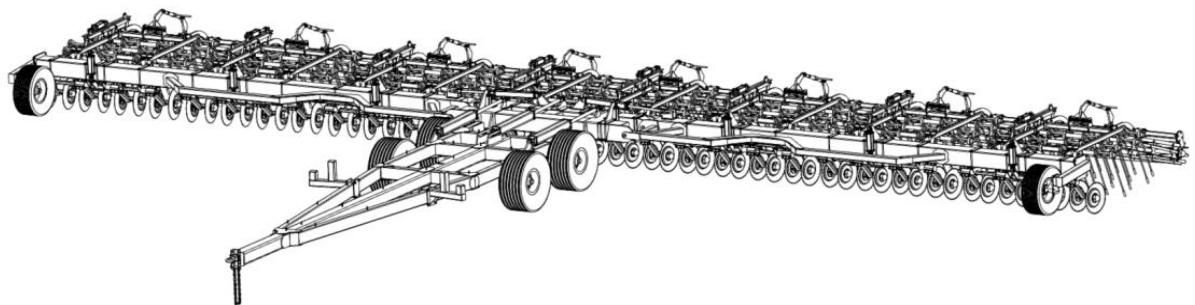




Forward Fold Coulter Harrow



Operator's Manual

2016

FORWARD

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Preface

This Operator and Parts Manual contains information pertaining to the operation, maintenance and adjustments of your Gates Manufacturing product. To obtain the maximum service, read the manual provided thoroughly. Your Gates Manufacturing product is designed to give you years of satisfaction. Taking the time to protect it against rust, wear and by replacing worn parts will add longer life and trade-in value to your product.

Disclaimer

Gates Manufacturing, Inc.'s policy is to improve and develop our products on a continuing basis. We reserve the right to make changes or add improvements at anytime without incurring any obligation to make such changes on machines previously sold.

Gates Manufacturing, Inc. recommends that operators READ and UNDERSTAND the Operator's Manual before using the machine and should review the machine's Operator's Manual annually.

Contact Information

Gates Manufacturing, Inc.
8708 33rd Ave. NW
Lansford, ND 58750

Phone: 701.784.5434
Fax: 701.784.5444
Email: info@gatesmfg.net

www.gatesmfg.net

Owner Registration Information

Bring this information when ordering parts.

Name_____

Size_____

Address_____

Serial Number_____

City_____

State/Prov._____

Date Purchased_____

Mail Code_____

Dealer_____

Gates Manufacturing, Inc. warrants its new, unused agricultural equipment, to be free of defects in material and workmanship, when properly assembled, at time of delivery to the first retail purchaser.

Basic Warranty Repair Period

Gates will repair or replace, at its option, without charge for parts any Gates Manufactured part that is found to be defective for a period of two years. Return of the defective part will be the responsibility of the customer to the dealer or Gates Manufacturing. It is the dealer's responsibility to hold the part for inspection by Gates Manufacturing.

Replacement parts are warranted for a period of one year from date of purchase, providing the bill of sale accompanies warranty claim.

Labor is covered during the first year of warranty only, and at a reasonable rate to be determined by Gates Manufacturing, Inc. Labor during the second year is not covered.

Exceptions to this Warranty

In no event shall the owner be entitled to recover for incidental, special or consequential damages such as, but not limited to; loss of profit or revenue, inconvenience of cost of rental of replacement equipment.

Hydraulic hose will be one warranty only.

Blades and springs will be one year warranty only prorated by wear subject to Gates Manufacturing appraisal.

Tires and cylinders will be the manufacturers responsibility.

The buyer of a Serial Numbered Gates product must be reported to Gates Manufacturing, Inc. by the dealer to initiate warranty.

Use of Gates Manufacturing products for rental units will be warranted for a one year period only.

Mileage and travel time.

Hydraulic Oil.

Repair, maintenance, and service items not related to defects.

- Loss or damage during shipment.
- Failure resulting from lack of or improper maintenance.
- Damage caused by operator abuse, negligence or improper operation.
- Damage due to accidents.

Gates® Manufacturing, Inc.
Lansford, ND 58750

Gates Coulter Harrow Features

The Gates Magnum Coulter Harrow is designed for residue management, fertilizer incorporation, seedbed preparation, and post-seeding operations. Its design lends itself to work excellent in wet conditions, accommodate air delivery applications and perform at high working speeds of 6-10 mph.

The Gates Magnum Coulter Harrow features 20" diameter boron coulter blades that are fixed at 7 degrees and spaced 12" apart on quick-change, dual-end coulter axles. The coulter arms are rubber torsion mounted, allowing for excellent flotation over rocks and obstacles. The torsion arms are mounted on a hydraulic rock-shaft allowing for precise gang height adjustments.

The individual harrow sections are 6', 8' and 10' in width and feature 4 or 5 bars, spaced 16" apart. The harrow tines are 5/8" in diameter and 30" long. Harrow Tines can be purchased with a carbide tip which provides excellent wear resistance. Average tine spacing is 3" for the 4 bar sections and 2.4" for the 5 bar sections. Each harrow section is mounted solid to the drawbar. This helps to eliminate section bounce and also provides more harrow down pressure. Tine angle is hydraulically controlled, allowing for precise on-the-go adjustment. The down pressure of each harrow section can also be adjusted by tightening the tension spring on the section.

The final stage of the Gates Magnum Coulter Harrow is the flat bar rolling basket. The baskets are mounted directly to the individual harrow sections and provide an excellent field finish.

The Gates Magnum Coulter Harrow is available in varying widths from 24' to 84'.

Safety Information



This safety alert symbol is used to denote potential danger and that care should be taken to prevent bodily injury. When you see this symbol it means: ATTENTION! BECOME ALERT! and/or YOUR SAFETY IS INVOLVED!

WARNING: Safe practices must be followed when assembling this equipment. All personnel involved must:



- Read and understand the instructions and manuals for this machine.
- Be instructed in the safe use of tools and all lifting devices involved in the assembly of this equipment.
- Clear the area of all personnel not involved in the assembly of this machine.

General Safety Practices

1. READ and UNDERSTAND the Operator's Manual before using any equipment. Review at least annually thereafter.
2. VERIFY all safety devices and shields are in place before using any equipment.
3. KEEP hands, feet, hair and clothing away from moving parts.
4. STOP engine, place all controls in neutral, set parking brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting or maintaining.
5. BE CAREFUL when working around high pressure hydraulic system.
6. DO NOT ALLOW RIDERS.
7. NEVER allow anyone unfamiliar, untrained or complacent operate the implement.
8. ESCAPING FLUID HAZARD: Escaping hydraulic fluid under pressure can penetrate the skin causing serious injury. Relieve pressure before disconnecting the hydraulic lines.
 - Check/tighten all connections BEFORE applying pressure
 - Use a piece of cardboard or paper to search for leaks.
 - NEVER use your hand.
 - IF ANY fluid is injected into the skin, seek immediate attention.
1. ONLY TOW at a safe speed do not exceed speeds higher than 20 mph (32 km/h). Use caution when making corners and meeting traffic.
2. ALWAYS use a safety chain between tractor drawbar and implement hitch when transporting on public roads.
3. ALWAYS use transport locks when transporting on public roads.
4. BE SURE implement hitch is securely fastened to hitch equipped with hammer strap on large tractor before operating hydraulics.
5. COMPLY with local lighting, marking and oversize regulations when transporting on highways.
6. FREQUENTLY check for traffic from rear, especially during turns.
7. BE CERTAIN tractor weight is equal to or greater than Coulter Harrow weight.
8. ALWAYS be certain that no one is behind or around implement before moving.
9. BE SURE no upward pressure is exerted on tractor by Coulter Harrow tongue before disconnecting from tractor.
10. NEVER subject the implement to steep sides/grades while in transport position

Safety During Transportation

SAFETY

Safety During Servicing

1. SHUT DOWN TRACTOR ENGINE remove key from tractor ignition and be certain all moving parts have stopped before servicing Coulter Harrow.
2. DO NOT OVERINFLATE tires. NEVER lean over tire while inflating it.
3. ALWAYS USE proper mounting procedures when mounting a tire to wheel or rim. A tire not seated properly may explode when being inflated causing injury or death.
4. ONLY service Coulter Harrow when in full field position.

Safety Decals



Indicates an immediate hazardous situation that will result in death or serious injury. The color associated with Danger is RED.



Indicates a potentially hazardous situation that could result in death or serious injury. The color associated with Warning is ORANGE.



Indicates a potentially hazardous situation that may result in minor or moderate injury. It may also be used to alert against unsafe practices. The color associated with Caution is YELLOW.



The Notice decals and statements in this manual are to inform the operator of the correct fluids, or operational practices for this machine. Failure to follow these notices will result in damage to the machine. The color associated with Notice is BLUE.

1. Keep safety signs clean and legible at all times.
2. Replace safety signs that are missing or have become illegible.
3. Replaced parts that displayed a safety sign should also display the current sign.
4. Safety signs are available from your dealer parts department or the factory.
4. Remove the smallest portion of the split backing paper.
5. Align the sign over the specified area and carefully press the small portion with the exposed sticky backing in place.
6. Slowly peel back the remaining paper and carefully smooth the remaining portion of the sign in place.
7. Small air pockets can be pierced with a pin and smoothed out using the piece of sign backing paper.

How to install safety signs:

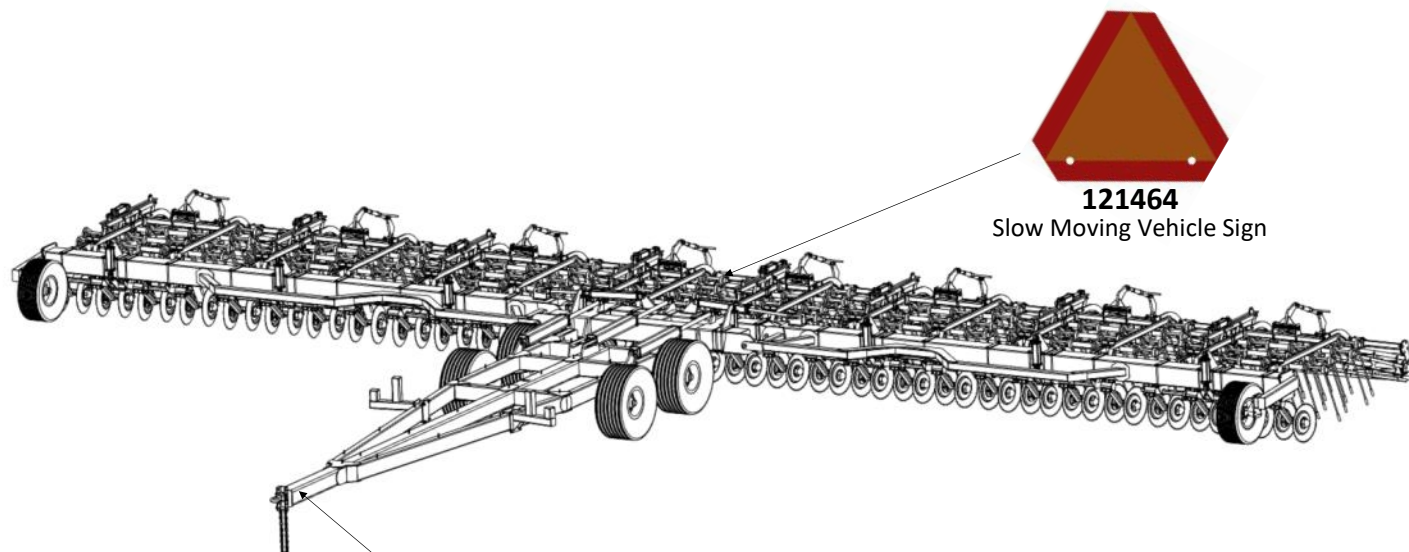
1. Be sure that the installation area is clean and dry.
2. Be sure the temperature is above 50°F (10°C).
3. Decide on the exact position before removing the backing paper.

Safety Decal Location

The types of safety signs and locations on the equipment are shown in following the illustration. Familiarize yourself with the various safety signs, the type of WARNING and the area or particular function related to that area, that requires your SAFETY AWARENESS.

IMPORTANT: If Safety Signs have been damaged, removed, become illegible or parts replaced without safety signs, new signs must be applied. New safety signs are available from your authorized dealer.

Safety Decals



121464
Slow Moving Vehicle Sign



⚠ DANGER

BE CERTAIN NO UPWARD PRESSURE IS EXERTED ON TRACTOR HITCH BY DRAWBAR TONGUE TO PREVENT DRAWBAR HITCH FROM RISING ABRUPTLY. NEVER disconnect tractor from drawbar while in field position with the harrows raised off the ground.

FAILURE TO FOLLOW THESE INSTRUCTIONS WILL RESULT IN SERIOUS INJURY OR DEATH

121478

⚠ WARNING

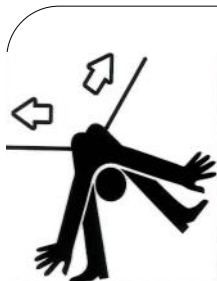


HIGH-PRESSURE FLUID HAZARD

To prevent serious injury or death:

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

121474



⚠ DANGER

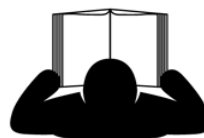
CABLE HAZARD

Never attempt to release a snagged boom draw cable while the cable fold arm is in the air and the wings are unfolded. The spring loaded draw cable can be safely cleared only when the drawbar is in full transport position (booms folded back).

FAILURE TO FOLLOW THESE INSTRUCTIONS WILL RESULT IN SERIOUS INJURY OR DEATH.

121479

⚠ WARNING



To Prevent Serious Injury or Death

- Avoid unsafe operation or maintenance.
- Do not operate or work on this machine without reading and understanding the operator's manual.
- If manual is lost, contact your nearest dealer for a new manual.

121473

Tractor Connection

NOTE: Only tow at safe speeds. Use caution when making corners or meeting traffic.

Turn on flashing warning lights when traveling on public roads except where such use is prohibited by law.

To prevent accidental disconnection, use a safety chain between tractor and implement when transporting on public roads.

Ensure that a Slow Moving Vehicle (SMV) sign is at the rear of the implement in clear view of overtaking traffic.

Lock tractor drawbar in center position, be sure hammer strap is properly secured on the tractor drawbar.

Using the jack supplied, adjust the height of the implement tongue to the approximate clevis opening height of the tractor drawbar. The Coulter Harrow drawbar should be level when hooked to the tractor. This is important for proper fold arm operation.

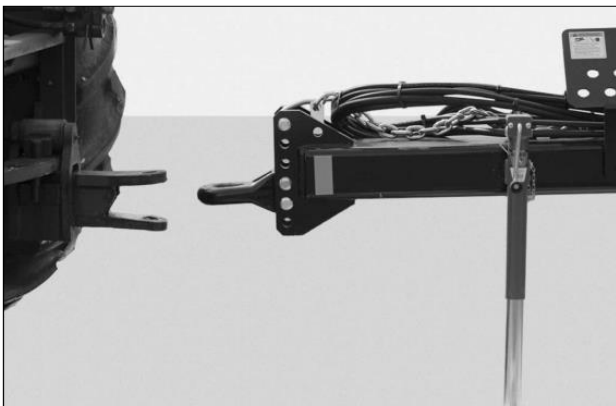


Figure 1 Back tractor until holes of both hitches align.

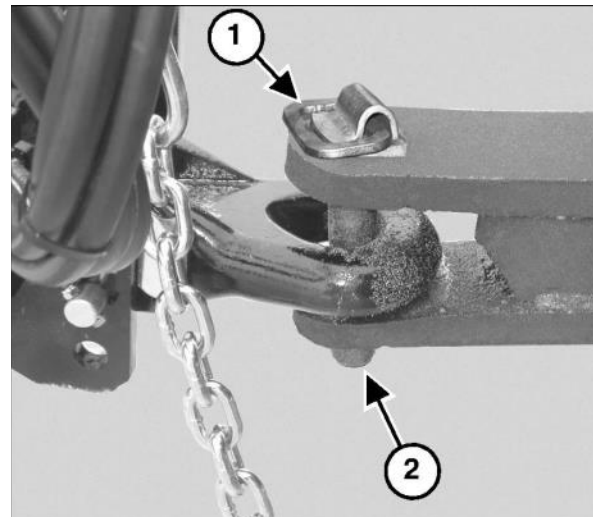


Figure 2 Attach implement hitch to tractor hitch with a draw pin (Item 1) locked in place with a hair or D-ring pin (Item 2).



CAUTION: Use caution when backing tractor up to implement hitch. Always have all persons in clear view before proceeding to back up. Always take tractor out of gear and set park brake before anyone goes behind tractor to insert drawbar spin.



CAUTION: Do not lower implement with the jack in the down position while attached to the tractor hitch or structural damage will result.

Tractor Connection Continued



Figure 3 Install safety chain to tractor hitch. Be sure safety lock is in the magnified position.

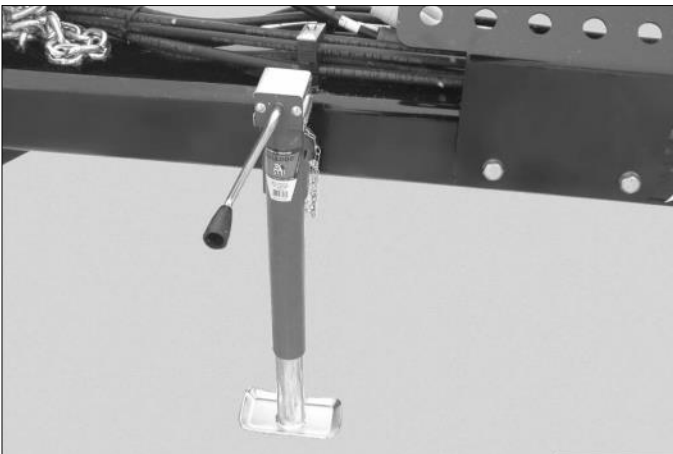


Figure 4 Lower the drawbar to release pressure from the jack.

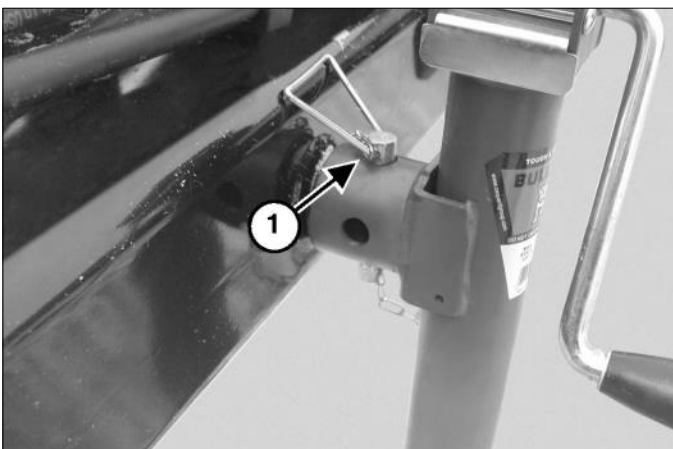


Figure 5 Remove the retainer pin (Item 1).

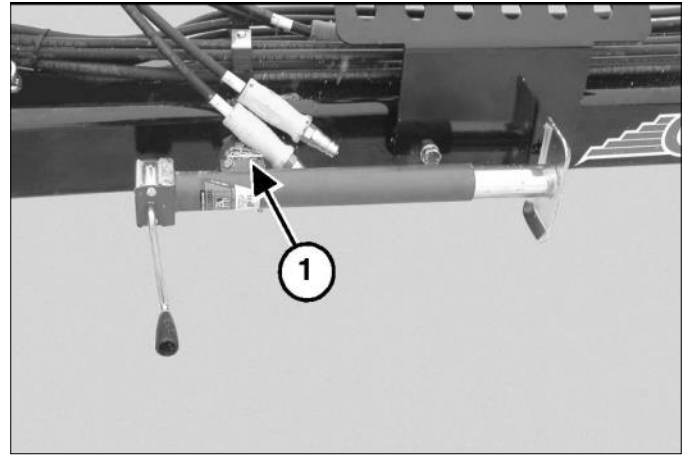


Figure 6 Rotate the jack to the storage position and install the retainer pin (item 1).

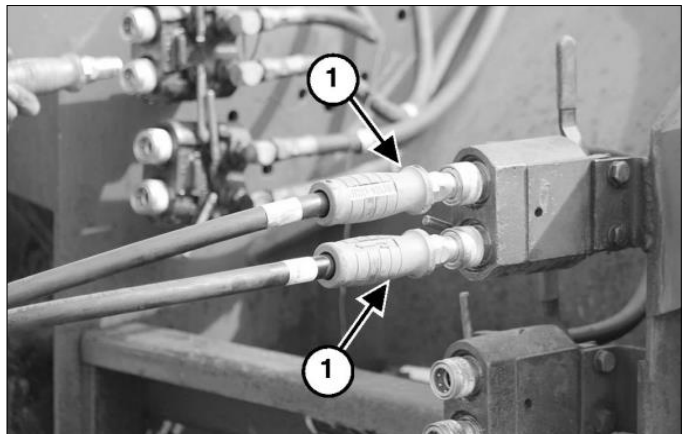


Figure 7 Connect the implement hydraulic lines to tractor hydraulic circuit. The hoses ends are color coded according to function as listed on the cart on the hose storage bracket.

NOTE: Be sure the hydraulic hose ends on the implement and female hydraulic couplers on the tractor are clean before connecting hydraulics.



CAUTION: Escaping hydraulic fluid under pressure can penetrate the skin causing serious injury. Relieve pressure before disconnecting the hydraulic lines. Check/Tighten all connections BEFORE applying pressure. Use a piece of cardboard or paper to search for leaks. NEVER use your hand. IF ANY fluid is injected into the skin seek immediate medical attention.

Disconnecting Coulter Harrow from Tractor



CAUTION: Before unhooking, be sure no upward pressure is exerted on the tractor hitch by the drawbar tongue as this may allow the hitch to upend abruptly. Failure to follow these instructions may result in serious injury or death.



CAUTION: Always make sure pressure is relieved from hydraulic circuits before servicing or disconnecting from hydraulic couplers. Failure to do so may result in hydraulic fluid being injected into the skin which may result in gangrene.

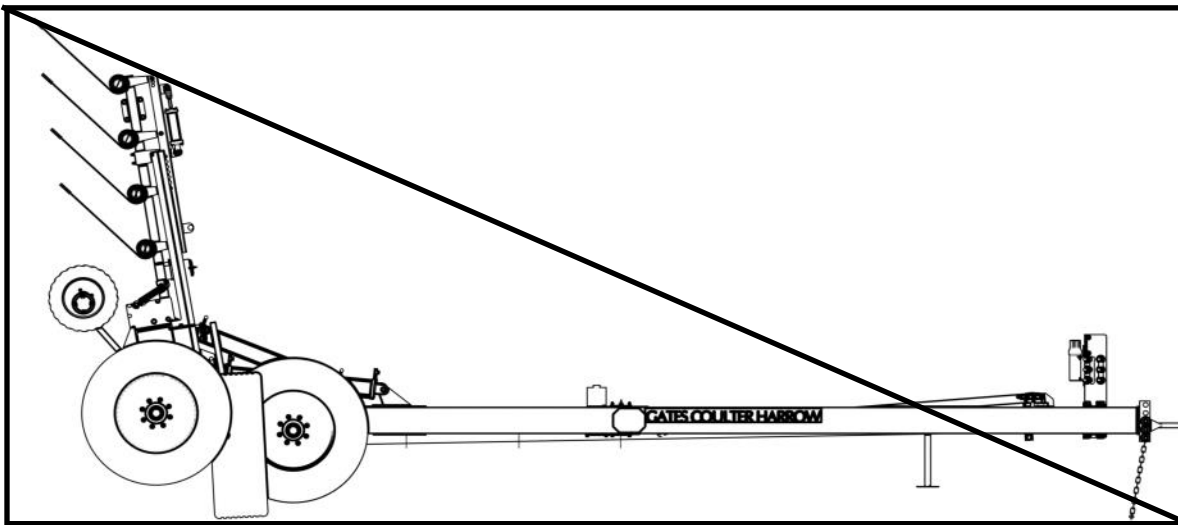
Disconnecting in Transport Position

1. Park the Coulter Harrow on level ground.
2. Position Coulter Harrow in transport position. Wings should be resting on cradles.
3. Relieve oil pressure from hydraulic circuit and disconnect hydraulic hoses.
4. Remove pin from drawbar tongue and carefully drive away.

Disconnecting in Field Position



CAUTION: Never attempt to disconnect Coulter Harrow drawbar with the wings raised in field position. Extreme upward pressure is exerted on the tractor hitch by the drawbar tongue in this position. Disconnecting in this position will allow the hitch to upend abruptly. Failure to follow these instructions could result in serious injury or death.



1. Park the Coulter Harrow on level ground.
2. Extend main frame hydraulic cylinders.
3. Transfer jack from stored position. Extend the jack until upward pressure on tractor hitch is relieved. Additional blocking under the base of each jack may be necessary to provide adequate support.
4. Relieve oil pressure from hydraulic circuit and disconnect hydraulic hoses.
5. Remove pin from drawbar tongue and carefully drive away.

Unfolding the Coulter Harrow

Transport to Field Position



CAUTION: Stand clear of harrow drawbar when wings are being raised or lowered. Hydraulic or mechanical failure may result in rapid uncontrolled wing movement. Failure to follow these instructions may result in serious injury or death.



CAUTION: Check for overhead high voltage power lines.

1. Extend the Main Frame cylinders enough to raise the wings off the cradles.
2. Unfold the wings until they are fully extended.
3. Finish extending the Main Frame cylinders while driving forward to set the harrows tines.
4. Retract gang cylinders to lower Coulter Blades to the ground.

Folding the Coulter Harrow



Field to Transport Position

CAUTION: Stand clear of harrow drawbar when wings are being raised or lowered. Hydraulic or mechanical failure may result in rapid uncontrolled wing movement. Failure to follow these instructions may result in serious injury or death.



CAUTION: Check for overhead high voltage power lines.

1. Extend gang cylinders to lift Coulter Blades off the ground.
2. To tilt up the back bar and wings, retract the Main Frame cylinders until the sections are almost vertical.
3. Fold the wings inward, keeping main frame tilted back enough for wings to clear wing cradles.
4. Finish retracting the Main Frame cylinders to set the wings in cradles.

Suggested Maintenance Schedule

Before Initial Operation

- ⇒ After receiving or assembling your Coulter Harrow, it is a good practice to double check the entire machine so that all bolts are securely tightened.
- ⇒ Make sure all grease fittings are in place and greased properly.
- ⇒ Inflate all lift tires to the recommended inflation pressure of 120 PSI and check wheel bolts.

After First Two Hours of Operation

- ⇒ Re-check wheel bolts for tightness.
- ⇒ Check coulter hubs for any side play in the bearings and tighten the spindle nuts if necessary.

Daily Maintenance (10 Hours)

- ⇒ Grease joints, 2 fittings per joint.
- ⇒ Visually inspect wheel bolts for looseness. Torque after first 10 hours of operation and frequently thereafter. Torque all wheel bolts to 110 ft-lbs.
- ⇒ Visually inspect coulter hubs for looseness. Tighten if necessary.
- ⇒ Remove mud from between wheels and the frame which may dry and cut into the side wall of the tires.
- ⇒ Check for loose fasteners and tighten securely.
- ⇒ Check for loose linkages on all harrow sections and tighten securely.

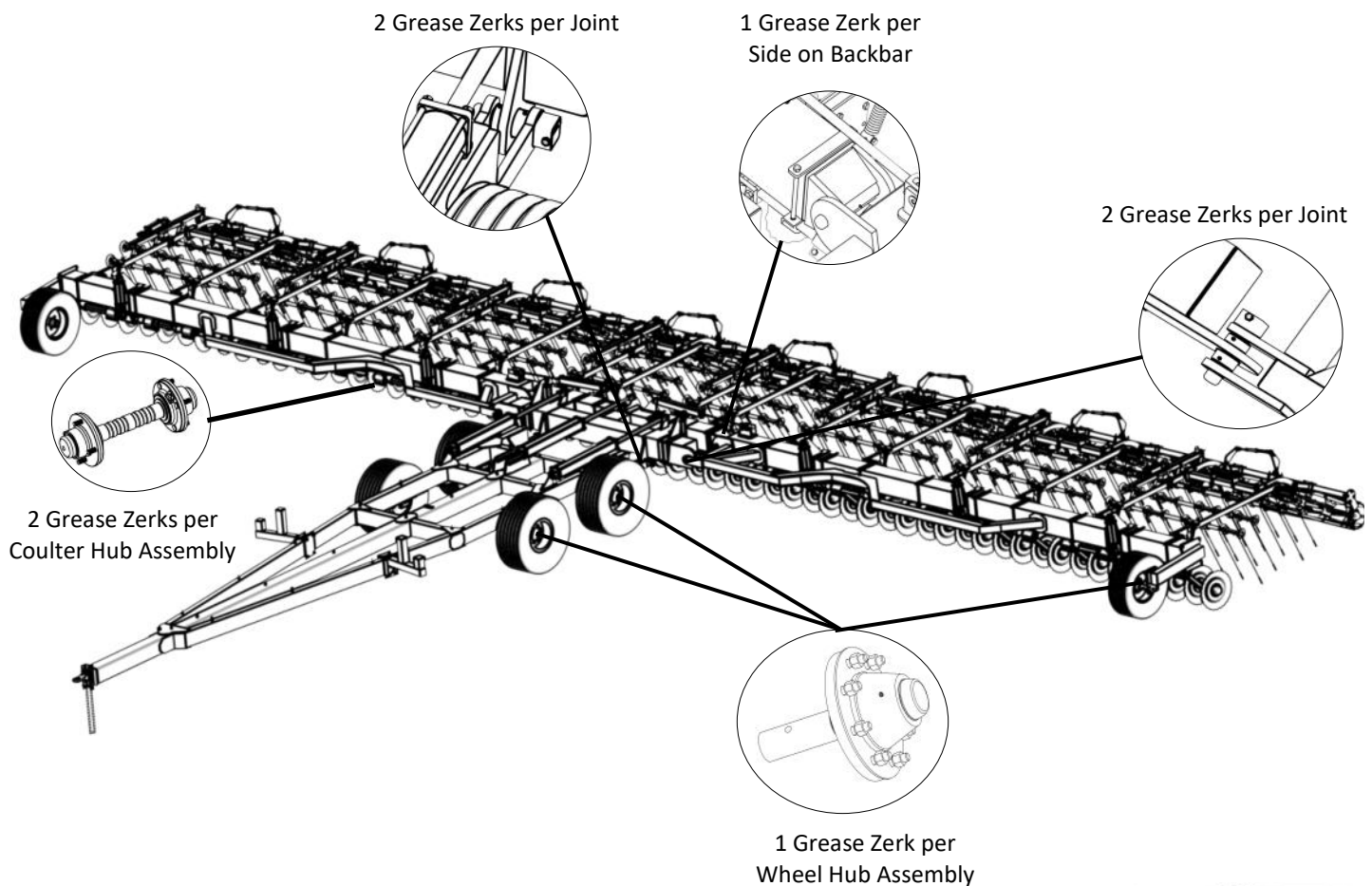
Seasonal Maintenance (100 Hours)

- ⇒ Grease wheel and coulter hubs and inspect for looseness.
- ⇒ Grease joints.
- ⇒ Check and adjust tire pressure. Recommended tire inflation is 120 PSI.

Maintenance Prior to Storage

- ⇒ Perform or check items listed under daily and seasonal maintenance.
- ⇒ Clean entire machine. Remove all dirt and excessive grease from implement.
- ⇒ Check over thoroughly for damaged or worn parts, cracked or broken blades and loose bolts.
- ⇒ Wheel bearings should be cleaned and repacked each year.
- ⇒ Grease all zerks on implement.
- ⇒ Block up to remove weight from tires.
- ⇒ If implement is lowered to the ground, place boards under blades.
- ⇒ Disconnect rods and fully retract the cylinders to prevent rusting of shafts and subsequent seal damage. If left extended, coat rods with grease to prevent corrosion. Remove grease prior to retracting cylinders.
- ⇒ Clean and place a protective coating of heavy oil or grease on earth working parts to prevent rusting.
- ⇒ Touch-up any spots where paint has been scratched or worn off.

General Grease Zerk Locations



Field Operation

Trash Clearance

To clear trash during field operation, simply lay tines back to fullest extent. If trash is still an issue, raise the main frame just enough to allow trash clearance.



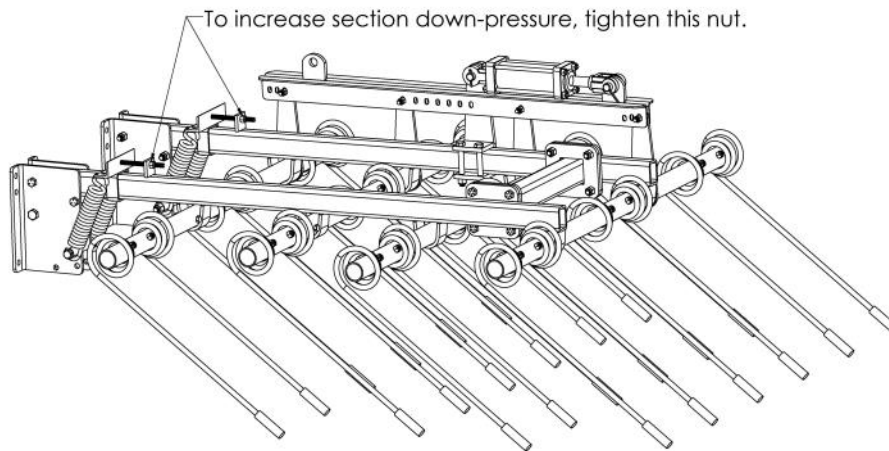
NOTE: When raising the main frame to clear trash, be sure not to lift the frame too far so the transport wheels touch the ground and skid. Failure to do so can cause damage to the drawbar.

Cornering

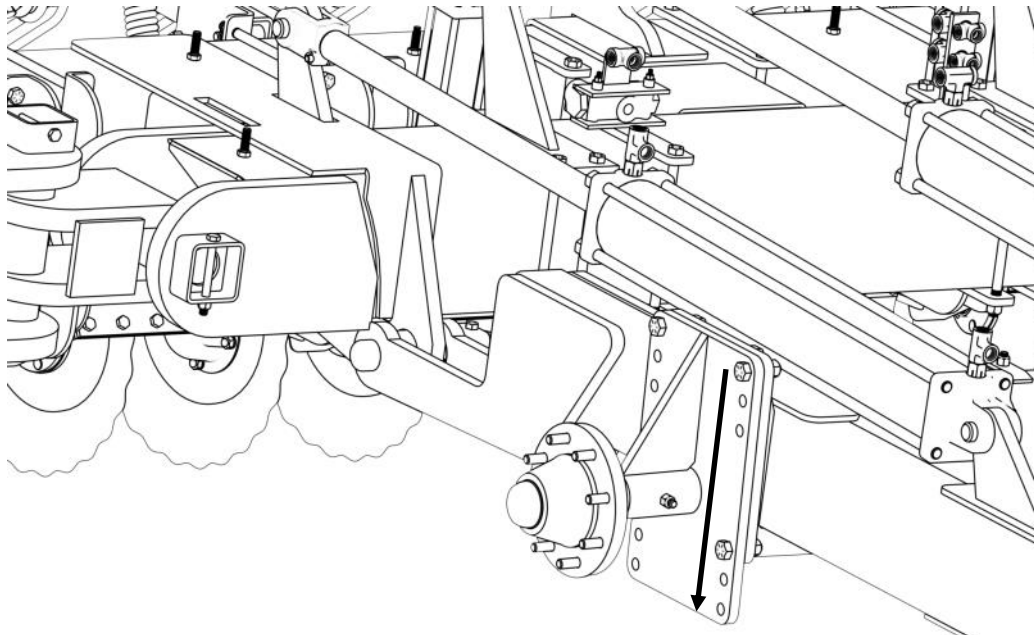
Turns sharp enough to stop the inside boom wheel are often routine. However, turns sharp enough to cause excessive skidding of the inside wheel and/or reverse rotation are not recommended.

Harrow Down Pressure Adjustment

1. Four adjustable down pressure springs are featured on each harrow section. These down pressure springs help reduce harrow bounce in the field and provide additional down pressure for increased soil agitation.
2. To adjust the down pressure on the harrow section, turn the 1/2" nut in the appropriate direction for increasing or decreasing down pressure.
3. Repeat procedures for all harrow lift arms.

**Coulter Harrow Height Adjustment**

The Coulter Harrow height can be adjusted in 2" increments by vertically moving the stub axle plates up or down, depending on the desired height.



Coulter Harrow Specifications

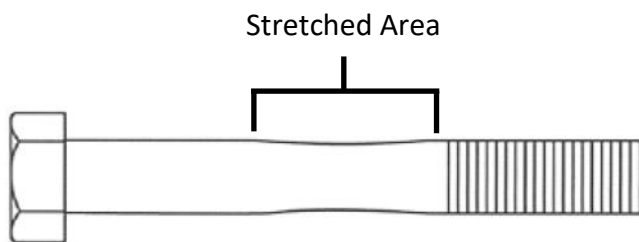
Feature	Specifications
Available Widths	24' to 60'
Frame	10" x 10" x 1/4" HSS
Gangs	Single Row Blades with Hydraulic Rockshaft Height Adjustment
Gang Mounting	Rubber Torsion Mounted Arm (2 Coulters per Arm)
Coulter Blades	20" Diameter Notched
	20" Diameter Reversed Crimp Soil Rebel
Coulter Spacing	12" Spacing with fixed 7° Coulter Axle Angle
Harrow Section	2, 3 or 4 bar, 5/8" x 30" Spring Coil Tines
Tine Angle Adjust	Manual or Hydraulic (Optional)
Tine Wear Tips	Chrome Carbide (Optional)
Wheels	8-bolt; 8,000 pound hubs with grease fitting
Tires	14Lx16.1
Power Requirements	Approximate Engine HP* Requirement: 4 to 8 HP per foot *Engine horsepower required will vary upon soil conditions, tillage depth and operating speed
Optional Equipment	Optional Rolling Baskets

Rear Fold Coulter Harrow	Dimension	
	With baskets	Without baskets
Transport Height	13 feet	10 feet
Transport Width	13 feet	13 feet

DO NOT use these values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only. Check tightness of fasteners periodically.

BOLT SIZE	WRENCH SIZE	GRADE 5		GRADE 8	
		lb-ft	N-m	lb-ft	N-m
1/4"	7/16" or 3/8"	7	9.5	12	17
5/16"	1/2"	15	20	25	34
3/8"	9/16"	30	41	45	61
7/16"	5/8" or 11/16"	45	61	70	95
1/2"	3/4"	70	95	105	142
9/16" Wheel Bolts	7/8"	170	231	-	-
5/8"	15/16"	170	231	210	285
3/4"	1-1/16"* or 1-1/8"*	250	339	375	509
7/8"	1-5/16"	350	475	600	814
1"	1-1/2"	450	610	880	1193
1-1/4"	1-7/8"	500	678	-	-
1-1/2"	2-3/4"	570	773	-	-
2"	3-1/8"	1200	1627	-	-

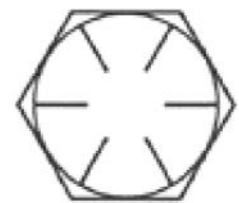
*Nylon Lock Nuts



Over Torqued Bolt



SAE Grade 5



SAE Grade
8

