

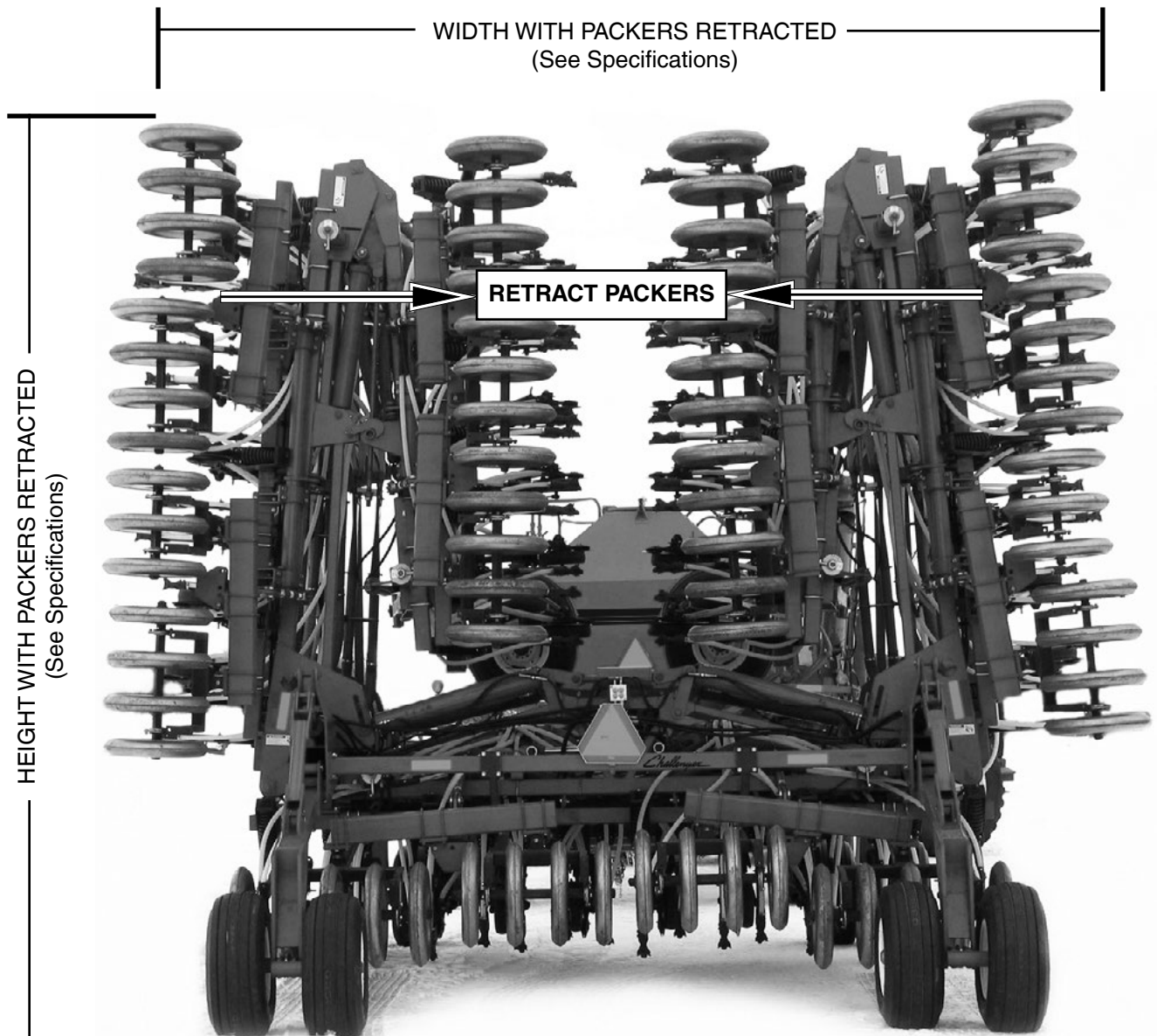
Maxim III Air Drill

Specifications

MAXIM III Specifications and Options

Base Size	3 Frame Models	5 Frame Models	
	40' (12.19 m)	50' (15.24 m)	60' (18.29 m)
Weight (3 1/2" Steel Packers with C-Shank)			
- 7 1/2" Spacing 19.0 cm Spacing	26,073 lb 11,851 kg	32,825 lb 14,920 kg	39,404 lb 17,911 kg
- 10" Spacing 25.4 cm Spacing	24,273 lb 11,033 kg	30,524 lb 13,875 kg	36,440 lb 16,564 kg
- 12" Spacing 30.5 cm Spacing	23,338 lb 10,608 kg	29,047 lb 13,203 kg	34,958 lb 15,890 kg
Working Width			
- 7 1/2" (19.0 cm) Spacing	40' (12.19 m)	50' (15.24 m)	60' (18.29 m)
- 10" (25.4 cm) Spacing	40' (12.19 m)	50' (15.24 m)	60' (18.29 m)
- 12" (30.5 cm) Spacing	40' (12.19 m)	52' (15.85 m)	60' (18.29 m)
Number of Shanks			
- 7 1/2" (19.0 cm)	64	80	96
- 10" (25.4 cm)	48	60	72
- 12" (30.5 cm)	40	52	60
Frame Width			
- Main	15 1/2' (4.72 m)	15 1/2' (4.72 m)	15 1/2' (4.72 m)
- Inner Wing	12' (3.66 m)	9 1/2' (2.9 m)	12' (3.66 m)
- Outer Wing	-	6 1/2' (1.98 m)	10' (3.05 m)
Transport Position			
- Width	19' 10" (6.05 m)	19' 10" (6.05 m)	19' 10" (6.05 m)
- Height	17' 4" (5.28 m)	16' 2" (4.93 m)	17' 4" (5.28 m)
- Length	31' 6" (9.6 m)	31' 6" (9.6 m)	31' 6" (9.6 m)
Opener to Ground			
- Hoe Point	13 3/4" (35 cm)	13 3/4" (35 cm)	13 3/4" (35 cm)
- Double Shoot/Knife	9 1/2" (24 cm)	9 1/2" (24 cm)	9 1/2" (24 cm)
Tires			
- Main Frame Castor Wheel	(4) 12.5L x 15 FI Load Range F	(4) 12.5L x 15 FI Load Range F	(4) 12.5L x 15 FI Load Range F
- Inner Wing Frame Castor Wheel (2 per wing)	(4) 12.5SL x 15 8 Ply Rating	(4) 12.5SL x 15 8 Ply Rating	(4) 12.5SL x 15 8 Ply Rating
- Outer Wing Frame Castor Wheel (2 per wing)	N/A	(4) 12.5SL x 15 8 Ply Rating	(4) 12.5SL x 15 8 Ply Rating
- Main Frame Transport Wheels	(4) 12.5L x 15 FI Load Range F 8 Bolt Hub	(4) 12.5L x 15 FI Load Range F 8 Bolt Hub	(4) 12.5L x 15 FI Load Range F 8 Bolt Hub
Dual Castor Wheels on Wings	Standard	Standard	Standard
Number of Ranks	7 1/2" (19.0 cm) Spacing - 4 row "Z" Pattern 10" (25.4 cm) & 12" (30.5 cm) Spacing - 4 row "Z" Pattern		
Trip Mechanism Options	400 lb (180 kg) Spring Cushion Trip with 1 (2.54 cm) x 2" (5.1 cm) shank 550 lb (248 kg) Spring Cushion Trip with 1 (2.54 cm) x 2" (5.1 cm) shank		
Shank Options	Forged Edge-On Conventional 'C' Shank (1 3/4" (4.4 cm) hole spacing) (47 Degree tillage tools)		
Packer Wheel Options	3 1/2" (8.9 cm) Steel or Rubber - (7 1/2" (19.0 cm), 10" (25.4 cm) & 12" (30.5 cm) Spacing) 4 1/2" (11.4 cm) Steel or Rubber - (10" (25.4 cm) & 12" (30.5 cm) Spacing ONLY)		
Frame to Opener	Vertical Clearance - 27 1/2" with Regular Hoe Point - 30 1/2" with Double Shoot/Knife Openers		
Rank to Rank Spacing	23 1/2", 23 1/2", 27 1/2"		
Shank to Shank Spacing	30" (76.2 cm) on 7 1/2" (19.0 cm) Spacing, 40" (101.6 cm) on 10" (25.4 cm) Spacing, 48" (122 cm) on 12" (30.5 cm) Spacing		
Frame Depth	78 1/2" (1.99 m) (4 ranks)		
Harrows	Optional		
Coulters - Fertilizer (Plain)	Optional - Front Row Mount on Row Centers - (20" (50.8 cm) Diameter) (Not available on 60ft - 7 1/2" spacing)		
Packer Mud Scrapers	Optional (For both Steel and Rubber Packers)		
Rock Deflectors	Optional (7 1/2" (19.0 cm), 10" (25.4 cm) & 12" (30.5 cm) Spacing)		
Safety Lights	Standard		
Safety Chain	Standard		

Transport Dimensions

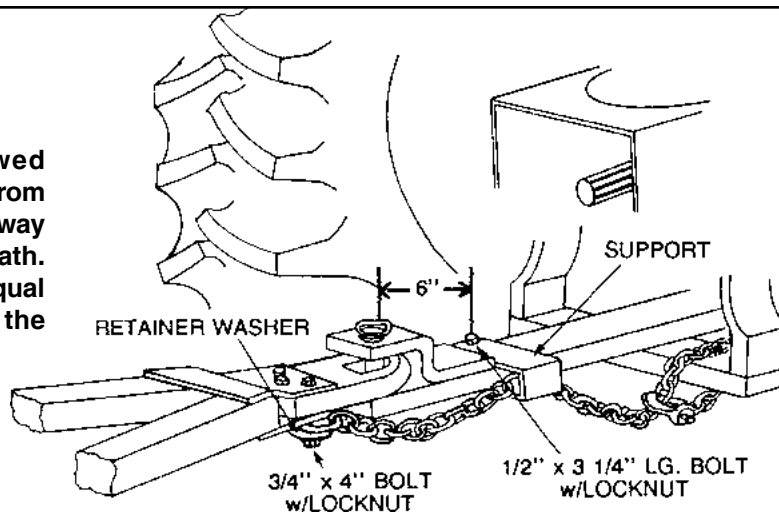


Operation



Caution

A safety chain will help control towed machines should it accidentally separate from the drawbar while transporting. A runaway machine could cause severe injury or death. Use a safety chain with a strength rating equal to or greater than the gross weight of the towed machines.



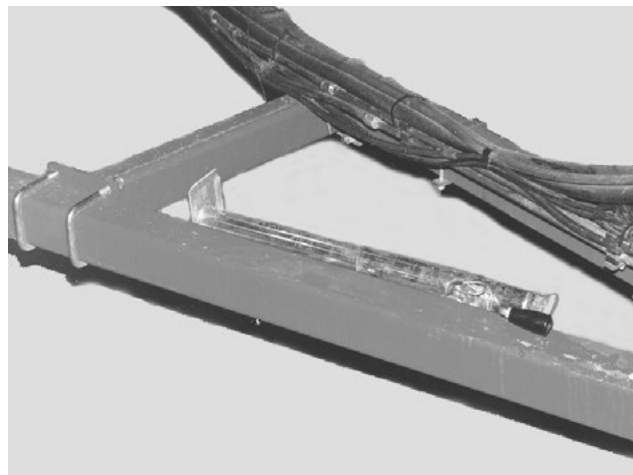
Attach safety chain to the tractor drawbar support or other specified anchor location with the appropriate parts.

Hitching to Tractor

- Ensure swinging drawbar is locked in the center position.
- Ensure hitch pin is in good condition.
- Level clevis with tractor drawbar using hitch jack.
- Back tractor into position and attach hitch clevis to drawbar, using an adequate hitch pin.
- Lock hitch pin in place with a hairpin or other proper locking device.
- After tractor to implement connection is made, relieve pressure off the hitch jack.
- Place hitch jack in raised position.
- Route Safety Chain through chain support and drawbar support.
- Lock safety hook onto chain.

Note: Provide only enough slack in chain to permit turning.

- Ensure hydraulic hose quick couplers are dirt free.
- Inspect all fittings and hoses for leaks and kinks. Repair as necessary
- Connect the hydraulic hoses to the tractor quick couplers.



Hitch Jack Raised

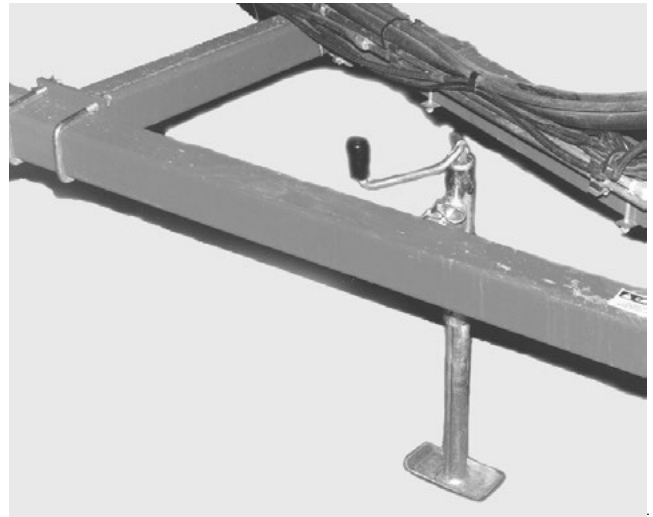


Caution

Dirt in the hydraulic system could damage O-rings, causing leakage, pressure loss and total system failure.

Unhitching from Tractor

- Pin hitch jack in storage position.
- Lower hitch jack taking the weight off the hitch clevis.
- Ensure all transport locks are properly secured.
- Relieve pressure in the hydraulic hoses by positioning tractor hydraulic lever in “float” position or turn tractor engine off and cycle lever back and forth several times.
- Disconnect the hydraulic hoses.
- Remove the safety chain.
- Remove the drawbar pin.
- Slowly move tractor away from cultivator.



Hitch Jack Lowered

Transport

Observe all applicable safety precautions under transport heading in Safety, Section 1.

- Refer to Specifications, Section 2, for weight, transport height, and width.
- Transport with tractor only!
- Ensure safety chain is attached correctly to the towing vehicle and the hitch of the implement.
- Inspect tires for any serious cuts or abrasions. If such has occurred, tire should be replaced.
- Raise and lower wings on **level ground**.
- Never raise or lower wings when moving.

Speed

- Always travel at a safe speed. Do Not Exceed 20 M.P.H. (32 kph).
- The weight of the implement being towed *must not exceed 1.5 times* the weight of towing vehicle.

Lights

- Ensure proper reflectors are in place, refer to Safety, Section 1.
- Use flashing amber warning lights, turn signals and SMV emblems when on public roads.
- Be familiar with, and adhere to, local laws.

MORRIS INDUSTRIES LTD. WILL NOT BE RESPONSIBLE FOR ANY DAMAGES OR OPERATOR INJURY RESULTING FROM NON-USE, OR IMPROPER USE, OF TRANSPORT LOCK VALVES.



Caution

Raise and lower wings on level ground. Never raise or lower wings when moving.

Operation

Transport - Continued

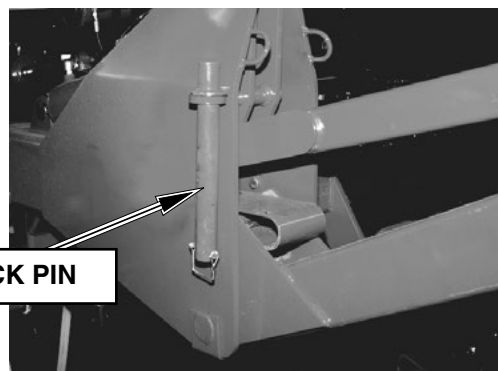
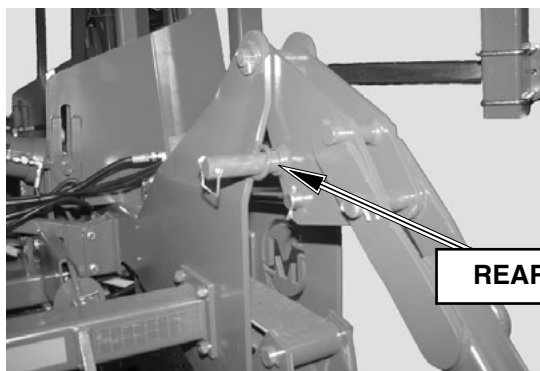
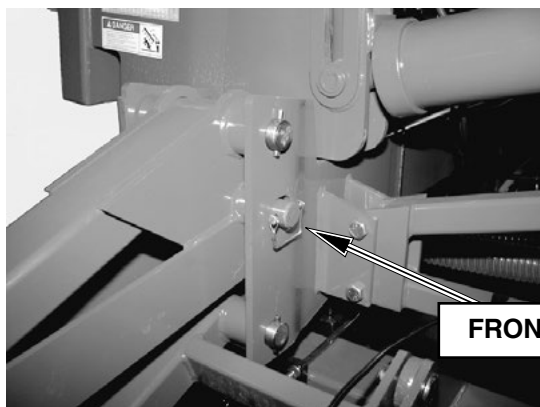
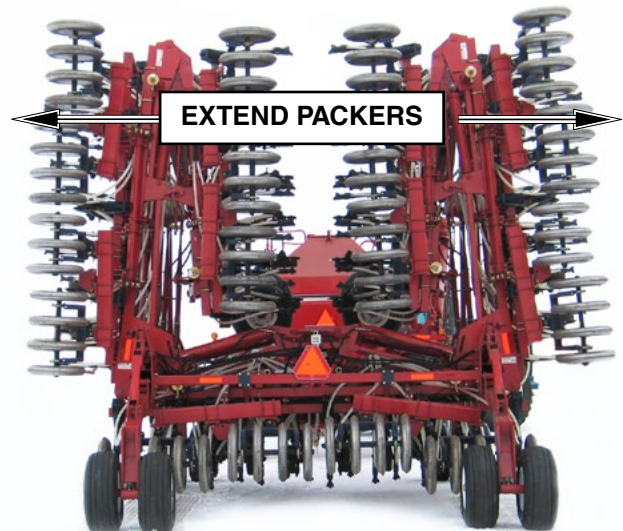
Transport to Field Position

- Position machine on **level ground**.
- Stop tractor, and engage park brake.
- As a precaution, check surrounding area to be sure it is safe to lower wings.

Danger

Always stay clear of wings being raised, lowered or in elevated position. Ensure cylinders are completely filled with hydraulic fluid - Wings may fall rapidly causing injury or death.

- Extend mainframe depth cylinders. (**Fully lowering the packers to the ground**)
- Remove transport lock pins from front gauge wheel arms and rear transport wheel arms.
- Place transport lock pins in storage position.



Transport - Continued

Transport to Field Position - Continued

- Unlock the wing valve and transport wheel valve. Do not walk under raised wings.
- Operate the wing lift/transport wheel hydraulic circuit to perform the following sequence of events:
 1. Lower the wings. **Never raise or lower wings when moving.**

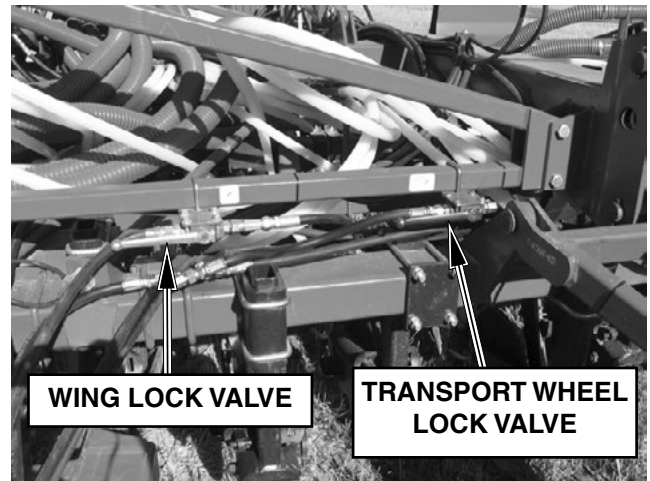
Note: When raising or lowering wings, do so in one continuous motion until fully up or down. Do not stop flow part way allowing wings to fold on their own. This may disrupt the sequence of operation.

2. Extend wing lift cylinders fully.
3. Raise the transport wheels fully.
4. Center holding cylinder fully extends. (5 frames)

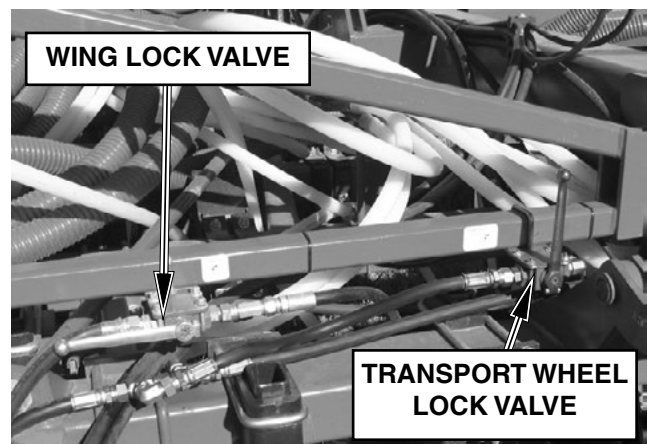
Important

Wings must lower fully before the transport wheels retract.

- Lock transport wheel valve.
- Operate depth control hydraulics, to raise machine fully, holding the hydraulic lever for several seconds to phase the system.



Unlock Valves



Lock Transport Wheel Valve

Operation

Transport - continued

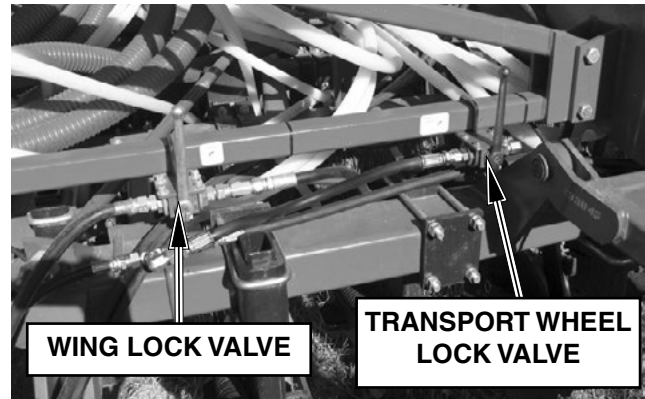
Field to Transport Position

- Position machine on **level ground**.
- Stop tractor, and engage park brake.
- Unlock transport wheel valve.
- Ensure wing lift cylinders are fully extended.

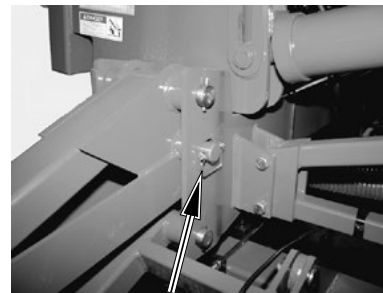
Note: The wing lift cylinders must be fully extended to ensure proper operation of the flow control valve (FCV) manifold.

- Raise Air Drill to highest position on depth control hydraulic circuit.
- Operate the wing lift hydraulic circuit to perform the following sequence of events:
 - 1.Center holding cylinder fully contracts. (5 frame)
 - 2.Lower the transport wheels fully.
 - 3.Raise wings fully. **Never raise or lower wings when moving.**

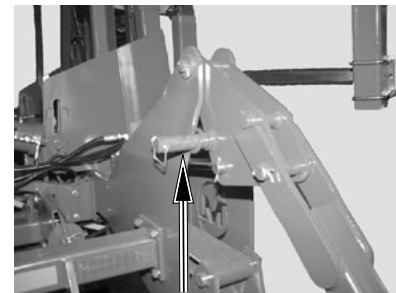
Note: When raising or lowering wings, do so in one continuous motion until fully up or down. Do not stop flow part way allowing wings to fold on their own. This may disrupt the sequence of operation.



Lock Valves



Front Lock Pin



Rear Lock Pin

Important

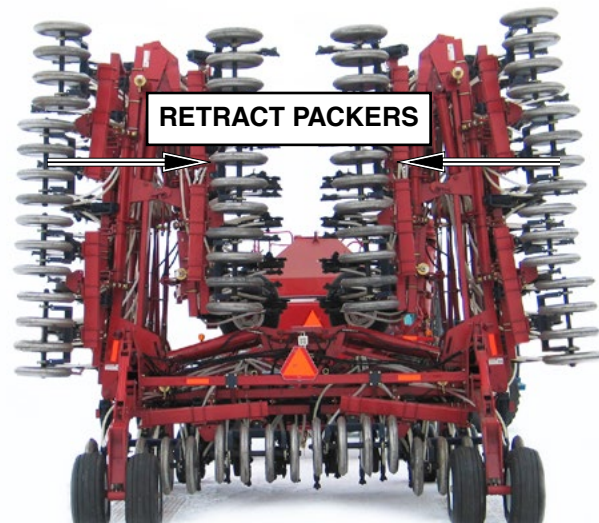
Transport wheels must fully lower and lock before raising wings.

- Lock wing lift valve and transport wheel valve. Do not walk under raised wings.
- Secure transport lock pins in front castor arms.
- Secure transport lock pins in rear transport arms.
- Ensure safety chain is properly installed, see "Hitching to Tractor" Section in Operators Manual.
- **Retract packers** with depth control circuit.



Danger

Always stay clear of wings being raised, lowered or in elevated position. Ensure cylinders are completely filled with hydraulic fluid - Wings may fall rapidly causing injury or death.



Leveling

Initial Leveling

For initial leveling the turnbuckles should be set to the following dimensions.

Main Frame - 36 1/2" (93 cm) pin center to center.

Wing Frames - 19 1/8" (49 cm) pin center to center.

All other adjustments must be performed in the field as outlined under "Final Leveling".

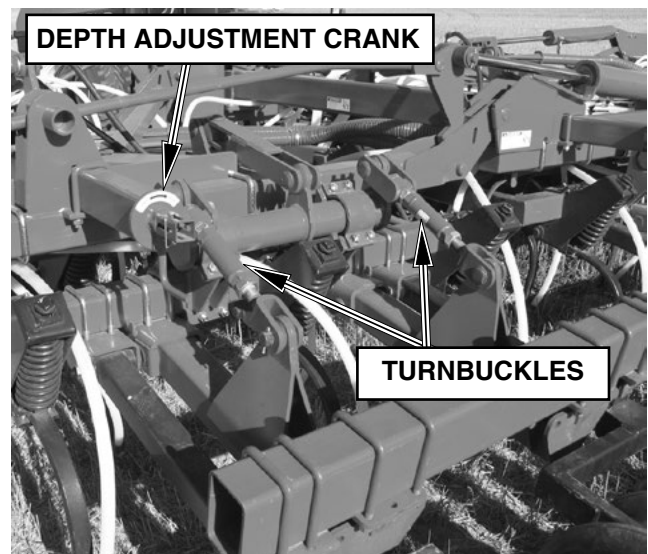
Important

Keep tire air pressure at the listed specifications to achieve and maintain proper level.

Final Leveling

In order for any Air Drill to perform as intended, it must be properly leveled. To properly level an Air Drill, the **final leveling must be done in the field with ground conditions being firm and unworked.**

If the Air Drill is leveled in preworked, soft conditions, the front may dip when working in harder conditions. This causes the back row of shanks to work shallower than the front and can result in rough, uneven field finish and uneven seed depth, which may result in strips appearing in the crop.



Note: Each operator is responsible for levelling their Air Drill. As field conditions vary, fine tuning is left to the operator's discretion.

Operation

Leveling - Continued

Final Leveling - Continued

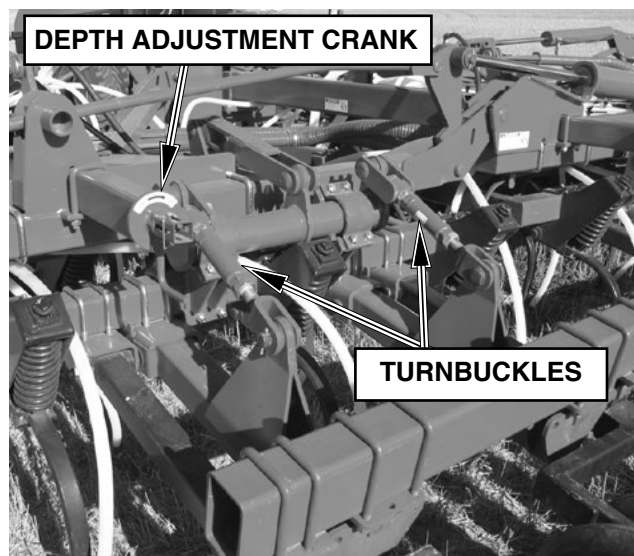
Final leveling requires the following basic steps to be followed:

- 1) Adjust all the depth adjustment cranks out to the end of the depth adjustment rods.
- 2) **Rephase** hydraulic depth system.
- 3) While moving forward with the tractor, lower the unit with the depth control circuit until the points are just skimming the surface. Stop with the machine at this position. Turn all the cranks all the way in to the stop tubes. This is a "0" or ground level position to start setting the depth from.
- 4) Turn all the cranks out 3 turns, this will set the depth at approximately 1 ½".
- 5) **Rephase** hydraulic depth system. While moving ahead lower the machine until it stops on the crank stops. Stop with the machine in the ground. At this point don't worry if the frames do not seem to be running at the same depth.
- 6) Check level of each frame individually starting with the main frame. To check the level use openers at the four corners of each frame section. Adjust the turnbuckles accordingly until all four points on each frame are all cutting at the same depth.
- 7) Repeat steps 5 and 6 until frames are level side-to-side and front-to-back.
- 8) Compare the depth of the wing frames to the main frame. Using the depth adjustment cranks on the wings raise or lower the wing frame sections until their depth matches the main frame. They should be within two turns of the main frame.
- 9) With the seed turned on set the final desired seed depth by adjusting all the cranks the same number of turns to raise or lower the machine as required.

Important

Final Levelling is
"VERY IMPORTANT"

It is suggested that the operator read carefully and carry out the procedures exactly as described.



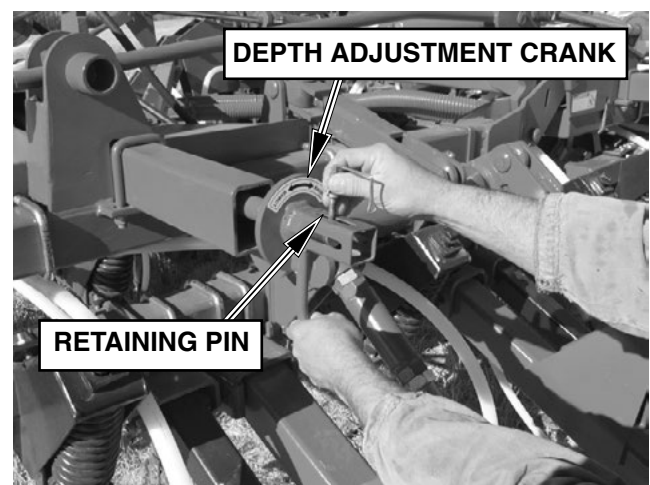
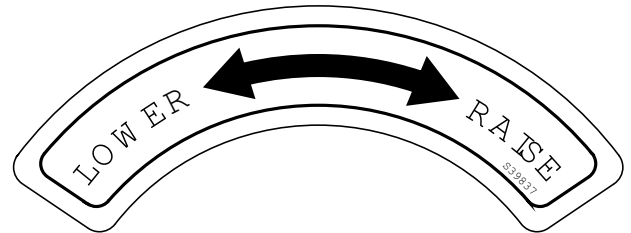
Note: Any change in the depth setting can now be done by adjusting all the depth adjustment cranks evenly across the whole unit. (See Depth Adjustment)

Depth Stop Adjustment

The Morris Maxim III Air Drill is equipped with mechanical depth stops. The mechanical depth stops ensure positive depth of each frame section and is unaffected by any hydraulic leak in the system. (i.e. leaking couplers, internal cylinder leaks, etc.)

Mechanical Depth Stop

- To increase or decrease the working depth, adjust all the depth adjustment cranks **evenly** across the whole machine.
 - a) 1/4 turn on the crank changes the depth approximately 1/8" (3 mm).
 - b) 1 turn on the crank changes the depth approximately 1/2" (12 mm).



Depth Adjustment Nut

Rephasing

- Raise machine fully, holding hydraulic lever for several seconds to phase the system.
- This will maintain equal pressure, cylinder stroke, and synchronize cylinders.
- **It is recommended that the unit be rephased at each turn on the headland.**

Oil Level

The hydraulic system draws its oil supply from the tractor reservoir.

- Check the oil level after the units system has been filled.
- Refer to tractor operators manual for more information.

Operation

Opener Adjustments

Edge-On Point Adjustment

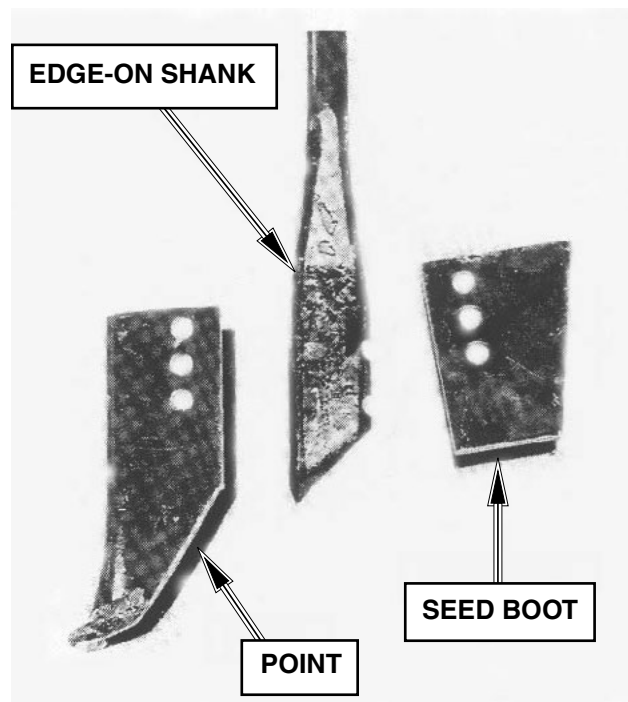
The Point can be adjusted down 3 positions in increments of $\frac{3}{8}$ " (10 mm).

Note: In wet or gumbo land, only move the point down to prevent plugging.

Note: Points can be lowered to compensate for tractor tire impressions.

Normal Adjusting Sequence

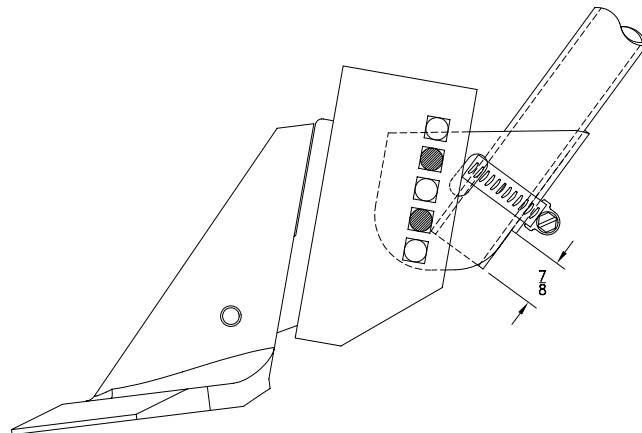
	Point	Shank	Seed Boot
1	Middle Hole	Top Notch	Bottom Hole
2	Bottom Hole	Bottom Notch	Bottom Hole
3	Top Hole	Top Notch	Middle Hole
4	Middle Hole	Bottom Notch	Bottom Hole



3 1/2" (89 mm) Sweep

- Insert hose $\frac{7}{8}$ " (22 mm) past hose holder as shown in diagram.
- Secure hose to holder with a hose clamp.

Note: If plugging occurs decrease dimension hose extends past hose holder.



Part Number S32010

Trip Lowering Kit

For the Conventional Shank, a trip lowering kit is available to compensate for tractor tire impressions. This kit will lower the trip $\frac{3}{8}$ " (10 mm).

Trip lowering Kit Part Number is C20521.

Opener Adjustments

Double Shoot Openers

Improperly adjusted or worn seed openers can cause poor seed/fertilizer separation and plugging which could result in poor emergence.

It is important that the seed openers be properly adjusted.

Note: Points should be adjusted according to wear and deflectors replaced when worn.

Listed below are guidelines for seed openers S25962, S28158, S29000, and S29140.

Note: When applying Anhydrous Ammonia it is strongly recommended to consult local agricultural extension offices for allowable rates which are dependent on soil moisture and soil type.

Soil Condition	Point Position		
	Top	Middle (Factory Setting)	Bottom
Light Soil	Soil moisture medium	Soil moisture wet NH3 or liquid application	Soil moisture wet NH3 or liquid application Worn Point adjustment
Medium Soil	Soil moisture medium	Soil moisture wet NH3 or liquid application	Soil moisture wet NH3 or liquid application Worn Point adjustment
Heavy Soil	Soil moisture dry	Soil moisture wet NH3 or liquid application	Not recommended Worn Point adjustment



DANGER

Failure to comply may result in death or serious injury.

Read Operator's Manual and decal ammonia tank before
Become familiar with all warnings, instructions, and controls.

Always wear gloves and goggles when transferring or handling ammonia

Always stay clear of hose and valve openings.

Always be sure pressure is relieved before disconnecting hoses or p

Always secure connecting parts and safety chains before towing amm

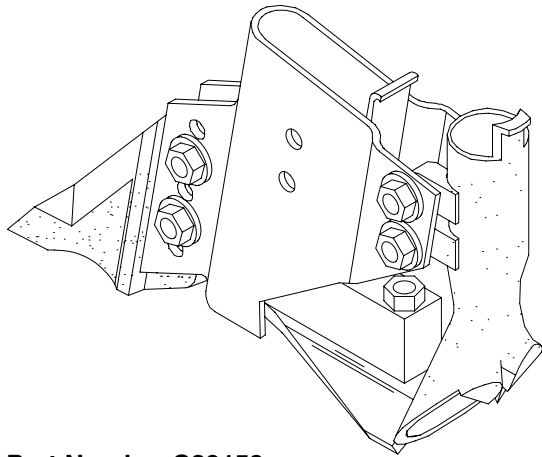
Always have ample water available in case of exposure to ammonia li

S29378

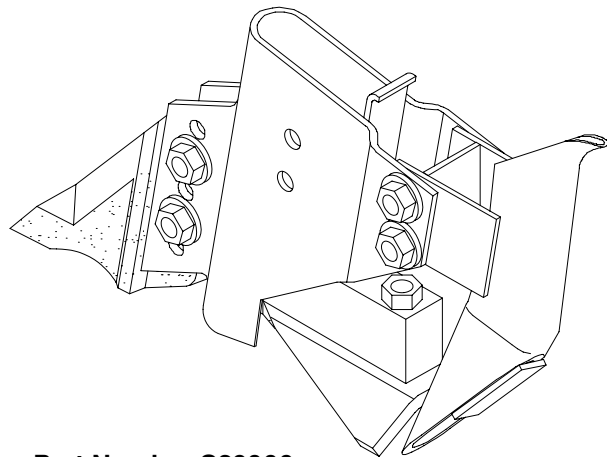
Operation

Opener Adjustments

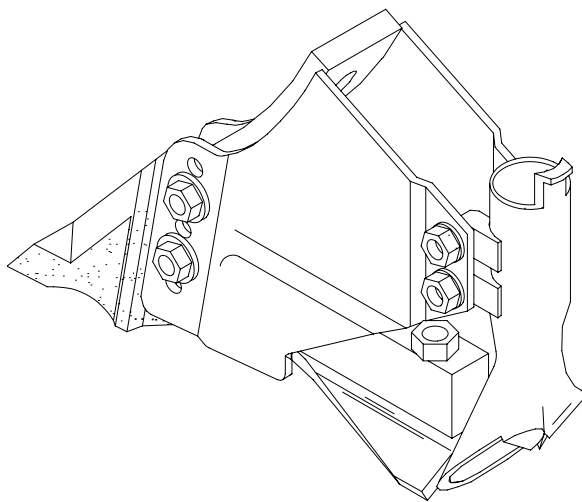
Double Shoot Openers - continued



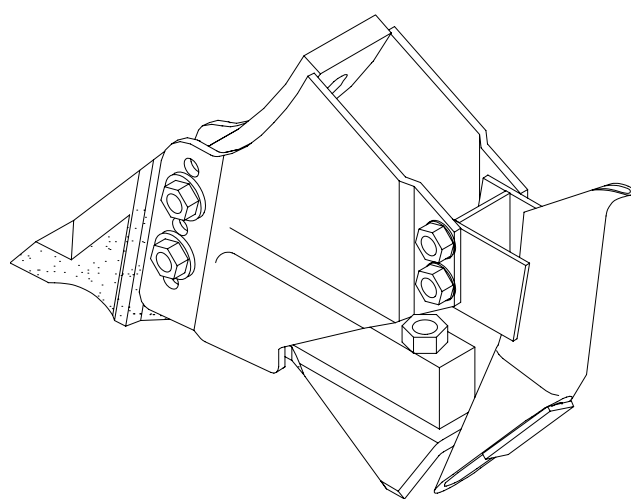
Part Number S28158



Part Number S29000



Part Number S25962



Part Number S29140

Important

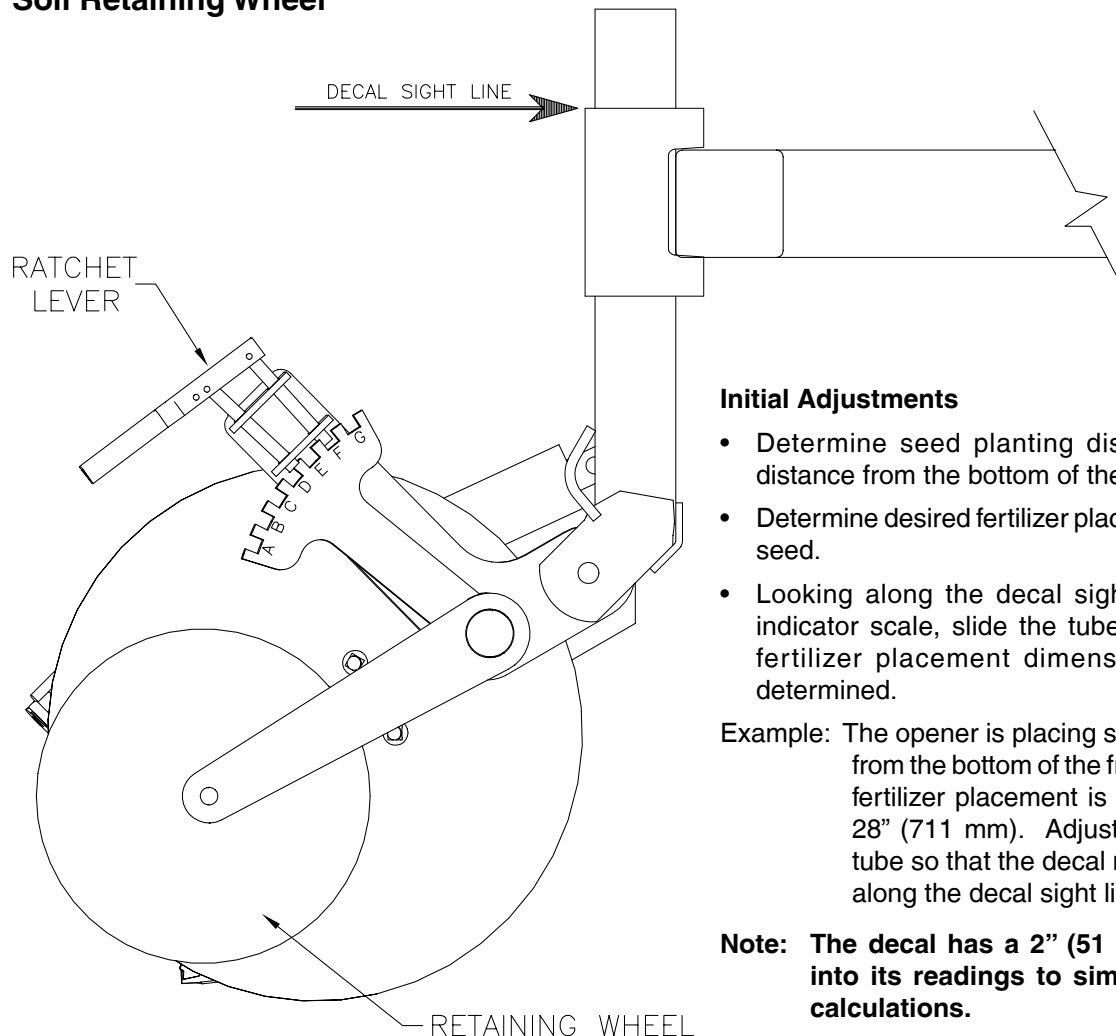
Re-tighten all bolts after initial 10 hours.
Check tightness periodically thereafter.

Component Replacement

- Tighten all bolts evenly.
- Drift head of bolts with hammer to seat shoulder of bolt head.
- Re-tighten bolts evenly to specified torque.
 - 3/8" bolts torque to 30 ft. lb. (41 N-m)
 - 7/16" bolts Grade 8 torque to 70 ft. lb. (95 N-m)

Fertilizer Coulter

Soil Retaining Wheel



Initial Adjustments

- Determine seed planting distance: the vertical distance from the bottom of the frame to the seed.
- Determine desired fertilizer placement relative to the seed.
- Looking along the decal sight line at the depth indicator scale, slide the tube up or down to the fertilizer placement dimension that has been determined.

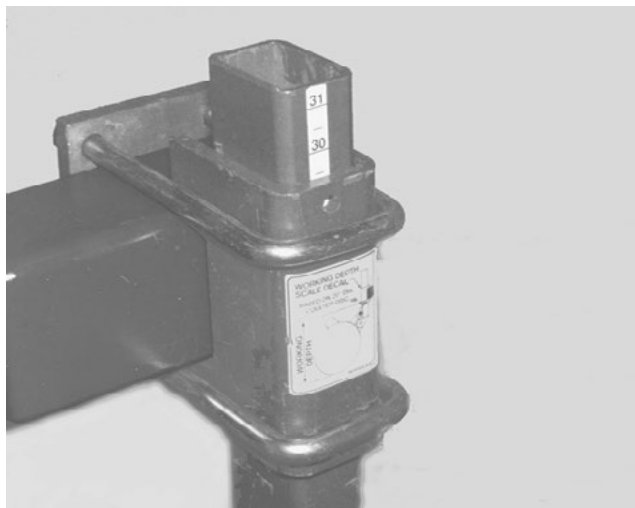
Example: The opener is placing seed at 27" (686 mm) from the bottom of the frame and the desired fertilizer placement is 1" (25 mm) lower at 28" (711 mm). Adjust the main mounting tube so that the decal **reads 28" (711 mm)** along the decal sight line.

Note: The decal has a 2" (51 mm) pre-load built into its readings to simplify initial setting calculations.

Final Adjustments

- Now that the correct mounting position and pre-load has been set, adjust the soil retaining wheel by using the ratchet lever.
- The soil retaining wheel must be in slight contact with the disc to ensure that the disc will remain clean when in wet conditions.

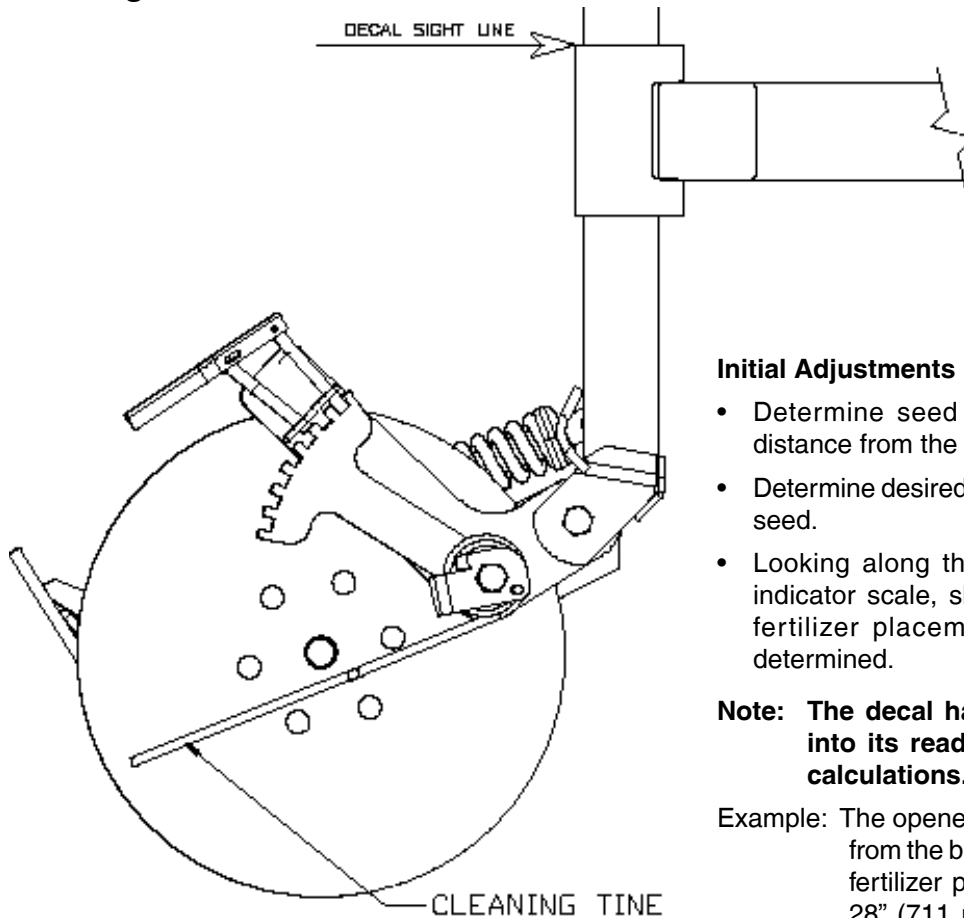
Note: Binding should not occur when rotating disc by hand. CAUTION must be used when performing this procedure.



Operation

Fertilizer Coulter

Cleaning Tine



Initial Adjustments

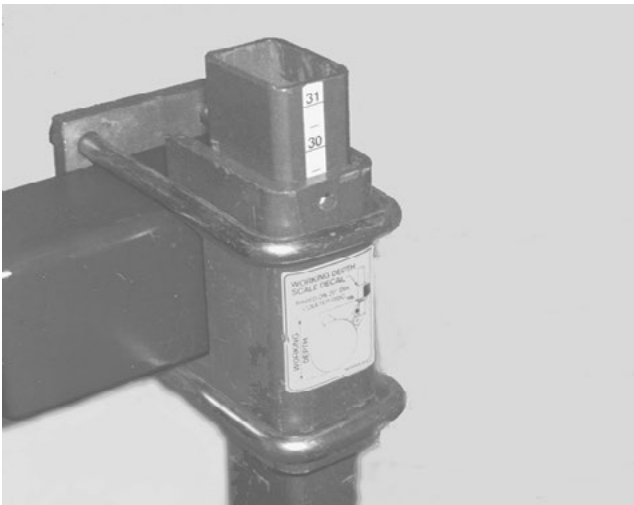
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- Looking along the decal sight line at the depth indicator scale, slide the tube up or down to the fertilizer placement dimension that has been determined.

Note: The decal has a 2" (51 mm) pre-load built into its readings to simplify initial setting calculations.

Example: The opener is placing seed at 27" (686 mm) from the bottom of the frame and the desired fertilizer placement is 1" (25 mm) lower at 28" (711 mm). Adjust the main mounting tube so that the decal **reads 28" (711 mm)** along the decal sight line.

Note: The previous instructions can not be used when mounting onto sub-frames, compensate for the difference in elevation.

- Adjust cleaning tine to clear soil surface without having straw bunching. If bunching of straw occurs raise tine one notch at a time until bunching is eliminated.



Depth Indicator Scale

Fertilizer Coulter

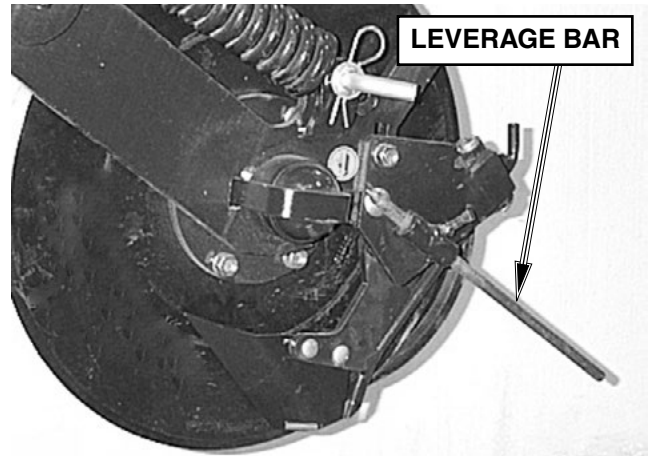
Coulter Positions

The coulter has two positions:

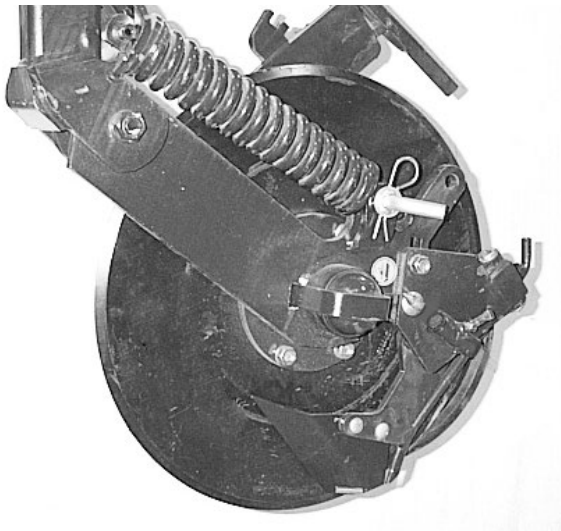
1. The working position.
2. The storage position.

The storage position is used when the coulter is not being used during field operation, this prevents unnecessary wear on the coulter unit.

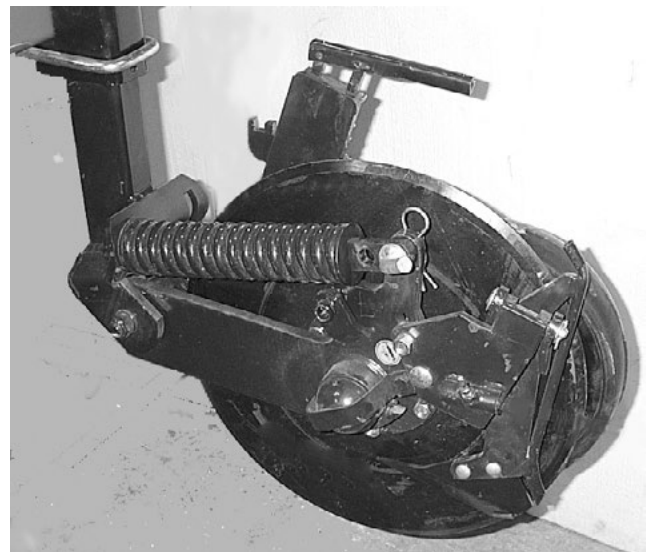
The working position is used when the coulter is being used during field operations.



Leverage Bar



Working Position



Storage Position

Operation

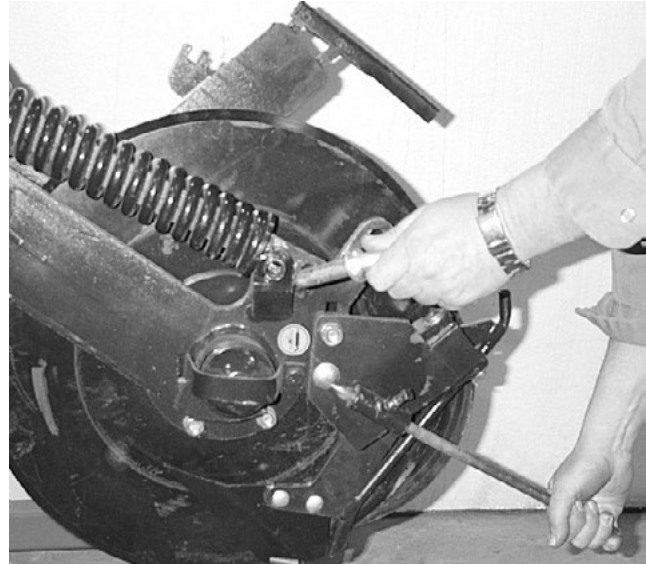
Fertilizer Coulter

Coulter Positions - continued

To change the position of the coulter follow the procedure below:

Storage Position

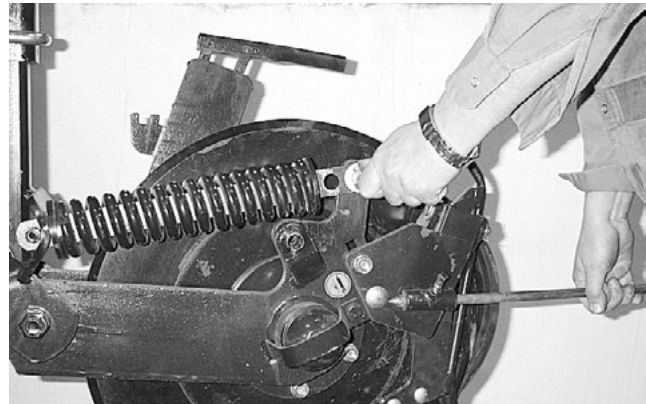
- Insert leverage bar or use closing tine if equipped, to relieve pressure on the spring retaining pin.
- Remove retaining pin.
- Release pressure on leverage bar and lift up on spring assembly
- Lift coulter with leverage bar and pin spring assembly in upper retaining hole.
- Remove leverage bar.



Remove Pin



Storage Position



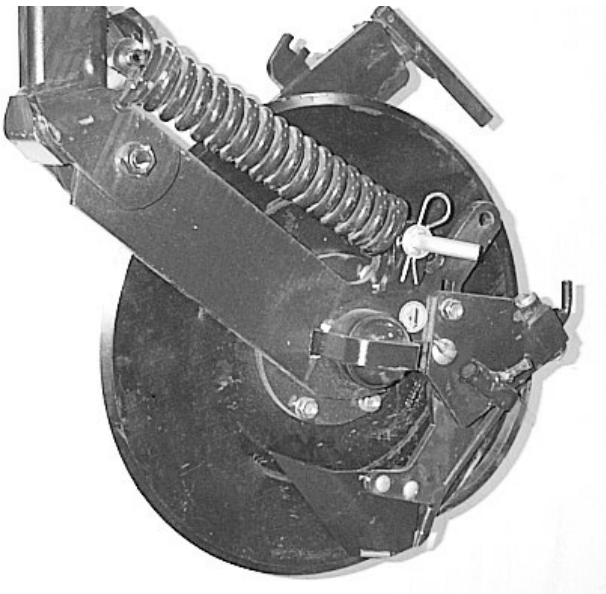
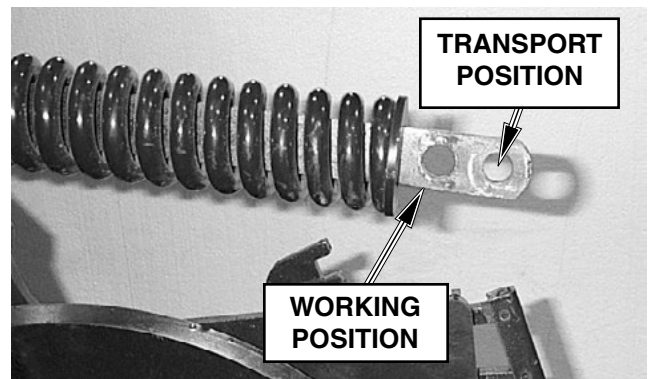
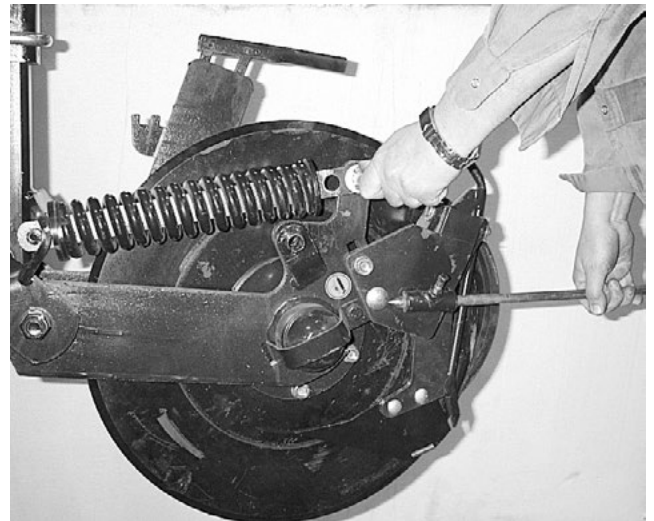
Pin in Upper Hole

Fertilizer Coulter

Coulter Positions - continued

Working Position

- Insert leverage bar or use closing time to relieve pressure on the spring retaining pin.
- Remove retaining pin.
- Release pressure on leverage bar and lift up on spring assembly.
- Lower coulter completely with leverage bar.
- Press spring assembly into position.
- With leverage bar raise coulter slightly to align spring rod hole with lower retaining hole. Use indicator marks to aid hole alignment.
- Install retaining pin.
- Remove leverage bar.



Working Position



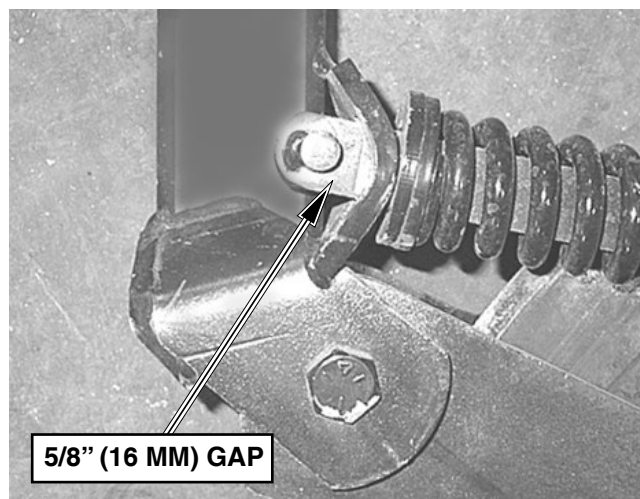
Press Spring into Place

Operation

Fertilizer Coulter

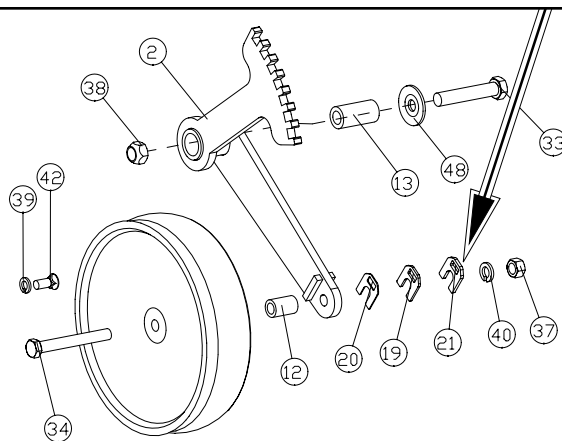
Operation Hints

1. With the machine raised out of ground, the coulter will always sit 2" (51 mm) lower than the desired relative distance from the seed. This is because of the 2" (51 mm) floatation designed into the assembly.
2. With the machine in the ground the coulter spring rod should extend with a gap of 5/8" (16 mm) between the stop rod and the seat. This ensures that there is adequate down pressure and that the scraper is running at the correct angle.
3. If hint one is set correctly hint two can be achieved by adjusting the soil retaining wheel. This wheel does three things, it controls the depth of the fertilizer, cleans the disc and retains the soil from peeling up or blowing out. Note: The **Soil-retaining wheel** runs **parallel** with the coulter disc.
4. Adjust the **Soil-retaining wheel** to soil type. Adjust the amount of pressure exerted by loosening the **Soil-retaining wheel** mounting bolt and move the appropriate sized shim, 1/16" (1.59 mm), 1/8" (3.18 mm) or 3/16" (4.76 mm) to the inside of the mounting bracket for more pressure and to the outside of the mounting bracket for less pressure. Retighten the mounting bolt.
5. The Soil Retaining Wheel may build up with mud behind the tractor tires and gauge wheels. This is possible in some conditions where sub soil moisture is high. This situation can be resolved by using the Coulter Blade Tine in these areas.

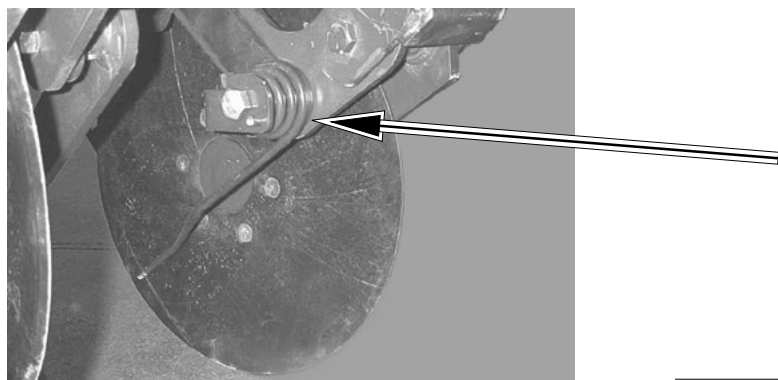


Coulter Spring Rod

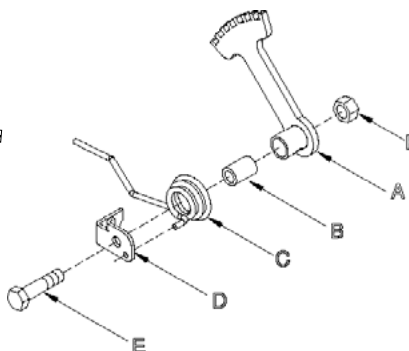
MOVE SPACER SHIMS TO CHANGE PRESSURE ON BLADE.



Soil Retaining Wheel Assembly



Coulter Blade Tine Assembly



Coulter Blade Tine Assembly

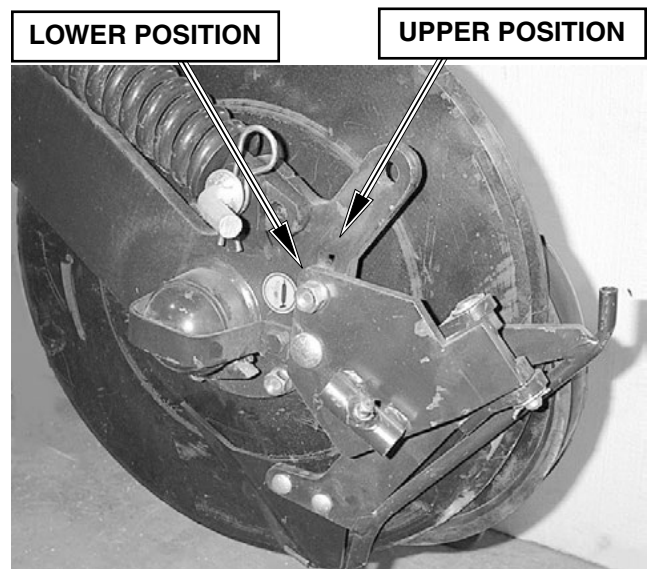
Fertilizer Coulter

Operation Hints

6. When using the coulter tine it is beneficial if the tines do not build up with trash. If buildup is happening raise tine until it starts to run clean.
7. When using coulter tine versus soil retaining wheel, increased gassing off may occur with NH₃. A closing tine could be used to assist in closing the furrow, refer to item 11.
8. Some straw may get under the scraper, but should clean itself without building up. If building up of trash occurs, ensure that the scraper is running flush with the blade and then increase spring pressure by adding a 5/8" flat washer under spring.
9. When the dry fertilizer tube/scraper is being used they should always be mounted in the highest position. The fertilizer will drop to the bottom of the furrow made by the blade and the wear on the scraper will be minimized.
10. When the NH₃ Fertilizer tube/scraper is used, soil moisture is the deciding factor in where to set the scraper position. In high moisture conditions the scraper can be raised to the highest position, and in dry conditions the scraper will need to be mounted on the bottom, although increased wear will occur.
11. Always **raise machine fully** before backing up.



Scraper Spring



IMPORTANT

The DRY/NH₃ opener is intended to allow the operator the flexibility to switch between granular fertilizer and NH₃ without having to change openers. The DRY/NH₃ opener is not intended to apply granular fertilizer and NH₃ in the same operation. Excessive gassing off of the NH₃ will occur in such an operation.

Morris Industries shall have no obligation or liability of any kind on account of end user incorrectly using the Dry/NH₃ Opener.

Operation

Hydraulic Depth Control System

Three Section Models

The hydraulic depth control system is a series system.

To lift the Maxim III Air Drill, hydraulic fluid is forced into the gland end of the flow divider cylinders 1. This causes the piston rods to retract, simultaneously, hydraulic fluid is forced from the butt end of cylinders 1 to the butt end of cylinders 2, causing them to extend, pivoting the packers and gauge wheels down. This causes the main frame to raise.

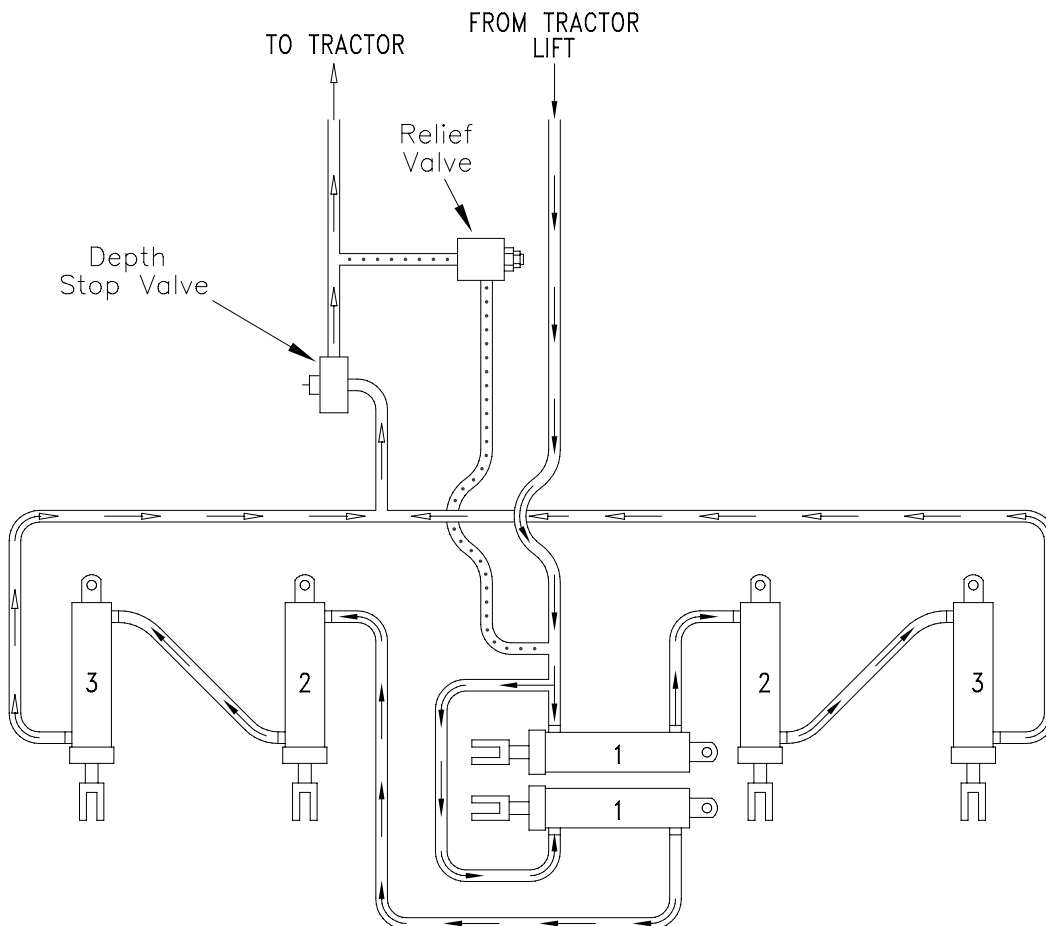
Hydraulic fluid is forced from the gland end of cylinders 2 to the butt end of cylinders 3, causing them to extend, pivoting the packers and gauge wheels down. This causes the wings to raise.

Finally the fluid exits the gland end of cylinders 3 into a common line through the depth stop valve and then to the tractor.

To lower the Maxim III Air Drill, hydraulic fluid flows through the cylinders in the reverse direction to that described above, until the depth control stops on the control rods seat firmly on their stops. Simultaneously the depth stop valve is closed isolating the Maxim III Air Drill hydraulics from the tractor. The oil from the tractor continues to flow across the relief valve until the hydraulic flow stops.

With the depth control stops firmly seated, the working depth will hold until the tractor hydraulic controls are activated to lift the Maxim III Air Drill.

Note: The relief valve prevents over pressuring the depth stops and rear truss.



Hydraulic Depth Control System

Five Section Models

The hydraulic depth control system is a series system.

To lift the Maxim III Air Drill, hydraulic fluid is forced into the gland end of the flow divider cylinders 1. This causes the piston rods to retract, simultaneously, hydraulic fluid is forced from the butt end of cylinders 1 to the butt end of cylinders 2, causing them to extend, pivoting the packers and gauge wheels down. This causes the main frame to raise.

Hydraulic fluid is forced from the gland end of cylinders 2 to the butt end of cylinders 3, causing them to extend, pivoting the packers and gauge wheels down. This causes the inner wings to raise.

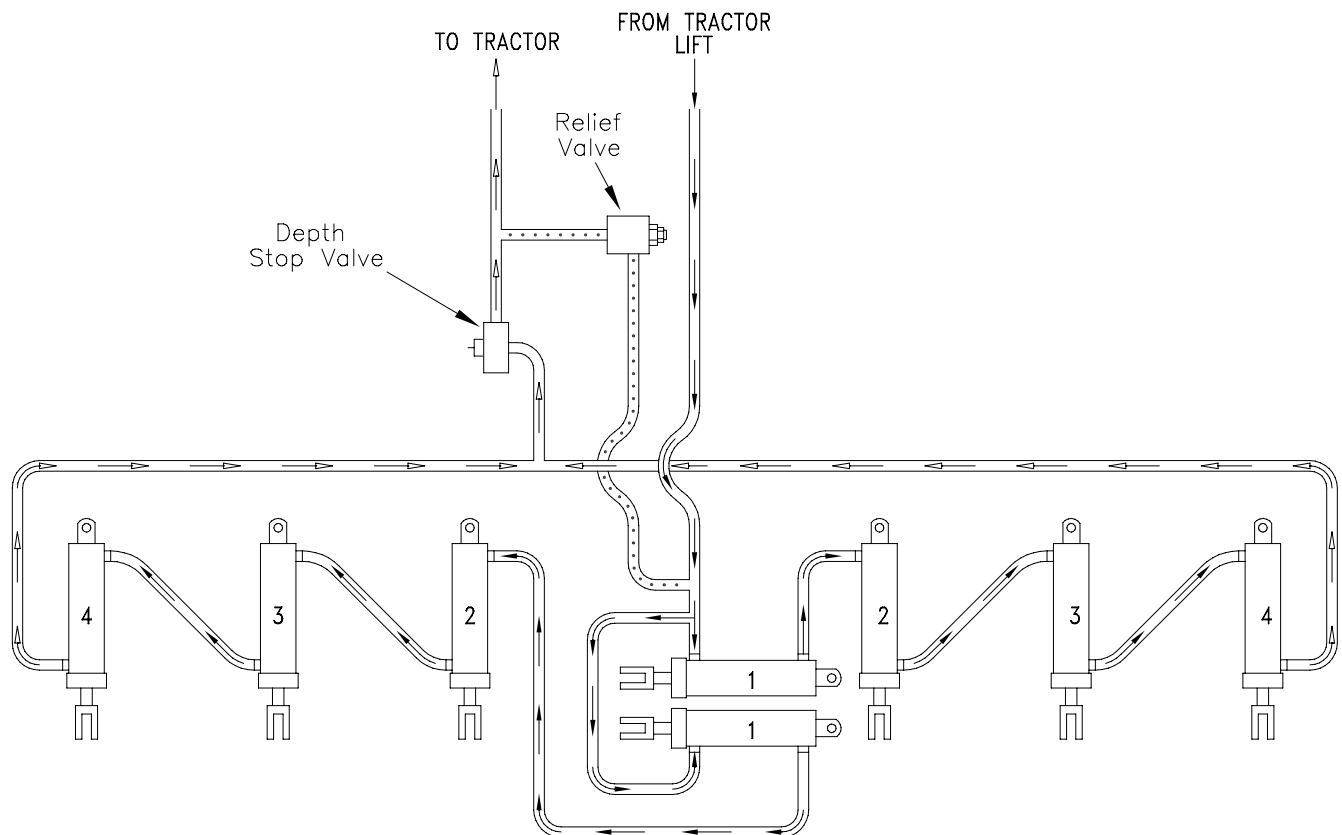
Hydraulic fluid is forced from the gland end of cylinders 3 to the butt end of cylinders 4, causing them to extend, pivoting the packers and gauge wheels down. This causes the outer wings to raise.

Finally the fluid exits the gland end of cylinders 4 into a common line through the depth stop valve and then to the tractor.

To lower the Maxim III Air Drill, hydraulic fluid flows through the cylinders in the reverse direction to that described above, until the depth control stops on the control rods seat firmly on their stops. Simultaneously the depth stop valve is closed isolating the Maxim III Air Drill hydraulics from the tractor. The oil from the tractor continues to flow across the relief valve until the hydraulic flow stops.

With the depth control stops firmly seated, the working depth will hold until the tractor hydraulic controls are activated to lift the Maxim III Air Drill.

Note: The relief valve prevents over pressuring the depth stops and rear truss.



Operation

Transport Hydraulics

Three Section Models

The hydraulic wing lift system is controlled by two parallel hydraulic systems. Ball valves located on the left front wing lift cylinder and the left rear transport wheel switch between the two systems.

The hydraulic wing lift systems work in two steps as out lined below:

Step 1 - Lower rear transport wheels fully.

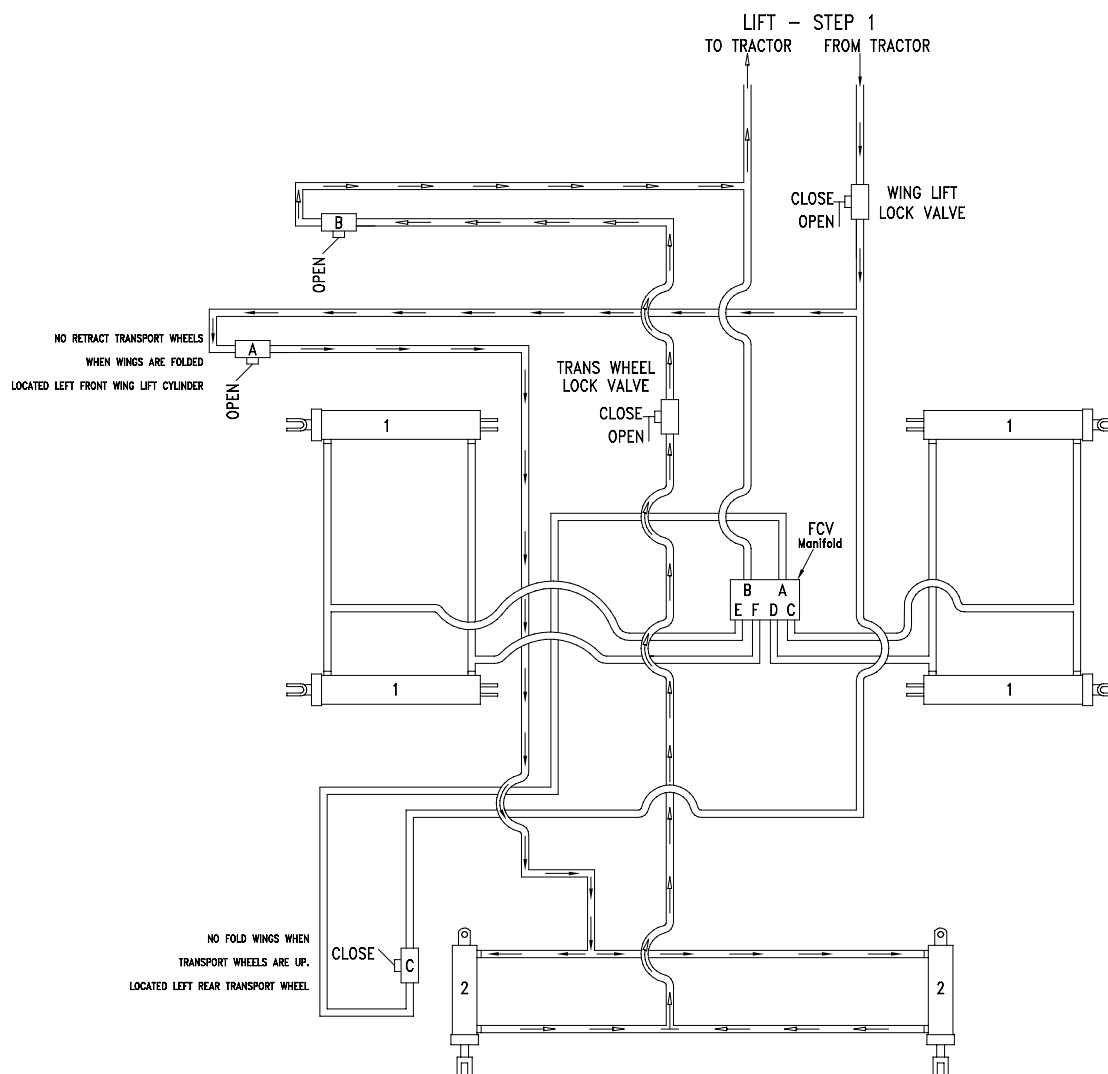
Step 2 - Raise wings fully.

Step 1

To lower the rear transport wheels, hydraulic fluid is forced from the tractor through a common line through the winglift lock valve and valve "A" to the butt end of cylinders #2. This will cause cylinders #2 to extend lowering the rear transport wheels to the ground.

While the transport wheels are lowering, hydraulic fluids displaced from the gland end of cylinders #2 through a common line to the transport wheel lock valve and then to valve "B" back to the tractor.

Once cylinders #2 fully extend valve "C" is closed which switches the hydraulic fluid flow to system 2.



Transport Hydraulics - Continued

Three Section Models

Step 2

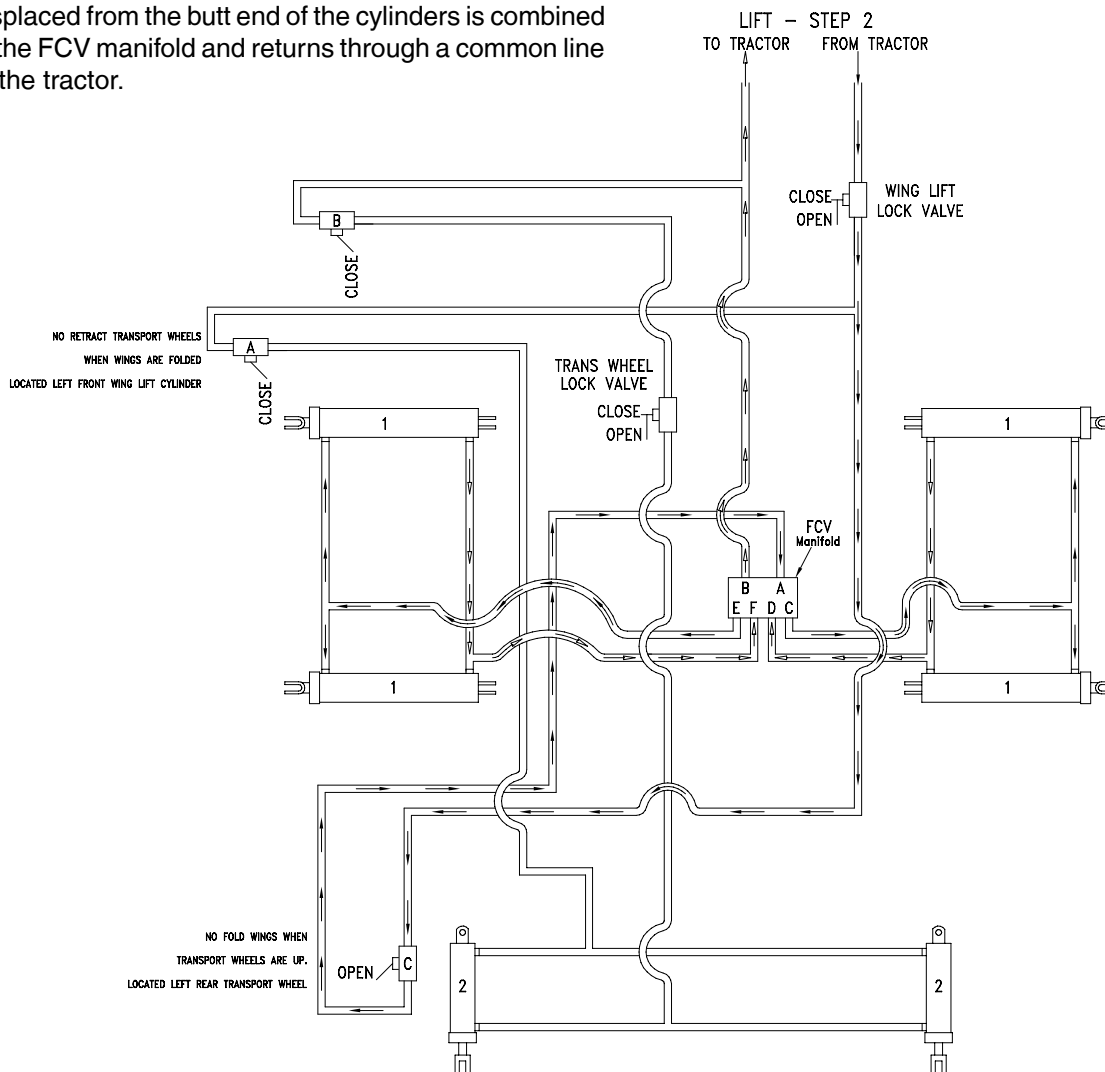
The wing lift system has a pressure compensated flow control valve (FCV) manifold integrated in the circuit to synchronize the raising and lowering of the wings.

To lift the wings, hydraulic fluid is forced from the tractor through a common line to valve "C" then to FCV manifold. The fluid is divided in the FCV manifold and flows to the gland end of each cylinder on both sides of the circuit. This cause cylinders #1 to retract raising the wings.

As the wings raise valve "A & B" closes, locking the transport wheels down. This prevents the transport wheels from being raised until the wings are fully lowered.

While the wings are being raised, hydraulic fluid displaced from the butt end of the cylinders is combined in the FCV manifold and returns through a common line to the tractor.

To lower the wings, hydraulic fluid flows opposite to that described for the lifting operation. Fluid is divided in the FCV manifold and flows into the butt end of all four cylinders simultaneously. This cause cylinders #1 to extend lowering the wings. While the wings are being lowered, hydraulic fluid displaced from the gland end of the cylinders is combined in the manifold and returns through a common line to the tractor.



Operation

Transport Hydraulics - Continued

Five Section Models

The hydraulic wing lift system is controlled by two parallel hydraulic systems. Ball valves located on the left front wing lift cylinder and the left rear transport wheel switch between the two systems.

The hydraulic wing lift systems work in two steps as out lined below:

Step 1 - Lower rear transport wheels fully.

Step 2 - Raise wings fully.

Step 1

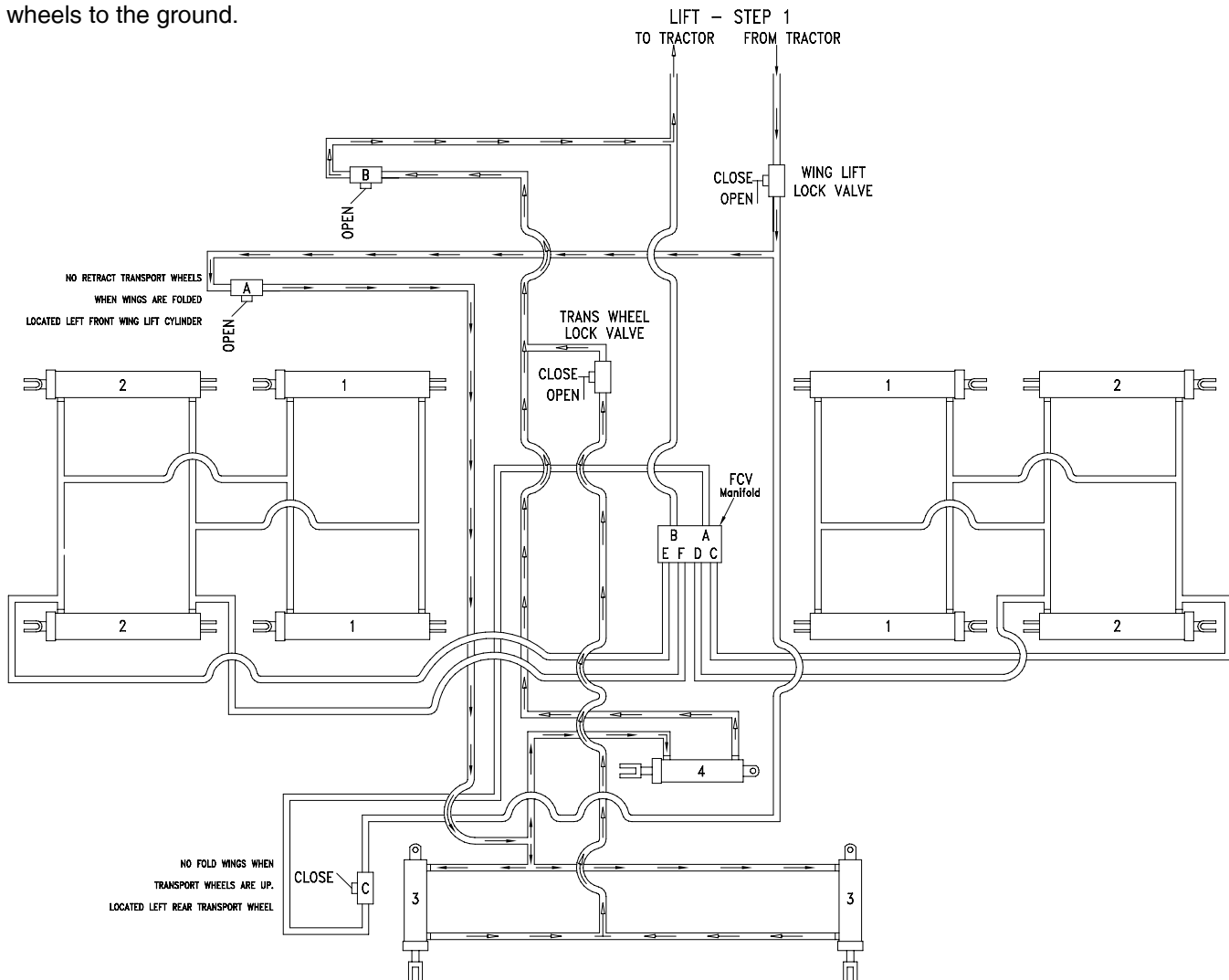
To lower the rear transport wheels, hydraulic fluid is forced from the tractor through a common line through the winglift lock valve and valve "A" to the butt end of cylinders #3 and the gland end of cylinder 4. This will cause cylinders #3 to extend lowering the rear transport wheels to the ground.

At this point the force to extend cylinders #3 is greater then the force to retract cylinder #4 allowing the hydraulic fluid to retract cylinder #4 to lift the outer corner of the inner wings off the ground.

While the transport wheels are lowering, hydraulic fluid is displaced from the gland end of cylinders #3 through a common line to the transport wheel lock valve and then back to the tractor.

While the outer end of the inner wings are being lifted off the ground, hydraulic fluid is displaced from the butt end of cylinder #4 through valve "B" back to the tractor.

Cylinder #4 fully retracts before cylinders #3 fully extend closing valve "C" which switches the hydraulic fluid flow to system 2.



Transport Hydraulics - Continued

Five Section Models

Step 2

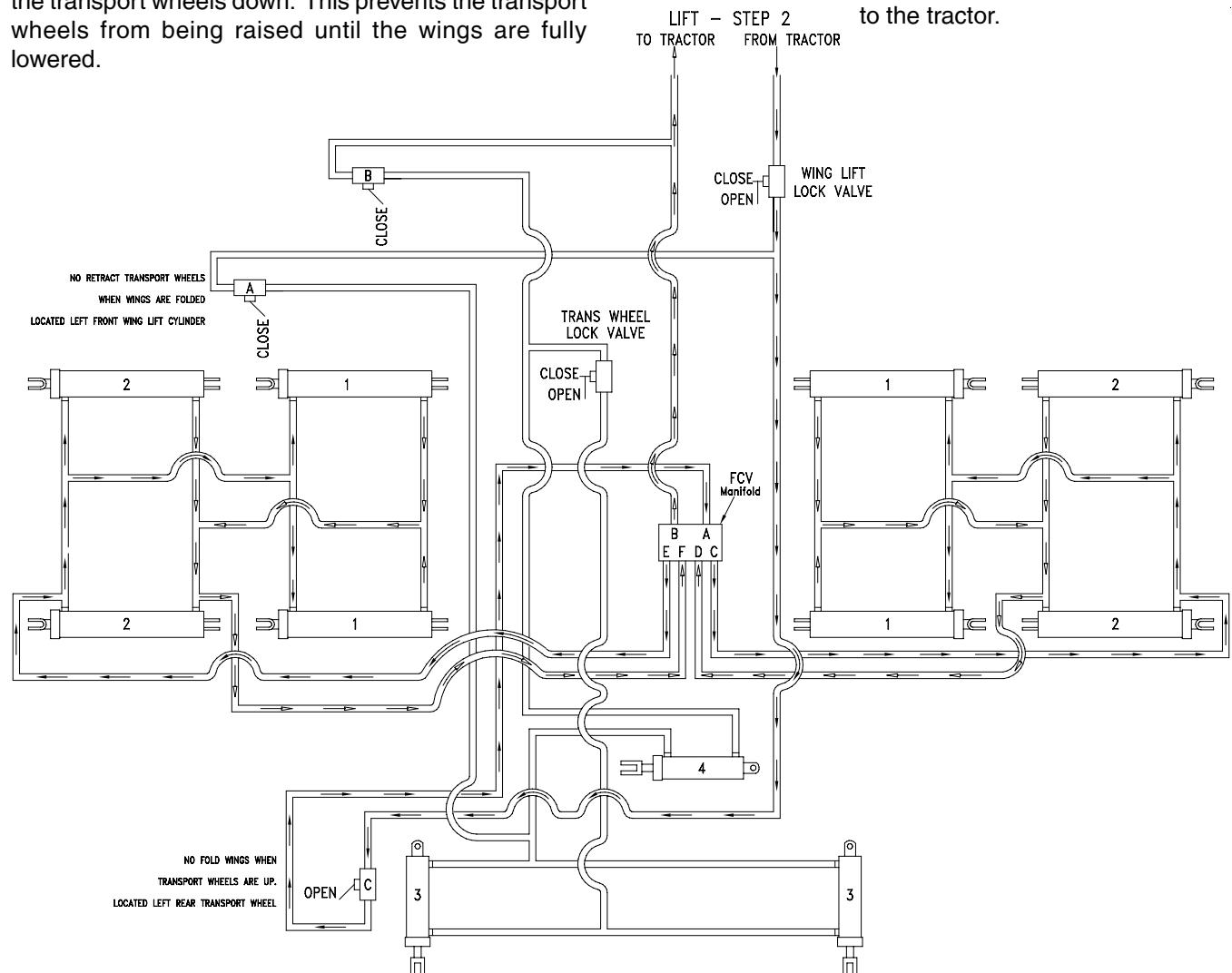
The wing lift system has a pressure compensated flow control valve (FCV) manifold integrated in the circuit to synchronize the raising and lowering of the wings.

To lift the wings, hydraulic fluid is forced from the tractor through a common line to valve "C" then to the FCV manifold. The fluid is divided in the FCV manifold and flows to the gland end of each cylinder on both sides of the circuit. The force required to retract the cylinders marked #1 is greater than the force required to retract the cylinders marked #2. Therefore the #2 cylinders retract first raising the outer wings. When the #2 cylinders retract fully raising the outer wings. When the #2 cylinders are fully retracted the #1 cylinders retract lifting the inner wings.

As the outer wings raise valves "A" & "B" close, locking the transport wheels down. This prevents the transport wheels from being raised until the wings are fully lowered.

While the wings are being raised, hydraulic fluid displaced from the butt end of the cylinders is combined in the FCV manifold and returns through a common line to the tractor.

To lower the wings, hydraulic fluid flows opposite to that described for the lifting operation. Fluid is divided in the FCV manifold and flows into the butt end of all eight cylinders simultaneously. A gravity lock holds the outer wings in place preventing the #2 cylinders from extending. Therefore, the #1 cylinders extend first to lower the inner wings. When the #1 cylinders are fully extended, and the gravity locks release the #2 cylinders then extend to lower the outer wings. While the wings are being lowered, hydraulic fluid displaced from the gland end of the cylinders is combined in the manifold and returns through a common line to the tractor.



Operation

Hydraulic Trip

Accumulator System Operation and Pre-Charge Information

- Always relieve hydraulic pressure from the system before performing maintenance or repairs.

Note: Accumulator stores pressure even when disconnected from tractor.

- The gas bladder in the hydraulic accumulator should be pre-charged with dry nitrogen gas before being mounted on a tillage unit.
- Different accumulator pre-charge pressures will allow for different ranges of trip out force, as shown in the following chart.
- Pre-charge pressure should be set for the most common working conditions.

Accumulator Operating Range 550 lb Trip		
Nitrogen Pre-charge Pressure	System Hydraulic Pressure and Trip Force	
	Minimum	Maximum
200 psi (1,378 kPa)	220 psi (1517 kPa) 120 lbs (55 kg)	800 psi (5516 kPa) 440 lbs (200 kg)
300 psi (2,067 kPa)	330 psi (2275 kPa) 181 lbs (82 kg)	1000 psi (6895 kPa) 550 lbs (250 kg)
400 psi (2,756 kPa)	440 psi (3034 kPa) 242 lbs (110 kg)	1000 psi (6895 kPa) 550 lbs (250 kg)
500 psi (3,445 kPa)	550 psi (3792 kPa) 302 lbs (137 kg)	1000 psi (6895 kPa) 550 lbs (250 kg)

*Maximum system hydraulic pressure is 1000 psi (6895 kPa) or 4 times the nitrogen pre-charge pressure, whichever is the lower number.

Warning



HIGH-PRESSURE FLUID HAZARD

To prevent serious injury or death:

- Relieve pressure on hydraulic system before servicing or disconnecting hoses.
- Wear proper hand and eye protection when searching for leaks. Use wood or cardboard instead of hands.
- Keep all components in good repair.

ACCUMULATOR



Hydraulic Trip - Continued

Setting Maximum System Pressure (Trip Out Force)

- To determine approximate trip out force in pounds on each shank, divide the system hydraulic pressure in the accumulator circuit by 1.82.

For example: A system hydraulic pressure of 800 psi (5,516 kPa) would be approximately 440 lbs (200 kg) trip force at each shank.

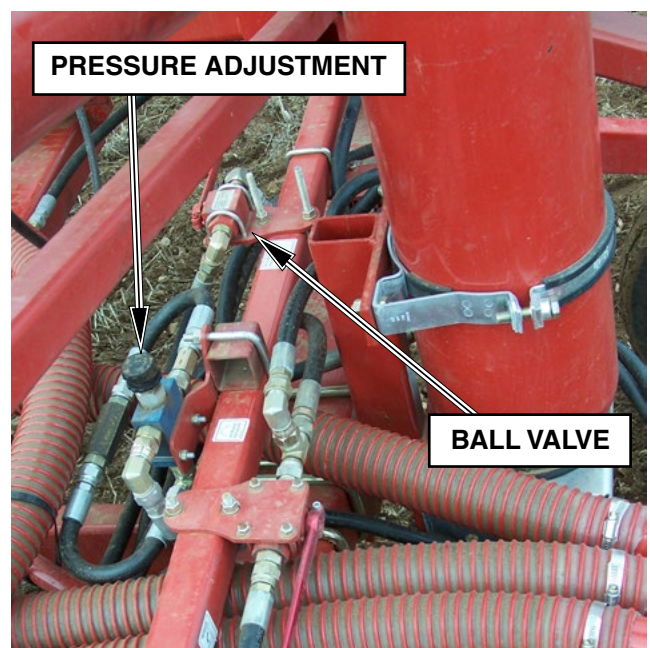
Note: Due to the variation of friction effects, this trip force is approximate.

- Maximum operating pressure can be set by dialing the reducing valve in to increase allowable pressure, and dialing it out to decrease allowable pressure. This adjustment is done in order to set a maximum working pressure; pressure can be decreased below the set point and increased back up to the set point on the go from the tractor.
- Begin by dialing the adjustment all the way out on the reducing valve .
 - Dial the reducing valve setting in 1 full turn.
 - Operate the tractor remote to pressurize the accumulator circuit (ensure the ball valve in the circuit is open to allow flow). Once the pressure has stopped climbing check the system pressure on the gauge.
 - If the pressure in the system is high enough to achieve the desired trip out force, setting is complete. If the pressure is too low, repeat steps 2 and 3 until the desired pressure is achieved.
 - If the system pressure is too high, relieve the circuit pressure using the tractor remote, and then dial the reducing valve adjustment out incrementally. Repeat step 3 until the desired system pressure has been reached.
- If on the go trip force adjustment is not desired, the ball valve at the gauge bracket can be closed after setting the accumulator system pressure in order to prevent slow pressure bleed off over time.



Important

Do not exceed 4 times the nitrogen pre-charge pressure or 1000 psi, as damage can occur.



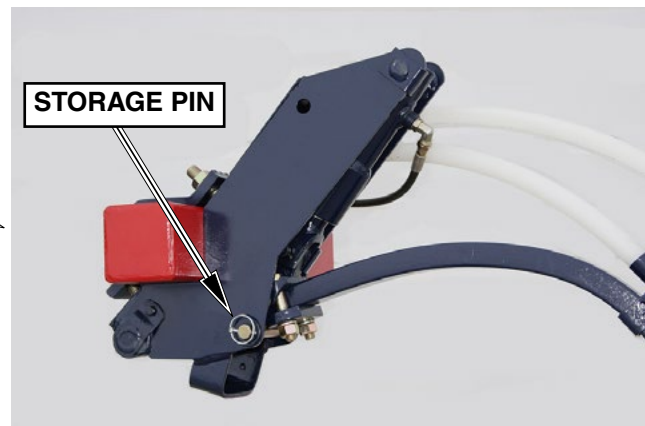
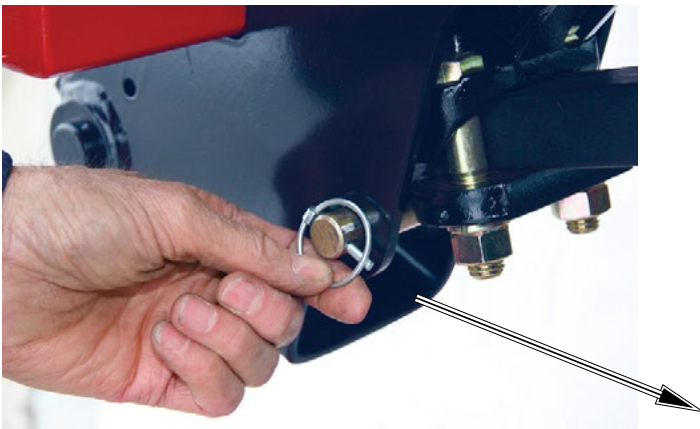
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Operation

Hydraulic Trip - Continued

Trip Lock-Up and Storage

- Before storing trips, remove all pressure from the accumulator circuit using the tractor remote.
- Once pressure is off of the trip circuit, storage pins can be removed from their storage position.
- Lift each shank up to its tripped out position and secure the storage pin in the lower storage hole (through the trip body side plates) underneath the shank holder casting.



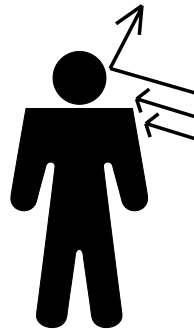
General Guidelines

The results obtained from the Maxim Air Drill are directly related to the depth uniformity of the unit. Poor levelling worn shovels, uneven tire pressures, and bent shanks must be avoided to obtain optimum field results.

- Operating depth should be uniform at all shank locations, when spot checking the implement in the field. See Levelling and Rephasing Procedure.
- Points should be adjusted according to wear. See Maintenance Section.
- Repair or replace bent shanks. Bent shanks cause shovels to work at uneven depths and can cause unnecessary ridging. See maintenance Section.
- Keep tire pressure at the listed specifications to maintain proper level. See maintenance Section.
- Have Air Drill moving forward before lowering into ground to avoid plugging openers.
- Avoid sharp turns. Turns sharp enough to cause the inside shovels of the Air Drill to reverse direction are not recommended. This may cause the seed openers to plug.



TAKE SAFETY SERIOUSLY.
Do Not Take Needless Chances!



Caution

Care should be taken when working near the Air Cart while the fan is running. Product blowing out of the system could cause personal injury.



Maintenance

Lubrication

Greasing pivot points prevents wear and helps restrict dirt from entering. However, once dirt does enter a bearing, it combines with the lubricant and becomes an abrasive grinding paste, more destructive than grit alone.

- Apply new lubricant frequently during operation to flush out old contaminated lubricant.
- Use a good grade of **lithium based grease**.
- Use a good grade of machine oil.
- Clean grease fittings and lubricator gun before applying lubricant.

Refer to the photos for grease fitting locations.

1. Hubs

- Grease every 500 hours. (Once a season)

2. Gauge Wheel Castor Pivot

- Grease every 100 hours. (Bi-weekly)

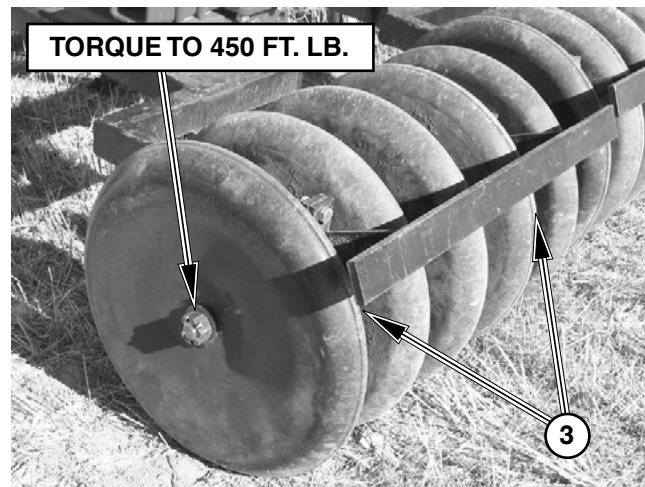
3. Packer Bearings

- Grease every 50 hours. (Weekly)
- Two bearings per packer gang.



Press Wheels

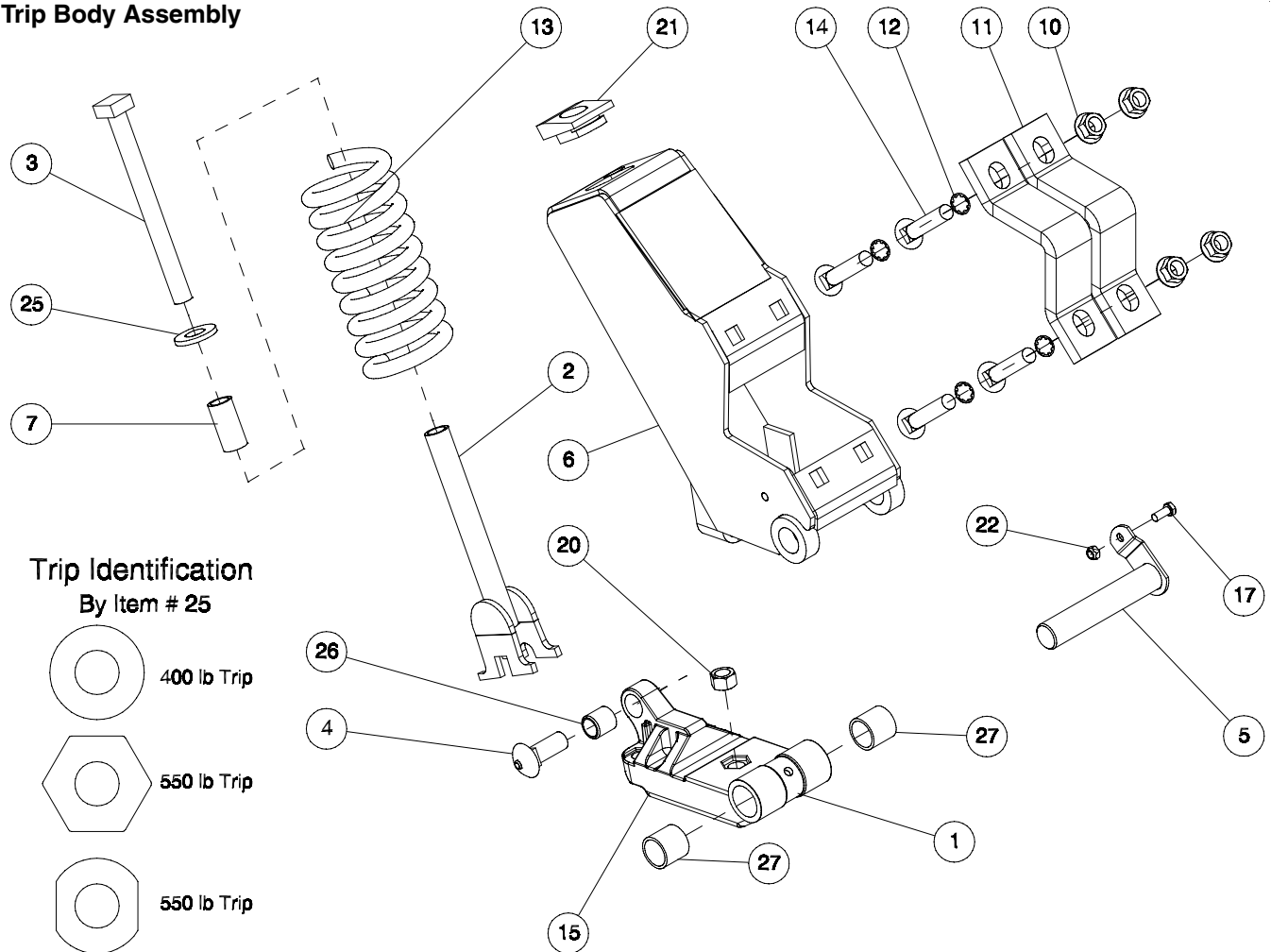
- Press wheels assembly is torqued to 450 ft. lbs. (610 N-m) at the factory.
- Check at 5 and 15 hours and periodically afterwards.
- Packer Wrench is located on the rear of the main frame cross brace.



Trip Maintenance

Spring Cushion Trips

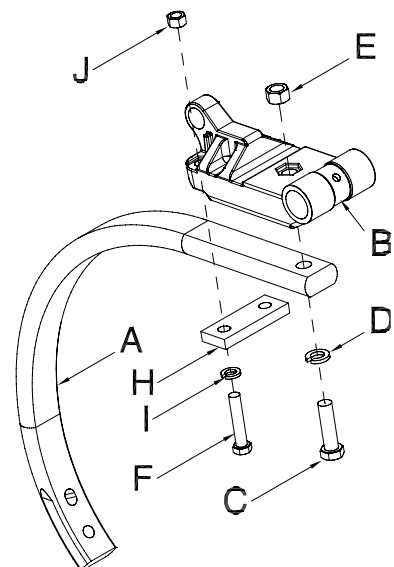
Trip Body Assembly



Shank Replacement

In the event a shank needs replacing, use the following procedure.

- Remove retaining bolt (C) from casting.
- Remove Shank Holder Clamp (H) from casting.
- Lift rear of shank up and pull out.
- Reverse above procedure to reassemble.



Maintenance

Trip Maintenance - Continued

Spring Cushion Trips

Main Bushing Replacement

In the event the pivot pin nylon bushings need replacing, use the following procedure.

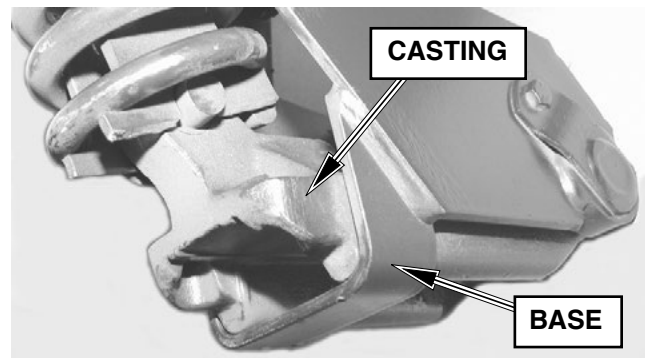
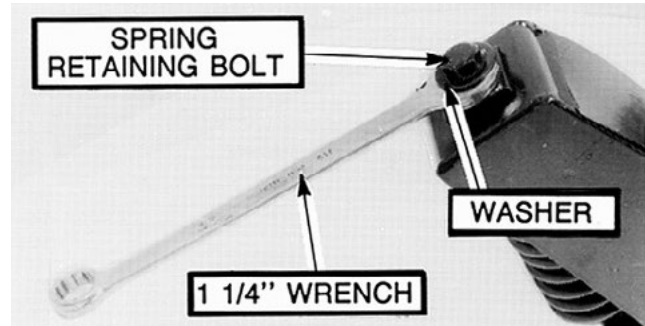
- Loosen spring retaining bolt.
- Slide a 1 1/4" wrench between the trip top and the washer on the bolt.
- Tighten bolt, this will lift the casting off the base taking the pressure off the pivot pin.
- Remove retaining bolt from pivot pin.
- Remove pivot pin from casting. To dismantle the spring, carefully unscrew the spring retaining bolt.

Note: Bolt is 8 1/4" (210 mm) long.

- Push casting down by lifting up on shank or by using a prybar.
- Remove the old bushings by pushing out towards the inside of the trip.
- Install the new bushings.

Reverse the above procedure to reassemble trip.

Note: Torque spring retaining bolt to 75 ft. lbs. (102 N-m) once trip is reassembled.

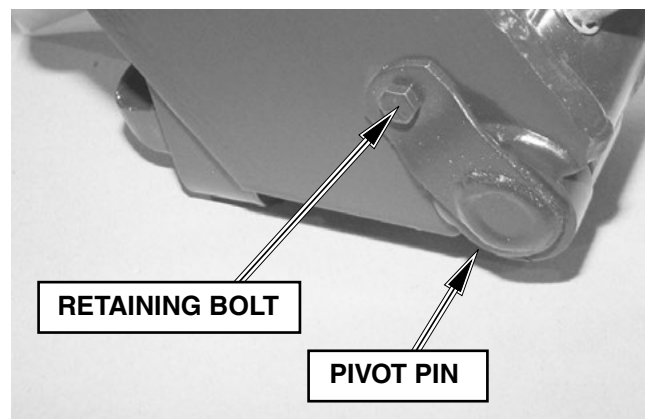


Danger

Care must be taken when replacing any trip components as the spring is under pressure.

Important

Re-torque bolts after initial 50 hours.
Check tightness periodically thereafter.
Torque Bolts as specified in Bolt Torque Chart.



Trip Maintenance - Continued

Spring Cushion Trips

Spring Rod Pivot Pin Bushing Replacement

A simple check can be performed to see if the bushings need replacing.

The bushing is visible when looking at the spring rod pivot pin from the right hand side for the trip unit.

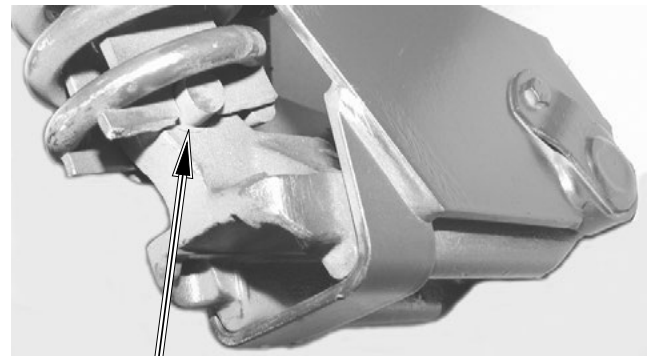
In the event the pivot pin nylon bushings need replacing, use the following procedure.

- Loosen spring retaining bolt.
- Slide two wrenches with a combined thickness of at least 1" (25 mm) between the trip top and the washer on the bolt.
- Tighten bolt fully, this will lift the casting off the base.
- Pry the casting away from the spring rod pin. The casting will drop down and the bushings can be easily accessed.
- Replace the bushing.

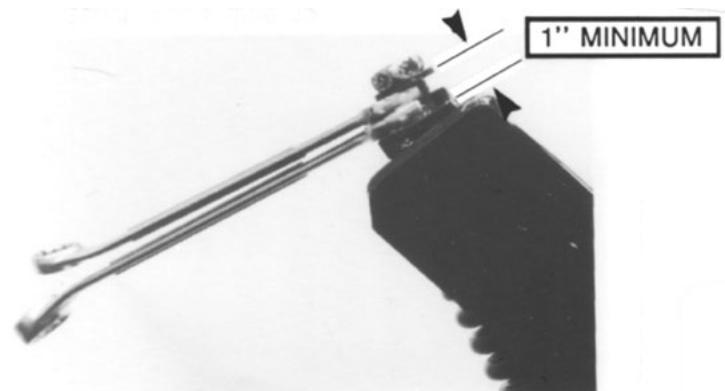
Reverse the above procedure to reassemble trip.

Note: The head of the spring pin must be orientated correctly with the slot in the spring rod for correct assembly - square shoulder enters the square ended slot.

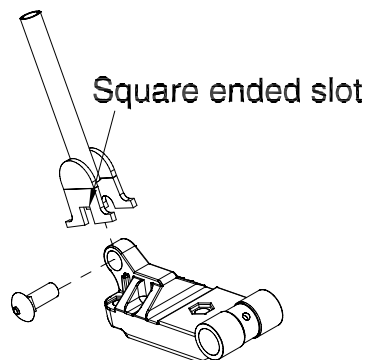
Note: Torque spring retaining bolt to 75 ft. lbs. (102 N-m) once trip is reassembled.



**SPRING ROD
BUSHING**



1" MINIMUM



Square ended slot

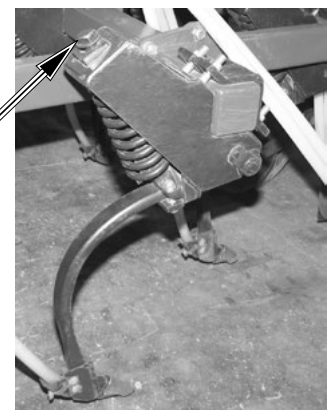
Danger

Care must be taken when replacing any trip components as the spring is under pressure.

Important

Re-torque bolts after initial 50 hours.
Check tightness periodically thereafter.
**Torque Bolts as specified in
Bolt Torque Chart.**

**Torque to
75 ft.lb. (102 Nm)**



Maintenance

Trip Maintenance - Continued

Hydraulic Trip Assembly

Bushing Replacement

In the event the pivot pin bushings need replacing, use the following procedure.

- **Remove all pressure** from the accumulator circuit using the tractor remote.
- Shut tractor engine off and ensure park brake is engaged before proceeding.
- Once the pressure is off of the trip circuit, disconnect hydraulic hose from trip cylinder.
- Remove cotter pins (3) from the trip cylinder and remove pins (4 & 5).
- Remove the cylinder. The cylinder pivot bushings (22) can be replaced at this point.
- Remove the shank (6) from casting (1).
- Remove the retaining bolt (14) from trip-casting pivot pin (23).
- Remove the pivot pin (23) from casting (1).
- Remove the casting from the trip body. The trip-casting pivot bushings can be replaced at this point.

Reverse the above procedure to reassemble trip.

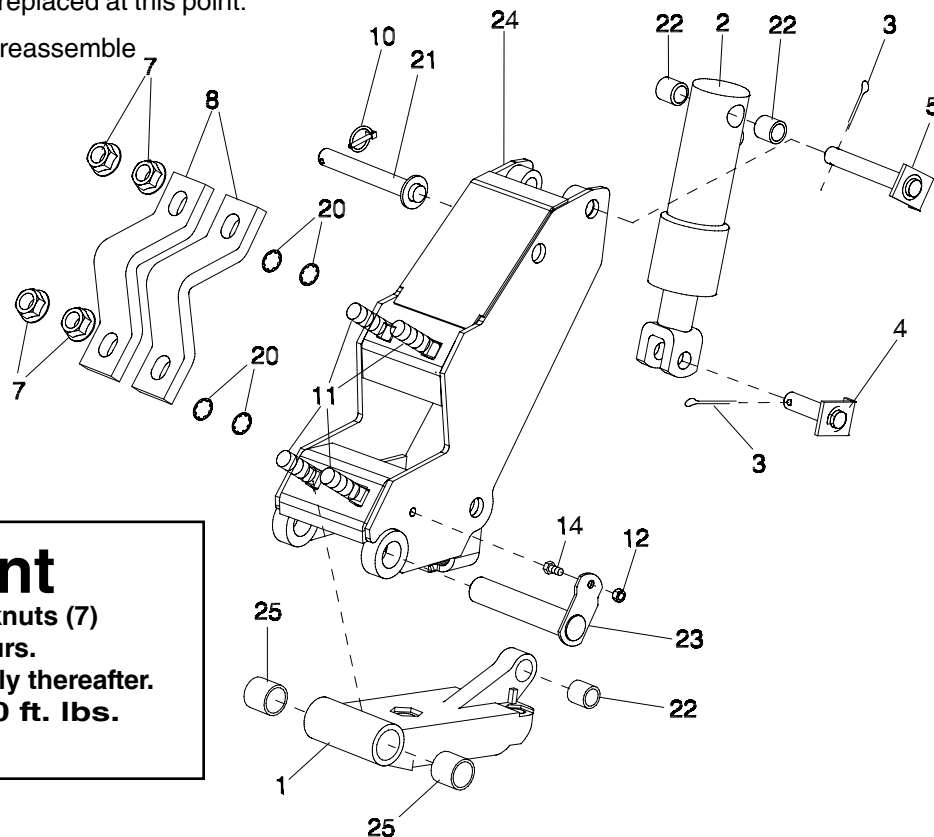
Warning



HIGH-PRESSURE FLUID HAZARD

To prevent serious injury or death:

- **Relieve pressure on hydraulic system before servicing or disconnecting hoses.**
- **Wear proper hand and eye protection when searching for leaks. Use wood or cardboard instead of hands.**
- **Keep all components in good repair.**



Important

Re-torque flanged locknuts (7)
after initial 50 hours.

Check tightness periodically thereafter.
Torque Bolts to 150 ft. lbs.

Trip Maintenance - Continued

Hydraulic Trip Assembly - Continued

Cylinder Replacement

In the event the trip cylinder needs repair or replacing, use the following procedure.

- **Remove all pressure** from the accumulator circuit using the tractor remote.
- Shut tractor engine off and ensure park brake is engaged before proceeding.
- Once the pressure is off of the trip circuit, disconnect hydraulic hose from trip cylinder.
- Remove the cotter pins (3) from the trip cylinder and remove pins (4 & 5). Refer to diagram on previous page.
- Remove the cylinder. Repair or replace cylinder as necessary.

Reverse the above procedure to reassemble trip.

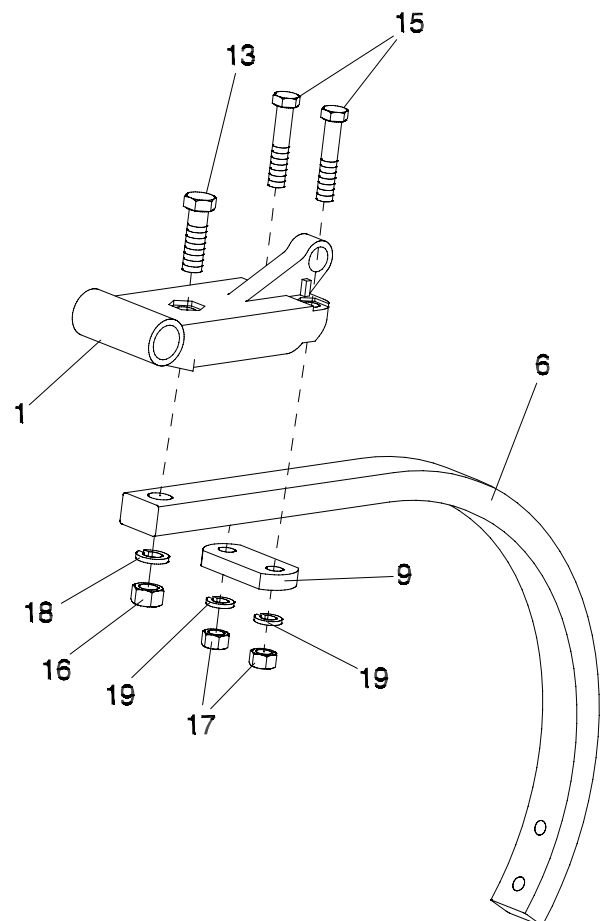
Shank Replacement

In the event a shank needs replacing, use the following procedure.

- Remove retaining bolt (13) from casting.
- Remove Shank Holder Clamp (9) from casting.
- Lift rear of shank up and pull out.
- Reverse above procedure to reassemble.

Note: Retaining strap bolts (15) must be installed as shown to prevent interference with the trip cylinder.

	Warning
	
HIGH-PRESSURE FLUID HAZARD To prevent serious injury or death: • Relieve pressure on hydraulic system before servicing or disconnecting hoses. • Wear proper hand and eye protection when searching for leaks. Use wood or cardboard instead of hands. • Keep all components in good repair.	

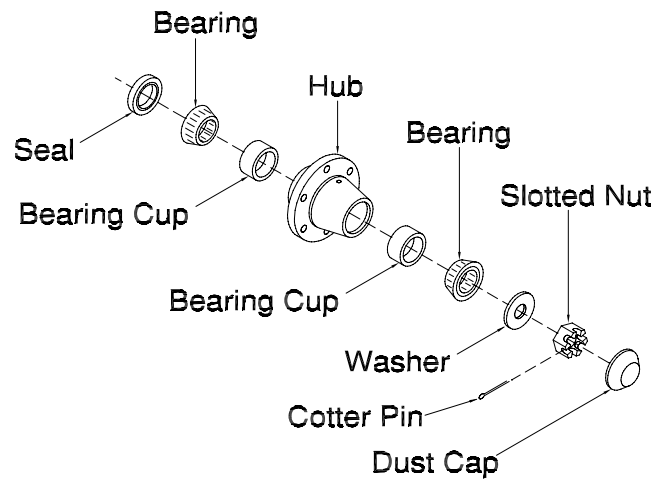


Maintenance

Wheel Bearings

- Lower the Air Drill and raise the wheels enough to clear the surface.
- Shut tractor off and remove key.
- Block wheel on tractor.
- Remove wheel from hub.
- Remove the dust cap, cotter pin, and the slotted nut and washer.
- Be careful when pulling the hub off as not to drop the outer bearing.
- Clean spindle and bearing components with solvent.
- Inspect for wear on bearings, spindle and cups, replace parts as required.
- Do not reuse old seals. Use only new seals when assembling.
- Pack inner hub with bearing grease.
- Be sure bearing and cup are dry and clean.
- Work grease into the bearing rollers, until each part of the bearing is completely full of grease.
- Install inner bearing and cup first, then press new seals in place.
- Place hub on spindle.
- Install outer bearing, washer and slotted nut.
- Tighten nut while turning the wheel until a slight drag is felt.
- Back nut off one slot and install a cotter pin. Bend cotter pin up around nut.
- Pack grease inside the dust cap and tap into position.

Important
Check wheel bearings for play every
5,000 acres (2,000 hectares)
or yearly, whichever occurs first.
Tighten as required.



Axle Pivot Bushings

Inspect seasonally the axle pivots for wear. Replace bushings if excessive movement is found.

In the event the Axle Pivot Bushings need replacing, use the following procedure.

- Lower machine taking weight off axles.
- Shut tractor off and remove key.
- Block wheel on tractor.
- Remove roll pin (E) from pivot pin (D).
- Remove pivot pin (D).
- Remove seals. **Note Seal Lips Facing Out.**
- Remove pivot bushings.
- Thoroughly clean all parts.
- Inspect pivot pin for abrasions, replace if necessary.

Note: Any abrasions on the pin will severely limit the life of the bushings.

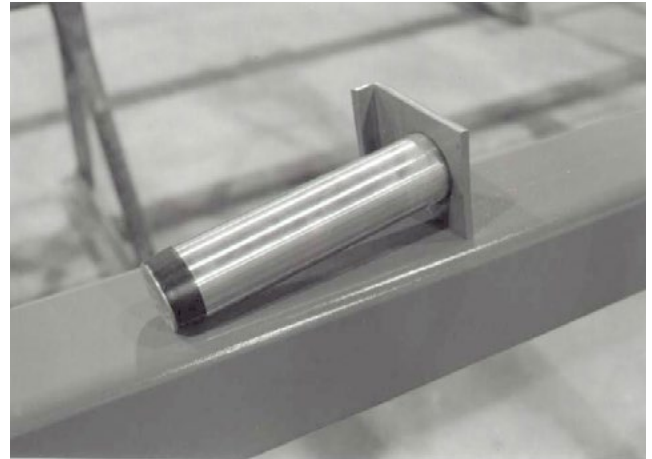
- Carefully press bushings in place, ensuring the inner lining of the bushings are not damaged.
- Install the seals with the **seal lips facing out.**

Note: Seal lips *must* face outward to prevent dust from entering bushings.

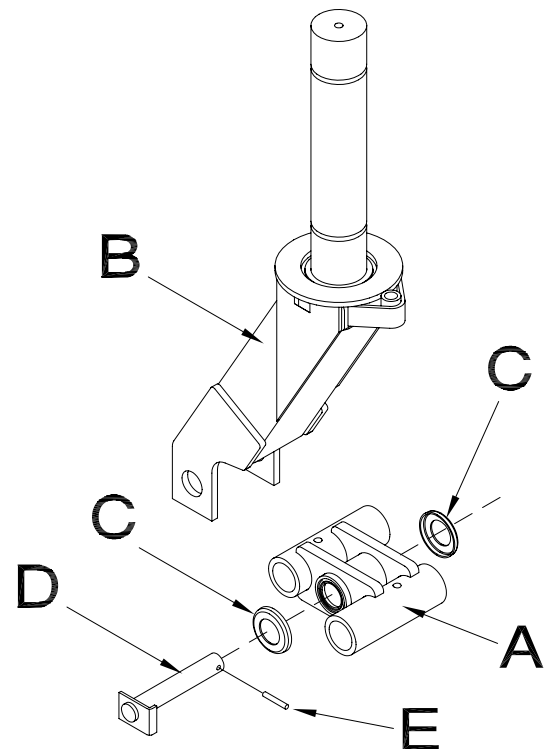
- Apply a thin layer of oil onto seal lips to ease in the installation of pivot pin.
- Place cupped washers (C) over seals.
- Align axle walking beam (A) with castor (B).
- Wrap a single layer of electrical tape over hole. This will ensure the edge of the hole will not damage the seal lips.

Note: Do not use grease on any components.

- Carefully install pivot pin, ensuring the seal lips and inner lining of the bushings are not damaged. **Do not force pin through the bushings.**



Tap Pivot Pin Hole



Maintenance

Packer Pivot Bushings

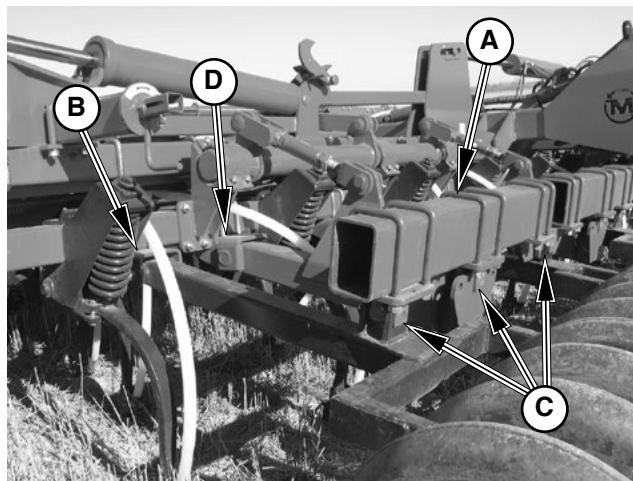
The packer pivot arms on the Maxim III use urethane bushings. These bushings allow the flexing of the packer gangs to follow uneven ground conditions. Wear is minimal but over time the urethane material may compress requiring replacement.

In the event the Packer Pivot Bushings need replacing, use the following procedure.

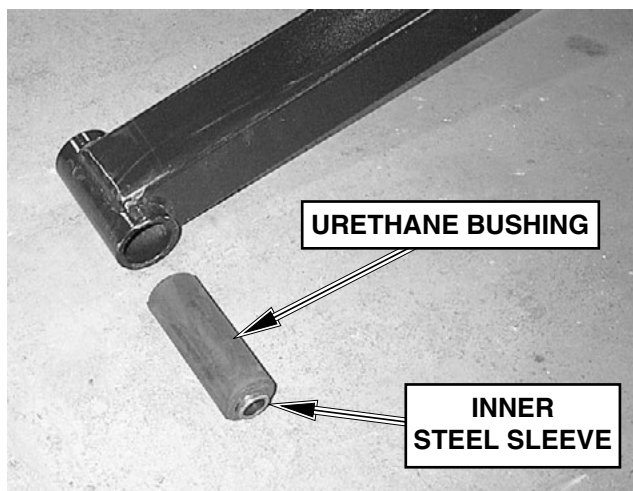
- Lower machine taking weight off packers.
- Shut tractor off and remove key.
- Block wheel on tractor.
- Remove packer evener beam (A).
- Remove pins from rear pivot brackets (C) to replace bushings.
- To replace front packer bushing, remove packer gang assemblies from pivot bracket (B).
- For pivot point (D) refer to axle pivot bushing replacement for details.
- Thoroughly clean all parts.
- Inspect pivot pins for abrasions, replace if necessary.

Note: Do not use grease on any components.

- Carefully install pivot pin, ensuring the inner lining of the bushings are not damaged. **Do not force pin through the bushings.**



Packer Pivot Arms - Wing Frame Shown



Packer Arm



Nylon Wear Strips

In the event the Nylon Wear Strips need replacing, use the following procedure.

- Lower the Air Drill till the openers are resting on the surface.
- Shut tractor off and remove key.
- Block wheel on tractor.
- Remove all clamp straps (A) and shims from the torque tube.
- Remove nylon wear strips.
- Insert the new nylon wear strips around the torque tube.

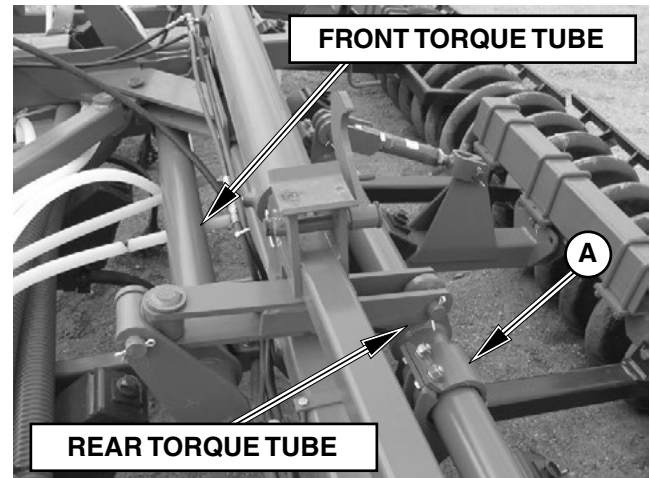
Note: Position nylon wear strip joint at the mid point of clamp strap.

- Secure torque tube in place with clamp straps (A), the 5/8" bolts, lockwashers, and nuts.

Note: The joint of the nylon wear strip should be at the mid point of clamp strap.

- A minimum of two shims are installed on the top bolts of each clamp strap. If the torque tube can not easily be turned by hand, shims will need to be placed between the clamp straps and the torque tube brackets.

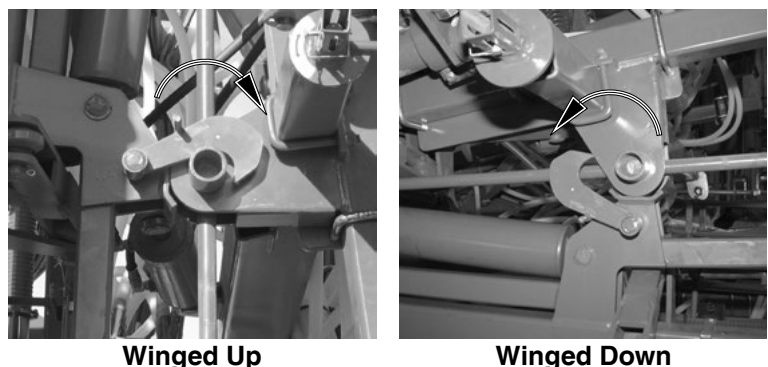
Note: Shims can be added or removed as needed so that the torque tube can be turned by hand.



Gravity Lock

Ensure gravity locks move freely in both directions.

Note: Damage to wing lift components will result if gravity locks malfunction.

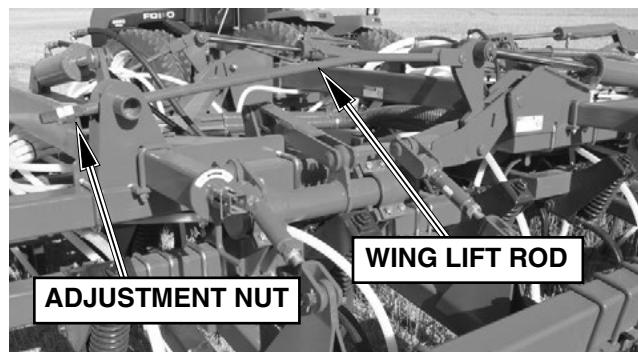


Maintenance

Outer Wing Lift Rod

Normally the nuts will be screwed all the way to the end of the thread on the wing lift rods.

- With the outer wing lift rod retracted fully, check the clearance between the lifting link and the gusset.
- Adjust rod length until there is a minimum of 1/16" (2 mm) between the lifting link and gusset in the lift arm when raising wing.
- If no adjustment is left and the clearance is less than a 1/16" (2 mm) check for worn components and replace as required.



Outer Wing Lift

Important

Failure to have gap will cause lifting link to break at contact point.



Wing Lift Rod Retracted



Check Gap

Fertilizer Coulter

Lubrication

- Use a good grade of **lithium based grease**.

1. Hubs

- Grease every 100 hours. (Bi-weekly)

Scraper Positions

The scraper has two positions to extend the life of the coulter disc.

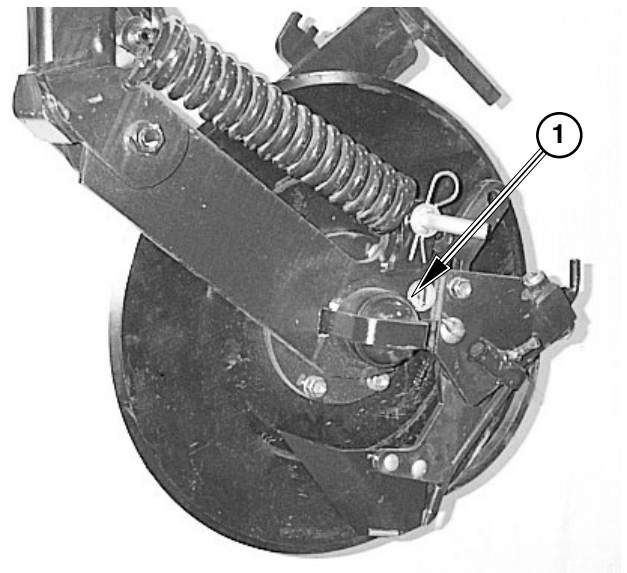
NH3 applications only

Initially the opener is set in the lower position.

Once the coulter disc has worn approximately 1 inch the scraper is moved to the upper position.

Granular or liquid applications

Initially the scraper is set in the upper position.

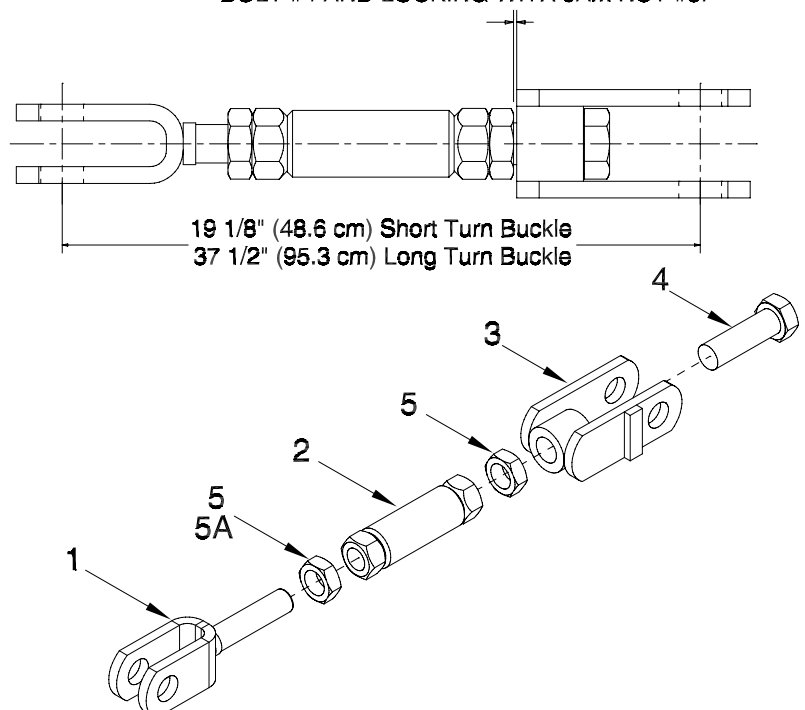


Hubs

Packer Turn Buckle Assembly

1. Clevis - right hand thread
2. Turn Buckle Body
3. Pivot Clevis
4. Hex Bolt - 1 1/4 x 4 Lg
5. Jam Nut - 1 1/4
- 5A. Jam Nut - 1 1/2 (Long Turn Buckle)

1/16" (1.6 mm) MAXIMUM GAP
NOTE: ITEM #3 MUST TURN FREELY WHEN ASSEMBLING
BOLT #4 AND LOCKING WITH JAM NUT #5.



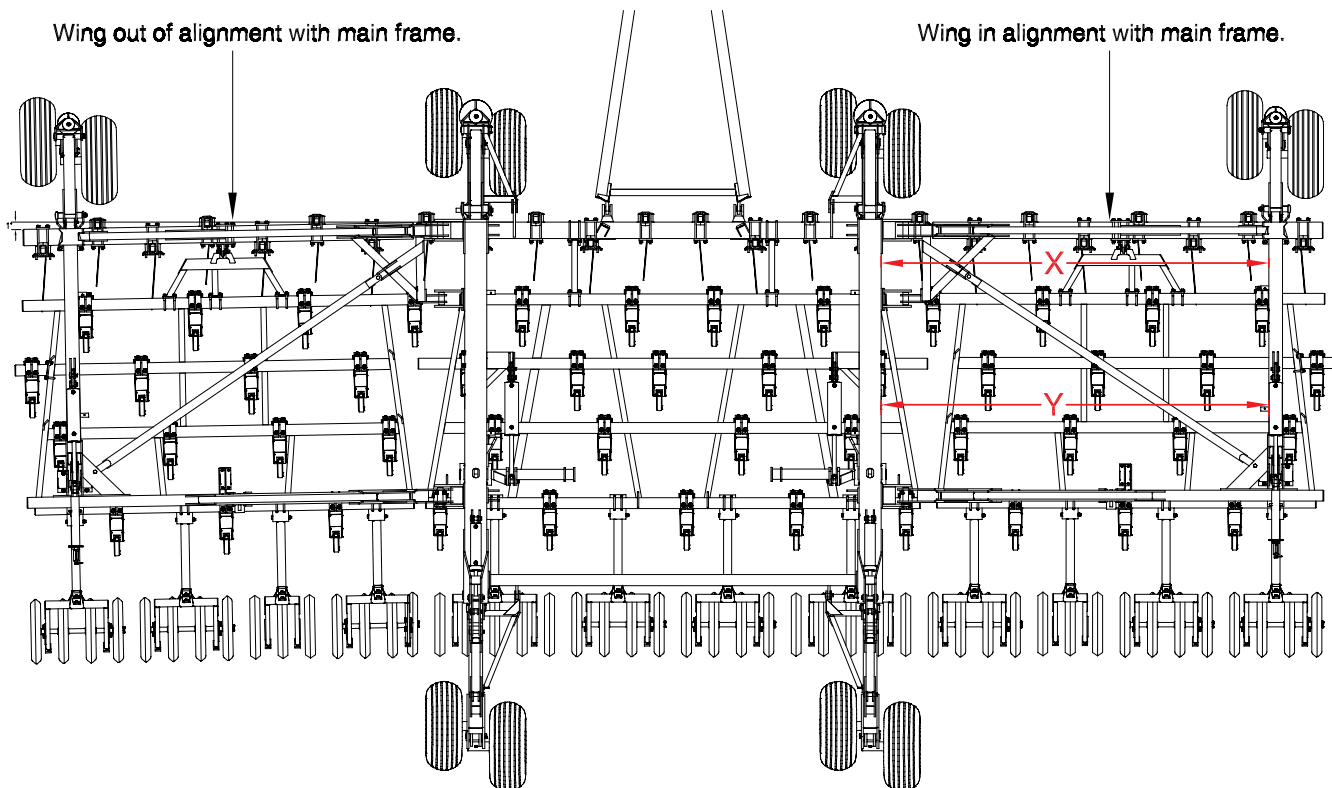
Maintenance

Wing Brace Adjustment

It is imperative that the adjustable wing braces on Maxim III Air Drill units be correctly adjusted to minimize stress on the machine components.

In order to correctly adjust the wing braces use the following procedure:

1. Start with the air drill on level ground with wings down. Pull the unit forward to ensure machine components are running straight. (i.e. packer gangs)



2. Check the alignment of the wing frames to ensure they are not too far forward or back. Also, check that the wing depth beams are parallel to the main depth beams (**dimension “X” & “Y” are equal**). Correct any problems. If there appears to be severe alignment problems, please contact Morris' Technical Support Department for advice.
3. Confirm the wing braces are tight. If they are loose, tighten the turnbuckle to remove all slack. Then tighten the turnbuckle an additional 1/4 inch (6.4 mm), which is approximately 2 revolutions of the short turn buckle, to tension the wing brace, and tighten the jam nut.

Important

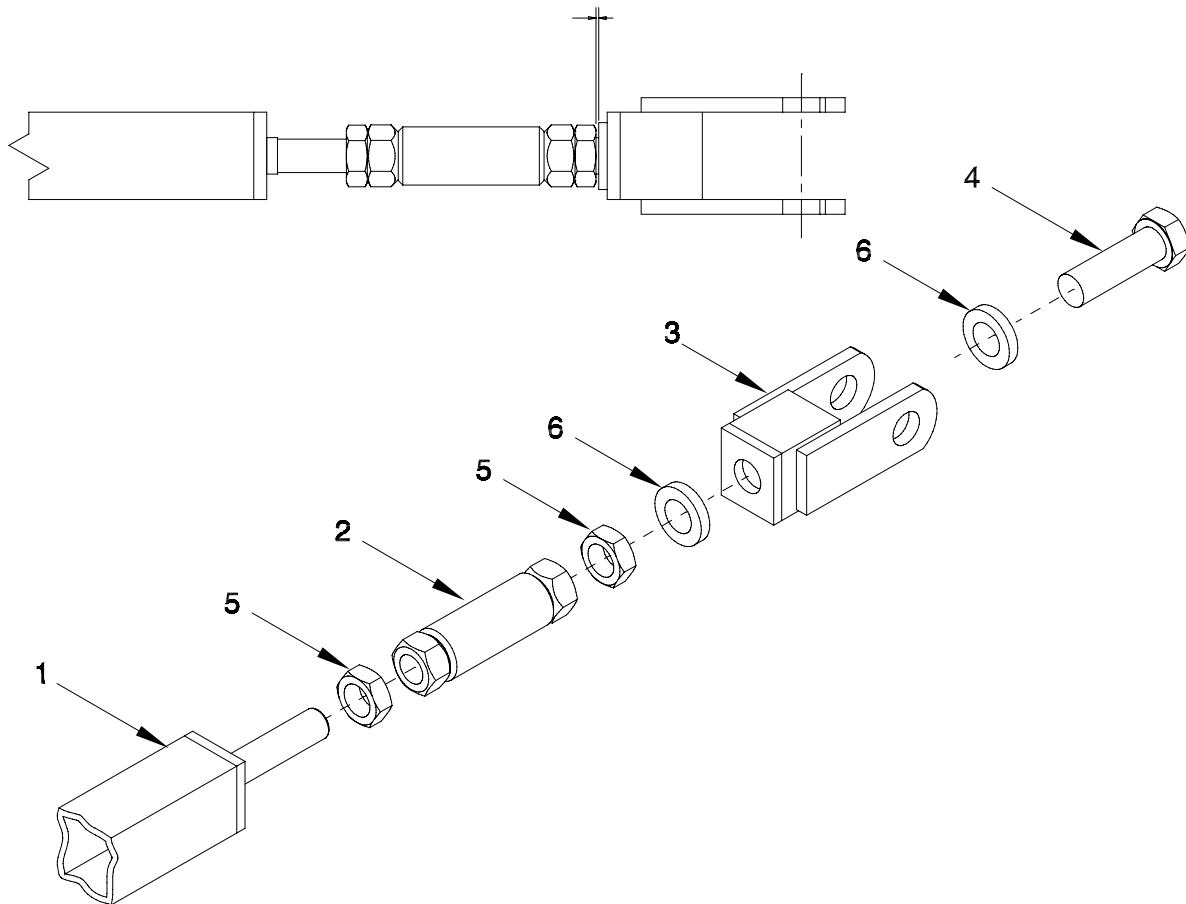
Wing braces must have tension at all times.

Air drill wing depth beam must be square with the main frame depth beam.

Wing Brace Adjustment - Continued

Turnbuckle Assembly

1/16" (1.6 mm) MAXIMUM GAP
NOTE: ITEM #3 MUST TURN FREELY WHEN ASSEMBLING
BOLT #4 AND LOCKING WITH JAM NUT #5.



Item	Part No.	Description	Qty
1	*****	Wing Brace.....	1
2	S39132	Turnbuckle Body - Short.....	1
3	S44020	Brace Clevis.....	1
4	S39754	Hex Bolt - 1 1/4 x 4 Lg.....	1
5	C15768	Jam Nut - 1 1/14.....	2
6	S26462	Washer - 1 9/32 ID x 2 1/2 OD	2

Troubleshooting

Problem	Cause	Correction
Machine not operating straight.	Not levelled.	Refer to Operation Section on levelling.
		Rephase cylinders.
		Check tire pressure.
	Packer pivot bushings worn.	Replace bushings.
Lack of penetration.	Not levelled.	Refer to Operation Section on levelling.
	Sweeps/points worn.	Replacement necessary.
	Sweep angle.	Conventional Stem requires 47 degree tools.
Sweeps/points wearing unevenly	Not levelled front to rear.	Refer to Operation Section on levelling.
	Tire tracks.	Replace worn sweeps.
	Front row always wears more than the others.	Replace worn sweeps.
Wing lifting too slowly.	Tractor hydraulic pressure.	Repair pump. Pressure relief valve needs resetting.
		Foreign material or sticking.
	Hydraulic breakaways.	Check compatibility.
		Re-route hydraulic hoses.
	Hose restriction.	
Wings not lowering.		Place valve lever in unlocked position.
	Transport valve closed.	
Transport wheels do not lock down before wings start to raise.		Repair cylinder.
	Leaky transport wheel cylinder	
Oil accumulation.	Damaged seal.	Replace seals.
		Tighten hose and pipe connections.
	Loose fittings.	Replace.
	Scored cylinder shaft will damage shaft seal.	
	Normal.	Slight seepage from seal is normal.

Troubleshooting

Problem	Cause	Correction
One wing will lift, other will not.	Assembly.	Hoses reversed at cylinder.
	Restriction in line.	Clean.
	Internal cylinder leak.	Repair cylinder.
Depth control not working.	Cylinders not phased.	Refer to Operation Section on rephasing.
	Leaks.	Use hand and eye protection - Check for external leaks.
	Low oil level.	Fill tractor reservoir.
	Hydraulics clogged.	Replace filter.
	Depth Control stops not adjusted evenly.	Measure and ensure all stops are adjusted properly.
One wing will drop when machine is fully raised.	Internal cylinder leak.	Repair cylinder.
		Repair cylinder.
One whole side will drop when machine is fully raised.	Internal cylinder leak on flow divider.	Repair cylinder.
Packer gangs squeaking.		Tighten gang nuts to 450 ft. lbs.
	Gangs not tight enough.	

Maintenance

Notes
