

Pre-Delivery Manual

3S-5000/F/HD/HDF
3-Section 50 Foot Folding 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, or, as above, may show 3S-5000HD model where differences are immaterial to present topic.

ORIGINAL INSTRUCTIONS



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195-325Q

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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 3S-5000 is a towed seeding implement. This three section drill has a working width of 50 feet. The drill has straight arm, double disk 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-5000 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.

Document Family

195-325M	Owner's Manual (this document)
195-325B	Seed Rate Charts
133-322M	Small Seeds Manual
195-325P	Parts Manual

Models Covered

3S-5000-6010	60 Row, 10 inch (25.4 cm) Spacing
3S-5000-8075	80 Row, 7.5 inch (19.1 cm) Spacing
3S-5000-1006	100 Row, 6 inch (15.2 cm) Spacing
3S-5000F-6010	60 Row, 10 inch (25.4 cm) Spacing
3S-5000F-8075	80 Row, 7.5 inch (19.1 cm) Spacing
3S-5000F-1006	100 Row, 6 inch (15.2 cm) Spacing
3S-5000HD-6010	60 Row, 10 inch (25.4 cm) Spacing
3S-5000HD-8075	80 Row, 7.5 inch (19.1 cm) Spacing
3S-5000HD-1006	100 Row, 6 inch (15.2 cm) Spacing
3S-5000HDF-6010	60 Row, 10 inch (25.4 cm) Spacing
3S-5000HDF-8075	80 Row, 7.5 inch (19.1 cm) Spacing
3S-5000HDF-1006	100 Row, 6 inch (15.2 cm) Spacing

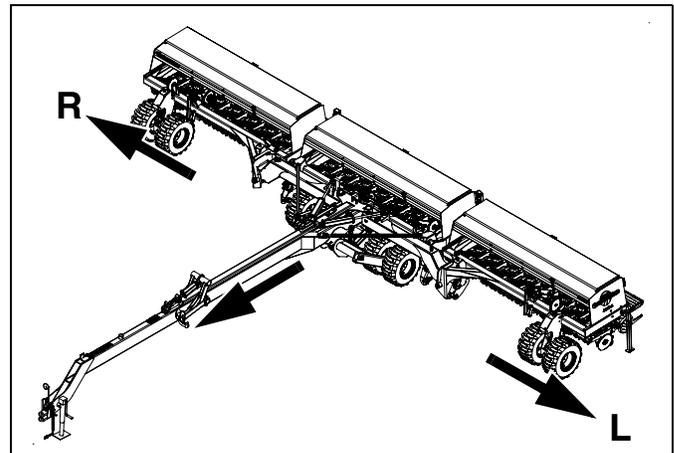


Figure 1
3S-5000

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.

Further Assistance

Great Plains Manufacturing, Inc. wants you to be satisfied with your new product. If for any reason you do not understand any part of this manual or are otherwise dissatisfied, please contact:

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

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



Important Safety Information

Look for Safety Symbol



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

Be Aware of Signal Words

Signal words designate a degree or level of hazard seriousness.



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



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



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

Prepare for Emergencies

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

Be Familiar with Safety Decals

- ▲ *Read and understand “Safety Decals” in Operator manual.*
- ▲ *Read all instructions noted on the decals.*
- ▲ *Keep decals clean. Replace damaged, faded and illegible decals.*

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.*

Transport Machinery Safely

Maximum transport speed for air 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 km/h). Never travel at a speed which does not allow adequate control of steering and stopping. Reduce speed if towed load is not equipped with brakes.*
- ▲ *Comply with state and local laws.*
- ▲ *Do not tow an air drill unless the towing vehicle is rated for, and ballasted for, the weight of the air drill.*
- ▲ *Carry reflectors or flags to mark air drill in case of breakdown on the road.*
- ▲ *Do not fold or unfold the air drill while the tractor is moving.*

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 air drill, put tractor in park, turn off engine, and remove key before performing maintenance.*
- ▲ *Make sure all system pressure is relieved.*
- ▲ *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 air drill before operation.*

Assembly

The following headings are step-by-step instructions for assembling the 3S-5000 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 3S-5000 drill is shipped via flat bed truck. It is the dealer’s responsibility to unload the new machine.

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.

Unload all equipment before beginning assembly.

Tools Required

- Forklift, loader or overhead hoist with a capacity of:
 - at least 13,000 pounds (5900 kg)
- A tractor of sufficient size and horsepower with at least two remote hydraulic circuits. Refer to “**Specifications and Capacities**” in the Operator’s Manual
- 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.

Pre-Assembly Checklist

1. Before assembling, read and understand “**Important Safety Information**” on page 2.
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. Allow room for wing unfolding and any markers (See “**Position for Assembly**” on).
5. Have all major components.
6. Have all fasteners and pins shipped with the drill.
- Note: If a pre-assembled part or fastener is temporarily removed, remember where it goes. Keep the parts separated.
7. 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.
8. Inflate tires to recommended pressure as listed on as listed on the “**Tire Inflation Chart**” on page 28.
9. Tighten wheel bolts as specified on “**Torque Values Chart**” on page 28.

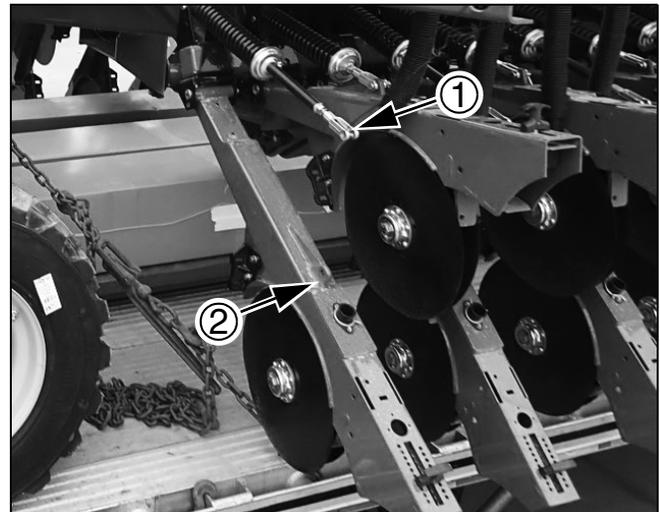


Figure 2
Opener Spring to Opener Frame

71302

Mount Outside Center Gauge Wheels

Refer to Figure 3

1. Jack up frame and support with jack stands or blocks.
2. Mount tires on hubs.

NOTICE

Interference and Equipment Damage Risks:

Bolt wheels with edge of center dish in toward hub as shown in Figure 3.

3. Secure wheel assemblies on hubs using $\frac{1}{2}$ -20 bolts. Tighten bolts as specified in “**Torque Values Chart**” on page 28.

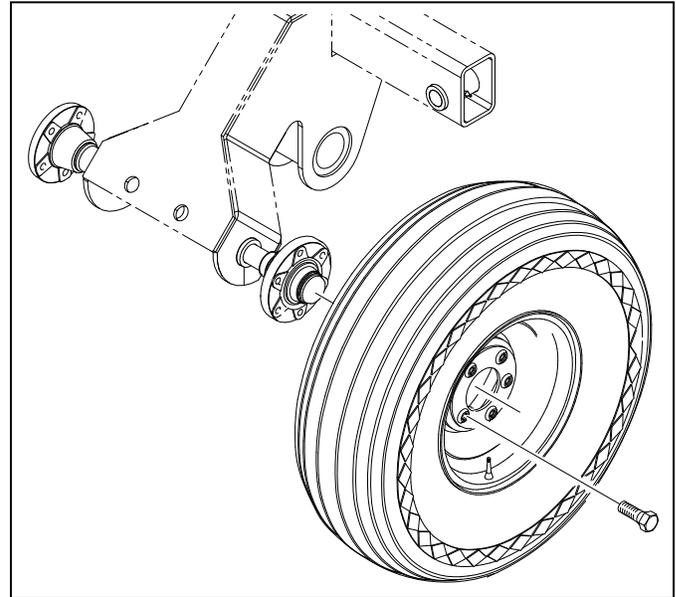


Figure 3
Gauge Wheel Installation

17175

Installing Middle Box on Frame

1. With forklift chains secured around lifting bar on back of center section box, lift center section box up to folded drill.
2. Bolt center section to drill tongue as shown using 7/8-inch bolts, flat washers, lock washers and nuts.
3. Connect truss tubes to center section as shown using clevis pins. Secure clevis pins with cotter pins provided. Take looseness out of truss by adjusting turnbuckle, but do not overtighten.

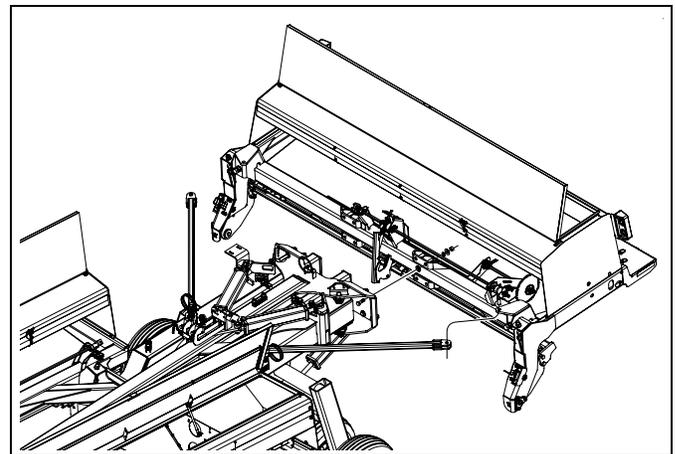


Figure 4
3S-5000 Middle Box

Install Press Wheels

Refer to Figure 5

1. Remove $\frac{1}{2} \times \frac{3}{4}$ 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 $\frac{1}{2} \times \frac{3}{4}$ 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.

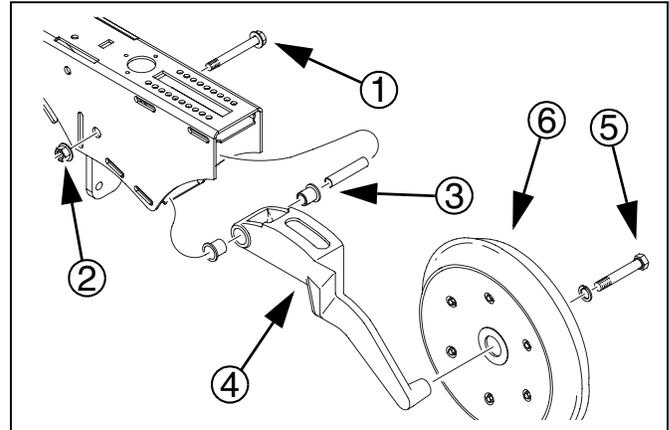


Figure 5
Press Wheel Assembly

24432

Install Center Breakaway Drive Shaft

Refer to Figure 6

1. Locate the uninstalled breakaway drive shaft shipped with your machine.
2. Secure the shaft's mounting block ① on the right-hand side's wing frame where shown. Use two sets of $\frac{1}{2}$ inch bolts, flat washers, lock spring washers, and hex nuts. Tighten each set of hardware firmly.

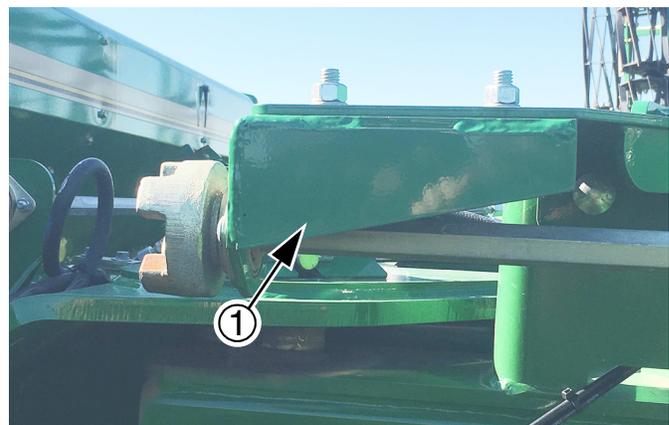


Figure 6
Breakaway Drive Shaft Mount

38689

Refer to Figure 7

3. Connect flat cross block of breakaway drive shaft to the machine's right-hand side drive shaft.
4. Run supplied cotter pin ① through the end of the right-hand drive shaft and cross block.
5. Secure with supplied U-joint pin ②.

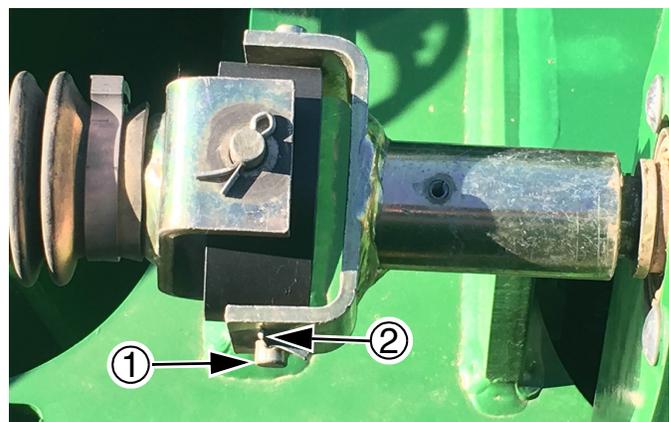


Figure 7
Breakaway Drive Shaft Coupling

38690

Install Wing Walkboards and Steps

There are two walkboards, one on the back of each wing seed box. The walkboards themselves are identical for each section. The way they install varies by section.

Bolts for walkboards are shipped in a bag in one of the drill boxes.

If the drill has swing-down ladders, the wing walkboard installation is identical at the outside ends.

If the drill has single steps, they are mounted as part of the walkboard installation, and require longer bolts at the outside ends.

Refer to Figure 8

1. Select eight sets of $\frac{1}{2} \times 1\frac{1}{4}$ inch bolts ③, lock washers and hex nuts ④.
2. Bolt each wing walkboard ① to box support channels ②.

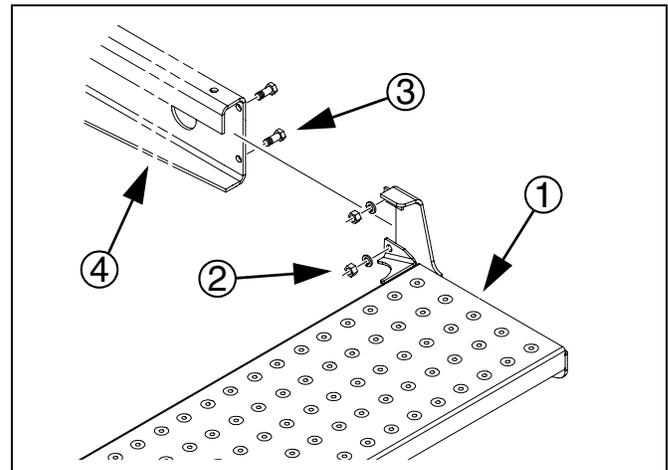


Figure 8
Wing Walkboards, Inner End

18810

Locate Ladder Mount Holes

Refer to Figure 9 or Figure 10

Where to place the top ladder mount depends on whether the drill has the Small Seeds option. Install with reference to the appropriate Figure for the drill.

Refer to Figure 9

Top mount weldments ⑬ 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. Select one:
 - ⑬ 195-063H LADDER MOUNT TOP WELDMENT LH, and four:
 - ⑰ 802-030C RHSNB 7/16-14X1 3/4 GR5.
2. Position top mount ⑬ over the four walkboard holes ④ appropriate for the configuration (see above).
3. Insert the four bolts ⑰ to loosely hold the top mount in place on the walkboard ④.
4. Select one:
 - ⑮ 195-340D LADDER MOUNT BOTTOM PLATE and four sets of:
 - ⑳ 804-014C WASHER LOCK 7/16 PLT
 - ㉑ 803-015C NUT HEX 7/16-14 PLT

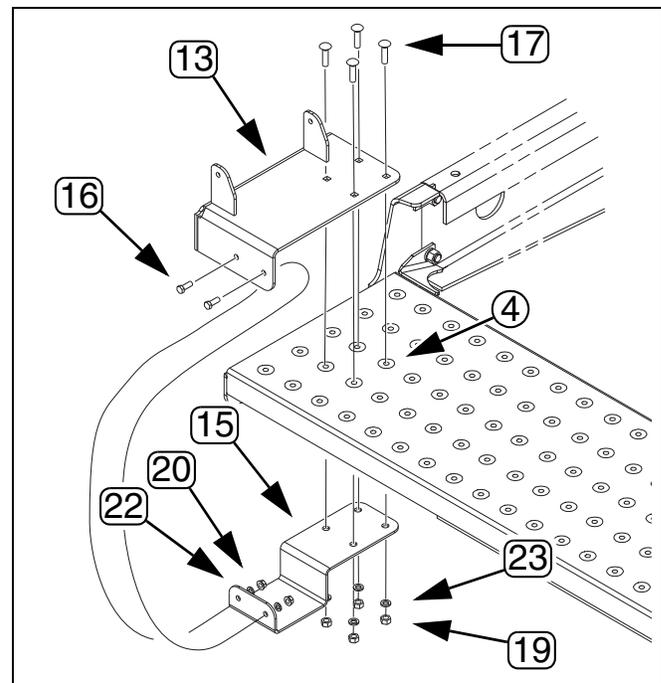


Figure 9
Small Seeds Mounting

27055

Refer to Figure 10

5. Position the bottom plate (15) under the walkboard (4) and inside the top mount (13). Loosely hold it in place with the washers (23) and nuts (19).
6. Select two sets of:
 - (16) 802-017C HHCS 3/8-16X1 GR5
 - (22) 804-013C WASHER LOCK SPRING 3/8 PLT
 - (20) 803-068C NUT HEX FLANGE 3/8-16 PLT
7. Insert the screws (16) through the side holes in both the top mount (13) and bottom plate (15), and secure with lock washers (22) and flange nuts (20).
8. Tighten the four $\frac{7}{16}$ in nuts (19) on bolts (17), securing the top mount (13) to the bottom plate (15).
9. Selecting one:
 - (14) 195-064H LADDER MOUNT TOP WELDMENT RH in place of mount (13), repeat step 1 through step 8 for right wing section.

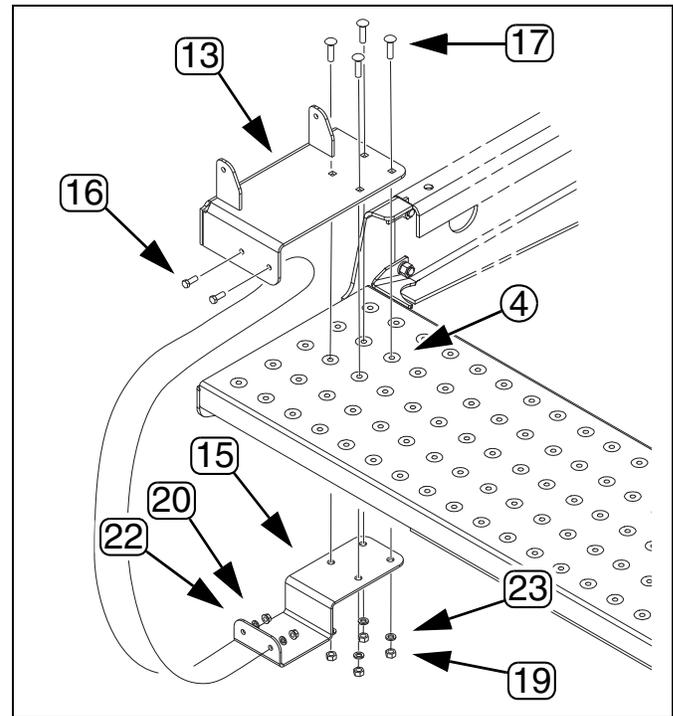


Figure 10
Mount w/o Small Seeds

27036

Install Ladders**Refer to Figure 11**

10. Starting with the left walkboard, select one:
 - (12) 195-062H LADDER WELDMENT 3-STEP NARROW
11. Lay the ladder (12) on the walkboard with the swing holes up and near the top mount (13) lug holes. Align the holes in the ladder in between the holes in the lugs.
12. Select two sets of:
 - (18) 802-079C HHCS 3/8-16X1 1/4 GR5
 - (24) 804-016C WASHER FLAT 1/2 SAE PLT
 - (21) 803-209C NUT FLANGE LOCK 3/8-16 PLT
13. Insert a screw (18) through (in this order):
 - the ladder (12) side plate,
 - a washer (24), and
 - the mount (13) lug.

Secure with lock nut (21).
14. Repeat step 10 through step 13 for right wing walkboard.
15. Swing both ladders down to check operation and position for decal placement.

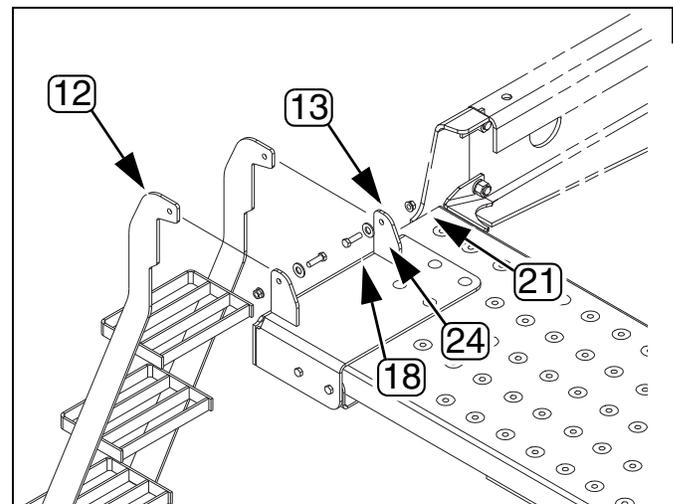


Figure 11
Ladder Installation

27037

Installing Reflectors and Decals

Decals are shipped in a bag in one of the drill boxes.

Note: To install new reflectors and decals:

- Clean the area where the reflector or decal is to be placed.
- Peel backing from reflector or decal. Press firmly on surface, being careful not to cause air bubbles under reflector or decal.

Place decals as follows.

1. On outside end of walkboard on each wing section, place amber reflectors and decal #838-102C as shown. On outside end of center section, place amber decal only.
2. On the backside of wing walkboards, place the amber reflectors as shown.
3. One back of center section, place a red reflector and a daytime reflector as shown.
4. On inside end of walkboard on each wing section, place amber reflector as shown.

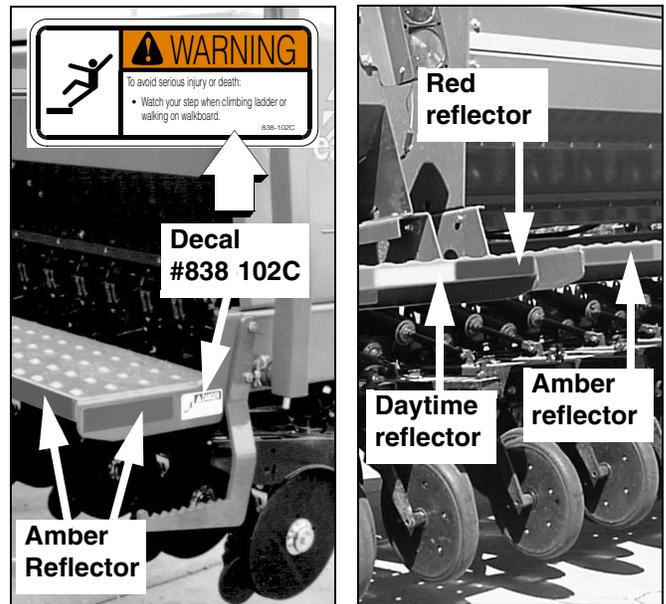


Figure 12
Walkboard Reflectors and Decals

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Acrometer Operation

The acrometer counts shaft rotations whenever the shaft is rotating - normally this is only with the drill lowered and in motion. The meter is programmed to display rotations as acres or hectares, when using all rows, factory-specified tires and tire inflations.

Note: Unusual conditions and/or non-standard row spacings can cause the acrometer tally to vary somewhat from actual acres planted.

Refer to Figure 41

Acrometers supplied with model 3S-5000 Drill drills have varied over time. For operational details (modes, resets, calibration), see the manual supplied with the acrometer:

Meter Style and Manual

- | | |
|------------|------------|
| ① 194-074M | ③ 152-314M |
| ② 152-325M | ④ 194-209M |

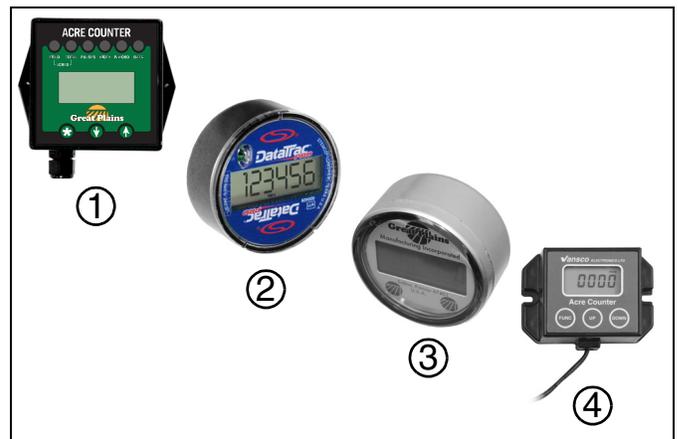


Figure 13
Acrometers

34776
34937
27378
36275

Handles and Lights

Install Box Handles

Refer to Figure 14

On outside ends of drill boxes, bolt handles to boxes. Use $\frac{1}{2}$ in hex-flange screws and lock nuts.



Figure 14
Box Handle

17347

Install Warning Lights

Refer to Figure 15

1. On inside ends of drill boxes, bolt warning lights to boxes. Use $\frac{1}{2}$ in hex-flange screws ① and lock nuts.
2. Plug warning-light leads into drill harness ②.
3. Check lights for correct installation after making electrical connections.
4. Fold drill, then check that both lights have an amber and a red lens facing toward rear of drill. If necessary, re-install lights properly.

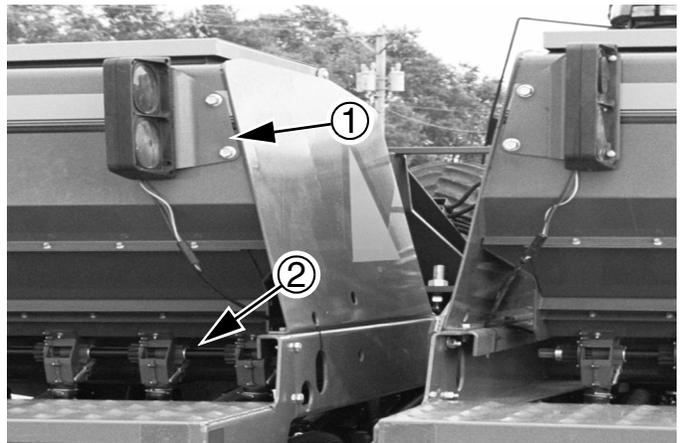


Figure 15
Warning Lights

17346

Install Slow Vehicle Sign

Refer to Figure 16

1. Locate the Slow Moving Vehicle sign ①, two mounting brackets ②, two sets of $\frac{5}{16}$ bolts ③, washers ④ and nuts ⑤, and four sets of $\frac{1}{4}$ bolts ⑥ and nuts ⑦.
2. Attach mounting brackets to the middle of the center box using $\frac{5}{16}$ hardware.
3. Attach Slow Moving Vehicle sign to secured mounting brackets using $\frac{1}{4}$ hardware.

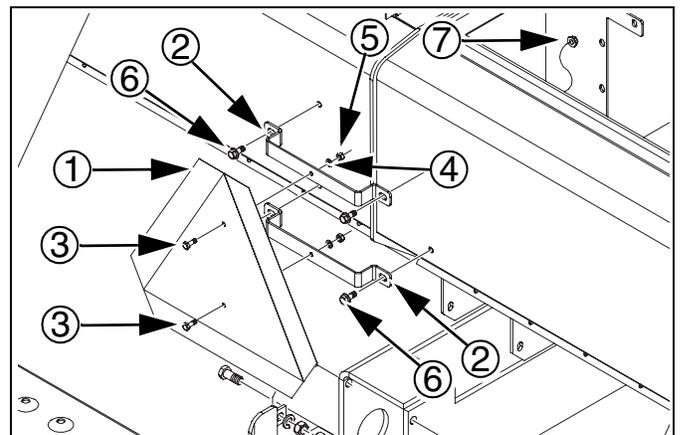


Figure 16
Slow Moving Vehicle

17346

Markers

Refer to Figure 17

Markers are not factory-installed, due to vertical clearance requirements during shipment. An installation manual is provided.

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

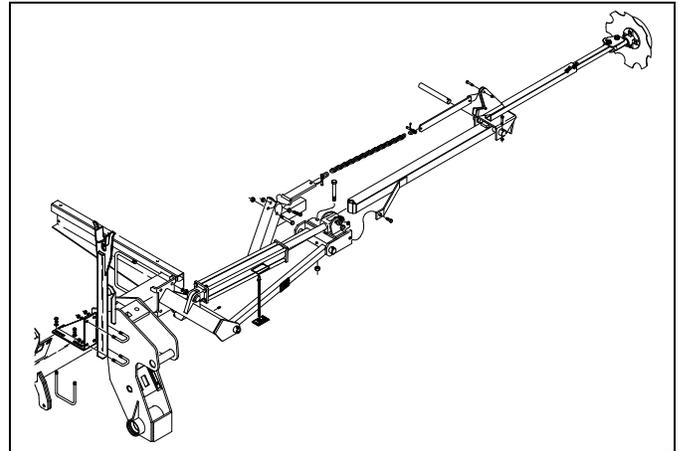


Figure 17
Marker

26493

Point Row Option

Refer to Figure 18

If the Point Row Option was ordered with the drill, the hydraulics and drill electrical lead are dealer installed. Refer to the point row installation manual for instructions.

Manual Number	Installation Kit
195-308M	Point Row

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.

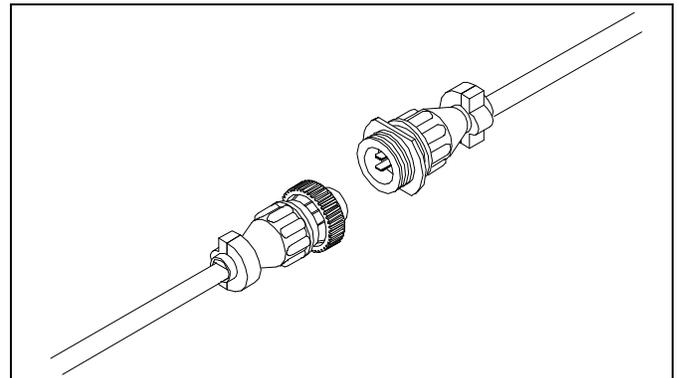


Figure 18
Point-Row Connector

26469

Other Assembly Items

There are a few additional standard components, and several possible optional items, that are not factory installed. Some of these need to be installed prior to first hydraulic hookup. Others are installed after hookup, bleeding and leveling. See "**Install Final Accessories**" on page 24.

Post Assembly Checklist

1. Check that all working parts are moving freely, bolts are tight, and cotter pins are spread.
2. Check for proper tension and alignment on all drive chains.
3. 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.
4. Inflate tires to recommended pressure and tighten wheel bolts as specified on page 28.



Setup

Hitching Tractor to Drill

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 drill and moving tractor. Stop tractor engine and set park brake before installing the hitch pin.

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.

1. Choose a drill-hitch option that is compatible with your tractor drawbar. The 3S-5000 has four hitch options:

- a clevis hitch,
- a small-hole, single-strap hitch or
- a large-hole, single-strap hitch.
- a CAT V hitch with adapter option

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.

2. To adjust the drill hitch to match your tractor-drawbar height, mount tongue jack on side of tongue as shown. Use jack to raise drill tongue so lowest hitch hole is 18 inches off ground.
3. Move the selector valve ② to the jack operating position as shown on the decal ③. Use the tractor hydraulics to raise or lower the drill tongue.

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

4. Securely attach safety chain to an anchor on a tractor capable of pulling the drill.
5. Plug drill electrical lead in tractor seven-pin connector. If your tractor is not equipped with a seven-pin connector, contact your dealer for installation.

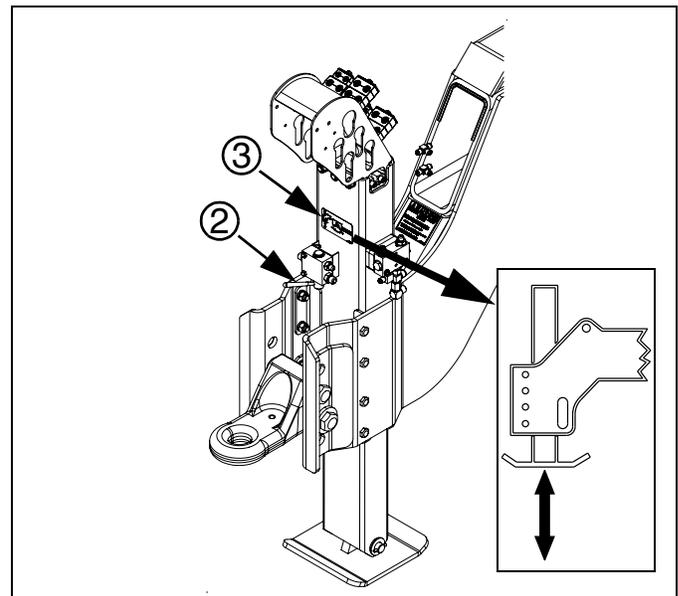
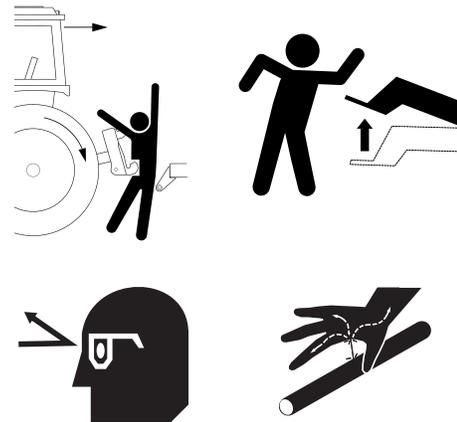
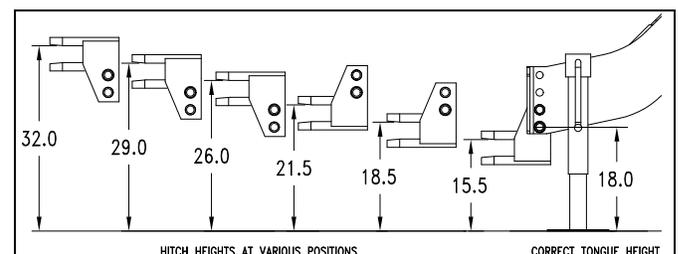


Figure 19
Hydraulic Jack

38568



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 20

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.

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.

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 Hydraulic Kit” on page 25.

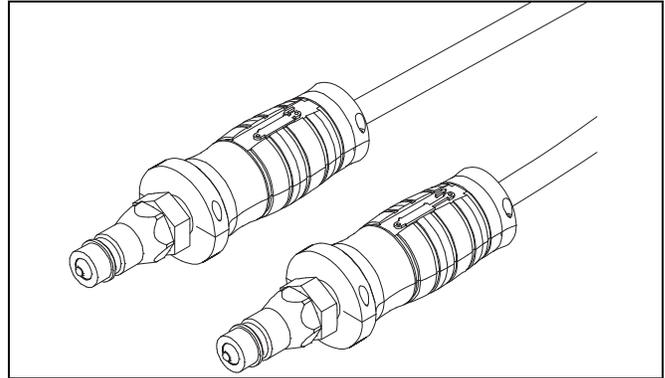
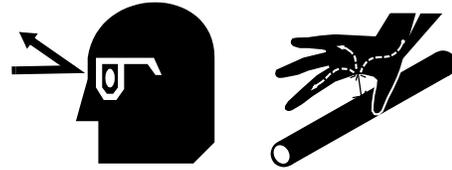


Figure 20
Color Coded Hose Handles

31733

Color	Hydraulic Function
Red	Opener Lift Cylinders
Blue	Transport Lift Cylinders
Grey	Fold Cylinders
Green	Marker Cylinders

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.

Hydraulic Operations

Consult the Operator’s Manual for unfolding and lowering instructions. Pay strict attention to the step ordering.

NOTICE

Both Opener and Transport Lift circuits must be raised and locked up before folding, or implement damage will result.

IMPORTANT!

TIRE DAMAGE WILL OCCUR.
UNFOLD DRILL BEFORE LOWERING!

TO UN-FOLD	TO FOLD
1. UNLOCK SUBFRAMES.	1. RAISE OPENERS.
2. UNLOCK AXLE.	2. RAISE DRILL.
3. UNFOLD	3. FOLD.
4. LOWER DRILL.	4. LOCK AXLE.
5. LOWER OPENERS.	5. LOCK SUBFRAMES.

R19-194C

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.*

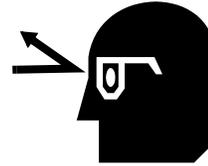
Never bleed at:

*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.

System capacity for entire drill is about

4½ U.S. gallons
(17 liters).



Bleeding Opener Lift Hydraulics

Refer to Figure 21

1. Check hydraulic fluid level in tractor reservoir and fill to proper level. Add fluid to system as needed. System capacity for entire drill is about 4½ gallons (17 liters).
 2. Make sure opener frames are locked up in road position. See "Folding" on page 17.
 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 ① completely clockwise for no oil flow.
 5. Loosen four top hose-end fittings ② at the locations shown.
 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.
- Note: Do not loosen an O-ring fitting for bleeding. Bleeding air from an O-ring fitting will damage the seal.

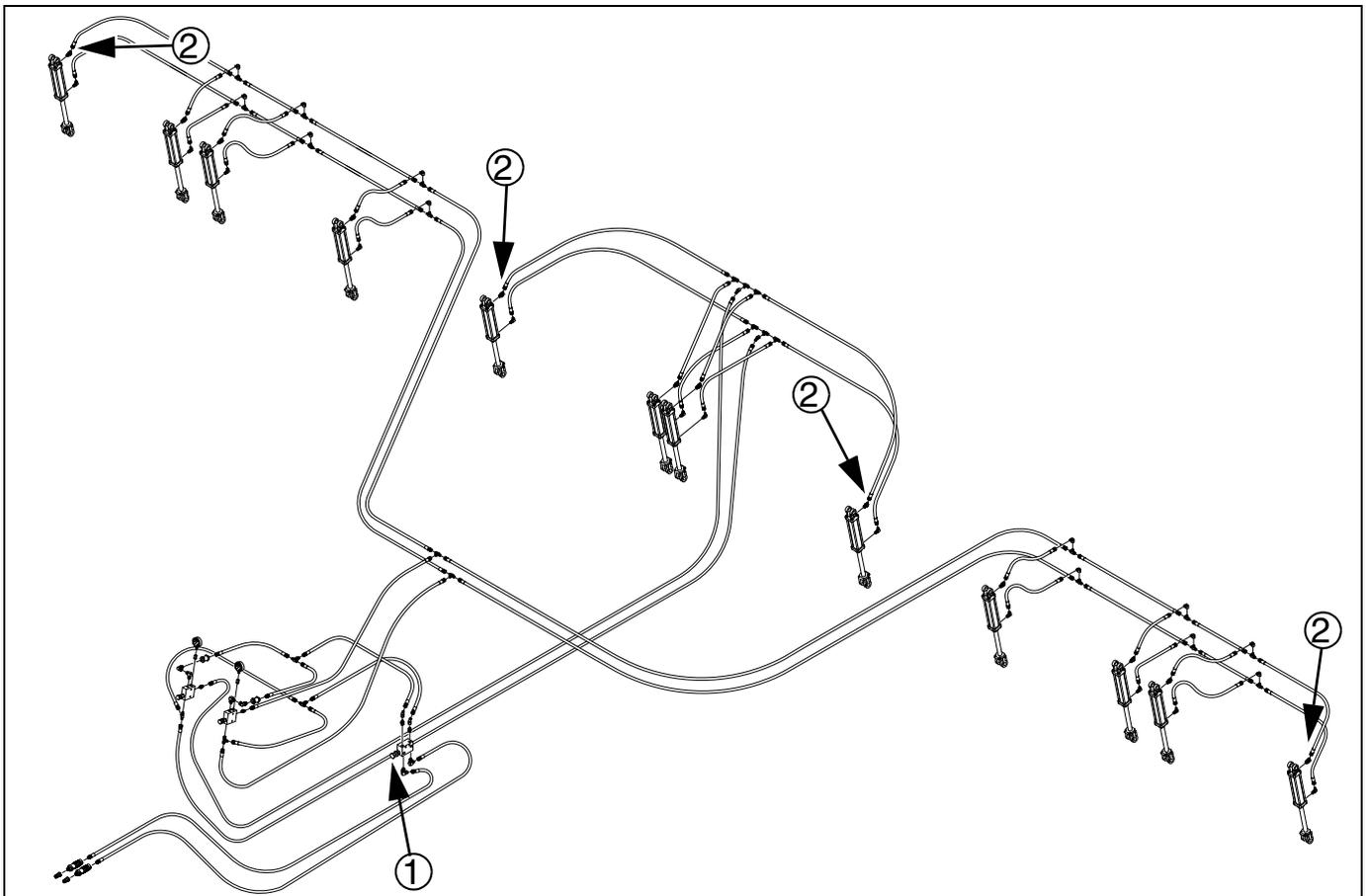


Figure 21
Bleeding Opener Lift Hydraulics

34348

Bleeding Fold & Jack Hydraulics

Refer to Figure 22

1. Check hydraulic fluid level in tractor reservoir and fill to proper level. Add fluid to system as needed.
 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 fittings ① at lower fold elbows.
- Note: Do not loosen an O-ring fitting for bleeding. Bleeding air from an O-ring fitting will damage the seal.
4. Make sure hydraulic jack valve is in the field position. See **"Folding"** on page 17.
 5. Slowly supply oil to rod end of fold cylinders until oil appears at loosened hose fitting. Tighten fitting and completely retract fold cylinders.
 6. With cylinders completely retracted, loosen base end hose fittings ② at elbow on lower fold cylinders.
 7. Loosen base and hose fittings ③ at hydraulic jack elbows.
 8. Slowly supply oil to base end of fold cylinders until oil appears at loosened hose fitting. Tighten base end hose fitting and cycle fold cylinders in and out several times.
 9. Set hydraulic jack valve to the jack position and repeat steps 5-8. See **"Folding"** on page 17 for hydraulic jack information.
 10. Re-pin cylinder rod clevis.

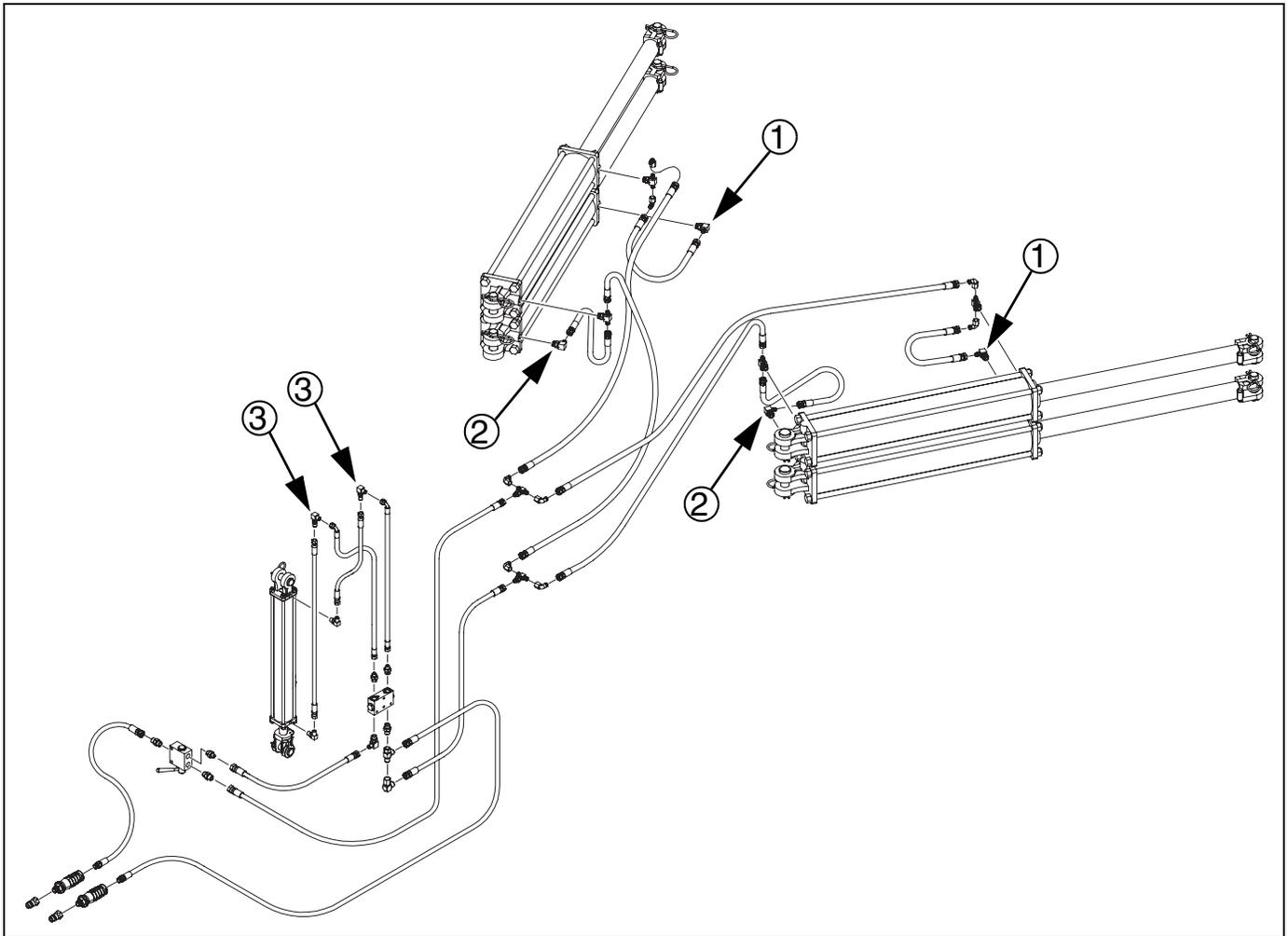


Figure 22
Bleeding Fold Hydraulics

34342

Bleeding Transport Lift Hydraulics

⚠ WARNING

Crushing Hazard:

The hydraulics could fail, causing the openers to fall and crush you. To prevent serious injury or death, always secure cylinder lock channels over extended transport-lift cylinders before working under openers.

Refer to Figure 23

1. Check hydraulic fluid level in tractor reservoir and fill to proper level. Add fluid to system as needed.
2. Lower drill into field position and completely retract box lift cylinder at middle of tongue. Loosen base end hose fitting on left transport lift cylinder and base end fitting on box lift cylinder ①.
3. Slowly supply oil to base end of transport lift cylinders until oil appears at loosened hose fitting. Oil may not appear at both locations at the same time. As oil begins to appear at a fitting, tighten that fitting and proceed until both fittings have been tightened.
4. Completely extend transport lift cylinders and immediately lock cylinders up by flipping up cylinder lock channels on both transport lift cylinders and box lift cylinder.
5. When cylinder lock channels are in place, loosen rod end hose fitting on left transport lift cylinder and rod end hose fitting on box lift cylinder ②.
6. Slowly supply oil to rod end of transport lift cylinders until oil appears at the loosened hose fittings. As oil begins to appear at fitting, tighten that fitting and proceed until all fittings are tightened.
7. Extend transport lift cylinders, and remove the cylinder lock channels. Completely cycle transport lift hydraulics several times.

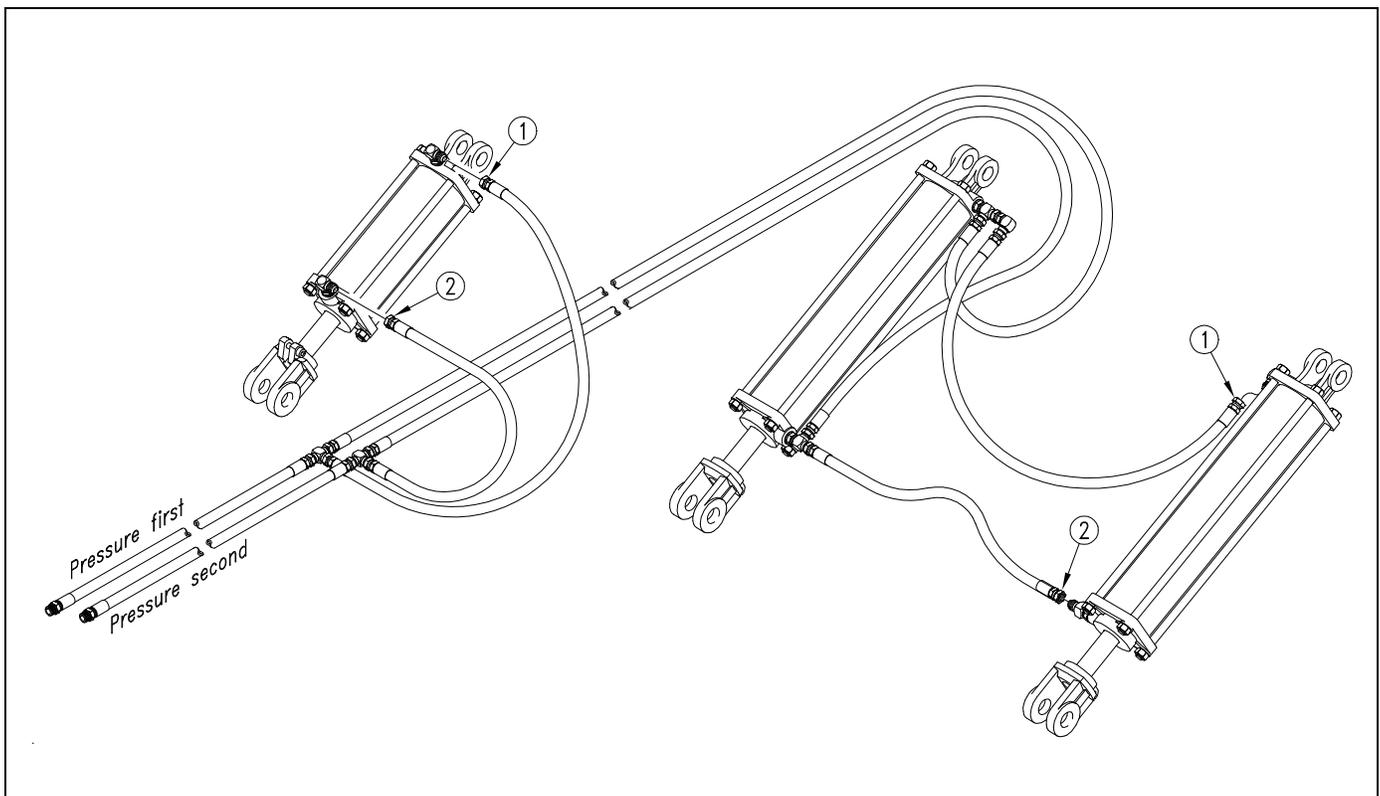


Figure 23
Bleeding Transport Lift Hydraulics

18836

Folding

WARNING

Crushing Hazard:

Bystanders could be crushed between the folding drill boxes and the drill tongue. To avoid serious injury or death, keep all bystanders well away during drill operation.

1. Park tractor and drill on level ground with tractor transmission in park. Be aware of clearance needed to fold drill.
2. Fold up markers.

Refer to Figure 24

3. Move the selector valve ① on the jack to the folding/unfolding position as shown on the decal ②.

Refer to Figure 25

4. Position opener lock handles in road position and completely raise openers.

Note: The opener transport lock handles are spring loaded and can be moved to ROAD position with openers up or down, but locks will only engage when openers are completely raised. There are two locks on each drill section (six total).

5. Make sure transport lift cylinders and front box lift cylinder are completely retracted.
6. Slowly supply oil to rod end of fold circuit. Completely fold wing frames until both wing gauge wheels contact tongue tube.
7. Supply oil to transport lift circuit until transport lift cylinders and front box lift cylinder are completely extended and drill is completely raised.

Refer to Figure 26 and Figure 27

8. Rotate cylinder lock channels over rods on the two transport lift cylinders and the front box lift cylinder.
9. Allow transport lift cylinders to settle back against lock channels.
10. Before transporting, check that hydraulic cylinders are holding lock channels securely.

Folding Summary

1. Move selector valve on jack.
2. Fold markers.
3. Raise openers.
4. Fold drill.
5. Extend transport and front box lift cylinders.
6. Lock transport and front box lift cylinders.

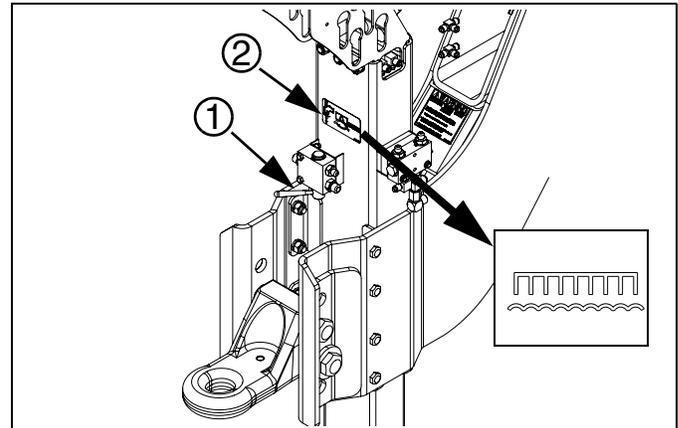


Figure 24
Hydraulic Jack

38568



Figure 25
Opener Lock Up

34294

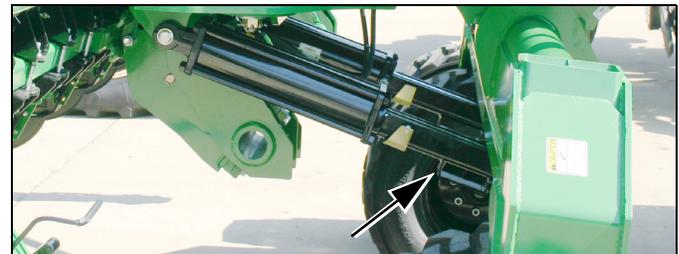


Figure 26
Transport Lift Cylinder Lock

34321

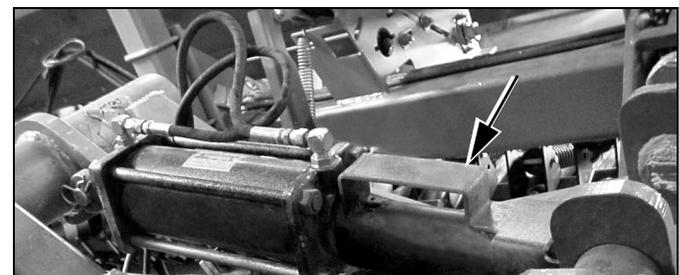


Figure 27
Front Box Lift Cylinder Lock

18959

Unfolding

WARNING

Crushing Hazard:

Bystanders could be crushed between the folding drill boxes and the drill tongue. To avoid serious injury or death, keep all bystanders well away during drill operation.

1. Park tractor and drill on level ground with tractor transmission in park. Be aware of clearance needed to unfold drill.

Refer to Figure 28

2. Move the selector valve ① on the jack to the folding/unfolding position as shown on the decal ②.
3. Supply oil to transport lift circuit until transport lift cylinders and front box lift cylinder are completely extended and drill is raised completely.

Refer to Figure 29 and Figure 30

4. Rotate cylinder lock channels off cylinder rods of transport lift cylinders and front box lift cylinder.
5. Completely retract transport lift cylinders and front box lift cylinder.
6. Slowly supply oil to base end of fold circuit. Unfold wing frames by completely extending fold cylinders.

Refer to Figure 31

7. Position opener transport lock handles in FIELD position.
8. Completely raise openers to allow opener transport locks to disengage.

Note: The opener transport lock handles are spring loaded and can be moved to field position with openers up or down, but locks will only disengage when openers are completely raised. There are two lock handles on each drill section (6 total).

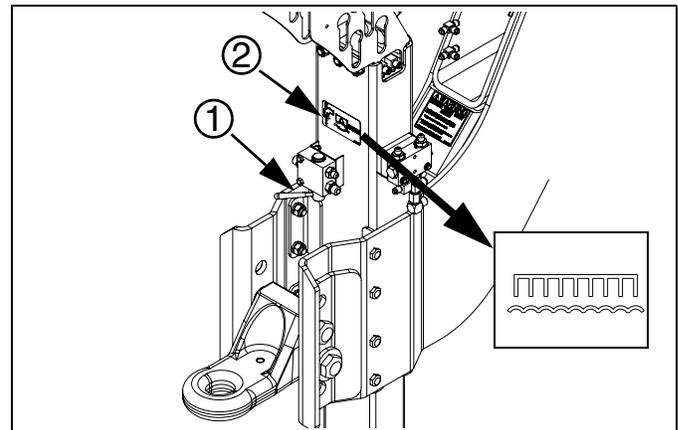


Figure 28
Hydraulic Jack

38568

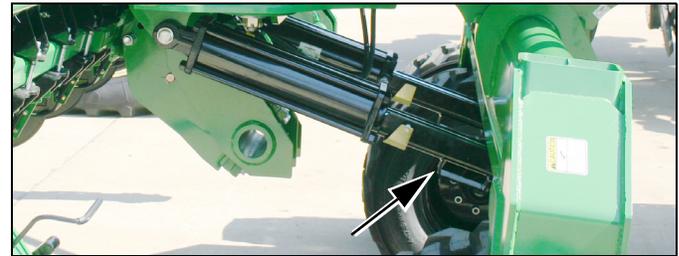


Figure 29
Transport Lift Cylinder Lock

34321

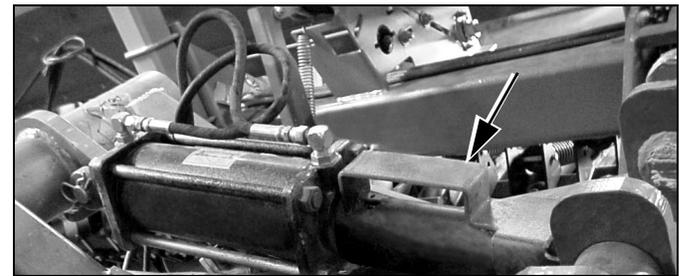


Figure 30
Front Box Lift Cylinder Lock

18959

Unfolding Summary

1. Move selector valve on jack.
2. Completely extend transport and front box lift cylinders.
3. Unlock transport and front box lift cylinders.
4. Retract transport and front box lift cylinders.
5. Unfold drill.
6. Lower openers.



Figure 31
Opener Lock Up

34294

Leveling the Drill

Center Box Frame Leveling

Refer to Figure 32

1. Park the drill on a clean level surface.
2. Raise the openers and lock them up.

⚠ WARNING

Raising openers while machine is unfolded and/or unhitched can result in damage to the machine and create unsafe working conditions.

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.

Refer to Figure 33

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. Torque the 7/8 inch box mount bolts ①.

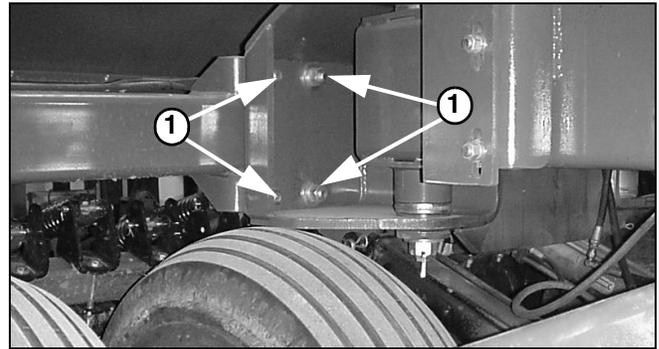


Figure 32
Center Box Mount Bolts

18873

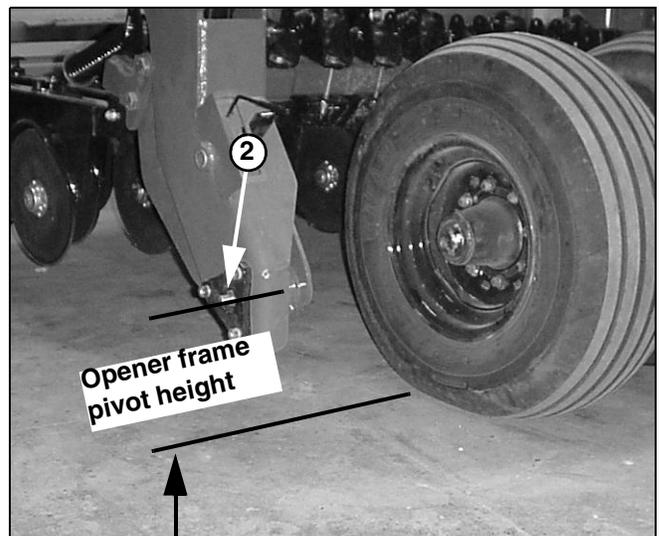


Figure 33
Opener Frame Leveling

18874

Frame Adjustments

Refer to Figure 34

Toolbar Height Adjustment

Toolbar height is factory set and normally will not require adjustment. If the toolbar is visibly not level, spacer washers on vertical pivot pins allow for a small amount of toolbar-height adjustment.

To check toolbar height, park drill on a level surface. Measure from ground to horizontal pivot pin ①. If dimension on either side of drill varies more than 1/4 inch, adjust toolbar height.

To adjust toolbar height, reposition spacer washers ②. First lower openers and set enough opener down pressure to help balance frame. Raise toolbar by removing spacer washers from top of the vertical pivot and placing them on bottom side of pivot. Lower toolbar by removing spacer washers from bottom of vertical pivot and placing them on top of pivot.

Truss Tube Tension

The truss tubes help hold the center tool bar perpendicular to the tongue and straight under load. After some time, slack can develop in the truss tubes.

Check that truss tubes are providing a small amount of tension to help hold draft load from toolbars. If not, adjust truss length at front clevis ends.

Check truss tube tension if tool bar height is adjusted.

Also check wing box alignment when checking truss tubes. See **“Wing Box Alignment”** on page 21.

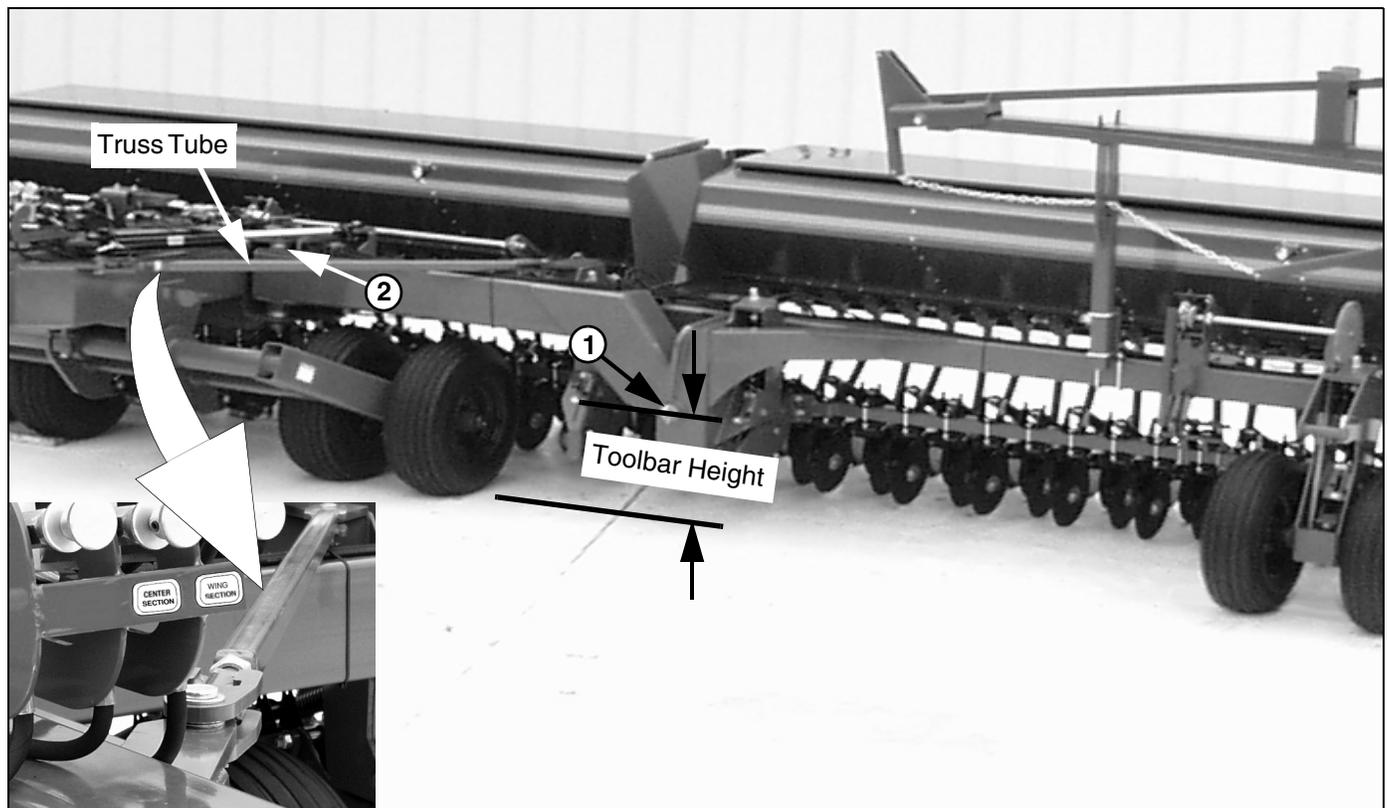


Figure 34
Toolbar and Truss Tube Adjustments

18845

Wing Box Alignment

Refer to Figure 35

1. Place a block ahead of the wing gauge wheels.
2. Pull forward against blocks to rock wing frames back. Pull forward until stop bolts are firmly against toolbars. See Figure 35 for stop bolt location.
3. Check for proper alignment by running a string line across back of drill toward outer ends of wings. For proper alignment, outside ends of boxes should be about 1 inch to 1-1/4 inch ahead of inside ends. See Figure 36.
4. To adjust box alignment, shorten or lengthen stop bolts to change the contact point with the toolbars. Adjust stop bolts in or out until outside ends of boxes are 1 inch to 1-1/4 inch ahead of inside ends.

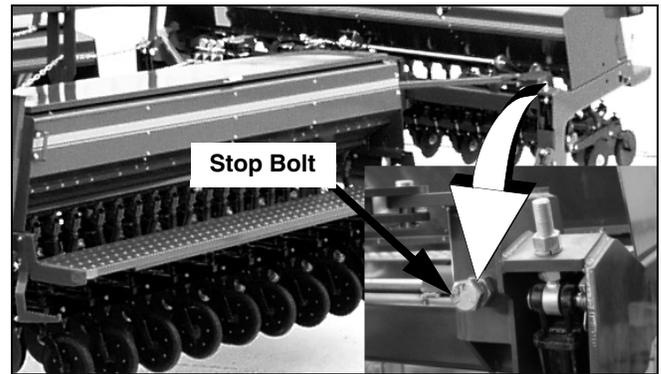


Figure 35
Stop Bolt Location

18988

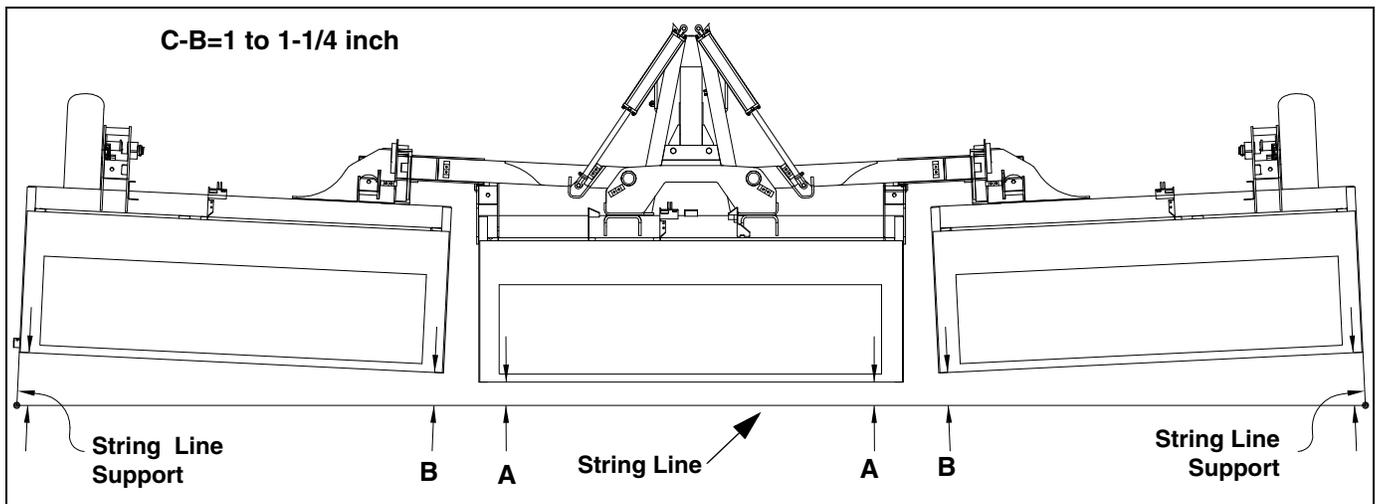


Figure 36
Wing Box Alignment Measurement

15654

Opener Frame Clearance

Refer to Figure 37

When fully raised, top of opener mounts ① should clear bottom of drill frame tube by at least 1/2 inch.

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, retighten jam nut. Repeat at each opener lift cylinder if necessary.

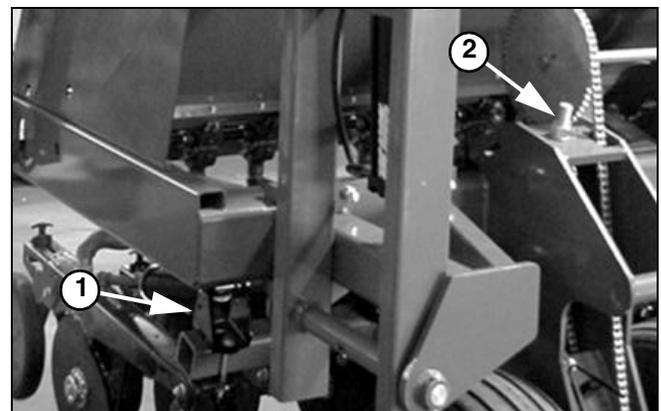


Figure 37
Stop Bolt Location

18988

Align Transfer Drive Shaft

Refer to Figure 38

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

1. Place a 4x4 or similar sized block ahead of the wing gauge wheels and pull forward or push wing box frames back until the toolbar is firmly against toolbar stop bolts on the center box frame.
2. To align the clutch jaws vertically, loosen the two 5/8 inch bolts ① on the backside of the adjustment plate ②. Slide the plate up or down in the desired direction.

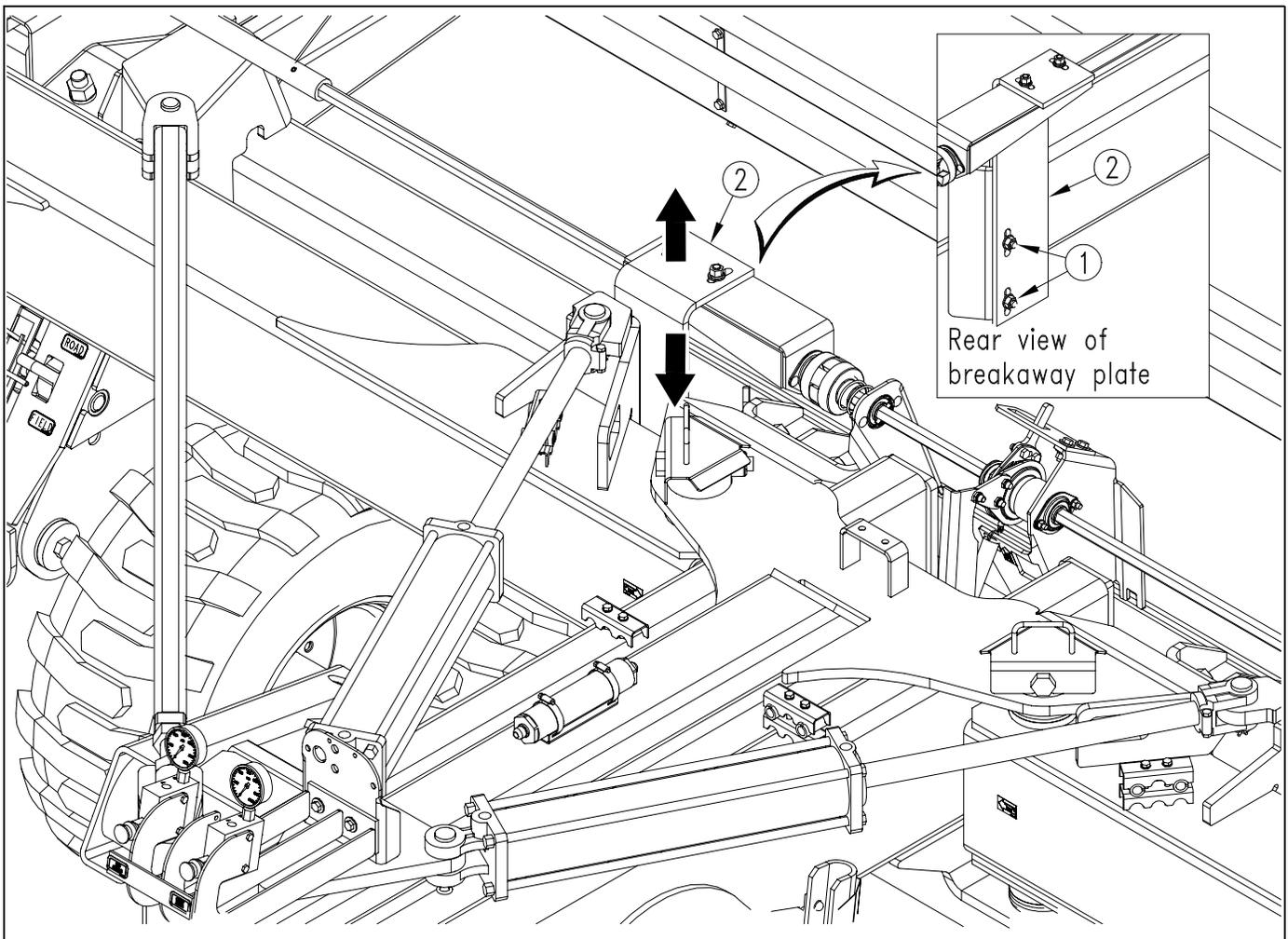


Figure 38
Transfer Drive Vertical Adjustment

18953

Refer to Figure 39

3. To align the clutch jaws from front to rear, loosen the two $\frac{1}{2}$ inch carriage bolts ③ and slide breakaway clutch ④ in the desired direction.
4. To adjust clutch jaws for full jaw contact, loosen the two $\frac{1}{2}$ inch carriage bolts ③ and slide breakaway clutch ④ until jaws on the fixed half of clutch make full contact with jaws on spring loaded half of clutch without compressing clutch spring.

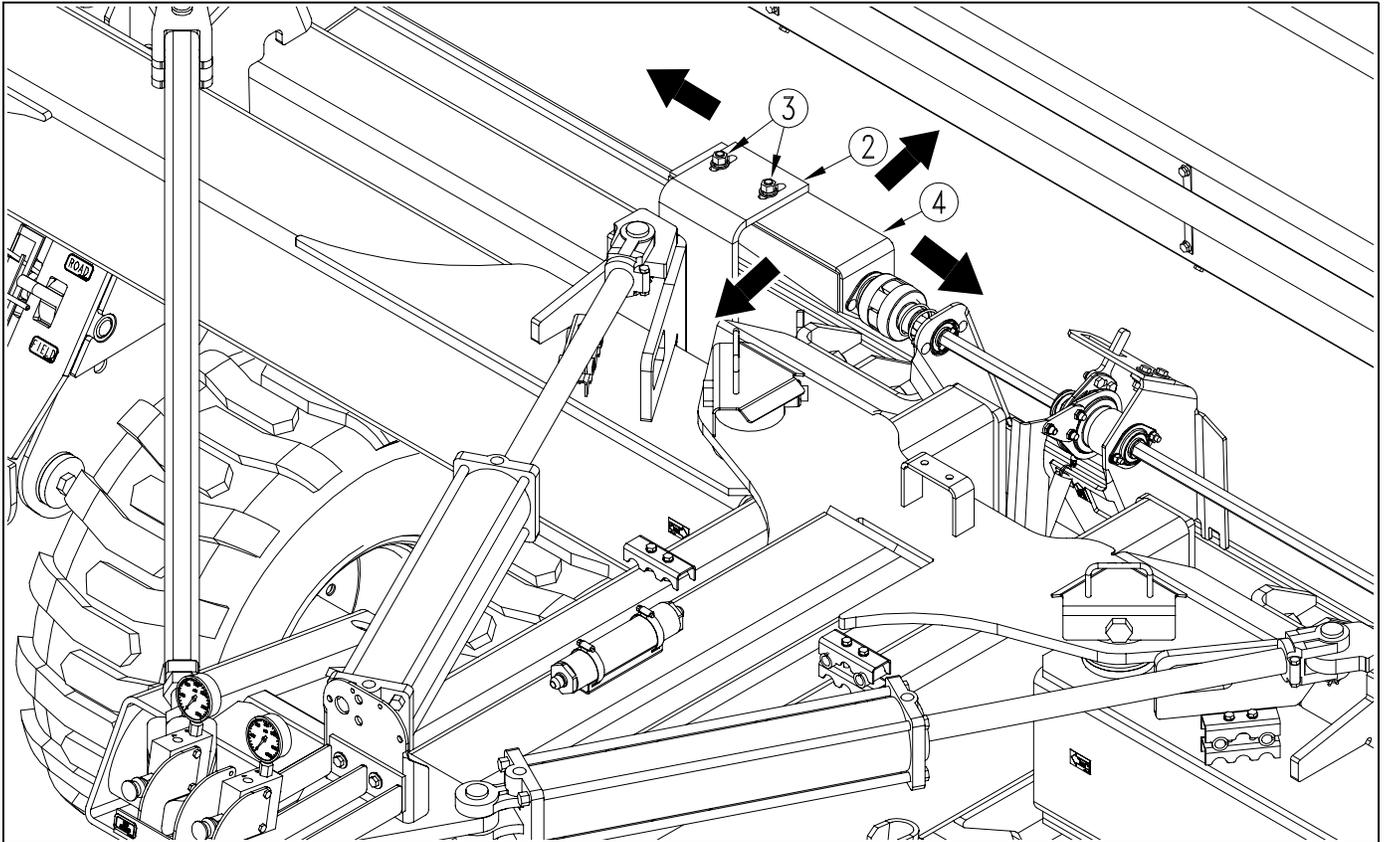


Figure 39
Transfer Drive Vertical Adjustment

18953

Refer to Figure 40

Note: The two $\frac{7}{8}$ inch hex shafts ⑤ should have $\frac{1}{8}$ inch between them when the clutch jaws have full contact.

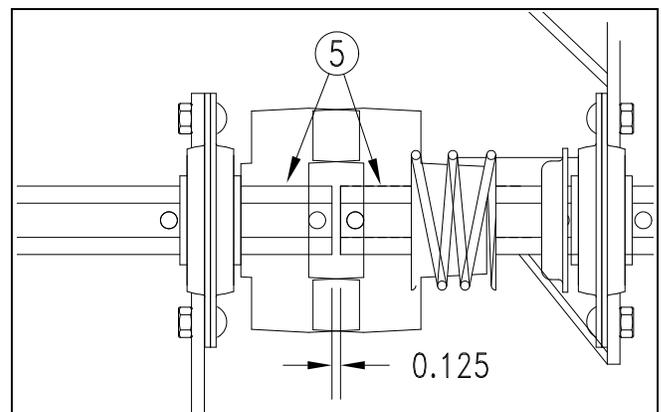


Figure 40
Stop Bolt Location

18988

Install Final Accessories

Acremeter Installation

Refer to Figure 41

The acremeter ① is supplied from the factory in a separate carton, to minimize risk of shipping damage.

To install the acremeter, please refer to the appropriate manual for the acremeter your machine has. Potential acremeters are shown to the left. Match your acremeter with the corresponding installation manual below.

Meter Style and Manual

- | | |
|------------|------------|
| ① 194-074M | ③ 152-314M |
| ② 152-325M | ④ 194-209M |

The acremeter 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.

Scraper Installation

Refer to Figure 42

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.
2. Position the inside scraper mount ① to the rear of the seed firmer mount ② on the opener weldment.

Secure it with two HHCS $\frac{3}{8}$ -16x1in 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 RHSNB $\frac{3}{8}$ -16x1 round head square neck bolt, flat washer, lock washer and nut.

4. Re-mount the removed disk blade.

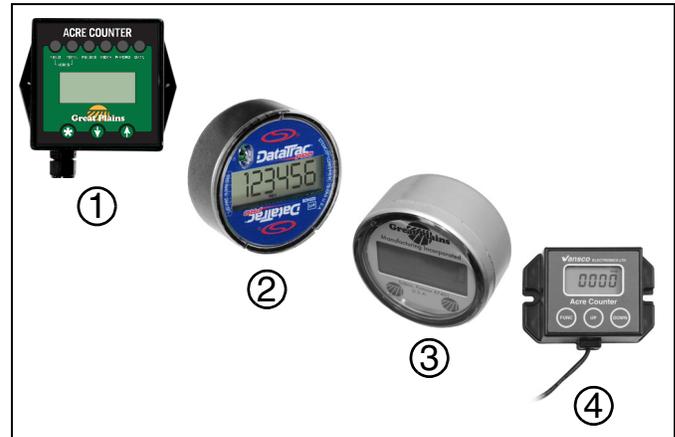


Figure 41
3S-5000 Acremeters

34776
34937
27378
36275

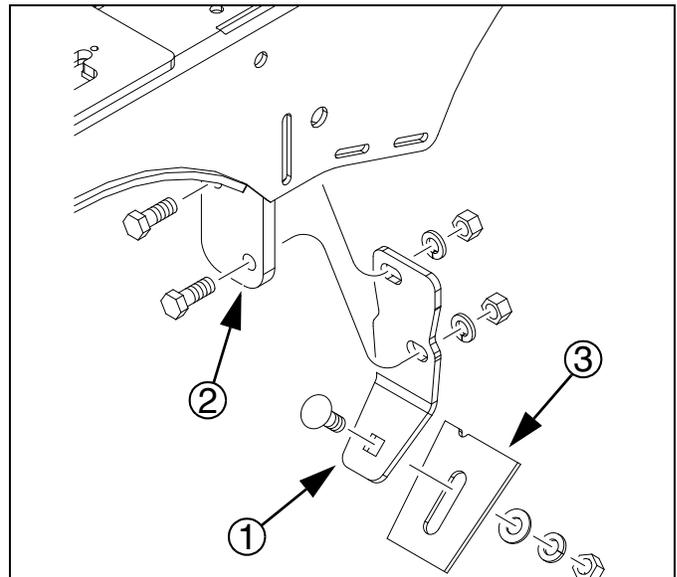


Figure 42
Scraper Installation

26460

Two Outlet Hydraulic Kit

Refer to Figure 43

Manual Number	Installation Kit
195-308M	Two Outlet Hydraulic

To operate all drill functions, the standard 3S-5000 requires a tractor with three remote valves. Tractors with two remote valves can be used with the two outlet hydraulic kit. Using a double selector valve mounted on drill tongue, this kit combines transport lift and opener lift circuits.

To operate a drill equipped with markers on a tractor with two remote valves, you must install two kits—one to combine the transport lift and opener lift circuits and one to combine the marker and fold circuits.

For more information refer to “Hydraulic Hose Hookup” on page 12.

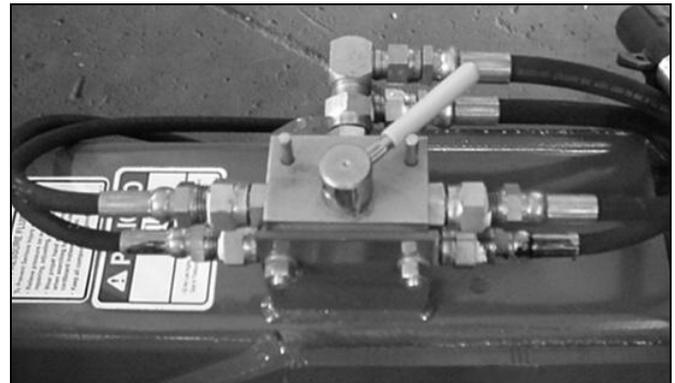


Figure 43
Two Outlet Hydraulics

18869

Fertilizer Orifice Plates

Refer to Figure 44

The manifold systems include size 28, 34 and 48 plates. To order alternate plates, use the following part numbers. Order one per row unit.

Orifice Size	Part Number	Port Diameter	Port Area
20	832-052C	0.020 in	0.20 mm ²
28*	832-056C	0.028 in	0.40 mm ²
34*	832-053C	0.034 in	0.59 mm ²
48*	832-054C	0.048 in	1.17 mm ²
59	832-057C	0.059 in	1.76 mm ²
80	832-055C	0.080 in	3.24 mm ²
98	832-059C	0.098 in	4.87 mm ²

* Sizes standard in many fertilizer bundles. Check your accessories before ordering. 29993

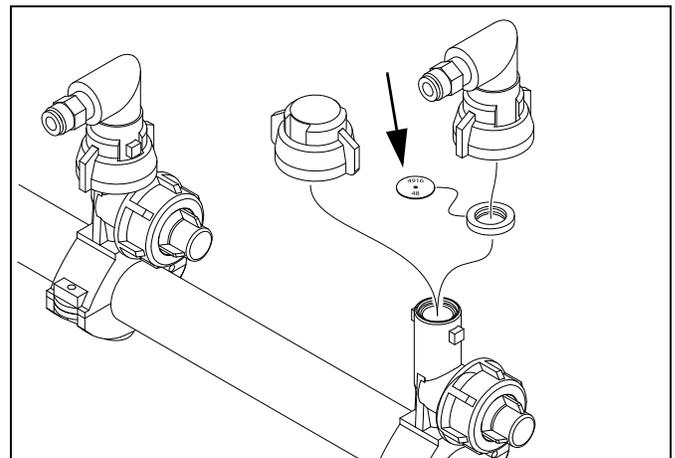


Figure 44
Fertilizer Orifice Plates

29984

Shaft Monitor

Refer to Figure 45

Manual Number	Installation Kit
116-284M	Shaft Monitor

This kit provides a cab alarm in the event that a main box seed meter shaft stops turning (which might result from excess down-pressure, low tire pressure/flat tire, chain break or clutch malfunction). Order one kit per air drill.

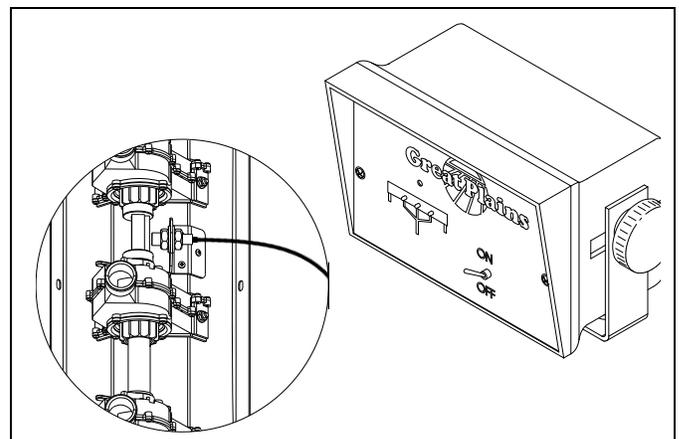


Figure 45
Shaft Monitor

18943
34210

Markers

Refer to Figure 46

Manual Number	Installation Kit
113-728M	Hydraulic Markers

Markers are not factory-installed, due to vertical clearance requirements during shipment. An installation manual is provided.

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

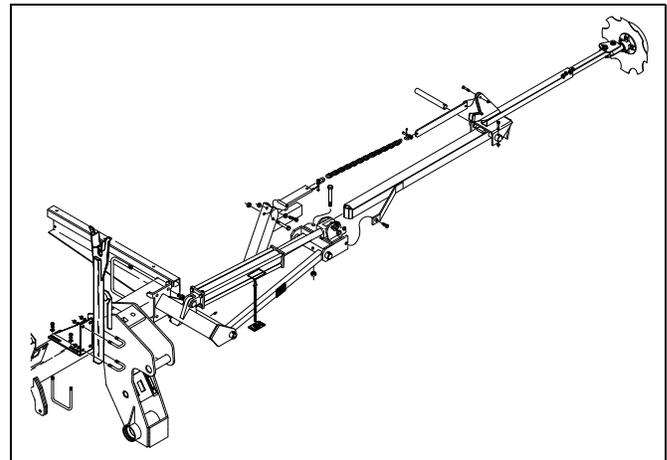


Figure 46
Marker

26493

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 13.

Refer to Figure 47

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.

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

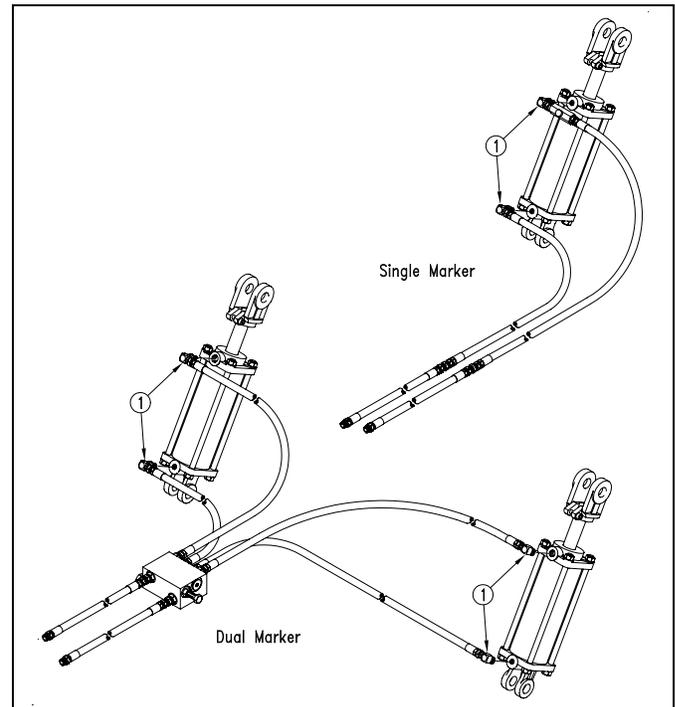


Figure 47
Bleeding Marker Hydraulics

18942

Open Center Conversion Kit

Refer to Figure 48

Manual Number	Installation Kit
194-149M	Open Center Conversion

The standard 3S-5000 drill is compatible with tractors having “active” or “closed center” hydraulic systems. For use with “non-active” or “closed center” tractors, a conversion kit is available. Order one kit per drill.

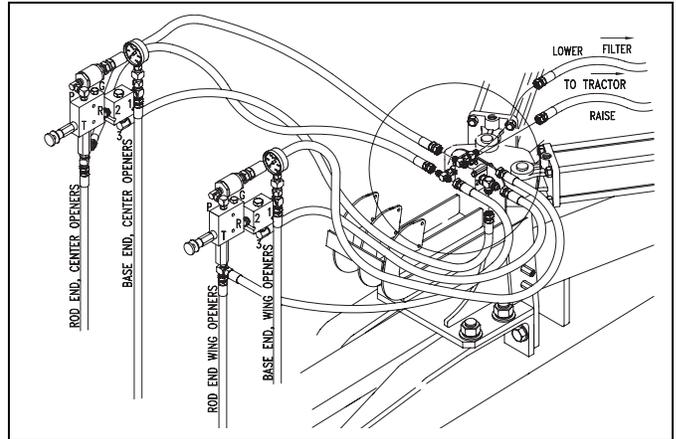


Figure 48
Open Center

18750

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.

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Tire Inflation Chart

Tire Inflation Chart		
Wheel	Tire Size	Inflation
Transport	14 17.5 NHS Skid Steer	80 psi (551 kPa)
Gauge Wheel	30.5 X 12 16.5 NHS Skid Steer	44 psi (303 kPa)
Transport	440/55R18	73 psi (503 kPa)
Gauge Wheel	340/60R16.5	73 psi (503 kPa)

Tire Warranty Information

All tires are warranted by the original manufacturer of the tire. Tire warranty information is found in the brochures included with your Operator's and Parts Manuals or online at the manufacturer's web sites listed below. For assistance or information, contact your nearest Authorized Farm Tire Retailer.
 ManufacturerWeb site
 Firestonewww.firestoneag.com
 Gleasonwww.gleasonwheel.com
 Titanwww.titan-intl.com

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