

W. & A. MANUFACTURING CO.



SPECIALIZED FARM EQUIPMENT

PHONE 870/534-7420 • P.O. BOX 5238 • 1810 OHIO ST. • PINE BLUFF, ARKANSAS 71611



DELTA PLOW OWNER'S MANUAL

Revised 11.20



This manual is applicable to: Delta Plow

Record the model number and serial number of your Delta Plow along with date purchased:

MODEL NUMBER _____

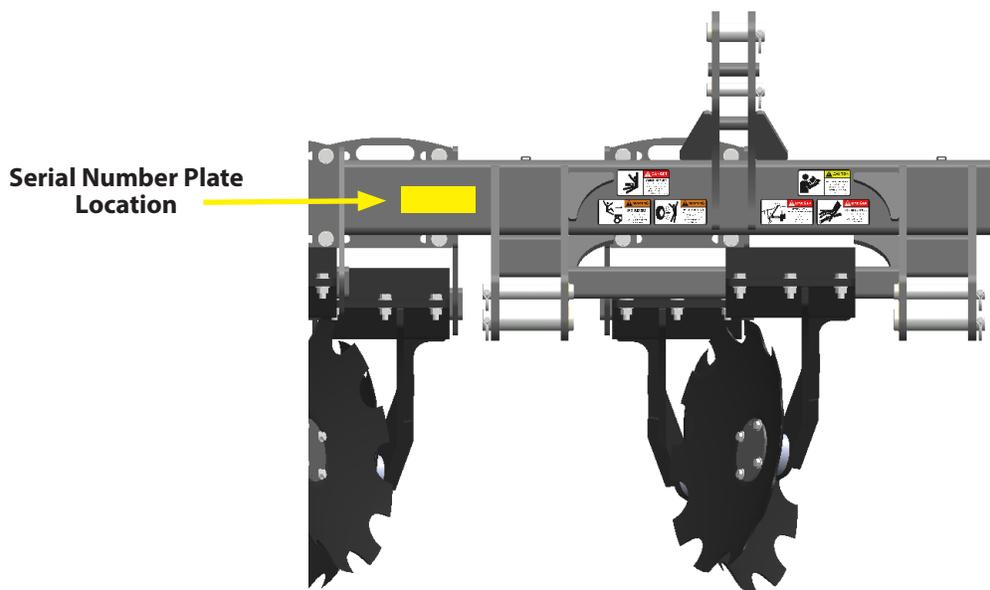
SERIAL NUMBER _____

DATE PURCHASED _____

SERIAL NUMBER

The serial number plate is located on the frame to be readily available. It is suggested that your serial number and purchase date also be recorded above.

The serial number provides important information about your Delta Plow and may be required to obtain the correct replacement part. Always provide the model number and serial number to your W&A Manufacturing dealer when ordering parts or anytime correspondence is made with W&A Manufacturing.





TO THE DEALER

Factory to Farm™ service includes full factory assembly. Dealer is responsible for field readiness.

PRE-DELIVERY CHECKLIST

Use the following checklist after your Delta Plow is completely assembled. Check off each item as it is found satisfactory or after proper adjustment is made.

- All working parts move freely, bolts are tight, and cotter pins are spread.
- Check for oil leaks and proper hydraulic operation.
- Hydraulic hoses correctly routed to prevent damage.
- Inflate tires to specified air pressure and torque wheel lug bolts and lug nuts as specified in the manual.
- All safety decals correctly located and legible. Replace if damaged.
- All reflective decals and SMV sign correctly located and visible when the disc is in transport position.
- Safety/warning lights correctly installed and working properly.
- Paint all parts scratched during shipment or assembly.
- All safety lockup devices on the Delta Plow are correctly located.

The Delta Plow has been thoroughly checked and to the best of my knowledge is ready for delivery to the customer.

(Signature Of Set-Up Person/Dealer Name/Date)

NAME _____ DELIVERY DATE _____

STREET ADDRESS _____ MODEL NO. _____ SERIAL NO. _____

CITY, STATE/PROVINCE _____ DEALER NAME _____

ZIP/POSTAL CODE _____ DEALER NO. _____



DELIVERY CHECKLIST

Use the following checklist after your Delta Plow is delivered as a reminder of very important information which should be conveyed to retail customer/end user. Check off each item as it is fully explained.

- Life expectancy of this or any other machine is dependent on regular lubrication as directed in the Owner's Manual.
- All applicable safety precautions.
- Along with retail customer/end user, check reflective decals and SMV sign are clearly visible with Delta Plow in transport position and attached to tractor. Check safety/warning lights are in working condition. Tell retail customer/end user to check federal, state/provincial, and local regulations before towing or transporting on a road or highway.
- Give Owner's Manual and all Instruction Sheets to retail customer/end user and explain all operating adjustments.
- Read warranty to retail customer/end user.
- Complete Warranty and Delivery Report form.

To the best of my knowledge, this machine has been delivered ready for field use and customer has been fully informed as to proper care and operation.

(Signature Of Set-Up Person/Dealer Name/Date)

AFTER DELIVERY CHECKLIST

The following is a list of items we suggest to check during the first season of use of the equipment.

- Check Delta Plow performance with retail customer/end user.
- Review importance of proper maintenance and adherence to all safety precautions with retail customer/end user.
- Check for parts that may need to be adjusted or replaced.
- Check all safety decals, reflective decals, and SMV sign are correctly located as shown in the Parts Guide and that decals are legible. Replace if damaged or missing.
- Check safety/warning lights are properly.

(Signature Of Set-Up Person/Dealer Name/Date)

All registrations must be submitted to W&A Manufacturing within 5 business days of delivery. Retain a copy of this form for auditing purposes.

All registrations must be submitted to:

W&A Manufacturing
PO Box 5238
Pine Bluff, AR



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GENERAL INFORMATION



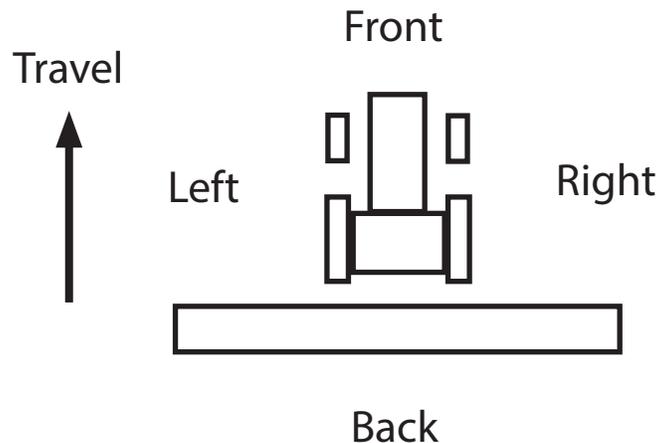
HOW TO USE THIS MANUAL

This manual is divided into sections. The first section contains a Table of Contents, General Information, and a Part Number Index. The remaining sections divide the machine into assemblies and sub-assemblies which illustrate and list all parts.

W&A Manufacturing parts in this manual are specially designed for this machine and should be replaced with W&A Manufacturing parts only.

Information in this manual was current at time of printing. However, due to W&A Manufacturing's ongoing product improvement, production changes may cause your machine to appear slightly different in detail. W&A Manufacturing reserves the right to change specifications or design without notice and without incurring obligation to install the same on machines previously manufactured.

Right-hand and left-hand as used in this manual are determined by facing the direction the machine will travel while in use.



MANUAL REPLACEMENT INFORMATION

Replacement manuals are available. Call the W&A Manufacturing Main Office at 308.708.8185, or download a printable PDF from our website, www.wamfgco.com.

MANUAL REVISIONS

When this manual is revised, the modification date is printed on the front cover and on the revised page(s).

TOUCH-UP PAINT

Repaint parts where paint is worn or scratched to prevent rust. Aerosol touch-up paint is available. To order, call W&A Manufacturing at 308.708.8185.



INTRODUCTION

Thank you for your purchase of a W&A Manufacturing Delta Plow. Putting your trust in our equipment is something we don't take lightly and are humbled that you chose W&A Manufacturing. Having designed all of our equipment with farmers like you in mind, we hope you enjoy years of productive use from it. Please read and understand this manual before operation.

WARRANTY INFORMATION

AGROdeviate LLC (AGROdeviate) warrants each W&A Manufacturing product it manufactures to be free from defects in material and workmanship for a period not to exceed one (1) year from the date of sale to the original owner. The warranty is valid provided written notice of the alleged defect is received by AGROdeviate during said period and within ten (10) working days after its discovery.

In addition, AGROdeviate warrants each TOOLBAR FRAMEWORK to be free from defects in material and workmanship for a period not to exceed three (3) years from the date of sale to the original owner. The warranty is valid providing written notice of the alleged defect is received by AGROdeviate during said period and within ten (10) working days after its discovery.

This warranty is subject to completion of Product Registration and submission to AGROdeviate. Warranty applies only if product is installed, operated, and maintained according to product manual and instructions. Warranty will be void if the product has been subject to misuse, misapplication, neglect, collision with obstruction, or alteration.

For products, parts, and components NOT manufactured by AGROdeviate, the warranty obligations of AGROdeviate shall be limited to the Original Equipment Manufacturers' warranty. Tires on AGROdeviate equipment are warranted through the respective tire manufacturer and their network of dealers.

All returns must be pre-approved by AGROdeviate and authorization issued before return. All returns must include a copy of the original invoice in order to be processed. Any returns without a copy of the original invoice will not be eligible to receive credit.

If determined that the product is defective in material and/or workmanship, the necessary parts will be replaced and/or repaired. All warranty repair or labor is to be performed by an AGROdeviate authorized party. AGROdeviate obligation under this warranty shall be limited to repairing or replacing parts deemed defective. Warranty does not cover travel expenses. AGROdeviate will bear no other costs including loss, incurred labor, rental fees, nor other.

All returns shall be pre-paid. If warranty is approved by AGROdeviate, return freight will be credited.

This warranty by AGROdeviate LLC is expressly in lieu of all other warranties, expressed or implied, including warranty of merchantability and fitness for use. We neither assume, nor authorize, any other entity to accept for us any liability relating to the sale of our products.



SAFETY

TAKE NOTE! THIS SAFETY ALERT SYMBOL FOUND THROUGHOUT THIS MANUAL IS USED TO CALL YOUR ATTENTION TO INSTRUCTIONS INVOLVING YOUR PERSONAL SAFETY AND THE SAFETY OF OTHERS. FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN INJURY OR DEATH.



**THIS SYMBOL MEANS:
-ATTENTION!
-BECOME ALERT!
-YOUR SAFETY IS INVOLVED!**

SIGNAL WORDS:

Note the use of signal words DANGER, WARNING, and CAUTION with the safety messages. The appropriate signal word for each has been selected using the following guidelines:



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



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



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

If you have questions not answered in this manual, require additional copies, or the manual is damaged, please contact W&A Manufacturing, PO Box 5238, Pine Bluff, AR, 308.708.8185, or visit our website: www.wamfgco.com.



SAFETY... YOU CAN LIVE WITH IT!



EQUIPMENT SAFETY GUIDELINES

Safety of the operator is one of the main concerns in designing and developing a new piece of equipment. Designers and manufacturers build in as many safety features as possible. However, every year many accidents occur which could have been avoided by a few seconds of thought and a more careful approach to handling equipment. You, the operator, can avoid many accidents by observing the following precautions in this section. To avoid personal injury, study the following precautions and insist those working with you, or for you, follow them.

In order to provide a better view, certain photographs or illustrations in this manual may show an assembly with a safety shield removed. However, equipment should never be operated in this condition. Keep all shields in place. If shield removal becomes necessary for repairs, replace the shield prior to use.

Replace any CAUTION, WARNING, DANGER or instruction safety decal that is not readable or is missing. Location of such decals is indicated in this booklet.

Do not attempt to operate this equipment under the influence of drugs or alcohol.

Review the safety instructions with all users annually.

This equipment is dangerous to children and persons unfamiliar with its operation. The operator should be a responsible adult familiar with farm machinery and trained in this equipment's operations. Do not allow persons to operate or assemble the unit until they have read this manual and have developed an understanding of the safety precautions and how it works.

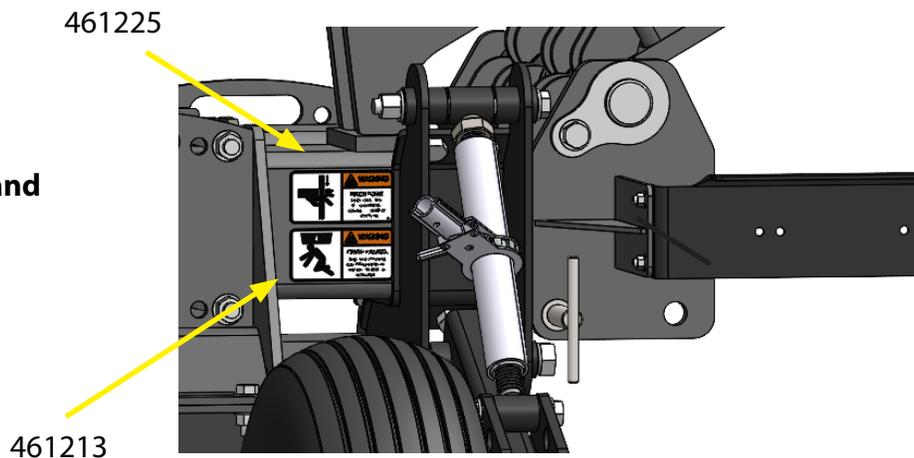
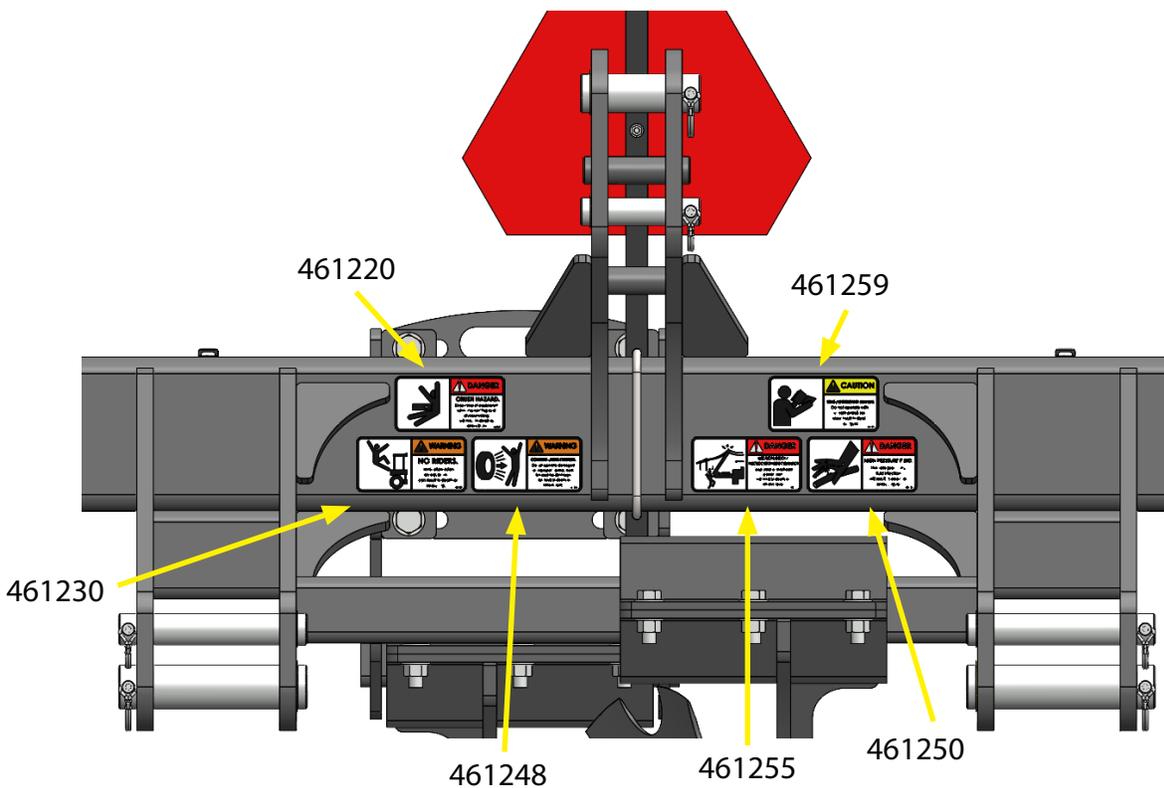
To prevent injury or death, use a tractor with a Rollover Protective Structure (ROPS). Do not paint over, remove or deface any safety signs or warning decals on your equipment. Observe all safety signs and practice the instructions on them.

Never exceed the limits of a piece of machinery. If its ability to do a job, or to do so safely, is in question - DON'T TRY IT.

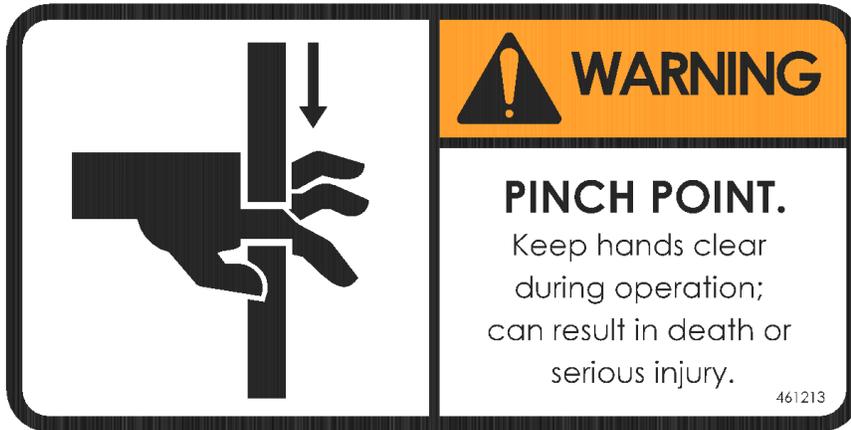


SAFETY SIGN LOCATIONS

These types of Safety Signs and locations on the equipment are shown in the illustrations below. Good safety requires that you familiarize yourself with the various Safety Signs, the type of warning and the area, or particular function related to that area, that require your SAFETY AWARENESS.



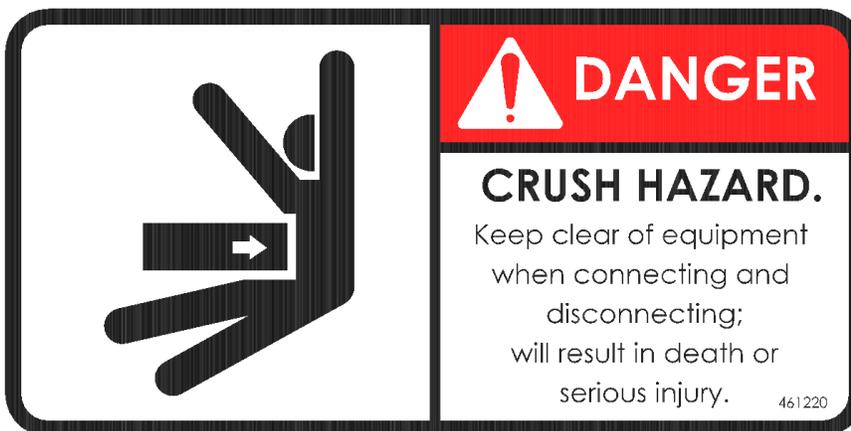
NOTE: LH/RH Safety Signs and locations are similar



461213

PINCH POINT - WARNING

- Keep extremities clear of equipment. Object(s) can move or shift; can result in death or serious injury.
- Hazards may include, but are not limited to, hinge mechanism movement, pin movement, row unit movement and shifting, accessory movement and shifting, etc.



461220

CRUSH HAZARD - WARNING

- Keep clear of moving and shifting equipment. Equipment movement area; will result in death or serious injury.
- Hazards may include, but are not limited to, connection and disconnection of equipment, unexpected equipment shifting, etc.



461225

CRUSH HAZARD - WARNING

- Keep clear of moving and shifting equipment. Equipment can move or shift; can result in death or serious injury.
- Hazards may include, but are not limited to, folding wing movement, raised equipment movement and shifting, etc.



461230

NO RIDERS - WARNING

- Never allow riders on equipment; can result in death or serious injury.
- Hazards may include, but are not limited to, falling from equipment, falling into equipment, injury while on equipment, etc.



461248

CONTENTS UNDER PRESSURE - WARNING

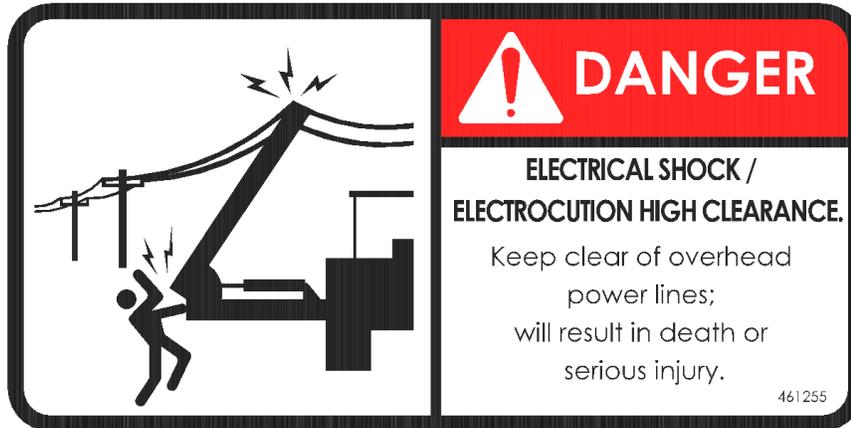
- Do not operate if damaged or improperly pressurized. Damaged or improperly pressurized components can discharge; can result in death or serious injury.
- Hazards may include, but are not limited to, damaged tire and/or rim, over pressurized tire, excessive tire wear, tire tears or punctures, ect.



461250

HIGH PRESSURE FLUID - DANGER

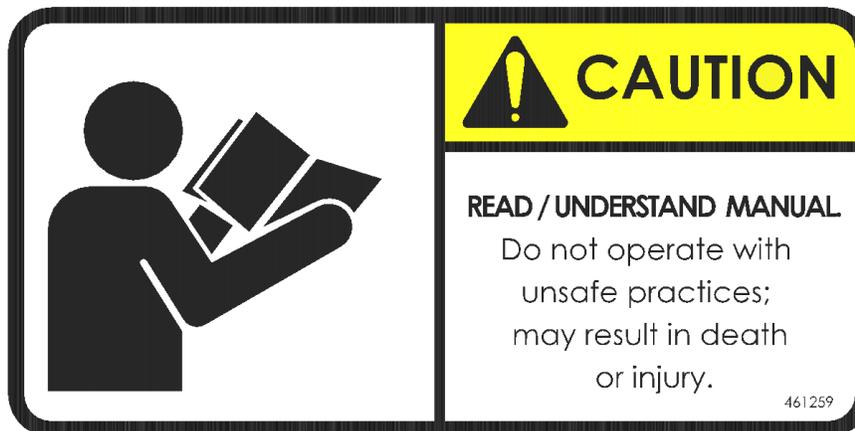
- Use safe practices. Fluid injection can occur; will result in death or serious injury.
- Hazards may include, but are not limited to, injury beyond the entry point, over pressurized components, damaged components, components with excessive wear, swollen components, ect.



461255

ELECTRICAL SHOCK/ELECTROCUTION HIGH-CLEARANCE DANGER

- Keep clear of overhead power lines, maintain 20-foot minimum distance. Electrical shock and/or electrocution can occur; will result in death or serious injury.
- Hazards may include, but are not limited to, high clearance equipment, low clearance power lines, lack of awareness of surroundings, etc.



461259

READ/UNDERSTAND MANUAL - CAUTION

- Do not operate without a complete understanding of the owner's manual. Do not operate with unsafe practices; may result in death or injury.
- Hazards may include, but are not limited to, compromising the safety of yourself and/or others, lack of awareness, damage to equipment, etc.



SAFETY SIGN CARE

- Keep safety signs clean and legible at all times.
- Replace safety signs that are missing or have become illegible.
- Replaced parts that displayed a safety sign should also display the current sign.
- Safety signs are available from Hawkins Ag.

HOW TO INSTALL SAFETY SIGNS

- Be sure that the installation area is clean and dry.
- Decide on the exact position before you remove the backing paper.
- Remove the smallest portion of the split backing paper.
- Align the decal over the specified area and carefully press the small portion with the exposed stick backing in place.
- Slowly peel back the remaining paper and carefully smooth the remaining portion of the decal in place.
- Small air pockets can be pierced with a pin and smoothed out using the piece of decal backing paper.

REMEMBER: If Safety Signs have been damaged, removed, become illegible or parts replaced without decals, new decals must be applied. New decals are available from W&A Manufacturing.

**W&A Manufacturing
PO Box 5238
Pine Bluff, AR 71611**

**308.708.8185
www.wamfgco.com**

PREPARATION & SET-UP



This section helps you prepare your tractor and Delta Plow for use. You must level the implement, hook up the implement hydraulics to the tractor, and check that the hydraulics have been bled.

POST-DELIVERY/SEASONAL SET-UP

On initial delivery, use with a new tractor, and seasonally check and as necessary, complete these items before continuing to the routine set-up items:

- Bleed hydraulic fold system (page 48)
- Check/Change Hitch Configuration
- Hitching Tractor to Implement
- Hydraulic Hose Hook-up
- Light Kit Guide and Relocation
- Electrical Hook-up
- Leveling the Implement

PRE-TILLAGE SET-UP

Complete this checklist before routine set-up:

- Read and understand important "Safety" information starting on page 9.
- Check that all working parts are moving freely, bolts are tight, and cotter pins are spread.
- Check that all grease fittings are in place and lubricated. See "Maintenance & Lube" on page 49.
- Check that all safety decals and reflectors are correctly located and legible. Replace if damaged. See "Safety Sign Locations" starting on page 13.

PREPARATION & SET-UP



CHECK/CHANGE HITCH CONFIGURATION

On initial delivery, use with a new tractor, and seasonally check and as necessary, complete these items before continuing to the routine set-up items:

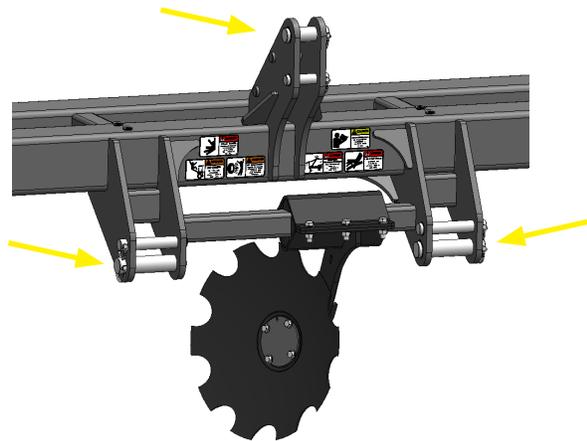
Choose a hitch option that is compatible with your tractor 3-point. The Delta Plow has two hitch configurations:

- Category 3
- Category 4

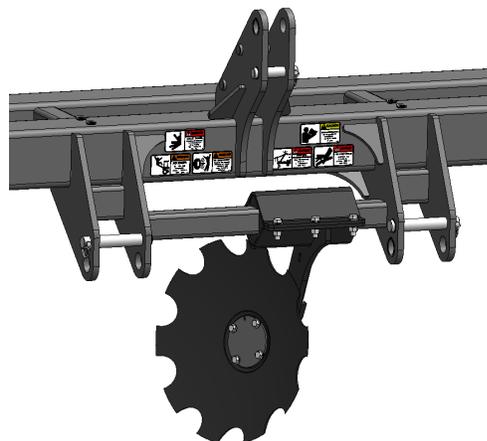
Changing between hitch categories requires removing pins at the implement hitch.

TO OPERATE AS CATEGORY 3

1. Remove and store the Category 4 pins shown below.



2. Once removed, the remaining pins are set to run the implement with a Category 3 hitch.



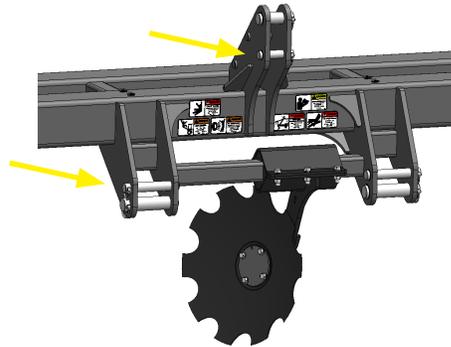
****SEE NEXT PAGE FOR CATEGORY 4 HITCH SET-UP****

PREPARATION & SET-UP

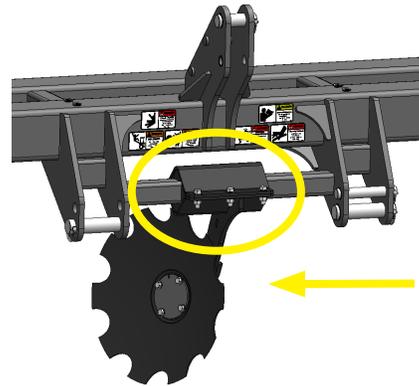


TO OPERATE AS CATEGORY 4

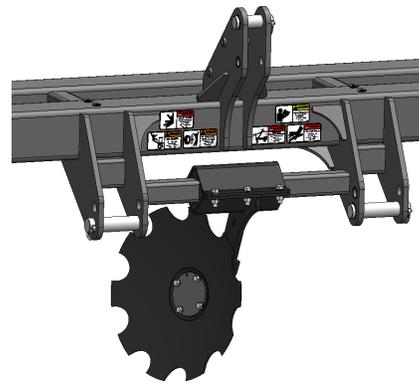
1. Remove top and lower Category 3 pins shown and store them.



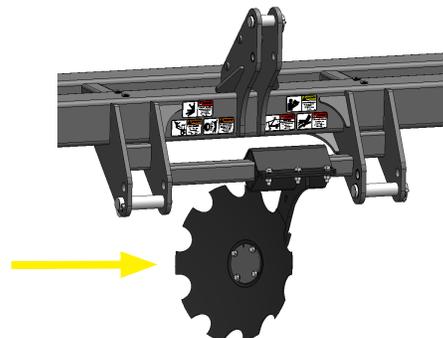
2. Loosen Hardware on Center Disk gang, but DO NOT remove. Mark edge of current location.



3. Slide row mount to allow clearance to remove final Category 3 pin and store.



4. After pin is removed, slide row back to its original position and tighten hardware. Once removed, the remaining pins are set to run the implement with a Category 4 hitch.



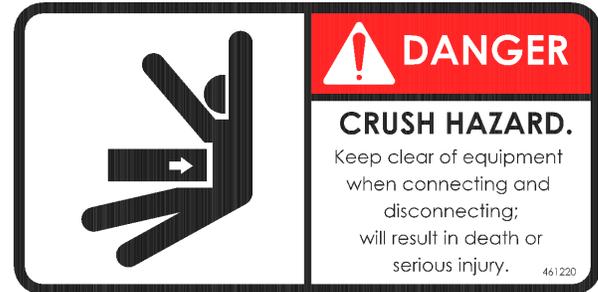
PREPARATION & SET-UP



HITCHING TRACTOR TO IMPLEMENT

On initial delivery, use with a new tractor, and seasonally check and as necessary, complete these items before continuing to the routine set-up items:

1. Connect the tractor 3-point lift arms to the lower hitch pins. If using a quick hitch, ensure that the pins lock securely.
2. Connect the top link to the upper hitch pin. Front-to-back leveling is performed in later steps.



461220

CRUSH HAZARD - WARNING

- Keep clear of moving and shifting equipment. Equipment movement area; will result in death or serious injury.
- Hazards may include, but are not limited to, connection and disconnection of equipment, unexpected equipment shifting, etc.



PREPARATION & SET-UP

HYDRAULIC HOSE HOOK-UP

The Delta Plow is equipped with independently controlled fold cylinders to individually fold the left and right wings.

This requires the use of two remote valves. Hoses at base end of cylinder will unfold machine. Rod end hoses will fold machine up.

1. Connect fold hoses for left wing into remote valve of choice.
2. Connect fold hoses for right wing into remote valve of choice.
- 3.
4. Check and make sure all hoses are tied up and secure before use.



461250

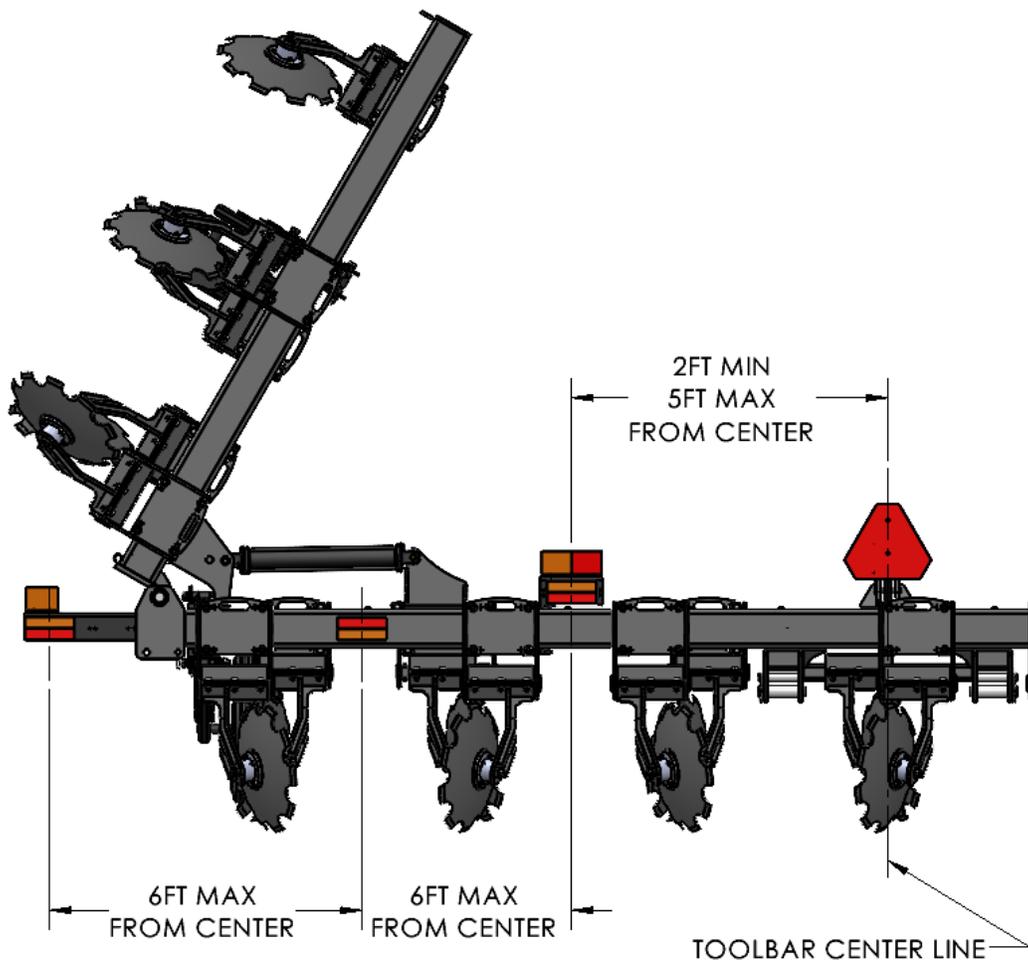
HIGH PRESSURE FLUID - DANGER

- Use safe practices. Fluid injection can occur; will result in death or serious injury.
- Hazards may include, but are not limited to, injury beyond the entry point, over pressurized components, damaged components, components with excessive wear, swollen components, ect.



LIGHT KIT GUIDE AND RELOCATION

The light kit is installed at the factory. However, due to shipping requirements and other circumstances, some positions are altered and SMV sign or lights may need relocated before use. Typically, the SMV sign is the only component that needs relocated; please check all components. Check that all forward-facing reflectors and lights are visible from the front and all rear-facing reflectors and lights are visible from the rear. Please refer to the depiction below for component locations.



PREPARATION & SET-UP



ELECTRICAL HOOK-UP

Lights are connected using a standard 7-pin connector. To connect, simply lift receptacle cover, align plug and insert. To disconnect, lift receptacle cover and remove plug. Once connected, check to make sure all lights are working properly. If lights are not working properly, contact your dealer to fix before transporting on public roadways.

7-pin Connector



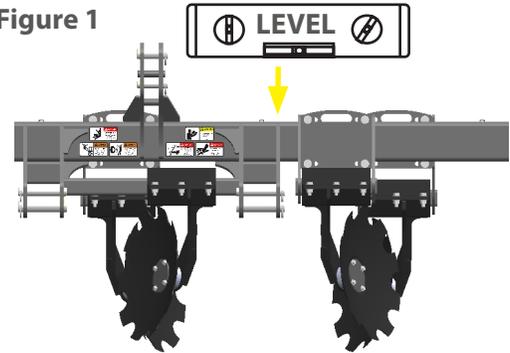


LEVELING THE IMPLEMENT

Center Frame L/R Leveling (Figure 1)

1. Hitch the Delta Plow to a tractor (page 22).
2. Raise the implement.
3. Adjust the tractor 2-point lift arms so that the center section tool bar is level.

Figure 1



Wing Leveling (Figure 2 & 3)

1. Remove wing lock pins from the lock position, and place in the non-locking position before folding the wings.
2. Check wing for level at the top of the tool bar.
3. Fold implement to access leveling bolts.
4. If wing is too high, tighten bolts in 1/4-1/2" turn increments, unfolding machine to re-check level. If wing is too low, loosen bolts in 1/4-1/2" turn increments, unfolding machine to re-check level.
5. Repeat process until wing is level.

Figure 2

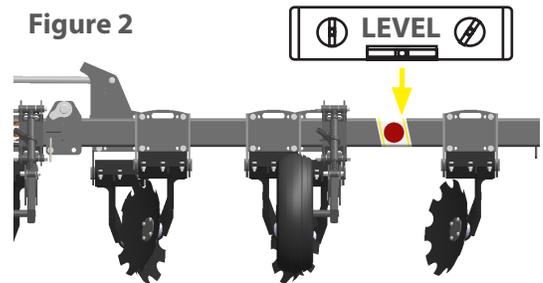
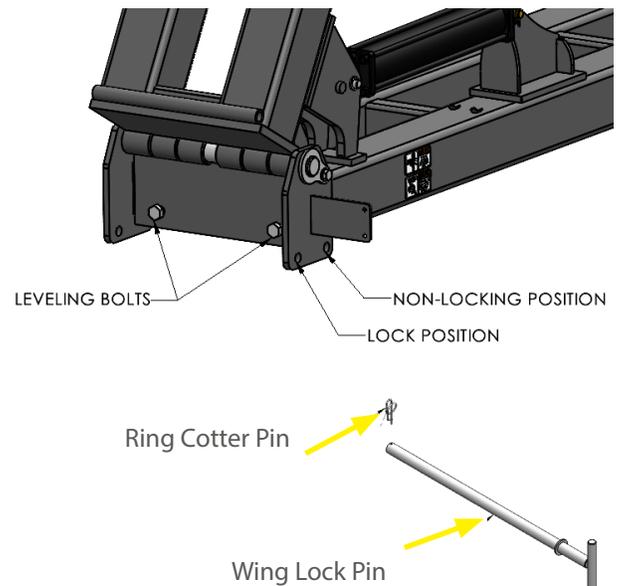


Figure 3



Front-to-Back Leveling

See "Leveling the Machine" on page 35. This adjustment needs to be completed in field conditions.



CRUSH HAZARD - WARNING

- Keep clear of moving and shifting equipment. Equipment can move or shift; can result in death or serious injury.
- Hazards may include, but are not limited to, folding wing movement, raised equipment movement and shifting, etc.



REMEMBER

Your best assurance against accidents is a careful and responsible operator. If there is any portion of this manual or function you do not understand, contact W&A Manufacturing.



BEFORE OPERATION

- Carefully study and understand this manual.
- Do not wear loose-fitting clothing which may catch in moving parts.
- Always wear protective clothing and substantial shoes.
- It is recommended that suitable eye protection be worn.
- The operator may come in contact with certain materials which may require specific safety equipment (ie: extremely dusty, molds, fungus, bulk fertilizers).
- Keep bolts tightened to specific torque listed on **Bolt Torque Chart**.
- Give the unit a visual inspection for any loose bolts, worn parts or cracked welds, and make necessary repairs. Follow the maintenance safety instructions included in this manual.
- Be sure that there are no tools lying on or near the equipment.
- Do not use the unit until you are sure that the area is clear, especially children and animals.
- Because it is possible that this equipment may be used in dry areas or in the presence of combustibles, special precautions should be taken to prevent fires and fire fighting equipment should be readily available.
- Don't hurry the learning process or take the unit for granted. Ease into it and become familiar with your new equipment.
- Practice operation of your equipment and its attachments. Completely familiarize yourself and other operators with its operation before using.



DURING OPERATION

- Keep hands, feet, and clothing clear of moving parts.
- Do not clean, lubricate or adjust your equipment while it is moving.
- Be especially observant of the operating area and terrain - watch for holes, rocks or other hidden hazards. Always inspect the area prior to operation.
- Periodically clear the equipment of brush, twigs or other materials to prevent buildup of dry combustible materials.
- Do not walk or work under raised components or attachments unless securely positioned and blocked.
- Keep all bystanders, pets and livestock clear of the work area.
- Never stand alongside of unit with engine running or attempt to start engine and/or operate machine while standing alongside of unit.
- As a precaution, always recheck the hardware on equipment following every 100 hours of operation. Correct all problems. Follow the maintenance safety procedures.



This section covers general operating procedures. Experience, machine familiarity, and the following information will lead to efficient operation and good working habits. Always operate farm machinery with safety in mind.

PRE-START CHECKLIST

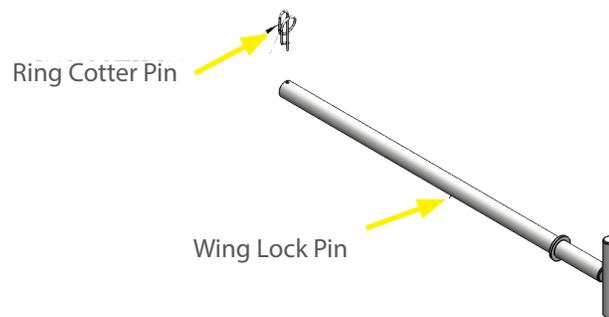
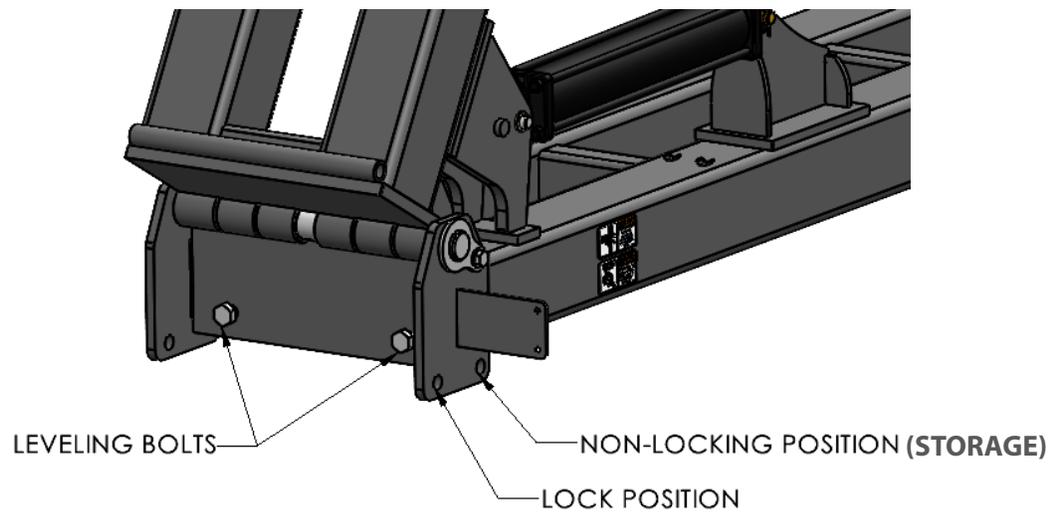
Perform the following steps before transporting the Delta Plow to the field.

- Carefully read "Important Safety Information" on page 9.
- Lubricate implement as indicated under "Maintenance & Lube" on page 47.
- Check all tires for proper inflation.
- Check all bolts, pins, and fasteners. Torque as shown in "Bolt Torque Chart" on page 50.
- Check implement for worn or damaged parts. Repair or replace parts before going to the field.
- Check hydraulic hoses, fittings, and cylinders for leaks. Repair or replace before going to the field.
- Perform all beginning-of-season and daily service items under "Maintenance & Lube" on page 48.



WING LOCK PINS

Remove the wing lock pins from the lock position and place in the non-locking position before folding the wing(s). To move wing lock pin position, pull ring cotter pin. Then, pull the pin out of the toolbar and reinsert it into the desired position. Insert the ring cotter pin.





FOLDING

Fold the implement for movements on public roads and between fields and narrow clearances. Do not use the folded configuration for parking or storage.

1. Hitch tractor (page 22).
2. Move to level ground. Be aware of vertical clearance needed to fold implement.
3. Put tractor in Park with parking brake engaged.
4. Verify that the wing lock pins are not installed in the lower lock holes (page 30).
5. Clear all persons from on or near the implement.
6. Use the tractor 3-point hitch to raise the implement slightly (so that the row units are off the ground).
7. Slowly move fold circuit lever(s) to retract cylinders. Observe the fold operation.
8. Wait for both wings to reach the fully folded position. Set tractor remote(s) to Neutral to hold at folded.



TIP OVER/CRUSHING HAZARD AND EQUIPMENT DAMAGE RISK:
Never unhitch a folded implement. A folded implement could topple backward or forward, causing serious injury or death and certain severe equipment damage. When unhitched, the implement is supported at the rear only by row unit tools and spring tension. Slopes, soft soils, and soils later softened by rain are particularly dangerous.



ELECTRICAL SHOCK/ELECTROCUTION HIGH-CLEARANCE DANGER:

- Keep clear of overhead power lines, maintain 20-foot minimum distance. Electrical shock and/or electrocution can occur; will result in death or serious injury.
- Hazards may include, but are not limited to, high clearance equipment, low clearance power lines, lack of awareness of surroundings, etc.



CRUSH HAZARD - WARNING:

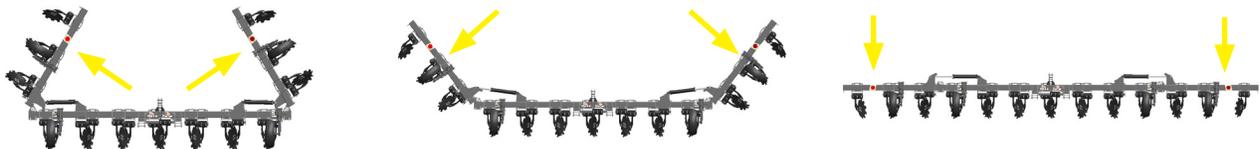
- Keep clear of moving and shifting equipment. Equipment can move or shift; can result in death or serious injury.
- Hazards may include, but are not limited to, folding wing movement, raised equipment movement and shifting, etc.



UNFOLDING

Unfold the implement for adjustments, field operations, maintenance, parking and storage.

1. Unless the implement was folded, with the currently hitched tractor, only a short time ago, check for evidence of oil leaks. Check the ground at hitch connections, hose fittings and under cylinders.
2. Be aware of vertical and horizontal clearances needed to unfold the implement.
3. Put tractor in Park with parking brake engaged.
4. Verify that the wing lock pins are not installed in the lower lock holes (page 30).
5. Clear all persons from on or near the implement.
6. Use the tractor 3-point hitch to raise the implement slightly (so that the row units are off the ground).
7. Slowly move fold circuit lever(s) to Extend cylinders. Observe the unfold operation.
8. Wait for both wings to reach the fully unfolded position. Set tractor remote(s) to Neutral to lock at unfolded.



TIP OVER/CRUSHING HAZARD AND EQUIPMENT DAMAGE RISK:

Never unhitch, park, or store a partially folded implement. A partially folded implement could topple backward or forward immediately or at a later time, causing serious injury or death and certain severe equipment damage. When unhitched, the implement is supported at the rear only by row unit tools and spring tension. Slopes, soft soils, and soils later softened by rain are particularly dangerous.



EQUIPMENT DAMAGE RISK:

Do not leave a partially folded implement lifted for extended periods of time. This places a needless unbalance load on the tractor's lower lift arms.



CRUSH HAZARD - WARNING

- Keep clear of moving and shifting equipment. Equipment can move or shift; can result in death or serious injury.
- Hazards may include, but are not limited to, folding wing movement, raised equipment movement and shifting, etc.



TRANSPORT CHECKLIST

Before transporting the implement, check the following items.

- Transport only with a tractor of proper size and adequate ballast.
- Hitch implement securely to tractor. See “Hitching Tractor to Implement” on page 14.
- Plug implement safety lights into tractor seven-pin connector.
- Make sure implement is folded properly. See “Folding” on page 31. Raise the implement for adequate ground clearance.
- Comply with all national, regional, and local safety laws when traveling on public roads.
- Travel with caution.



LOSS OF CONTROL HAZARD:

Ensure that the towing vehicle is adequate for the task. Using an inadequate tow vehicle is extremely unsafe, and can result in loss of control, serious injury and death. To reduce the hazard, use only a 3-point towing vehicle that is both rated for the implement load, and properly ballasted for the load.



ELECTRICAL SHOCK/ELECTROCUTION HIGH-CLEARANCE DANGER:

- Keep clear of overhead power lines, maintain 20-foot minimum distance. Electrical shock and/or electrocution can occur; will result in death or serious injury.
- Hazards may include, but are not limited to, high clearance equipment, low clearance power lines, lack of awareness of surroundings, etc.



BRAKING AND LOSS OF CONTROL HAZARD:

Do not exceed 20 mph (32km/h) when driving straight. Do not exceed 13 mph (21 km/h) in turns. The weight of the implement can cause under-steer, and the height of the implement is a tipping hazard.

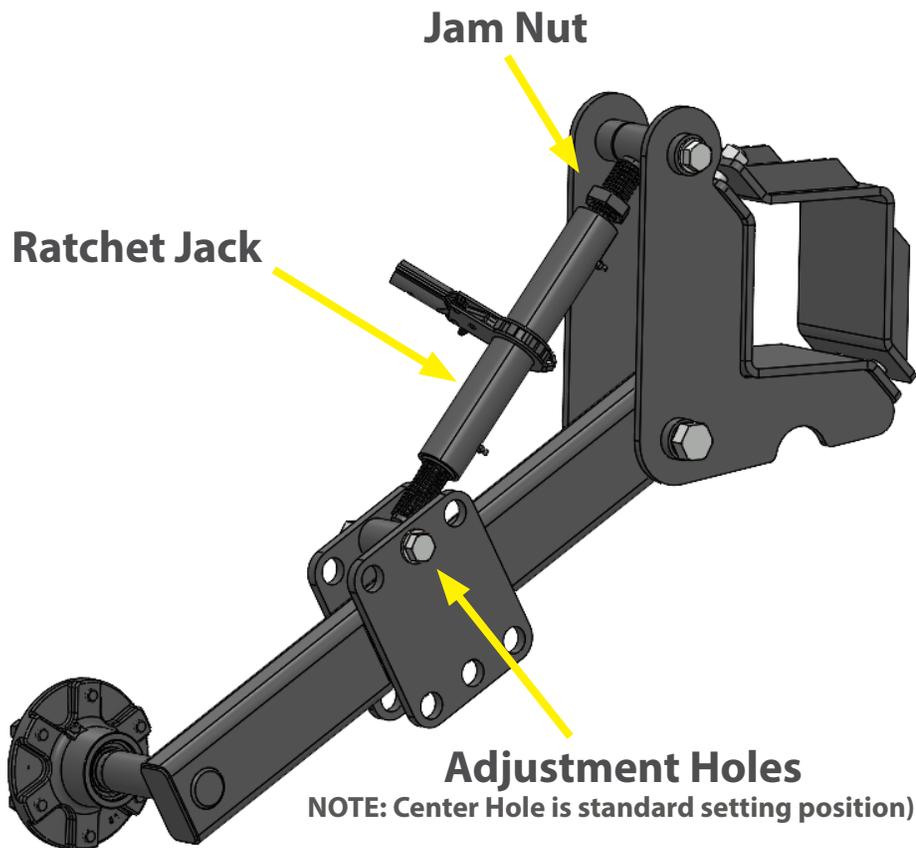


GAUGE WHEEL ADJUSTMENT

Gauge wheels are equipped with two different methods to adjust the depth of the gauge wheels. The first is to use the ratcheting turn buckle. To do this, loosen the jam nut with a combination wrench (1 ¾"). Then, turn the turn buckle to either lengthen or shorten the turn buckle. Then, re-tighten the jam nut.

The second method of adjustment is to change the lower position of the ratcheting turn buckle. The ratcheting turn buckle's standard location is in the center of the 3 holes on the lower arm and is the recommended setting for the Delta Plow.

The gauge wheels are designed to help the tractor carry the machine through the field and hold proper depth.

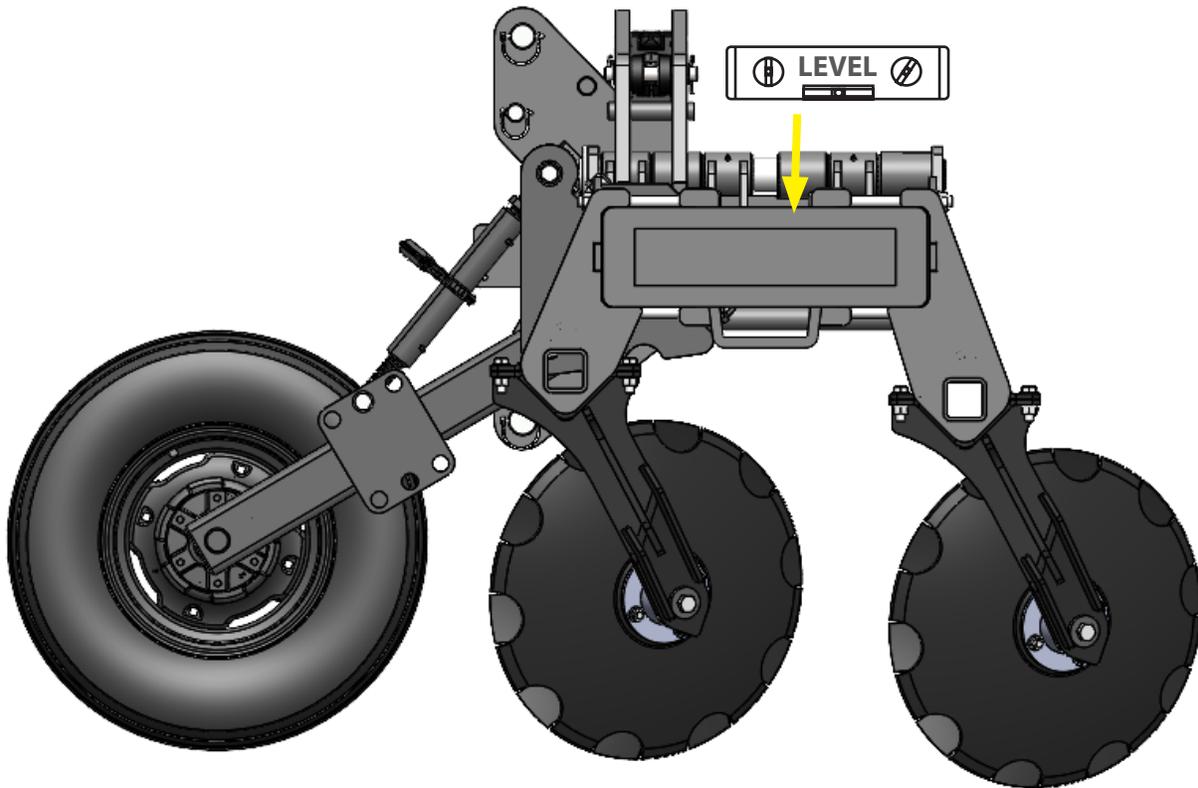




LEVELING THE MACHINE

When initially setting the Delta Plow up to operate in the field the machine should be set level front to back and level left to right. To level center and wings refer to “Leveling the Implement” section on page 26.

Initial operating setting is level front to back. Adjust third-link on tractor until toolbar is level.



Tipping the machine front to back can be used to change the shape of the beds, by increasing or decreasing depth of the rear blades.

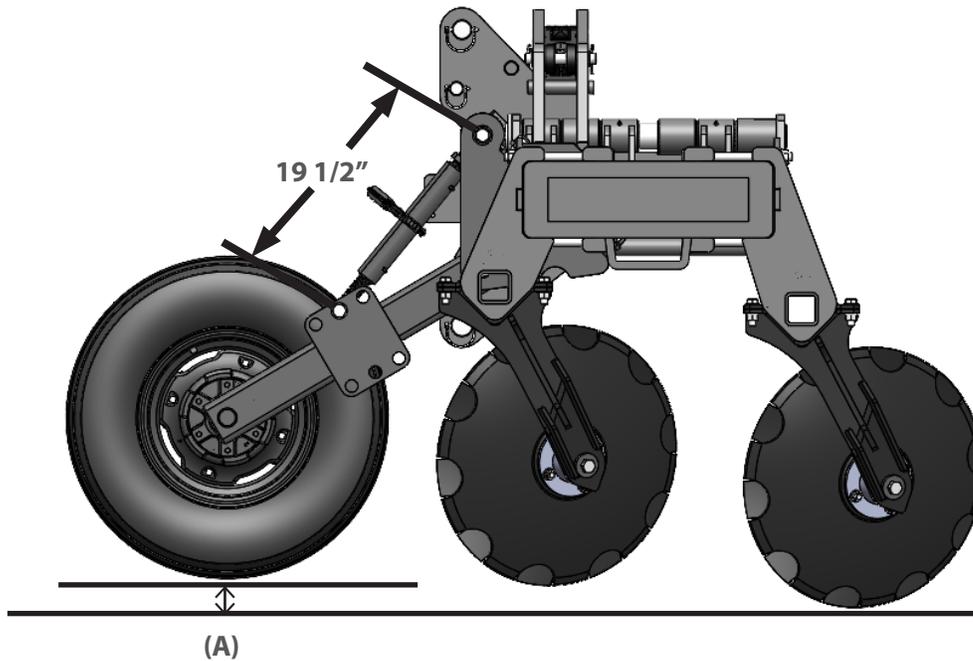
NOTE: By design, rear blades run slightly deeper than the front blades.



DEPTH SETTINGS

DEPTH SETTING FOR PRE-WORKED FIELD

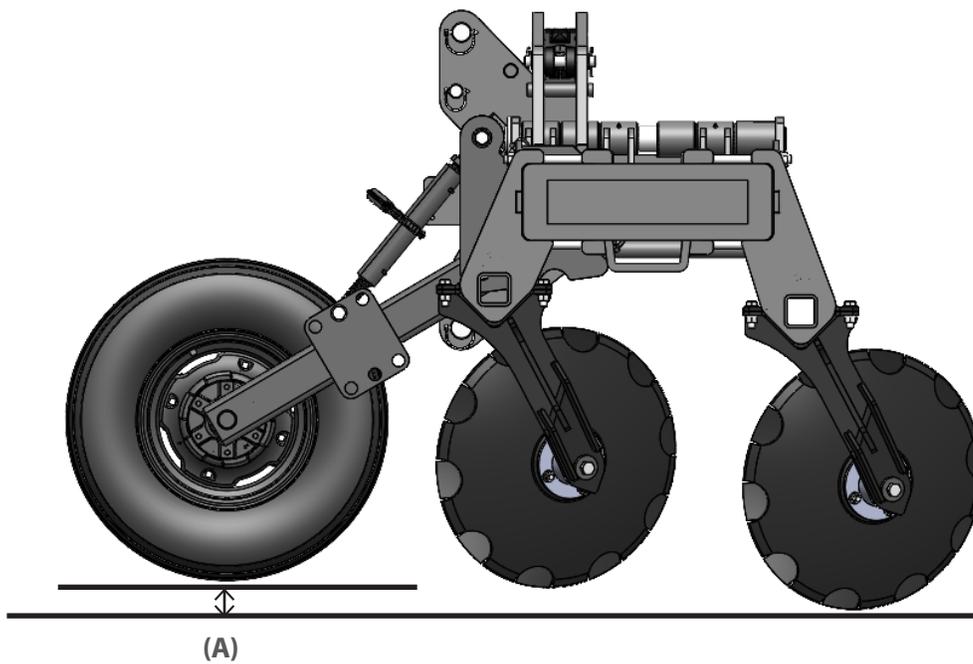
- Set on flat concrete, measure tire to ground.
- Set depth (A) roughly 1"-2" higher than desired furrow depth.
- A good starting point is 19 1/2" from bolt to bol on the gauge wheel.





DEPTH SETTING FOR RE-BEDDING OR SECOND PASS

- With machine on tractor, and front to back leveling complete, lower machine to ground until rear blade slightly touches the ground.
- Measure distance between ground and tire, if desired furrow depth is 8", wheel should be 9-10" off of the ground.





SPEED RECOMMENDATIONS

The ideal operating speed for the Delta Plow is 6-8 mph. Field conditions can change the effectiveness of the Delta Plow and need to be taken into consideration by the operator.

- Ideal operating speed: 6-8 mph
- Minimum operating speed: 5 mph
- Maximum operating speed: 10 mph

SPEED EFFECTS

- In most conditions, speeding up will cause the soil to move further and peak beds higher.
- In most conditions, slowing down will cause the soil to move less, creating shorter, wider beds. Lack of sufficient speed may cause a dip in the center of the bed, especially on row spacings wider than 30".
- See troubleshooting section for more information on performance issues related to speed.

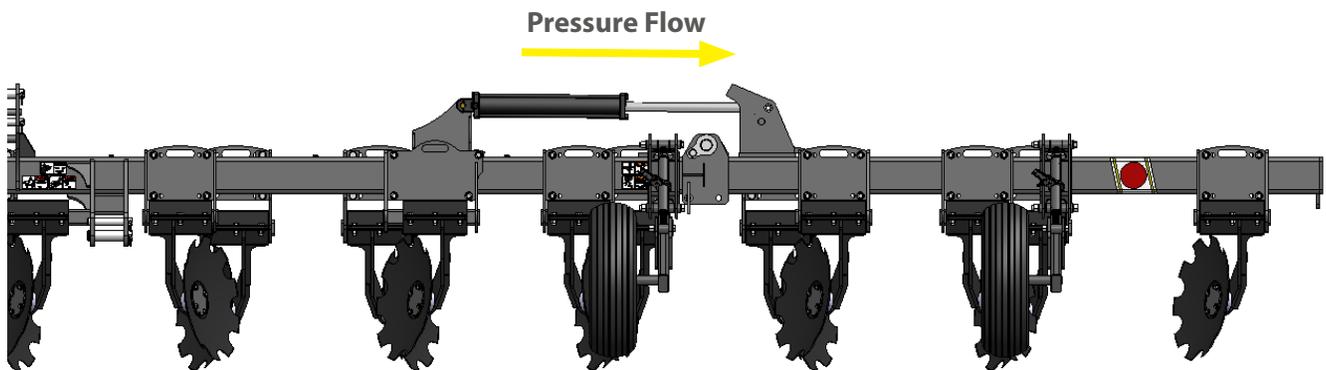


FIELD OPERATION - WING DOWN PRESSURE

While operating the Delta Plow in the field, the wings will need to be held down to prevent the wing from riding up. In order to work properly, the wings need to be leveled according to the leveling procedure on page 26.

DELTA PLOW HYDRAULIC WING DOWN FORCE OPERATION:

1. Unfold the wings of the Delta Plow
2. Once unfolded, engage the SCV of the tractor with the flow set very low in the direction of unfolding. This will allow the cylinders to keep pushing the wings down and prevent the wings from riding up.
 - Recommended remote valve flow should be set at 10%-20% of maximum flow.
 - If wings are not staying level, increase the flow in 5% increments until operating correctly. Do not exceed 40% flow.



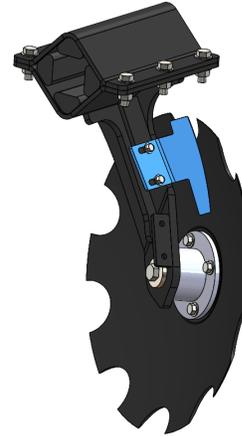


OPTIONAL SCRAPER ADJUSTMENT

INSIDE MOUNT ARM SCRAPERS

- To adjust the disk scrapers, loosen bolts shown below that hold the scraper blade to the arm, and move the scraper until it is about 1/8" from the disk blade.
- Once adjusted, ensure blade can spin freely.

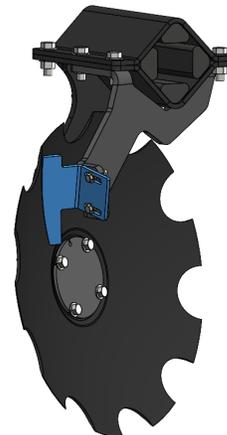
INSIDE MOUNT



STANDARD MOUNT ARM SCRAPERS

- To adjust the disk scrapers, loosen bolts shown below that hold the scraper blade to the arm, and move the scraper until it is about 1/8" from the disk blade.
- Once adjusted, ensure blade can spin freely.

STANDARD MOUNT



Delta Plow blades are very sharp. Be careful of pinch points between blade and scraper. Use protective gloves when handling these parts.



PARKING

For long-term parking, see also “**Storage**” below.

1. Choose a parking location that has room for unfolding, is level, has firm soil and is unlikely to develop soft soil in rain. With the implement still hitched, maneuver it to the parking location.

If the implement must be parked folded, leave it hitched to the tractor. Skip steps 2, 4, and 7.

2. Unfold the implement. Set the fold circuit(s) to Float.
3. Lower the implement to just above ground level at the rear of the row units. Set the tractor remotes to Neutral to hold at slight lift. Shut off the tractor and remove the key (Refer to Figure 18).
4. Unplug implement hydraulic hoses and electrical lines from tractor.
5. Start the tractor. Lower the 3-point hitch until the implement is supported by the row units.
6. Disconnect the hitch arms and link.

STORAGE

Store the Delta Plow where children do not play. If possible, store the implement inside for longer life.

1. Thoroughly clean implement.
2. Park the implement at the storage location as per “Parking” above.
3. Lubricate areas noted under “Maintenance & Lube” beginning on page 47. Apply heavy grease to exposed cylinder rods.
4. Inspect implement for worn or damaged parts. Make repairs and service during the off-season.
5. Use spray paint to cover scratches, chips, and worn areas on the implement to protect the metal.
6. Cover with a tarp if stored outside.



DANGER

TIP OVER/CRUSHING HAZARD AND EQUIPMENT DAMAGE RISK:

Never unhitch, park, or store a partially folded implement. A partially folded implement could topple backward or forward immediately or at a later time, causing serious injury or death and certain severe equipment damage. When unhitched, the implement is supported at the rear only by row unit tools and spring tension. Slopes, soft soils, and soils later softened by rain are particularly dangerous.



FOLLOWING OPERATION

- Store the unit in an area away from human activity.
- Do not park equipment where it will be exposed to livestock for long periods of time. Damage and livestock injury could result.
- Do not permit children to play on or around the stored unit.
- Make sure all parked machines are on a hard, level surface.



PERFORMING MAINTENANCE

- Good maintenance is your responsibility. Poor maintenance is an invitation to trouble.
- Before working on this machine, stop the towing vehicle, set the brakes, shut off the engine and remove the ignition keys.
- Be certain all moving parts on attachments have come to a complete stop before attempting to perform maintenance.
- Always use the proper tools or equipment for the job at hand.
- Use extreme caution when making adjustments.
- Follow the torque chart in this manual when tightening bolts.
- Replace all shields and guards after servicing and before moving.
- After servicing, be sure all tools, parts and service equipment are removed.
- Never replace hex bolts with less than Grade 5 bolts unless otherwise specified. Refer to **Bolt Torque Chart** for head identification marking.
- Where replacement parts are necessary for periodic maintenance and servicing, genuine factory replacement parts must be used to restore your equipment to original specifications. The manufacturer will not claim responsibility for use of unapproved parts and/or accessories and other damages as a result of their use.
- If equipment has been altered in any way from the original design, the manufacturer does not accept any liability for injury or warranty.
- A first aid kit should be kept readily accessible while performing maintenance on this equipment.



DELTA PLOW DO'S AND DON'TS

- DO follow all safety precautions in this manual.
- DO locate and familiarize yourself with the various Safety Signs and instructional decals prior to operation.
- DO inspect equipment for damage and wear before use; repair as needed.
- DO use caution when connecting pressurized systems, such as hydraulics and pneumatics.
- DO follow recommend maintenance.
- DO level the toolbar for optimum performance.
- DO lift implements completely out of the soil before turning the unit.
- DO use caution when moving large equipment. Using a spotter is recommended when working around obstacles on the ground and/or overhead.
- DON'T fold the toolbar with locking pins in the locked position.
- DON'T over-pressurize the hydraulic system; Delta Plow hydraulics are designed for 3,000 PSI MAX working pressure.
- DON'T exceed the limits of a piece of machinery.
- DON'T modify equipment from factory build; modification may compromise equipment safety and integrity and will void product warranty.

TROUBLESHOOTING



Troubleshooting		
Problem	Possible Cause	Solution
Blades not turning.	Blade not making contact with the ground.	Make sure the machine is making contact with the ground.
	Residue build-up is preventing the blade from turning.	Remove residue build-up from the blades.
	The bearing has gone out or is seized.	Replace hub.
Beds are uneven.	Machine is not running level.	Adjust machine to be level side to side.
		Adjust the level from front to back to change shape of beds.
		Check gauge tire pressure to make sure all tires are equal.
	Wings are riding out of ground.	Make sure that wing down force is on and working. (See page 39)
Wings are floating up	Toolbar is not level.	Level toolbar.
	Wing down force not in use.	Make sure that wing down force is on and working (See page 39)
	Wing down force flow set too low	Ensure engaged properly, adjust flow setting. (See page 39)

TROUBLESHOOTING



Troubleshooting		
Problem	Possible Cause	Solution
Blades plugging with mud.	Ground conditions too wet.	Allow soil to dry further before tilling.
	Scrapers set improperly.	Adjust scrapers. (See page 40)
	No scrapers in use.	Add optional scraper package.
Machine is throwing large clods due to buildup on blades.	Operating too fast.	Slow operating speed until problem alleviated. (See page 38)
	Operating too slow.	Increase operating speed until problem alleviated. (See page 38)
Furrow depth too shallow or bed height too low.	Operating machine too shallow.	Increase operating depth by adjusting gauge wheels. (See pages 36-37)
Furrow depth too deep or bed height too tall.	Operating machine too deep.	Decrease operating depth by adjusting gauge wheel. (See pages 36-37)



MAINTENANCE

- Proper maintenance will ensure longevity and optimum performance of your W&A equipment.
- Visual inspection is recommended before each use. Check for loose bolts, worn parts, cracked welds and other damage. Replace and repair as needed.
- In addition to visual inspection before each use, carefully inspect hydraulic components every 100 hours for leaks, excessive wear, swelling and damage. Leaks should be corrected by tightening the fittings according to the **Hydraulic Fitting Torque Chart** or replacing components. Replace any components showing signs of excessive wear, swelling or damage.
- Always replace bolts with the same grade, refer to **Bolt Torque Chart** for grade identification. Tighten bolts according to **Bolt Torque Chart**.
- Always replace parts with W&A parts only.
- We recommend greasing each grease zerk on the toolbar hinge every 100 hours. Grease all attachment grease zerks weekly, or according to specified lubrication schedule.
- Before long-term storage (3 months or more) clean debris from equipment and touch-up paint to prevent corrosion.
- Store in a flat dry place away from human activity and livestock.
- After long-term storage (3 months or more) visually inspect equipment and carefully inspect all components. Especially parts more easily affected by weather damage, such as hydraulic hoses and wiring. Repair and replace as needed before use.



DAILY MAINTENANCE

1. Inspect row units for any loose or missing hardware.

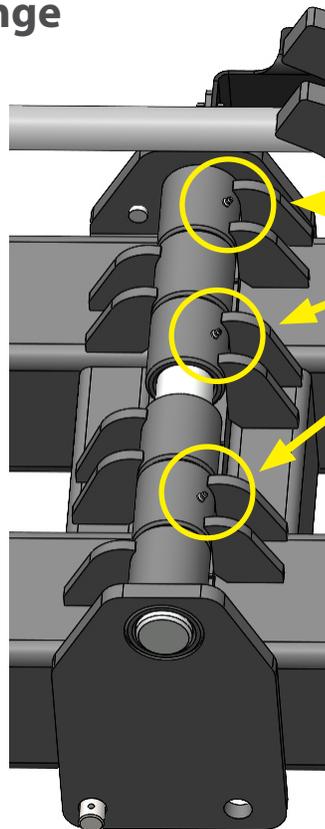
WEEKLY MAINTENANCE

1. Grease the toolbar hinges - three (3) grease zerks on each hinge.
2. Grease gauge wheel bearings.

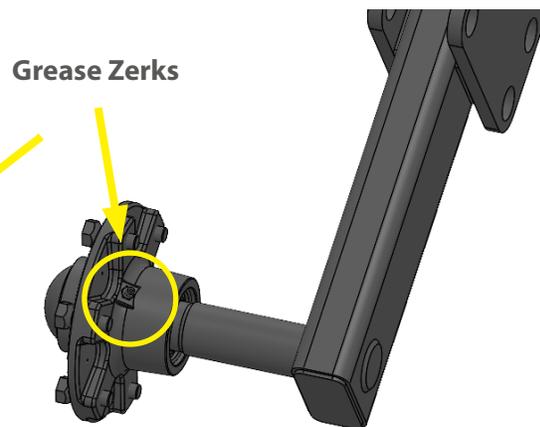
YEARLY MAINTENANCE

1. Clean machine off.
2. Grease all grease zerks.
3. Replace all parts as necessary.
4. Chck Bolt Torque on Hubs.

Toolbar Hinge



Gauge Wheel



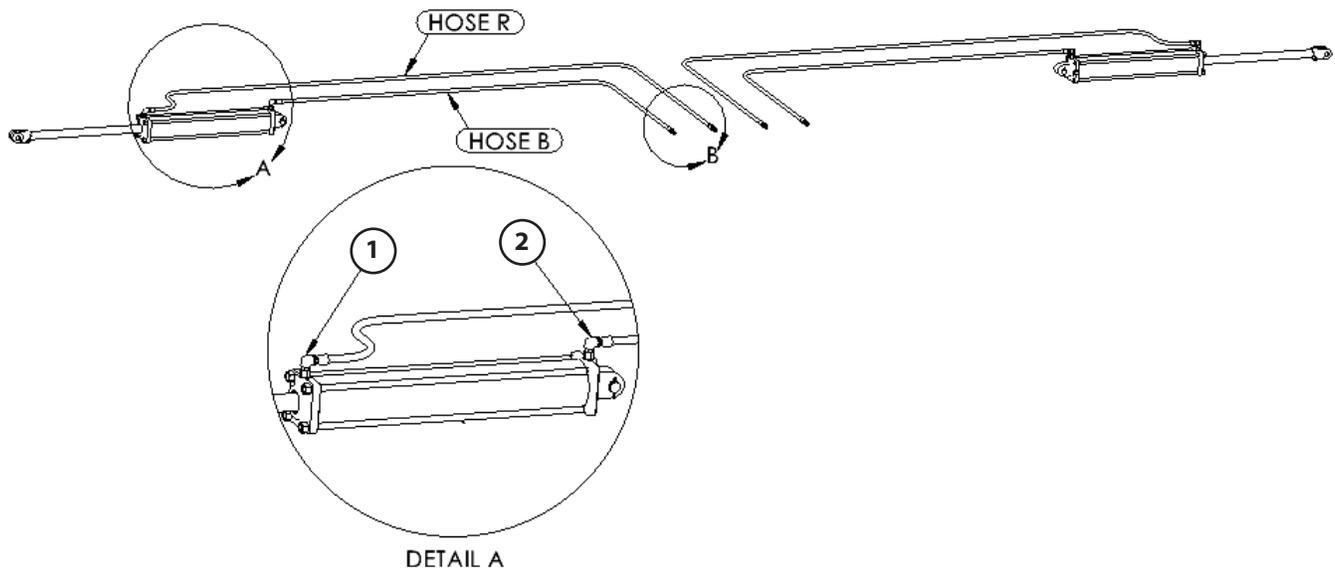
Grease Zerks



BLEEDING FOLD HYDRAULICS

To function properly, the hydraulics must be free of air. If hydraulics have not been bled, they will operate with jerky, uneven motions and could cause wings to drop rapidly during folding or unfolding. If hydraulics were not bled during initial implement setup or if you replace a part in hydraulic system during the life of the implement, complete the following procedures:

1. Check hydraulic fluid level in tractor reservoir and fill to proper level. Add fluid to system as needed.
2. With implement unfolded and fold cylinders completely extended, disconnect rod end pins and swing the cylinders so they will not contact anything when extended.
3. Loosen rod end hose fittings (1) at a ORB connection.
4. Slowly supply oil to rod end of fold cylinders until oil appears at loosened hose fitting. Tighten fitting and completely retract fold cylinders.
5. With cylinders completely retracted, loosen base end hose fittings (2) at ORB connection.
6. Slowly supply oil to base end of fold cylinders until oil appears at loosened hose fitting. Tighten base end hose fitting and cycle fold cylinders in and out several times.
7. Re-pin cylinder rod clevises.



DANGER

HIGH PRESSURE FLUID - DANGER

- Use safe practices. Fluid injection can occur; will result in death or serious injury.
- Hazards may include, but are not limited to, injury beyond the entry point, over pressurized components, damaged components, components with excessive wear, swollen components, ect.



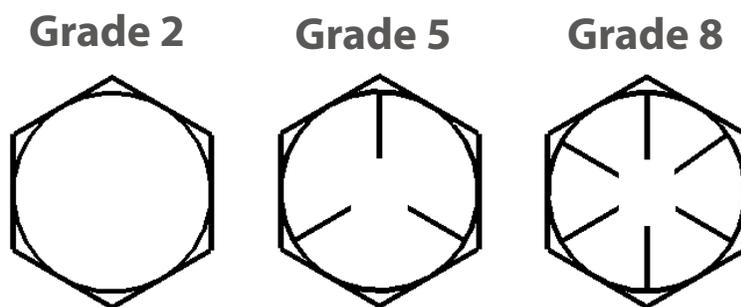
CHECKING BOLT TORQUE

The table shown below gives correct torque values for various bolts and capscrews. Tighten all bolts to the torques specified in chart unless otherwise noted. Check tightness of bolts periodically, using bolt torque chart as a guide. Replace hardware with the same grade bolt.

BOLT TORQUE CHART

Torque Specifications						
Bolt Diameter	Bolt Torque*					
	SAE Grade 2		SAE Grade 5		SAE Grade 8	
INCH	lbft	(Nm)	lbft	(Nm)	lbft	(Nm)
1/4	6	(8)	9	(12)	12	(17)
5/16	10	(13)	19	(25)	27	(36)
3/8	20	(27)	33	(45)	45	(63)
7/16	30	(41)	53	(72)	75	(100)
1/2	45	(61)	80	(110)	115	(155)
9/16	70	(95)	115	(155)	165	(220)
5/8	95	(128)	160	(215)	220	(305)
3/4	165	(225)	290	(390)	400	(540)
7/8	170	(230)	420	(570)	650	(880)
1	226	(345)	630	(850)	970	(1320)

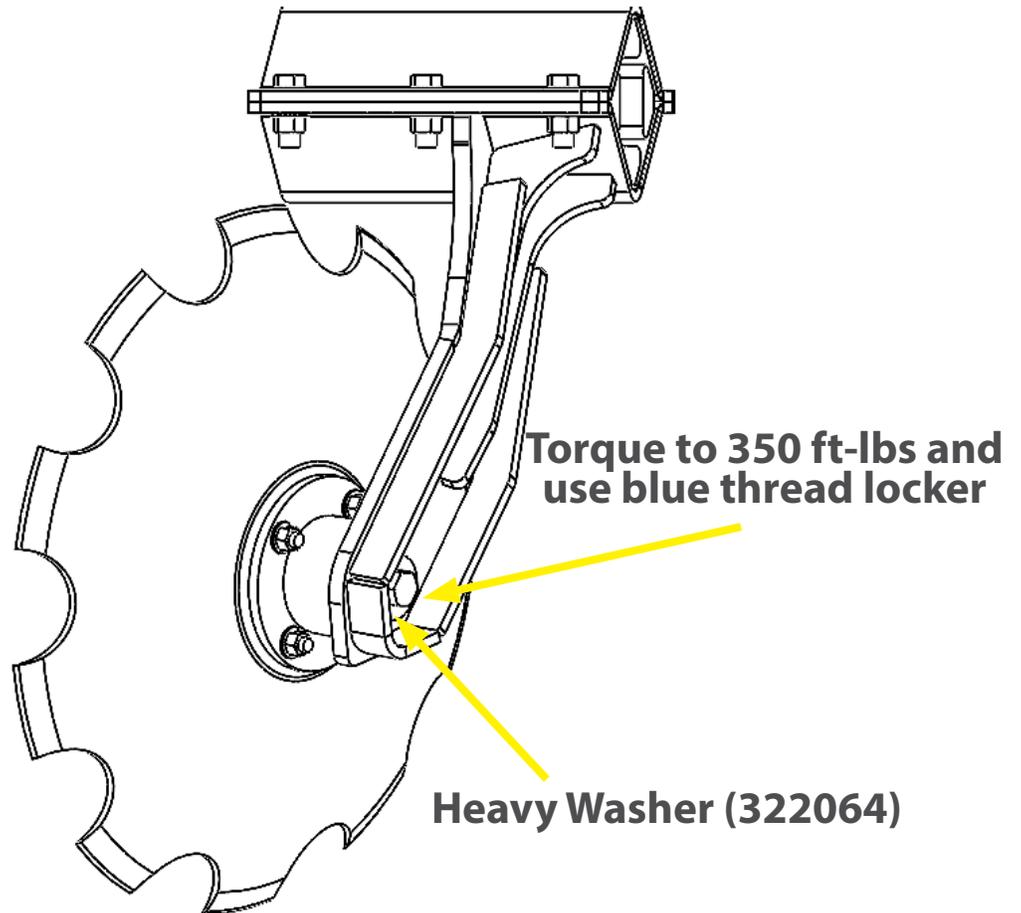
BOLT HEAD IDENTIFICATION





ROW UNIT BOLT TORQUE

The main bolt that holds the disc blade on must be torqued to 350 FT-LBS and have blue thread locker (EX: Loctite 243) applied to the threads. The **Heavy Washer (322064)** must also be used.





HYDRAULIC FITTING IDENTIFICATION

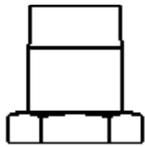
Hydraulic fitting styles, types and sizes are numerous and at times easily confused. The chart below shows the most common types and sizes of hydraulic fittings for the industry, male ends depicted. This chart is printed at 1 to 1 for ease of identification.

NPTF (National Pipe Taper Fuel) uses tapered threads to create a seal.

ORB (O-Ring Boss) uses an O-ring to seal after threads.

JIC (Joint Industry Council) 37-degree flare sealing surface before threads.

ORFS (O-Ring Face Seal) uses an O-ring to seal before threads.



-4 NPTF



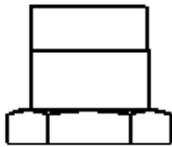
-4 ORB



-4 JIC



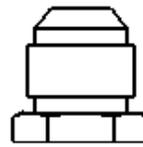
-4 ORFS



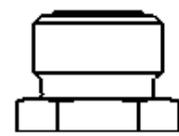
-6 NPTF



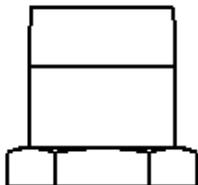
-6 ORB



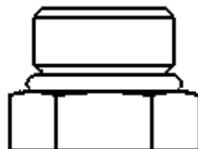
-6 JIC



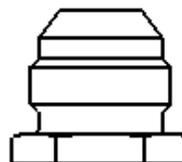
-6 ORFS



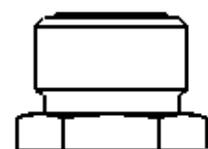
-8 NPTF



-8 ORB



-8 JIC

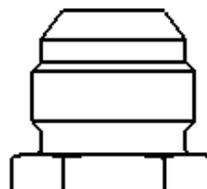


-8 ORFS

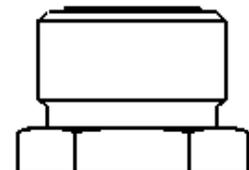
N/A



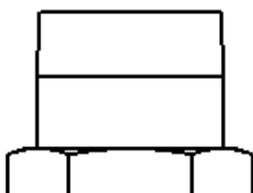
-10 ORB



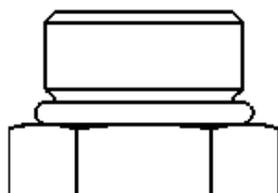
-10 JIC



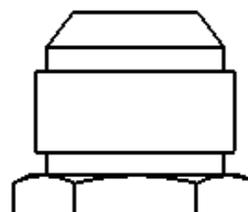
-10 ORFS



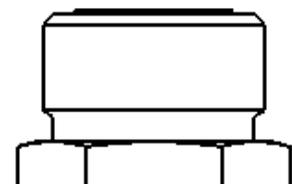
-12 NPTF



-12 ORB



-12 JIC

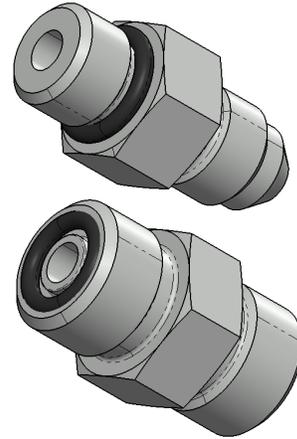


-12 ORFS



CHECKING HYDRAULIC FITTINGS

- Before connecting hydraulic fittings, check that fittings are clean and undamaged. Replacement fittings and hoses are available from W&A Manufacturing.
- Ensure O-ring(s) are installed properly as shown in the image. (ORB fitting above, ORFS fitting below)
- “Wet Torque” fittings according to the chart below. Wet Torque is the process of lubricating all threads, O-rings and sealing surfaces with the hydraulic fluid used in the system. Then tightening to a specified torque.
- Do not force fittings together. Ensure male and female are of the same type and size, align sealing surfaces and threads properly.
- Do not apply force to a connection or use the connection as support. Doing so may damage components and/or cause the connection to leak.



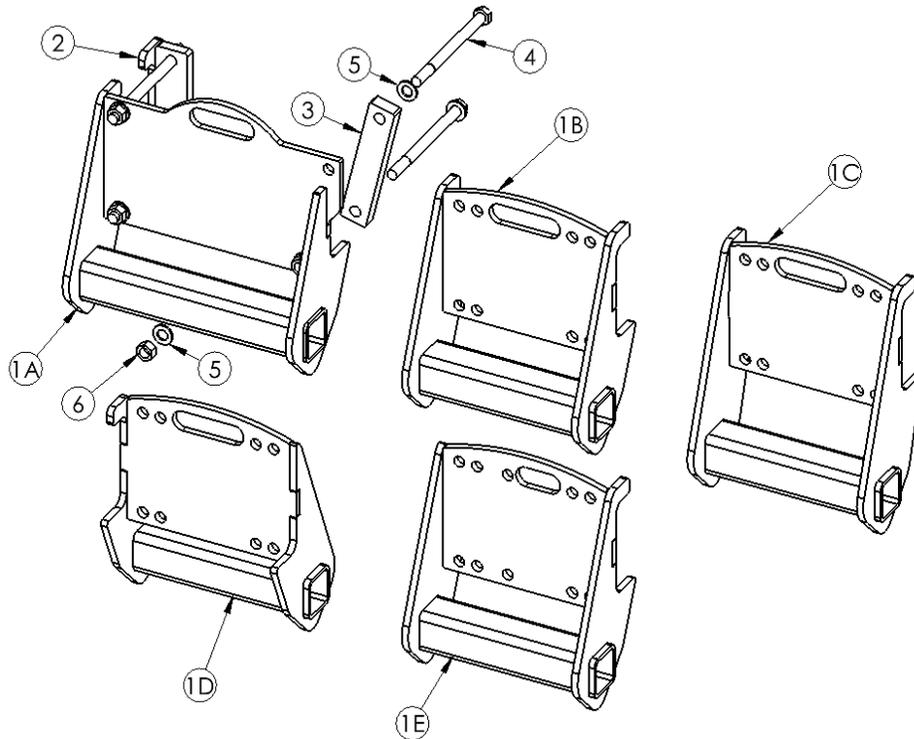
HYDRAULIC FITTING TORQUE CHART

Torque lbft (Nm)				
Dash Size	NPTF	ORB	JIC	ORFS
-4	12-16 (16-22)	10-15 (14-20)	11-13 (15-18)	10-12 (14-16)
-6	14-32 (19-43)	17-21 (23-28)	20-22 (27-30)	18-20 (24-27)
-8	32-40 (43-54)	30-35 (41-47)	43-47 (58-64)	32-35 (43-47)
-10	-	30-35 (41-47)	55-65 (75-88)	45-50 (61-68)
-12	40-48 (54-65)	30-35 (41-47)	80-90 (108-122)	65-70 (88-95)

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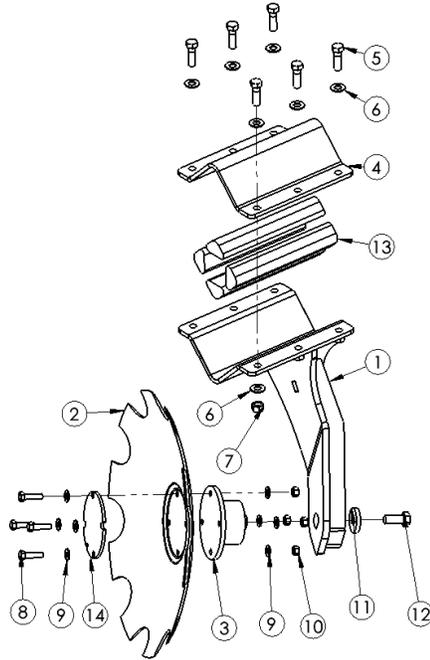
ROW UNIT MOUNTS



Item Number	Part #	Description	Quantity
1A	322004	WIDE FRONT MOUNT	1
1B	322054	STANDARD FRONT MOUNT	1
1C	322055	STANDARD REAR MOUNT	1
1D	322062	SINGLE EAR FRONT MOUNT	1
1E	322076	3 HOLE FRONT MOUNT	1
2	322063	ROW UNIT CLAMP	1
3	322017	NARROW ROW UNIT CLAMP	1
4	411603	3/4-10 X 4 1/2 BOLT GR5	4
5	413072	3/4 SAE WASHER	8
6	410012	3/4-10 LOCK NUT GR A	4



LEFT HAND THROW ROW UNIT

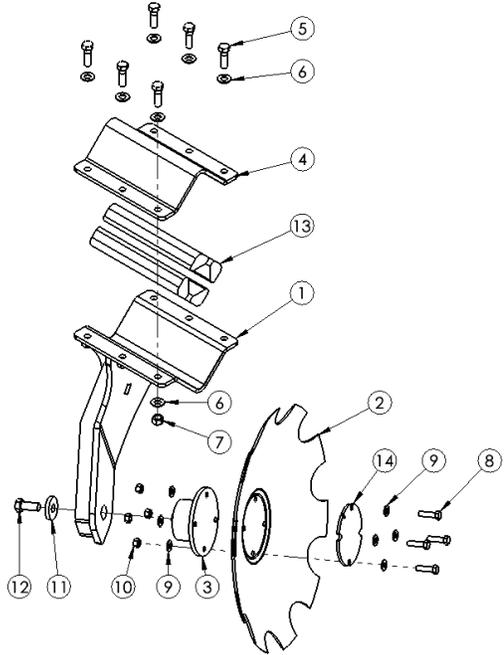


Item Number	Part #	Description	Quantity
1	322049	LEFT HAND THROW ROW ARM	1
2	322002	24" NOTCHED BLADE	1
3	322001	DISC HUB UNIT	1
4	322069	ROW UNIT CAP	1
5	411561	5/8-11 X 2 GR5	6
6	413011	5/8 FLAT WASHER SAE	12
7	410009	5/8-11 NUT CENTER LOCK	6
8	411553	1/2-13 X 1 3/4 BOLT GR8	4
9	413007	1/2 FLAT WASHER SAE	8
10	410008	1/2-13 NUT CENTER LOCK	4
11	322064	DISK HUB WASHER	1
12	411583	3/4-16 X 1 3/4 BOLT GR8	1
13	322066	RUBBER ELEMENT	4
14	322068	DISC DOUBLER	1



PARTS GUIDE

RIGHT HAND THROW ROW UNIT

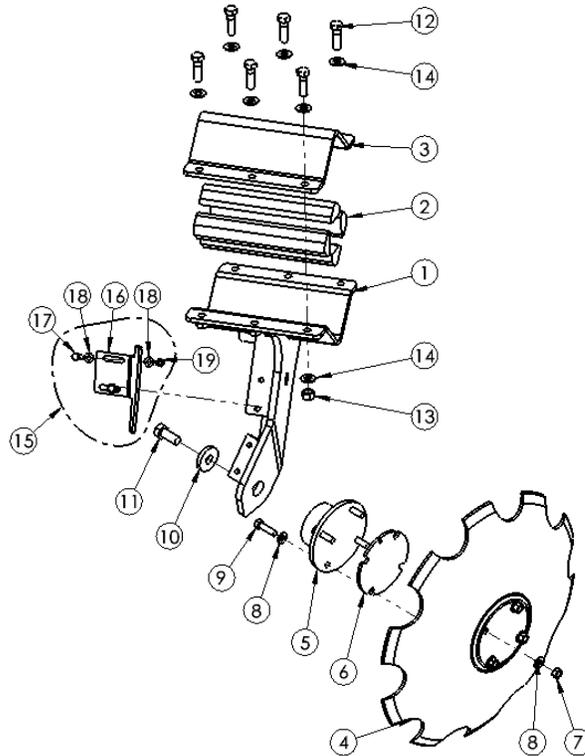


Item Number	Part #	Description	Quantity
1	322048	RIGHT HAND THROW ROW ARM	1
2	322002	24" NOTCHED BLADE	1
3	322001	DISC HUB UNIT	1
4	322069	ROW UNIT CAP	1
5	411561	5/8-11 X 2 BOLT GR5	6
6	413011	5/8 FLAT WASHER SAE	12
7	410009	5/8-11 NUT CENTER LOCK	6
8	411553	1/2-13 X 1 3/4 BOLT GR8	4
9	413007	1/2 FLAT WASHER SAE	8
10	410008	1/2-13 NUT CENTER LOCK	4
11	322064	DISK HUB WASHER	1
12	411583	3/4-16 X 1 3/4 BOLT GR8	1
13	322066	RUBBER ELEMENT	4
14	322068	DISC DOUBLER	1

PARTS GUIDE



LEFT HAND THROW ROW UNIT INSIDE MOUNT



Item Number	Part #	Description	Quantity
1	322079	LEFT HAND THROW INSIDE MOUNT ARM	1
2	322066	RUBBER ELEMENT	4
3	322069	ROW UNIT CAP	1
4	322002	24" NOTCHED BLADE	1
5	322001	DISC HUB UNIT	1
6	322068	DISC DOUBLER	1
7	410008	1/2-13 NUT CENTER LOCK	4
8	413007	1/2 FLAT WASHER SAE	8
9	411553	1/2-13 X 1 3/4 BOLT GR8	4
10	322064	DISC HUB WASHER	1

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PARTS GUIDE

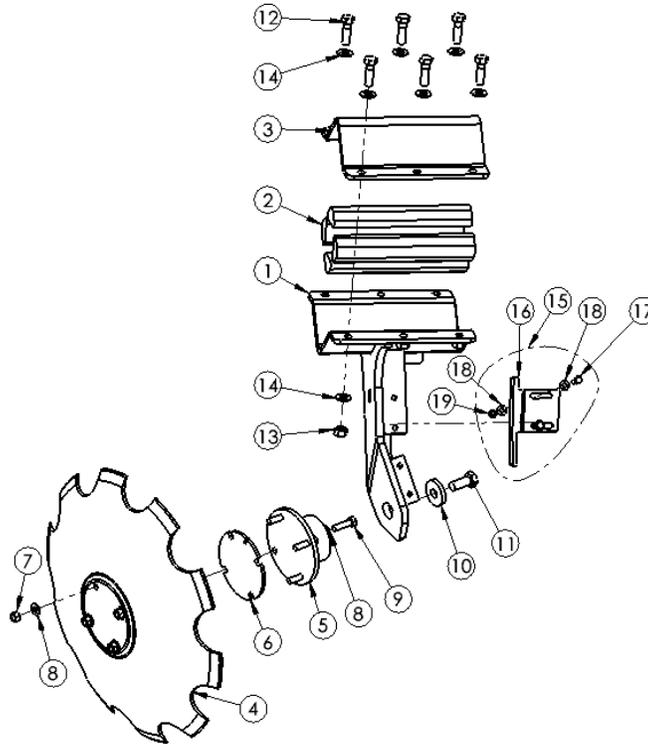


LEFT HAND ROW UNIT INSIDE MOUNT

Item Number	Part #	Description	Quantity
11	411583	3/4-16 X 1 3/4 BOLT GR8	1
12	411561	5/8-11 X 2 BOLT GR5	6
13	410009	5/8-11 NUT CENTER LOCK	6
14	413011	5/8 FLAT WASHER SAE	12
15	322109	LH SCRAPER ASSEMBLY	1
16	322108	LH SCRAPER	1
17	411509	3/8-16 X 1 1/2 BOLT GR5	2
18	413009	3/8 FLAT WASHER SAE	4
19	305106	3/8-16 NUT NYLON LOCK	2



RIGHT HAND THROW ROW UNIT INSIDE MOUNT



Item Number	Part #	Description	Quantity
1	322078	RIGHT HAND THROW INSIDE MOUNT ARM	1
2	322066	RUBBER ELEMENT	4
3	322069	ROW UNIT CAP	1
4	322002	24" NOTCHED BLADE	1
5	322001	DISC HUB UNIT	1
6	322068	DISC DOUBLER	1
7	410008	1/2-13 NUT CENTER LOCK	4
8	413007	1/2 FLAT WASHER SAE	8
9	411553	1/2-13 X 1 3/4 BOLT GR8	4
10	322064	DISC HUB WASHER	1

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PARTS GUIDE

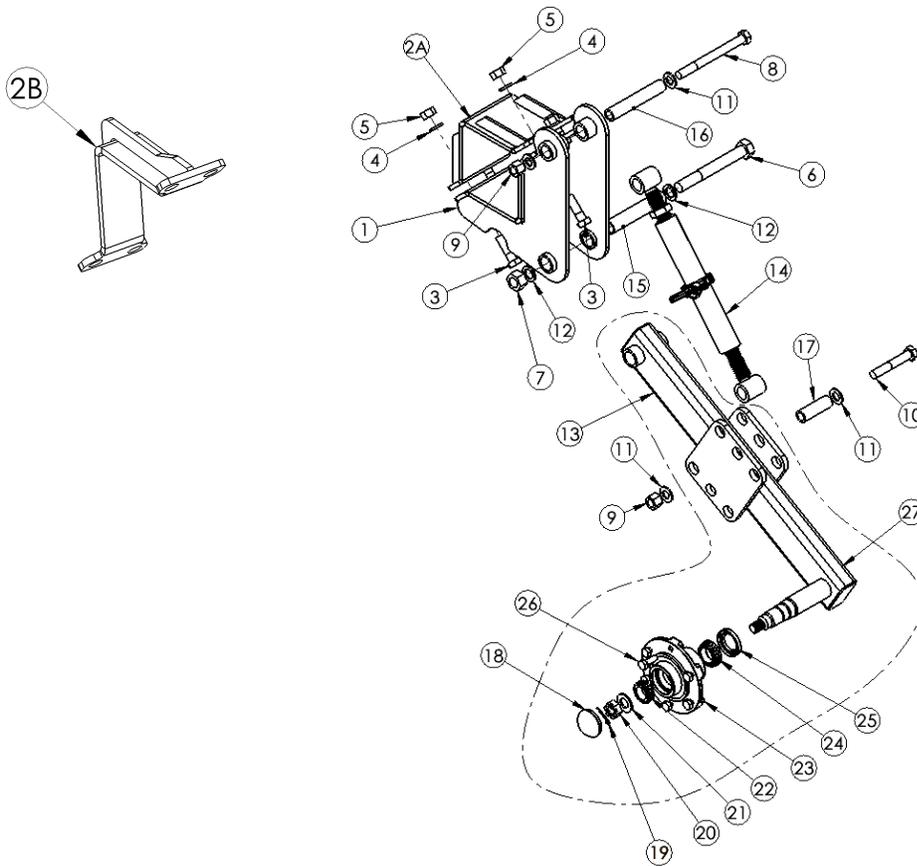


RIGHT HAND ROW UNIT INSIDE MOUNT

Item Number	Part #	Description	Quantity
11	411583	3/4-16 X 1 3/4 BOLT GR8	1
12	411561	5/8-11 X 2 BOLT GR5	6
13	410009	5/8-11 NUT CENTER LOCK	6
14	413011	5/8 FLAT WASHER SAE	12
15	322112	RH SCRAPER ASSEMBLY	1
16	322111	RH SCRAPER	1
17	411509	3/8-16 X 1 1/2 BOLT GR5	2
18	413009	3/8 FLAT WASHER SAE	4
19	305106	3/8-16 NUT NYLON LOCK	2



GAUGE WHEEL



Item Number	Part #	Description	Quantity
1	250001	GAUGE WHEEL MAIN BODY	1
2A	250002	GAUGE WHEEL REAR CLAMP	1
2B	ZNF40506	GAUGE WHEEL REAR CLAMP NARROW	1
3	411586	3/4-10 X 2 1/2 BOLT GR5	4
4	413512	3/4 LOCK WASHER	4
5	410012	3/4-10 NUT CENTER LOCK	4
6	411650	1-8 X 8 BOLT GR5	1
7	410016	1-8 NUT CENTER LOCK	1
8	411600	3/4-10 X 8 BOLT GR5	1
9	305101	3/4-10 NUT NYLON LOCK	2

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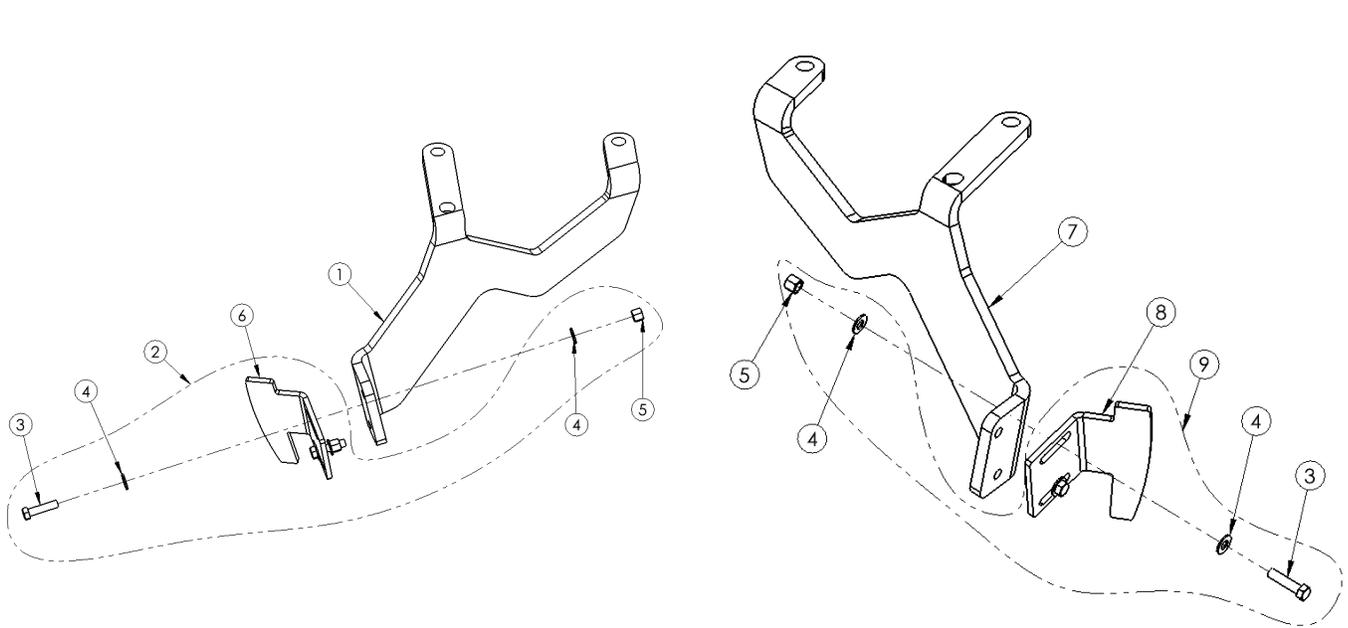


GAUGE WHEEL

Item Number	Part #	Description	Quantity
10	411592	3/4-10 X 4 1/2 BOLT GR5	1
11	413072	3/4 FLAT WASHER SAE	4
12	10000008	10GA BUSHING	2
13	350045	LOWER ARM ASSEMBLY	1
14	350041	RATCHET JACK	1
15	350034	MAIN PIVOT BUSHING	1
16	350036	UPPER RATCHET JACK BUSHING	1
17	350038	LOWER RATCHET JACK BUSHING	1
18	GWX20016	HUB CAP	1
19	CLT21011	COTTER PIN .15 X 1.5	1
20	GWX20014	7/8-14 CASTLE NUT	1
21	GWX20013	HEAVY WASHER	1
22	GWX20007	OUTER GAUGE WHEEL BEARING	1
23	GWX20009	GAUGE WHEEL HUB	1
24	GWX20011	INNER GAUGE WHEEL BEARING	1
25	GWX20006	GAUGE WHEEL SEAL	1
26	GWX20012	1/2-20 X 1.25 HUB BOLT	6



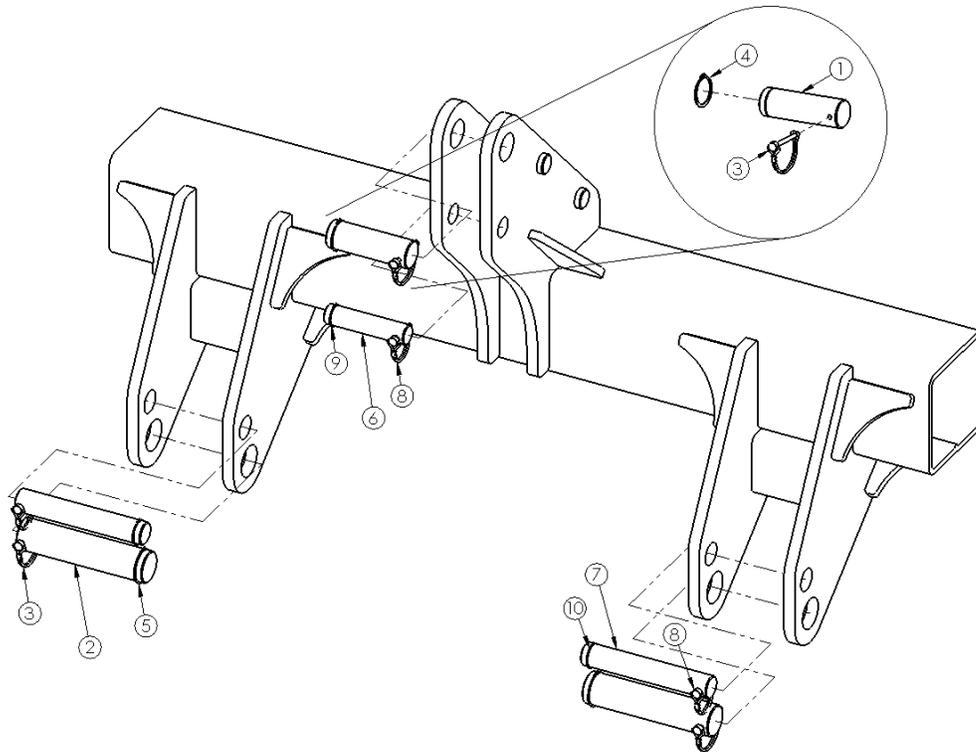
SCRAPERS



Item Number	Part #	Description	Quantity
1	322116	RH SCRAPER ARM	1
2	322112	RH SCRAPER ASSEMBLY	1
3	411509	3/8-16 X 1.5 BOLT GR5	2
4	413009	WASHER 3/8 SAE	4
5	305106	NUT 3/8-16 NYLOC	2
6	322110	RH SCRAPER	6
7	322115	LH SCRAPER ARM	1
8	322108	LH SCRAPER	1
9	322109	LH SCRAPER ASSEMBLY	1



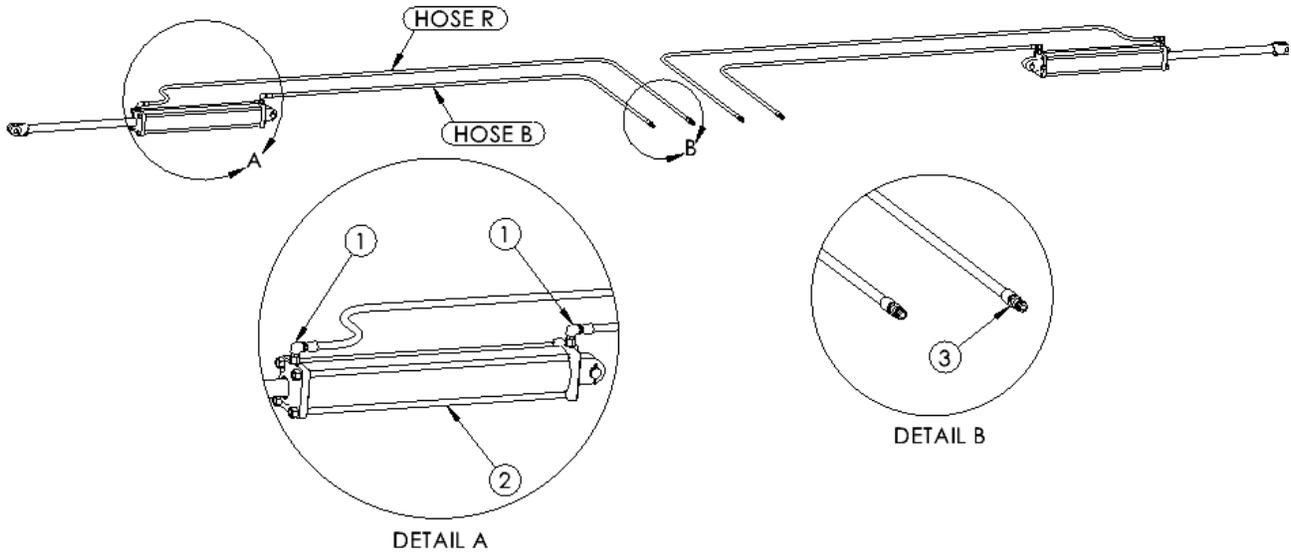
HITCH PINS



Item Number	Part #	Description	Quantity
1	315151	TOP HITCH PIN 4N	1
2	315153	LOWER HITCH PIN 4N	2
3	315161	LOCKING PIN LARGE	3
4	315155	RETAINING RING 1 3/4	1
5	315157	RETAINING RING 2	2
6	315152	TOP HITCH PIN 3N, 3	1
7	315154	LOWER HITCH PIN 3N, 3	2
8	315162	LOCKING PIN SMALL	3
9	315156	RETAINING RING 1 1/4	1
10	315158	RETAINING RING 1 7/16	2
NOT SHOWN	315150	HITCH PIN PACK 3N, 3-4N	1
NOT SHOWN	315165	HITCH PIN PACK 4N ONLY	1



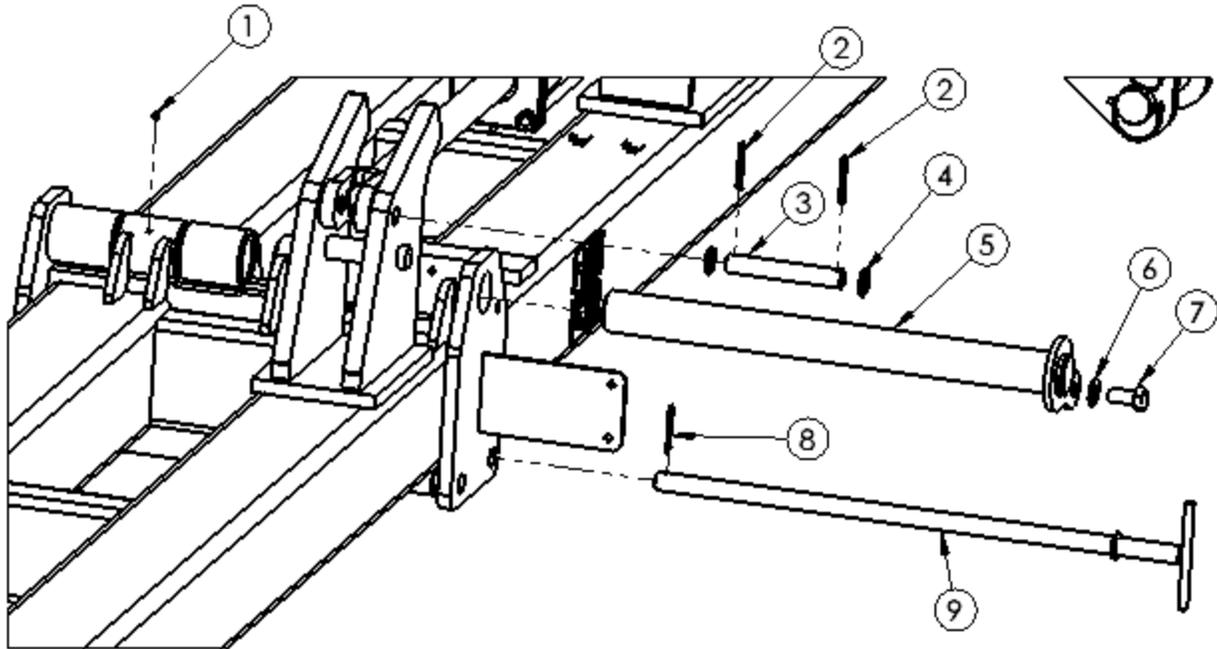
TOOLBAR HYDRAULICS



Item Number	Part #	Description	Quantity
1	457241	RESTRICTION FITTING -8 MALE ORB X -8 FEMALE ORB ELBOW	4
2	FTB20002	4X30 TIE ROD CYLINDER (BASE CLEVIS PIN INCLUDED)	2
3	457240	1/2" MALE AG TIP QUICK COUPLER	4
HOSE R	FTB30061	ROD END HOSE	2
HOSE B	FTB30070	BASE END HOSE	2



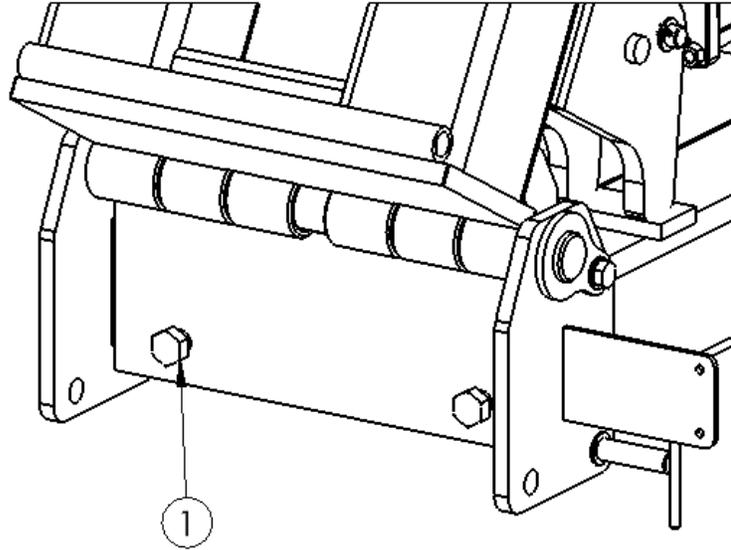
TOOLBAR HINGE PARTS



Item Number	Part #	Description	Quantity
1	450004	DRIVE IN GREASE ZERK	3
2	10000106	1/4 X 2 COTTER PIN	2
3	FTB30026	ROD END CYLINDER PIN	1
4	10000008	1 X 1 1/2 X 10 GA WASHER	2
5	306775	TOOLBAR PIN	1
6	413072	3/4 SAE FLAT WASHER	1
7	305115	3/4-10 X 1 1/2 BOLT GR5	1
8	10000402	HAIR PIN	1
9	FTB30030	NON-FLOAT PIN	1



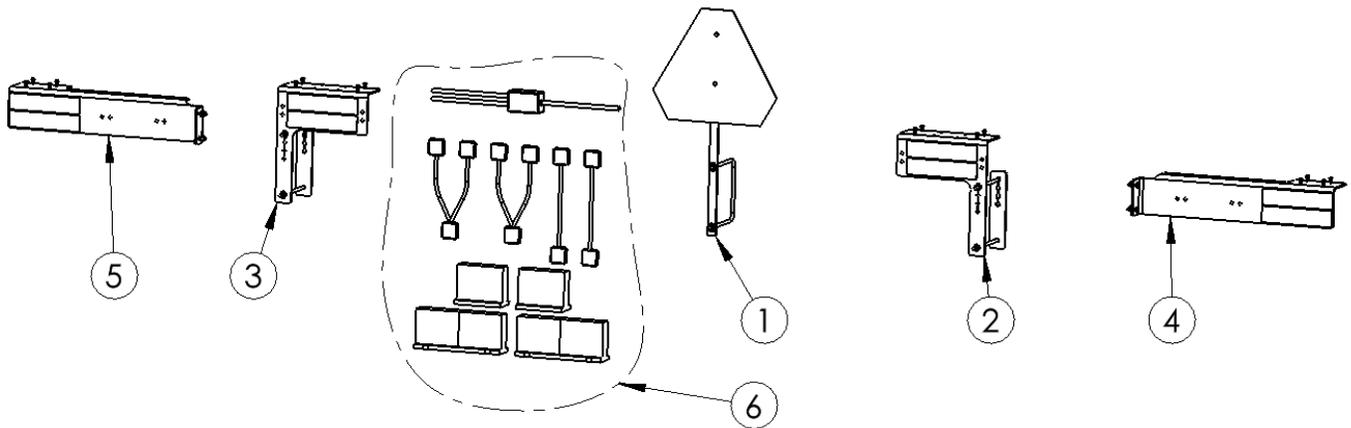
TOOLBAR WING ADJUSTMENT



Item Number	Part #	Description	Quantity
1	411638	1-8X2 BOLT GR5	2



LIGHT KIT



Item Number	Part #	Description	Quantity
1	302851	SMV SIGN ASSEMBLY	1
2	302854	INNER BRACKET RH ASSEMBLY (RED, ORANGE)	1
3	302855	INNER BRACKET LH ASSEMBLY (RED, ORANGE)	1
4	302856	OUTER BRACKET LH ASSEMBLY (RED, ORANGE, AMBER)	1
5	302857	OUTER BRACKET RH ASSEMBLY (RED, ORANGE, AMBER)	1
6	302836	LIGHT AND WIRING ASSEMBLY	1

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