



OPERATOR'S MANUAL

**Maxim II
Air Drill**

S33476-05

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Safety

SAFETY-ALERT SYMBOL



Watch for this symbol. It identifies potential hazards to health or personal safety. It means:

ATTENTION - BE ALERT.
Your Safety is involved.

Familiarize yourself with the location of all decals. Read them carefully to understand the safe operation of your machine.

Signal Words

The words **DANGER**, **WARNING** or **CAUTION** are used with the safety alert symbol. Learn to recognize the safety alerts, and follow the recommended precautions and safe practices.

Three words are used in conjunction with the safety-alert symbol:



DANGER

Indicates an imminently hazardous situation that, if not avoided, will result in **DEATH OR SERIOUS INJURY**.



WARNING

Indicates a potentially hazardous situation that, if not avoided, could result in **DEATH OR SERIOUS INJURY**.



CAUTION

Indicates a potentially hazardous situation that, if not avoided, may result in **MINOR OR MODERATE INJURY**.

Replace any **DANGER**, **WARNING**, **CAUTION** or instructional decal that is not readable or is missing. The location and part number of these decals is identified later in this section of the manual.

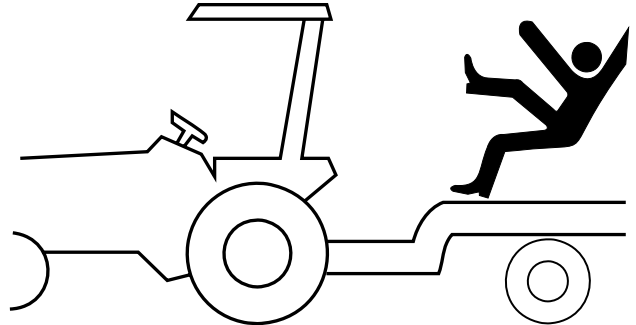
The words **Important** and **Note** are not related to personal safety but are used to give additional information and tips for operating or servicing this equipment.

IMPORTANT: Identifies special instructions or procedures which, if not strictly observed could result in damage to, or destruction of the machine, process or its surroundings.

NOTE: Indicates points of particular interest for more efficient and convenient repair or operation.

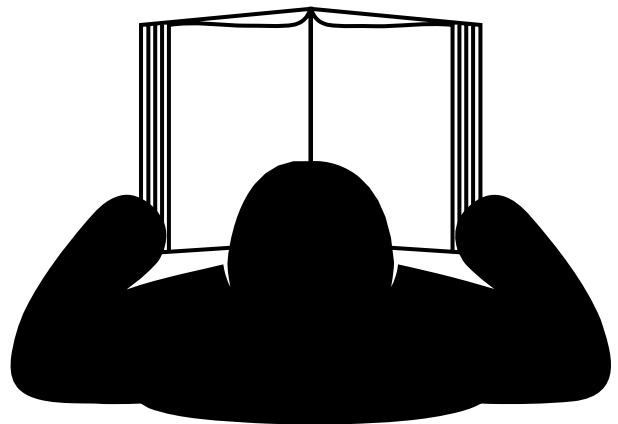
General Operation

- **DO NOT RIDE!!** Do not allow riders on the implement when in motion.
- Do not allow extra riders in the tractor unless an instructor seat and seat belt are available.
- **Check behind** when backing up.
- **Reduce speed** when working in hilly terrain.
- Never allow anyone within the immediate area when operating machinery.
- **Stand clear** when raising or lowering wings.
- **Keep all shields in place**, replace them if removed for service work.
- Always lock auger attachment in raised position.
- Keep hands clear of tank opening when closing lid. Keep lid seal clean to ensure proper sealing.
- **Do Not enter Air Cart tank unless another person is present and the tractor engine has been shut off.**



Tractor Operation

- Be aware of the correct tractor operating procedures, when working with implements.
- Review tractor operator's manual.
- Secure hitch pin with a retainer and lock drawbar in centre position.



Safety

Chemicals

- **Use extreme care** when cleaning, filling or making adjustments.
- **Always read** granular chemical or treated seed manufacturer's warning labels carefully and remember them.
- Wear close fitting clothing and appropriate personal protective equipment for the job as specified by the chemical and/or seed manufacturer.
- **Always wear** safety goggles, breathing apparatus and gloves when handling with granular chemical or treated seed.
- **Do not feed** any treated seed to livestock. Treated seed is poisonous and may cause harm to persons or livestock.
- **Wash exposed skin immediately** - do not leave chemicals on your skin.
- **Properly store** chemicals in original containers with labels intact per the manufacturer's instructions.
- Always follow the manufacturer's operating instructions and warning labels when operating an ammonia tank with the equipment.
- **Do Not enter Air Cart tank unless another person is present and the tractor engine has been shut off.**



Danger

Failure to comply may result in death or serious injury.

Read Operator's Manual and decals on **Ammonia** tank before operating Air Cart. 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 parts.

Always secure connecting parts and safety chains before towing ammonia trailer.

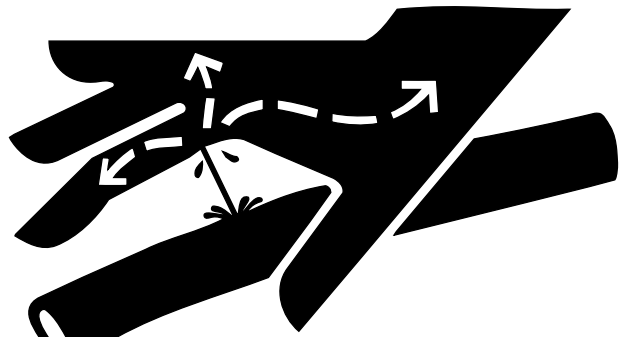
Always have ample water available in case of exposure to ammonia liquid or gases.

Transporting

- **Be aware** of the height, length and width of implement. Make turns carefully and be aware of obstacles and overhead electrical lines.
- Always travel at a safe speed. Do Not Exceed 20 M.P.H. (32 kph) with an empty air cart.
- **REDUCE SPEED** with material in Air Cart tanks. **Do Not** Exceed a speed of 10 M.P.H. (16 kph).
- Use an agricultural tractor that is large enough with sufficient braking capacity so that the weight of the loaded equipment towed **does not exceed 1.5 times** the weight of the tractor.
- Use flashing amber warning lights, turn signals and SMV emblems when on public roads.
- Do not transport in poor visibility.
- The slow moving vehicle (SMV) emblem and reflectors must be secured and be visible on the machine for transport.
- Avoid soft surfaces, the additional wing weight on the centre wheels could cause the machine to sink.
- Ensure safety chain is attached correctly to the towing vehicle and the hitch of the implement.
- Check that wings are firmly seated in transport wing stops, and lock pins installed.
- Secure transport locks on depth control cylinders.
- Be familiar with and adhere to local laws.

Hydraulics

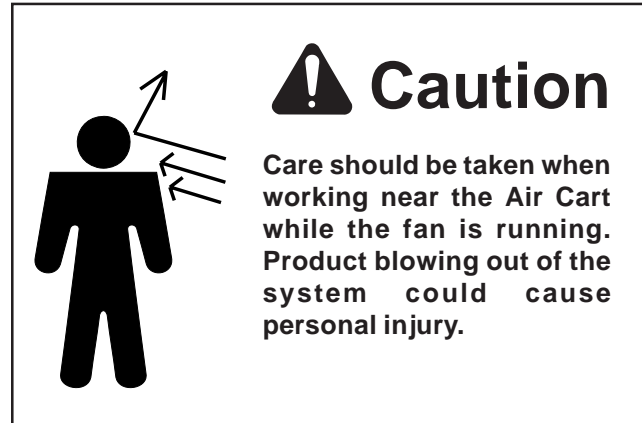
- **Do not** search for high pressure hydraulic leaks without hand and face protection. A tiny, almost invisible leak can penetrate skin, thereby requiring immediate medical attention.
- Use cardboard or wood to detect leaks - never your hands.
- Double check that all is clear before operating hydraulics.
- **Never** remove hydraulic hoses or ends with machine elevated. Relieve hydraulic pressure before disconnecting hydraulic hoses or ends.
- Maintain proper hydraulic fluid levels.
- Keep all connectors clean for positive connections.
- Ensure all fittings and hoses are in good condition.
- Do not stand under wings.



Safety

Maintenance

- **Shut tractor engine off** before making any adjustments or lubricating the machine.
- **Block** machine securely to prevent any movement during servicing.
- Wear close fitting clothing and appropriate personal protective equipment for the job.
- **Always wear** safety goggles, breathing apparatus and gloves when working on seeder filled with granular chemical or treated seed per the manufacture's instructions.
- Do not modify the machine.



Storage

- Store implement away from areas of main activity.
- Level implement and block up securely to relieve pressure on jack.
- Do not allow children to play on or around stored implement.

Safety Signs

DANGER

- WINGS MAY FALL RAPIDLY CAUSING BODILY INJURY.
- ALWAYS STAY CLEAR OF FOLDING WINGS WHEN BEING RAISED, LOWERED, OR IN ELEVATED STATE.
- ALWAYS INSTALL ALL LOCKUP DEVICES PROVIDED WHEN WINGS ARE IN ELEVATED POSITION.
- ENSURE CYLINDER IS COMPLETELY FILLED WITH HYDRAULIC FLUID TO AVOID UNEXPECTED MOVEMENT.

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DANGER

Failure to comply may result in death or serious injury.

Read Operator's Manual and decals on **Ammonia** tank before operating Machine. 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 parts.

Always secure connecting parts and safety chains before towing ammonia trailer.

Always have ample water available in case of exposure to ammonia liquid or gases.

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WARNING

Personal injury or property damage may result from loss of control.

- Always use large enough tractor with sufficient braking capacity.
 - Weight of fully loaded implement should not be more than 1.5 times weight of tractor.
- Maximum recommended towing speed is 20 mph (32 km/h).
- Use flashing amber warning lights and SMV emblem when on public roads, except where prohibited by law.
- Refer to tractor and implement Operator's Manuals for weights and further information.

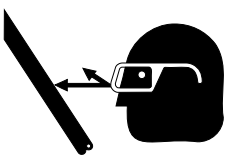

N24301



Familiarize yourself with the location of all decals. Read them carefully to understand the safe operation of your machine.

Safety

Safety Signs - Continued

	! WARNING HIGH-PRESSURE FLUID HAZARD To prevent serious injury or death: <ul style="list-style-type: none">• 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. <small>C-4262</small>
	

! WARNING
<p>This implement may exceed maximum road regulations. Before you transport this implement contact a local agency regarding road regulations concerning maximum allowable implement dimensions.</p> <small>C31201</small>

! WARNING

<p>Keep off while machine is moving or mechanism is running.</p> <small>D13705</small>

! CAUTION
<p>TRANSPORT LOCK ... MUST BE INSTALLED BEFORE TRANSPORTING MACHINE. SEE OPERATOR'S MANUAL</p> <small>F-4644</small>

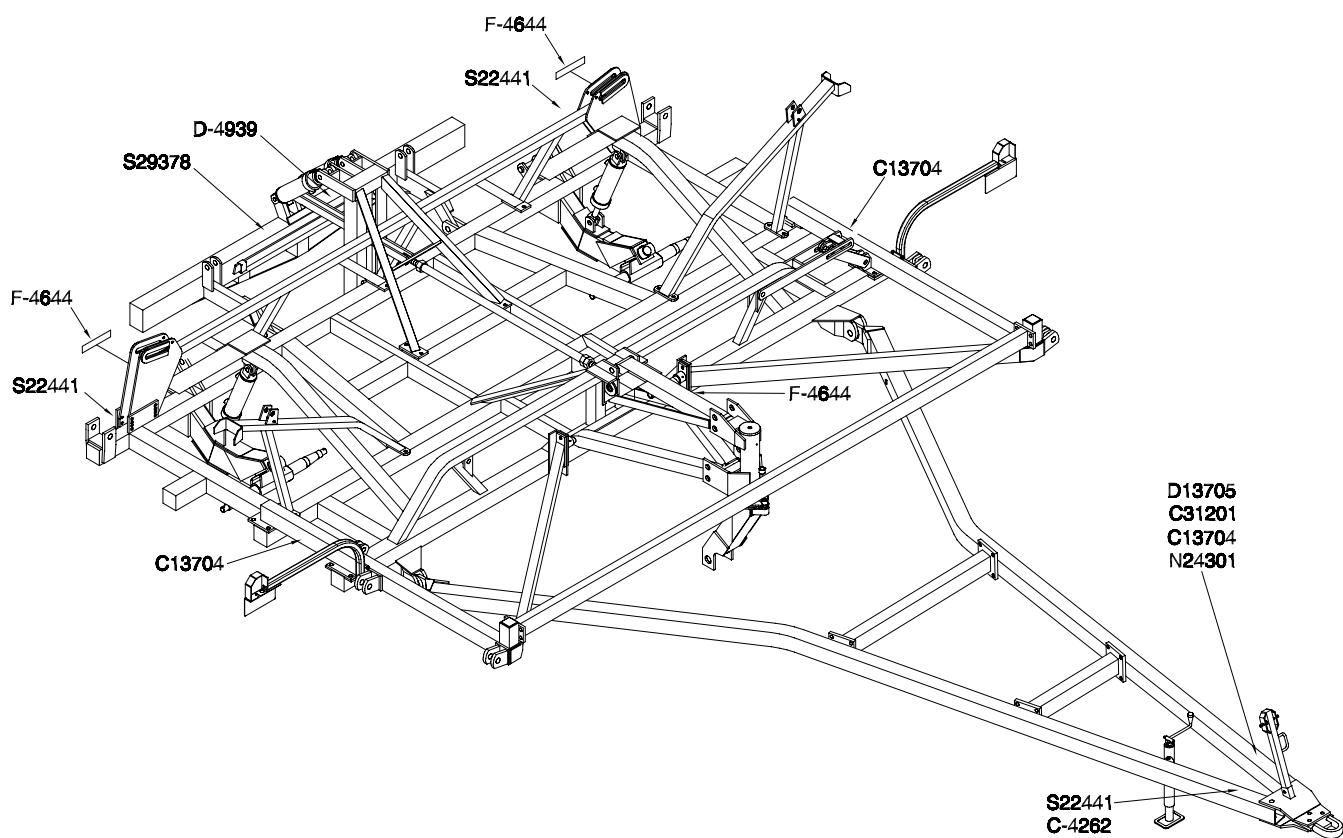
! CAUTION
<p>TRANSPORT WHEELS MUST BE <u>LOCKED</u> IN PLACE BEFORE FOLDING UNIT UP OR DOWN AND WHEN TRANSPORTING. FAILURE TO DO SO COULD RESULT IN SEVERE DAMAGE TO MAIN PACKER FRAME AND/OR PACKER GANG PIVOTS.</p> <small>S22441</small>



Familiarize yourself with the location of all decals. Read them carefully to understand the safe operation of your machine.

Safety Signs - Continued

Locations



Safety

Lighting and Marking

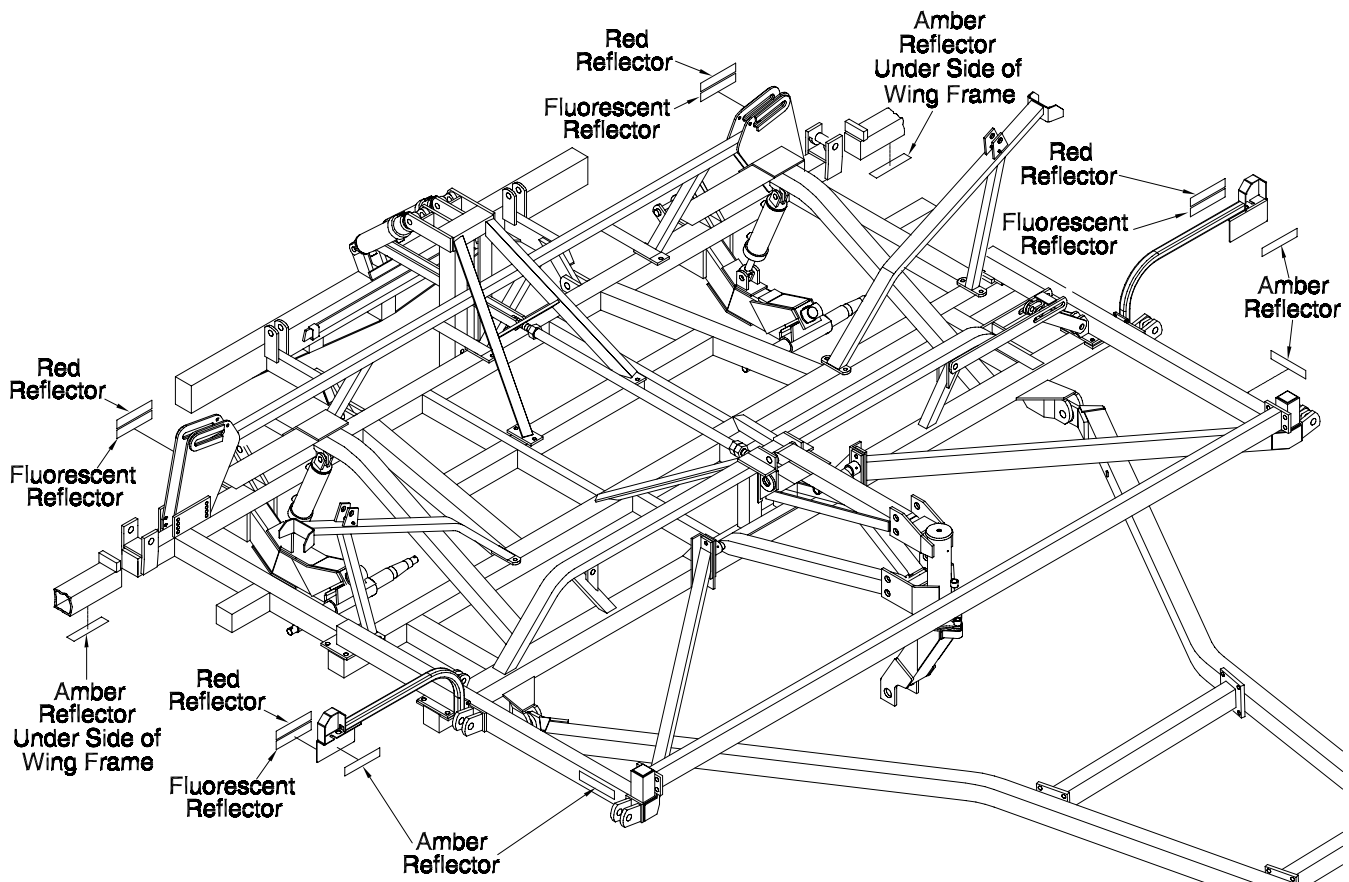
MORRIS recommends the use of the correct lighting and marking to meet the ASAE standard for roadway travel. Be familiar with and adhere to local laws.

Amber warning and red tail lights secured on the machine promote correct transportation of this implement.

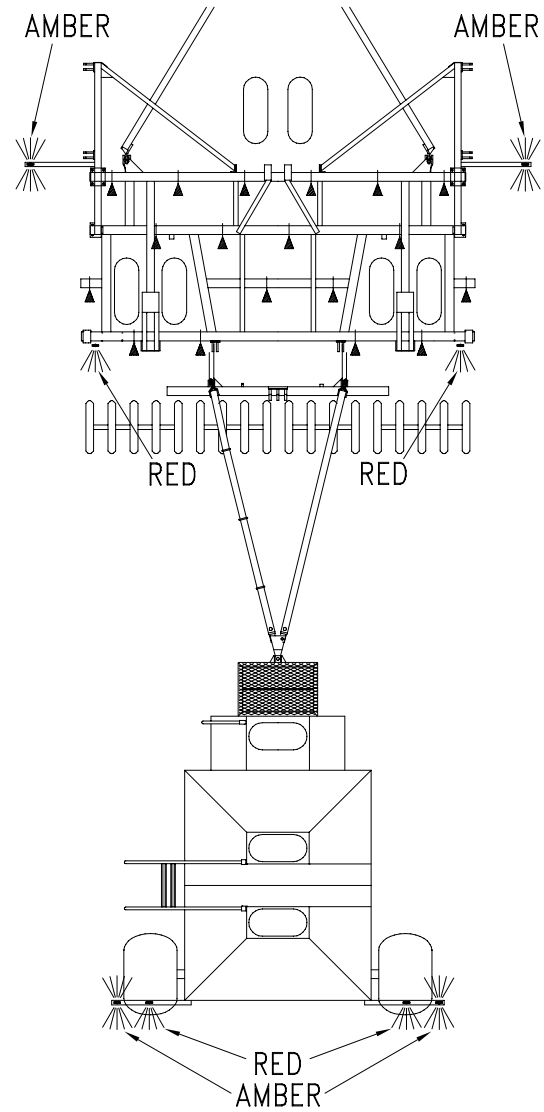
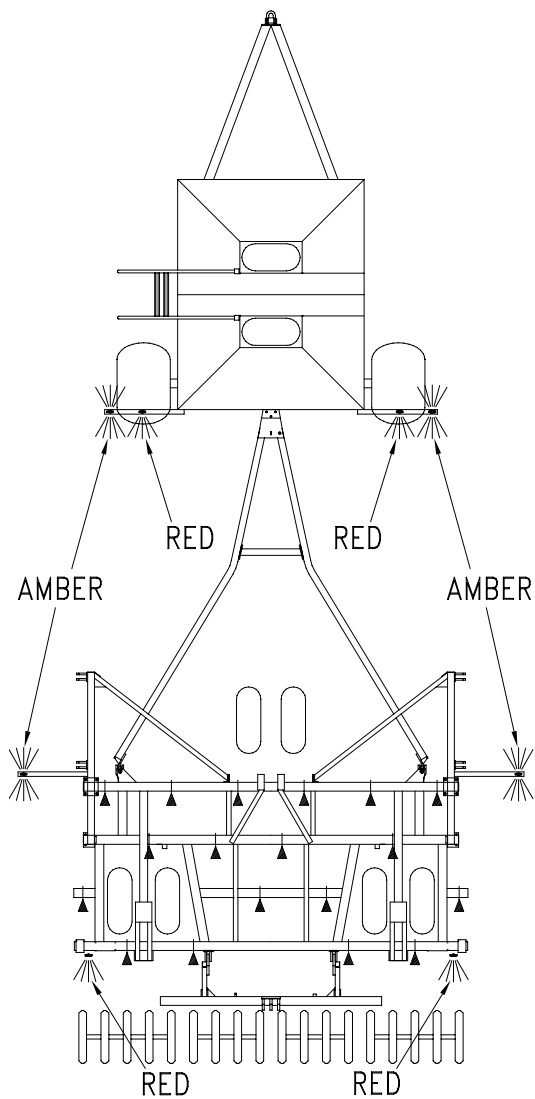
Note: Always replace missing or damaged lights and/or connectors.

Amber warning and red tail lights must be mounted to the rear of the implement and be visible from front and rear. The lights must be within 16 inches (41 cm) of the extremities of the machine and at least 39 inches (99 cm) but not over 10 feet (3 m) above ground level.

Note: Always replace missing or damage front, side, rear reflectors and SMV emblem.



Lighting and Marking - Continued



Safety

Notes

Section 2: Specifications

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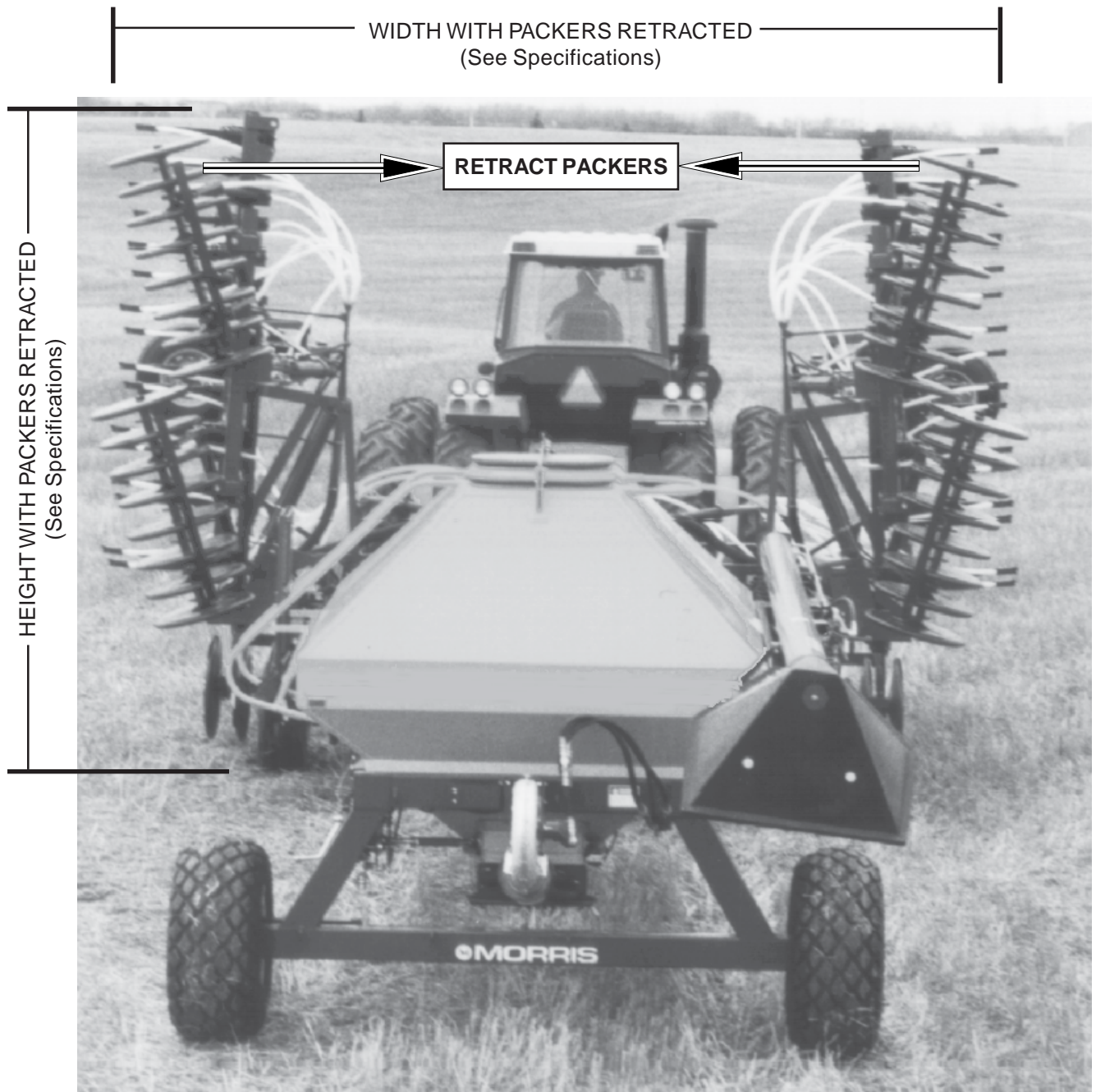
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Specifications

MAXIM II Specifications and Options

Base Size	3 Frame Models			5 Frame Models		
	29' (8.84 m)	34' (10.36 m)	39' (11.89 m)	49' (14.94 m)	55' (16.77 m)	60' (18.29 m)
Weight (3 1/2" Steel Packers with Edge-On Shank)						
- 7 1/2" Spacing	14,962 lbs.	17,039 lbs.	18,952 lbs.	25,257 lbs.	N/A	N/A
19.0 cm Spacing	6,801 kg	7,745 kg	8,615 kg	11,480 kg	N/A	N/A
- 10" Spacing	13,566 lbs.	15,025 lbs.	16,946 lbs.	22,550 lbs.	26,981 lbs.	28,801 lbs.
25.4 cm Spacing	6,166 kg	6,830 kg	7,703 kg	10,250 kg	12,264 kg	13,091 kg
- 12" Spacing	12,330 lbs.	14,151 lbs.	16,003 lbs.	20,909 lbs.	25,357 lbs.	27,294 lbs.
30.5 cm Spacing	5,605 kg	6,432 kg	7,274 kg	9,504 kg	11,526 kg	12,406 kg
Working Width						
- 7 1/2" (19.0 cm) Spacing	29' 5" (8.97 m)	34' 5" (10.49 m)	39' 5" (12.01 m)	49' 5" (15.06 m)	N/A	N/A
- 10" (25.4 cm) Spacing	30' (9.14 m)	35' (10.67 m)	40' (12.19 m)	50' (15.24 m)	55' (16.76 m)	60' (18.29 m)
- 12" (30.5 cm) Spacing	29' (8.84 m)	35' (10.67 m)	41' (12.50 m)	49' (14.93 m)	55' (16.76 m)	61' (18.59 m)
Number of Shanks						
- 7 1/2" (19.0 cm)	47	55	63	79	N/A	N/A
- 10" (25.4 cm)	36	42	48	60	66	72
- 12" (30.5 cm)	29	35	41	49	55	61
Frame Width						
- Main	14' 6" (4.42 m)	14' 6" (4.42 m)	14' 6" (4.42 m)	14' 6" (4.42 m)	14' 6" (4.42 m)	14' 6" (4.42 m)
- Inner Wing	7' 6" (2.29 m)	10' (3.05 m)	12' 6" (3.81 m)	10' (3.05 m)	12' 6" (3.81 m)	12' 6" (3.81 m)
- Outer Wing	N/A	N/A	N/A	7' 6" (2.29 m)	7' 6" (2.29 m)	10' (3.05 m)
Overall Length	25' 8" (7.82 m)	25' 8" (7.82 m)	25' 8" (7.82 m)	29' 7" (9.02 m)	29' 7" (9.02 m)	29' 7" (9.02 m)
Transport Position						
- Width	19' 10" (6.03 m)	19' 10" (6.03 m)	19' 10" (6.03 m)	22' 6" (6.86 m)	24' 6" (7.47 m)	24' 6" (7.47 m)
- Height	12' 1" (3.68 m)	14' 1" (4.29 m)	16' 7" (5.06 m)	17' 6" (5.33 m)	17' (5.18 m)	17' (5.18 m)
Tires						
- Main Frame Castor Wheel	(2) 11L x 15 FI Load Range D	(2) 11L x 15 FI Load Range D	(2) 11L x 15 FI Load Range D	(2) 11L x 15 FI Load Range D	(2) 12.5L x 15 FI Load Range F	(2) 12.5L x 15 FI Load Range F
- Inner Wing Frame Castor Wheel	(1 per wing) (2) 11L x 15 6 ply rating	(1 per wing) (2) 11L x 15 6 ply rating	(1 per wing) (2) 11L x 15 6 ply rating	(1 per wing) (2) 11L x 15 6 ply rating	(2 per wing) (4) 11L x 15 6 ply rating	(2 per wing) (4) 11L x 15 6 ply rating
- Outer Wing Frame Castor Wheel (1 per wing)	N/A	N/A	N/A	(2) 11L x 15 6 ply rating	(2) 11L x 15 6 ply rating	(2) 11L x 15 6 ply rating
- Main Frame Transport Wheels	(4) 11L x 15 FI Load Range D 6 Bolt Hub	(4) 11L x 15 FI Load Range D 6 Bolt Hub	(4) 11L x 15 FI Load Range F 8 Bolt Hub	(4) 11L 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	Optional	Optional	Optional	Optional	Standard on Inner Wing Optional for Outer Wing	
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					
Trip Mechanism	400 lb (180 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	2" (5.1 cm) Steel or Rubber - (7 1/2" (19.0 cm) & 10"(25.4 cm) Spacing) 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	24" (61.0 cm)					
Shank to Shank Spacing	30" (76.2 cm) on 7 1/2" (19.0 cm) & 10" (25.4 cm) spacing, 36" (91.4 cm) on 12" (30.5 cm) spacing					
Frame Depth	76" (1.93 m) (4 ranks)					
2-Bar Harrows	Optional (3 Row 10" (25.4 cm) Spacing ONLY)					
Coulters	Optional - Front Row Mount on 30" (76.2 cm) Centres - (20" (50.8 cm) diameter)					
- Trash Cutting (Rippled or Plain)						
- Fertilizer (Plain)	Optional - Random Mounting on 20" (50.8 cm) Centres - (20" (50.8 cm) diameter) (N/A on 55 and 60 ft)					
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



Specifications

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Section 3: Checklist

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SAFETY-ALERT SYMBOL



Watch for this symbol. It identifies potential hazards to health or personal safety. It points out safety precautions. It means:

ATTENTION - BE ALERT.
Your safety is involved.

Manuals

Note: Pre-Delivery Inspection Form must be completed and submitted to Morris Industries within 30 days of delivery date.

Warranty Void if Not Registered

Parts Manual

Order Part Number S33478

Assembly Manual

Order Part Number S33477

Checklist

Please read the Operator's Manual carefully and become a "SAFE" operator.

Adopt a good lubrication and maintenance program.

General

- ☐ Check if assembled correctly
- ☐ Check hose connections

Lubrication - Grease

- ☐ Gauge Wheel Pivots
- ☐ Packer Bearings
- ☐ Wheel Hubs

Tire Pressure

- ☐ See maintenance, section 6

Level Frames

- ☐ Side to side
- ☐ Front to back

Transport

- ☐ Tighten wheel bolts
- ☐ Transport lock pins are in place
- ☐ Check hose connections.

OWNER REFERENCE

Model: _____
Serial No: _____
Dealer: _____
Town: _____ State: _____
Phone: _____
OWNER/OPERATOR: _____
Date: _____



TAKE SAFETY SERIOUSLY.

**DO NOT TAKE
NEEDLESS CHANCES!!**

Checklist

Notes

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Introduction

Introduction

This Operator's Manual has been carefully prepared to provide the necessary information regarding the operation and adjustments, so that you may obtain maximum service and satisfaction from your new MORRIS Maxim II Air Drill.

To protect your investment, study your manual before starting or operating in the field. Learn how to operate and service your Maxim II Air Drill correctly, failure to do so could result in personal injury or equipment damage.

If you should find that you require information not covered in this manual, contact your local MORRIS Dealer. The Dealer will be glad to answer any questions that may arise regarding the operation of your MORRIS Maxim II Air Drill.

MORRIS Dealers are kept informed on the best methods of servicing and are equipped to provide prompt efficient service if needed.

Occasionally, your Maxim II Air Drill may require replacement parts. Your Dealer will be able to supply you with the necessary replacement parts required. If the Dealer does not have the necessary part, the MORRIS Factory will supply the Dealer with it promptly.

Your MORRIS Maxim II Air Drill is designed to give satisfaction even under difficult conditions. A small amount of time and effort spent in protecting it against rust, wear and replacing worn parts will increase the life and trade-in value.



Shown: 34 foot Maxim II Air Drill on 10 inch spacing with 7180 VRT Air Cart

Keep this book handy for ready reference at all times. It is the policy of Morris Industries Ltd. to improve its products whenever it is possible to do so. The Company reserves the right to make changes or add improvements at any time without incurring any obligation to make such changes on machines sold previously.

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CAUTION



BE ALERT

SAFETY FIRST

**REFER TO SECTION 1 AND REVIEW
ALL SAFETY RECOMMENDATIONS.**

Application

The Maxim Air Drill utilizes a floating and fully independent frames, this system makes each frame fully flexible, front to back and side to side for improved seeding accuracy.

The 400 lb. Spring Cushion Trip allows the Maxim Air Drill to be used in a variety of seeding applications from conventional to zero till including banding applications.

Tractor

Tires

- Proper ballast and tire pressure are required when pulling heavy implements.
- Consult your tractor operator's manual and follow all recommended procedures.

Hydraulics

- Wipe all hydraulic fittings and couplers with a clean cloth to avoid contaminating the system.
- Check that hydraulic reservoir is filled to the proper level.

Drawbar

- Center and pin in a fixed position for easier hitching and greater stability.



Warning

Do not permit smoking, sparks or an open flame where combustible fuels are being used. Keep the work area well ventilated.



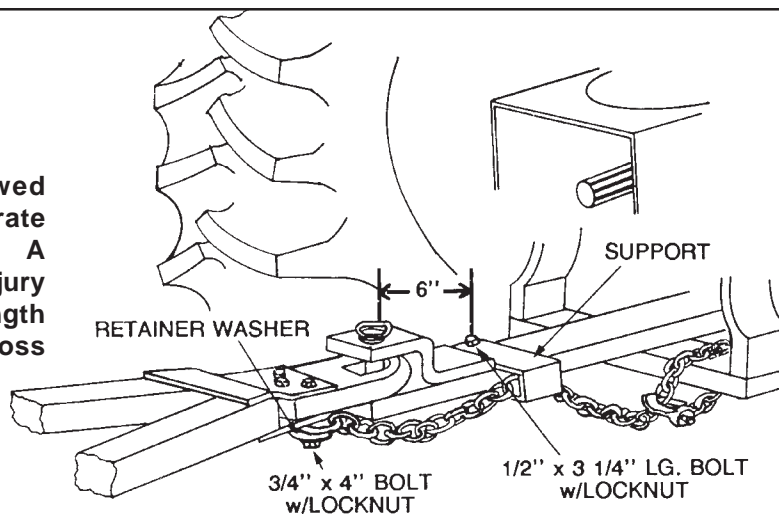
Warning

Do not search for high pressure hydraulic leaks without hand and face protection. A tiny, almost invisible leak can penetrate skin, that requires immediate medical attention.

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.



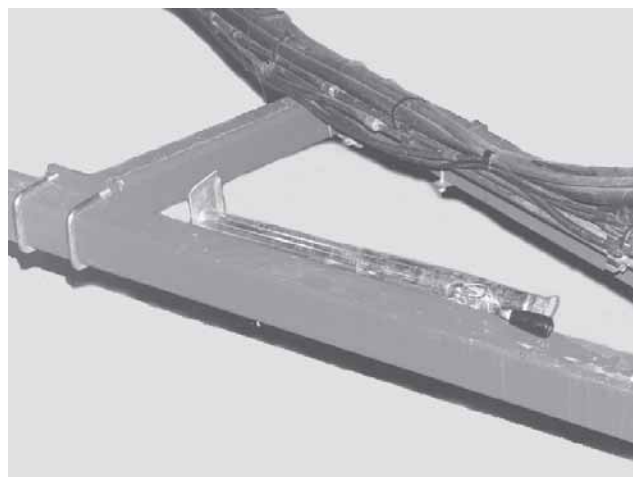
Attach safety chain to the tractor drawbar support or other specified anchor location with the appropriate parts.

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.



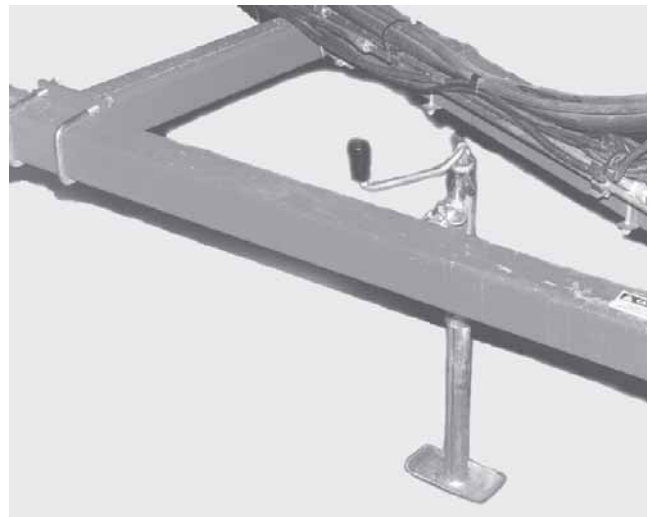
Hitch Jack Raised

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.

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

Speed

- Always travel at a safe speed. Do Not Exceed 20 mph (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.



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.

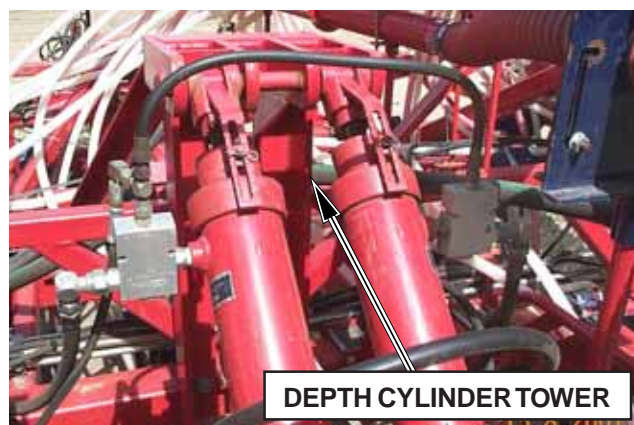
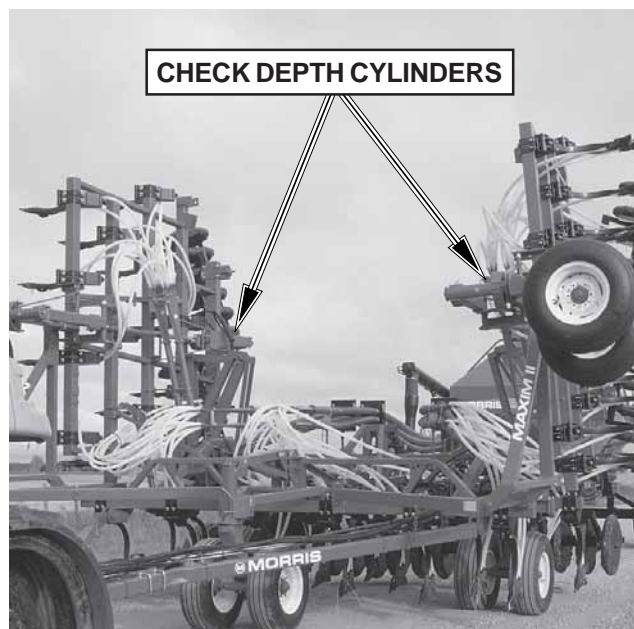
Important

When an air drill has been left folded with the packer wheels retracted (full transport position) for any amount of time, check depth control cylinders on the wings. If **one of the cylinders has extended more than 2 inches**, the potential is there for a pressure imbalance to occur when fully extending the depth control cylinders. This pressure imbalance may cause damage to the main depth cylinder tower or the main depth cylinder shafts.

Note: If the depth cylinder has extended on both wings of a 3-frame or both inner wings of a 5-frame unit, or, if the two depth cylinders on the main frame have extended there is a leak in the system but the pressure imbalance will not occur.

To minimize this pressure imbalance when extending the cylinders, “feather” the hydraulic flow and intermittently activate the circuit until all depth cylinders are fully extended. This will prevent the operating pressure from building to its maximum level and damage from occurring to the main depth cylinder tower or the main depth cylinder shafts. Rephase the circuit as outlined in the operator’s manual, once cylinders have been fully extended.

Contact your Morris Dealer for assistance in determining the cause of the cylinder extending.



Transport - Continued

Transport to Field Position - Continued

- Extend mainframe depth cylinders. (**Fully extending the packers**)
- Position lock lever in forward position, unlatching wing rest latch.
- Remove wing transport lock strap pins. Do not walk under raised 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.

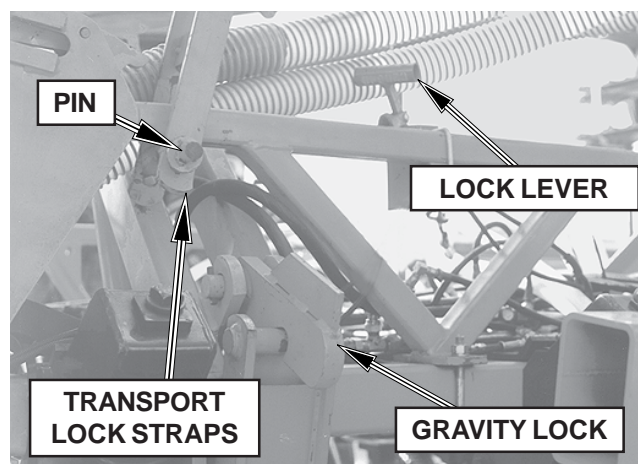
- Operate the wing lift hydraulics performing the following sequence of events:
 1. Lower the wings. **Never raise or lower wings when moving.**
 2. Swing the transport wheel gravity locks up. Remove transport lock pin and castor lock pin from mainframe gauge wheel.
 3. Extend wing lift cylinders fully.
 4. Raise the transport wheels fully.

Important

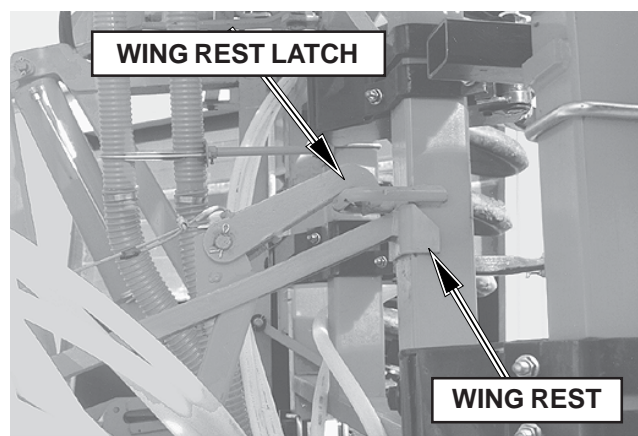
Wings must lower fully before the transport wheels retract.

See transport hydraulics for adjustments.

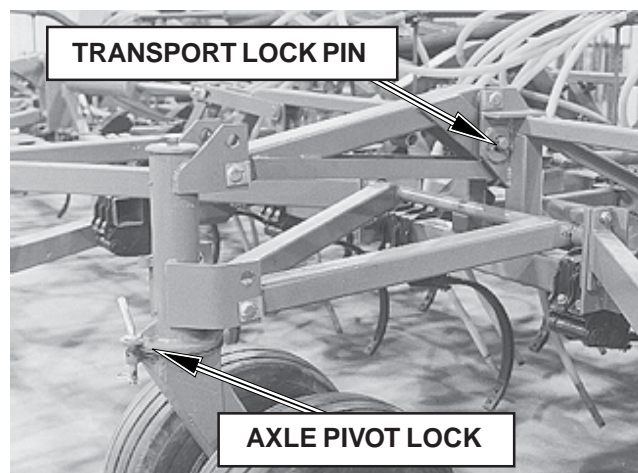
- Operate depth control hydraulics, to raise machine fully, holding the hydraulic lever for several seconds to phase the system.
- On the **Five Frame Models** ensure that the inner wing foot has retracted.



Gravity Lock and Lock Straps



Wing Rest



Main Frame Gauge Wheel Castor

Operation

Transport - Continued

Field to Transport Position

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

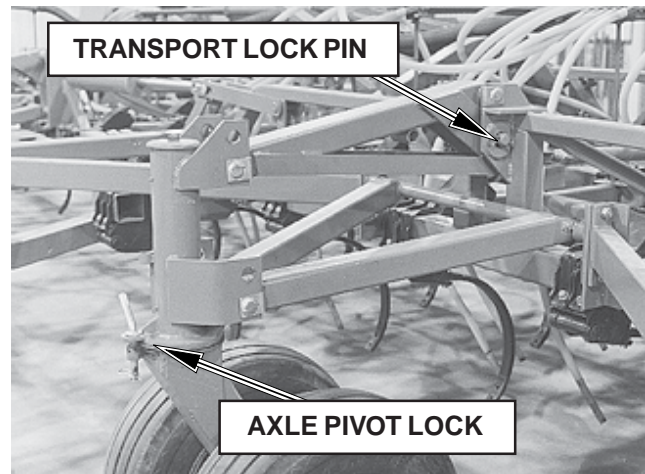
Note: On five-section models the wing lift cylinders must be fully extended to ensure proper operation of the FCV manifold.

- Raise Air Drill to highest position, depth control hydraulics.
- Install transport lock pin for mainframe gauge wheel.
- Secure mainframe gauge wheel castor lock pin. **It is important to pin the gauge wheel to prevent excessive shimming of wheels.**
- Swing the transport wheel gravity locks down.
- Operate the wing lift hydraulics performing the following sequence of events:
 1. Lower transport wheels fully.
 2. Raise the wings fully. **Never raise or lower wings when moving.**
- Secure wing transport lock strap pins. Do not walk under raised wings.
- Position lock lever in rear position, latching wing rest latch.
- Ensure safety chain is properly installed, see page two of Operation Section.
- **Retract packers** with depth control circuit.

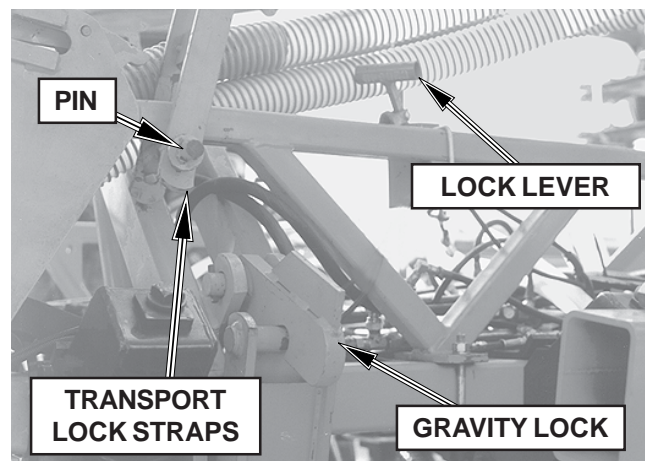
Note: The front gauge wheel lock pin must be installed to retract packers.

Danger

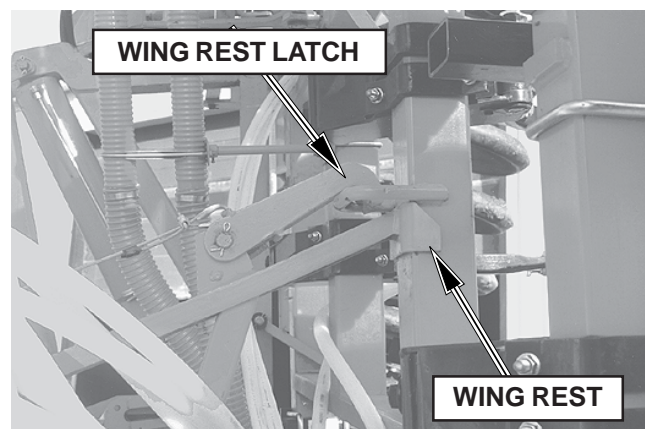
Always stay clear of wings being raised, lowered or in elevated position. Ensure cylinders are completely filled with hydraulic fluid - Wings may fall rapidly causing injury or death.



Main Frame Gauge Wheel Castor



Gravity Lock and Lock Straps



Wing Rest

Leveling

Initial Leveling

- 1) Initial leveling should be done on a flat, level surface, similar to that of a concrete floor.
- Adjust packer pivot brackets to bottom of adjusting slot.

a) Regular Seed Openers

(Lower Height Setting - Field Clearance Settings)

- Adjust the short turnbuckles length to 19 $\frac{3}{8}$ " (492 mm) from pin center to pin center.
- Adjust the long turnbuckles length to 101 $\frac{1}{2}$ " (2578 mm) from pin center to pin center.
- **55 ft and 60 ft Inner Wing** adjust the long turnbuckle length to 100 $\frac{3}{4}$ " (2559 mm) from pin center to pin center.

b) Double Shoot/Knife Openers

(Higher Height Setting - Field Clearance Settings)

- Adjust the short turnbuckles length to 18 $\frac{1}{8}$ " (460 mm) from pin center to pin center.
- Adjust the long turnbuckles length to 101 $\frac{1}{2}$ " (2578 mm) from pin center to pin center.
- **55 ft and 60 ft Inner Wing** adjust the long turnbuckle length to 100 $\frac{3}{4}$ " (2559 mm) from pin center to pin center.

- 2) Lower the unit with the depth control circuit until the points are about 1" above the ground.
- 3) Check the mainframe side to side level. Adjust the packer pivot brackets as necessary.
- 4) Adjust the mainframe front-to-back with long turnbuckle link so the front row of points is about 1" lower than the back row of points. Lengthen the link to lower the front of the frame.

Note: Frames should be preset with a 1" (25 mm) difference front to back due to the tendency of the packers to sink more in worked soil than the front wheels. This setting is approximate and may have to be adjusted, depending on soil conditions.

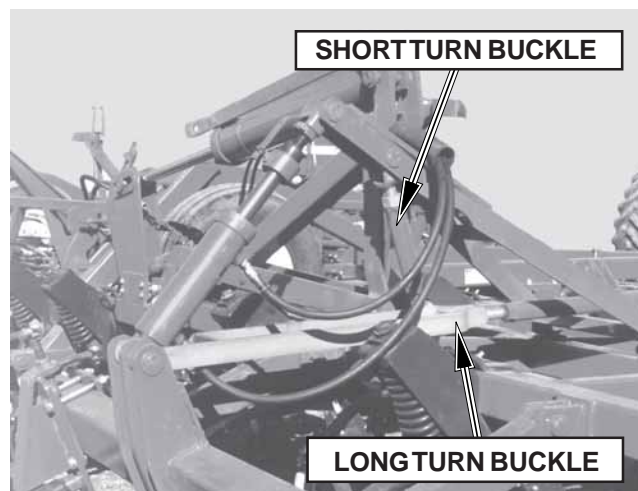
- 5) Adjust the wing frames side-to-side and front to back in the same way as the main frame (Step 3 and 4).
- 6) Adjust the wing frames to the same height as the main frame, by adjusting the short turnbuckle link. Lengthen the link to lower the frame.

Important

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



Packer Pivot Bracket



Operation

Levelling - Continued

Final Levelling

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

If the Air Drill is levelled 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.

Final levelling requires the following basic steps to be followed:

- 1) Ensure that all stroke control collars are backed off completely.
- 2) **Rephase** hydraulic depth system.
- 3) Lower the unit with the depth control circuit until the points on the rear row of the main frame are seeding at the desired depth.
- 4) When the desired depth is reached and with the unit still in the ground turn down the stroke control collars on **all** the frames.

After the stroke control collars have been set:

- 5) **Rephase** hydraulic depth system. Pull the unit 100 feet (30 m) at the desired depth at **approximately 2 m.p.h. (3.2 kph)**. Stop the unit in the ground.

Note: Only do one adjustment at a time.

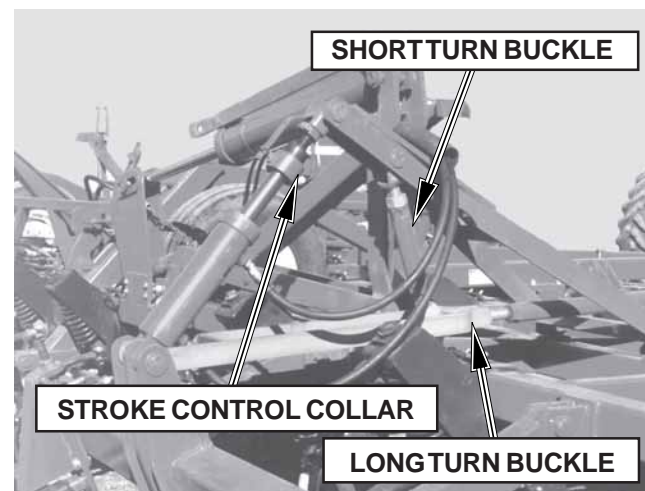
- 6) Check the seeding depth of the points on the **rear row** of the wing frames. Adjust short turnbuckle on the wing frames to match the seeding depth of the main frame. Lengthen the link to lower the frame.
- 7) Check frame side to side level. Adjust the packer pivot brackets as necessary.
- 8) Check depth front to back on all frames. Adjust the long turnbuckles. Lengthen link to lower the front of the frame.
- 9) Pull the unit 100 feet (30 m) at the desired depth travelling at **normal operating speed**. Check machine level and make any adjustments necessary by repeating steps 5 through 8.

Important

Final Levelling is
“**VERY IMPORTANT**”

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

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



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

Field Clearance Settings

To accommodate different seed openers, the Maxim Air Drill has two Height Settings for Regular Seed Openers and Double Shoot/Knife Openers.

Regular Seed Openers

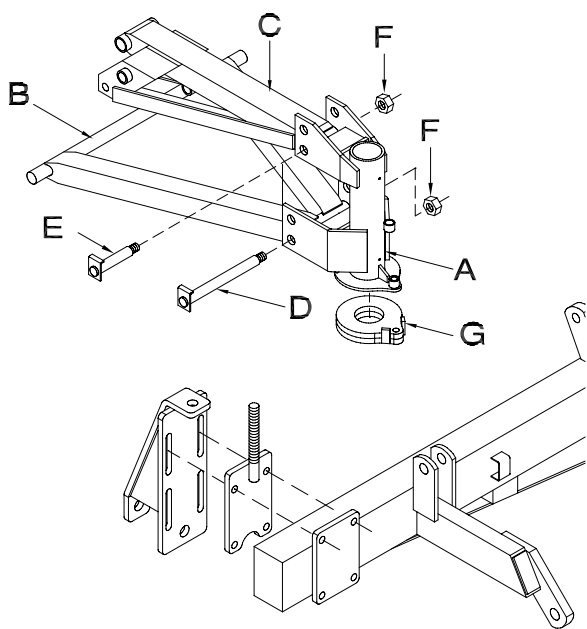
Lower Height Setting

- Mount main frame gauge wheel in lower holes.
- Mount packers on main frame 1" (25 mm) from bottom of slot.
- Place spacer on the bottom of wear plate.
 - Wear plates are located on the wing gauge wheel lower link.
 - Wear plate should contact the hitch truss in the middle as shown.

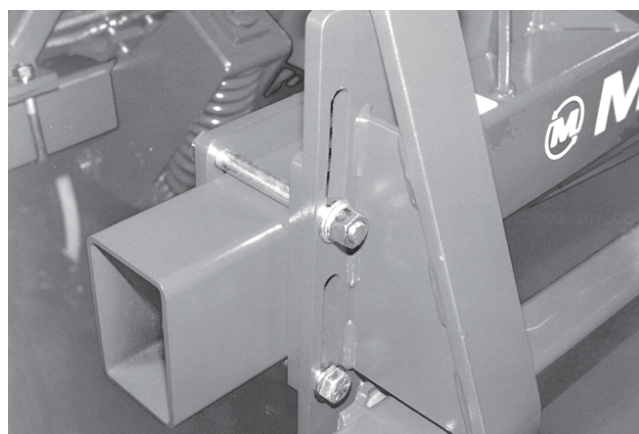
Note: On the 49 ft. model, the wear plate is used only on the outer wings.

Fertilizer Coulter or Mounted Harrow with Regular Seed Boots

- When spacer plate (G) is used attach links (B) and (C) to the lower holes of the castor bracket (A).
- Mount to middle position of slot when spacer plate (G) is used on front castor.



(A) Gauge Wheel Main Frame



(B) Packers Main Frame



(C) Wear Plate

Operation

Field Clearance Settings - Continued

Double Shoot/Knife Openers

Upper Height Setting

- a) Mount main frame gauge wheel in upper holes.
- b) Mount packers on main frame 1" (25 mm) from top of slot.
- c) Place spacer on the top of wear plate.
 - Wear plates are located on the wing gauge wheel lower link.
 - Wear plate should contact the hitch truss in the middle as shown.

Note: On the 49 ft. model, the wear plate is used only on the outer wings.



(A) Gauge Wheel Main Frame



(B) Packers Main Frame



(C) Wear Plate

Depth Stop Adjustment

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

Mechanical Depth Stop

- To increase or decrease the working depth, adjust all the stroke control collars **evenly** across the whole machine.
 - a) 1 turn on the collar changes the depth approximately 3/16" (5 mm).
 - b) 6 turns on the collar changes the depth approximately 1" (25 mm).
- The optional spacer may be required when seeding shallow. These spacers are available under part number S25999 through the Parts Department.

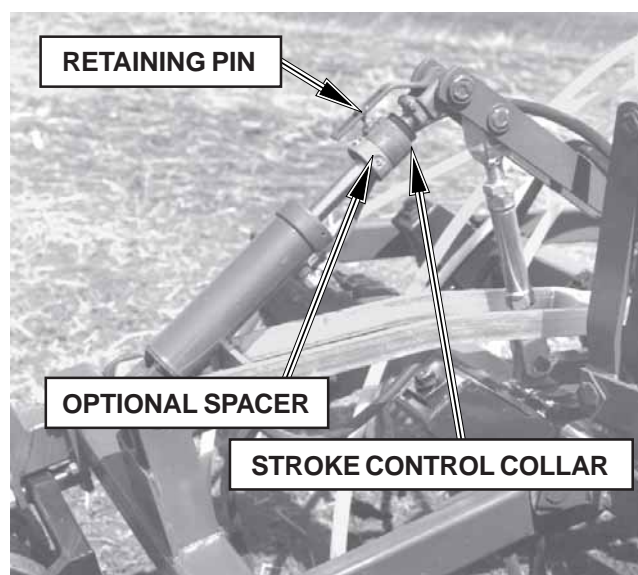
Rephasing

- 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 cultivator system has been filled.
- Refer to tractor operators manual for more information.



Stroke Control Collars

Operation

Opener Adjustments

Edge-On Point Adjustment

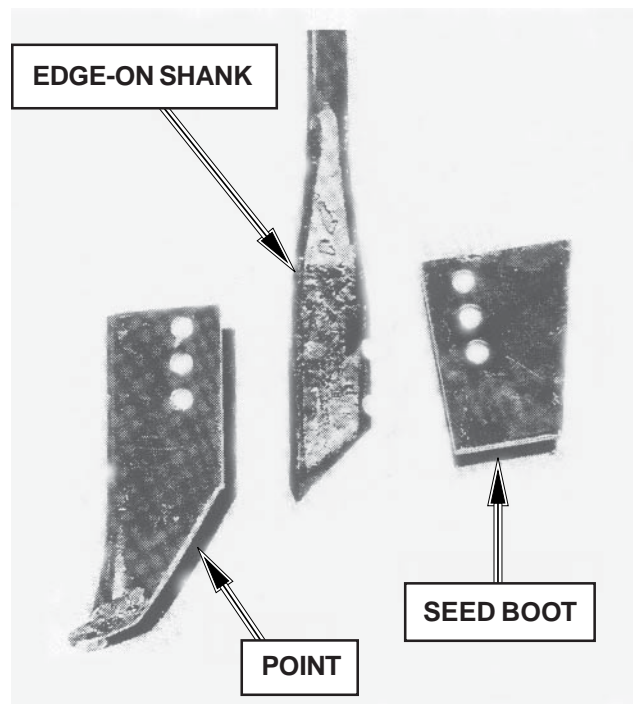
The Point can be adjusted down 3 positions in increments of 3/8" (10 mm).

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

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

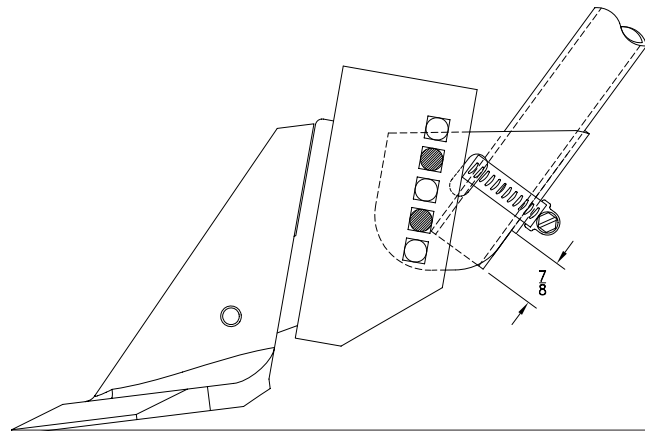
Note: Points can be lowered to compensate for tractor tire impressions.



3 1/2" (89 mm) Sweep

- Insert hose 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 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 NH ³ or liquid application	Soil moisture dry NH ³ or liquid application Worn Point adjustment
Medium Soil	Soil moisture medium	Soil moisture wet NH ³ or liquid application	Soil moisture dry NH ³ or liquid application Worn Point adjustment
Heavy Soil	Soil moisture dry	Soil moisture wet NH ³ or liquid application	Not recommended Worn Point adjustment



DANGER

Failure to comply may result in death or serious injury.

Read Operator's Manual and decals on **Ammonia** tank before operating Machine. 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 parts.

Always secure connecting parts and safety chains before towing ammonia trailer.

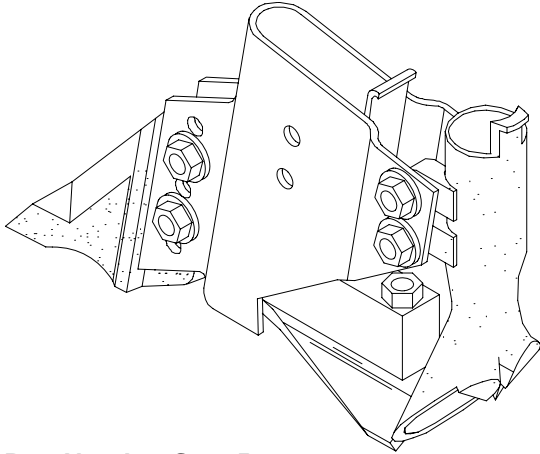
Always have ample water available in case of exposure to ammonia liquid or gases.

S29378

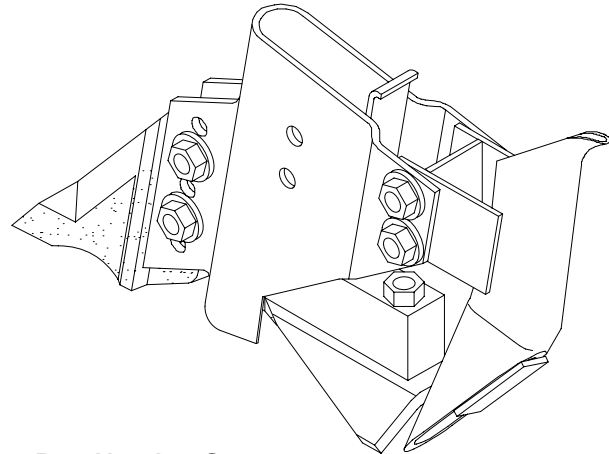
Operation

Opener Adjustments

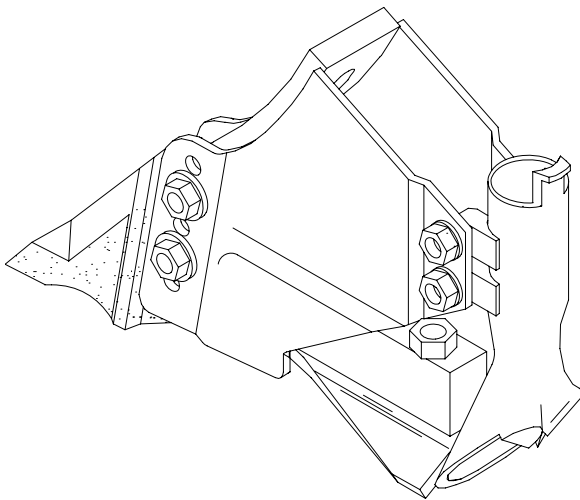
Double Shoot Openers - Continued



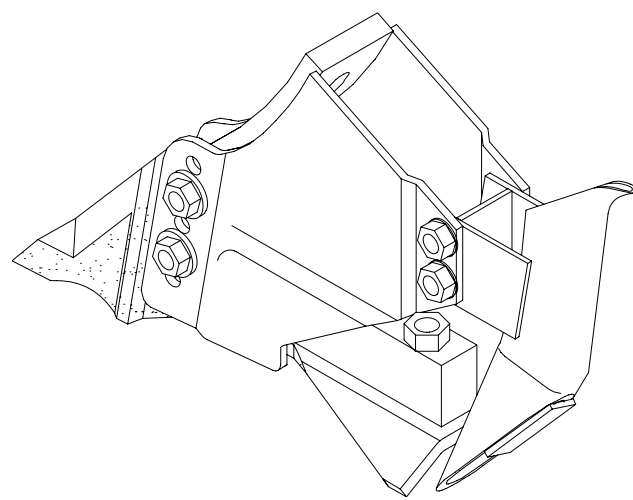
Part Number S28158



Part Number S29000



Part Number S25962



Part Number S29140

Important

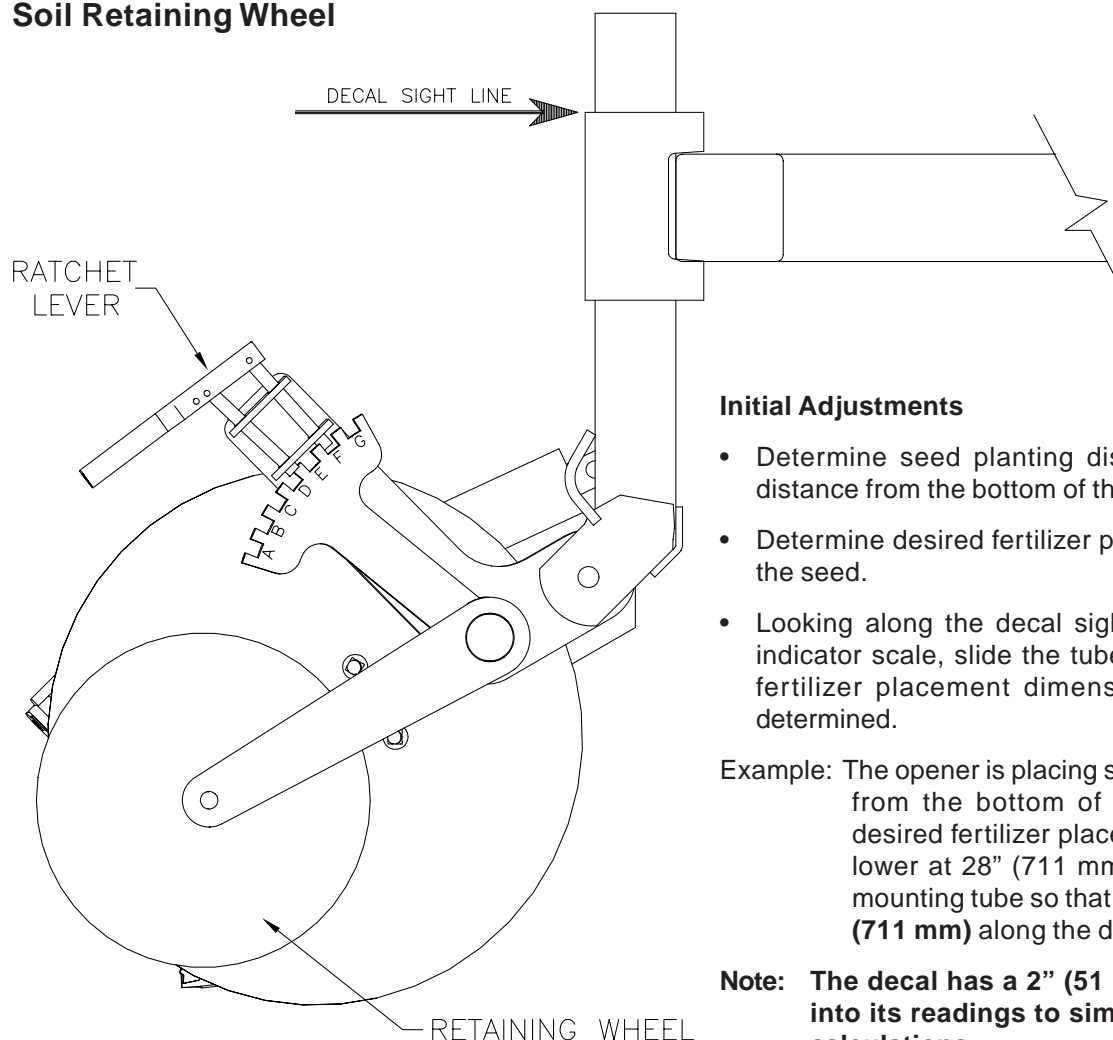
Re-tighten all bolts after initial 10 hours.
Check tightness periodically thereafter.

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.

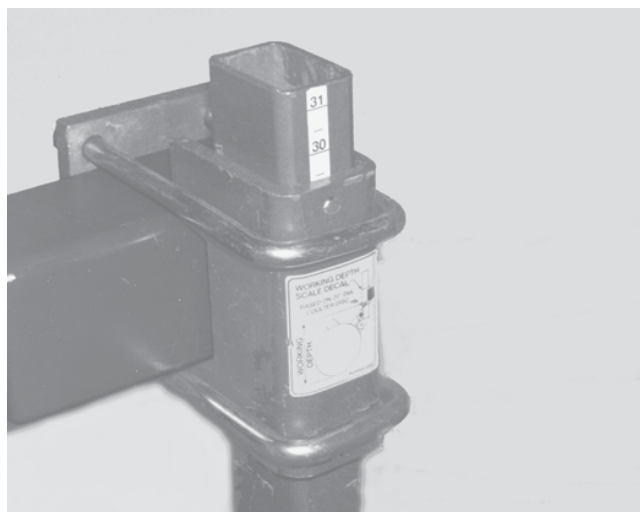
Example: The opener is placing seed at 27" (686 mm) from the bottom of the frame and the desired fertilizer placement is 1" (25 mm) lower at 28" (711 mm). Adjust the main mounting tube so that the decal **reads 28" (711 mm)** along the decal sight line.

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.

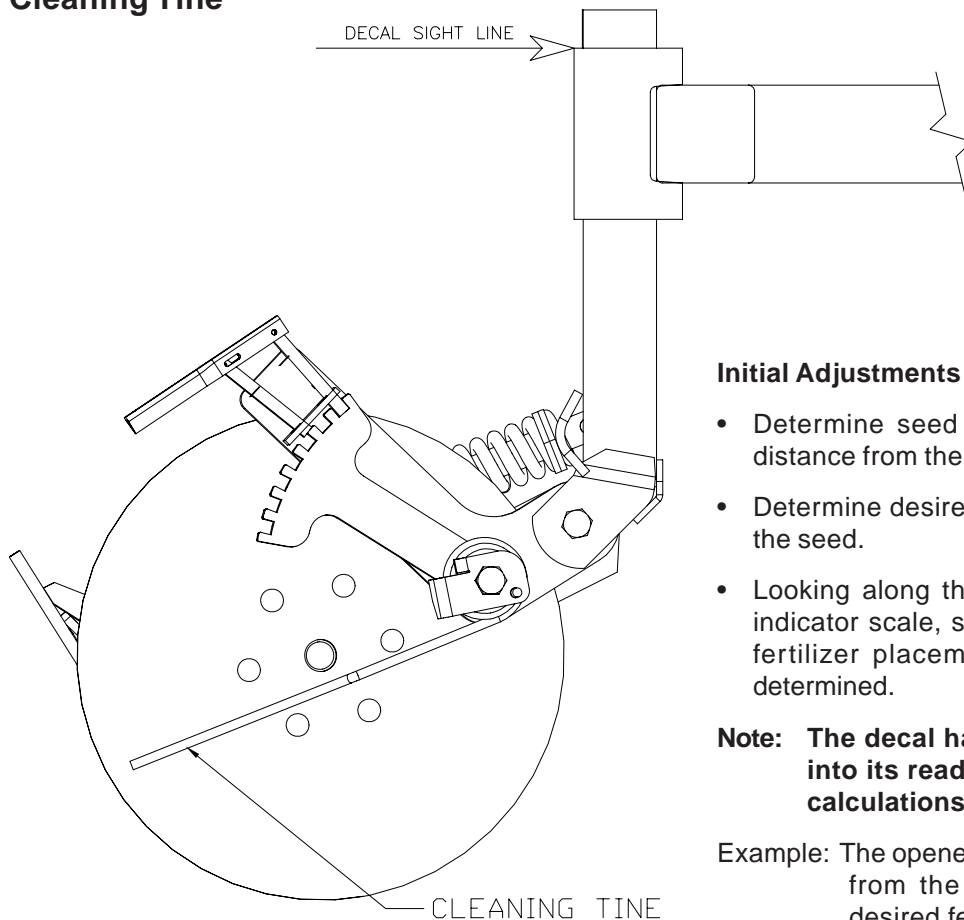
Note: Binding should not occur when rotating disc by hand. **CAUTION** must be used when performing this procedure.



Operation

Fertilizer Coulter

Cleaning Tine



Initial Adjustments

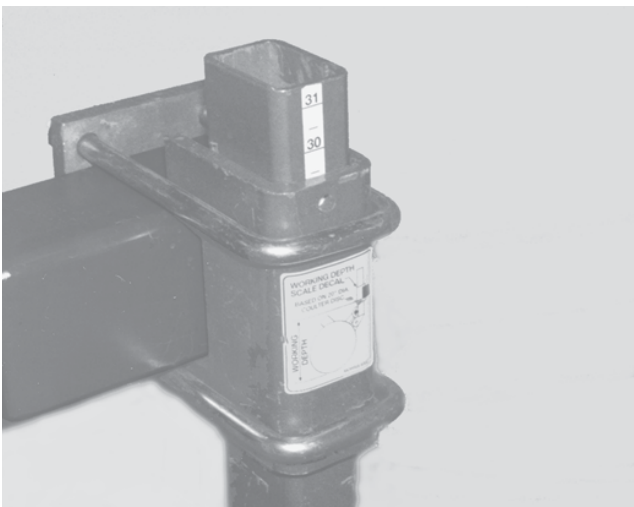
- Determine seed planting distance: the vertical distance from the bottom of the frame to the seed.
- Determine desired fertilizer placement relative to the seed.
- Looking along the decal sight line at the depth indicator scale, slide the tube up or down to the fertilizer placement dimension that has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

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

Closing Tine

The closing tine is located on coulters which do not have a trip located behind it to close the fertilizer opening. These tines can be placed on all coulters as an option if so desired.

Mount the tine as follows:

- There are left and right tines.
- The tine coil should face outward and be positioned to the top as shown.
- Secure tine with set screw and jam nut.
- Adjust tine for desired closing action.



Closing Tine

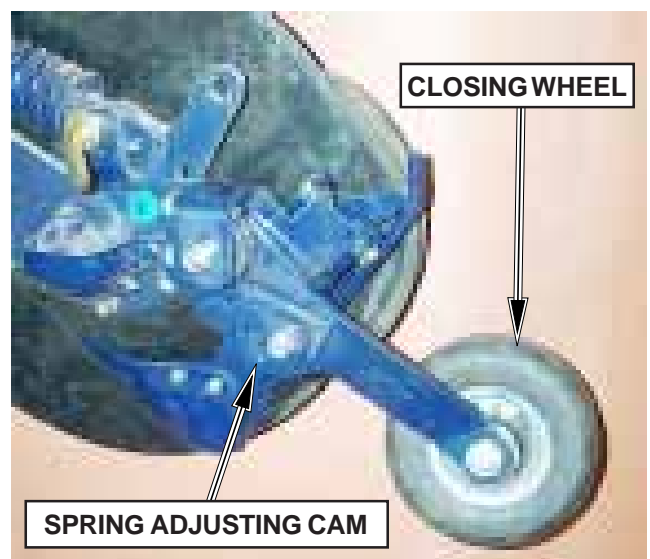
Important

**Retighten setscrew after the first
20 acres (10 ha).**

Closing Wheel

The closing wheel is located on coulters which do not have a trip located behind it to close the fertilizer opening. These wheels can be placed on all coulters as an option if so desired.

The closing wheel down pressure can be adjusted as required.



Closing Wheel

Operation

Fertilizer Coulter

Coulter Positions

The coulter has two positions the working position and 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 storage position is also used on the main frame to raise coulters for transport where necessary.

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



Leverage Bar



Working Position



Storage Position

Fertilizer Coulter

Coulter Positions - Continued

The coulter has two positions the working or field position and the storage position.

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

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

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



Pin in Upper Hole



Storage Position

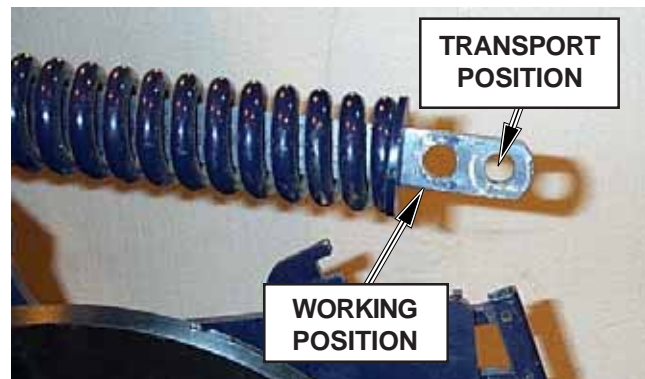
Operation

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

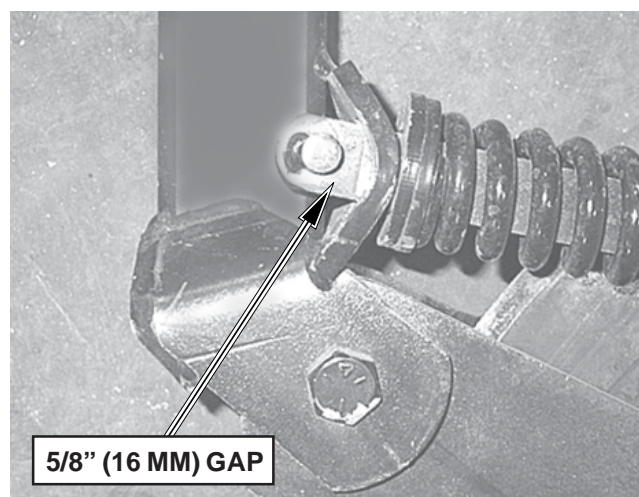


Press Spring into Place

Fertilizer Coulter

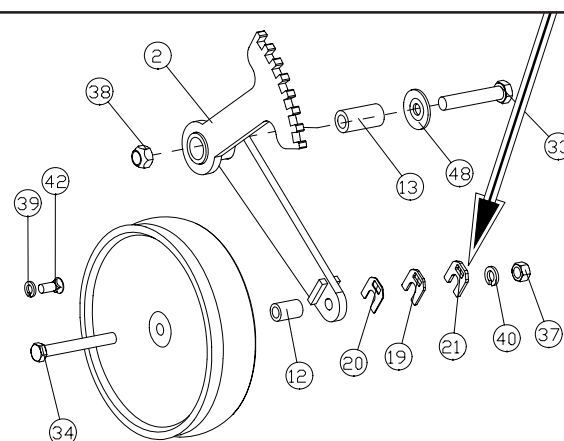
Operation Hints

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 that 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.

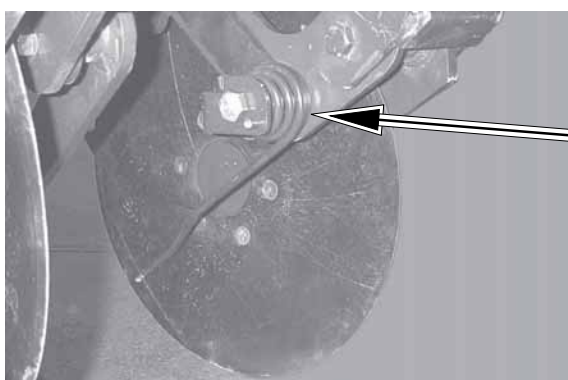


Coulter Spring Rod

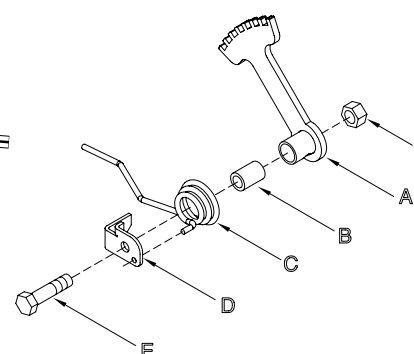
MOVE SPACER SHIMS TO CHANGE PRESSURE ON BLADE.



Soil Retaining Wheel Assembly



Coulter Blade Tine Assembly



Coulter Blade Tine Assembly

Operation

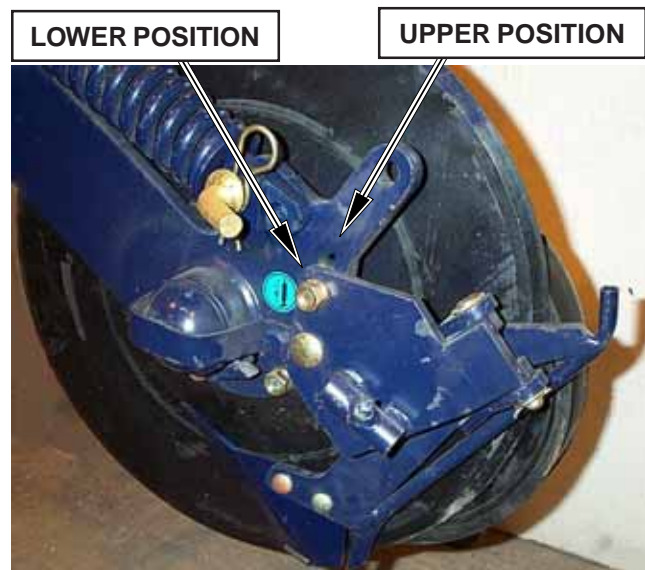
Fertilizer Coulter

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. The Closing Tine should be adjusted so that the tine is not keeping the Soil Retaining Wheel from controlling the depth, yet still creating enough agitation to close the furrow.
12. 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.



Closing Tine

Hydraulic Depth Control System

Three Section Models

The hydraulic depth control system is a series system.

To lift the Maxim Air Drill, hydraulic fluid is forced into the butt end of cylinders 1. This causes the piston rods to extend, pivoting the packers and the gauge wheel down. This causes the main frame to raise.

Simultaneously, hydraulic fluid is forced from the gland 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 wings to raise.

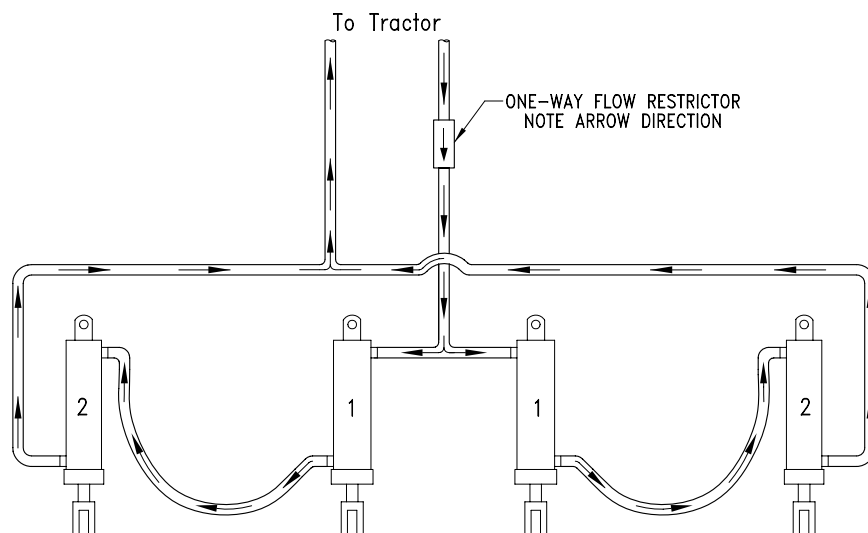
Finally the fluid exits the gland end of cylinders 2 into a common line and then to the tractor.

To lower the Maxim Air Drill, hydraulic fluid flows through the cylinders in the reverse direction to that described above, until the stroke control collars seat firmly on the gland end of the cylinders. This causes the flow of oil from the tractor to stop.

With the stroke control collars firmly seated, the cylinders will hold this working depth until the tractor hydraulic controls are activated to lift the Maxim Air Drill.

Note: A one-way flow restrictor valve is incorporated into the hydraulic system to maintain a positive oil pressure.

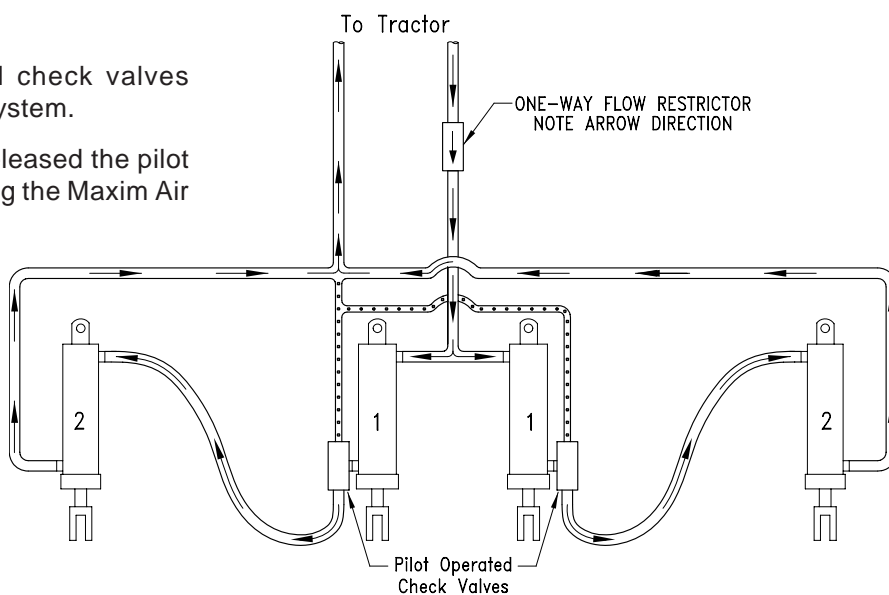
29 ft. and 34 ft. Models



39 ft. Model

The 39 ft. unit has pilot operated check valves incorporated into the depth control system.

Once the tractor hydraulic lever is released the pilot operated check valves close, isolating the Maxim Air Drill hydraulics from the tractor.



Operation

Hydraulic Depth Control System

Five Section Models

The hydraulic depth control system is a series system.

To lift the Maxim Air Drill, hydraulic fluid is forced into the butt end of cylinders 1. This causes the piston rods to extend, pivoting the packers and gauge wheels down. This causes the main frame to raise.

Simultaneously, hydraulic fluid is forced from the gland end of cylinders 1 through the pilot operated check valves to the butt end of cylinders 2, causing them to extend, pivoting the packers and gauge wheels down. This causes the inner wings to raise.

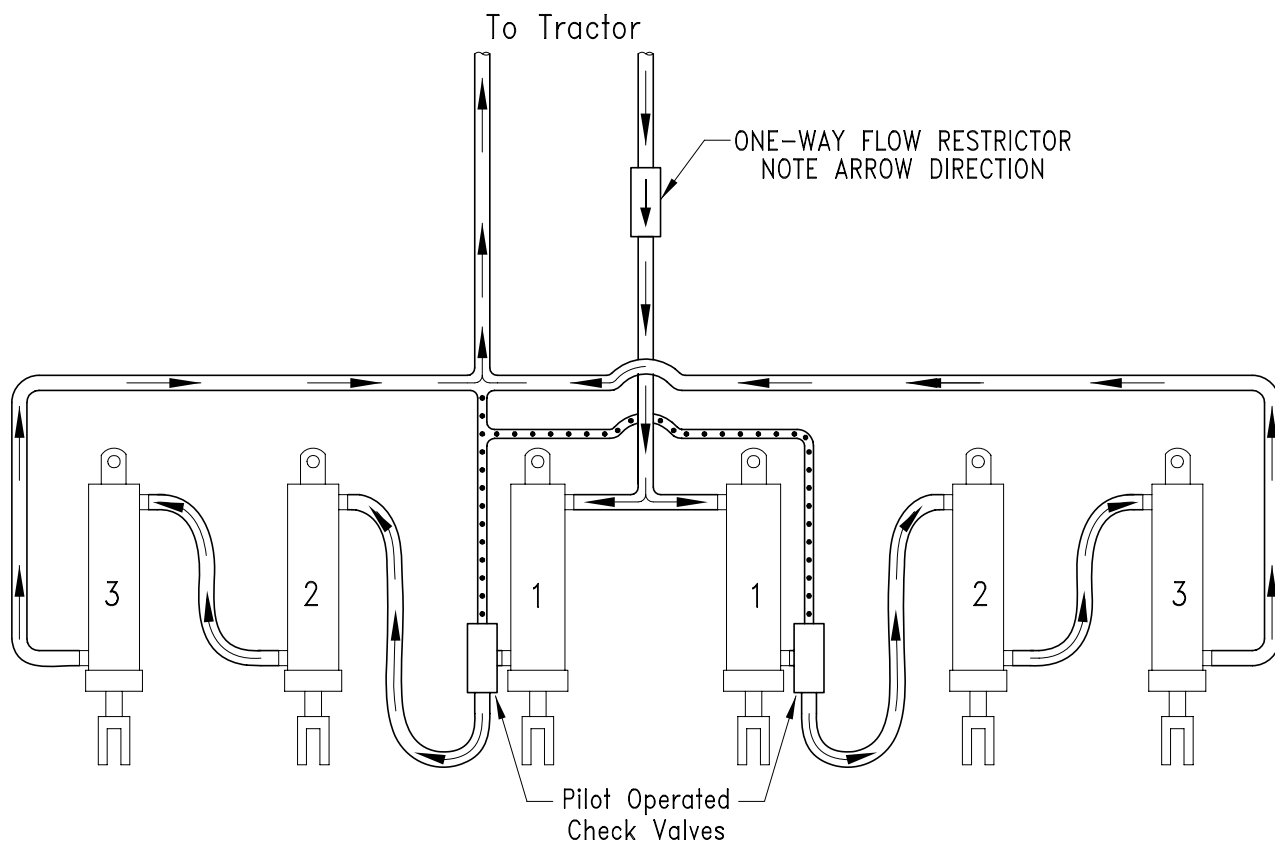
Hydraulic fluid is forced from the gland end of cylinders 2 to the butt end of cylinders 3, causing them to extend, pivoting the packers and gauge wheels down. This causes the outer wings to raise.

Finally the fluid exits the gland end of cylinders 3 into a common line and then to the tractor. Once the tractor hydraulic lever is released the pilot operated check valves close, isolating the Maxim Air Drill hydraulics from the tractor.

To lower the Maxim Air Drill, hydraulic fluid flows through the cylinders in the reverse direction to that described above, until the stroke control collars seat firmly on the gland end of the cylinders. This causes the flow of oil from the tractor to stop.

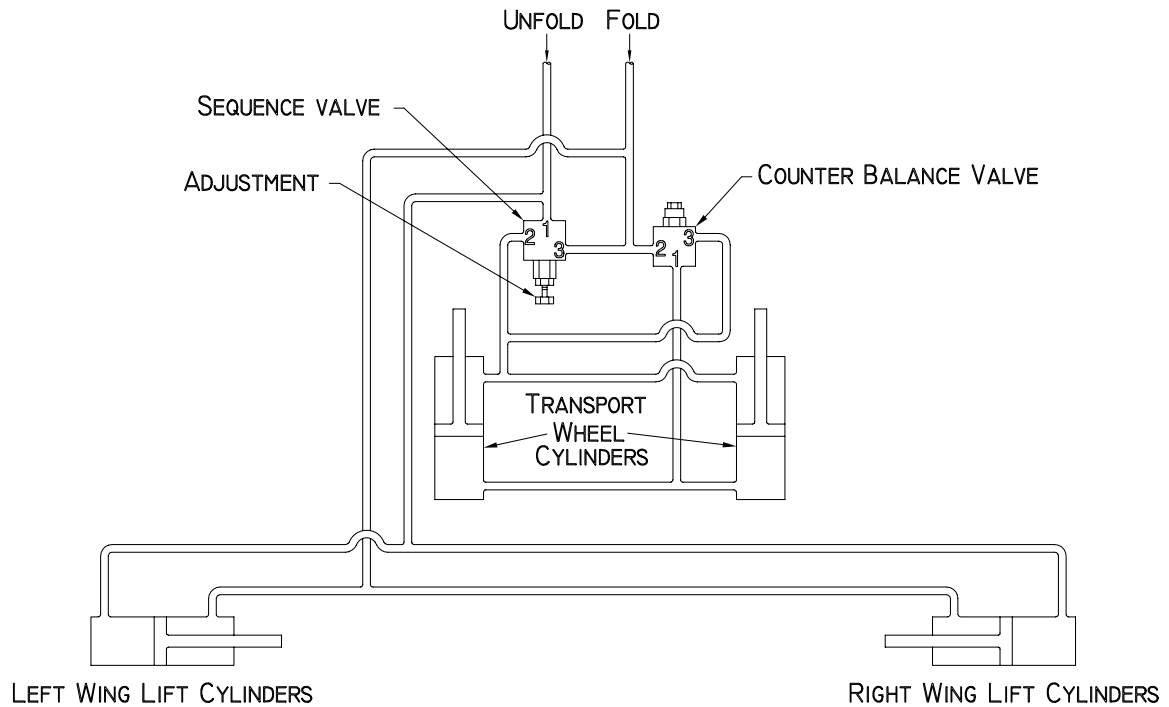
With the stroke control collars firmly seated, the cylinders will hold this working depth until the tractor hydraulic controls are activated to lift the Maxim Air Drill.

Note: A one-way flow restrictor valve is incorporated into the hydraulic system to maintain a positive oil pressure.

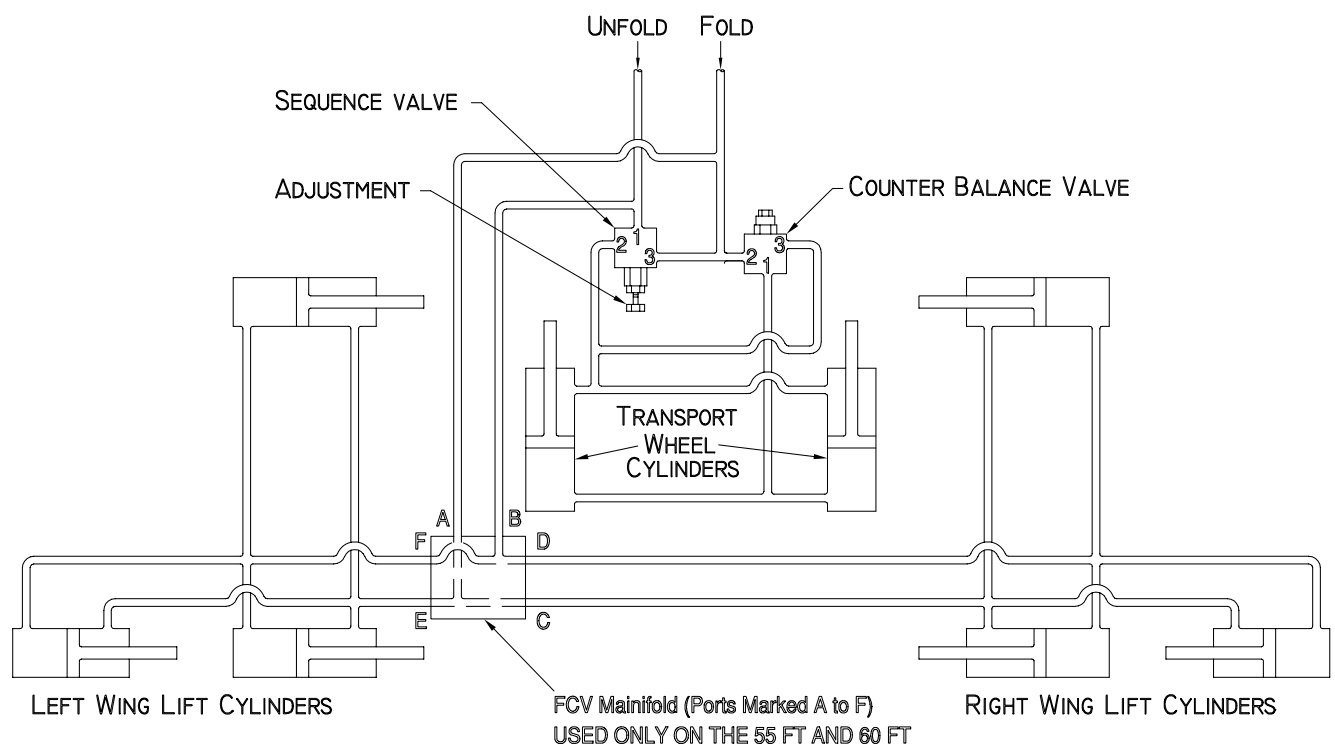


Transport Hydraulics

Three Section Models



Five Section Models



Operation

Transport Hydraulics

The transport hydraulic system is controlled by a parallel hydraulic system. A sequence valve and counter balance valve are used to control the order in which the hydraulic cylinders are activated.

The valves are located on the main frame with the sequence valve mounted on top of the counter balance valve. The counter balance valve is preset at 3000 psi (20,670 kPa) with a pilot pressure of 1000 psi (6,890 kPa). The sequence valve is preset at 2400 psi (16,536 kPa).

Note: The sequence valve may have to be adjusted depending on individual tractor characteristics. The counter balance valve should not be adjusted.

The function of both the sequence valve and counter balance valve are critical, during the unfolding procedure, without these valves the transport wheel cylinders will retract as soon as the tractor lever is moved in the unfolding direction, causing damage to the main frame packer assembly.

Note: On the 49, 55 and 60 foot model, a pressure compensated flow control valve (FCV) manifold is integrated in the circuit to synchronize the raising and lowering of the wings.

To unfold the Maxim Air Drill, the sequence valve prevents hydraulic fluid from flowing to the transport wheel cylinders, forcing the fluid to the wing lift cylinders causing the wings to unfold first.

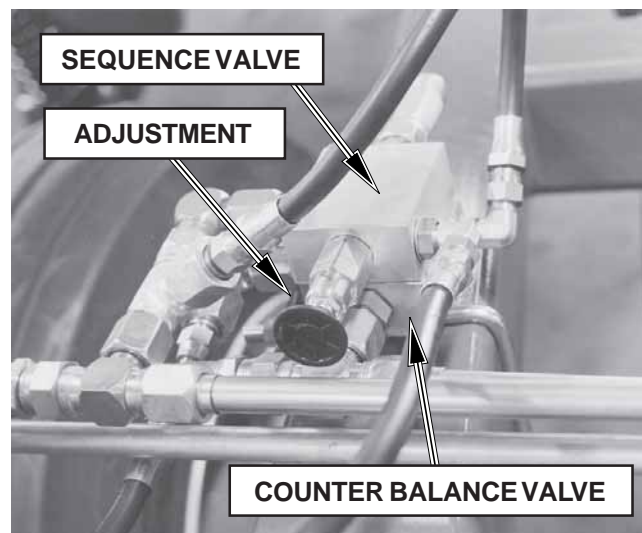
Once the wing lift cylinders are fully extended the pressure in the circuit builds to the point that the sequence valve opens, causing the pilot line to the counter balance valve to pressurize opening the counter balance valve. With both valves open the hydraulic fluid retracts the transport wheels up into field position.

During the folding procedure, hydraulic fluid free flows through both valves. First, hydraulic fluid extends the transport wheel cylinders lifting the main frame packers off the ground. Once the transport wheel cylinders are fully extended, the wing lift cylinders retract folding the wings. As the weight of the wings transfer onto the main frame, the counter balance valve prevents the transport wheels from retracting.

CAUTION

TRANSPORT WHEELS MUST BE LOCKED IN PLACE BEFORE FOLDING UNIT UP OR DOWN AND WHEN TRANSPORTING. FAILURE TO DO SO COULD RESULT IN SEVERE DAMAGE TO MAIN PACKER FRAME AND/OR PACKER GANG PIVOTS.

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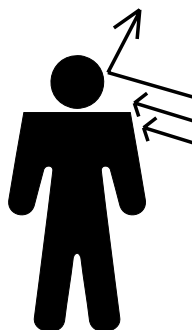
General Guidelines

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.



Operation

Notes

Section 6: Maintenance

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Maintenance

CAUTION



BE ALERT

SAFETY FIRST

**REFER TO SECTION 1 AND REVIEW
ALL SAFETY RECOMMENDATIONS.**

General

This section deals with two goals, maximum life and dependable operation. Adopt a regular maintenance and lubrication program. Care and sufficient lubrication is the best insurance against delays.

Safety

- Always shut off the tractor and remove key before dismounting.
- Guard against hydraulic high pressure leaks with hand and face protection.
- Never work under the Implement unless it is in the down position or transport lock pins are in place and secured with hair pins. Do not depend on the hydraulic system to support the frame.
- Always wear safety goggles, breathing apparatus and gloves when working on seeder filled with chemical. Follow manufactures recommended safety procedures when working with chemicals or treated seeds.
- Do not feed left over treated seed to livestock, treated seed is poisonous and may cause harm to persons or livestock.



Warning

Securely support any machine elements that must be raised for service work.



Caution





**Keep service area
clean and dry. Wet or
oily floors are slippery.**

Tighten Bolts

- Before operating the unit.
- After the first two hours of operation.
- Check tightness periodically thereafter.
- Use Bolt Torque Chart for correct values on various bolts.
- Note dashes on hex heads to determine correct grade.

Note: DO NOT use the values in the Bolt Torque Chart if a different torque value or tightening procedure is given for a specific application.

- Fasteners should be replaced with the same or higher grade. If higher grade is used, only tighten to the strength of the original.

Bolt Torque Chart				
Grade 5 Bolt Marking 		Bolt Size	Grade 8 Bolt Marking 	
Nm	lb. ft.		lb. ft.	Nm
11	8	1/4	12	16
23	17	5/16	24	33
41	30	3/8	45	61
68	50	7/16	70	95
102	75	1/2	105	142
149	110	9/16	155	210
203	150	5/8	210	285
366	270	3/4	375	508
536	395	7/8	610	827
800	590	1	910	1234
1150	850	1-1/8	1350	1850
1650	1200	1-1/4	1950	2600
2150	1550	1-3/8	2550	3400
2850	2100	1-1/2	3350	4550

Tires

- Inspect tires and wheels daily for tread wear, side wall abrasions, damaged rims or missing lug bolts and nuts. Replace if necessary.
- Tighten wheel bolts - refer to Bolt Torque Chart.
- Check tire pressure daily, when tires are cold.
- Correct tire pressure is important.
- Do not inflate tire above the recommended pressure.



Caution

Tire replacement should be done by trained personnel using the proper equipment.

Tire Specifications		
SIZE	LOAD RANGE	PRESSURE
9.5L x 15FI	D	60 P.S.I.
11L x 15SL	6 ply rating	28 P.S.I.
11L x 15FI	D	60 P.S.I.
11L x 15FI	F	90 P.S.I.
12.5L x 15FI	F	90 P.S.I.

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. Gauge Wheel Lower Pivot Arms

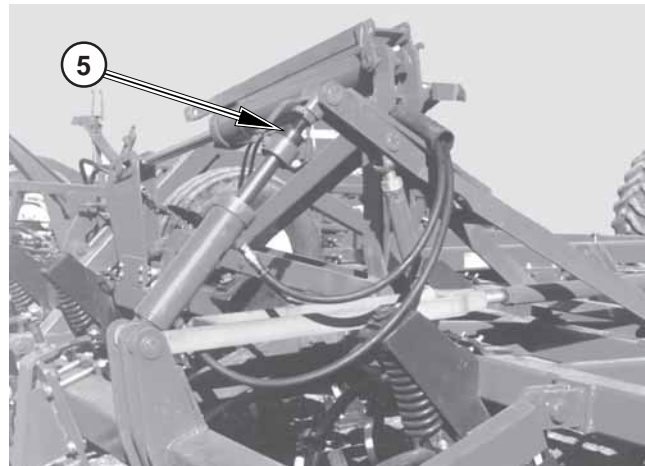
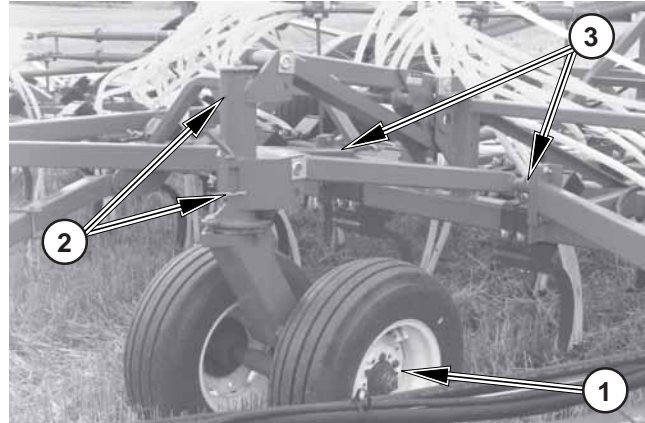
- Grease every 10 hours. (Daily)

4. Packer Bearings

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

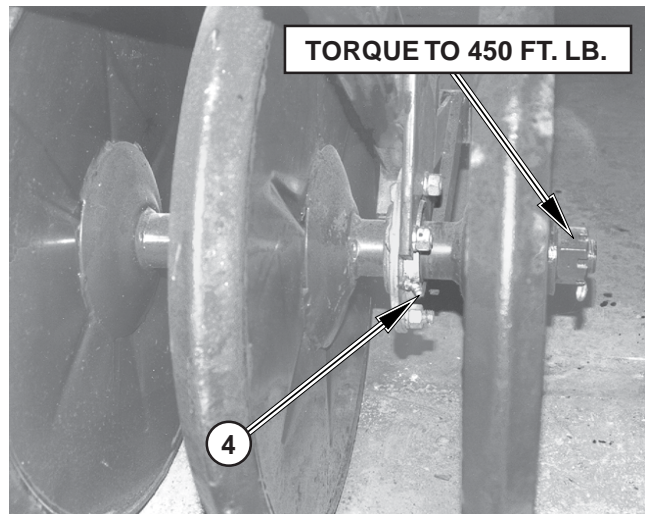
5. Stroke Control Collars

- Clean and Grease threads at end of season.



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 Torque Wrench is located on the front side of the main frame packer assembly.



Maintenance

Trip Maintenance - Continued

Spring Cushion Trips - Continued

Shank Replacement - 400 lb Trip

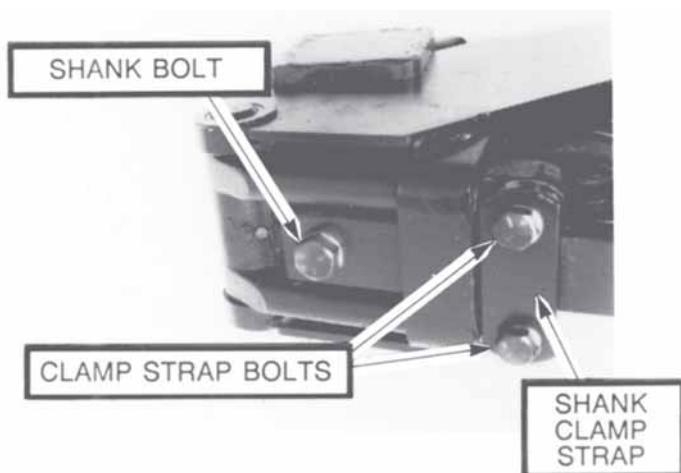
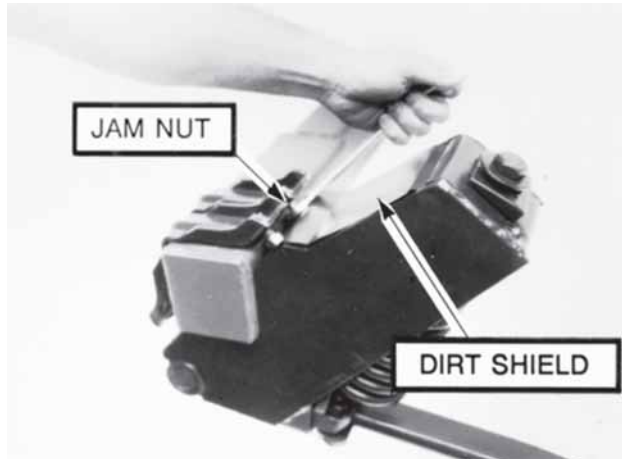
The dirt shield must be removed to install a new shank. This allows access to the shank bolt nut.

- Loosen the two jam nuts that retain the dirt shield.
- Use a screw driver to remove dirt shield.

Caution

Use care when removing shield, Personal injury may occur.

- With shank in place, the shank bolt can be installed. Mount the shank clamp with the two clamp strap bolts.
- Install dirt shield.
- Snug the two jam nuts to the dirt shield, torque to 20 ft. lbs. (27 Nm).



Trip Maintenance - Continued

Spring Cushion Trips - Continued

Main Bushing Replacement

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

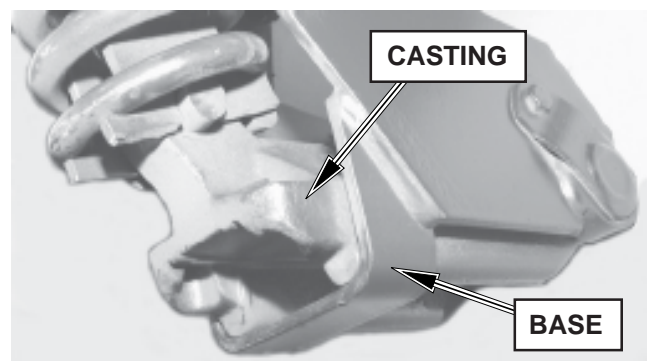
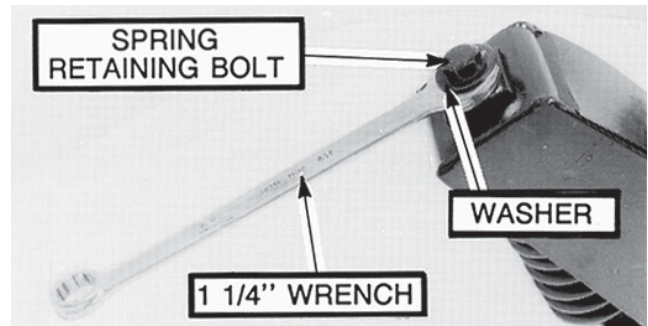
- Loosen spring retaining bolt.
- Slide a 1 1/4" wrench between the trip top and the washer on the bolt.
- Tighten bolt, this will lift the casting off the base taking the pressure off the pivot pin.
- Remove retaining bolt from pivot pin.
- Remove pivot pin from casting. To dismantle the spring, carefully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

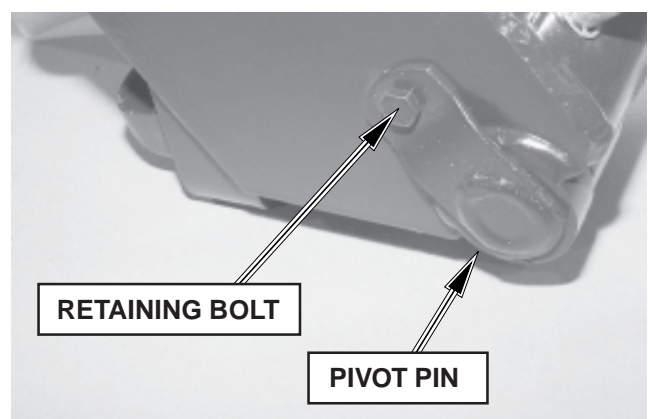


Danger

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.



Maintenance

Trip Maintenance - Continued

Spring Cushion Trips - Continued

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, the following procedure can be used.

- 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.

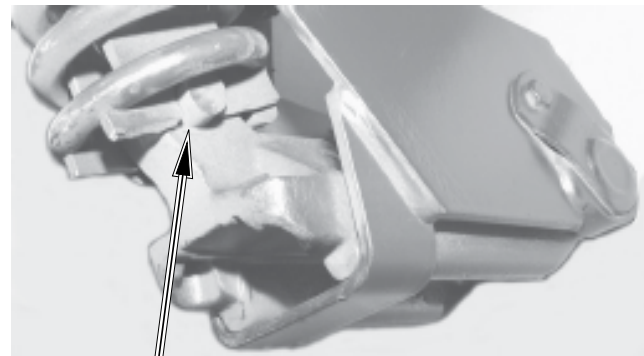
Note: Torque spring retaining bolt to 75 ft. lbs. (102 N-m) once trip is reassembled.

Danger

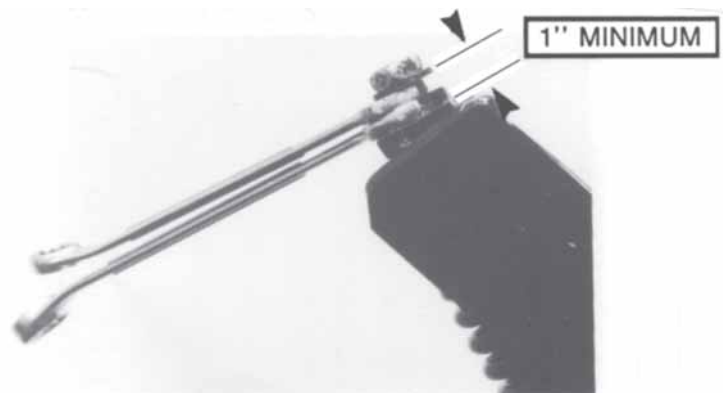
Care must be taken when replacing any trip components as the spring is under pressure.

Important

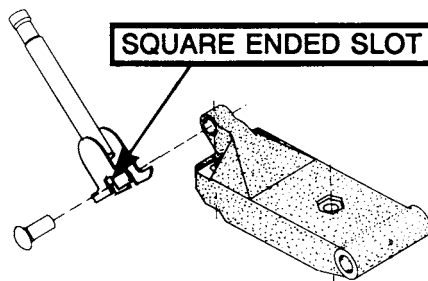
Re-torque bolts after initial 50 hours.
Check tightness periodically thereafter.
Torque Bolts as specified in
Bolt Torque Chart.



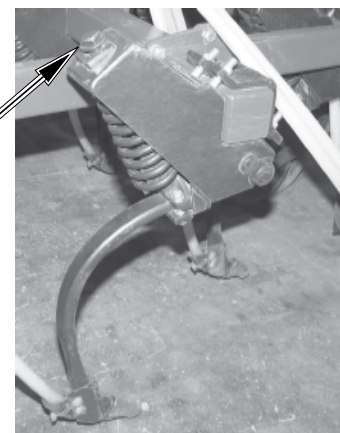
SPRING ROD
BUSHING



1" MINIMUM



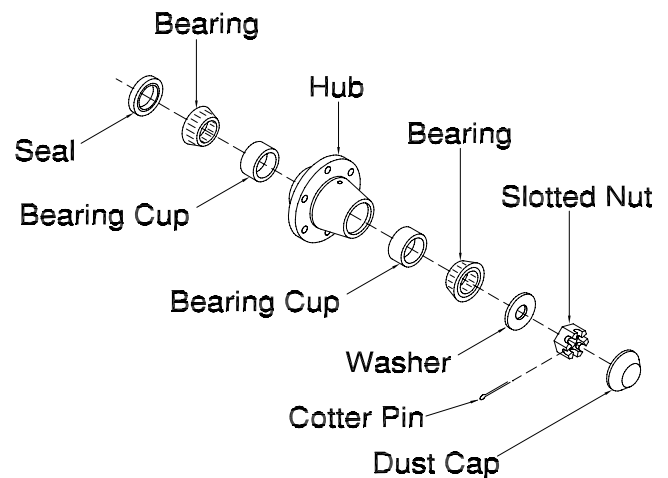
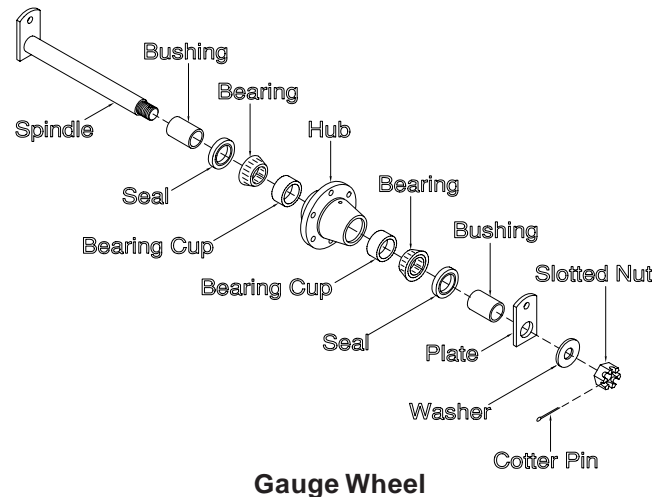
SQUARE ENDED SLOT



Torque to
75 ft.lb. (102 Nm)

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.

Maintenance

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.

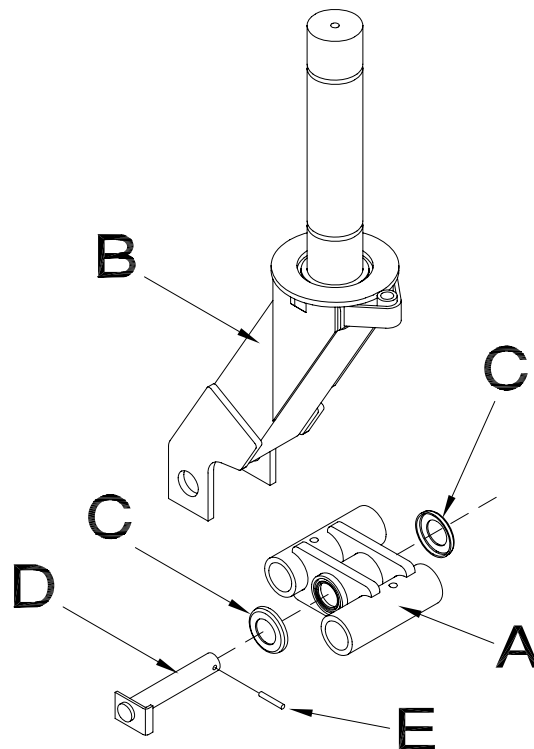
- Apply a thin layer of oil onto seal lips to ease in the installation of pivot pin.
- Place cupped washers (C) over seals.
- Align axle walking beam (A) with castor (B).
- Wrap a single layer of electrical tape over hole. This will ensure the edge of the hole will not damage the seal lips.

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



Packer Pivot Bushings

The packer pivot arms on the Maxim II use nylon bushings for the convenience of lower day to day (grease free) maintenance. However, bushings do wear and will require replacement if excessive movement is found.

As the bushings wear, the level of the air drill may require adjustment periodically. It is recommended that the level be checked at the beginning of each seeding season.

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

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

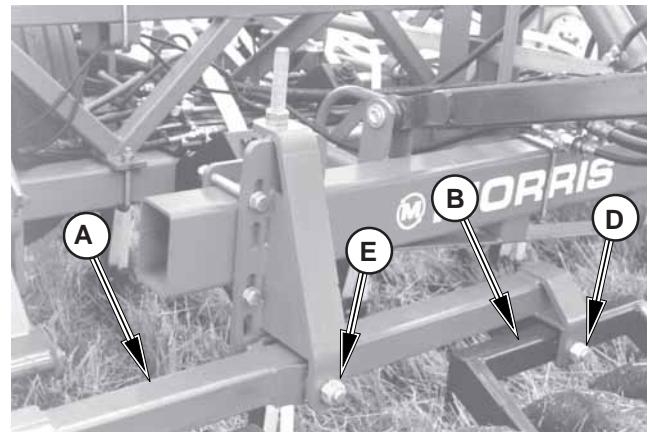
- Lower machine taking weight off packers.
- Shut tractor off and remove key.
- Block wheel on tractor.
- Remove pivot pin (D).
- Remove packer gang assemblies (B) from pivot arm (A).
- Remove pivot pin (E).
- Remove pivot arm (A).
- Remove pivot bushings (C).
- Thoroughly clean all parts.
- Inspect pivot pins for abrasions, replace if necessary.

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

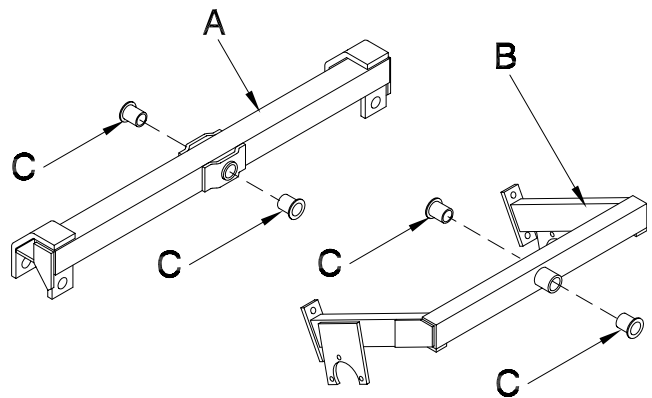
- Carefully press bushings in place, ensuring the inner lining of the bushings are not damaged.

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 - Main Frame Shown



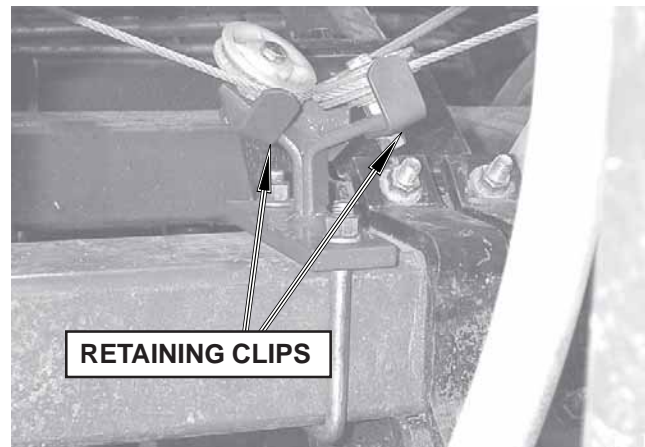
Maintenance

Wing Latch Assembly

- Check wing latch operation.
- Adjust cable slack so that latches rest a 1/2" (13 mm) off wing rest arm in lowered position.
- Adjust retaining clips (D) to guide cable in idlers. Retaining clips should be positioned at exit point of cable on both pulleys.



Wing Latch

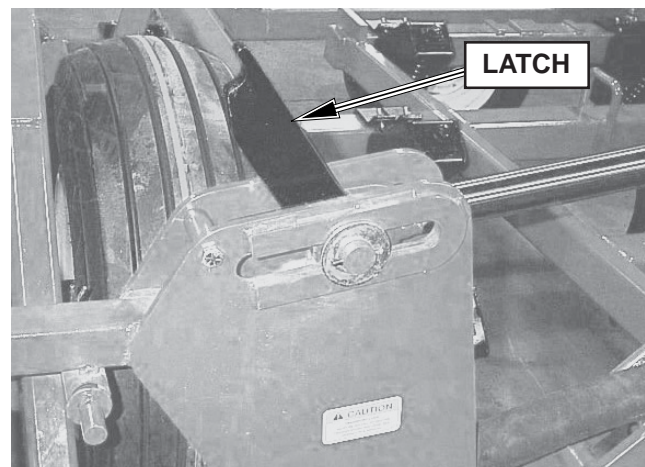


Cable Guide

Cylinder Latch

- 34, 39, 49, 55 & 60 ft models

- Check for freedom of movement.
- Ensure the latch is in correct position when wings are in lowered position.



Cylinder Latch - Field Position

Depth Control System

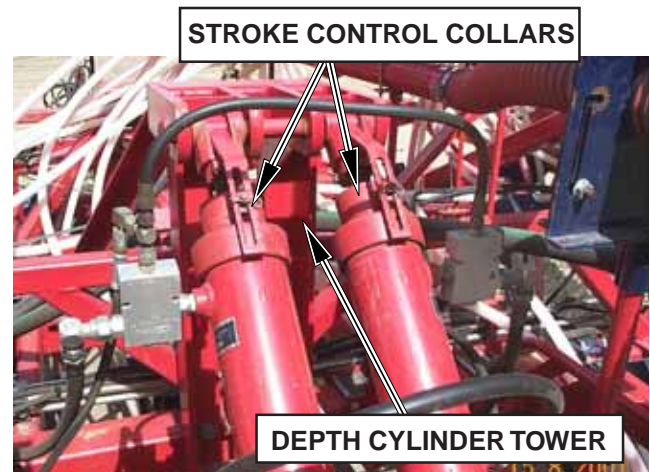
When servicing the depth control system; i.e. replacing oil line / pilot operated check valve or a cylinder is removed from the system, an oil void will be created. This oil void will cause a pressure imbalance in the depth control system. This pressure imbalance may cause damage to the main depth cylinder tower or the main depth cylinder shafts.

When an **oil line** or **pilot operated check valve** is removed or replaced the following procedure must be followed:

- To minimize the pressure imbalance when extending the cylinders, “feather” the hydraulic flow and intermittently activate the circuit until all depth cylinders are fully extended.
- This will prevent the operating pressure from building to its maximum level and damage from occurring to the main depth cylinder tower or the main depth cylinder shafts.
- Rephase the circuit as outlined in the operator’s manual, once cylinders have been fully extended.

When a **cylinder** is removed or replaced the following procedure must be followed:

- Retract stroke control collars to allow cylinders to retract fully.
- Remove the upper pin on the main frame depth cylinders.
- Operate depth hydraulics to fully extend all depth cylinders.
- Hold lever several seconds to rephase cylinders.
- Cycle cylinders a few times to purge air out of system.
- Reconnect main frame depth cylinders.



Main Frame Depth Cylinders

Maintenance

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.

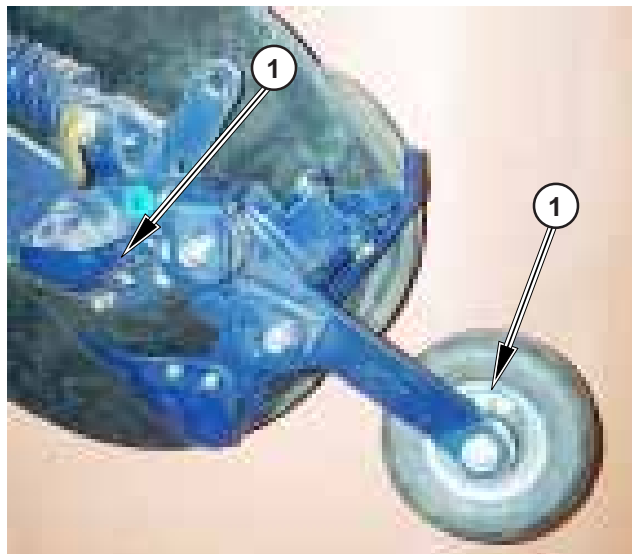
NH3 applications only

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

Closing Tine

The closing tine can be adjusted outward as it wears and can be reversed to use the other half of the tine.

Mount the tine as follows:

- There are left and right tines.
- The tine coil should face outward and be positioned to the top as shown.
- Secure tine with set screw and jam nut.



Closing Tine

Important

Retighten setscrew after the first 20 acres.

Hydraulics

Refer to Section 1 regarding hydraulic safety. In addition:

- Inspect hydraulic system for leaks, damaged hoses and loose fittings.
- Damaged Hoses and hydraulic tubing can only be repaired by replacement. **DO NOT ATTEMPT REPAIRS WITH TAPE OR CEMENTS.** High pressure will burst such repairs and cause system failure and possible injury.
- Leaking cylinders - install a new seal kit.
- Fittings - use Teflon Tape on all NPT hydraulic joints. **Do not use liquid Teflon or Teflon tape on JIC or ORB ends.**
- Hydraulic Hose Connections - when connecting the hoses to the cylinders, tubing, etc. always use one wrench to keep the hose from twisting and another wrench to tighten the union. Excessive twisting will shorten hose life.
- Keep fittings and couplers clean.
- Check the Tractor Manual for proper filter replacement schedule.

Refer to the Trouble Shooting Section.

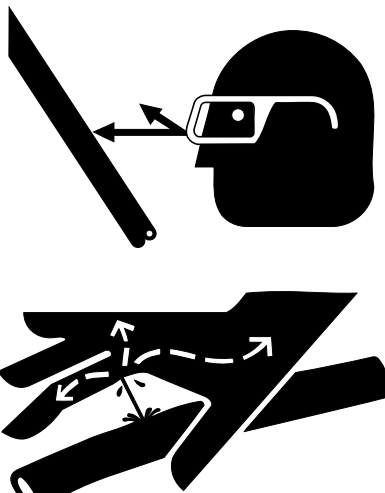


Contact your nearest Dealer for genuine repair parts. Dealers carry ample stocks and are backed by the manufacture and regional associations.

Caution

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

Note: Extreme care must be taken to maintain a clean hydraulic system. Use only new hydraulic fluid when filling reservoir.



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.

Section 7: Storage

Section Contents

Preparing for Storage	7-2
Cylinder Shaft Protection	7-3
Removing From Storage	7-3

Storage

Preparing for Storage

- To insure longer life and satisfactory operation, store the implement in a shed.
- If building storage is impossible, store away from areas of main activity on firm, dry ground.
- Clean machine thoroughly.
- Clean and grease threads on stroke control collars.
- Inspect all parts for wear or damage.
- **Avoid delays** - if parts are required, order at the end of the season.
- Lubricate grease fittings. (Refer to Maintenance Section).
- Tighten all bolts to proper specifications (Refer to Maintenance Section).
- For a safer storage, lower the implement into field position and release the hydraulic pressure.
- If implement must be stored in a raised position, ensure that wings are properly secured with lock pins.
- Level implement using hitch jack and block up.
- Relieve pressure from hydraulic system.
- Raise frames, block up and relieve weight from the tires.
- Cover tires with canvas to protect them from the elements when stored outside.
- Coat exposed cylinder shafts (**Refer to Cylinder Shaft Protection**).
- Paint any surfaces that have become worn.



Warning

**Do not allow children to play
on or around the machine.**

MORRIS PAINT

Spray Cans:

Part Number	Description
W-4647	Red MORRIS Spray Can
W-4648	Blue MORRIS Spray Can
N31087	White MORRIS Spray Can

Litre Cans:

Part Number	Description
Z-10	Red MORRIS Paint/Litre
Z-11	Blue MORRIS Paint/Litre

Cylinder Shaft Protection

The steps summarized below should be followed when protecting chrome plated shafting on equipment:

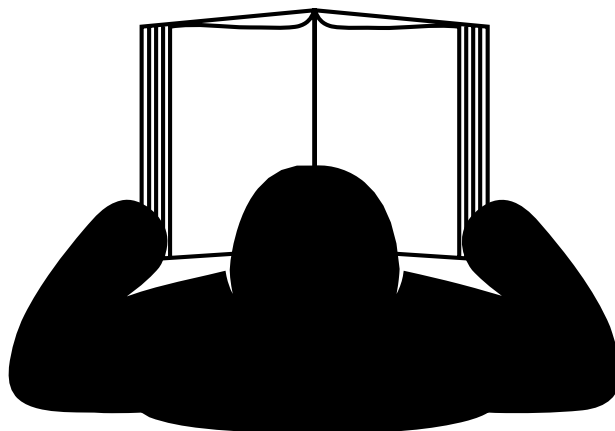
- Position the equipment as it will be stored, and identify all the exposed portions of the chrome plated shafts.
- Clean dirt and dust from the exposed portions of the shafting using a dry cloth or a cloth which has been dampened with an appropriate solvent.
- Prepare a mixture of 60% oil-based rust inhibitor and 40% Kerosene. Apply a thin coating of this mixture to the exposed surfaces of the chrome plated shafting. No. 1 fuel oil may be substituted for Kerosene. A cloth dipped in the mixture can be used to apply the coating.
- Inspect the shaft surfaces after six months and apply additional corrosion preventative mixture.
- If the equipment is to be moved and then stored again for an extended period of time, the steps above should be repeated for all shafts that were stroked during the move.
- **Before retracting the cylinders the protective coating should be removed**, to prevent fine sand and dirt that has accumulated in the coating, from damaging the shaft seal. **Under no circumstances should sandpaper or other abrasive be used to clean the surfaces.** Plastic or copper wool in combination with an appropriate solvent will remove most of the dirt.

Caution

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

Removing From Storage

- Review Operator's Manual.
- Check tire pressure (Refer to Tire Pressure List)
- Clean machine thoroughly. Remove coating from exposed cylinder shafts (**Refer to Cylinder Shaft Protection**).
- Lubricate grease fittings. (Refer to Lubricating Section).
- Tighten all bolts to proper specifications (Refer to Bolt Torque Chart).



Storage

Notes

Section 8: Troubleshooting

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Machine not operating straight.	8-2
Lack of penetration.	8-2
Sweeps/points wearing unevenly	8-2
Wing lifting too slowly.	8-2
Wings not lowering.	8-2
Transport wheels retract before wings unfold.	8-2
Oil accumulation.	8-2
One wing will lift, other will not.	8-3
Depth control not working.	8-3
One wing or one whole side will drop when machine is fully raised.	8-3
Depth Hydraulics chatter when lowering.	8-3
Unable to insert transport pin on wing locks.	8-3
Packer gangs squeaking.	8-3

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.
	Hydraulic breakaways.	Foreign material or sticking. Check compatibility.
	Hose restriction.	Reroute hydraulic hoses.
Wings not lowering.	Transport pins installed.	Remove pins.
	Sequence valve.	Adjust (See Transport Hydraulics)
Transport wheels retract before wings unfold.	Sequence valve set too low.	Increase pressure setting on sequence valve. (Turn adjustment bolt in)
Oil accumulation.	Damaged seal.	Replace seals.
	Loose fittings.	Tighten hose and pipe connections.
	Scored cylinder shaft will damage shaft seal.	Replace.
	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 collars not adjusted evenly.	Measure and ensure all collars are adjusted properly.
One wing or one whole side will drop when machine is fully raised.	Internal cylinder leak.	Repair cylinder.
	Pilot Operated Check Valve leaking.	Replace Pilot Operated Check Valve on side the problem is occurring.
Depth Hydraulics chatter when lowering.	Restrictor valve C15975 not installed correctly.	Install restrictor valve into hydraulic line to raise unit. Note direction of arrow on valve. Refer to <i>"Hydraulic Depth Control System"</i> in Operation Section.
Unable to insert transport pin on wing locks.	Spacer plate not adjusted properly.	Refer to <i>"Field Clearance Settings"</i> in Operation Section.
Packer gangs squeaking.	Gangs not tight enough.	Tighten gang nuts to 450 ft. lbs.

Troubleshooting

Notes



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