear.

Handle forward is then Transport operations (Fold), and handle back is then Field operations (Marker).

Consult the drill Operator’s manual for setting initial marker extension length, and the latest information on chain length and stop bolt adjustment.

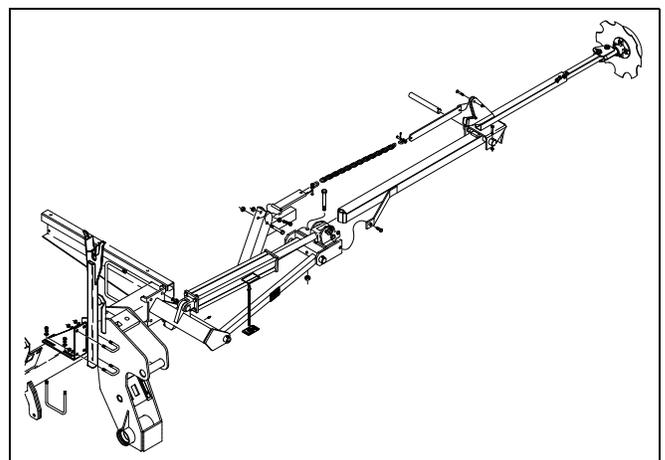


Figure 19
Marker

26493

Open Center Conversion

If the drill was shipped with an Open Center kit, it is not factory-installed. Install it now. An installation manual is provided.

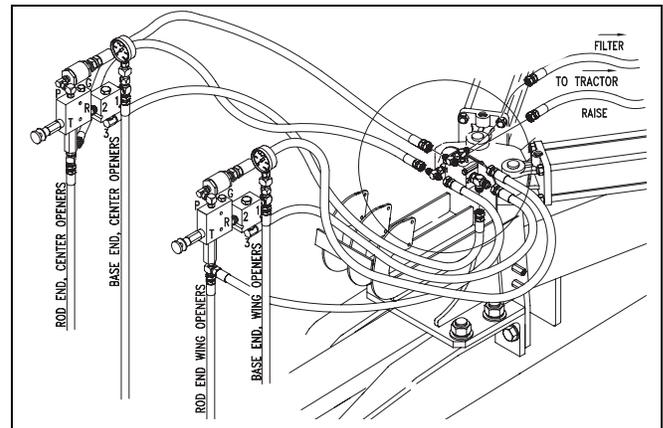


Figure 20
Open Center Conversion

18750

Point Row Option

If the Point Row Option was ordered with the drill, the hydraulics and drill electrical lead are factory-installed.

If the customer's primary tractor is available, install the control module in the tractor cable and make the electrical connection. Consult the Point Row installation manual provided.

If the primary tractor is not available, temporarily connect the control module so that openers can be operated during Setup.

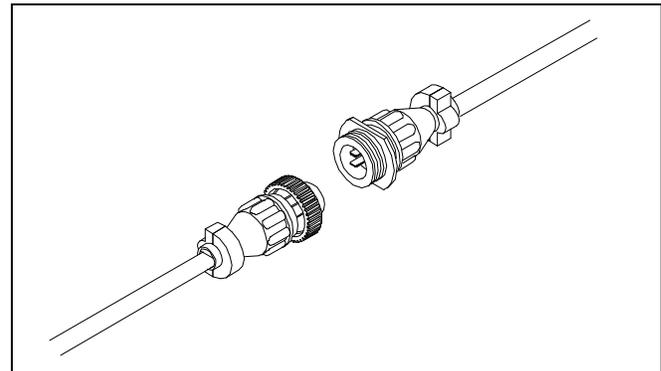


Figure 21
Point-Row Connector

26469

Post Assembly Checklist

- Check that all working parts are moving freely, bolts are tight, and cotter pins are spread.
- Check for proper tension and alignment on all drive chains.
- Check that all safety decals and reflectors are located correctly and are legible. Replace if improperly located or damaged. Refer to "**Safety Decals**" in the Operator's manual.
- Inflate tires to recommended pressures as listed on the "**Tire Inflation Chart**" in the Operator's Manual. Tighten wheel bolts as specified on "**Torque Values Chart**" on page 37.





Setup

The assembly steps of the preceding chapter must be completed prior to setup.

Setup steps consist of:

1. Hitch to suitable tractor.
2. Connect hydraulics.
3. Bleed hydraulics.
4. Level drill.
5. Install any options not factory-installed.

Hitching

DANGER

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

WARNING

This drill can have positive and negative tongue weight, which can work the hitch pin loose during transport. To avoid serious injury or death due to a road accident, always use a clevis hitch or clevis drawbar with a locking-style hitch pin.

Choose a drill-hitch option that is compatible with your tractor drawbar.

Refer to Figure 22

The 3S-3000HD has three hitch options:

- a clevis hitch,
- a small-hole, single-strap hitch or;
- a large-hole, single-strap hitch.

Use the clevis hitch with tractors that have single-tang drawbars. Use the single-strap hitch for tractors with clevis drawbars. Always use a locking-style hitch pin sized to match the holes in the hitch and drawbar.

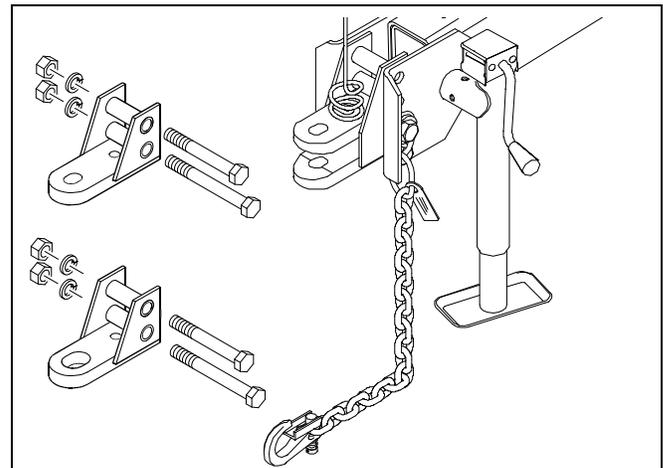


Figure 22
Hitch Options

27006

Refer to Figure 23 and Figure 24

To adjust the drill hitch to match your tractor-drawbar height, mount tongue jack on side of tongue. Use jack to raise drill tongue so lowest hitch hole is 18 inches (45.7cm) above ground level with drill lowered to FIELD position.

Refer to Figure 24

Bolt drill hitch onto drill tongue to match your tractor-drawbar height. You can turn the hitch over for a total of six different hitch heights. Always have two bolts in two holes of both tongue and hitch.

NOTE:

When hitching drill to a different tractor, check for a difference in drawbar heights. If heights are different, readjust hitch height accordingly.

Securely attach safety chain to an anchor on a tractor capable of pulling the drill.



Figure 23
Jack in Lifting Location

15564

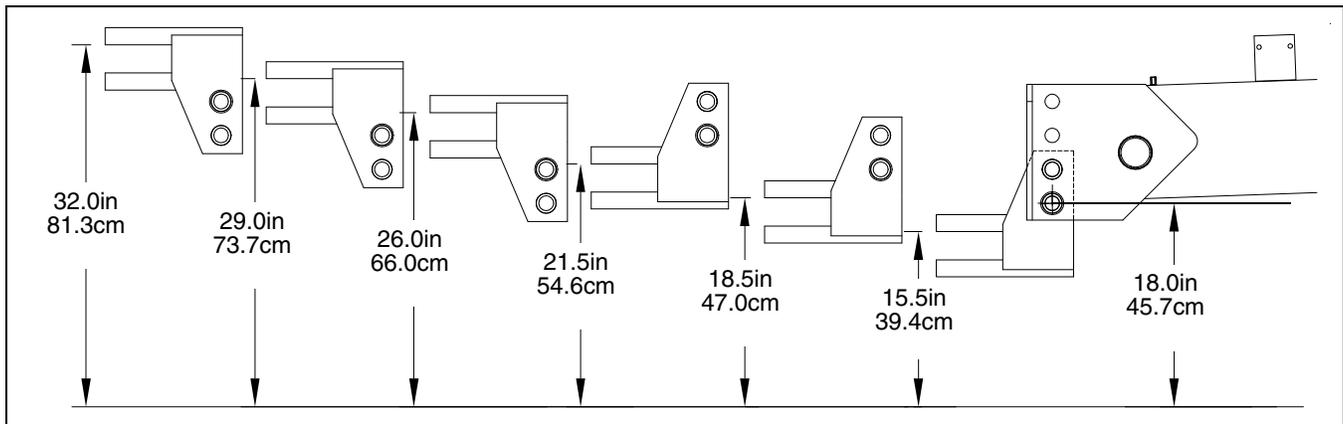


Figure 24
Heights for Various Hitch Positions - Correct Tongue Height

15623

Refer to Figure 25

Use crank to raise jack foot. Remove pin and jack. Store jack on top of tongue.



Figure 25
Jack in Storage Location

15563

Electrical Connections

Refer to Figure 26

Plug drill electrical lead into tractor seven-pin connector.

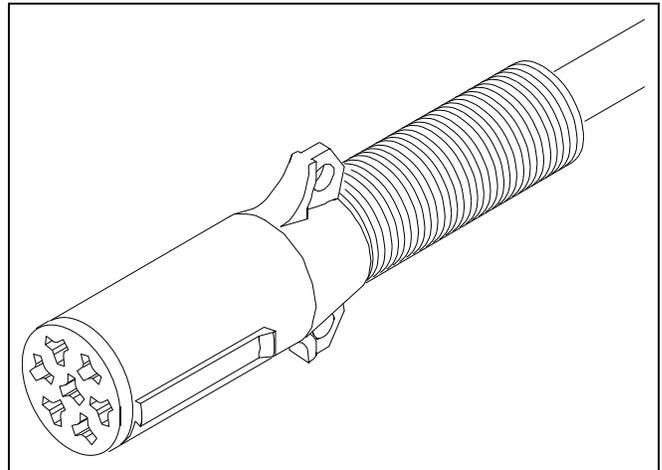


Figure 26
Lighting Connector

26467

Refer to Figure 27

If the drill is equipped with the optional shaft monitor, mate the connector for the cab display.

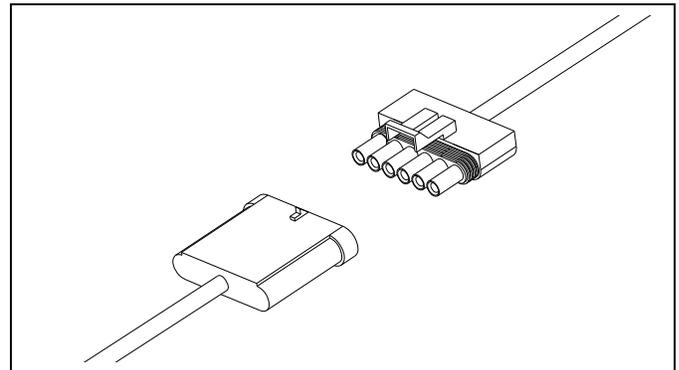


Figure 27
Shaft Monitor Connector

34222

Refer to Figure 28

If the drill is equipped with the point row option, mate the connector for the cab control.

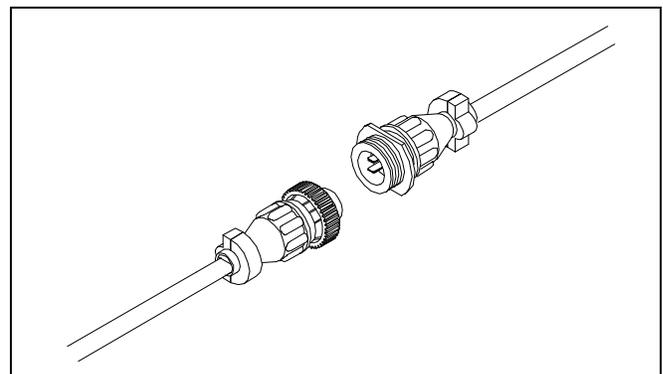


Figure 28
Point-Row Connector

26469

Hydraulic Hose Hookup

WARNING

Only trained personnel should work on system hydraulics!

Escaping fluid under pressure can have sufficient pressure to penetrate the skin, causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic lines. Use a piece of paper or cardboard, NOT BODY PARTS, to check for leaks. Wear protective gloves and safety glasses or goggles when working with hydraulic systems. If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene will result.

Refer to Figure 29

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

Color	Hydraulic Function
Red	Opener Lift Cylinders
Blue	Transport Lift Cylinders
Gray	Fold Cylinders
Green	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.

1. Connect opener-lift hoses to circuit designated for hydraulic-motor control.
2. Connect transport-lift hoses to tractor remote valve.
3. Connect fold hoses to tractor remote valve.
4. Connect marker hoses to tractor remote valve.

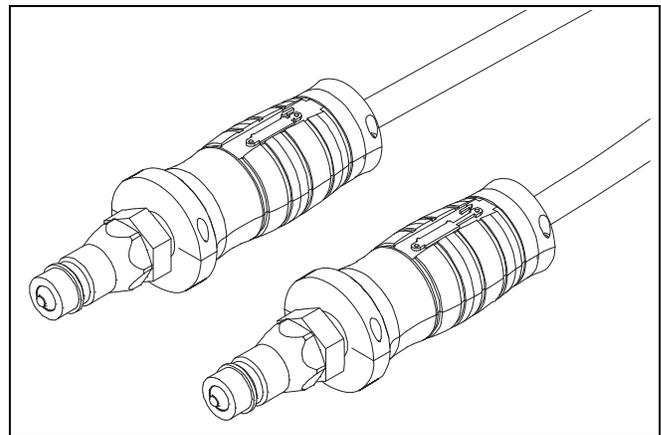
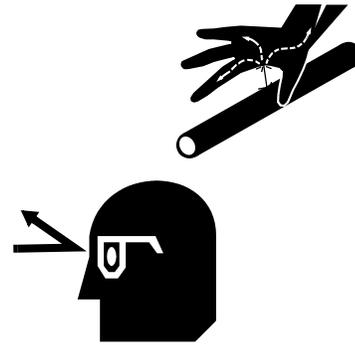


Figure 29
Color Coded Hose Grips

31733

NOTICE

To run drill on tractors with open-center hydraulics or on tractors with fixed-displacement hydraulic pumps, you must install a Great Plains kit, part number 194-143A.

NOTE:

If your tractor has only two remote valves, you must install a double-selector valve to combine the transport-lift and opener-lift circuits. See “**Two Outlet Kit**” on page 18.

Bleeding Hydraulics

To function properly, the hydraulics must be free of air. If hydraulics have not been bled, they will operate with jerky, uneven motions and could cause wings to drop rapidly during folding or unfolding. If hydraulics were not bled during initial implement setup or if you replace a part in hydraulic system during the life of the drill, complete the following procedures.

WARNING

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, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result.

WARNING

Raising openers on unfolded, unhitched drill will cause drill tongue to rise suddenly, which could cause serious injury or death. Be certain that drill is hitched securely to your tractor drawbar and the safety chain is securely attached to tractor before raising openers and unfolding drill.

NOTICE

Bleed only at:

*JIC (Joint Industry Conference, 37° flare) or
NPT (National Pipe Thread, tapered thread) fittings.*

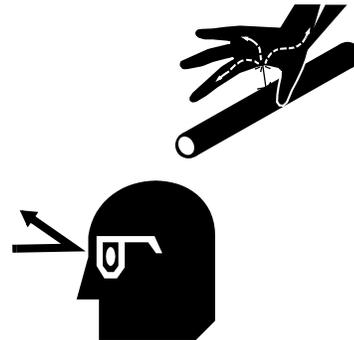
Never bleed at:

*ORB (O-Ring Boss) or
QD (Quick Disconnect) fittings.*

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

NOTE:

System capacity for entire drill is about
4 ½ U.S. gallons
(17 liters).



Bleeding Fold Hydraulics

Refer to Figure 30

1. Review warnings, bleeding notes and system information on page 24.
2. With drill unfolded and fold cylinders completely extended, disconnect rod end pins and swing the cylinders so they will not contact anything when extended.
3. Loosen rod end hose JIC fitting (1) at elbow on right fold cylinder.
4. Slowly supply oil to rod end of fold cylinders (3) until oil appears at loosened hose fitting. Tighten fitting and completely retract fold cylinders.
5. With cylinders completely retracted, loosen base end hose JIC fitting (2) at elbow on right fold cylinder.
6. Slowly supply oil to base end of fold cylinders (4) until oil appears at loosened hose fitting. Tighten base end hose fitting and cycle fold cylinders in and out several times.
7. Re-pin cylinder rod clevis.

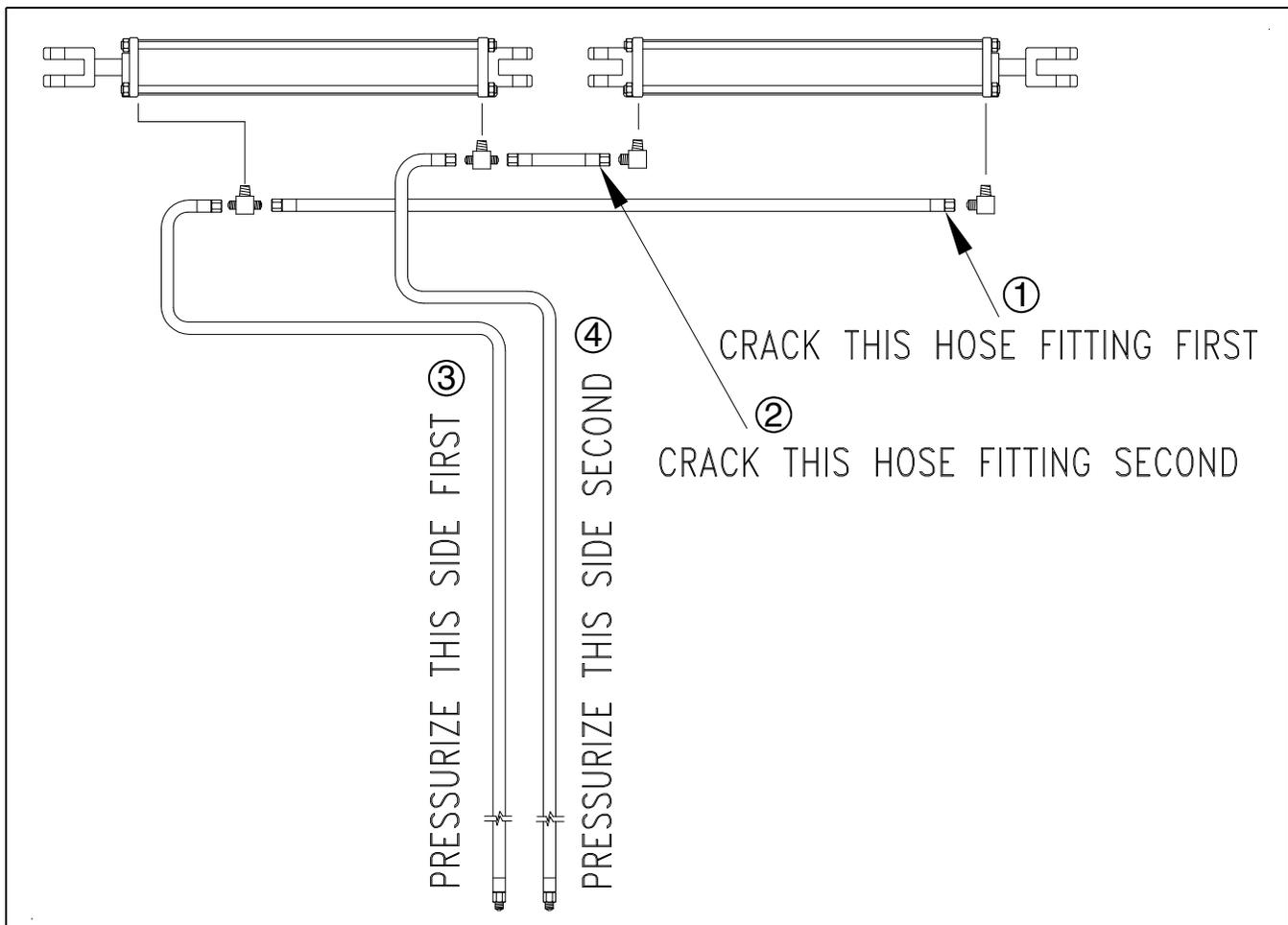


Figure 30
Bleeding Fold Hydraulics

15644

Bleeding Opener Lift Hydraulics

Refer to Figure 31

1. Review warnings, bleeding notes and system information on page 24.
2. Make sure opener frames are locked up in ROAD position. See **“Opener Lock Up”** in Operator’s Manual.
3. Turn knob on both pressure-control valves completely counterclockwise, then turn valves clockwise far enough to build up 1000 psi (about three turns).
4. Turn knob on bypass valve completely clockwise for no oil flow.
5. Loosen six hose-end JIC fittings at three locations on the opener-lift circuit:
 - both JIC fittings on the two $\frac{3}{8}$ -inch opener lift hoses feeding the center opener lift cylinders,
 - the JIC fittings on the two $\frac{3}{8}$ -inch opener lift hoses feeding the center opener lift cylinders, and;
 - the end where these center two hoses tee at the middle of the center box frame.
6. Slowly supply oil to top side of pressure-control valves until oil begins to appear at a loosened hose fitting. As oil begins to appear at a fitting, tighten that fitting.
7. Slowly supply oil to bottom side of pressure-control valves until oil begins to appear at remaining loosened hose fitting. As oil begins to appear at the fitting, tighten fitting. Continue to supply oil to bottom side of pressure-control valves until all openers are raised completely.
8. Move opener transport locks to FIELD position and cycle openers up and down ten times. Each time you lower openers, hold tractor remote lever until opener circuit builds up to pressure set at control valves.
9. After cycling openers, return opener transport locks to ROAD position, and lock openers up.

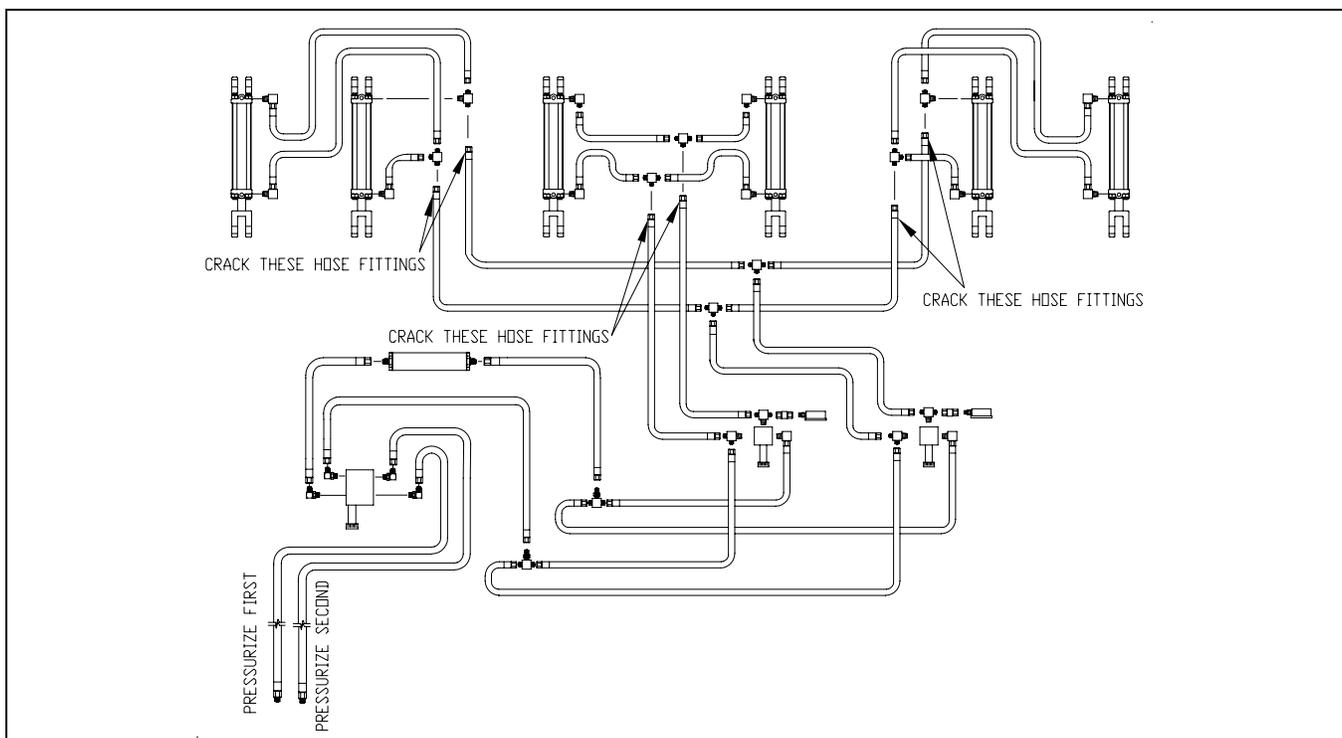


Figure 31
Bleeding Opener Lift Hydraulics

15644

Bleeding Transport Lift Hydraulics

Refer to Figure 32

1. Start with the transport axle in the lowered (field) position, and the box lift cylinder (at the middle of the tongue) completely retracted. Loosen the base end hose fitting at the elbow on the left transport lift cylinder and the base end hose fitting on the box lift cylinder at the middle of the tongue.
 2. Slowly supply oil to the base end of the transport lift cylinders until oil appears at the loosened hose fittings. Oil may not appear at both location at same time. As oil begins to appear at a fitting, tighten that fitting and proceed until both fittings have been tightened. Completely extend the transport lift cylinders and IMMEDIATELY lock the cylinders up by flipping up the cylinder lock channels on both transport lift cylinders and the box lift cylinder at the middle of the tongue.
- ⚠ WARNING**
- NEVER CRAWL UNDER THE DRILL IN THE RAISED POSITION WITHOUT THE CYLINDER LOCK CHANNELS IN PLACE.*
3. When the cylinder lock channels are in place, loosen the rod end hose fitting at the elbow on the left transport lift cylinder and the rod end hose fitting on the box lift cylinder at the middle of the tongue.
 4. Slowly supply oil to the rod end of the transport lift cylinders until oil appears at the loosened hose fittings. As oil begins to appear at a fitting, tighten that fitting and proceed until both fittings have been tightened.
 5. Extend the transport lift cylinders, and remove the cylinder lock channels. Completely cycle the transport lift hydraulics several times.

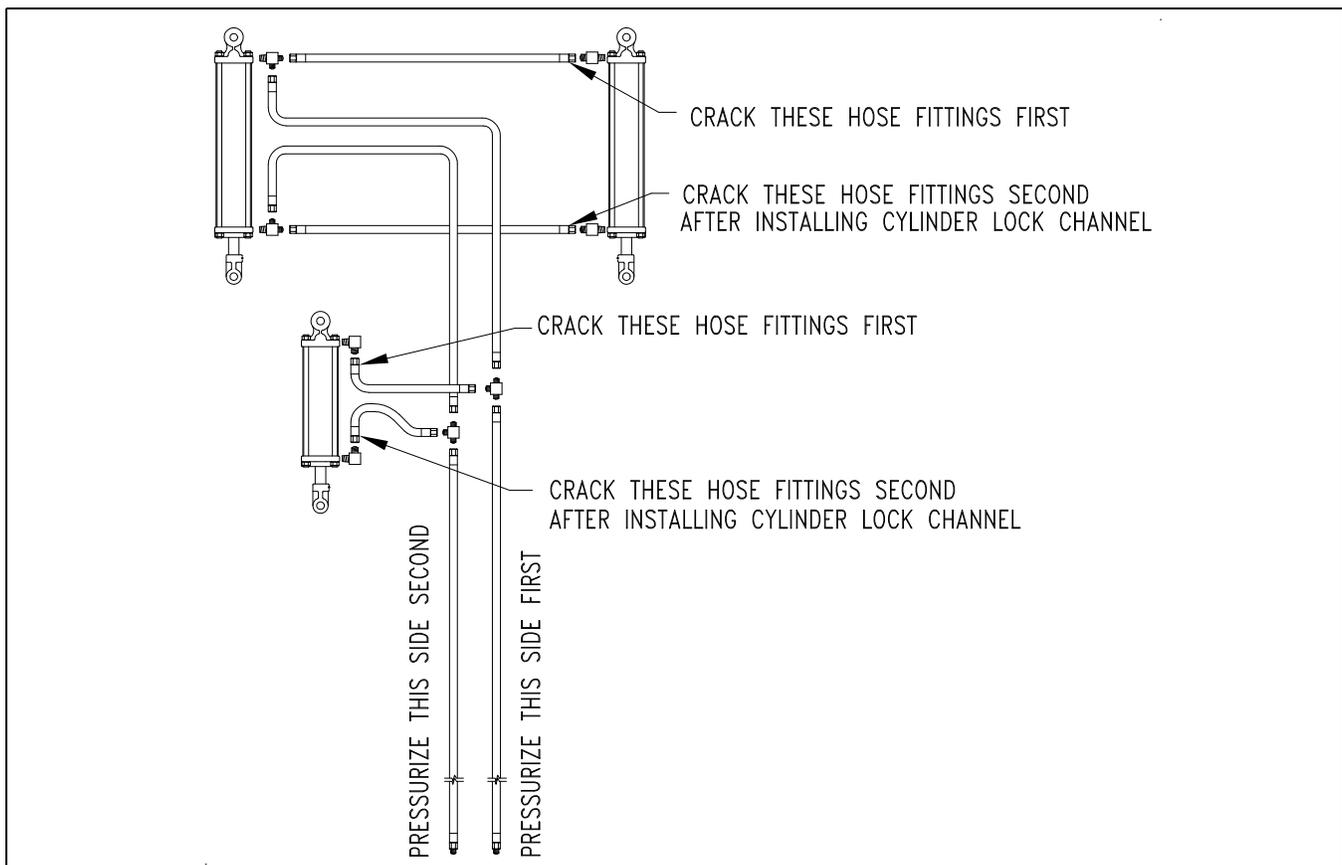


Figure 32
Bleeding Transport Lift Hydraulics

15645

Bleeding Marker Hydraulics

CAUTION

You may be injured if hit by a folding or unfolding marker. Markers may fall quickly and unexpectedly if the hydraulics fail. Never allow anyone near the drill when folding or unfolding markers.

1. Review warnings, bleeding notes and system information on page 24.

Refer to Figure 33

2. With markers unfolded in field position, crack hydraulic-hose JIC fittings (1) at base and rod ends of each marker cylinder.
3. With tractor at idle speed, activate tractor hydraulic valve forward until oil appears at a fitting. When oil begins to seep out around a fitting, tighten that fitting. Reverse the tractor hydraulic valve until oil appears at opposite hose fitting. Tighten that fitting.
4. If you have dual markers, activate tractor hydraulic valve forward again until oil seeps out around a fitting on the other marker cylinder. Tighten that fitting. Reverse tractor hydraulic valve until oil seeps out around remaining hose fitting and tighten it.
5. Fold and unfold markers slowly to work out all air.

NOTE:

Use caution when folding and unfolding markers for the first time, checking for pinching and kinking of hoses.

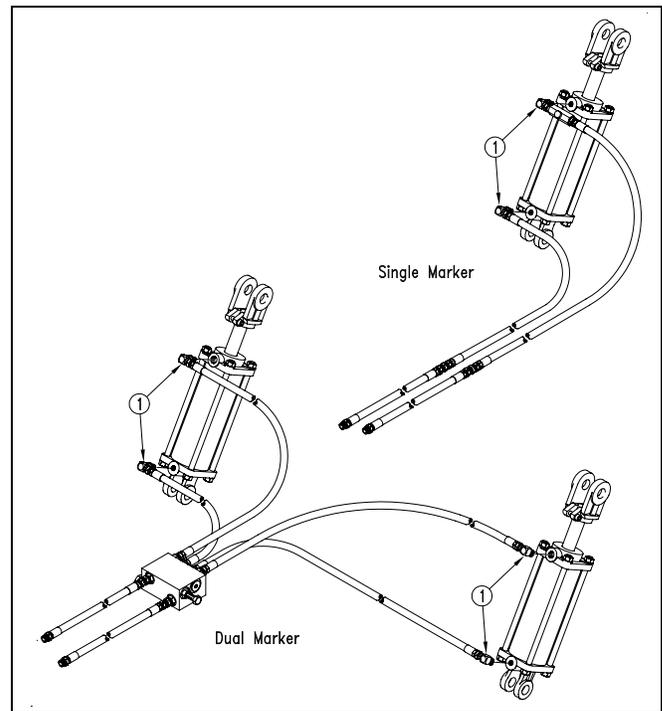


Figure 33
Bleeding Marker Hydraulics

18942

Leveling the Drill

To perform leveling, the drill must be hitched to a tractor, with at least the hydraulics connected.

WARNING

Raising openers on unfolded, unhitched drill will cause drill tongue to rise suddenly, which could cause serious injury or death. Be certain that drill is hitched securely to your tractor drawbar and the safety chain is securely attached to tractor before raising openers and unfolding drill.



Center Box Frame Leveling

1. Park the drill on a clean level surface.
2. Raise the openers and lock them up. See Operator's Manual for opener lift and lock instructions.

Refer to Figure 34

(bolts, nuts and washers shown removed for clarity - loosen, but do not remove them).

3. Loosen the eight center box mount bolts (1), four bolts on each side of tongue and slide center box frame sideways until it is centered with mainframe and transport axle.

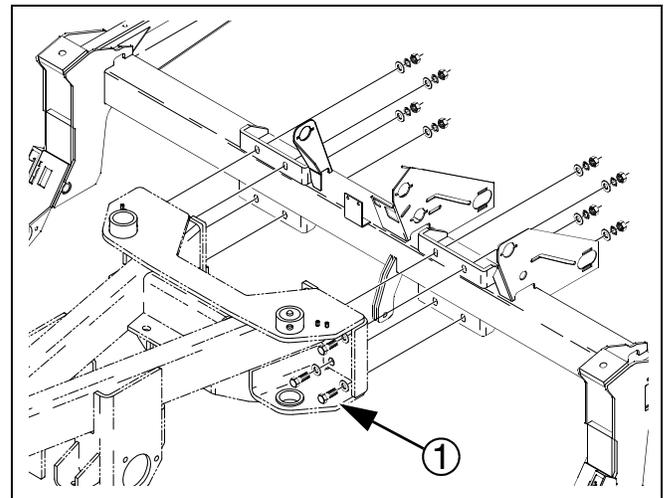


Figure 34
Center Box Mount Bolts

26498

Refer to Figure 35 and Figure 34

4. Measure the height of center box opener frame pivots (2) from the level surface and raise low end of box frame up until both opener frame pivots measure the same distance from the ground.
5. Tighten the $\frac{7}{8}$ x $2\frac{3}{4}$ -inch box mount bolts (1) to torque specified in "Torque Values Chart" on page 37.

Opener Frames Level

Check that opener frames are level across drill. When fully raised, top of opener mounts should clear bottom of drill frame tube by at least $\frac{1}{2}$ inch (1.3cm).

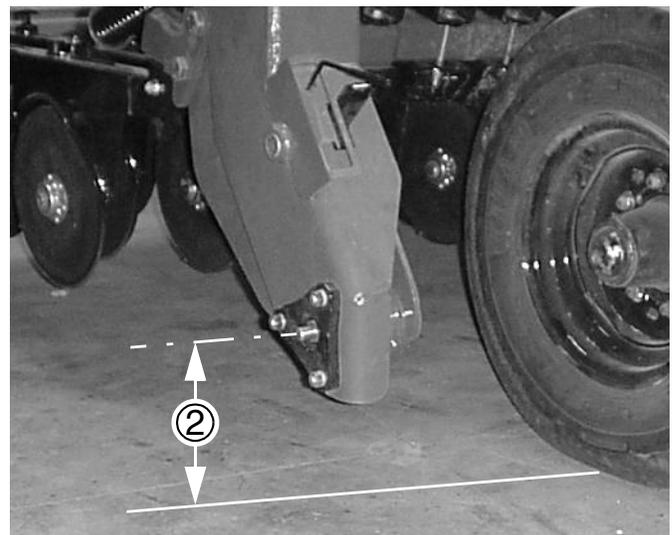


Figure 35
Opener Frame Pivot Height

18874

Wing Box Alignment

1. Place a block ahead of the wing gauge wheels.

Refer to Figure 36

2. Pull forward against blocks to rock wing frames back. Pull forward until stop bolts (3) are firmly against toolbars.

Refer to Figure 37

3. Check for proper alignment by running a string line (4) across back of drill toward outer ends of wings. Make sure string is parallel to center box (both measurements (5) equal).
4. For proper alignment, outside ends of boxes (6) should be about 1 to 1 1/4 inch (2.5 to 3.2cm) ahead of inside ends (7).
5. To adjust box alignment, shorten or lengthen stop bolts (3) to change the contact point with the toolbars. Loosen jam nut and thread stop bolt in or out. Adjust stop bolts in or out until outside ends of boxes are 1 to 1 1/4 inch (2.5 to 3.2cm) ahead of inside ends.
6. Tighten jam nut.

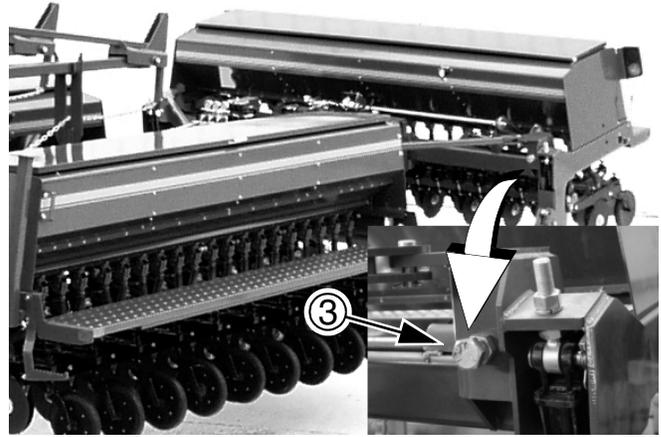


Figure 36
Stop Bolt Location

18988

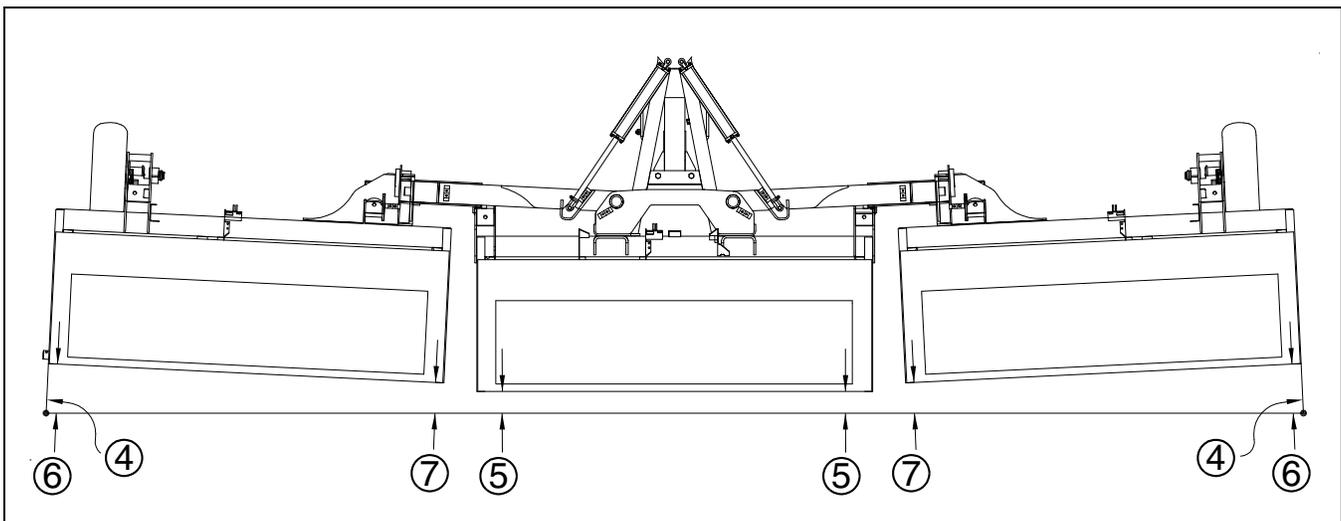


Figure 37
Wing Box Alignment Measurement

15654

Align Transfer Drive Shaft

Refer to Figure 38 and Figure 39

After wing boxes are properly aligned, the transfer drive shaft must be aligned so the pair of break-away jaws (1) are fully engaged and are concentric. The $\frac{7}{8}$ -inch hex drive shafts holding the clutch jaws should not contact each other (2) when wing boxes are properly aligned and back against their stops.

1. Place a 4 x 4 inch (10 x 10cm) or similar sized block ahead of the wing gauge wheels and pull forward or push wing box frames back until the tool bar is firmly against tool bar stop bolts on the center box frame.
2. To align the clutch jaws vertically, loosen the two $\frac{5}{8}$ -inch bolts (3) securing the bearing flangettes (4). Slide the flangettes in the desired direction. Tighten bolts.

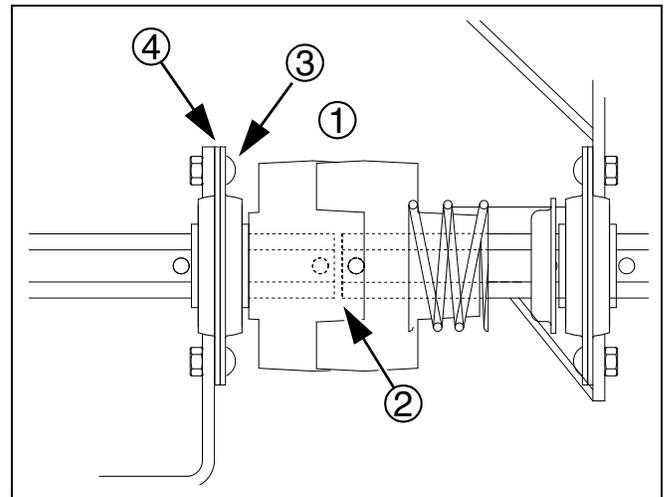


Figure 38
Transfer Drive Jaws

18955

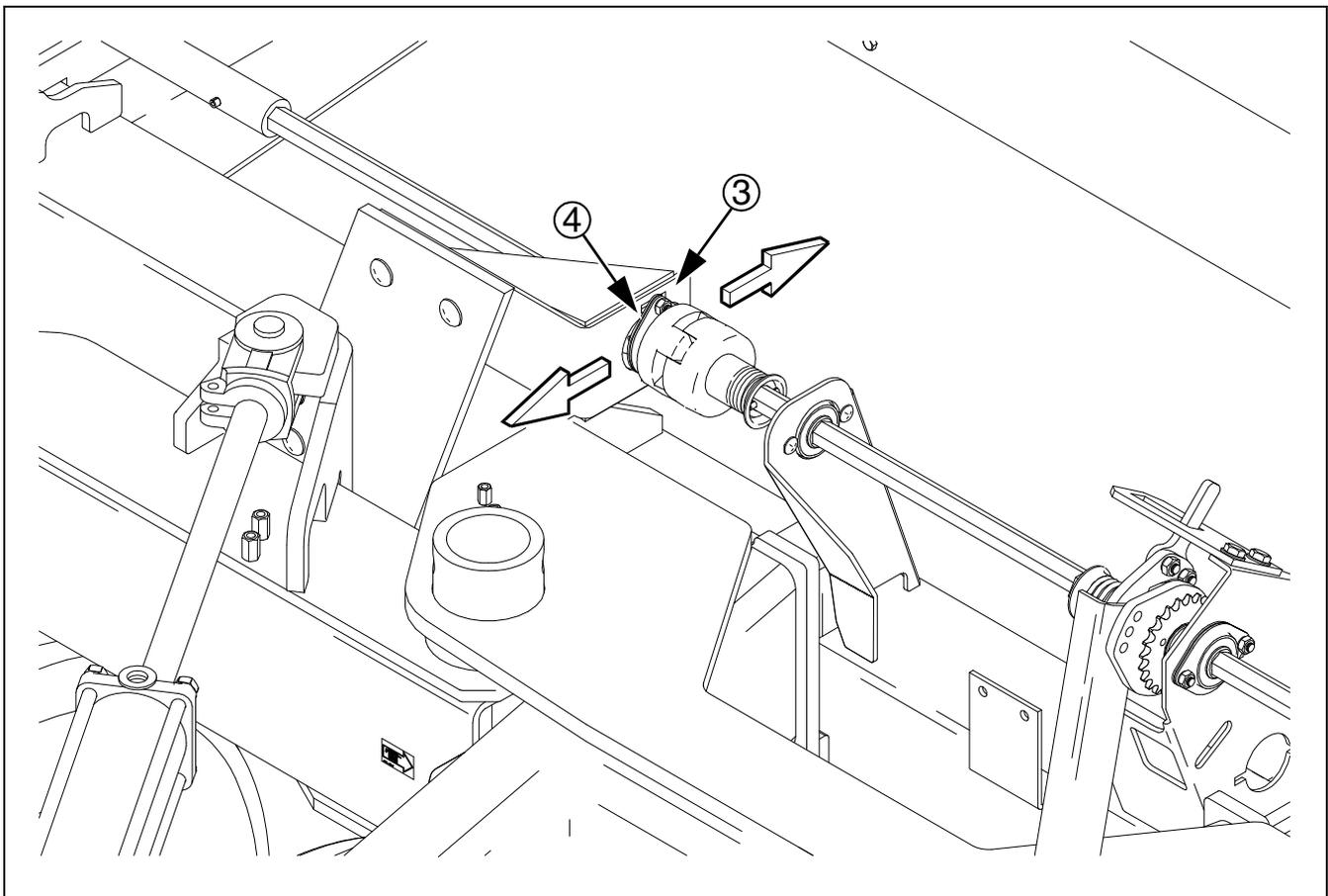


Figure 39
Transfer Drive Shaft Front-Back Adjustment

15620

Refer to Figure 40 and Figure 41

3. To align the clutch jaws (1) vertically, loosen the two $\frac{5}{16}$ -inch bolts (5) at the bottom of the breakaway clutch bracket (6), and adjust the bracket as needed.
4. To adjust clutch jaws for full jaw contact, loosen the two $\frac{5}{16}$ -inch carriage bolts (8) and slide breakaway clutch bracket (9) until jaws on the fixed half of clutch make full contact with jaws on spring loaded half of clutch without compressing clutch spring.

NOTE:
The two $\frac{7}{8}$ -inch hex shafts (7) should have $\frac{1}{8}$ inch (3.2mm) gap (2) between them when the clutch jaws have full contact.

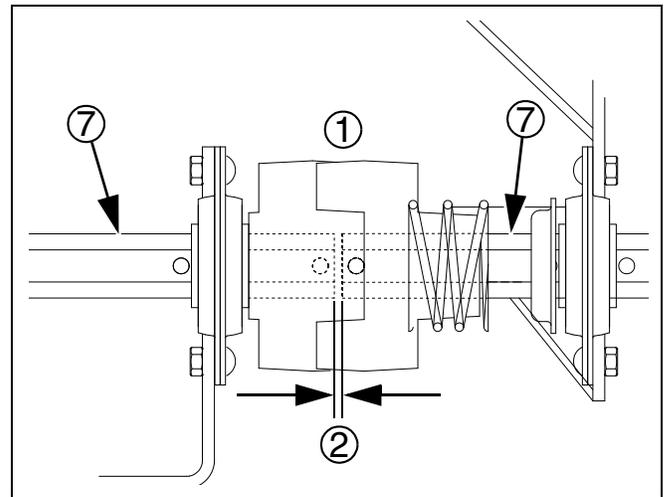


Figure 40
Transfer Drive Shaft Gap

18955

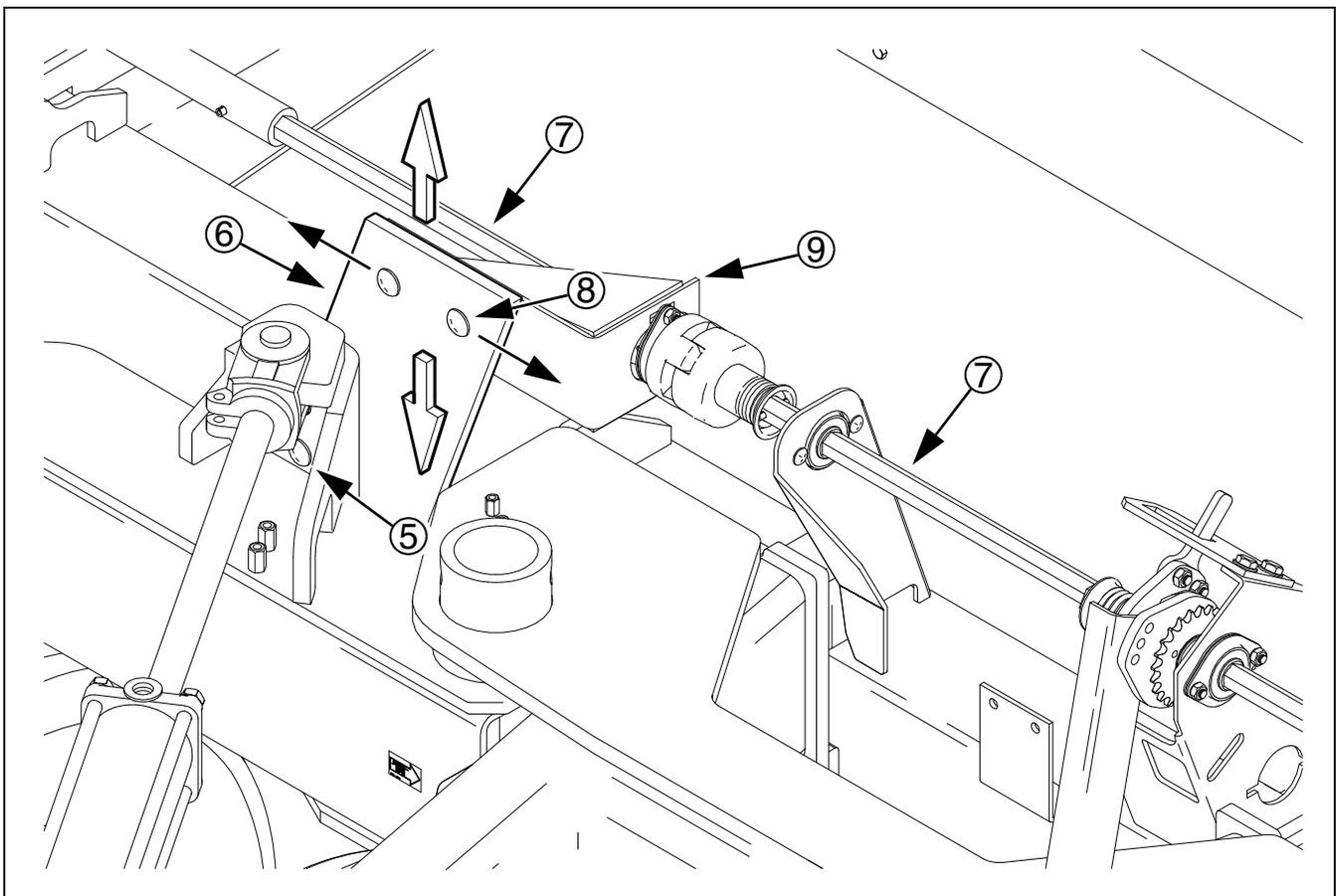


Figure 41
Transfer Drive Shaft Vertical and Left-Right Adjustment

15621

Toolbar Height

Refer to Figure 42 and Figure 43

Toolbar height (1) above ground level (2) is factory set and normally does not require adjustment. If you tear down the drill for repair, or if the tool bar is visibly not level, spacer washers (3) on vertical pivot pins allow for a small amount of tool bar-height adjustment.

To check tool bar height, park drill on a level surface, and check for correct tire inflation. Measure from ground to horizontal pivot pin (1). If dimension on either side of drill varies more than $\frac{1}{4}$ inch (6.4mm), adjust tool bar height.

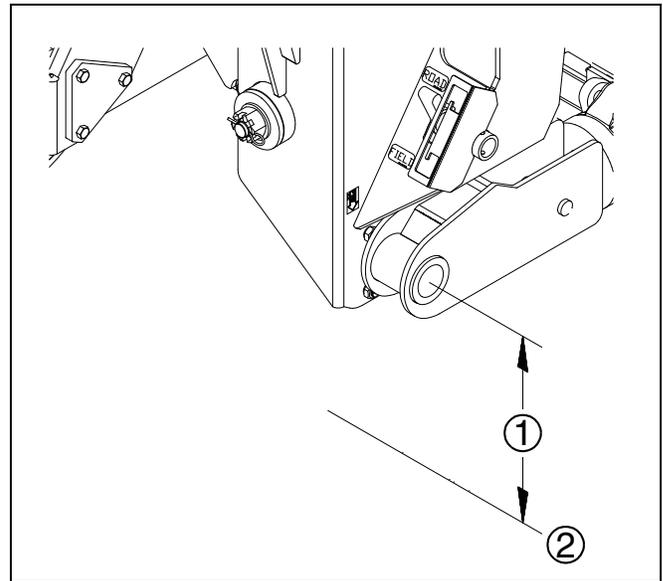


Figure 42
Toolbar Height

15616

To adjust tool bar height, reposition spacer washers (3). First lower openers and set enough opener down pressure to help balance frame. Raise tool bar by removing spacer washers from top of the vertical pivot and placing them on bottom side of pivot. Lower tool bar by removing spacer washers from bottom of vertical pivot and placing them on top of pivot.

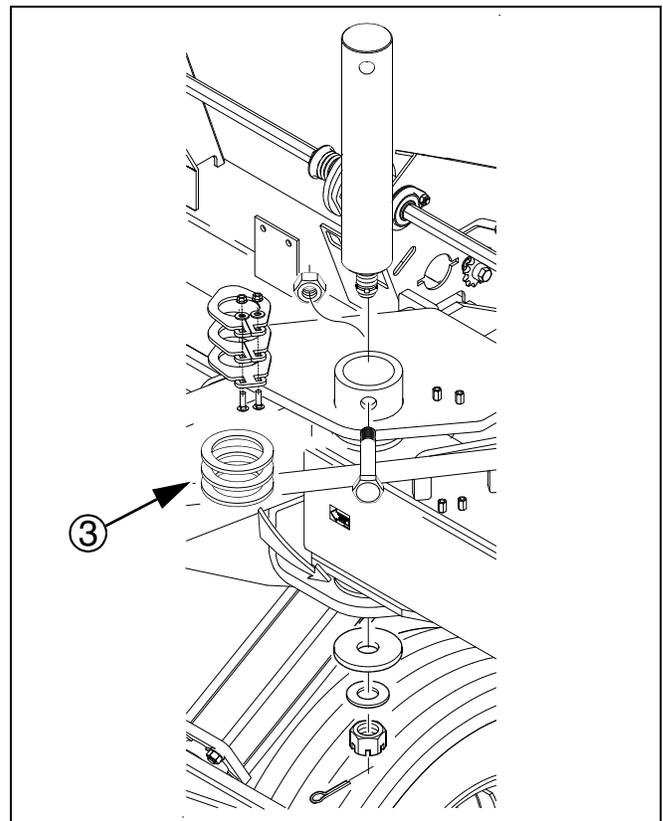


Figure 43
Toolbar Height

15617

Opener-Frame Clearance

Refer to Figure 44

When fully raised, top of opener mounts (1) should clear bottom of drill frame tube by at least $\frac{1}{2}$ inch (12.7mm).

To adjust opener frames so all openers have the same clearance, loosen jam nut (2) on opener lift cylinders and turn adjustment nut. When openers are at the correct height, re-tighten jam nut. Repeat at each opener lift cylinder if necessary.

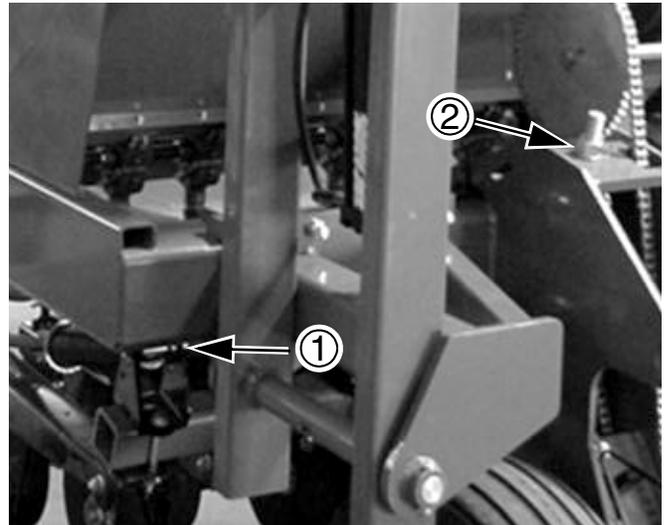


Figure 44
Opener Frame Clearance

18853

Install Final Accessories

Acrometer Installation

Refer to Figure 45

The acrometer (1) is supplied from the factory in a separate carton, to minimize risk of shipping damage. It is installed on the left end of the center main drive shaft.

Screw the threaded end of the meter into the $\frac{1}{2}$ -inch tapped hole (2) in the left end of center main drive shaft.

Tighten the threaded end only enough to prevent it from working loose from normal vibration. In use, there is no torque or tension that might tend to unscrew it.

The acrometer counts shaft rotations whenever the shaft is rotating - normally this is only with the drill unfolded, the opener sub-frame lowered, and the drill in motion. The meter is geared to display rotations as acres, when using factory-specified tires and inflations.

Tally field acres by noting the meter reading prior to, and after planting. Subtract the starting from the ending readings.

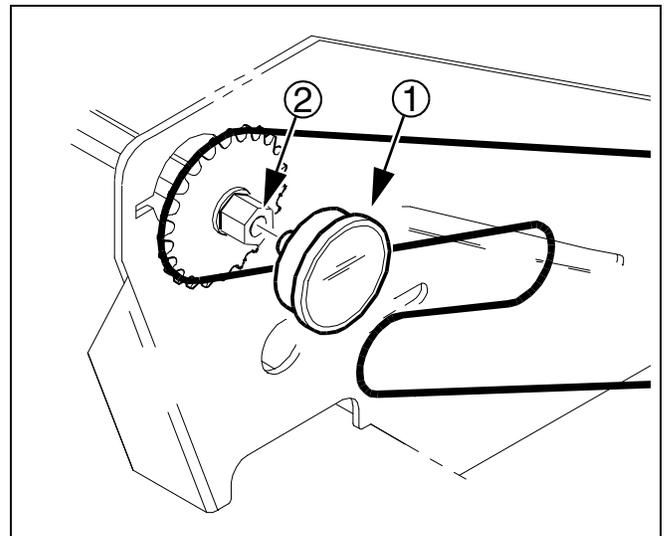


Figure 45
Acrometer Installation

27000

Shaft Monitor

Refer to Figure 46

If the drill was ordered with the optional shaft monitor, install the sensors and leads per the included installation manual.

If the primary tractor is available, also install the display console in the cab.

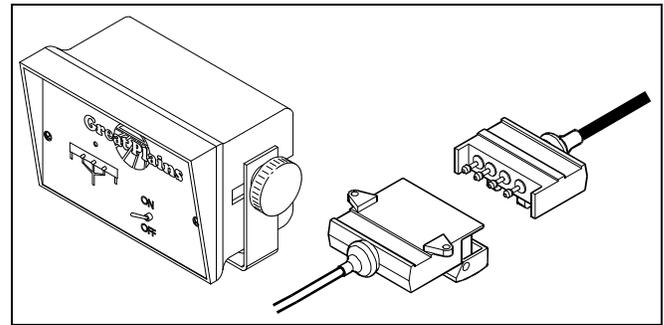


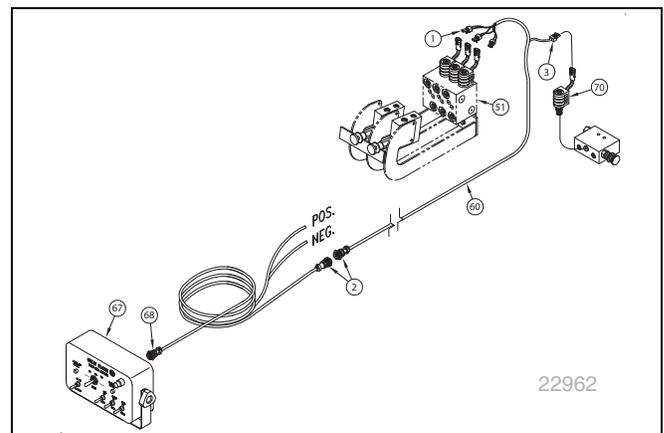
Figure 46
Shaft Monitor

18943
26468

Point Row Controller

If the drill was ordered with the Point Row option, the solenoid valves, hydraulic lines and control leads were installed on the drill at the factory.

If the primary tractor is available, also install the display console in the cab.



22962

Scraper Installation

1. Remove one or both disk blades to gain safe access to the mount. Note the position of bushings and spacers for correct re-assembly.

Refer to Figure 47

2. Position the inside scraper mount (1) to the rear of the seed firmer mount (2) on the opener weldment. Secure it with two $\frac{3}{8}$ x 1-inch hex head bolts, lock washers, and nuts. Insert the bolts from the front.
3. Position the scraper blade (3) below and behind the inside scraper mount (1), with the notch on top to machine right. Secure it loosely with one $\frac{3}{8}$ x 1-inch round head square neck bolt, flat washer, lock washer and nut.
4. Re-mount the removed disk blade.

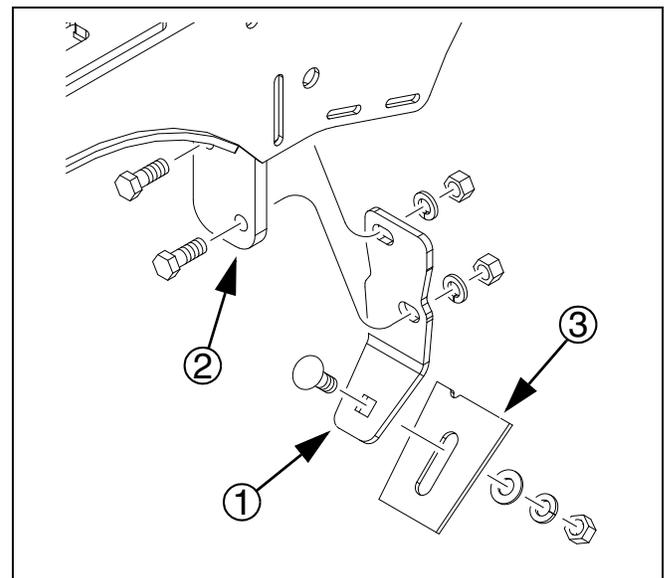


Figure 47
Scraper Installation

26460



Appendix

Specifications and Capacities

	3S-3000HD-6006	3S-3000HD-4875	3S-3000HD-3610
Row Count	78	63	48
Row Spacing	6 in (15.2 cm)	7.5 in (19.1 cm)	10 in (25.4 cm)
Main Seed Box Capacity	92.7 bushels (3267 liters)		
Tractor Requirements	125 hp minimum		
Weight, standard HD model	12447 lbs (5646 kg)	12425 lbs (5636 kg)	12409 lbs (5629 kg)
Weight, standard HDF model	13496 lbs (6123 kg)	13454 lbs (6102 kg)	13416 lbs (6085 kg)
Down-Force per Row	130-207 lbs (59-94 kg)	135-280 lbs (61-127 kg)	144-373 lbs (65-169 kg)
Opener Travel	8in (20cm)		
Hydraulic Circuits	3 circuits required, load-sensitive or closed-center 15 to 30 gpm at 2300 psi Optional kits are available for two-circuit, and open center.		
Hitch Load	3700 lbs (1678 kg) folded with seed loaded Caution: <i>negative tongue weight when raised and unfolded</i>		
Transport Width	15 feet (4.6 meters)		
Operating Width	30 feet (9.1 meters)		
Swath	365 in (9.271m)	362 in (9.195m)	360 in (9.144m)
Height	7 feet 4 inches (224 cm)		
Length	27 feet 7 inches (8.4 meters)		
Tire Sizes	Gauge Wheels: 265/70B16.5 NHS Skid Steer Transport: 395/55B16.5 NHS Skid Steer		

Torque Values Chart

Bolt Size in-tpi ^a	Bolt Head Identification						Bolt Size mm x pitch ^c	Bolt Head Identification					
	Grade 2		Grade 5		Grade 8			Class 5.8		Class 8.8		Class 10.9	
	N-m ^b	ft-lb ^d	N-m	ft-lb	N-m	ft-lb	N-m	ft-lb	N-m	ft-lb	N-m	ft-lb	
1/4-20	7.4	5.6	11	8	16	12	M 5 X 0.8	4	3	6	5	9	7
1/4-28	8.5	6	13	10	18	14	M 6 X 1	7	5	11	8	15	11
5/16-18	15	11	24	17	33	25	M 8 X 1.25	17	12	26	19	36	27
5/16-24	17	13	26	19	37	27	M 8 X 1	18	13	28	21	39	29
3/8-16	27	20	42	31	59	44	M10 X 1.5	33	24	52	39	72	53
3/8-24	31	22	47	35	67	49	M10 X 0.75	39	29	61	45	85	62
7/16-14	43	32	67	49	95	70	M12 X 1.75	58	42	91	67	125	93
7/16-20	49	36	75	55	105	78	M12 X 1.5	60	44	95	70	130	97
1/2-13	66	49	105	76	145	105	M12 X 1	90	66	105	77	145	105
1/2-20	75	55	115	85	165	120	M14 X 2	92	68	145	105	200	150
9/16-12	95	70	150	110	210	155	M14 X 1.5	99	73	155	115	215	160
9/16-18	105	79	165	120	235	170	M16 X 2	145	105	225	165	315	230
5/8-11	130	97	205	150	285	210	M16 X 1.5	155	115	240	180	335	245
5/8-18	150	110	230	170	325	240	M18 X 2.5	195	145	310	230	405	300
3/4-10	235	170	360	265	510	375	M18 X 1.5	220	165	350	260	485	355
3/4-16	260	190	405	295	570	420	M20 X 2.5	280	205	440	325	610	450
7/8-9	225	165	585	430	820	605	M20 X 1.5	310	230	650	480	900	665
7/8-14	250	185	640	475	905	670	M24 X 3	480	355	760	560	1050	780
1-8	340	250	875	645	1230	910	M24 X 2	525	390	830	610	1150	845
1-12	370	275	955	705	1350	995	M30 X 3.5	960	705	1510	1120	2100	1550
1 1/8-7	480	355	1080	795	1750	1290	M30 X 2	1060	785	1680	1240	2320	1710
1 1/8-12	540	395	1210	890	1960	1440	M36 X 3.5	1730	1270	2650	1950	3660	2700
1 1/4-7	680	500	1520	1120	2460	1820	M36 X 2	1880	1380	2960	2190	4100	3220
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							

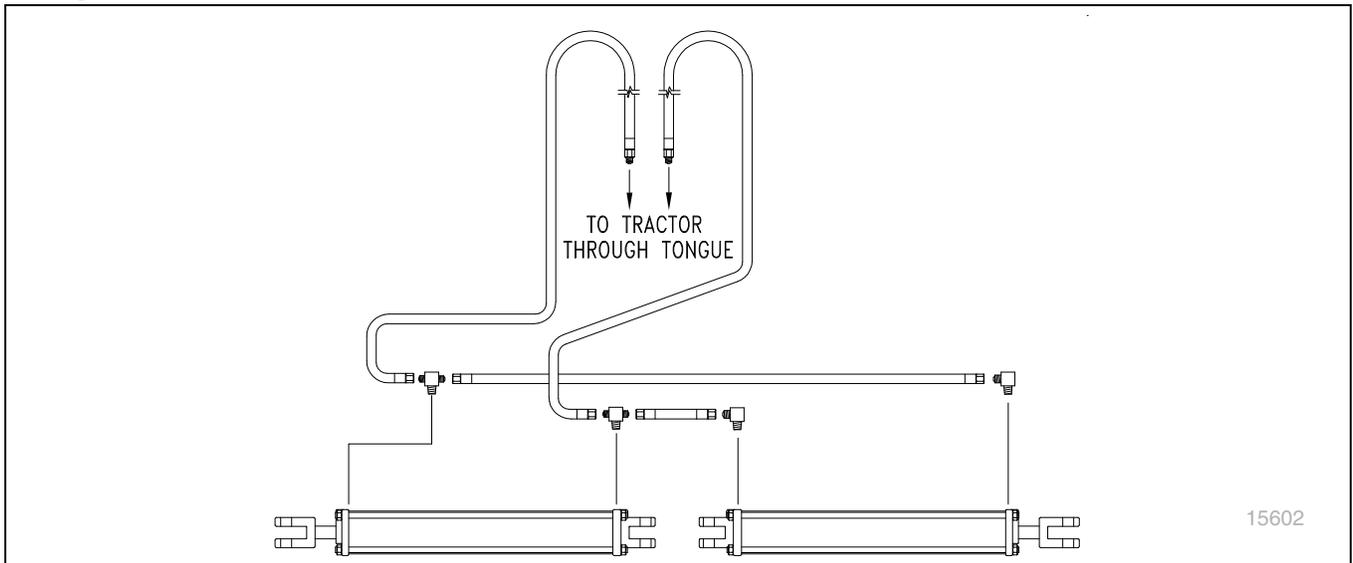
- a. in-tpi = nominal thread diameter in inches-threads per inch
b. N·m = newton-meters
c. mm x pitch = nominal thread diameter in mm x thread pitch
d. ft-lb = foot pounds

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

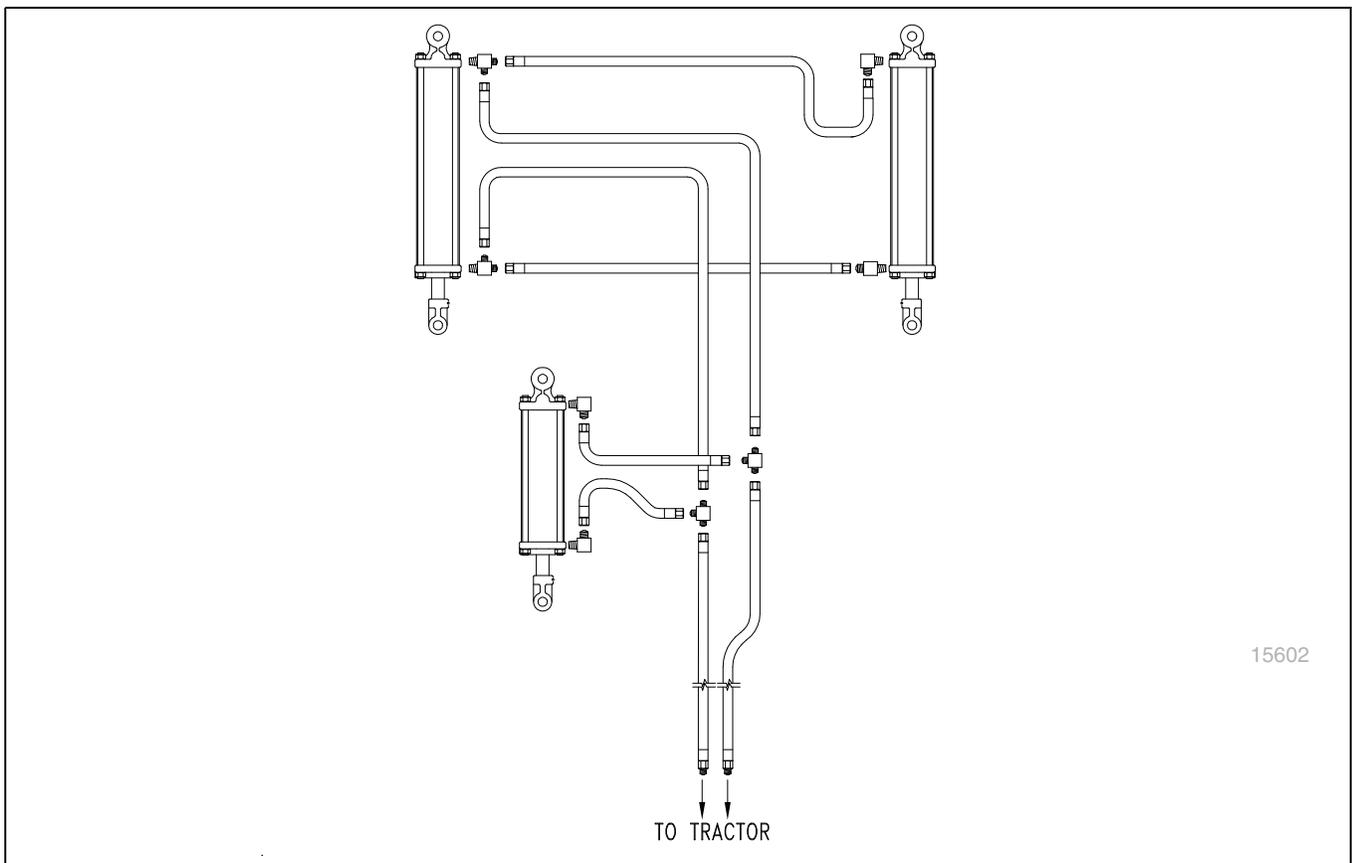
25199

Hydraulic Diagrams

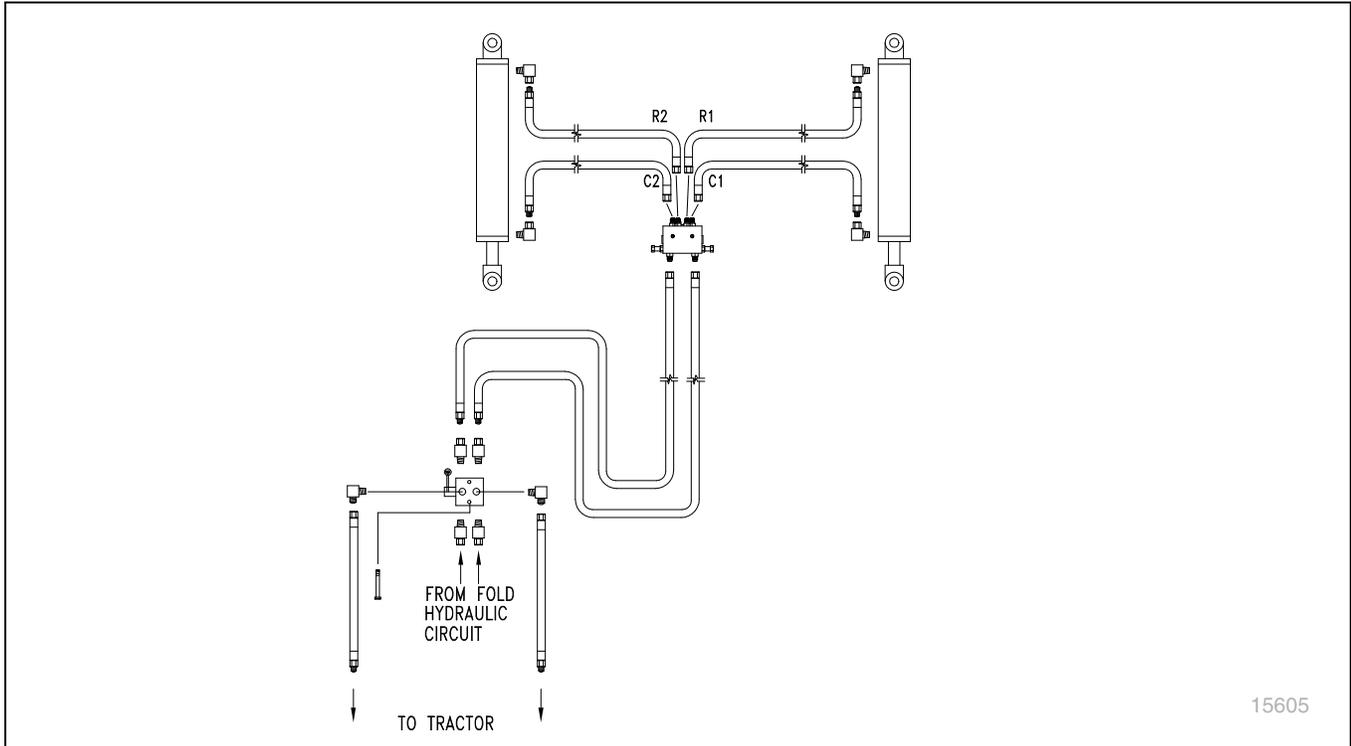
Transport Lift



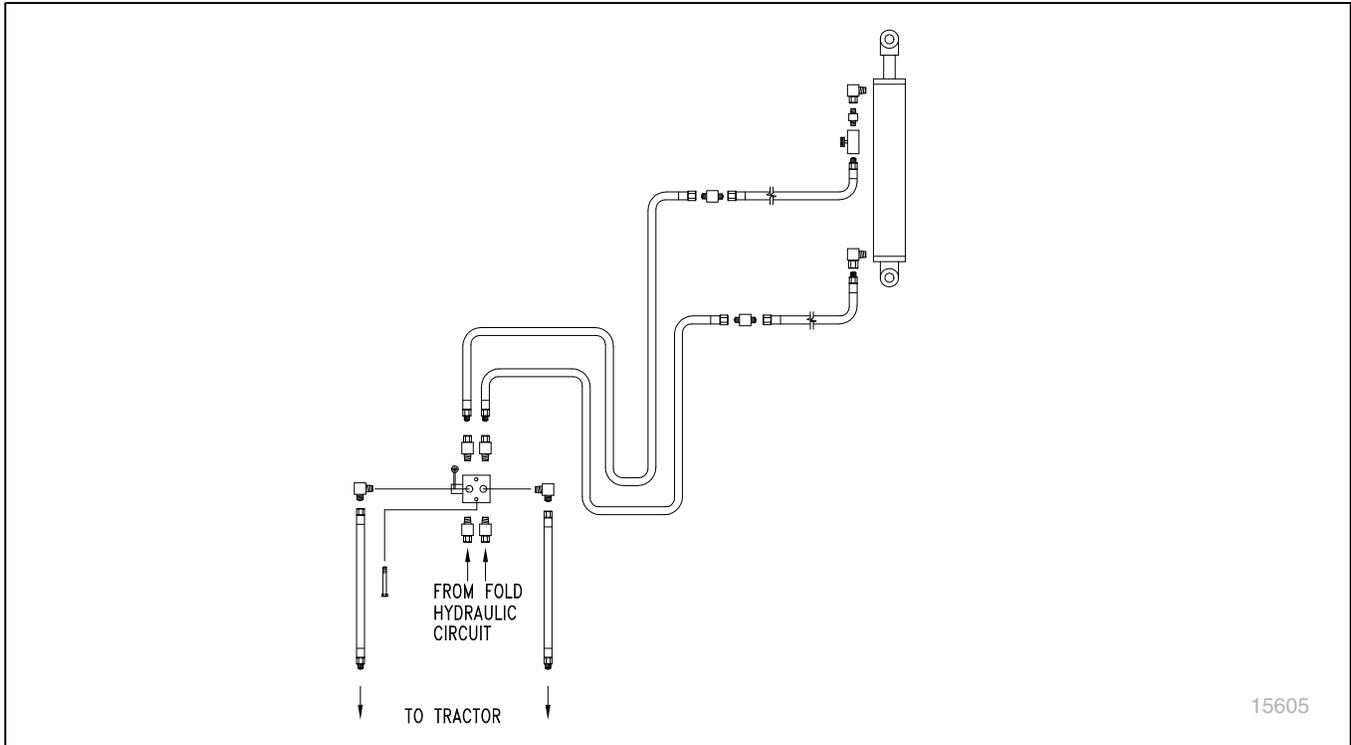
Fold



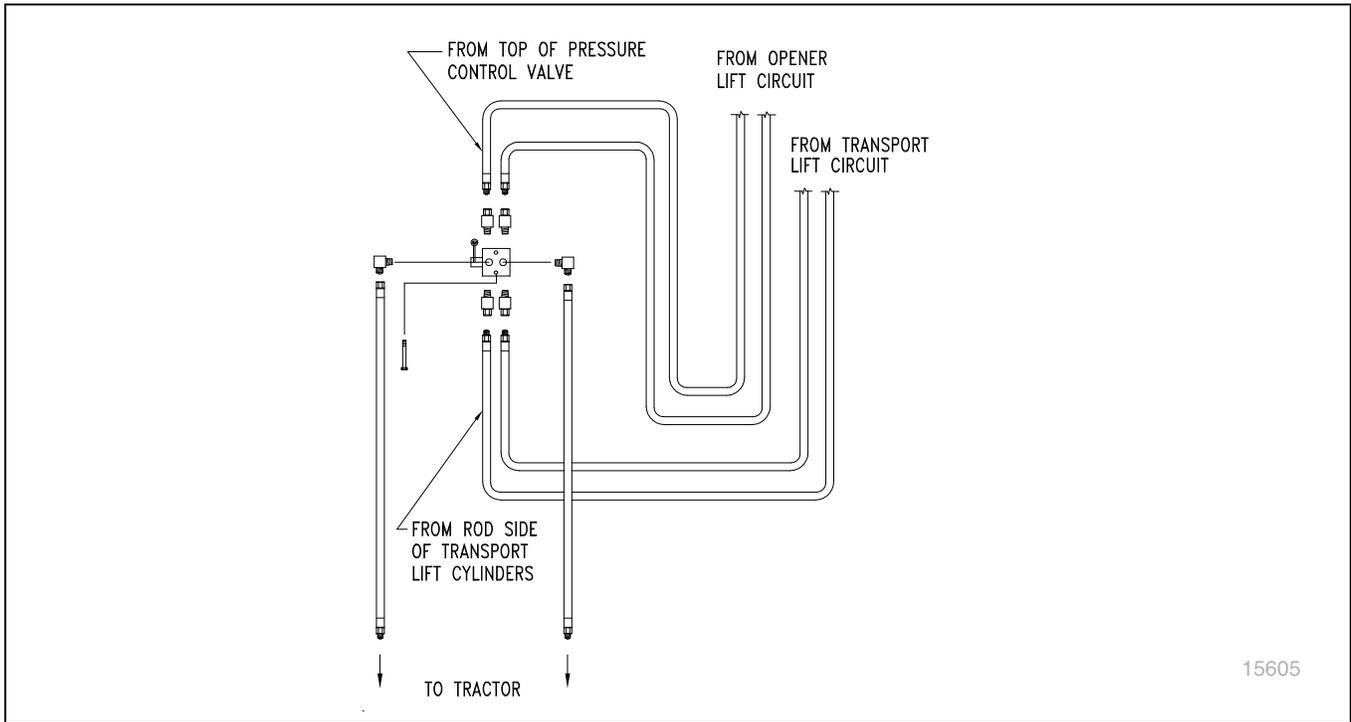
Dual Markers



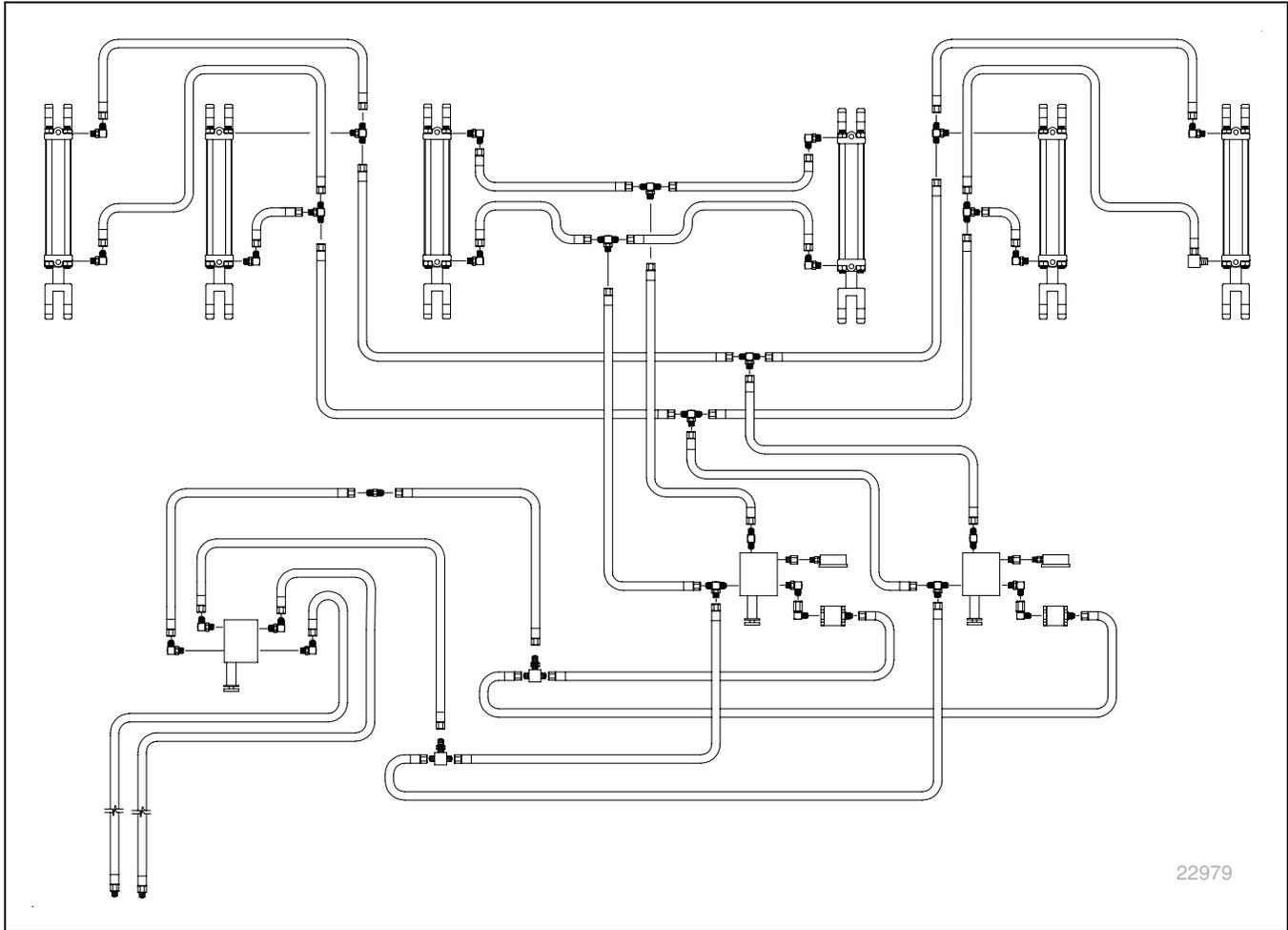
Single Marker



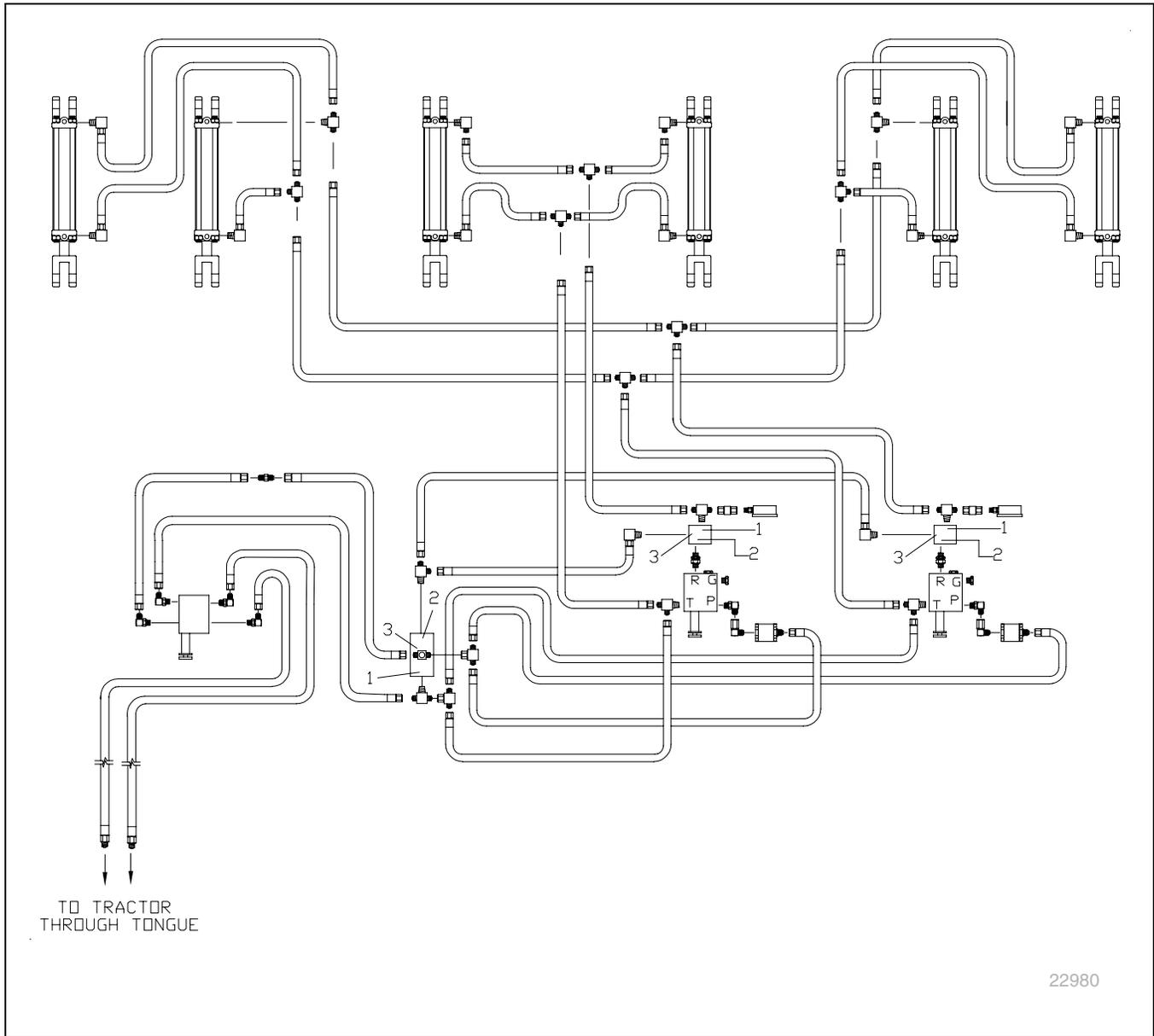
Two Outlet Conversion



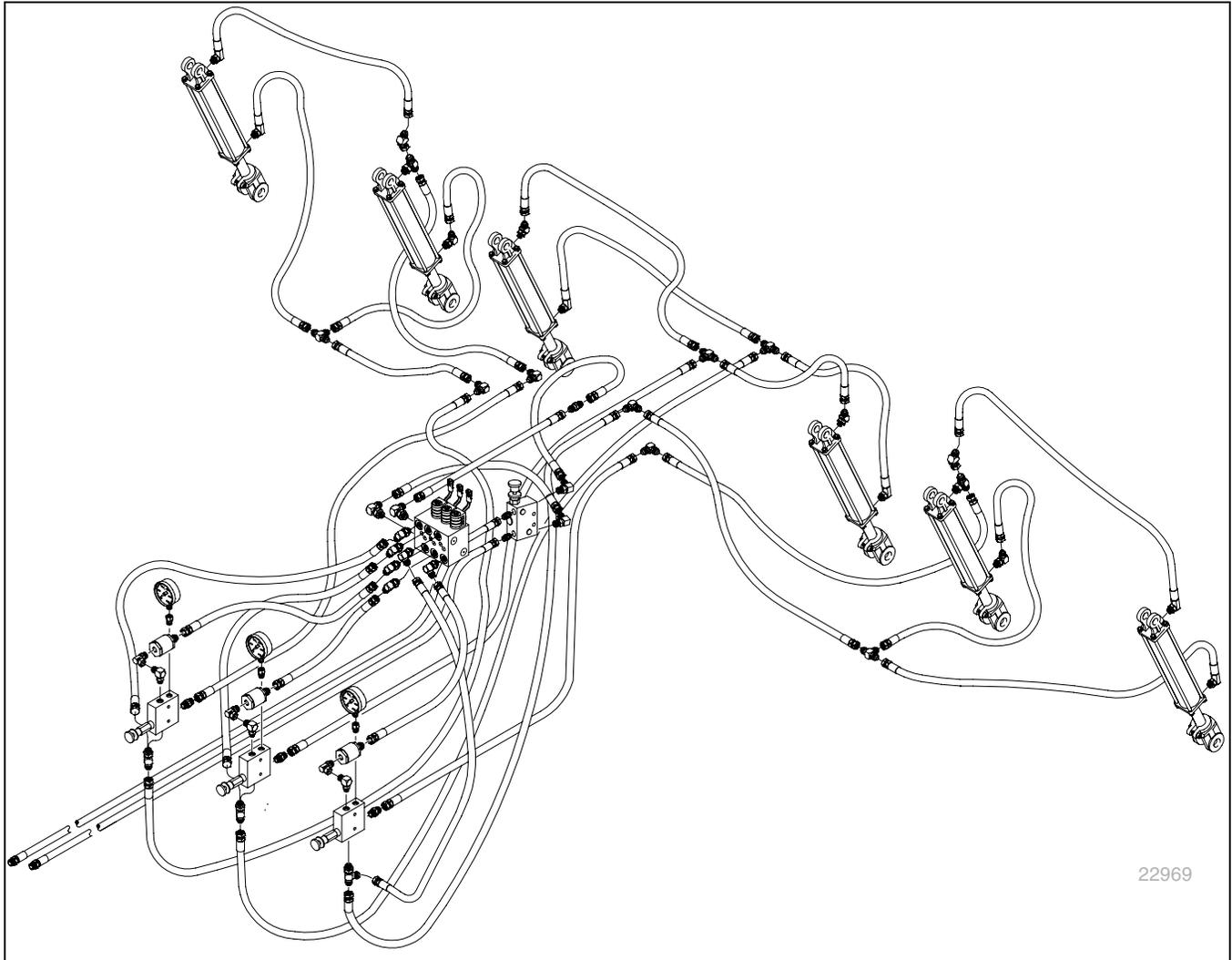
Opener Lift: Standard Closed-Center



Opener Lift: Optional Open-Center



Point-Row



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