



**MORRIS**

Advanced Air Seeding and Tillage Systems

# Magnum III

# OPERATOR'S Manual

Part Number C31364-1

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## **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.**

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



**DANGER**

Tells you that a hazard exists which would result in a high probability of death or serious injury if proper precautions are not taken.



**WARNING**

Tells you that a hazard exists which can result in injury or death if proper precautions are not taken.



**CAUTION**

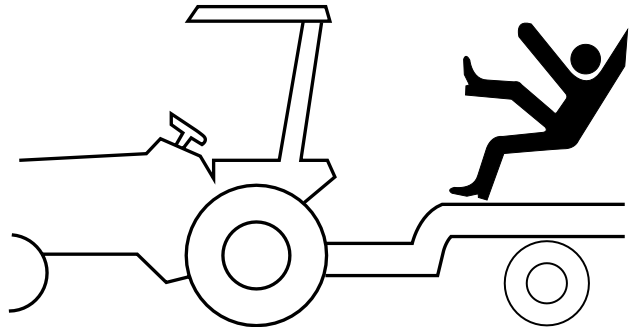
Tells you to remember safety practices, or directs attention to unsafe practices which could result in personal injury if proper precautions are not taken.

# Safety

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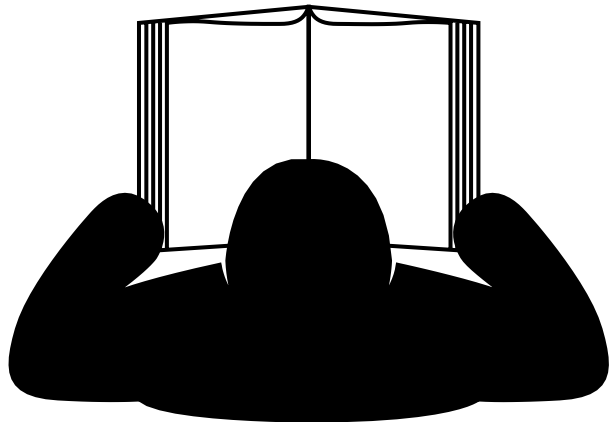
## General Operation

- **DO NOT RIDE!!** No one should be allowed to ride on the implement when in motion.
- No one but the operator in the driver's compartment!!
- **Check behind** when backing up.
- **Reduce speed** when working in hilly terrain.
- Never allow anyone within the immediate area when working.
- **Stand clear** when raising or lowering wings.



## Tractor Operation

- Be aware of tractor safety procedure when working with implement.
- Review tractor manuals.
- Secure hitch pin with a retainer and lock drawbar in centre position.



## Chemicals

- **Use extreme care** when cleaning, filling or making adjustments.
- **Always read** granular chemical or treated seed labels carefully and always keep label warnings in mind.
- Wear close fitting clothing and appropriate safety equipment for the job.
- **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.
- **Do Not enter tank unless another person is present.**



## DANGER

**Failure to comply may result in death or serious injury.**

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

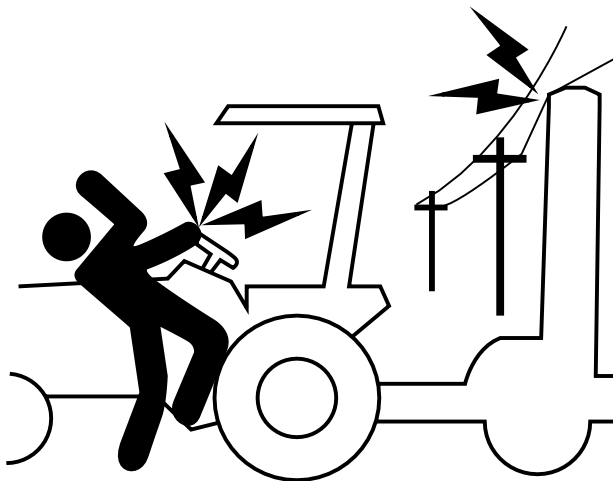
**Always** have ample water available in case of exposure to ammonia liquid or gases.

# Safety

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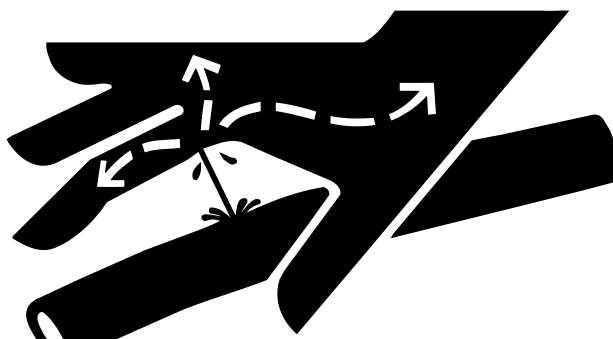
## Transporting

- **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.
- **REDUCE SPEED** with material in Air Cart tanks. **Do Not** Exceed a speed of 10 M.P.H.
- The weight of the implement being towed *must not exceed 1.5 times* the weight of towing vehicle.
- Do not transport in poor visibility.
- The slow moving vehicle (SMV) emblem, safety reflectors and hazard lights must be secured on the machine for safe transport.
- Avoid soft surfaces, the additional wing weight on the centre wheels could cause the machine to sink.
- Ensure safety chain is attached correctly.
- Check that wings are firmly seated in transport wing stops, and lock pins installed.
- Secure transport locks on depth control cylinders.



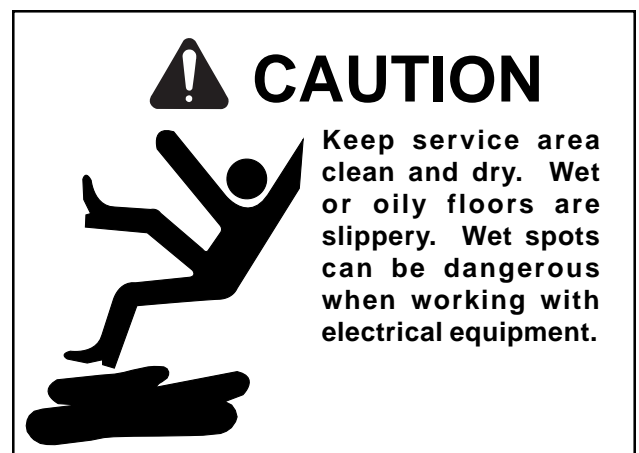
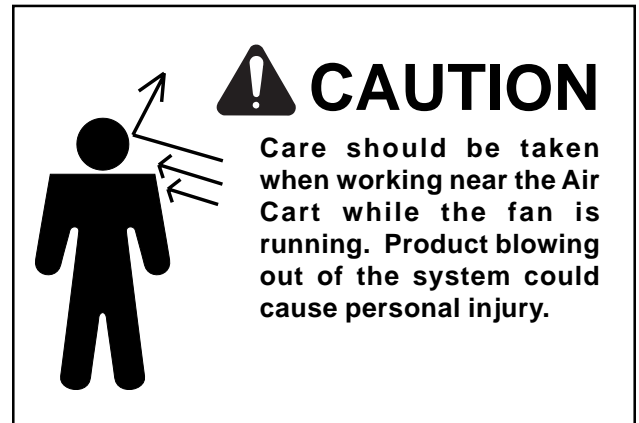
## Hydraulics

- **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.



## Maintenance

- **Shut tractor off** before making any adjustments or lubricating the machine.
- **Block** machine securely to prevent any movement during servicing.
- Wear close fitting clothing and appropriate safety equipment for the job.
- **Always wear** safety goggles, breathing apparatus and gloves when working on seeder filled 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.
- **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.
- **To prevent personal injury**, do not walk within radius of raised cultivator wings. Always ensure wing rests are locked and in place.
- Do not modify the machine.




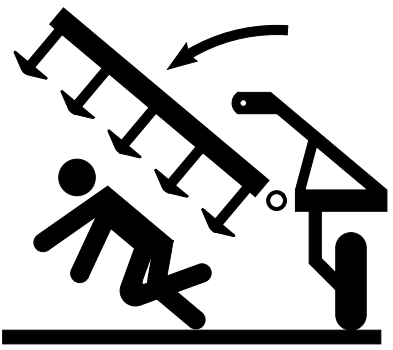
## Storage


- 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 implement.


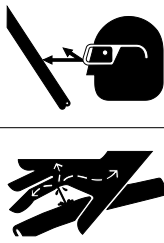


# Safety

## Decals

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

 <b>CAUTION</b>
<ul style="list-style-type: none"><li>- READ AND UNDERSTAND THE OPERATORS MANUAL BEFORE OPERATING.</li><li>- FOR ROAD TRAVEL, USE FLASHING LIGHTS AND AN SMV SIGN AS REQUIRED. OBSERVE HIGHWAY TRAFFIC REGULATIONS</li><li>- <b>NO RIDERS</b></li></ul>

 <b>WARNING</b>	
<b>HIGH-PRESSURE FLUID HAZARD</b>	
<p>To prevent serious injury or death:</p> <ul style="list-style-type: none"><li>• Relieve pressure on hydraulic system before servicing or disconnecting hoses.</li><li>• Wear proper hand and eye protection when searching for leaks. Use wood or cardboard instead of hands.</li><li>• Keep all components in good repair.</li></ul>	

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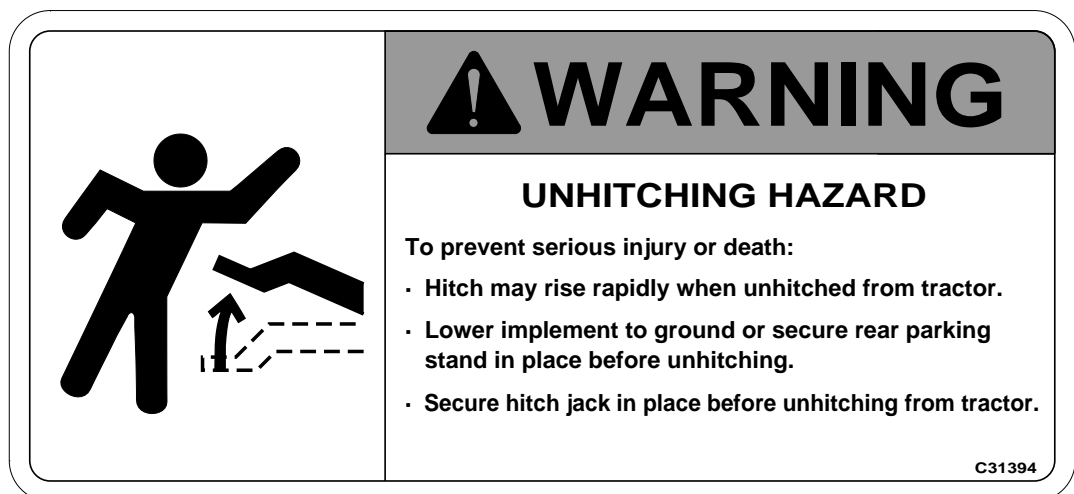
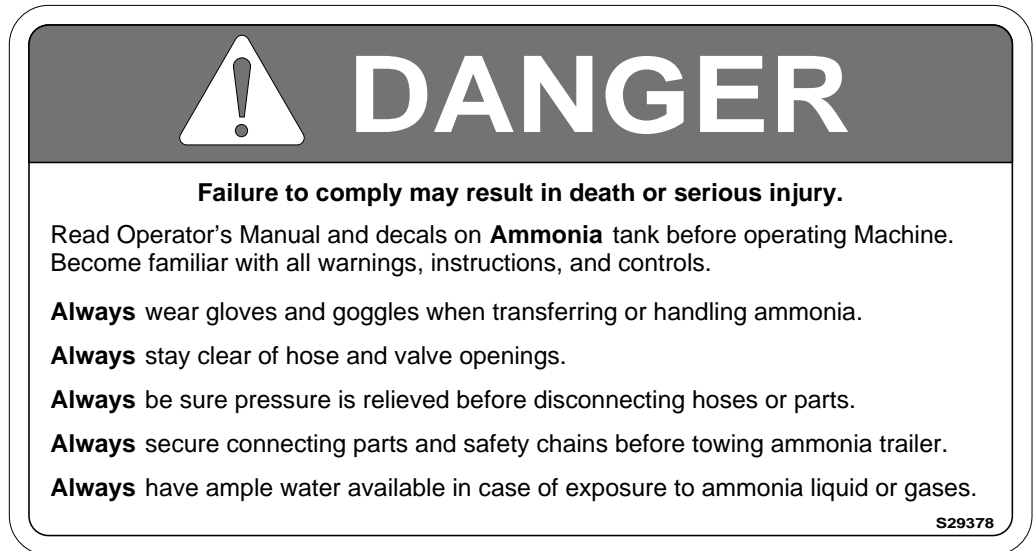
 <b>CAUTION</b>
<b>TRANSPORT LOCK</b>
<p>... MUST BE INSTALLED BEFORE TRANSPORTING MACHINE. SEE OPERATOR'S MANUAL</p>

F-4644



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

## Decals - Continued



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

# Safety

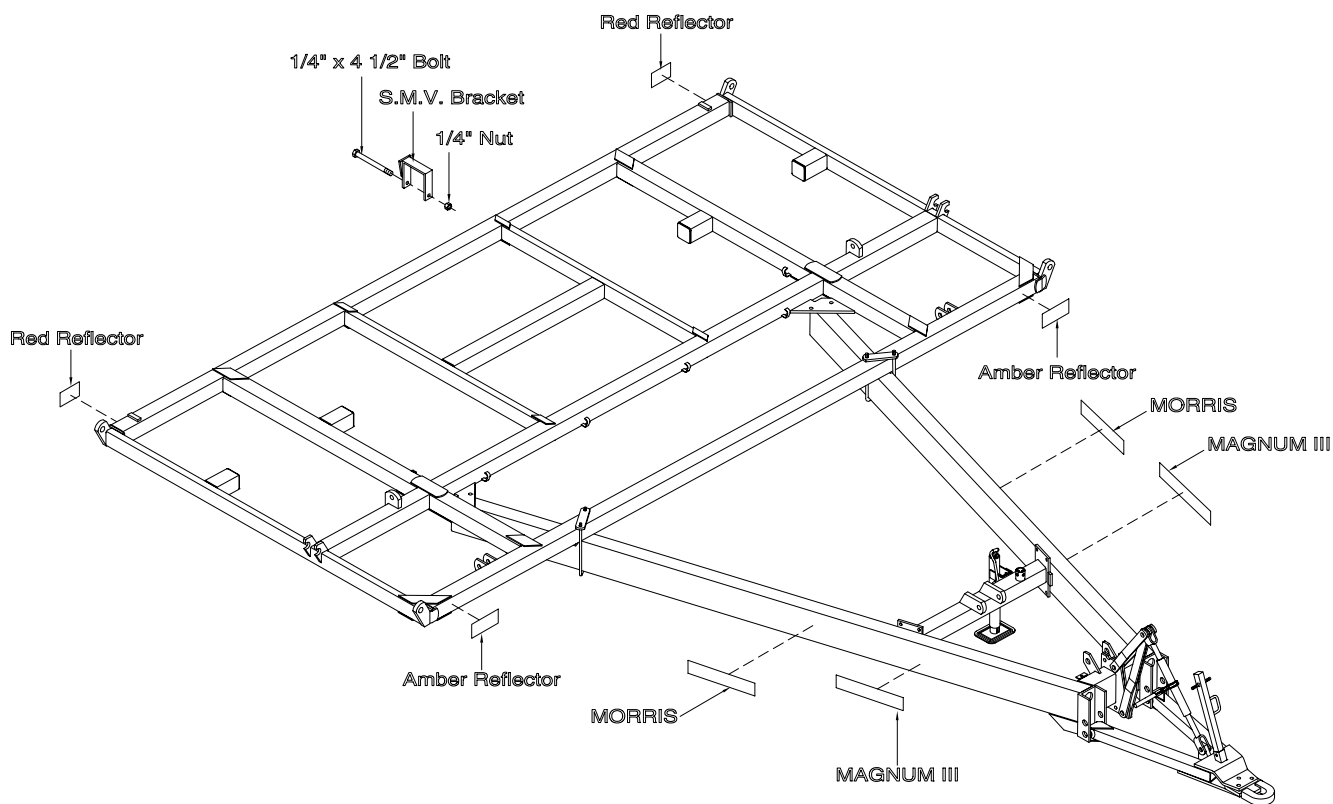
## Reflectors

The Slow Moving Vehicle (S.M.V.) Emblem and Safety Reflectors must be secured on the machine to promote safe transportation of this implement.

**Note:** Always replace missing or damaged reflectors.



Use SMV Emblem when transporting, to warn vehicles approaching from the rear. Comply with all provincial, federal and local laws when travelling on the highway.



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

## Safety Lights

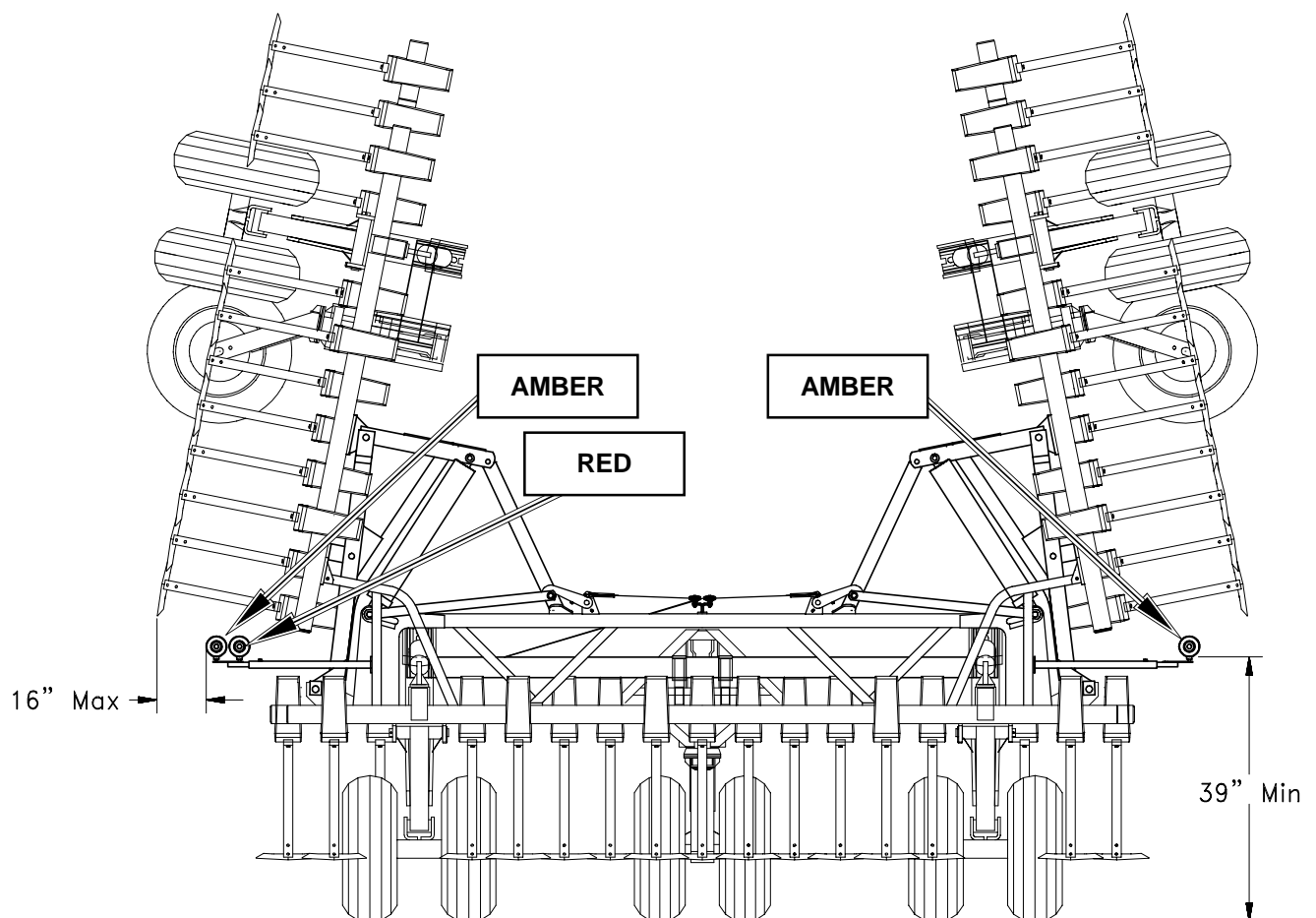
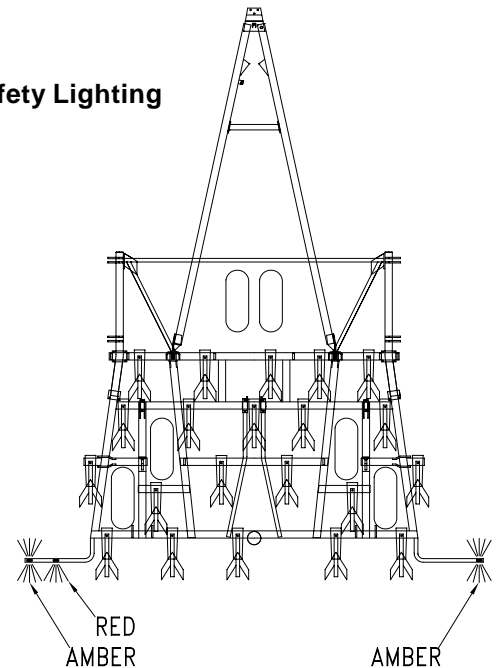
Morris recommends the use of safety lights to meet the ASAE standard for highway travel. Be familiar with and adhere to local laws.

Hazard lights secured on the machine promote safe transportation of this implement.

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

Hazard lights must be mounted to the rear of the implement and be visible from front and rear. The lights must be within 16 inches of the extremities of the machine and at least 39 inches but not over 10 feet above ground level.

**Tillage Safety Lighting**





# Specifications

## MAGNUM III CHISEL PLOWS

### Specifications and Options

Model		CP-825				CP-831				CP-840		CP-843			CP-850
Working Width (ft)		25'	27'	29'	31'	31'	33'	35'	37'	40'	42'	43'	45'	47'	50'
	(m)	7.62	8.23	8.84	9.45	9.45	10.06	10.67	11.28	12.19	12.80	13.11	13.72	14.33	15.24
Number of Shanks		25	27	29	31	31	33	35	37	40	42	43	45	47	50
Weight	- (lb)	6,860	7,150	7,490	8,655	7,345	7,665	8,005	8,540	10,695	10,985	12,740	13,030	13,370	13,555
	- (kg)	3,118	3,250	3,405	3,934	3,339	3,484	3,639	3,882	4,861	4,993	5,791	5,923	6,077	6,161
Extensions	- 2 Ft (61 cm)	0	1	1	0	0	1	1	0	0	1	0	1	1	0
	- 4 Ft (122 cm)	0	0	1	0	0	0	1	0	0	0	0	0	1	0
	- 6 Ft (183 cm)	0	0	0	1	0	0	0	1	0	0	0	0	0	0
Transport	- Height (ft)	10'	11'	12'	13'	13'	14'	15'	16'	16'	17'	13'			13'
	(m)	3.05	3.35	3.66	3.96	3.96	4.27	4.57	4.88	4.88	5.18	3.96			3.96
- Width		18' 9" (5.72 m)				18' 9" (5.72 m)				21' 9" (6.63 m)		18' 9" (5.72 m)			21' 9" (6.63 m)
Number of Sections		3				3				3		5			5
Frame Width	- Main	13' (3.96 m)				13' (3.96 m)				16' (4.88 m)		13' (3.96 m)			16' (4.88 m)
	- Inner Wing	6' (1.83 m)				9' (2.74 m)				12' (3.66 m)		9' (2.74 m)			9' (2.74 m)
	- Outer Wing	N/A				N/A				N/A		6' (1.83 m)			8' (1.83 m)
Tire Size Base Machine	- Main	(2) 9.5L x 15FI Load Range D				(4) 9.5L x 15FI Load Range D				(4) 9.5L x 15FI Load Range D		(4) 9.5L x 15FI Load Range D			(4) 11L x 15FI Load Range D
	- Inner Wing	(2) 9.5L x 15SL 6 ply rating				(2) 9.5L x 15SL 6 ply rating				(4) 9.5L x 15SL 6 ply rating		(2) 9.5L x 15SL 6 ply rating			(2) 9.5L x 15SL 6 ply rating
	- Outer Wing	N/A				N/A				N/A		(2) 9.5L x 15SL 6 ply rating			(2) 9.5L x 15SL 6 ply rating
Dual Wheels		825D - Main Frame				831 - Main Frame 831D - Main and Wing Frame				Main and Wing Frame		Main Frame			Main Frame
Gauge Wheels		N/A				Optional				Optional		Standard			Standard
Number of Wheels		825 - 4 / 825D - 6				831 - 6 / 831D - 8				8		10			10
Overall Length		21' (6.4 m)				21' (6.4 m)				24' (7.32 m)		24' (7.32 m)			24' (7.32 m)
Frame Depth		100" (2.54 m)				100" (2.54 m)				100" (2.54 m)		100" (2.54 m)			100" (2.54 m)
Self Levelling Hitch		N/A				N/A				N/A		Standard			Standard
Safety Chain		Standard													
Safety Lights		Standard													
Sweeps -16" 50 Degree		Standard													
Sweep to Frame Clearance		30" (76.2 cm)													
Number of Rows		4													
Shank Spacing		12" (30.5 cm)													
Rank to Rank Spacing		32" (81.3 cm)													
Shank to Shank Spacing		36" (91.5 cm)													
Trip Mechanism		1-1/4" (3.18 cm) x 2" (5.1 cm) Shank with 2-1/4" (5.72 cm) hole centres fits 50 Degree tillage tools.													
755 LH Automatic Trip		30" (76.2 cm) Sweep to Frame Clearance.													

# Specifications

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## Notes

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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.**

**Note:** Ownership Verification Form must be completed and submitted to Morris Industries Ltd. within 30 days of the delivery date.

**Warranty Void if Not Registered.**

**Require a Parts Manual? . . . . .** Order Part Number C31366



# Check List

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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 Pivot
- \_\_\_ Wheel Hubs

☒ **Tire Pressure:**

- \_\_\_ See maintenance section

☒ **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 \_\_\_\_\_ Prov. (State) \_\_\_\_\_  
Phone \_\_\_\_\_  
OWNER/OPERATOR \_\_\_\_\_  
Date \_\_\_\_\_



**TAKE SAFETY SERIOUSLY.**

**DO NOT TAKE  
NEEDLESS CHANCES!!**

# Introduction

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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 MAGNUM III chisel plow.

To protect your investment, study your manual before starting or operating in the field. Learn how to operate and service your MAGNUM III chisel plow 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 MAGNUM III chisel plow.

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

Occasionally, your MAGNUM III chisel plow 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 MAGNUM III chisel plow 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.



**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.



## CAUTION



**BE ALERT**

## SAFETY FIRST

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

## Application

The Morris MAGNUM III has excellent straw handling capacity. The unique design of the trip allows the Morris MAGNUM III to be used in a wide range of applications from primary tillage to seeding.

## 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

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



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



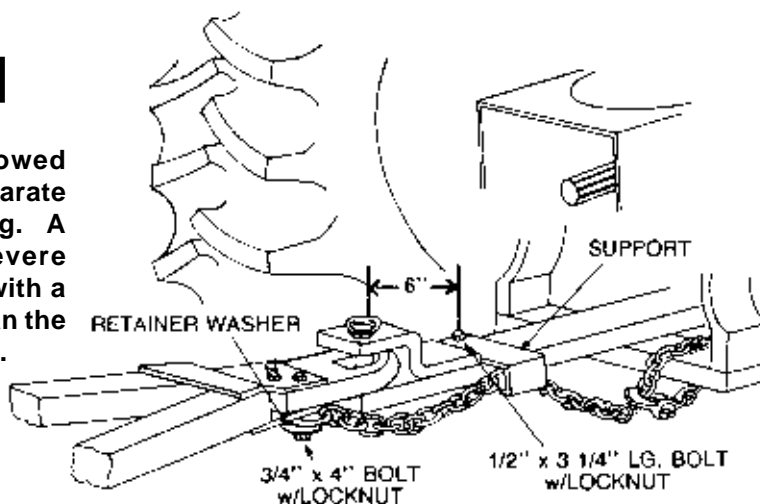
**Do not search for high pressure hydraulic leaks without a hand and face protection. A tiny, almost invisible leak can penetrate skin, thereby requiring immediate medical attention.**

# 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 centre 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.
- 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



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

## Hitching to Tractor - continued

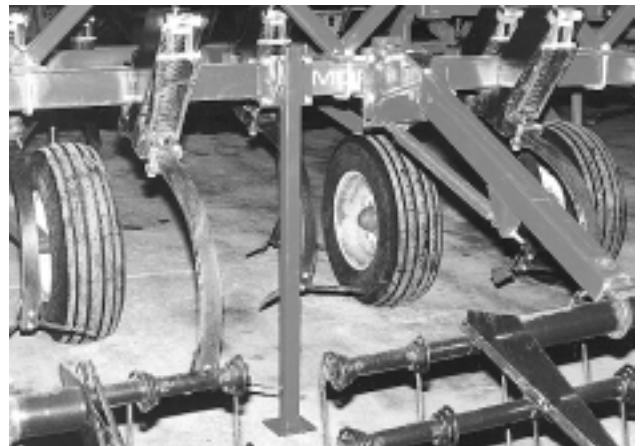
- After tractor to implement connection is made, relieve pressure off the hitch jack.
- Place hitch jack in raised position.
- Place park stand in raised position.



**Park Stand Raised**

## Unhitching from Tractor

- Lower park stand to lower most position possible.
- 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 chisel plow.



**Park Stand Lowered**



**Hitch Jack Lowered**

# Operation

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## 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!
- Always connect safety chain provided to the towing vehicle and the hitch of the seed cart.
- 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

- Only tow at safe speeds.
- The weight of the implement being towed *must not exceed 1.5 times* the weight of towing vehicle.
- Do Not Exceed 20 M.P.H.

## Lights

- Ensure proper reflectors and safety lights are in place, refer to Safety Section 1.
- Be familiar with and adhere to local laws.



## CAUTION

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

## 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.
- Extend main frame depth cylinders.
- Remove two transport lock pins from the main frame axles. Do not walk under the wings when removing the pins.

## IMPORTANT

**Secure main frame axle transport locks to axle tower preventing interference with cylinder operation.**

- Unlatch wing transport locks. Do not walk under raised wings.
- Operate wing lift hydraulics until wings are lowered and the cylinder shafts are completely extended to allow wings to float when working in uneven land.
- Operate depth control hydraulics, lowering machine fully, then raise machine fully holding the hydraulic lever for several seconds to phase the system.



## DANGER

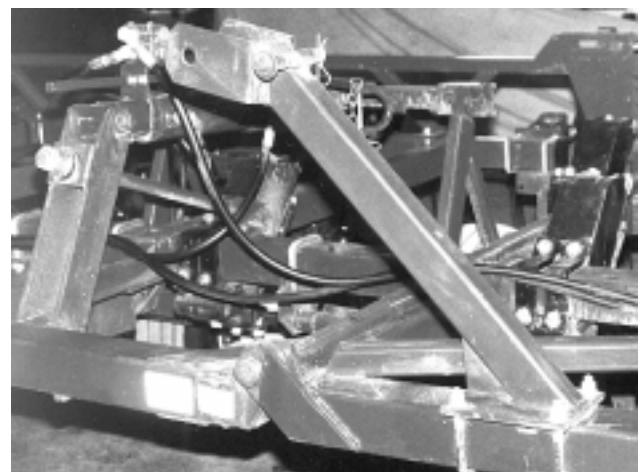
**Always stay clear of wings being raised, lowered or in elevated position. Ensure cylinders are completely filled with hydraulic fluid - Wings may fall rapidly causing injury or death.**



**Main Frame - Single Axle**



**Main Frame - Dual Axle**



**Wing Transport Locks**



# Operation

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## Transport - continued

### Field to Transport Position

- Position machine on **level ground**.
- Stop tractor, and engage park brake.
- Operate the depth control hydraulics, to raise the implement fully above ground.
- Operate the wing lift hydraulics, to raise the wings fully into transport position.
- Secure wing transport locks pins, **3-frame only**.
- Secure depth control transport locks. Do not walk under the wings when installing the pins.
- Ensure safety chain is properly installed, see page two of Operation Section.



**Main Frame Axle**



## **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.



**Wing Transport Locks**

## Levelling

There are two steps necessary to level the unit:

- 1) An initial levelling where certain measurements must be checked.
- 2) A final levelling procedure that must and can only be done in the field.

### Initial Levelling

- Check that tires are properly inflated. See Maintenance Section.
- Adjust the Dual Wheel axle control rods that a  $\frac{5}{8}$ " of rod is past the Jam Nut.
- Adjust the Single Wheel axle control rods that  $\frac{5}{8}$ " of rod is past the Jam Nut.

### Final Levelling

In order for any chisel plow to perform as intended, it must be properly levelled. To properly level a floating hitch chisel plow, the **final levelling must be done in the field with ground conditions being firm and unworked.**

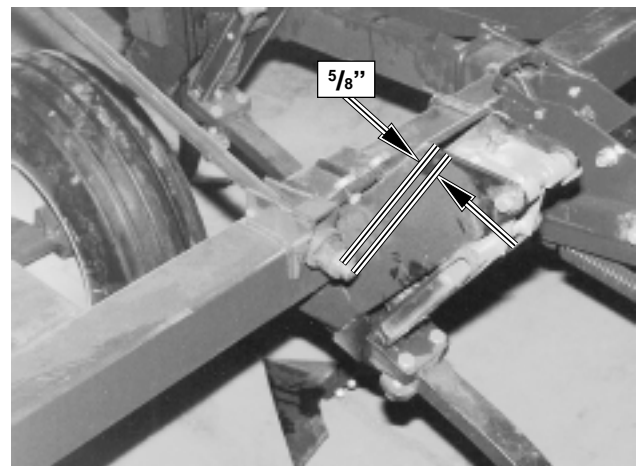
If the chisel plow is levelled in preworked, soft conditions, the front may dip when working in harder conditions. This causes the back row of shanks to work shallower than the front and by using the chisel plow in this manner can result in the following:

- 1) The finish of your field can be rough and uneven.
- 2) The back row of shanks can ridge. When used in conjunction with an Air Cart this could result in uneven seed depth and strips may appear.

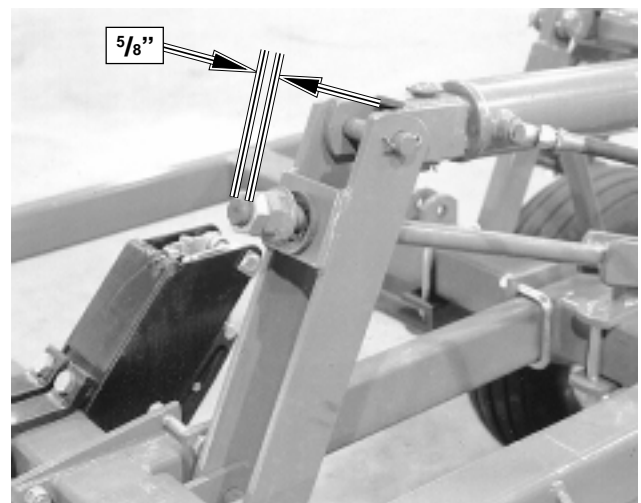
**Note: Each operator is responsible for levelling their chisel plow. As field conditions vary, fine tuning is left to the operator's discretion.**

## IMPORTANT

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



Single Axle



Dual Axle

# Operation

## Levelling - Continued

### Final Levelling - Continued

Final levelling requires the following six basic steps to be followed:

- 1) **Rephase** hydraulic depth system.
- 2) Pull the unit 100 feet at the desired depth at **approximately 2 m.p.h.**. Stop the unit in the ground.
- 3) Check the depth on the main frame side to side. Adjust the main frame cylinder control rods as required to level the main frame.

Check the depth on the main frame front to back. Adjust the hitch ratchet jack as required to level main frame.

On 3-Section units the hitch ratchet jack must be adjusted for every change in depth of the chisel plow.

The 5-Section units have a self-levelling hitch, so the hitch ratchet jack will not need to be adjusted for every change in depth of the chisel plow.

**Note: Only do one adjustment at a time, repeat step 1 and 2 before next adjustment.**

- 4) Once the main frame is level, proceed to each wing (On 5-Section units level the inner wings before proceeding to the wings). Adjust wing axle control rod as required until wing is level side to side with main frame.
- 5) Adjust wing gauge wheels, if so equipped, down until the tires are in contact with the ground and taking some of the wing weight to level wings front to back.
- 6) Pull the unit 100 feet at the desired depth travelling at **normal operating speed**. Check machine level and make any adjustments necessary by repeating steps 3 through 5.

### Gauge Wheel Adjustment

- Loosen clamp bolts
- Adjust Turn Buckle to desired position.
- Tighten clamp bolts.
- When working deeper than 5 inches move axle assembly to the upper hole as shown.

## IMPORTANT

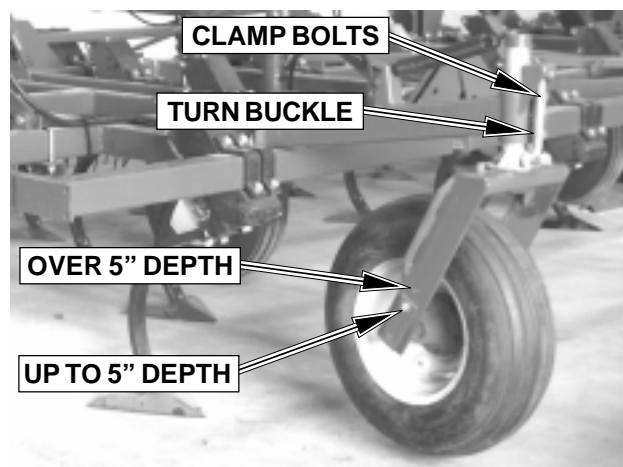
Final Levelling is  
“VERY IMPORTANT”

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

**Note:** With machine at desired working depth position “A”- Frame in appropriate holes to maintain a level line of pull.



"A" - Frame Hitch



Gauge Wheel

## Depth Stop Adjustment

The Magnum III incorporates both a positive mechanical depth stop and hydraulic double depth stop valves as standard equipment.

The mechanical depth stops ensure positive depth of each frame section, unaffected by any leaks in the system. (i.e. leaking couplers, internal cylinder leaks, etc.)

The double depth stop valves ensure consistent working depth by isolating the implement's hydraulic system from the tractor. The double depth stop valves provide the operator quick easy one point depth adjustment.

### Mechanical Depth Stop

- Ensure depth stop valve plungers do not close before stroke control collars are fully seated.
- 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".
  - b) 6 turns on the collar changes the depth approximately 1".
- 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 chisel plow system has been filled.
- Refer to tractor operators manual for more information.



Stroke Control Collar - Single Axle



Stroke Control Collar - Dual Axle

# Operation

## Depth Stop Adjustment - Continued

### Hydraulic Depth Stop

Hydraulic double depth stop valves ensure consistent working depth by isolating the implement's hydraulic system from the tractor. This system provides a simple and convenient method of adjusting machine depth from an accessible single point location at the front of the machine.

- When using the depth stop valves, consistent machine depth depends on whether the valves are closed or open.

If they are **closed** the operating depth will remain constant by isolating the implement's hydraulic system from the tractor.

If the depth stops are **not closed** the implement's hydraulic oil may leak back to the tractor. This will give the impression that a cylinder is leaking and will cause the unit to run out of level.

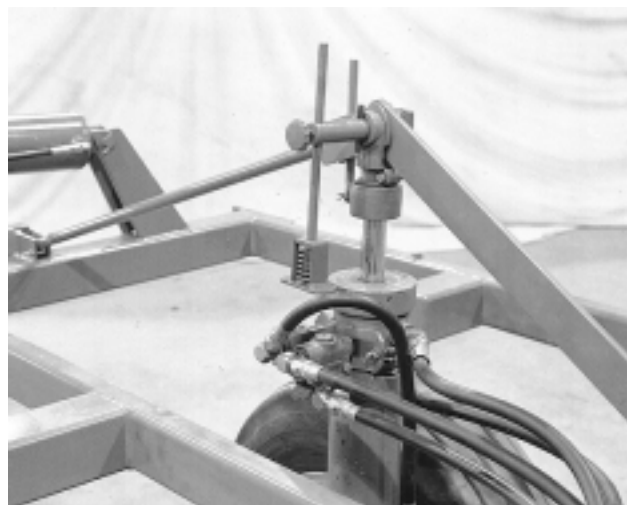
**Always ensure the depth stops are closed by holding the hydraulic lever momentarily longer after the chisel plow has reached its preset working depth. Do not rely on tractor detente.**

- Ensure mechanical depth stops do not contact cylinder collars before depth stop valve plungers close fully.
- To increase or decrease the working depth, move the depth control rod as desired so the depth stop plunger will be depressed when the desired working depth is acquired.
- Do not overtighten rod tightener. The depth valve operates hydraulically and very little pressure is required on the poppet to stop oil flow.

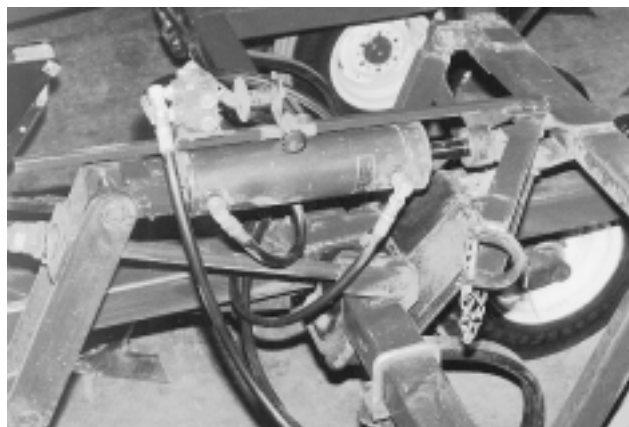
## IMPORTANT

It is essential the valves be engaged while chisel plow is moving forward, **NOT WHILE THE MACHINE IS STATIONARY**. This will ensure consistent closing of the valve poppets.

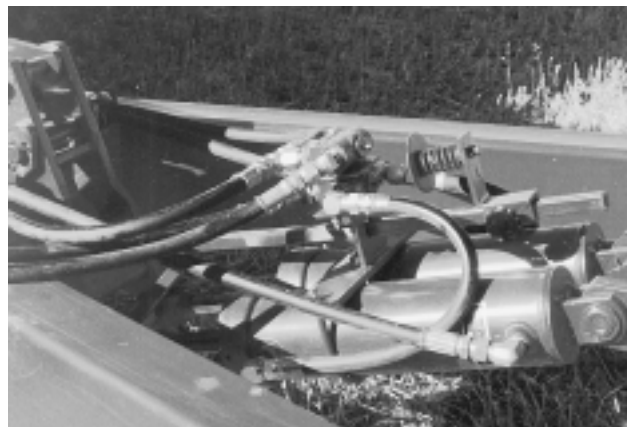
The valves should remain engaged at all times while working in the field. If the above is not followed, the chisel plow will creep down, which will eventually lead to certain sections going deeper than others.



825 - Depth Stop Valves



825D, 831, 831D & 840 - Depth Stop Valves



843 & 850 - Depth Stop Valves

## Hydraulic Depth Control System

### Three Section

#### 825 Single Axle Model

The hydraulic depth control system is a series system.

To lift the chisel plow, hydraulic fluid is forced into the butt end of cylinder 1. This causes the piston rod to extend, rotating the left wing axle down. This causes the left wing to raise.

Simultaneously, hydraulic fluid is forced from the gland end of cylinder 1 to the butt end of cylinder 2, causing it to extend, rotating the left main axle down. This causes the left side of the main frame to raise.

Simultaneously, hydraulic fluid is forced from the gland end of cylinder 2 to the butt end of cylinder 3, causing it to extend, rotating the right main axle down. This causes the right side of the main frame to raise.

Simultaneously, hydraulic fluid is forced from the gland end of cylinder 3 to the butt end of cylinder 4, causing it to extend, rotating the right wing axle down. This causes the right wing to raise.

Finally the fluid exits the gland end of cylinder 4 back to the tractor.

#### Mechanical Depth Stop

To lower the chisel plow, 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.

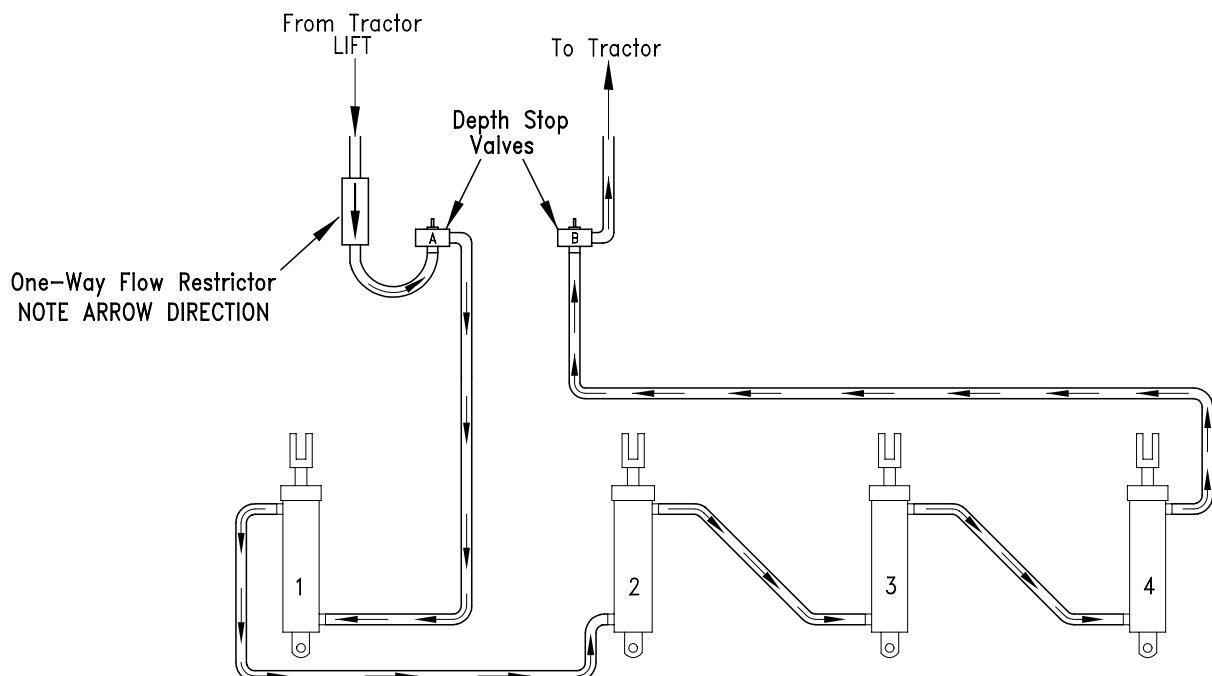
With the stroke control collars firmly seated, the cylinders will hold this working depth until the tractor hydraulic controls are activated to lift the chisel plow.

#### Hydraulic Depth Stop

To lower the chisel plow, hydraulic fluid flows through the cylinders in the reverse direction to that described above, until the depth stop plate depresses the plungers on the two depth valves A and B. This causes the poppets to seat and stop the flow of oil from the tractor.

With the poppets seated, the depth stop valves will hold the cylinders this working depth until the tractor hydraulic controls are activated to lift the chisel plow.

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



# Operation

## Hydraulic Depth Control System - continued

### Three Section

#### 825D, 831, 831D, and 840 Models

The hydraulic depth control system is a series system.

To lift the chisel plow, hydraulic fluid is forced into the butt end of cylinder 1. This causes the piston rod to extend, rotating the left main axle down. This causes the left side of the main frame to raise.

Simultaneously, hydraulic fluid is forced from the gland end of cylinder 1 to the butt end of cylinder 2, causing it to extend, rotating the right main axle down. This causes the right side of the main frame to raise.

Simultaneously, hydraulic fluid is forced from the gland end of cylinder 2 to the butt end of cylinder 3, causing it to extend, rotating the right wing axle down. This causes the right wing frame to raise.

Simultaneously, hydraulic fluid is forced from the gland end of cylinder 3 to the butt end of cylinder 4, causing it to extend, rotating the left wing axle down. This causes the left wing to raise.

Finally the fluid exits the gland end of cylinder 4 back to the tractor.

#### Mechanical Depth Stop

To lower the chisel plow, 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.

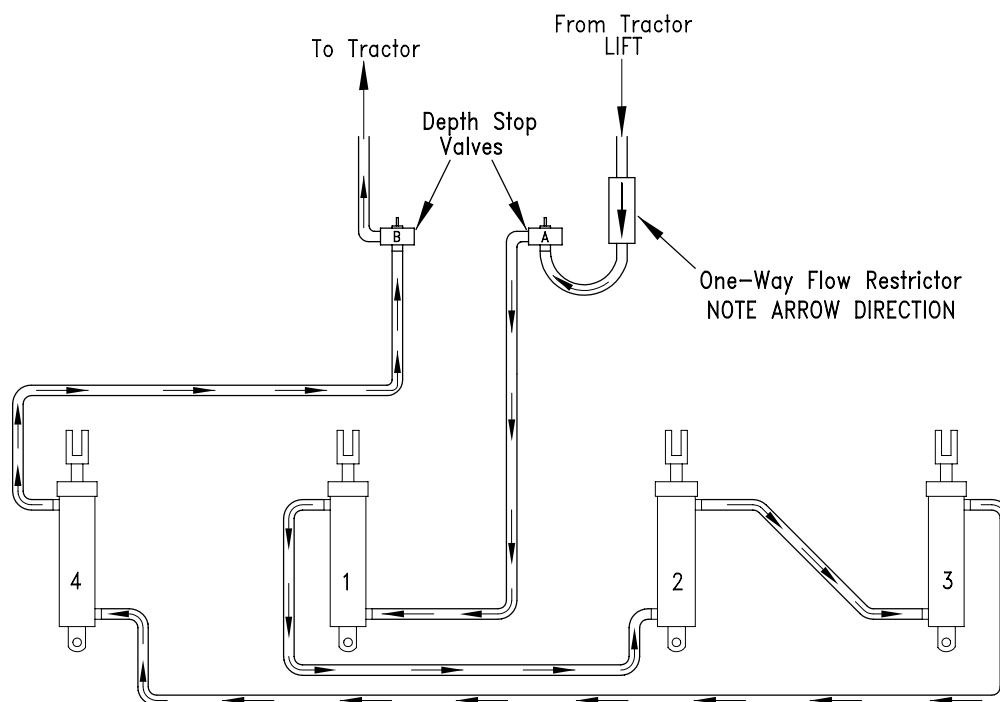
With the stroke control collars firmly seated, the cylinders will hold this working depth until the tractor hydraulic controls are activated to lift the chisel plow.

#### Hydraulic Depth Stop

To lower the chisel plow, hydraulic fluid flows through the cylinders in the reverse direction to that described above, until the depth stop plate depresses the plungers on the two depth valves A and B. This causes the poppets to seat and stop the flow of oil from the tractor.

With the poppets seated, the depth stop valves will hold the cylinders this working depth until the tractor hydraulic controls are activated to lift the chisel plow.

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



## Hydraulic Depth Control System - continued

### Five Section

#### All Models

The hydraulic depth control system is a series system.

To lift the chisel plow, hydraulic fluid is forced into the gland end of cylinders 1. This causes the piston rods to retract, pivoting the Hitch "A"- Frame down, which maintains machine level as the frames raise.

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 main frame axles 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 inner wing frame axles 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 outer wing frame axles down. This causes the outer wings to raise.

Finally the fluid exits the gland end of cylinders 4 into a common line and then back to the tractor.

#### Mechanical Depth Stop

To lower the chisel plow, 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.

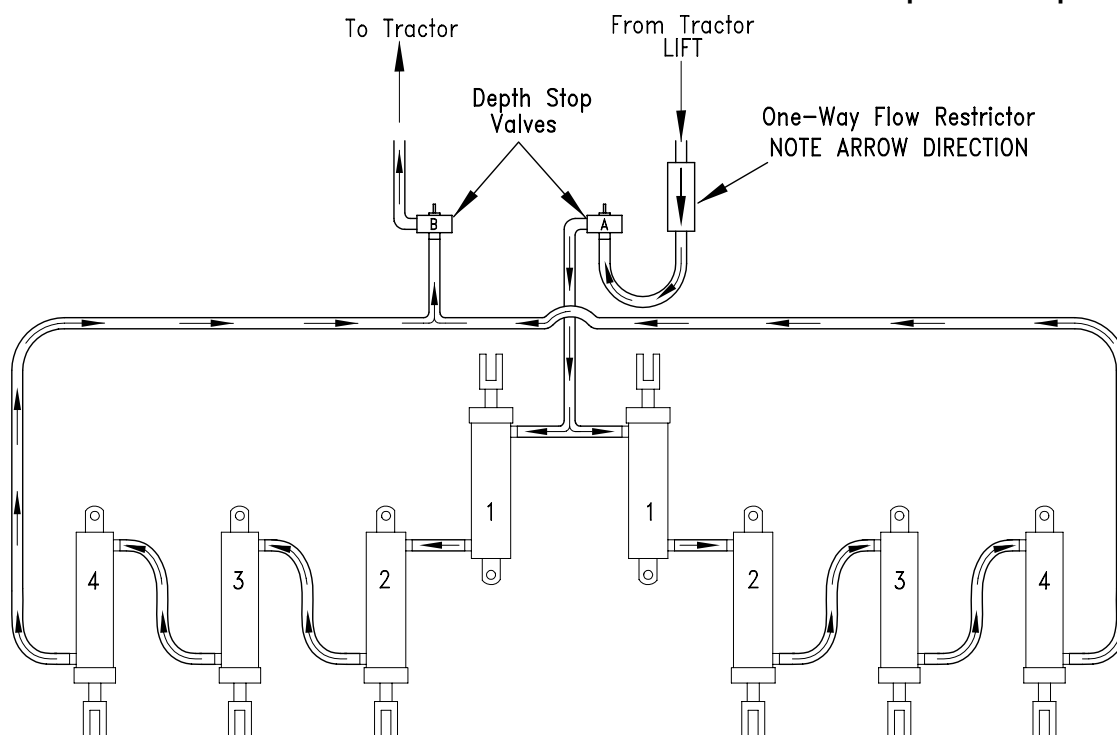
With the stroke control collars firmly seated, the cylinders will hold this working depth until the tractor hydraulic controls are activated to lift the chisel plow.

#### Hydraulic Depth Stop

To lower the chisel plow, hydraulic fluid flows through the cylinders in the reverse direction to that described above, until the depth stop plate depresses the plungers on the two depth valves A and B. This causes the poppets to set and stop the flow of oil from the tractor.

With the poppets seated, the depth stop valves will hold the cylinders this working depth until the tractor hydraulic controls are activated to lift the chisel plow.

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





# Operation

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## Hydraulic Wing Lift System

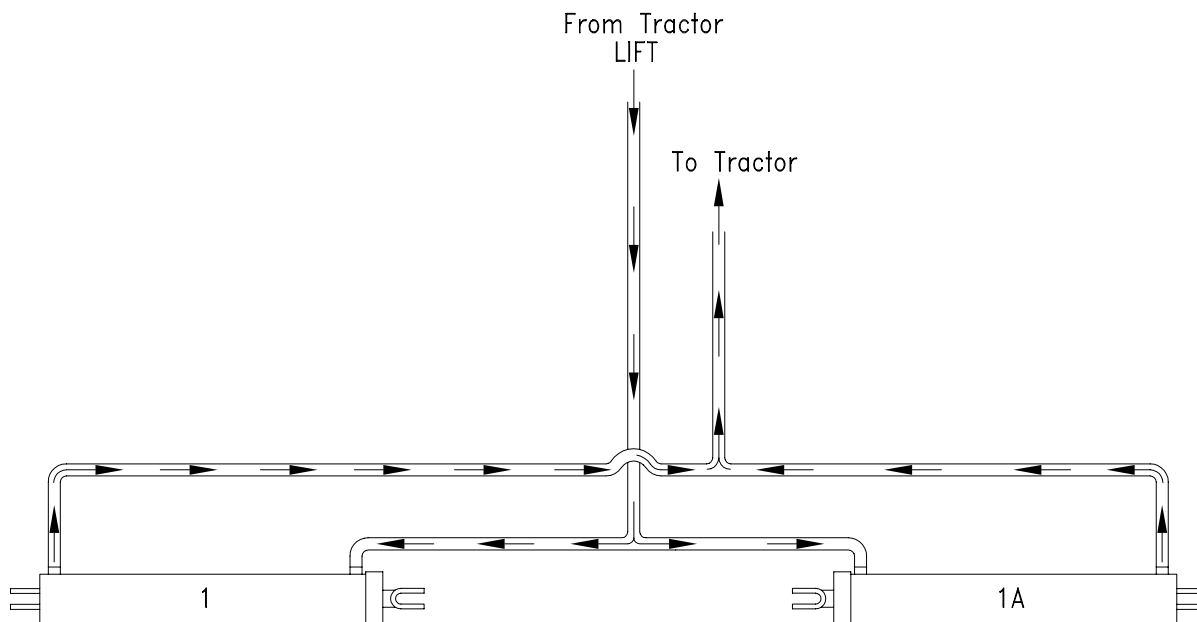
### Three Section Models

The hydraulic wing lift system is controlled by a parallel system.

To lift the wings, hydraulic fluid is forced from the tractor through a common line to the gland end of cylinders 1 and 1A, simultaneously forcing both cylinders to retract and lift each wing. The wing frame requiring the least amount of pressure will raise first, followed by the other wing frame.

While the wings are being raised, hydraulic fluid displaced from the butt end of the cylinders return through a common line to the tractor.

To lower the wings, hydraulic fluid is allowed to flow into the butt end of both wing lift cylinders, causing the wings to lower. Hydraulic fluid from the gland ends of the cylinders is forced through a common line back to the tractor.



## Hydraulic Wing Lift System

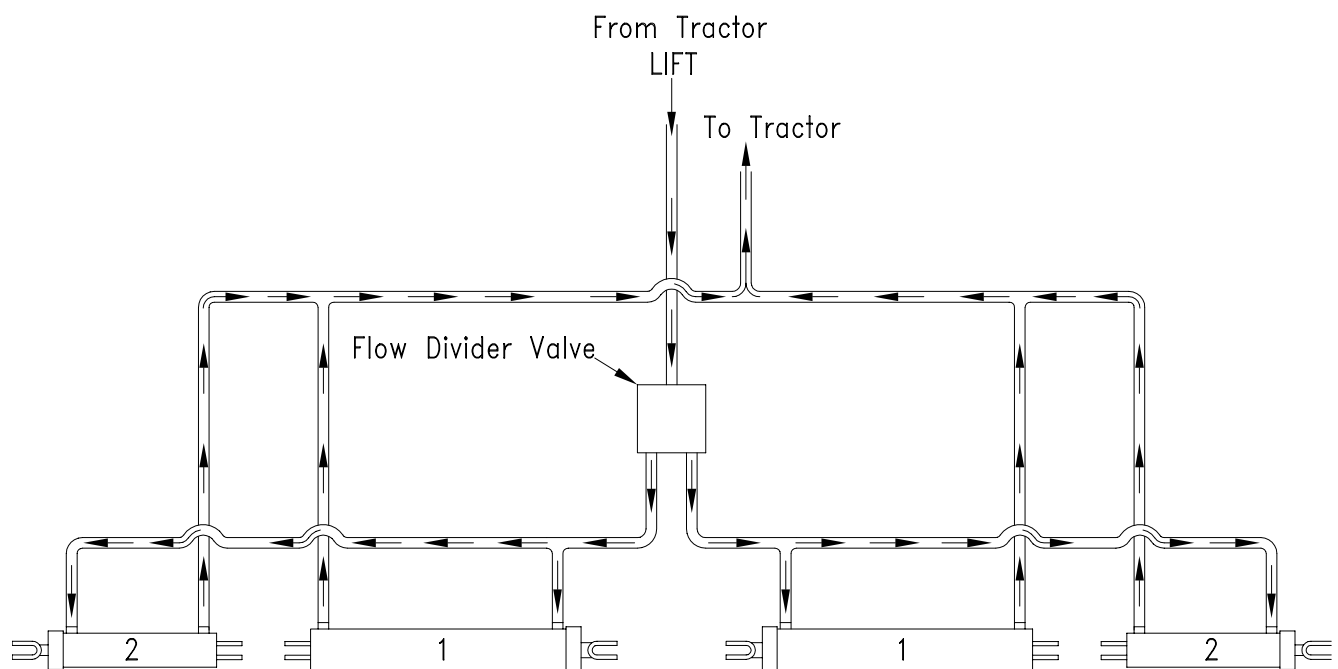
### Five Section Models

The hydraulic wing lift system is controlled by a parallel hydraulic system with a pressure compensated flow control valve 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 the flow control valve. The fluid is divided in the flow control valve 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 are fully retracted then the #1 cylinders retract lifting the inner wings.

While the wings are being raised, hydraulic fluid displaced from the butt end of the cylinders returns through a common line to the tractor.

To lower the wings, hydraulic fluid flows opposite to that described for the lifting operation. Fluid flows into the butt end of all eight cylinders simultaneously. The force required to extend the #1 cylinders is less than the force required to extend the #2 cylinders. Therefore, the #1 cylinders extend first to lower the inner wings. When the #1 cylinders are fully extended, 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 flow control valve and returns through a common line to the tractor.



# Operation

## 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 <sup>3</sup> or liquid application	Soil moisture dry NH <sup>3</sup> or liquid application Worn Point adjustment
Medium Soil	Soil moisture medium	Soil moisture wet NH <sup>3</sup> or liquid application	Soil moisture dry NH <sup>3</sup> or liquid application Worn Point adjustment
Heavy Soil	Soil moisture dry	Soil moisture wet NH <sup>3</sup> 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.

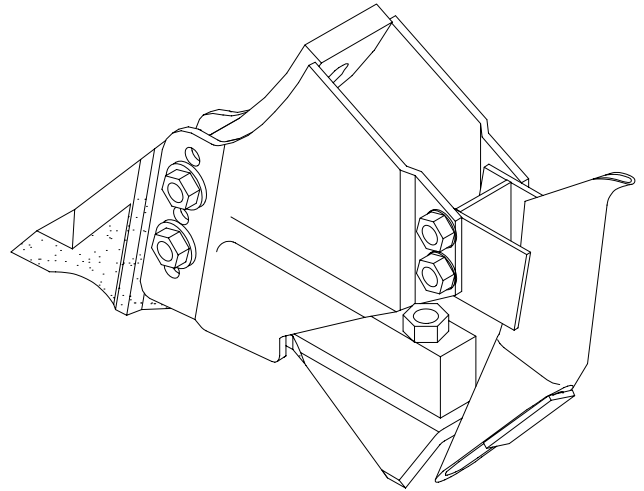
S29378

## Opener Adjustments

### Double Shoot Openers - continued

#### Component Replacement

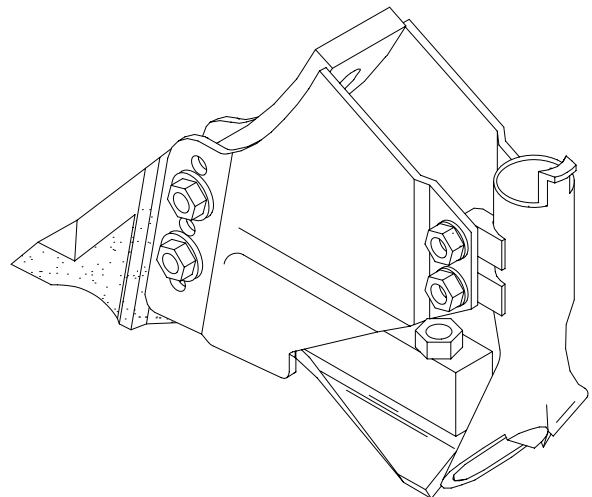
- Tighten all bolts evenly.
- Drift head of bolts with hammer to seat shoulder of bolt head.
- Re-tighten bolts evenly to specified torque.
  - **3/8" bolts torque to 30 ft. lb.**
  - **7/16 bolts Grade 8 torque to 70 ft. lb.**



Part Number S29140

## IMPORTANT

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



Part Number S25962

# Operation

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## General Guidelines

The result obtained from the Morris Magnum III chisel plow 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.
- 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
- Avoid sharp turns. Turns sharp enough to cause the inside shovels of the unit to reverse direction are not recommended. This may cause the seed boots to plug.



**TAKE SAFETY SERIOUSLY.**

**Do Not Take Needless Chances!**

## 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.



**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. Wet spots  
can be dangerous  
when working with  
electrical equipment.**



# Maintenance

## Tighten Bolts

- Before operating the machine.
- 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.



**Tire replacement requires trained personnel and proper equipment.**

Tire Specifications		
SIZE	LOAD RANGE	PRESSURE
9.5L x 15SL	6 ply rating	32 P.S.I.
9.5L x 15FI	D	60 P.S.I.
11L x 15FI	D	60 P.S.I.

## 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.

### 2. Gauge Wheel Castor Pivot

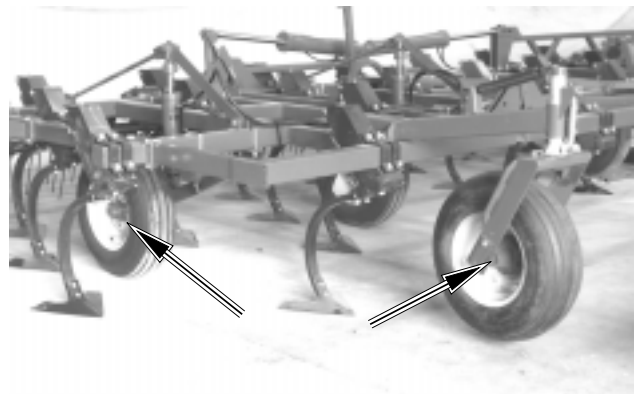
- Grease every 100 hours.

### 3. Stroke Control Collars

- Clean and Grease threads at end of season.



**Gauge Wheel Castor Pivot**



**Hubs**



**Stroke Control Collars**



# Maintenance

## Trip Maintenance - Continued

### 755 LH Trip

#### Bushing Replacement

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

- Tighten spring retaining bolt (20) enough to take the pressure off spring assembly.
- Remove cotter pin (31) from trip-rocker pivot pin (16) and remove pin.
- Remove spring assembly. The trip-rocker pivot bushings (14) can be replaced at this point.
- The spring assembly may be dismantled at this point if required by unscrewing the spring retaining bolt (20).

**Note: Bolt is 12 1/2" long.**

- Remove shank from casting (2).
- Remove retaining bolt (18) from trip-casting pivot pin (17).
- Remove pivot pin (17) from casting (2).
- Push front of casting down and slide casting out the front of trip body. The trip-casting pivot bushings can be replaced at this point.

**Note: Ensure the spring plug ends are aligned when reassembling the spring assembly.**

Reverse the above procedure to reassemble trip. Loosen spring retaining bolt 1/2" to apply pressure on spring assembly.

#### Compression Straps

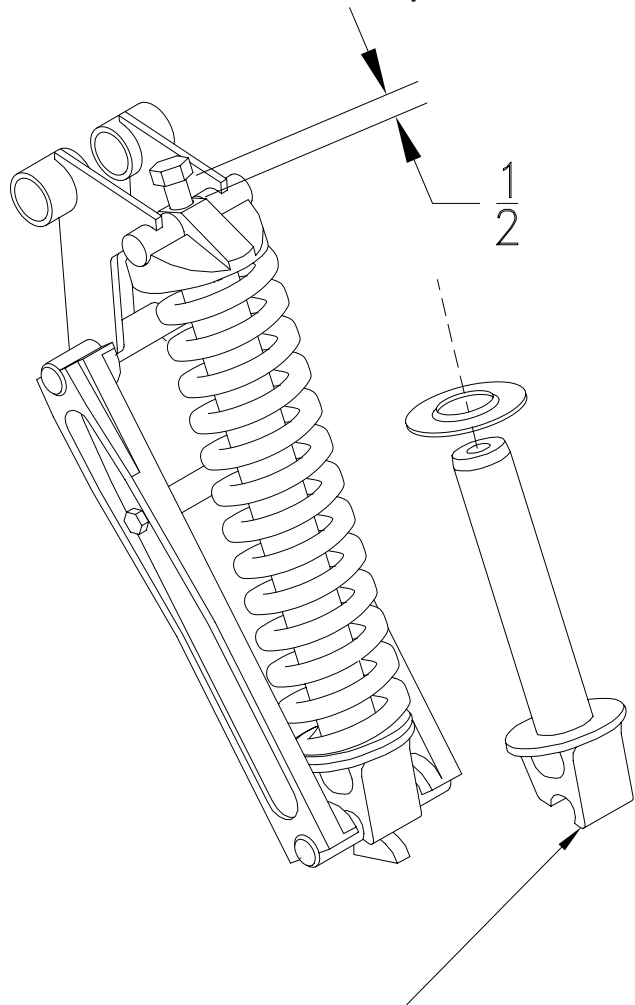
In the event the compression straps need replacing, use the following procedure.

- Tighten spring retaining bolt (20) enough to take the pressure off spring assembly.
- Remove retaining bolt (19) from connecting straps.
- Remove compression straps (5) from spring assembly by sliding outward of pins.

Reverse the above procedure to reassemble trip. Loosen spring retaining bolt 1/2" to apply pressure on spring assembly.

**Important: Do not remove spring retaining bolt with trip rocker still pinned into trip body.**

**Note: Spring retaining bolt must have a clearance of 1/2" once trip is reassembled.**



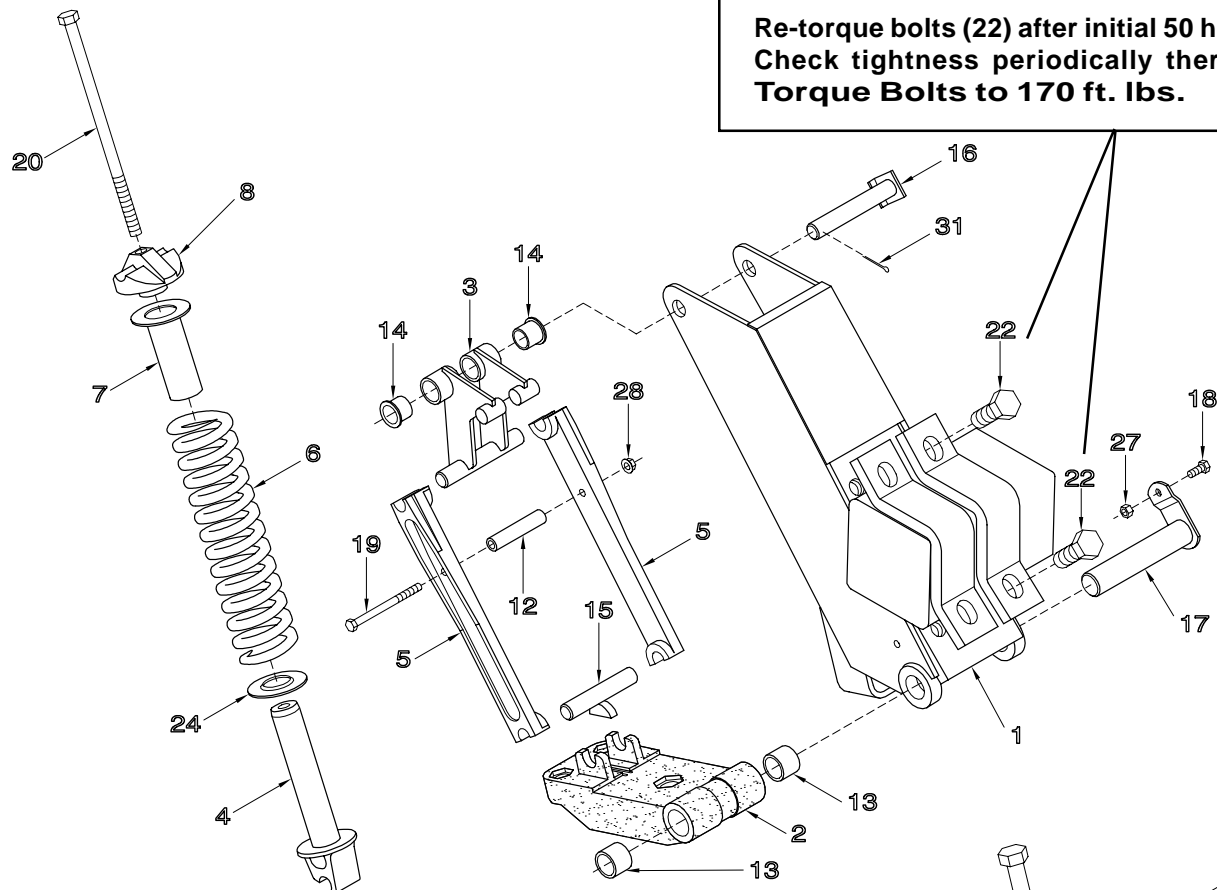
**Note: Mount Longer lip of plug end to the front.**

## Trip Maintenance - Continued

### LH 755 Trip Assembly

## IMPORTANT

Re-torque bolts (22) after initial 50 hours.  
Check tightness periodically thereafter.  
Torque Bolts to 170 ft. lbs.

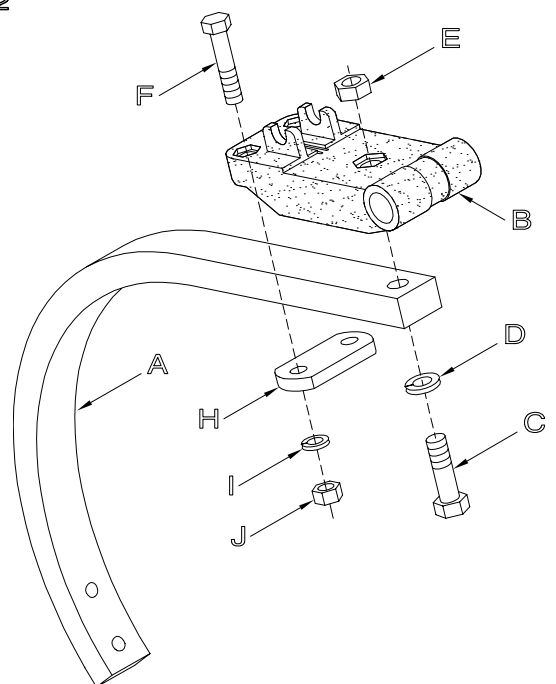


### Shank Replacement

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.

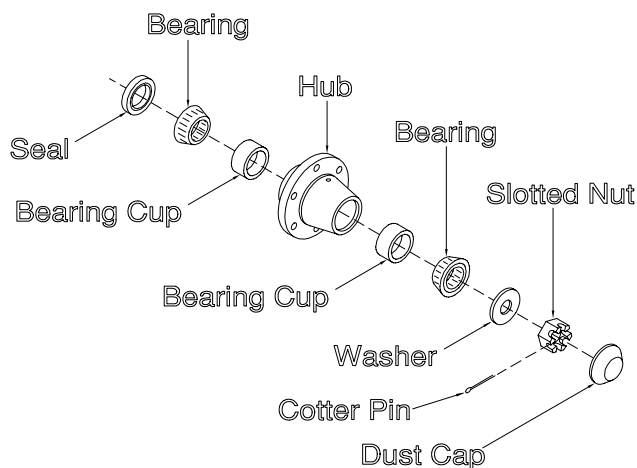
**Note:** Retaining strap bolts (F) must be installed as shown to prevent interference with connecting straps.



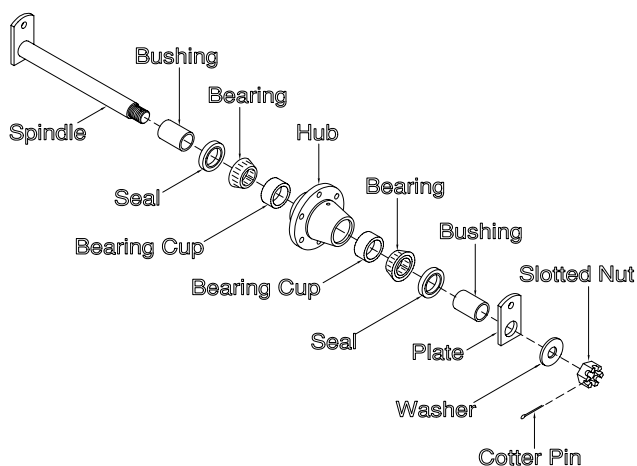
# Maintenance

## Wheel Bearings

- Lower the cultivator 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.



**Frame Wheels**



**Gauge Wheels**

## Hydraulics

Refer to Section 1 regarding hydraulic safety.

- 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 seal tape on all NPT hydraulic joints. **Do not use Teflon tape on JIC 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.

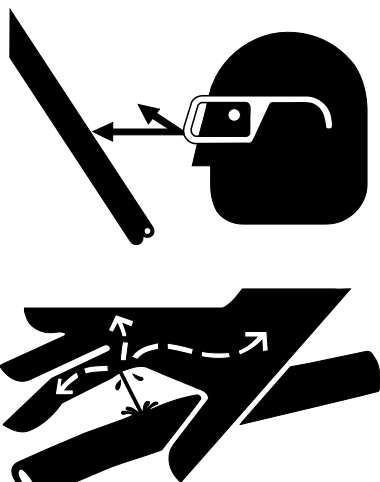


Contact your nearest Dealer for genuine repair parts. Dealers carry ample stocks and are backed by the manufacture and regional associations.



**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.

# Maintenance

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## Notes

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## 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 colars.
- 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 Lubricating Section).
- Tighten all bolts to proper specifications (Refer to Bolt Torque Chart).
- 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.



**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

# Storage

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## Cylinder Shaft Protection

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

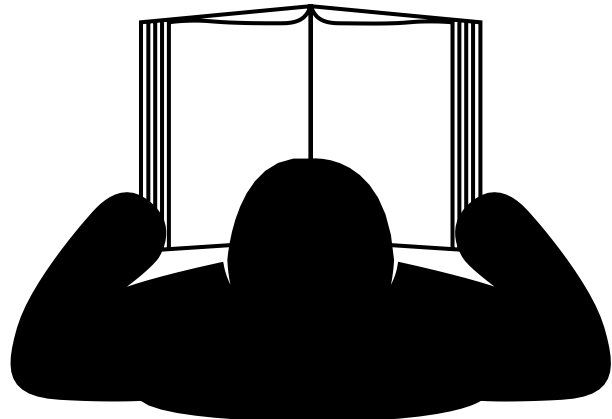
- Position the equipment as it will be stored, and identify all the exposed portions of the chrome plated shafts.
- Clean dirt and dust from the exposed portions of the shafting using a dry cloth or a cloth which has been dampened with an appropriate solvent.
- Prepare a mixture of 60% oil-based rust 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.



**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).



# Troubleshooting

Problem	Cause	Correction
Machine not operating straight.	Not levelled.	Refer to Operation Section on levelling.
		Rephase cylinders.
		Check tire pressure.
Lack of penetration.	Not levelled.	Refer to Operation Section on levelling.
	Sweeps worn.	Replacement necessary.
	Sweep angle.	755 Stem requires 50 degree tools.
Sweeps 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.	Cylinder linkage binding.
Wings not lowering.	Transport pins installed.	Remove pins.
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

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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.
	Internal Leaks.	Raise the machine and level off. Run the machine at operating depth for 50 feet. Stop with machine in ground and mark cylinder shafts with felt marker. run at operating depth, observing the cylinder movement and direction. The leaking cylinder will normally be the first in the series to move.
	Low oil level.	Fill tractor reservoir.
	Hydraulics clogged.	Replace filter.
	Depth control plungers not fully closed/retracted.	Adjust depth stop to ensure <b>both</b> plungers close.
	O-ring on cartridge on valve damaged.	Replace cartridge on rear depth stop valve.
Tire damage.	Load Sensing Systems create a void in the cylinders	Install C15975 restrictor valve on return line. See Service Bulletin #194.
	Sweeps too close to tires.	Check shank spacing.



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