125-000-01

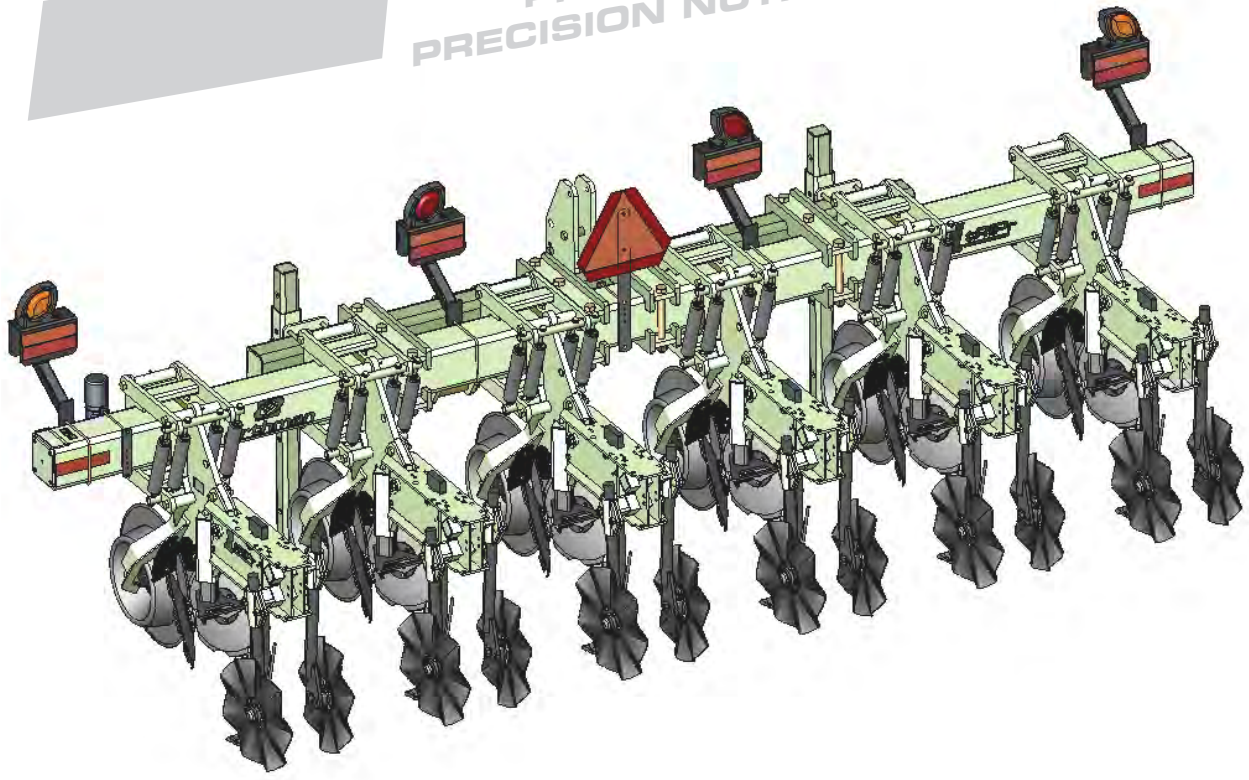
1tRIPr

Operator's Manual

Orthman AGRICULTURAL

1tRIPr®

PREPLANT TILLAGE AND
PRECISION NUTRIENT PLACEMENT



Made in the U.S.A.

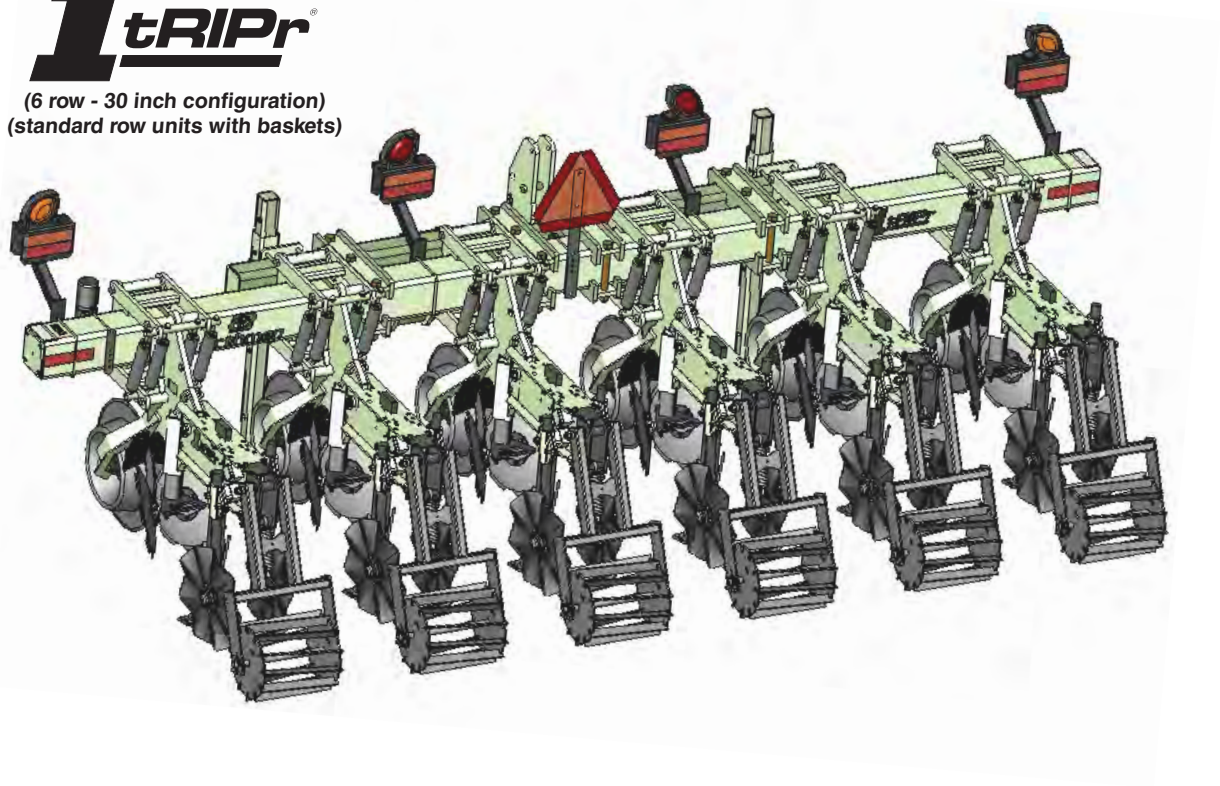
INTRODUCTION

The Orthman *1tRIPr*® preplant tillage tool combines proven strip-till soil management, precision nutrient placement, and seedbed preparation in a single field pass to provide unprecedented field efficiency. The *1tRIPr*® name is derived from combining multiple operations to meet preplant objectives while conserving moisture, soil, time, and money, in *1tRIP.*

The *1tRIPr*® row unit wraparound mount and parallel linkage provide a durable row unit foundation. The strong foundation, teamed with Orthman's rigid, folding, or stacking toolbars, provides supreme implement strength. Four down pressure springs per row unit supply down pressure to assist with soil penetration. Parallel linkages allow the row unit to operate independent of the toolbar to provide uniform tillage depth despite terrain variations.

1tRIPr®

(6 row - 30 inch configuration)
(standard row units with baskets)



The depth band coulter assembly initiates the strip-till application. The depth band provides consistent row unit tooling depth while the coulter cuts all surface and subsurface residue to reduce rearward tooling interference and aid in residue decomposition. The coulter also reduces side draft by providing lateral implement stability.

The trash opener assembly reduces field residue directly behind the depth band coulter assembly prior to the arrival of rearward tooling.

The tillage shank assembly shatters the root zone compacted layer to increase soil porosity, reduce run off, and allow root systems to utilize deeper soil moisture and nutrients. Tillage shank assembly fertilizer tube(s) allow precision fertilizer placement at two depths, if desired, to provide crop plants with timely fertilizer access to maximize development from germination through maturity.

The wavy coulter assemblies “lift and pinch” action incorporates field residue, decreases soil variability, and firms the seedbed. Optional rearward mounted rolling baskets are available to reduce clod size, retain existing soil moisture, firm, and complete the seedbed.

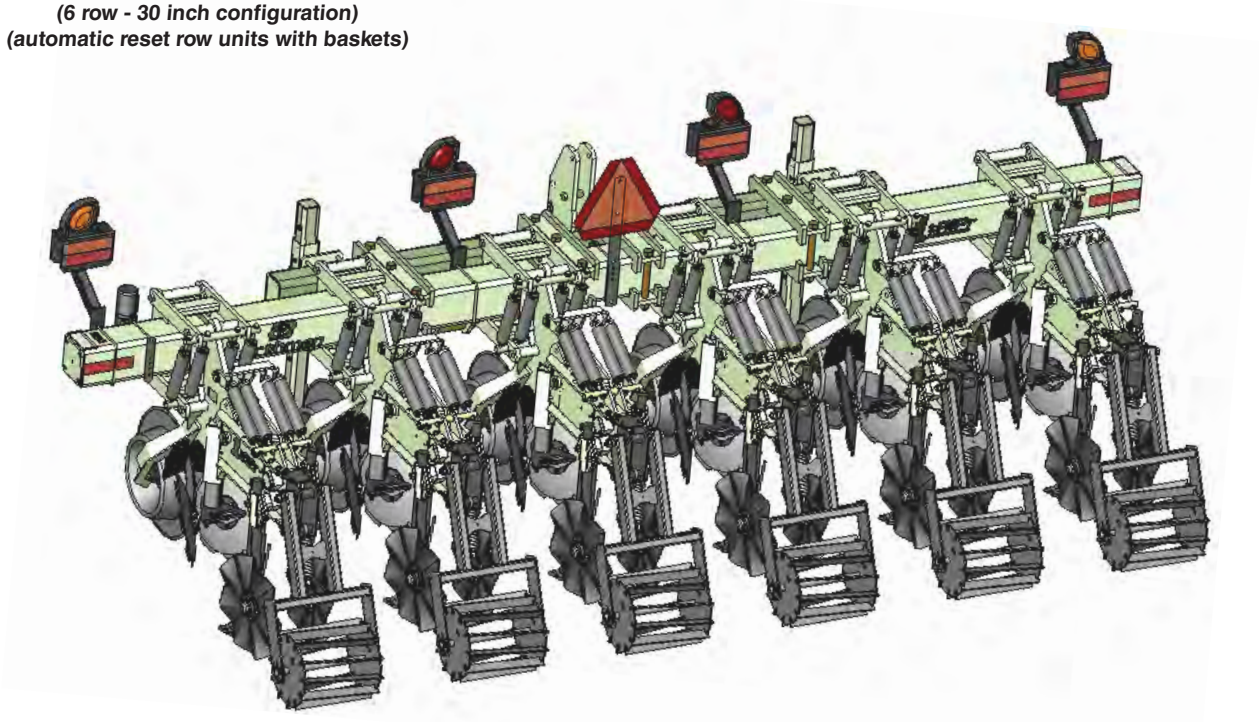
The *1tRIPr®* utilized with a Combo Caddy or attachment package attaches the planter and *1tRIPr®* to maximize each field pass. Contact your Orthman dealer for Combo Caddy or attachment package information to meet your needs. The *1tRIPr®* can also be utilized as a stand-alone preplant tillage and precision nutrient placement tool.

NOTE: If combining strip-tillage and planting operations with a Combo Caddy or attachment package, lateral offset of the 1tRIPr® row unit relative to seed placement is recommended to allow fertilizer placement without detriment to seed germination.

1tRIPr®

(6 row - 30 inch configuration)
(automatic reset row units with baskets)

This manual is considered to be an integral component of the *1tRIPr®* and is designed to educate the owner and/or operator(s) regarding safety, operation, maintenance,



troubleshooting, and component identification. All personnel involved in the operation of this implement are responsible for reading and understanding entire manual content. This manual is designed to keep the operator safe and knowledgeable as well as prolong the life of the implement and maximize field efficiency. This manual should accompany the implement if it were ever to be sold.

We would like to thank you for placing your confidence in Orthman Mfg., Inc. Your *1tRIPr®* is manufactured to meet the highest standards and is built with precision and strength to increase your agricultural operation’s dependability and profitability.

Thank you for choosing Orthman.

STILL THE STRONGEST.

WARRANTY

Orthman Mfg., Inc. warrants the whole goods products it manufactures to be free from defects in material or workmanship for a period of one (1) year from the date of sale of the product(s) to the original user. Products not manufactured, but supplied by Orthman Mfg., Inc. on Orthman products, are subject to, conform with, and are limited to the warranty of our suppliers.

Orthman Mfg., Inc. warrants the parts it manufactures to be free from defects in material or workmanship for a period of ninety (90) days from the date of delivery of the product(s) to the original user. Products not manufactured, but supplied by Orthman Mfg., Inc. on Orthman products, are subject to, conform with, and are limited to the warranty of our suppliers.

Warranty of Orthman whole goods and/or parts applies only to material and workmanship. Misuse, misapplication, neglect, alteration, accident, normal wear, or acts of God affecting Orthman products are not eligible for warranty.

Warranty of serial numbered goods will only be considered if the product has a completed Warranty Registration on file at Orthman. This Warranty Registration must be completed and returned to Orthman within thirty (30) days of the sale of the product(s) to the original user. *No serial numbered goods or related parts and/or labor will be warranted without a Warranty Registration on file.* Warranty issues falling within the first thirty days of a product's use will be handled at the discretion of Orthman. Warranty of parts will not require a Warranty Registration, but proof of date of delivery of the product to the original customer must be provided.

WARRANTY CLAIMS: A warranty claim and request to return defective product(s) must be presented to the Orthman Service Department by the selling dealer describing the defect in material or workmanship of an Orthman product(s) within ten (10) days of its discovery. This claim may be made via phone, e-mail, fax, or written request. Claims for warranty of serial numbered goods must include the Orthman product serial number and model number. Claims for warranty of partswill not require a product serial number or model number, but must be identified by an Orthman part number. Claims for warranty of whole goods or parts must also include proof of date of sale of the product to the original customer by an Orthman dealer.

The Orthman Service Department will proceed in making a preliminary decision as to the eligibility of the claim for warranty consideration. After the Orthman Service Department deems it necessary to proceed with warranty consideration, a Return Goods Authorization (RGA) will be completed by the Orthman Service Department in conjunction with the selling dealer. Upon completion of the RGA, the defective product(s) must be returned to Orthman to ensure warranty consideration. Defective product(s) must be returned to Orthman by either the selling dealer or the customer. Customer delivery of defective product(s) must be approved by Orthman and the selling dealer prior to delivery. The defective product(s) in question must be sent, freight prepaid, within sixty (60) days of the discovery of the product(s) failure and initial warranty claim. Replacement product(s) may be sent to the selling dealer, directly to the customer, or picked up at the Orthman facility. Replacement product(s), sent directly to the customer or picked up must be approved by Orthman and the selling dealer. At the discretion of the Orthman Service Department, replacement product(s) may be sent prior to, or after, the Orthman Service Department receives the defective product(s).

Any variation in the above procedure is at the sole discretion of the Orthman Service Department.
No products will be accepted at Orthman without all proper paperwork completed including Warranty Registration and RGA(s).
Parts returned to Orthman without proper authorization will be returned to the sender at the sender's expense.

Orthman agrees to handle all warranty claims in a timely manner and will inform dealers of any revisions or modifications to the Orthman Warranty Policy. Eligible warranty claims will be processed by Orthman within sixty (60) days of receiving failed product(s) or a valid service or repair labor claim. Eligible warranty claims regarding returned product(s) or service and/or repair labor will be paid through a credit memo issued to the appropriate dealer's account as determined by the Orthman Service Department.

If a warranty claim is found to be ineligible for warranty coverage, the Orthman Service Department will be responsible to inform the dealer in order to determine the course of action to be taken. Orthman reserves the right to make changes in specification and design without notice and without incurring any obligations to owners of products previously sold.

Orthman provides this manual without warranty of any kind, expressed or implied. This manual reflects the product at the time of publication. All information within is based upon current information on the publication date. Orthman assumes no responsibility for damages incurred due to the use of the illustrations, information, and specifications within this publication.

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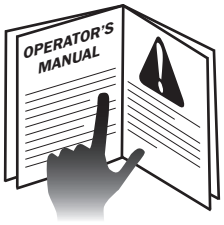


FOR YOUR PROTECTION

READ AND UNDERSTAND THE ENTIRE CONTENT OF THIS MANUAL BEFORE OPERATING OR SERVICING IMPLEMENT. Read and understand all operator manuals for the machinery used in conjunction with your Orthman equipment.

- Carefully **READ ALL SAFETY DECALS** in this manual as well as on the implement. Keep implement clean so decals are easily visible. Keep all safety decals in good, clean, and legible condition. Immediately replace damaged and/or missing decals. Replacement decals are available from your Orthman dealer.

- Learn to operate the implement and all components properly. Do not let others operate implement without proper instruction. Unauthorized implement modifications may impair function and safety. If you do not understand any content in this manual or need assistance, contact your Orthman dealer.

(Orthman Manufacturing Inc. - 75765 Rd. 435 - Lexington, NE 68850 - (308) 324-4654)

EQUIPMENT SAFETY GUIDELINES

Operator safety is the primary concern when designing an Orthman implement. Orthman integrates as many safety features into the implement as possible. You can avoid many hazards and possible accidents by observing precautions in this safety section.

- Insist that yourself and personnel working with and around you follow all safety precautions. Be cautious when working with or around implement to avoid injury.

SAFETY ALERT SYMBOL

The **SAFETY ALERT SYMBOL** warns of potential hazards to personal safety and that extra precautions must be taken. When you see this symbol, carefully read the message(s) that follow. Follow all recommended precautions and safe operating practices in this manual.

NOTE: Hazard control and accident prevention are dependent upon the safety awareness and proper training of personnel involved in the operation of this implement.

BE AWARE OF SIGNAL WORDS

SIGNAL WORDS designate a degree or level of **HAZARD** seriousness. These signal words include:

DANGER
RED

DANGER indicates a hazardous situation that, if not avoided, will result in death or serious injury. Danger is limited to extreme situations, typically for machine components which for functional purposes, cannot be guarded.

WARNING
ORANGE

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

CAUTION
YELLOW

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

SHUTDOWN AND STORAGE

AVOID CRUSHING. Make sure all personnel are clear of the implement. Lower implement to the ground, place tractor in park, turn off engine, and remove key.

USE BAR STANDS AND CYLINDER STOPS TO SUPPORT THE IMPLEMENT.
Store implement on a clean, dry, and level surface. An uneven surface could cause implement to shift or fall, resulting in injury or death, as well as implement damage. Securely support all implement components that must be raised. Store implement away from human activity.

SAFE TRANSPORT

- Engage transport locking devices prior to transport.
- Plan your route to avoid traffic. Yield to traffic in all situations.
- Maximum transport speed is 20 mph (32 kph). Various conditions will require reduced speed. Travel at speeds that allow for adequate control of stopping and steering.

AVOID ELECTROCUTION. Be aware of overhead power lines. Contact or close proximity to power lines can result in injury or death. Use extreme care when operating implement near power lines.

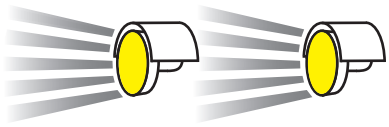
- Know implement transport height and gross weight. Avoid overhead obstructions not allowing your transport height. Do not use bridges rated below combined implement and tractor weight.

- Make sure a slow moving vehicle (SMV) placard is mounted to the implement and is easily visible to other motorists.
- Make allowances for implement size when transporting. Sudden braking can cause a towed load to swerve and/or rollover. Never use independent braking with implement in tow as loss of control and/or rollover can result. Reduce speed if towed implement is not equipped with brakes.

- Do not coast. Always keep tractor or towing device in gear to provide engine braking when traveling downhill.
- Comply with state and local laws governing implement transport.

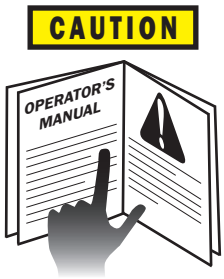
WARNING AND SAFETY LIGHTS

- Oversized implements and slow moving vehicles create a hazard when transported on public roads.



- Make sure all warning, safety lights, and turning signals are working and clean. Use safety lighting when using public roads day and night. Replace missing or damaged lights immediately. Comply with state and local laws governing implement safety lighting.
- A safety lighting package, conforming to implement lighting standard ANSI/ASAE S279.12, if not supplied with, is available for addition to your equipment. Contact your Orthman dealer for safety lighting package information. Refer to toolbar operator's manual for safety lighting package installation and adjustment.

⚠ SAFE OPERATION



READ AND UNDERSTAND THE ENTIRE CONTENT OF THIS MANUAL BEFORE OPERATING OR SERVICING IMPLEMENT. Implement is to be operated by qualified personnel only. Never let children operate implement. A complete understanding of safety precautions, operation, and maintenance is mandatory before implement use.

AVOID ELECTROCUTION. Be aware of overhead power lines. Contact or close proximity to power lines can result in injury or death. Use extreme care when operating implement near power lines.

- Know implement transport height and gross weight. Avoid overhead obstructions not allowing your transport height. Do not use bridges rated below combined implement and tractor weight.

AVOID ROLLOVER. Do not fold or unfold implement and avoid sharp turns when on a hillside, as shift of weight could cause rollover. Operate implement at a safe distance from terrain irregularities and other obstructions that could cause rollover.

AVOID CRUSHING. Make sure all personnel are clear of implement at all times implement is in motion. Be aware of obstructions above, below, and around implement when in operation or transport. Injury or death can result from being struck by the implement.

⚠ NO RIDERS

NEVER ALLOW RIDERS ON TRACTOR OR IMPLEMENT. Riders hinder operator visibility and can be thrown from the implement and/or be struck by foreign objects resulting in injury or death.

⚠ PRACTICE SAFE MAINTENANCE

Proper maintenance is your responsibility. Maintenance neglect and/or poor maintenance practices can result in injury or death. Always use the proper tools to maintain implement.

AVOID CRUSHING. Make sure all personnel are clear of the implement. Lower implement to the ground, place tractor in park, turn off engine, and remove key.

USE BAR STANDS AND CYLINDER STOPS TO SUPPORT THE IMPLEMENT. Store implement on a clean, dry, and level surface. An uneven surface could cause implement to shift or fall, resulting in injury or death, as well as implement damage. Securely support all implement components that must be raised. Store implement away from human activity.

AVOID ENTANGLEMENT. Never lubricate or service implement in motion. Keep away from power driven parts when in motion. Disengage power sources prior to maintaining implement. Injury or death can result from contact with power driven parts when in motion.

AVOID CRUSHING. Do not stand between the tractor and implement when connecting or disconnecting implement. Injury or death can result from being trapped between the tractor and implement.

Escaping pressurized hydraulic fluid can penetrate skin, resulting in injury or death. Relieve hydraulic system pressure before connecting or disconnecting tractor. Use cardboard or wood, **NOT BODY PARTS**, to check for suspected hydraulic leaks. Wear protective gloves and safety glasses or goggles when working with hydraulic systems. If an accident occurs, see a doctor immediately for proper treatment.

⚠ PRACTICE SAFE MAINTENANCE

- Never operate a combustion engine in an enclosed area. Make sure there is adequate ventilation. Exhaust fumes can cause asphyxiation.

- Service tires safely. Tire and rim separation can result in serious injury or death. Do not over inflate tires. Only mount or dismount tires if you possess the proper equipment, otherwise contact a trained professional. Always maintain correct tire pressure. Inspect tires and wheels daily. Do not operate tires with inadequate pressure, cuts, visible damage, or missing hardware.

- Be extremely careful working around unshielded sharp edges. Injury may result from contact with sharp edges.
- Keep all parts in good condition and properly installed. Replace damaged or missing parts immediately.
- Remove tools and unused parts prior to implement operation.

⚠ PREPARE FOR EMERGENCIES

- Be prepared for a fire. Keep a readily accessible fire extinguisher at all times.
- Keep a readily accessible stocked first aid kit and emergency phone numbers for your doctor, hospital, ambulance, and fire department.
- Wear protective clothing and equipment. Wear clothing appropriate for the situation. Protect your eyes, ears, hands, and feet with the use of protective goggles, ear plugs, gloves, boots, etc.

⚠ ANHYDROUS AMMONIA - NH_3

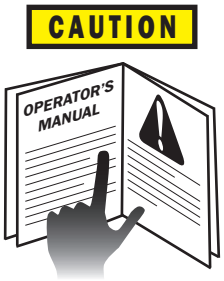
LIQUID FERTILIZER

ANHYDROUS AMMONIA (NH_3) AND LIQUID FERTILIZER APPEARS HARMLESS. DIRECT EXPOSURE TO NH_3 OR LIQUID FERTILIZER IS EXTREMELY DANGEROUS AND CAN RESULT IN INJURY AND/OR DEATH.

- Keep a clean supply of water readily accessible in case of exposure to NH_3 or liquid fertlizer.
- Wear protective goggles and gloves when working with NH_3 or liquid fertilizer. Be sure all persons involved in the operation are properly trained concerning the dangers and precautions involved in the application of NH_3 or liquid fertilizer.
- If you choose to apply NH_3 or liquid fertilizer, it is advisable to consult documented information regarding safe handling and application of NH_3 or liquid fertilizer. Information is available from the following recognized sources:

1. American National Standards Institute - *www.ansi.org - (212) 642-4900*
2. Material Safety Data Sheets - MSDS - *www.msdsonline.com*
3. National Safety Council - *www.nsc.org/necas*
4. The Fertilizer Institute - *www.tfi.org*
5. United States Department of Transportation - D.O.T. - *www.dot.gov*
6. Compressed Gas Association - *www.cganet.com*

SAFETY NEVER HURTS



⚠ **READ AND UNDERSTAND THE ENTIRE CONTENT OF THIS MANUAL BEFORE OPERATING OR SERVICING IMPLEMENT.**

- Understand all implement functions.
- Never stand between tractor and implement when connecting or disconnecting implement.
- Be aware of all surroundings before moving implement.
- Operate implement from operator's seat only.
- Never mount or dismount a moving tractor.
- Never leave engine running when implement is unattended.
- Keep away from power driven parts when in motion.
- Make sure all personnel are clear before lowering implement to the ground.

SAFETY DECALS

DANGER

WARNING

CAUTION

Safety decals promote awareness and knowledge concerning safe operation and maintenance of the implement.

Carefully **READ ALL SAFETY DECALS** in this manual as well as on the implement. Keep implement clean so decals are easily visible. Keep all decals in good and legible condition. Immediately replace damaged and/or missing decals. Replacement decals are available from your Orthman dealer.

To install decals: Thoroughly clean area where decal is to be placed and attach decal void of bubbles. Refer to this safety information section for proper decal placement.

IMPORTANT

Equipment operators should understand the enclosed manual before operating this equipment. Replacement manual, call 308-324-4654

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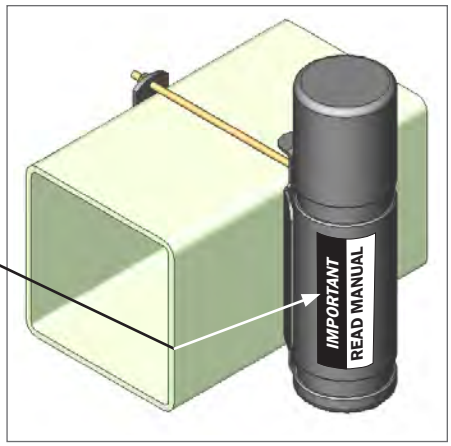
153-101

(manual enclosure)



153-152

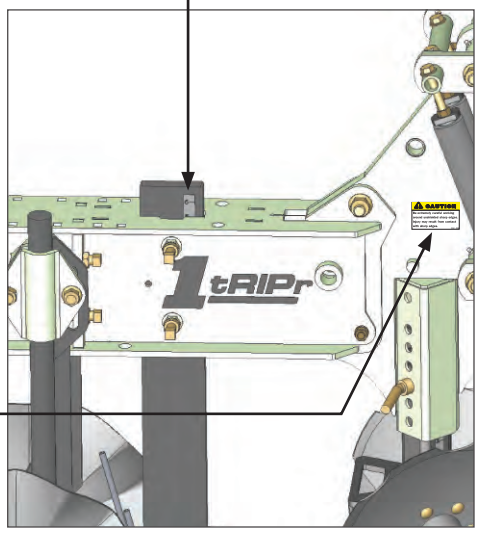
(side of tillage shanks and trash openers)

CAUTION

Be extremely careful working around unshielded sharp edges. Injury may result from contact with sharp edges.

153 - 045

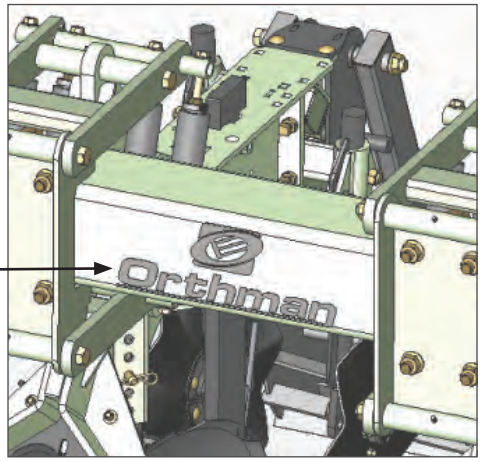
(outer side of outer row units)



ORTHMAN DECALS

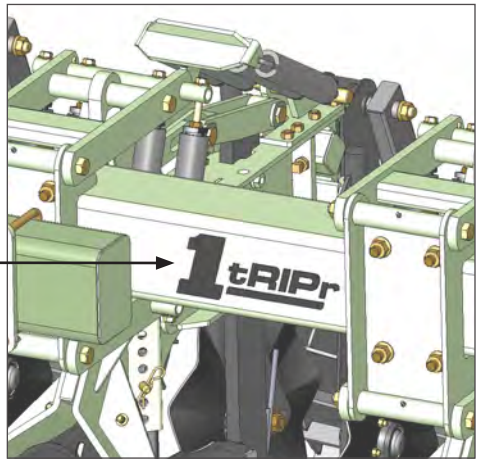
153-000

(front right and rear left of toolbar)



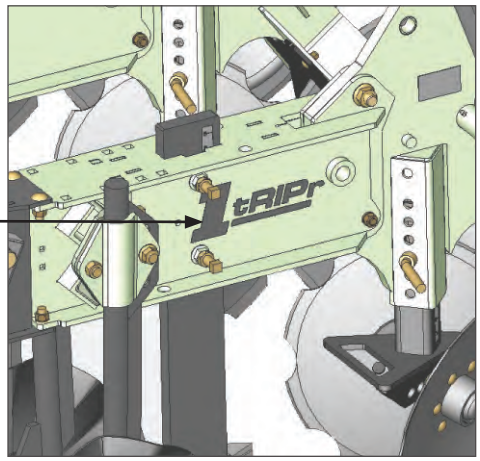
153-194

(front left and rear right of toolbar)



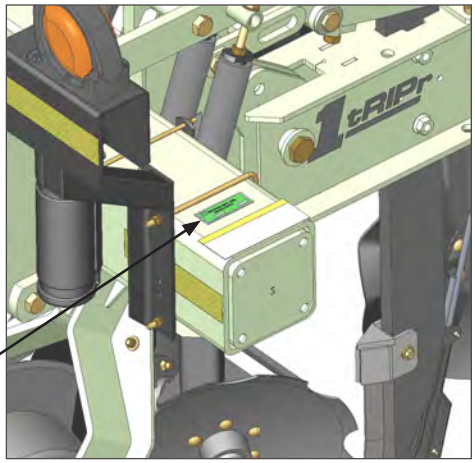
153-193

(outer side of outer row units)



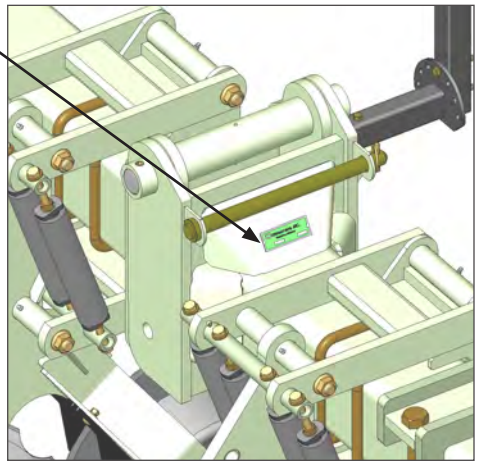
ORTHMAN SERIAL TAG

The Orthman serial tag contains valuable information. The model and serial numbers provide Orthman dealers and the Orthman Service Department with the exact specifications of your implement if any warranty or service issues need to be addressed.

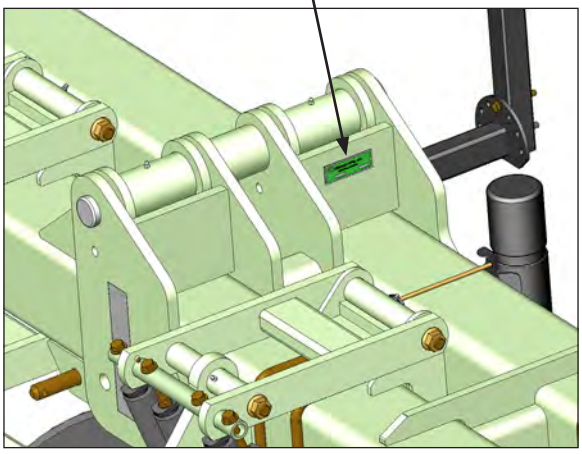


(serial tag location on rigid toolbar)

153-011



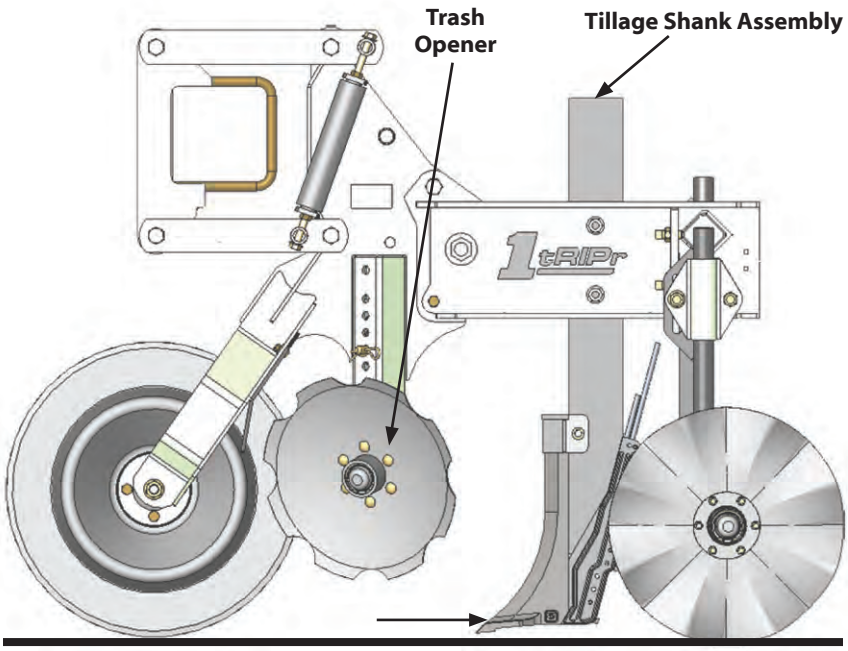
(serial tag location on 1500 folding



(serial tag location on 1550 folding toolbar)

SHIPPING CONFIGURATION

The majority of the 1tRIPr® is assembled at Orthman Mfg., Inc. The 1tRIPr® is assembled in an appropriate shipping configuration to ensure transport safety and efficiency from the manufacturer. Installation of optional tooling (if applicable) and adjustment of installed tooling is necessary prior to an initial field trial.



Shipping/Storage Surface

⚠ CAUTION

Be extremely careful working around unshielded sharp edges. Injury may result from contact with sharp edges.

153 - 045

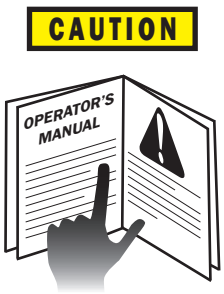
The shipping configuration provides even implement weight distribution between the depth band coulter assembly and the wavy coulter assemblies. The trash opener assembly and the tillage shank assembly do not bear implement weight, as illustrated above.

Prior to off-season storage, it is recommended to restore the 1tRIPr® row units to the shipping configuration illustrated above to avoid placing weight on the trash opener or tillage shank assembly. When storing in-season, lower implement very slowly to avoid sharp impact between the storage surface and the tillage shank assembly foot piece.

CAUTION

NOTE: The tillage shank assembly foot piece consists of a hard material to decrease wear and improve field performance. Due to material hardness, sharp impact, excessive weight, etc. can damage the tillage shank assembly foot piece.

PREPARING THE 1TRIPR



Tooling options available for added 1tRIPr® versatility are illustrated and explained in the tooling options section of this manual. Field adjustments are illustrated and explained in the field settings section of this manual.

If an Orthman toolbar is used in conjunction with 1tRIPr® row units, be sure to consult the toolbar operator's manual before attempting to operate the implement. Read and understand operator manuals for machinery used in conjunction with the 1tRIPr®.

Before each use, check hardware for wear and proper torque. Replace damaged or missing hardware with hardware of an identical grade to restore implement to original specifications.

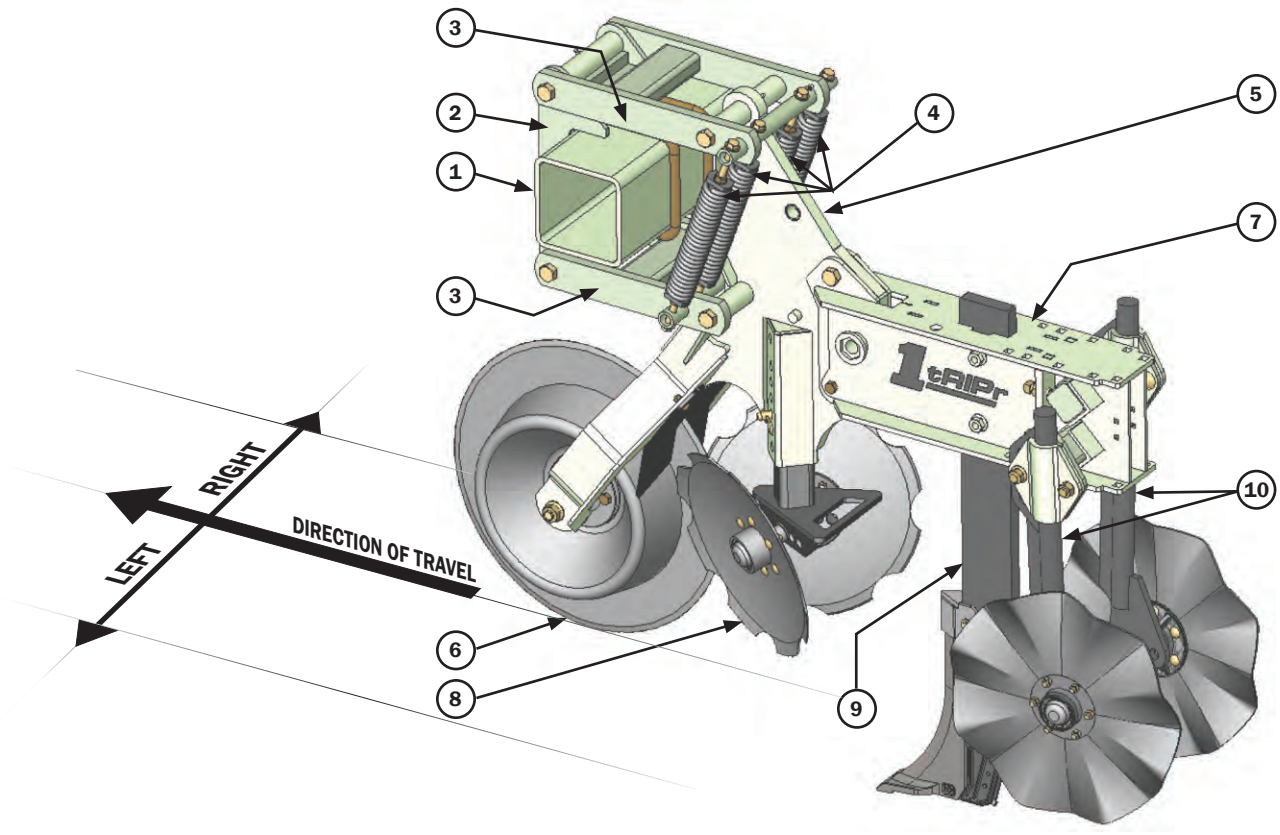
IMPLEMENT TO TRACTOR CONNECTION

AVOID CRUSHING. Do not stand between tractor and implement when connecting or disconnecting implement. Injury or death can result from being trapped between the tractor and implement.

AVOID CRUSHING. Make sure all personnel are clear of the implement. Lower implement to the ground, place tractor in park, turn off engine, and remove key.

USE BAR STANDS TO SUPPORT THE IMPLEMENT. Park implement on a clean, dry, and level surface. An uneven surface could cause implement to shift or fall, resulting in injury or death, as well as implement damage. Securely support all implement components that must be raised.

STANDARD ROW UNIT COMPONENT IDENTIFICATION



NOTE: Right and left as illustrated above and referenced from this point on, is determined by facing the same direction the implement will travel while in use.

1. TOOLBAR. Proven Orthman toolbar design provides unmatched strength.

2. MOUNT. A wrap- around mount provides a long lasting row unit foundation.

3. PARALLEL LINKAGES. Parallel linkages, with the ability to travel vertically, allow the row units to operate independent of the toolbar to allow uniform tillage depth despite terrain variations.

4. DOWN PRESSURE SPRINGS. Four adjustable down pressure springs per row unit supply down pressure to assist with row unit tooling soil penetration.

5. MAINFRAME. The row unit mainframe serves as the primary mount for row unit tooling.

6. DEPTH BAND COULTER ASSEMBLY. The depth band provides consistent row unit tooling depth while the coulter cuts surface and subsurface residue.

7. TAIL SECTION. The tail section houses adjustable tooling.

8. TRASH OPENER OR ROW CLEANER ASSEMBLY. The trash opener reduces field residue directly behind the depth band coulter prior to the arrival of rearward tooling.

9. TILLAGE SHANK ASSEMBLY. The tillage shank assembly *(mole shank or mole knife)* shatters the root zone compacted layer, while allowing precision fertilizer placement at two depths, if desired.

10. WAVY COULTER ASSEMBLIES. Wavy coulter assemblies provide “lift and pinch” action to incorporate field residue, till, and firm the seedbed.

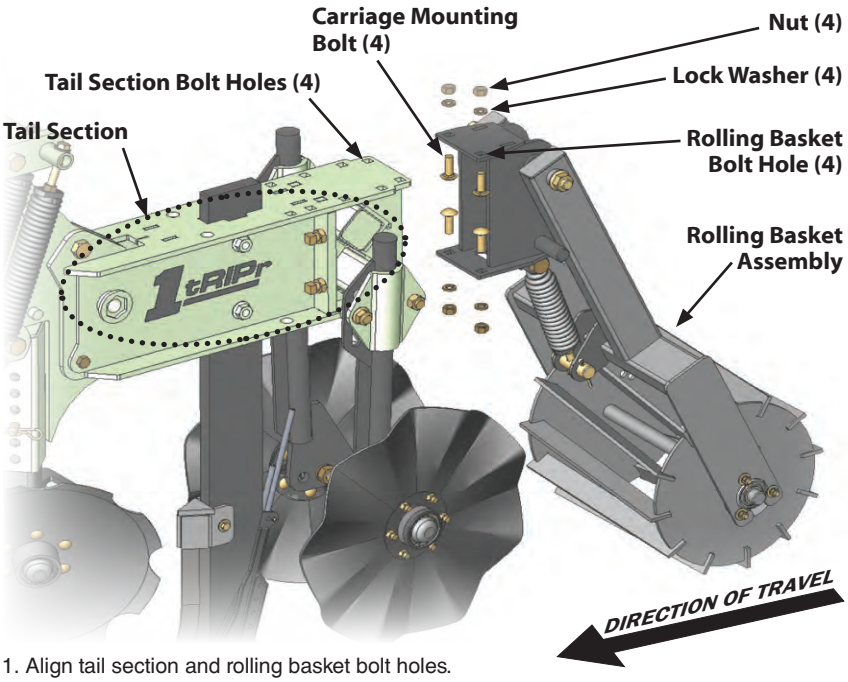
ROLLING BASKET ASSEMBLY

An optional rolling basket assembly is available to complement the *1tRIPr®* row unit. Rolling baskets reduce clod size, retain existing soil moisture, firm, and complete the optimum seedbed. The rolling basket is mounted to the rear of the row unit tail section.

INSTALLATION OF ROLLING BASKET ASSEMBLY

AVOID CRUSHING. *Make sure all personnel are clear of the implement. Lower implement to the ground, place tractor in park, turn off engine, and remove key.*

USE BAR STANDS TO SUPPORT THE IMPLEMENT. *Park implement on a clean, dry, and level surface. An uneven surface could cause implement to shift or fall, resulting in personal injury or death, as well as implement damage. Securely support all implement components that must be raised. Remove buildup of grease, oil, or debris prior to installing the rolling basket.*



CAUTION

Be extremely careful working around unshielded sharp edges. Injury may result from contact with sharp edges.

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1. Align tail section and rolling basket bolt holes.
2. Mount rolling basket assembly to tail section with carriage mounting bolts, lock washers, and nuts.
3. Tighten all hardware to proper torque specifications. *(pg. 8 - 4)*

NOTE: *Recommended tools: 3/4" socket or end wrench.*

NOTE: *Due to clearance issues, rolling baskets cannot be used in conjunction with certain planter attachment packages. A lift assist wheel extension package is available to utilize rolling baskets and lift assist wheels simultaneously. Contact your Orthman dealer for lift assist wheel extension package information to alleviate clearance issues. For basket down pressure adjustment, see page 5-10.*

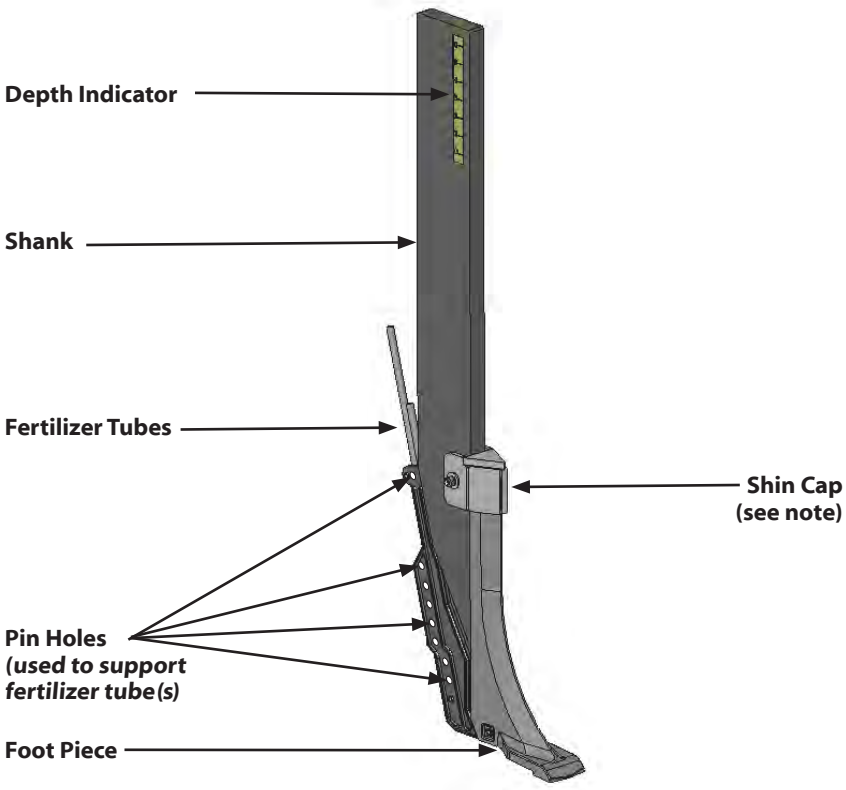
MOLE SHANK ASSEMBLY

The mole shank assembly provides benefits to maximize strip-till soil management. The foot piece shatters the root zone compacted layer to increase soil porosity, reduce run off, and allow root systems to utilize deeper soil moisture and nutrients.

NOTE: A depth indicator allows for uniform mole shank assembly depth between row units. Depth indicator decal does not reflect actual tillage depth. Use depth indicator decal as a tool to achieve uniform depth across the implement.

Fertilizer tube(s) allow precision fertilizer placement at two depths, if desired. Precision fertilizer placement provides crop plants with timely fertilizer access to maximize development from germination through maturity.

If combining strip-tillage and planting operations with a Combo Caddy or attachment package, lateral offset of the *1tRIPr®* row unit relative to seed placement is recommended to allow fertilizer placement without detriment to seed germination.



NOTE: Refer to (pg. 4 - 4) for mole shank assembly installation instructions. Refer to (pg. 4 - 5) for fertilizer tube installation instructions.
Shin cap may not be included or fit on later model machines due to footpiece design.

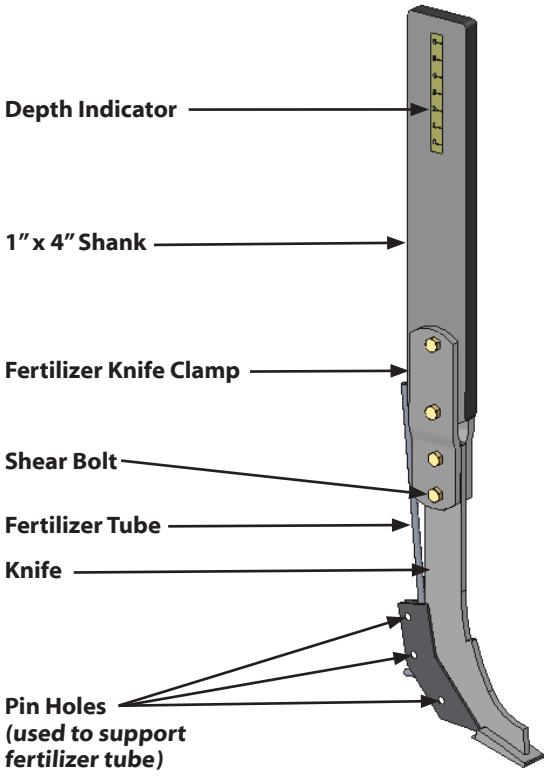
MOLE KNIFE ASSEMBLY

The mole knife assembly provides benefits to maximize strip-till soil management. The knife shatters the root zone compacted layer to increase soil porosity, reduce run off, and allow root systems to utilize deeper soil moisture and nutrients. The fertilizer knife clamp shear bolt provides mole knife shear protection.

NOTE: A depth indicator allows for uniform mole knife assembly depth between row units. Depth indicator decal does not reflect actual tillage depth. Use depth indicator decal as a tool to achieve uniform depth across the implment.

Fertilizer tube(s) allow precision fertilizer placement at two depths, if desired. Precision fertilizer placement provides crop plants with timely fertilizer access to maximize development from germination through maturity.

If combining strip-tillage and planting operations with a Combo Caddy or attachment package, lateral offset of the *1tRIPr®* row unit relative to seed placement is recommended to allow fertilizer placement without detriment to seed germination.

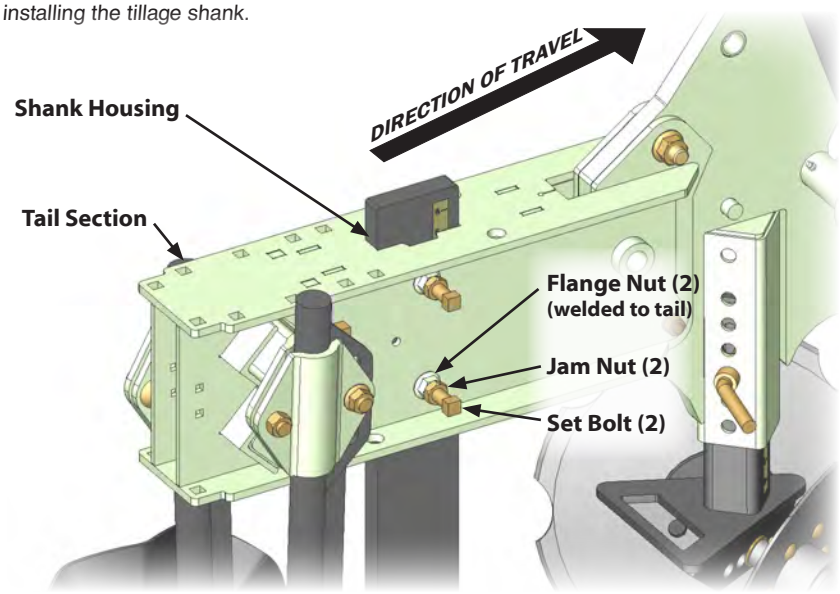


NOTE: Refer to (pg. 4 - 4) for mole knife assembly installation instructions. Refer to (pg. 4 - 5) for fertilizer tube installation instructions. Contact your Orthman dealer for additional fertilizer tubes to place fertilizer at two depths.

INSTALLATION
TILLAGE SHANK ASSEMBLY
(MOLE SHANK AND MOLE KNIFE)

AVOID CRUSHING. *Make sure all personnel are clear of the implement. Lower implement to support blocks to attain proper shank installation height, place tractor in park, turn off engine, and remove key.*

USE BAR STANDS TO SUPPORT THE IMPLEMENT. *Park implement on a clean, dry, and level surface. An uneven surface could cause implement to shift or fall, resulting in personal injury or death, as well as implement damage. Securely support all implement components that must be raised. Remove buildup of grease, oil, or debris prior to installing the tillage shank.*



(MOLE SHANK ASSEMBLY PICTURED)

1. Loosen jam nuts and set bolts to provide adequate shank housing clearance for the shank to be inserted in the bottom side of the tail.
2. Insert shank into shank housing.
3. Tighten set bolts and jam nuts to secure tillage shank assembly to tail section.
4. Tighten hardware to proper torque specifications. *(pg. 8 - 4)*

CAUTION

Be extremely careful working around unshielded sharp edges. Injury may result from contact with sharp edges.

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NOTE: A depth indicator allows for uniform tillage shank assembly depth between row units. Depth indicator decal does not reflect actual tillage depth. Use depth indicator decal as a tool to achieve uniform depth across the implement.

NOTE: Tail Flange nuts are welded to both sides of the tail. Jam nuts and set bolts can be moved to the opposite side for ease of adjustment.

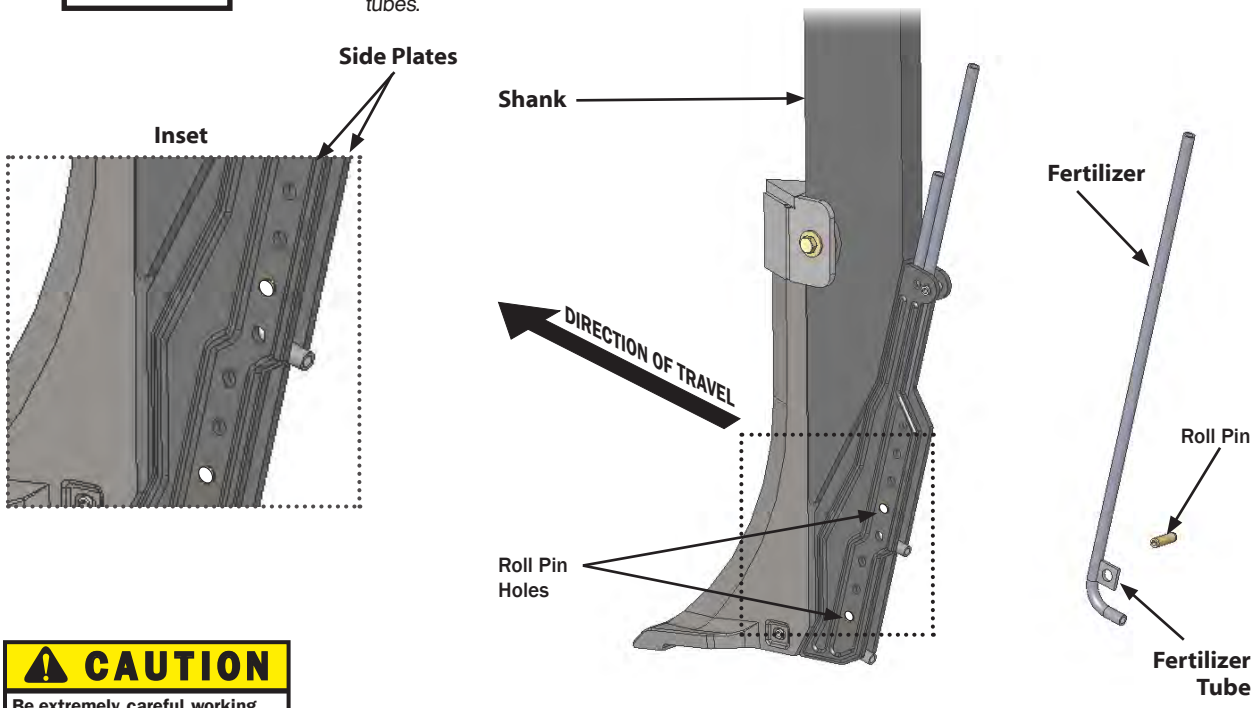
NOTE: Recommended tools: Jam Nut - 15/16 end wrench, Set Bolt - 5/8 eight point socket.
(3/4 end wrench will substitute for the 5/8 eight point socket, although not recommended)

INSTALLATION
MOLE SHANK ASSEMBLY
FERTILIZER TUBE

If you choose to apply NH_3 or liquid fertilizer, it is advisable to consult documented information regarding safe handling and application of NH_3 or liquid fertilizer. Refer to recognized sources. (pg. 2 - 7)

AVOID CRUSHING. *Make sure all personnel are clear of the implement. Lower implement to support blocks to attain proper shank installation height for fertilizer tubes, place tractor in park, turn off engine, and remove key.*

USE BAR STANDS TO SUPPORT THE IMPLEMENT. *Park implement on a clean, dry, and level surface. An uneven surface could cause implement to shift or fall, resulting in personal injury or death, as well as implement damage. Securely support all implement components that must be raised. Remove buildup of grease, oil, or debris prior to installing the fertilizer tubes.*



CAUTION

Be extremely careful working around unshielded sharp edges. Injury may result from contact with sharp edges.

153 - 045

1. Distinguish roll pin holes for desired fertilizer placement depth.
2. Insert fertilizer tubes between side plates. *(see inset)*
3. Align desired roll pin holes and fertilizer tube mount tab.
4. Insert roll pin through side plate roll pin holes and fertilizer tube mount tab to secure fertilizer tube.

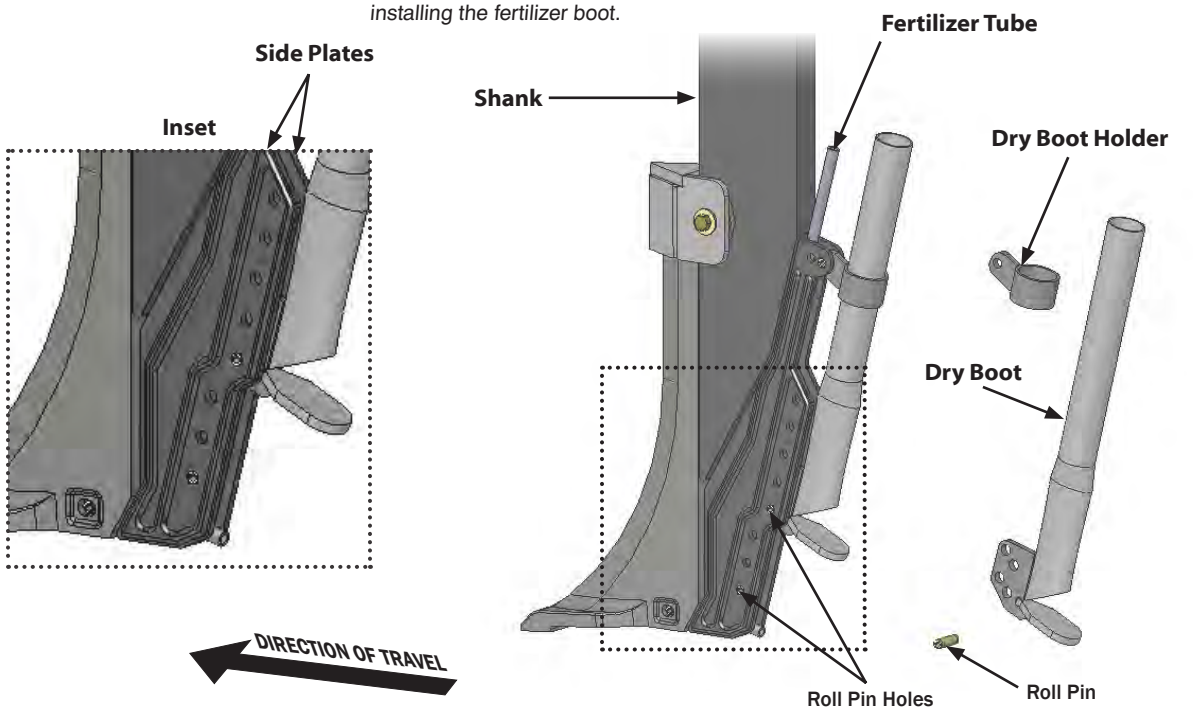
NOTE: The uppermost roll pin holes and upper roll pin may be used to support the upper portion of the fertilizer tube.

INSTALLATION MOLE SHANK ASSEMBLY ADJUSTABLE DRY FERTILIZER BOOT

If you choose to apply NH_3 or liquid fertilizer, or dry fertilizer it is advisable to consult documented information regarding safe handling and application of NH_3 or liquid fertilizer. Refer to recognized sources. (pg. 2 - 7)

AVOID CRUSHING. *Make sure all personnel are clear of the implement. Lower implement to support blocks to attain proper shank installation height for fertilizer tubes, place tractor in park, turn off engine, and remove key.*

USE BAR STANDS TO SUPPORT THE IMPLEMENT. *Park implement on a clean, dry, and level surface. An uneven surface could cause implement to shift or fall, resulting in personal injury or death, as well as implement damage. Securely support all implement components that must be raised. Remove buildup of grease, oil, or debris prior to installing the fertilizer boot.*

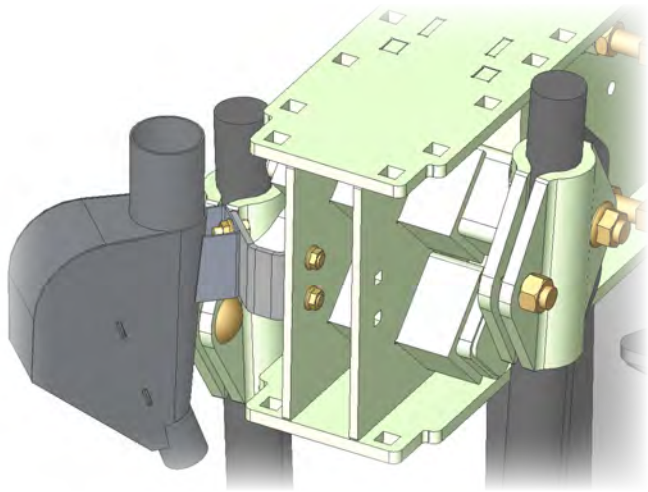


1. Distinguish roll pin holes for desired fertilizer placement depth.
2. Insert fertilizer tube, and or dry fertilizer boot between side plates (see inset).
3. Align desired roll pin holes and fertilizer tube mount tab.
4. Insert roll pin through side plate roll pin holes and fertilizer tube and or dry fertilizer boot mount tabs to secure tube and or boot.

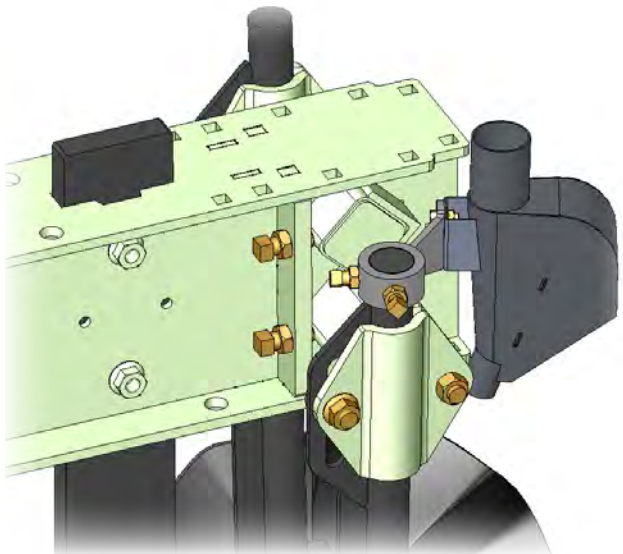
NOTE: *the uppermost roll pin holes and upper roll pin may be used to support the upper portion of the fertilizer tube and or boot.*

INSTALLATION OF AIR DIFFUSER AND AIR DIFFUSER MOUNT

There are two different types of Orthman Air Diffuser mounts.



Mount style 1 is only for use with 1tRIPr® row units that have been produced in 2009 or later. To install this mount remove two 5/16" carriage bolts from the Diffuser and mount package. Align two square bolt holes on mount bracket with two square bolt holes on row unit tail. Tighten with 1/2" end wrench. This mount can be utilized on either side of the tail. The Air Diffuser and mount package comes from Orthman Manufacturing ready to install on the left side of the 1tRIPr® row unit tail. Diffuser mount will need to be removed from the diffuser and flipped over to be installed on the right side.



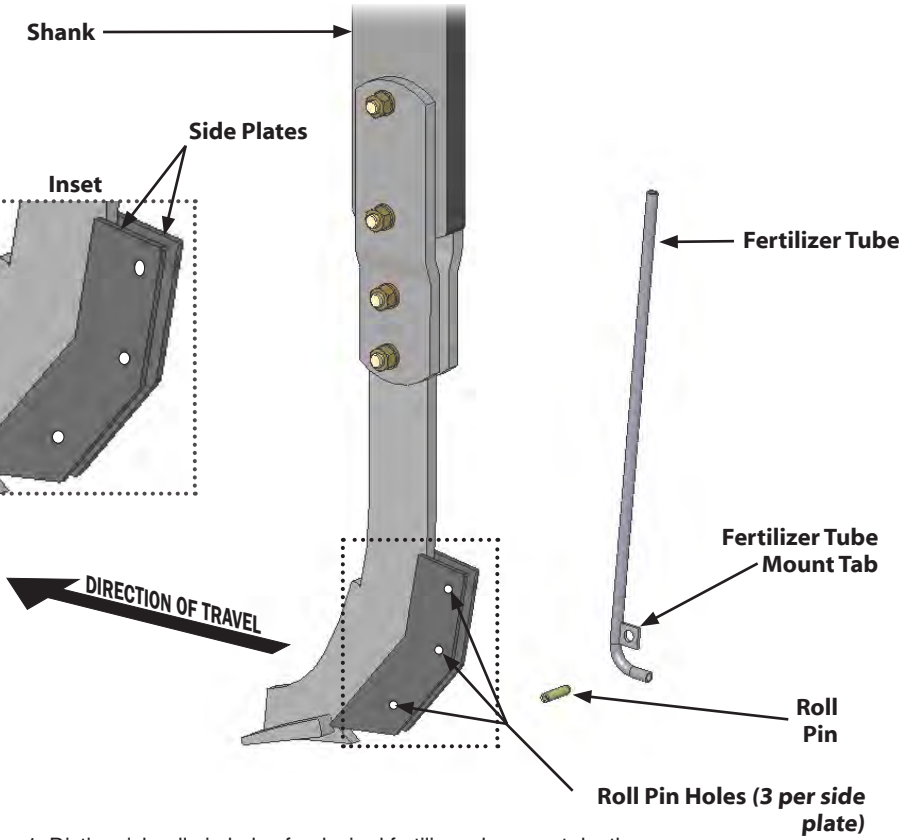
Mount style 2 is for use with any 1tRIPr® row unit ever produced, and will most likely be received if you have purchased an Orthman Atlas Lifting Cart, or other machine lifting device. This is due to the fact the purchasers of these lifting devices may already own 1tRIPr® machines produced before 2009 that do not have the mount holes in the tail for mount style 1. Contact Orthman Manufacturing for Diffuser mount options. To install this mount, loosen jam nuts and set screws and slide the round part over the top of the left or right round wavy coulter shank, set the preferred angle, and then re-tighten the set screws and jam nuts. This Air Diffuser and mount package may come assembled from Orthman Manufacturing ready to install on the left side of the 1tRIPr® row unit. Diffuser mount may need to be removed from the diffuser and flipped over to be installed on the right side.

INSTALLATION MOLE KNIFE ASSEMBLY FERTILIZER TUBE

If you choose to apply NH3, it is advisable to consult documented information regarding safe handling and application of NH3. Refer to recognized sources. (pg. 2 - 7)

AVOID CRUSHING. *Make sure all personnel are clear of the implement. Lower implement to the ground, place tractor in park, turn off engine, and remove key.*

USE BAR STANDS TO SUPPORT THE IMPLEMENT. *Park implement on a clean, dry, and level surface. An uneven surface could cause implement to shift or fall, resulting in personal injury or death, as well as implement damage. Securely support all implement components that must be raised. Remove buildup of grease, oil, or debris prior to installing the mole knife.*



⚠ CAUTION

Be extremely careful working around unshielded sharp edges. Injury may result from contact with sharp edges.

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1. Distinguish roll pin holes for desired fertilizer placement depth.
2. Insert fertilizer tube between side plates. *(see inset)*
3. Align desired roll pin holes and fertilizer tube mount tab.
4. Insert roll pin through side plate roll pin holes and fertilizer tube mount tab to secure fertilizer tube.

NOTE: *Contact your Orthman dealer for additional fertilizer tubes to place fertilizer at two depths.*

INSTALLATION OF AUTOMATIC RESET TRIP LINKAGE

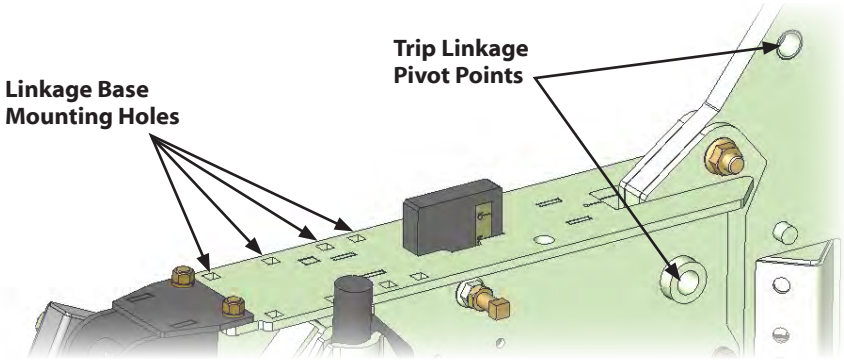
One of the most innovative Orthman 1tRIPr® row unit accessories is the Automatic Reset Trip Linkage. This allows the row unit to be tripped by underground obstructions and then automatically reset. This helps protect the shank and wavy coulter tooling. The Automatic Reset "AR" Linkage will be installed on your 1tRIPr® machine from the factory if ordered with that option. The AR Linkage can also be ordered as a package and adapted to any standard row unit made in 2009 or later.

AVOID CRUSHING. *Make sure all personnel are clear of the implement. Lower implement to the ground, place tractor in park, turn off engine, and remove key.*

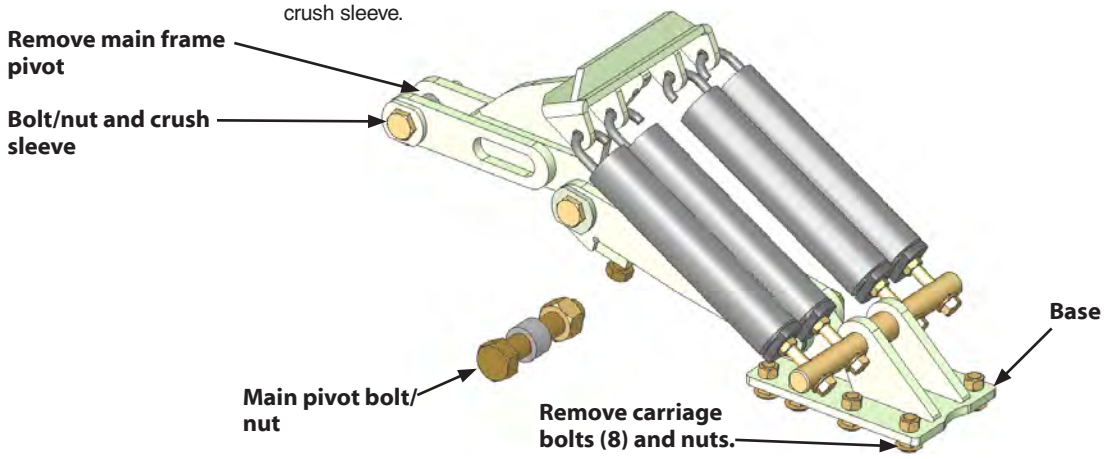
USE BAR STANDS TO SUPPORT THE IMPLEMENT. *Park implement on a clean, dry, and level surface. An uneven surface could cause implement to shift or fall, resulting in personal injury or death, as well as implement damage. Securely support all implement components that must be raised. Remove buildup of grease, oil, or debris prior to adjusting.*

If installing the AR linkage to a 1tRIPr® row unit please follow these instructions.
If AR linkage is already installed onto your machine's row units, please advance to the AR linkage field settings section.

1. Locate the trip linkage pivot points on the tail and mainframe sections, and the linkage base mounting holes on the tail.



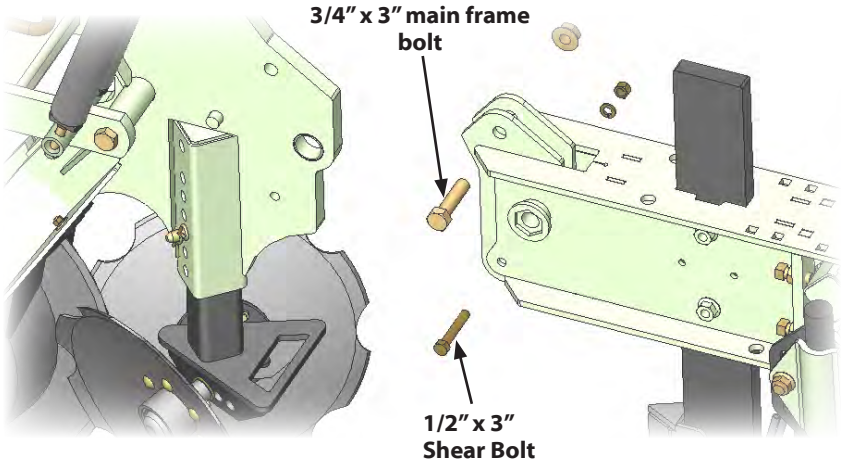
2. The AR Linkage package you receive should be mostly assembled. Remove the ¾"x 3 1/2" long main frame pivot bolt and crush sleeve. Also remove the eight ½" x 1 ¼" carriage bolts that are in the base plate. Locate the 1" x 5" long main pivot bolt with nut and crush sleeve.



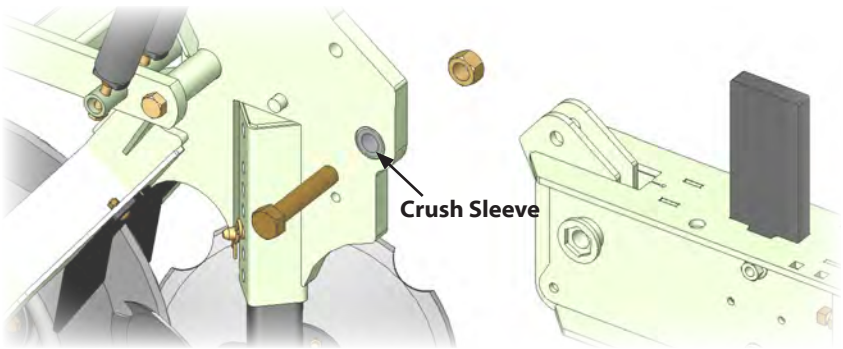
AVOID CRUSHING. *Make sure all personnel are clear of the implement. Lower implement to the ground, place tractor in park, turn off engine, and remove key.*

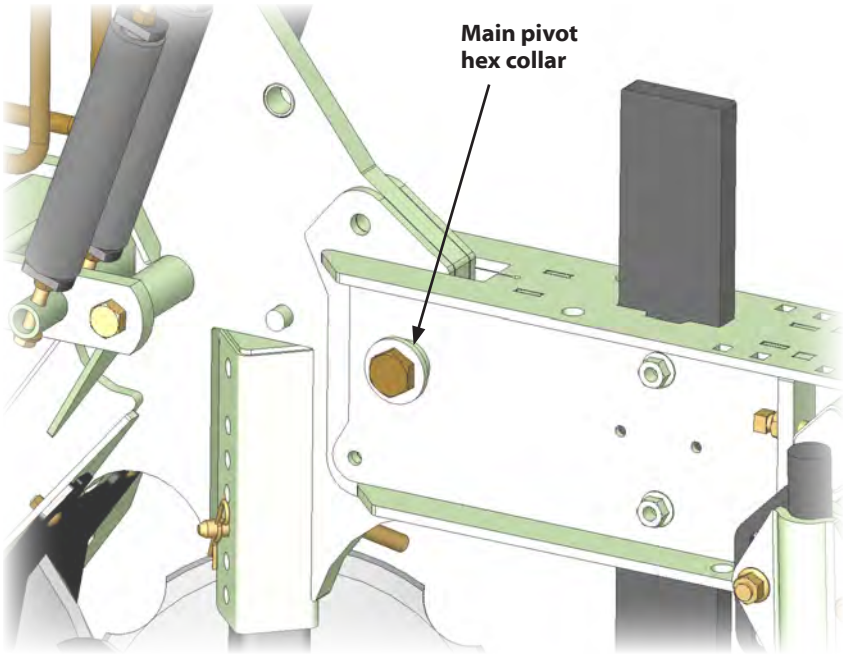
USE BAR STANDS TO SUPPORT THE IMPLEMENT. *Park implement on a clean, dry, and level surface. An uneven surface could cause implement to shift or fall, resulting in personal injury or death, as well as implement damage. Securely support all implement components that must be raised. Remove buildup of grease, oil, or debris prior to adjusting.*

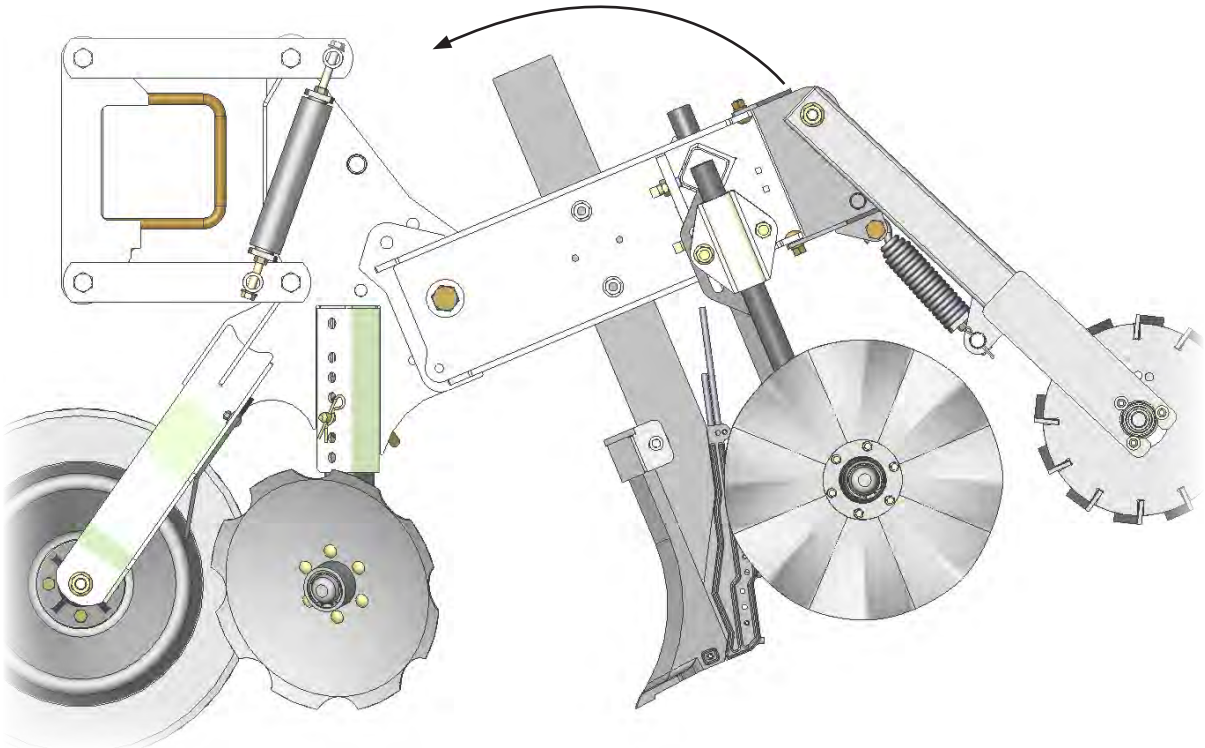
3. To install the main pivot bolt and crush sleeve, the tail section of the 1tRIPr® row unit will have to be removed. Be sure to use a safe, adequate lifting device. It may be easier to manipulate the tail section of the row unit with the tillage shank in a raised position. It may also be desirable to have the 1tRIPr® machine lifted up with a tractor so there is no pressure on the tail section of the row units. If not hooked to a tractor it is important to only remove one row unit at a time and fully complete the installation of one AR Linkage before starting on the next row unit, as the tail sections of the row units keep the machine from tipping over backwards. To remove the tail section of the 1tRIPr® remove the ¾" x 3" long main frame bolt, and the ½" x 3" long shear bolt.



4. Once the tail section is removed, insert the main pivot crush sleeve into the main frame. Then re-position tail section over the main frame and install main pivot bolt. There is a hex collar on the side of the tail section to keep this bolt from rotating. Install so the head of the bolt fits down inside this collar. Tighten the nut down and the tail should clamp tight over the crush sleeve. It should be possible to lift the tail up as if it were tripping and pivot it about this bolt now. See figures on page 4-11.



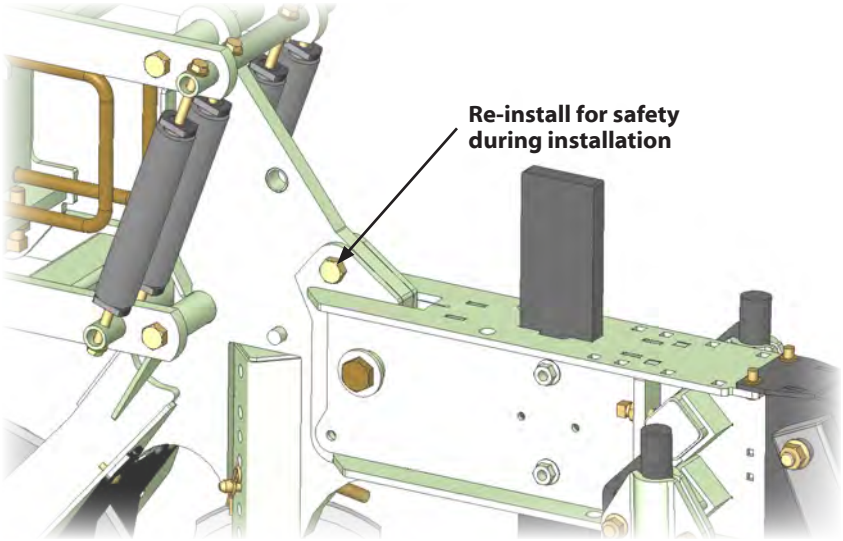

Main pivot
hex collar



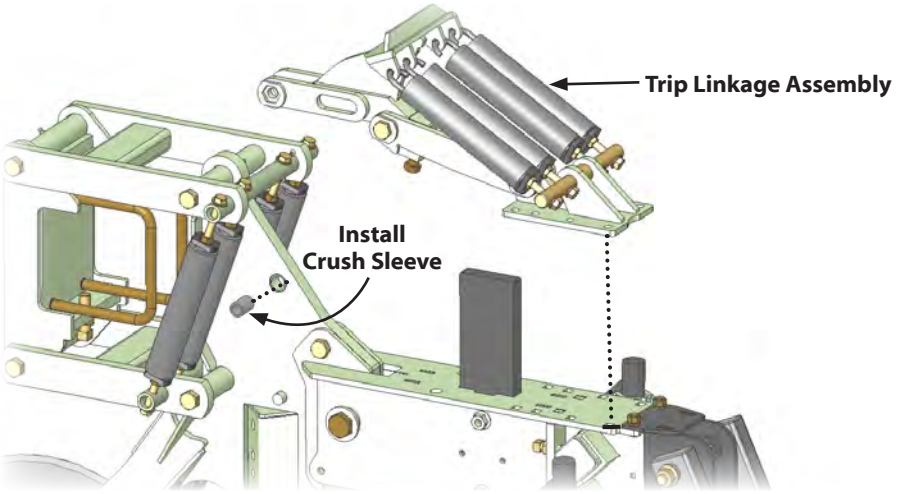
AVOID CRUSHING. *Make sure all personnel are clear of the implement. Lower implement to the ground, place tractor in park, turn off engine, and remove key.*

USE BAR STANDS TO SUPPORT THE IMPLEMENT. *Park implement on a clean, dry, and level surface. An uneven surface could cause implement to shift or fall, resulting in personal injury or death, as well as implement damage. Securely support all implement components that must be raised. Remove buildup of grease, oil, or debris prior to adjusting.*

5. After checking that the tail section will pivot and the pivot bolt is tightened it is advisable to re-install ¾" x 3" long main frame bolt. This will keep the tail positioned properly for the rest of the installation and serve as a safety pin so the unit will not accidentally trip while someone is working on it. Be sure to remove this bolt when installation is completed or trip linkage will not function.

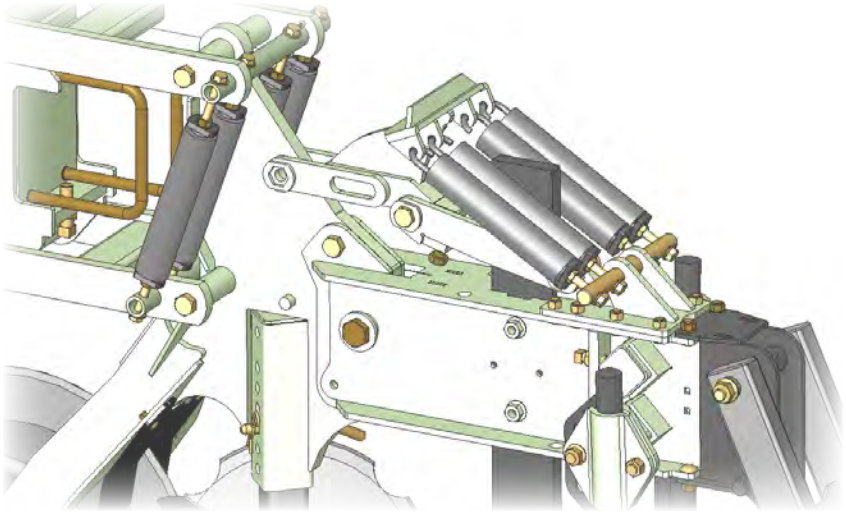


6. Install crush sleeve into main frame, and then lower trip linkage assembly onto the tail section. Line up the eight bolt holes in the tail section plate and install 8 carriage bolts.



AVOID CRUSHING. *Make sure all personnel are clear of the implement. Lower implement to the ground, place tractor in park, turn off engine, and remove key.*

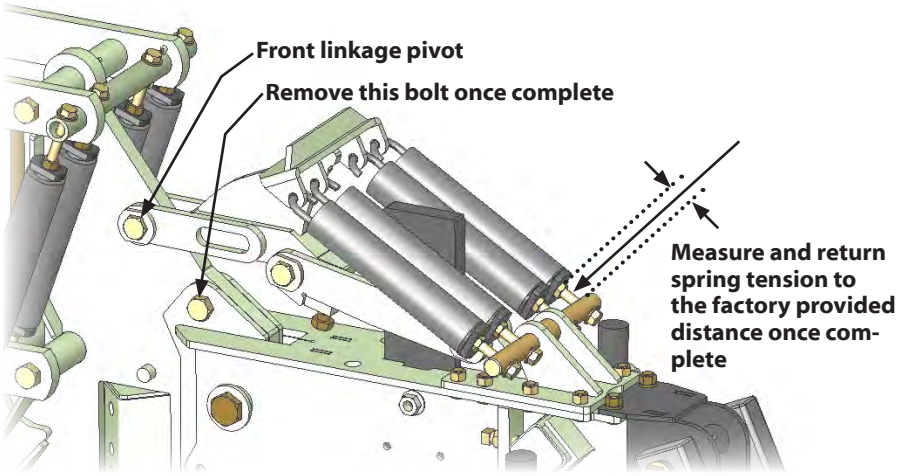
USE BAR STANDS TO SUPPORT THE IMPLEMENT. *Park implement on a clean, dry, and level surface. An uneven surface could cause implement to shift or fall, resulting in personal injury or death, as well as implement damage. Securely support all implement components that must be raised. Remove buildup of grease, oil, or debris prior to adjusting.*



7. Once the carriage bolts are tightened it may be necessary to loosen the spring tension bolts, and/or use an alignment punch to install the front linkage pivot bolt.

Be sure to measure distance of spring tension before loosening it in order to return it to its factory setting once the front linkage pivot bolt is installed.

Once trip linkage mounting bolts are tight and spring tension is returned to factory setting, remove ¾" x 3" long main frame bolt that was installed for safety in step 5. The AR Linkage installation is now complete.

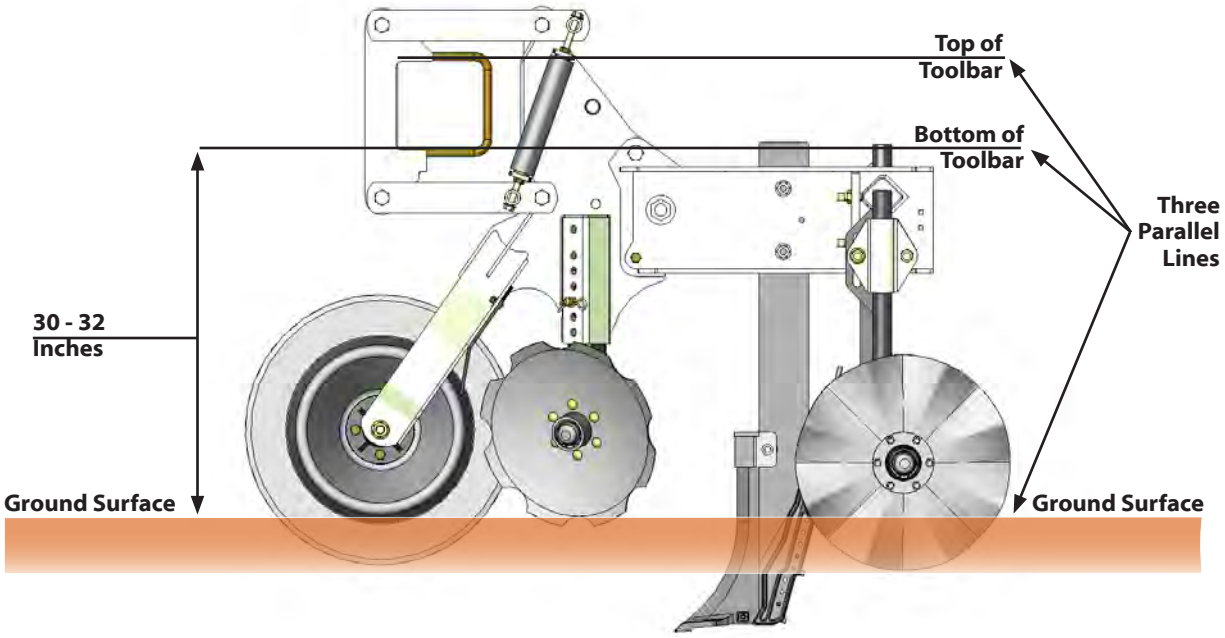


TOOLBAR HEIGHT AND ORIENTATION

PLACE TRACTOR IN PARK AND REMOVE KEY BEFORE DISMOUNTING TRACTOR TO ADJUST IMPLEMENT.

NEVER ALLOW RIDERS ON TRACTOR OR IMPLEMENT. Riders hinder operator visibility and can be thrown from the implement and/or be struck by foreign objects resulting in injury or death.

NOTE: When setting toolbar height and orientation, disregard row unit performance. Toolbar height and orientation must be established prior to tooling adjustment.



The top and bottom of the toolbar must operate parallel with the ground surface. Adjustment of tractor three point third link, lift assist wheels, and/or toolbar gauge wheels, if equipped, will allow the toolbar to operate parallel with the ground surface.

The bottom of the toolbar should operate approximately 30 - 32 inches above the ground surface. Use tractor lower hitch stop, lift assist wheels, and/or toolbar gauge wheels, if equipped, to set desired toolbar height.

Have an assistant pull the tractor and implement slowly forward in the field position as you view the end of the toolbar from a safe distance. Observe toolbar height and orientation while in operation. Make adjustments accordingly until the top and bottom of the toolbar operate parallel with the ground surface and the bottom of the toolbar operates approximately 30 - 32 inches above the ground surface. *(as pictured above)*

TOOLBAR HEIGHT AND ORIENTATION

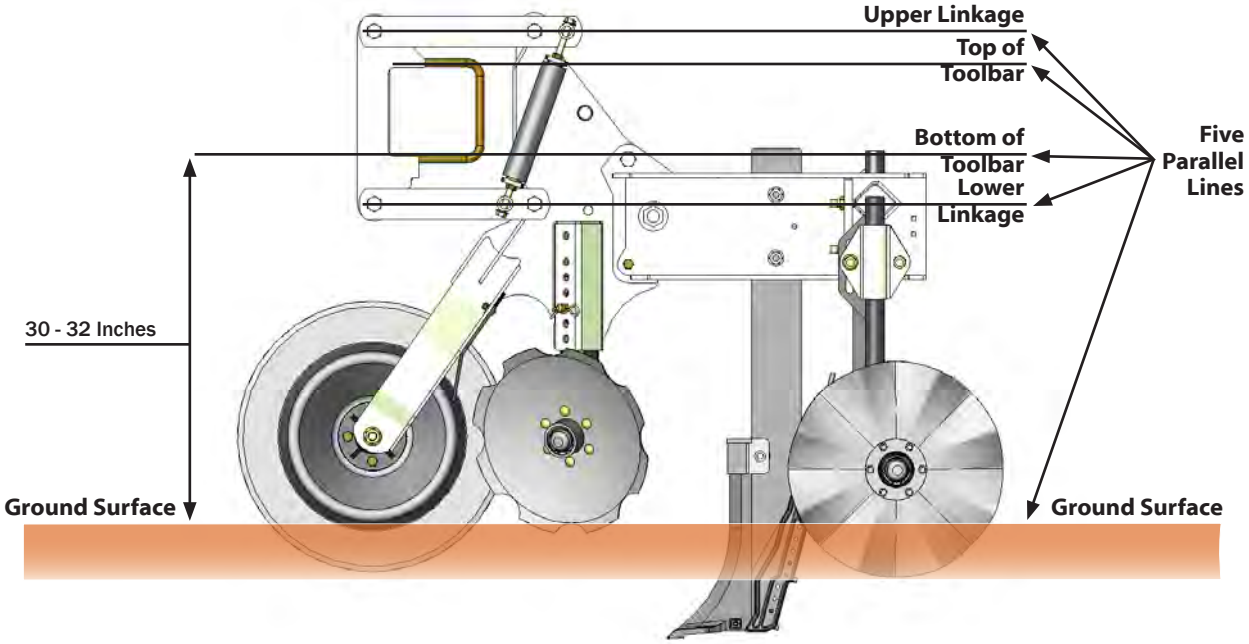
PLACE TRACTOR IN PARK AND REMOVE KEY BEFORE DISMOUNTING TRACTOR TO ADJUST IMPLEMENT.

NEVER ALLOW RIDERS ON TRACTOR OR IMPLEMENT. Riders hinder operator visibility and can be thrown from the implement and/or be struck by foreign objects resulting in injury or death.

After desired toolbar height and orientation is established, set tractor lower hitch stop, lift assist wheels, and/or toolbar gauge wheels, if equipped.
NOTE: *Larger implements may require lift assist wheels and/or toolbar gauge wheels to support toolbar weight. Lift assist wheels and/or toolbar gauge wheels displace a portion of toolbar weight to allow maximum parallel linkage travel.*
NOTE: *Smaller implements may operate without lift assist wheels and/or toolbar gauge wheels. The tractor hitch will bear a portion of the toolbar weight by setting a lower hitch stop on the tractor three point hitch control.*

ROW UNIT DEPTH

Effectively, the depth band coulter assembly provides consistent row unit tooling depth by governing soil penetration. Adjustable down pressure springs supply row unit down pressure to assist with row unit soil penetration. Parallel linkages, with the ability to travel vertically, allow row units to operate independent of the toolbar. The depth band, down pressure springs, and parallel linkages should allow the toolbar serve as a towing device allowing uniform tillage despite terrain variations.



For the toolbar to serve as a towing device, the ground surface, lower linkage, bottom of toolbar, top of toolbar, and upper linkage must generally operate parallel to one another when in the field position. The depth band coulter assembly should allow the toolbar to operate at the desired height and provide consistent row unit tooling depth by governing soil penetration. It is important to arrive at the setting illustrated above so further tooling adjustments will be uniform.

⚠ ROW UNIT DOWN PRESSURE

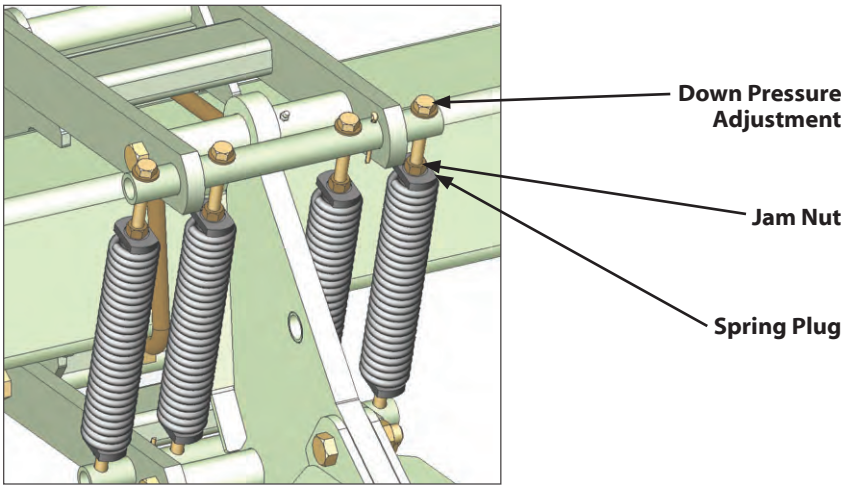
AVOID CRUSHING. *Make sure all personnel are clear of the implement. Lower implement to the ground, place tractor in park, turn off engine, and remove key.*

USE BAR STANDS TO SUPPORT THE IMPLEMENT. *Park implement on a clean, dry, and level surface. An uneven surface could cause implement to shift or fall, resulting in personal injury or death, as well as implement damage. Securely support all implement components that must be raised. Remove buildup of grease, oil, or debris prior to adjusting.*

Four adjustable down pressure springs supply row unit down pressure to assist with row unit tooling soil penetration. After toolbar height and orientation is set *(pg. 5 - 1, 5 - 2)* row unit down pressure can be adjusted.

Down pressure springs should be adjusted so that parallel linkages operate independent of the toolbar and the toolbar serves as a towing device. Compacted soil conditions may require an increase in down pressure and softer soil conditions may require a decrease in down pressure to provide adequate soil penetration across the implement.

If a rigid toolbar is used with the *1tRIPr®* row units, down pressure adjustment between row units typically varies slightly. If a folding or stacking toolbar is used, wing sections tend to float upward, unless mechanically restrained. *(refer to toolbar operator's manual)* Wing row units, not mechanically restrained, may require a decreased amount of down pressure to allow row units to perform consistently across the implement.



⚠ CAUTION

Be extremely careful working around unshielded sharp edges. Injury may result from contact with sharp edges.

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NOTE: Recommended tools: Down Pressure Adjustment Bolt and Jam Nut - 3/4 end wrench, Spring Plug - 1 1/4 end wrench.
NOTE: Adjust all four down pressure springs per row unit evenly.

1. Loosen jam nut from spring plug.
2. Adjust down pressure adjustment bolt.
   (clockwise - increase pressure, counterclockwise - decrease pressure)
3. Tighten jam nut against spring plug to torque specifications. *(pg. 8 - 4)*

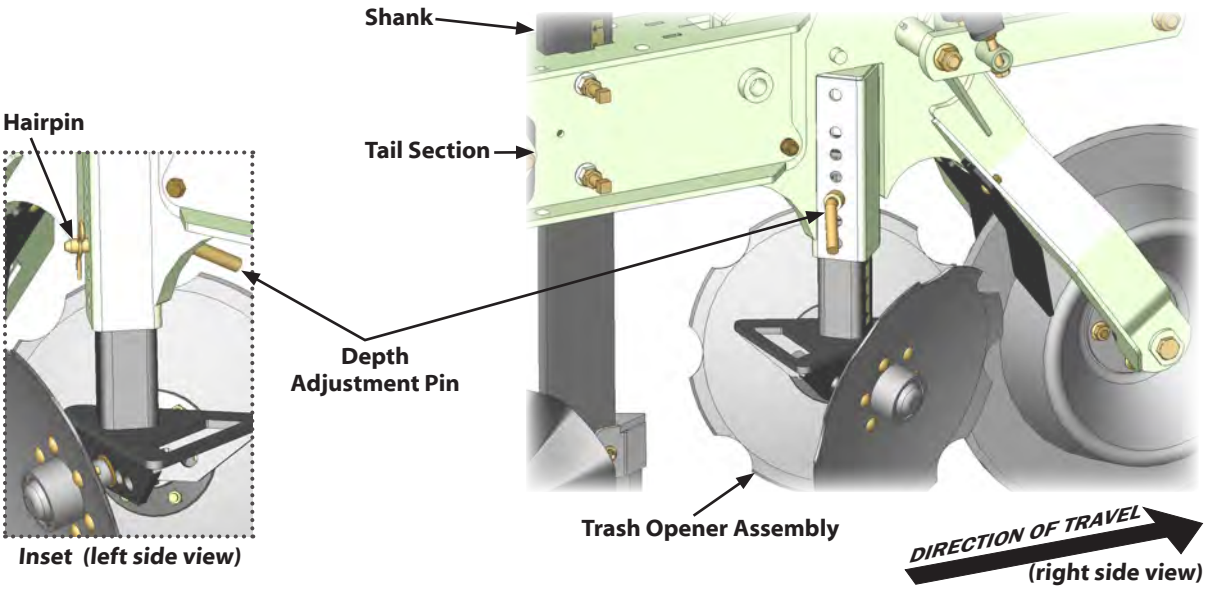
NOTE: Too much down pressure applied to the individual row units can essentially lift the toolbar to an undesireable operating height. Lifting the toolbar will cause the parallel linkages to "bottom out" and the row units will not operate independent of the toolbar resulting in non-uniform tillage across the implement.

TRASH OPENER ASSEMBLY DEPTH

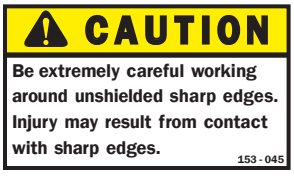
The trash opener assembly reduces field residue directly behind the depth band coulter assembly prior to the arrival of rearward tooling. The trash opener assembly can be vertically pin adjusted *in 1/4 inch increments.*

AVOID CRUSHING. *Make sure all personnel are clear of the implement. Lower implement to the ground, place tractor in park, turn off engine, and remove key.*

USE BAR STANDS TO SUPPORT THE IMPLEMENT. *Park implement on a clean, dry, and level surface. An uneven surface could cause implement to shift or fall, resulting in injury or death, as well as implement damage. Securely support all implement components that must be raised. Remove buildup of grease, oil, or debris prior to adjusting the trash opener assembly.*



NOTE: Recommended trash opener depth is approximately 1/2 inch below soil surface to gently remove surface residue with minimal soil disturbance. Trash openers are often removed when operating in a low residue cover crop such as drilled wheat, alfalfa, beans, etc.



1. Remove hairpin from depth adjustment pin.
2. Physically support weight of trash opener assembly.
3. Remove depth adjustment pin from tail section and shank.
4. Vertically adjust trash opener assembly to desired depth.
5. Insert depth adjustment pin through receiver tube. Replace hairpin in depth adjustment pin.

NOTE: A depth indicator allows for uniform trash opener assembly depth between row units. Depth indicator decal does not reflect actual tillage depth. Use depth indicator decal as a tool to achieve uniform depth across the implement.

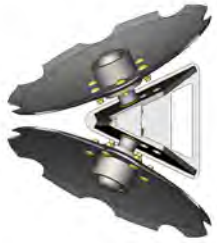
TRASH OPENER ASSEMBLY WIDTH

The trash opener assembly reduces field residue directly behind the depth band coulter assembly prior to the arrival of rearward tooling. The trash opener assembly can be adjusted fore and aft. The trash opener width can be adjusted.

AVOID CRUSHING. *Make sure all personnel are clear of the implement. Lower implement to the ground, place tractor in park, turn off engine, and remove key.*

USE BAR STANDS TO SUPPORT THE IMPLEMENT. *Park implement on a clean, dry, and level surface. An uneven surface could cause implement to shift or fall, resulting in injury or death, as well as implement damage. Securely support all implement components that must be raised. Remove buildup of grease, oil, or debris prior to adjusting the trash opener assembly.*

The trash opener discs can be adjusted fore and aft by removing them and changing their position to one of three holes on the trash opener mount. Each rearward hole move the disc assembly nearly 1" further away from the depth band coulter. As the discs are moved rearward the distance between the discs will increase.

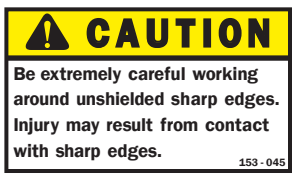


Front Position

Middle Position

Rearward Position

There are two spacers along with a washer that set the width between the discs. A combination of these spacers may be used to attain different widths between discs at different fore and aft positions. As discs are moved rearward it is adviseable to remove spacers to decrease the width between the discs.



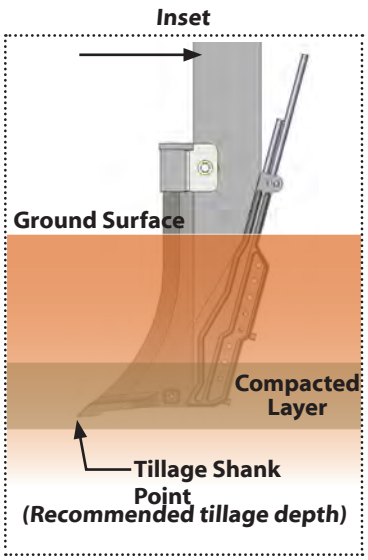
NOTE: Recommended tools: Snap Ring Pliers, 1-1/8" sockets and/or end wrenches.

Fore/aft and width adjustment

1. Remove snap ring and cap.
2. Secure bolt to remove nut.
3. Reposition discs.
4. Secure bolt and install nut.
5. Tighten all hardware to proper tourque specifications (pg. 8-4).
6. Install cap and snap ring.

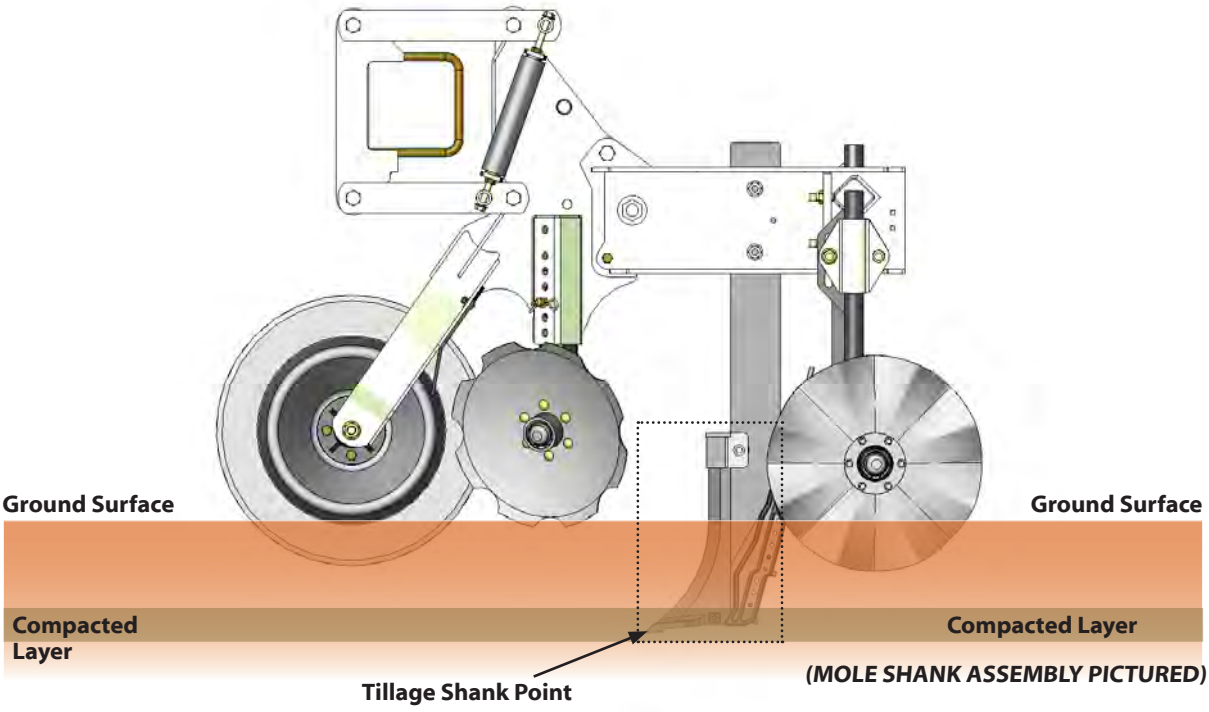
TILLAGE SHANK ASSEMBLY DEPTH

(MOLE SHANK OR MOLE KNIFE)



The mole shank assembly or mole knife assembly shatters the root zone compacted layer while placing fertilizer at two precision depths, if desired. Once compacted layer depth and thickness is researched and established, tillage shank assembly depth is adjusted accordingly.

The illustration to the left is an example. Varying compacted layer depth and thickness either within or between fields, will warrant tillage shank depth adjustment. The tillage shank point should operate in close proximity to the lowest point of the compacted layer. Operating the tillage shank point below the compacted layer will heave and lift the compacted layer. It is recommended to operate the tillage shank point near, but not past the lowest point of the compacted layer for optimum performance.



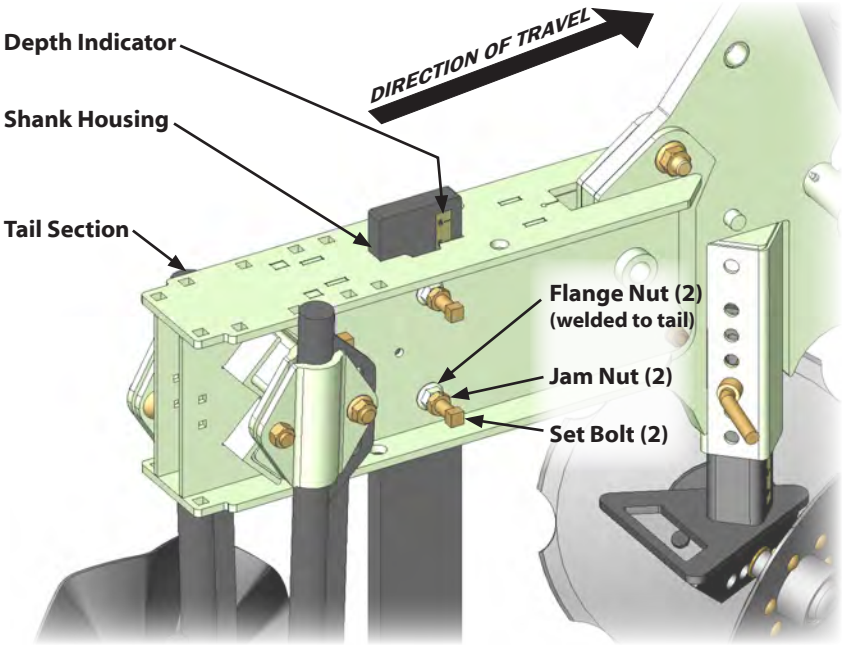
NOTE: It is important to make sure that the toolbar height and orientation as well as the parallel linkages generally operate as illustrated above prior to adjusting tillage shank depth.

TILLAGE SHANK ASSEMBLY DEPTH

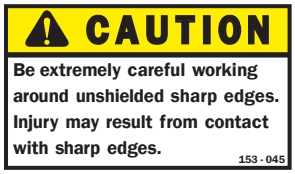
(MOLE SHANK OR MOLE KNIFE)

AVOID CRUSHING. *Make sure all personnel are clear of the implement. Lower implement to the ground, place tractor in park, turn off engine, and remove key.*

USE BAR STANDS TO SUPPORT THE IMPLEMENT. *Park implement on a clean, dry, and level surface. An uneven surface could cause implement to shift or fall, resulting in injury or death, as well as implement damage. Securely support all implement components that must be raised. Remove buildup of grease, oil, or debris prior to adjusting tillage shank depth.*



NOTE: Recommended tools: Jam Nut - 15/16 end wrench, Set Bolt - 5/8 eight point socket. (3/4 end wrench will substitute for the 5/8 eight point socket, although not recommended)



1. Physically support the weight of the tillage shank assembly.
2. Slightly loosen jam nuts and set bolts.
3. Vertically adjust tillage shank assembly to desired depth.

NOTE: A depth indicator allows for uniform tillage shank assembly depth between row units. Depth indicator decal does not reflect actual tillage depth. Use depth indicator decal as a tool to achieve uniform depth across the implment.

4. Tighten set bolts and jam nuts to secure tillage shank assembly to tail section.
5. Tighten hardware to proper torque specifications. (pg. 8- 4)

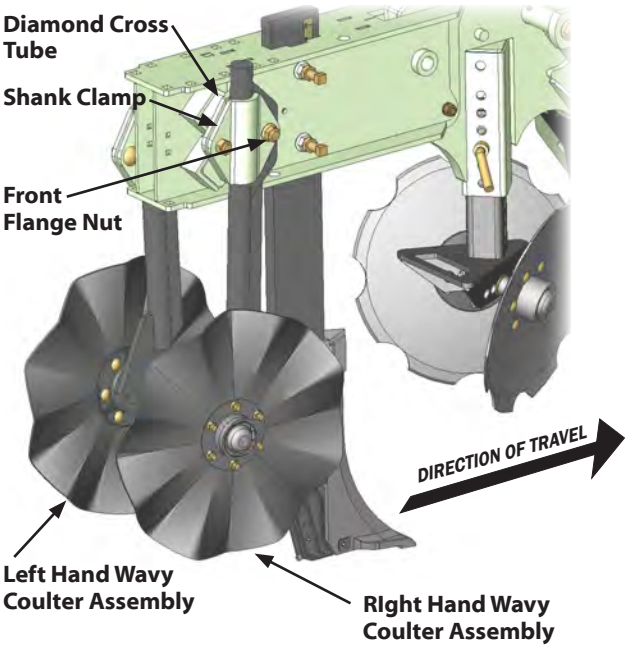
NOTE: Tail Flange nuts are welded to both sides of the tail. Jam nuts and set bolts can be moved to the opposite side for ease of adjustment.

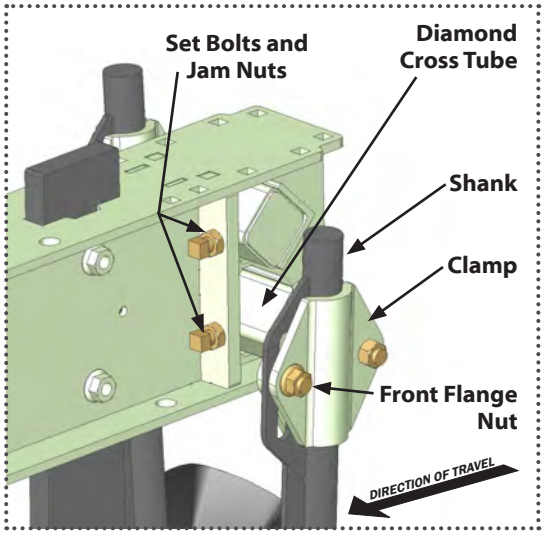
WAVY COULTER ASSEMBLY DEPTH AND WIDTH

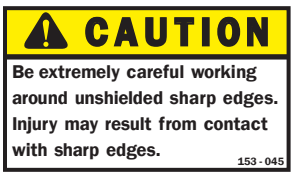
Wavy coulter assemblies provide “lift and pinch” action to incorporate field residue, till, and firm the seedbed.

AVOID CRUSHING. *Make sure all personnel are clear of the implement. Lower implement to the ground, place tractor in park, turn off engine, and remove key.*

USE BAR STANDS TO SUPPORT THE IMPLEMENT. *Park implement on a clean, dry, and level surface. An uneven surface could cause implement to shift or fall, resulting in injury or death, as well as implement damage. Securely support all implement components that must be raised. Remove buildup of grease, oil, or debris prior to adjusting wavy coulter assembly.*







NOTE: Recommended tools: Jam Nut and Front Flange Nut - 15/16 end wrench, Set Bolt - 5/8 eight point socket, (3/4 end wrench will substitute for the 5/8 eight point socket, although not recommended)

DEPTH ADJUSTMENT

1. Physically support the weight of the wavy coulter assembly.
2. Slightly loosen shank clamp front flange nut.
3. Vertically adjust wavy coulter assembly to desired depth.
4. Tighten front flange nut to torque specifications. *(pg. 8 - 4)*

WIDTH ADJUSTMENT

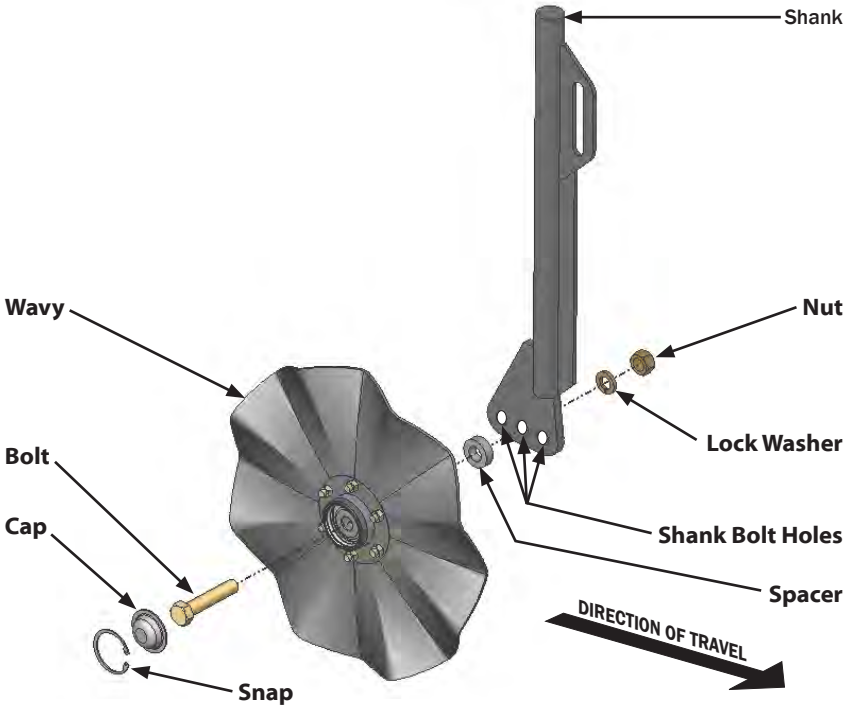
1. Slightly loosen left hand and right hand jam nuts and set bolts.
2. Laterally adjust wavy coulter assemblies and diamond cross tubes to desired width.
3. Tighten left hand and right hand set bolts and jam nuts.
4. Tighten all hardware to proper torque specifications. *(pg. 8 - 4)*

WAVY COULTER ASSEMBLY FORE AND AFT

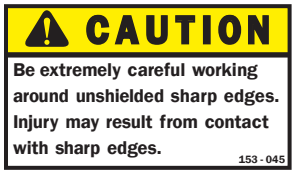
Each wavy coulter assembly can be adjusted fore and aft.

AVOID CRUSHING. ***Make sure all personnel are clear of the implement. Lower implement to the ground, place tractor in park, turn off engine, and remove key.***

USE BAR STANDS TO SUPPORT THE IMPLEMENT. ***Park implement on a clean, dry, and level surface. An uneven surface could cause implement to shift or fall, resulting in injury or death, as well as implement damage. Securely support all implement components that must be raised. Remove buildup of grease, oil, or debris prior to adjusting wavy coulter assembly.***



(RIGHT HAND WAVY COULTER PICTURED)



NOTE: If utilizing a Combo Caddy and the 1tRIPr® row units are mounted to a double toolbar, the wavy coulters near the Combo Caddy lift wheels must occupy the forward most shank bolt holes.

NOTE: Recommended tools: Snap Ring Pliers, 1 1/8 sockets and/or end wrenches.

FORE/AFT AND RIGHT OR LEFT SIDE OF SHANK ADJUSTMENT

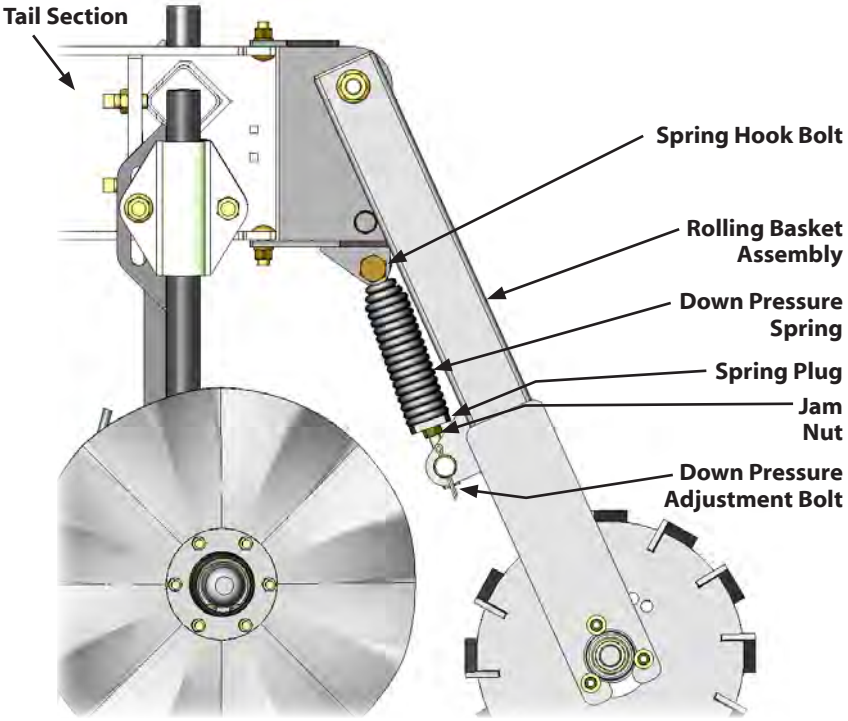
1. Remove snap ring and cap.
2. Secure bolt to remove nut and lock washer.
3. Reposition wavy coulter, bolt, and spacer to desired side of shank and bolt hole.
4. Secure bolt to install lock washer and nut.
5. Tighten all hardware to proper torque specifications. *(pg. 8 - 4)*
6. Install cap and snap ring.

ROLLING BASKET DOWN PRESSURE

An optional rolling basket assembly is available to complement the *1tRIPr®* row unit. Rolling baskets reduce clod size to decrease soil variability, retain existing soil moisture, firm, and complete the optimum seedbed. Rolling baskets are mounted to the rear of the row unit tail section. For mounting instructions see page 4-1.

AVOID CRUSHING. *Make sure all personnel are clear of the implement. Lower implement to the ground, place tractor in park, turn off engine, and remove key.*

USE BAR STANDS TO SUPPORT THE IMPLEMENT. *Park implement on a clean, dry, and level surface. An uneven surface could cause implement to shift or fall, resulting in injury or death, as well as implement damage. Securely support all implement components that must be raised. Remove buildup of grease, oil, or debris prior to adjusting rolling basket down pressure.*



(VIEW LOOKING FROM SIDE OF THE ROW UNIT)

⚠ CAUTION

Be extremely careful working around unshielded sharp edges. Injury may result from contact with sharp edges.

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NOTE: Recommended tools: Down Pressure Adjustment Bolt and Jam Nut - 3/4 end wrench, Spring Plug - 1 1/4 end wrench.

1. Loosen jam nut from spring plug.
2. Adjust down pressure adjustment bolt.
   (clockwise - increase pressure, counterclockwise - decrease pressure)
3. Tighten jam nut against spring plug to torque specifications. *(pg. 8 - 4)*

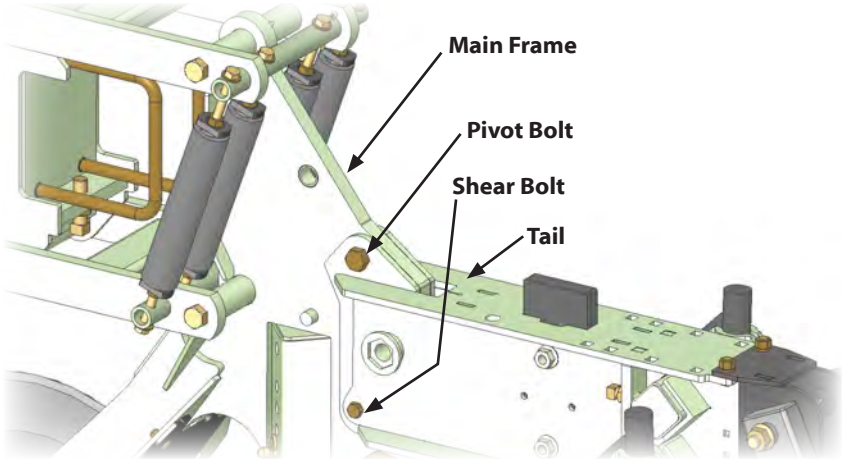
NOTE: Spring hook bolt can be removed and basket assembly can be flipped over on top of row unit for narrower shipping widths.

STANDARD SHEAR BOLT PROTECTED TAIL

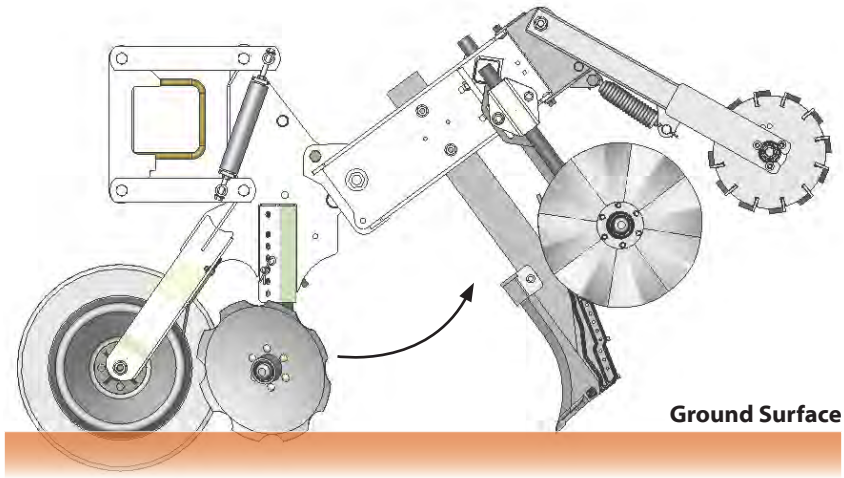
AVOID CRUSHING. *Make sure all personnel are clear of the implement. Lower implement to the ground, place tractor in park, turn off engine, and remove key.*

USE BAR STANDS TO SUPPORT THE IMPLEMENT. *Park implement on a clean, dry, and level surface. An uneven surface could cause implement to shift or fall, resulting in injury or death, as well as implement damage. Securely support all implement components that must be raised. Remove buildup of grease, oil, or debris prior to adjusting.*

The Standard 1tRIPr® row unit comes with a shear bolt protected tail. The tail is mounted to the main frame with two bolts. The lower bolt is a ½" coarse thread by 3" long grade 5 bolt. This is the shear bolt. It is installed with a ½" hex nut and ½" lock washer. The upper bolt is ¾" x 3" long grade 5 bolt with a ¾" flanged lock nut. This is the pivot bolt.



The Standard 1tRIPr® row unit tail shear bolt is designed to protect the shank and other tail tooling from damage by shearing when a rock or other obstacle is hit underground. This method is only meant for occasional tripping, and is not effective in rocky conditions. For more information on row unit tripping see page 5-13 of this manual and contact Orthman Manufacturing Sales department for Automatic Reset Tripping Linkage.
When the shank encounters an immovable object, the resulting force will shear the lower ½" bolt, and the tail will rotate upward about the upper pivot bolt to clear the obstacle.



At that time the operator should stop and replace the shear bolt. Use a ½" by 3" long bolt. Orthman recommends using a grade 5. A grade 2 bolt can be used, but the operator must be aware that a grade 2 could shear too easily, and a softer grade 2 bolt may deform or bend instead of shear off clean. This may deform the shear bolt hole, and make the bolt difficult to remove. A grade 8 bolt is not recommended, as the shank will experience damage or bending before a grade 8 bolt will shear.

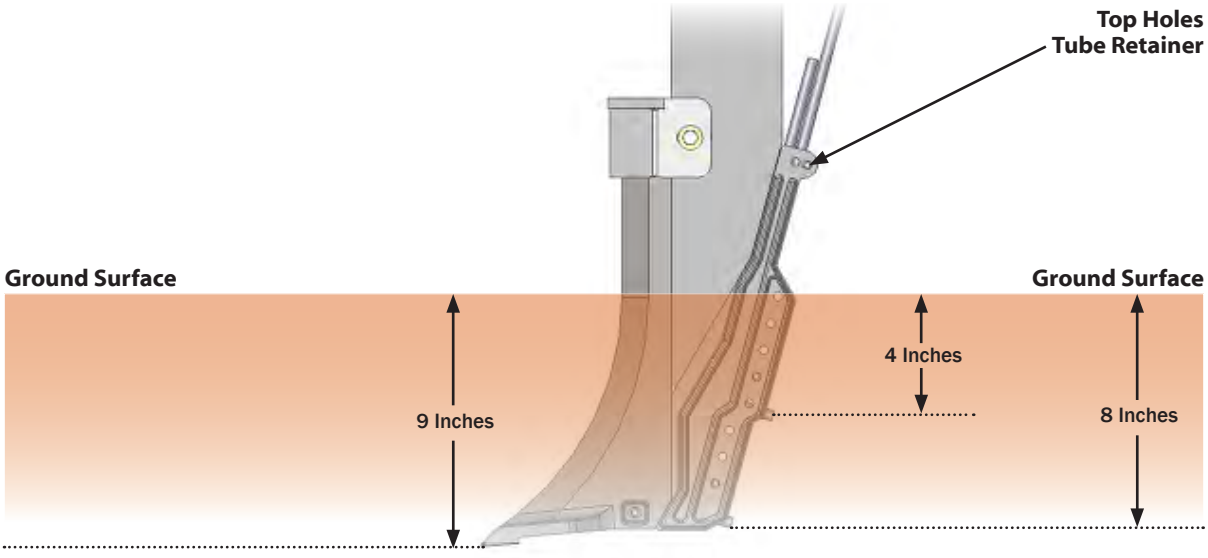
If the upper pivot bolt or lower shear bolt is tightened up too much they will exert a clamping load on the main frame that will add resistance to the tail's ability to trip. It is important to not over-tighten these two bolts. A good check is to remove the lower shear bolt, and use a lifting device to rotate the tail upward about the upper pivot bolt. If the tail will not rotate up, the upper pivot bolt is too tight. When installing the lower shear bolt, tighten it to the point where the nut will flatten a lock washer. If these two bolts are tightened correctly, the tail should not be loose, but will not have an excessive clamping load.

ADJUSTABLE LIQUID TUBES

If you choose to apply NH_3 or liquid fertilizer, or dry fertilizer it is advisable to consult documented information regarding safe handling and application of NH_3 or liquid fertilizer. Refer to recognized sources. (pg. 2 - 7)

The Orthman 1tRIPr® Mole Shank Assembly can be used to place fertilizer at 2 different depths simultaneously, and depending on your fertilizer setup could be used to apply 2 different rates of fertilizer in the strip at precisely 2 different depths.

The lowest setting is 1" above the deepest part of the mole point. The holes in the side plate are arranged in 1" increments vertically. This will help you calculate at what depth you are applying fertilizer. For example: If you have your shank set to till at a depth of 9", the fertilizer tubes shown in the image below would be applying fertilizer at depths of 8" and 4". The top holes are used to retain the liquid fertilizer tube or tubes. Use the innermost hole for retention if you are only utilizing one fertilizer tube, and use the outermost hole for retention if you are utilizing dual fertilizer tubes.



The example shown is the current factory setting from Orthman Manufacturing, and is only recommended as a starting point for the user. Your specific soil conditions, fertilizer placement points and fertilizer amounts will vary due to your own agronomic requirements.

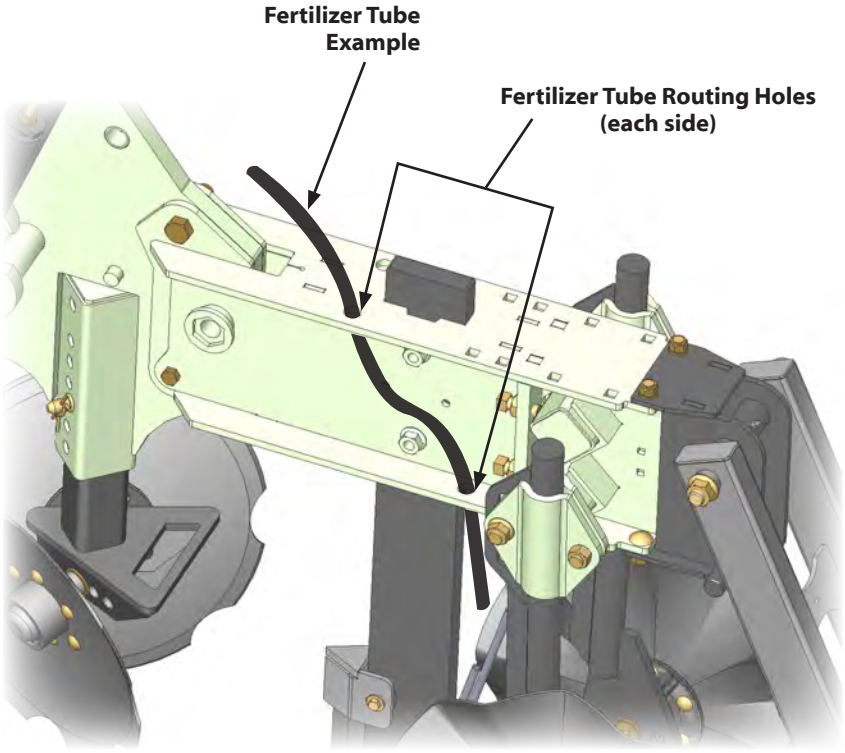
The tops of the fertilizer tubes may need to be bent or formed at the top for better fit up to the end user's fertilizer hose routing and hose clamps. Use caution when forming fertilizer tubes as to not kink the tube.

NOTE: The example shown is just one possible setting. Your specific soil conditions, fertilizer placement points and fertilizer amounts will vary due to your own agronomic requirements.

NOTE: If applying two different types of fertilizer, like NH3 through one tube and liquid fertilizer through the other tube it is the responsibility of the user to adequately insulate, or add additional space between the tubes in order that the NH3 does not freeze the liquid fertilizer tube.

If you choose to apply NH_3 or liquid fertilizer, or dry fertilizer it is advisable to consult documented information regarding safe handling and application of NH_3 or liquid fertilizer. Refer to recognized sources. (pg. 2 - 7)

The 1tRIPr® tail has routing holes that can be used for liquid or NH3 fertilizer tube routing. A front and back hole on each side of the tail allows for dual tubes to be held in place.



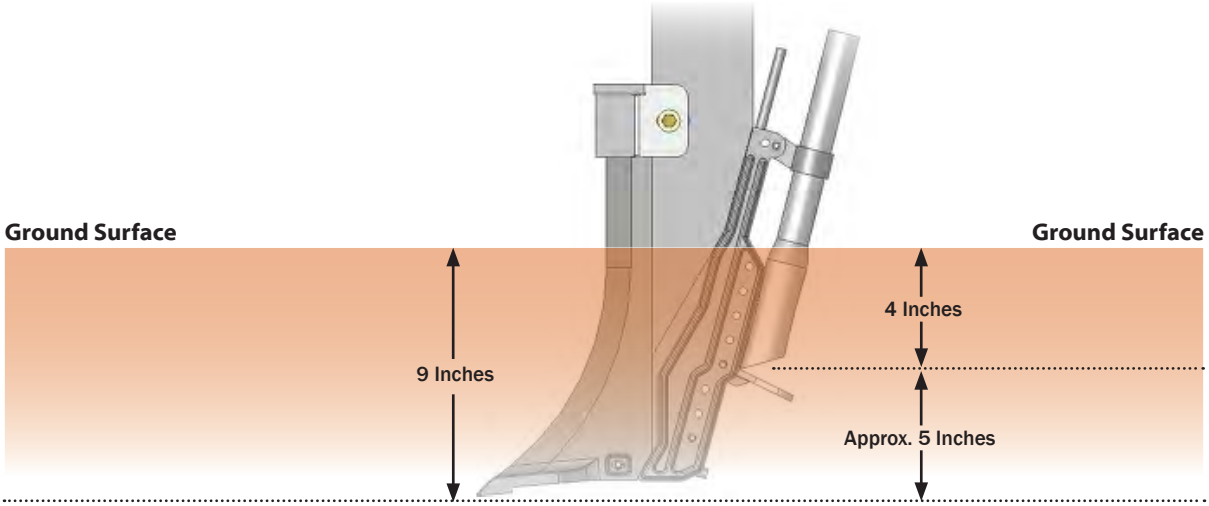
NOTE: If applying two different types of fertilizer, like NH3 through one tube and liquid fertilizer through the other tube it is the responsibility of the user to adequately insulate, or add additional space between the tubes in order that the NH3 does not freeze the liquid

ADJUSTABLE DRY FERTILIZER BOOT

If you choose to apply NH_3 or liquid fertilizer, or dry fertilizer it is advisable to consult documented information regarding safe handling and application of NH_3 or liquid fertilizer. Refer to recognized sources. (pg. 2 - 7)

The Orthman 1tRIPr® Mole Shank Assembly can also be used to place fertilizer at 2 different depths simultaneously with one of those options being dry fertilizer. The Adjustable Dry Fertilizer Boot and be used for applying dry fertilizer under the ground at various depths, and can also be used in conjunction with one liquid fertilizer tube. The Adjustable Dry Fertilizer Boot can by utilized in the lower settings on the shank side plate but the user should be aware that running the Adjustable Dry Fertilizer Boot at deeper setting may result in premature wear of the boot.

The setting shown is approximately 5" above the deepest part of the mole point. The holes in the side plate are arranged in 1" increments vertically. This will help you calculate at what depth you are applying fertilizer. For example: If you have your shank set to till at a depth of 9", the dry fertilizer boot shown in the image (below/to the right) would be applying fertilizer at a depth of 4". The top holes are used to retain the dry fertilizer boot holder. This holder may be used in the orientation shown for applying at deeper settings, and can be reversed or to angle upwards for more clearance from the narrow, flat part of the boot when running at a more shallow setting.

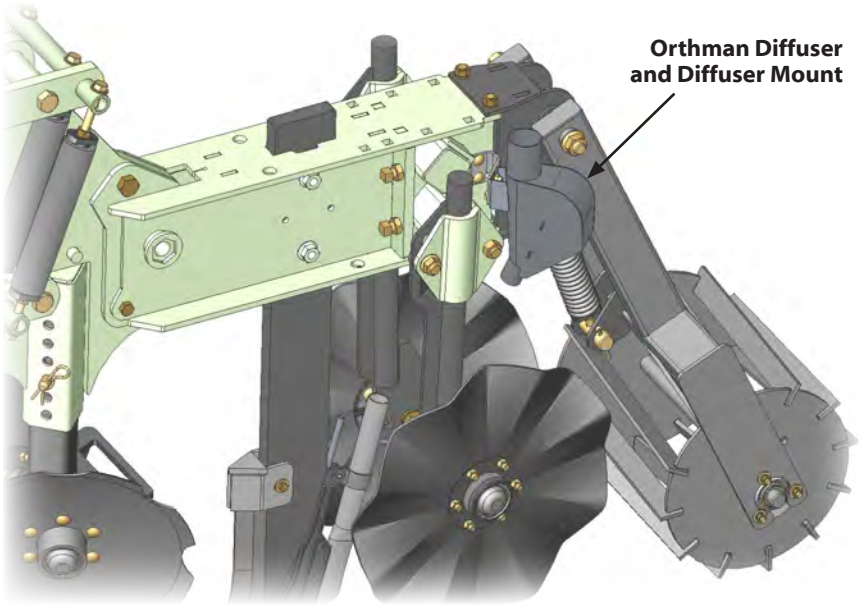


NOTE: *The example shown is just one possible setting. Your specific soil conditions, fertilizer placement points and fertilizer amounts will vary due to your own agronomic requirements.*

NOTE: *If applying two different types of fertilizer, like NH3 through one tube and liquid fertilizer through the other tube it is the responsibility of the user to adequately insulate, or add additional space between the tubes in order that the NH3 does not freeze the liquid fertilizer tube.*

The Adjustable Dry Fertilizer Boot is designed to work with 1 ¼ inside diameter hose.

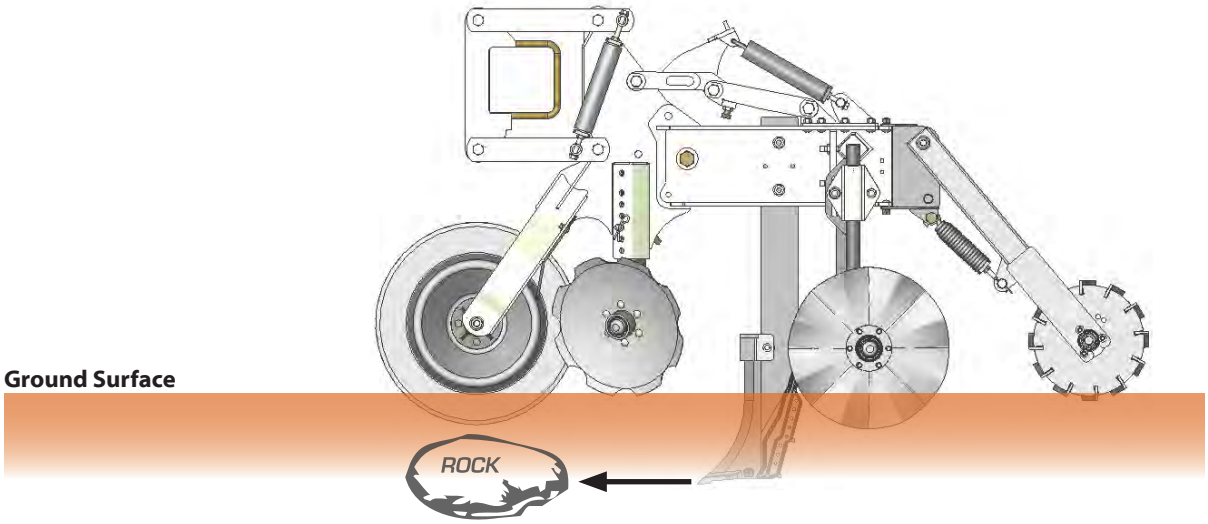
If utilizing an Orthman Air Diffuser it can be orientated as shown in the picture (below/to the right). The Air Diffuser can be mounted on either side of the row unit tail. The Air Diffuser is designed to work with an input hose size of 2" inside diameter. The output hose size is 1 ¼ inside diameter to match up with the Adjustable Dry Fertilizer Boot.

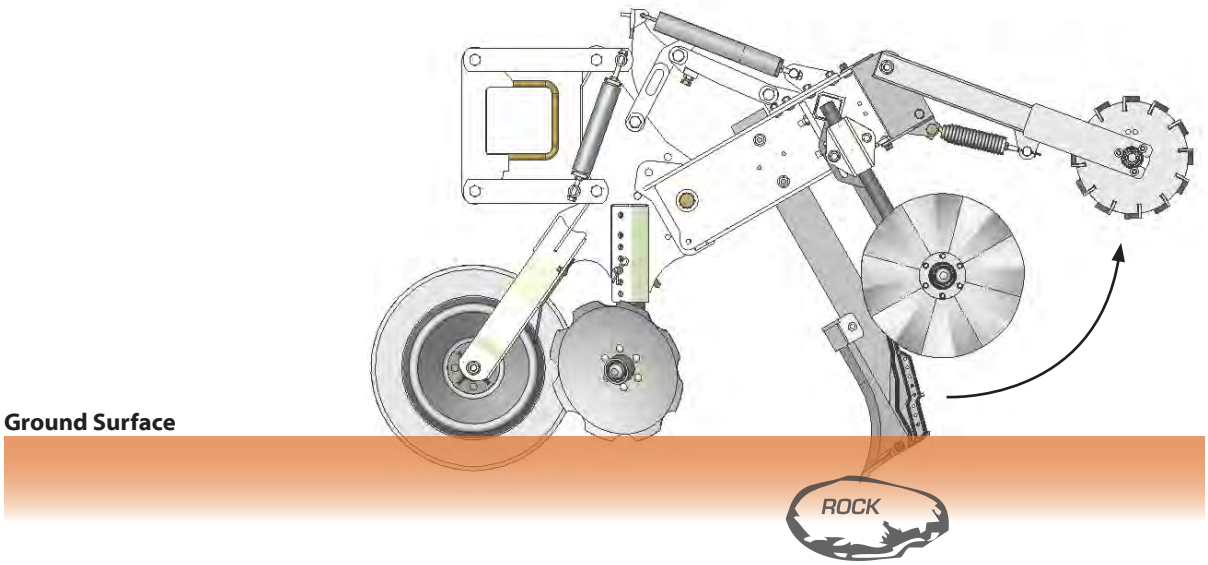


NOTE: If user has purchased and Orthman Atlas Cart, the Diffuser mount may be a different style that mounts to the top part of the round shank of the wavy coulters. This is due to the fact that the purchaser of an Orthman Atlas Cart may already own an older version of the 1tRIPr® machine that does not have the diffuser mount holes in the tail. Contact Orthman Manufacturing for any Diffuser mount bracket concerns.

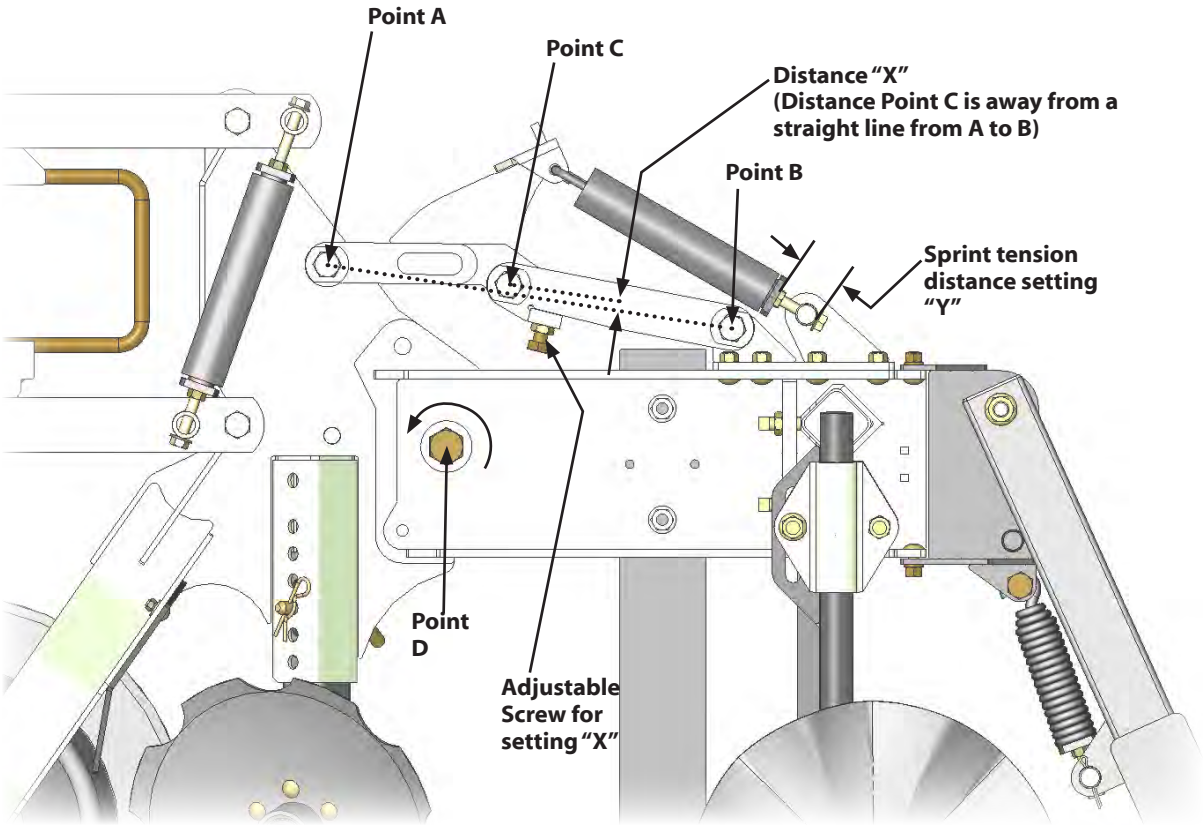
AUTOMATIC RESET LINKAGE

The Automatic Reset Linkage is engineered as a significant upgrade from a standard shear bolt for row unit and shank protection. When a rock or other obstacle is hit underground the row unit tail (that includes shank, wavy coulters and optional basket) will trip up and out of the ground. When the obstacle is passed over, four powerful reset springs, will drive the 1tRIPr® shank back into the ground, in most conditions. The Automatic Reset Linkage helps to protect valuable tooling from breaking and bending in rough and rocky soil conditions. The AR Linkage may help, but will not prevent damage from occasional glancing blows.





The AR Linkage comes set from the factory to trip easily, and will need adjusted to adapt to your specific operating conditions. It is important that the user understand how the AR Linkage works and the results of the different adjustments. The image below identifies the important geometry points and adjustment locations. Without the AR Linkage, the tail would be free to rotate about point "D". The Linkage installed keeps the tail from rotating about point "D" by creating a brace between points "A" and "B". That brace is made of two links and has the ability to buckle in the middle at point "C". When the shank encounters an immovable object, the resulting force will buckle the linkage at point "C" allowing the tail to rotate upward about point "D" until the obstacle is cleared. The upward rotation of the tail, and the buckling of the linkage causes the four reset springs to become stretched. The spring force stored in the stretched springs provides the power necessary to rotate the tail downward, which in turn drives the shank back into the ground and snaps the linkage back into place.



If you visualize a straight line between points "A" and point "B", the distance point "C" is away from that straight line directly effects how difficult it is to buckle the trip linkage. The closer point "C" is to that line the more difficult it is to trip. The further away point "C" is from that line the easier it is to trip. Our factory setting from Orthman Mfg. puts this point "C" further from that line so it trips easily. Our factory setting (or distance "X" is ¾") Operators are encouraged to adjust this setting by loosening the jam nut under point "C" and adjusting the set bolt. (with 15/16 wrenches) One full turn of this set bolt represents about 1/8". It may only be necessary to move the set bolt ¼ to ½ a turn to achieve the correct offset distance for your soil and desired tripping operation.

The preset tension in the four reset springs will affect two things. The amount of force available to drive the shank back into the ground from the tripped position, and the amount of force required to trip the linkage. A higher spring tension will increase both of these. The factory setting of the spring tension (or factory setting “Y”) is set to be 2”. This measurement may vary slightly due to differences in spring cut lengths and spring plug castings. This measurement is taken from the flat surface of the cast spring plug to the nearest flat surface of the ½” flat washer. To adjust the spring tension, loosen the jam nut that is up tight against the spring plug, and while holding the spring from rotating, screw in or out each of the four bolts equally, and then re-tighten the jam nut to prevent the springs from coming loose.

This table has been created to help understand the effects that the set screw setting "X" and spring setting "Y" settings have on the AR Linkage's ability to trip. The spring settings across the top represent different options for spring setting "Y". Coordinate those with the numbers on the left of the chart that represent set screw setting "X". The numbers shown in the chart represent the estimated amount of force (in pounds) that is required to trip the tail when the shank is at the deepest setting. For instance: With the factory set screw setting of ¾", and the factory spring setting of 2" it will take approx. 2,850 pounds of force at the foot piece of the shank at its lowest setting to trip the row unit tail. As you can see, as the spring setting "Y" is decreased (tightened up), and as the set screw setting "X" is decreased (unscrewed), the force required to trip is increased. This will make it more difficult for the row unit to trip when it encounters an obstacle.

			SPRING SETTING "Y"				
			factory 2"	1 7/8"	1 3/4"	1 5/8"	1 1/2"
SET SCREW SETTINGS "X"	factory setting	3/4	2863	3181	3340	3817	3817
	1/4 of a turn out	23/32	3181	3340	3658	3897	3897
	1/2 of a turn out	11/16	3260	3578	3817	3976	3976
	3/4 of a turn etc.	21/32	3340	3658	3976	4056	4135
	1 full turn out	5/8	3578	3897	4135	4374	4612
		19/32	3817	3976	4374	4612	4771
		9/16	3976	4056	4612	4771	4851
		17/32	3976	4374	4771	4851	5248
	2 full turns out	1/2	3976	4771	4930	5407	5567
		15/32	3976	4851	5407	5567	5885
		7/16	3976	4851	5567	5646	6759
		13/32	3976	4851	5964	6362	7157
	3 full turns out	3/8	3976	4851	6759	6998	7634
		11/32	3976	4851	6998	7793	7952
		5/16	3976	4851	7555	8032	8747
		9/32	3976	4851	7714	8747	9622
	screw removed	1/4	3976	4851	7952	9702	10338

Orthman Manufacturing encourages the operator to start out at this factory setting, where the row unit tail will most likely trip very easily. From that point you can adjust the set screw and the reset springs to attain the AR linkage setting that works well for you.

The standard version of the 1tRIPr® without the AR linkage is equipped with a shear bolt (pg. 5-11, 5-12). The amount of force it takes to shear this bolt is slightly over 8,000 lbs. Notice that the chart has values that exceed the 8,000 lb. mark. Orthman Manufacturing recommends using extreme caution when setting the AR Linkage to a setting above 8,000 lbs. Using a setting that exceeds the 8,000 lb. mark is likely to increase the chances of damaging the shank in the event an obstacle is encountered.

TROUBLESHOOTING

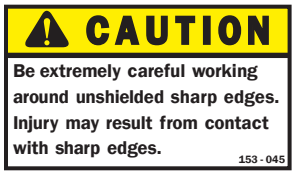
AVOID CRUSHING. *Make sure all personnel are clear of the implement. Lower implement to the ground, place tractor in park, turn off engine, and remove key.*

USE BAR STANDS TO SUPPORT THE IMPLEMENT. *Park implement on a clean, dry, and level surface. An uneven surface could cause implement to shift or fall, resulting in injury or death, as well as implement damage. Securely support all implement components that must be raised. Remove buildup of grease, oil, or debris prior to adjusting row unit tooling.*

PROBLEM:

Row unit tooling does not penetrate soil. Wing row units float upward.

SOLUTION OPTIONS:



1. Make sure when in the field position, correct toolbar height and orientation is achieved. Use tractor lower hitch stop, lift assist wheels, and/or toolbar gauge wheels, if equipped, to set field position toolbar height and orientation. *(pg. 5 - 1)*

2. Adjust row unit down pressure springs to arrive at a setting where parallel linkages operate independent of the toolbar and the toolbar serves as a towing device. *(pg. 5 - 3)*

   NOTE: Too much down pressure applied to the individual row units can essentially lift the toolbar to an undesireable operating height. Lifting the toolbar will cause the parallel linkages to "bottom out" and the row units will not operate independent of the toolbar resulting in non-uniform tillage across the implement.

3. Raise wavy coulter assemblies. Wavy coulters can act as a "footprint" and prevent soil penetration. *(pg. 5 - 8)*

4. If a rigid toolbar is used with the *1tRIPr®* row units, down pressure adjustment between row units typically varies slightly. If a folding or stacking toolbar is used, wing sections tend to float upward, unless mechanically restrained. *(refer to toolbar operator's manual)* Wing row units, not mechanically restrained, may require a decreased amount of down pressure to allow row units for perform consistently across the implement. *(pg. 5 - 3)*

5. *Lower tillage shank. Operating with the tillage shank too shallow can cause row units to not penetrate soil. Tillage shanks run at the correct depth can help pull other row unit tooling into the ground. Proper tillage done by the shank will loosen ground for wavy coulters to penetrate (pg. 5-6).*

TROUBLESHOOTING

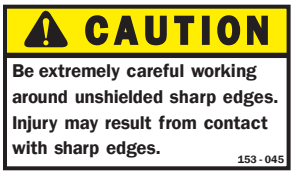
AVOID CRUSHING. *Make sure all personnel are clear of the implement. Lower implement to the ground, place tractor in park, turn off engine, and remove key.*

USE BAR STANDS TO SUPPORT THE IMPLEMENT. *Park implement on a clean, dry, and level surface. An uneven surface could cause implement to shift or fall, resulting in injury or death, as well as implement damage. Securely support all implement components that must be raised. Remove buildup of grease, oil, or debris prior to adjusting rolling basket down pressure.*

PROBLEM:

Row unit plugs with field residue between the depth band coulter assembly and trash opener assembly.

SOLUTION OPTIONS:



1. Proper toolbar height and orientation setting should ensure maximum depth band coulter cutting depth. Make sure the coulter is penetrating soil in order that the depth band governs soil penetration *(pg. 5 - 1)*.

2. Wet or damp field conditions can adversely affect the performance of the *1tRIPr®* row unit. Typically, wet or damp field conditions do not allow residue to pass through the row unit as effectively as drier conditions.

3. Alter ground speed to change rate at which field residue passes through row unit tooling. Slower ground speeds generally reduce plugging by allowing residue to smoothly pass through row unit tooling.

4. Slightly raise trash opener assembly to reduce residue in contact with the trash opener assembly *(pg. 5 - 4)*.

5. Remove and store trash opener assembly *(pg. 5 - 4)*.

6. *Adjust trash opener width (pg. 5-5)*.

7. *Adjust trash opener distance* fore and aft *(pg. 5-5)*.

TROUBLESHOOTING

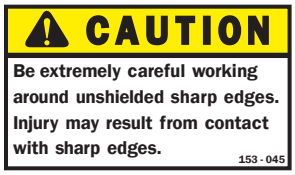
AVOID CRUSHING. *Make sure all personnel are clear of the implement. Lower implement to the ground, place tractor in park, turn off engine, and remove key.*

USE BAR STANDS TO SUPPORT THE IMPLEMENT. *Park implement on a clean, dry, and level surface. An uneven surface could cause implement to shift or fall, resulting in injury or death, as well as implement damage. Securely support all implement components that must be raised. Remove buildup of grease, oil, or debris prior to adjusting row unit tooling.*

PROBLEM:

Row unit plugs with field residue between the trash opener assembly and tillage shank.

SOLUTION OPTIONS:



1. Slightly lower trash opener assembly to reduce the amount of field residue in front of the tillage shank. (pg. 5 - 4)

2. Proper toolbar height and orientation setting should ensure maximum depth band coulter cutting depth. Make sure the coulter is penetrating soil in order that the depth band governs soil penetration. (pg. 5 - 1)

3. Alter ground speed to change rate at which field residue passes through row unit tooling. Slower ground speeds generally reduce plugging by allowing residue to smoothly pass through row unit tooling.

4. Wet or damp field conditions can adversely effect the performance of the 1tRIPr® row unit. Typically, wet or damp field conditions do not allow residue to pass through the row unit as effectively as drier conditions.

6. *Adjust trash opener width (pg. 5-5).*

7. *Adjust trash opener distance* fore and aft *(pg. 5-5).*

TROUBLESHOOTING

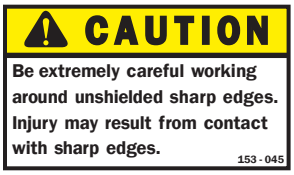
AVOID CRUSHING. *Make sure all personnel are clear of the implement. Lower implement to the ground, place tractor in park, turn off engine, and remove key.*

USE BAR STANDS TO SUPPORT THE IMPLEMENT. *Park implement on a clean, dry, and level surface. An uneven surface could cause implement to shift or fall, resulting in injury or death, as well as implement damage. Securely support all implement components that must be raised. Remove buildup of grease, oil, or debris prior to adjusting rolling basket down pressure.*

PROBLEM:

Row unit plugs with field residue between the tillage shank and wavy coulters.

SOLUTION OPTIONS:



1. Slightly increase wavy coulter tillage width. Increasing tillage width should allow residue to pass between the wavy coulters (pg. 5 - 8).

   NOTE: *It is not recommended for wavy coulter tillage width to exceed the width at which trash openers remove residue. If wavy coulter tillage zone exceeds the residue free strip, wavy coulters are more likely to plug as well as not penetrate soil.*

2. Increase distance between tillage shank assembly and wavy coulter assemblies by adjusting wavy coulter assemblies fore and aft (pg. 5 - 9).

   NOTE: *Increasing distance relationship between row unit tooling usually increases the ability of field residue to pass through the row unit without plugging.*

3. Alter ground speed to change rate at which field residue passes through row unit tooling. Slower ground speeds generally reduce plugging by allowing residue to smoothly pass through row unit tooling.

4. Wet or damp field conditions can adversely effect the performance of the 1tRIPr® row unit. Typically, wet or damp field conditions do not allow residue to pass through the row unit as effectively as drier conditions.

TROUBLESHOOTING

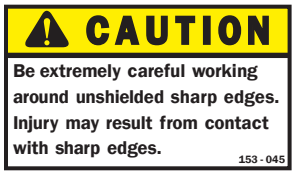
AVOID CRUSHING. *Make sure all personnel are clear of the implement. Lower implement to the ground, place tractor in park, turn off engine, and remove key.*

USE BAR STANDS TO SUPPORT THE IMPLEMENT. *Park implement on a clean, dry, and level surface. An uneven surface could cause implement to shift or fall, resulting in injury or death, as well as implement damage. Securely support all implement components that must be raised. Remove buildup of grease, oil, or debris prior to adjusting row unit tooling.*

PROBLEM:

Field residue plugs between row units.

SOLUTION OPTIONS:



1. Slightly raise trash opener assembly to reduce the amount of field residue passing between row units (pg. 5 - 4).

2. Alter ground speed to change rate at which field residue passes through row unit tooling. Slower ground speeds generally reduce plugging by allowing residue to smoothly pass through row unit tooling.

3. Decrease wavy coulter tillage width. Decreasing tillage width should allow more clearance between row units (pg. 5 - 8, 5 - 9).

4. Increase distance between tillage shank assembly and wavy coulter assemblies by adjusting wavy coulter assemblies fore and aft (pg. 5 - 8).

   NOTE: *Increasing distance relationship between row unit tooling usually increases the ability of field residue to pass through the row unit without plugging.*

5. Wet or damp field conditions can adversely effect the performance of the 1tRIPr® row unit. Typically, wet or damp field conditions do not allow residue to pass through the row unit as effectively as drier conditions.

6. *Adjust trash opener width (pg. 5-5).*

7. *Adjust trash opener distance* fore and aft *(pg. 5-5).*

TROUBLESHOOTING

AVOID CRUSHING. *Make sure all personnel are clear of the implement. Lower implement to the ground, place tractor in park, turn off engine, and remove key.*

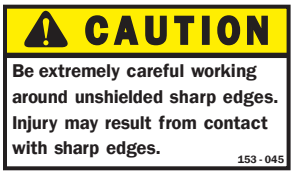
USE BAR STANDS TO SUPPORT THE IMPLEMENT. *Park implement on a clean, dry, and level surface. An uneven surface could cause implement to shift or fall, resulting in injury or death, as well as implement damage. Securely support all implement components that must be raised. Remove buildup of grease, oil, or debris prior to adjusting rolling basket down pressure.*

PROBLEM:

Row unit does not trip or trips too easily.

Shear bolt will not shear or shears too easily.

SOLUTION OPTIONS:

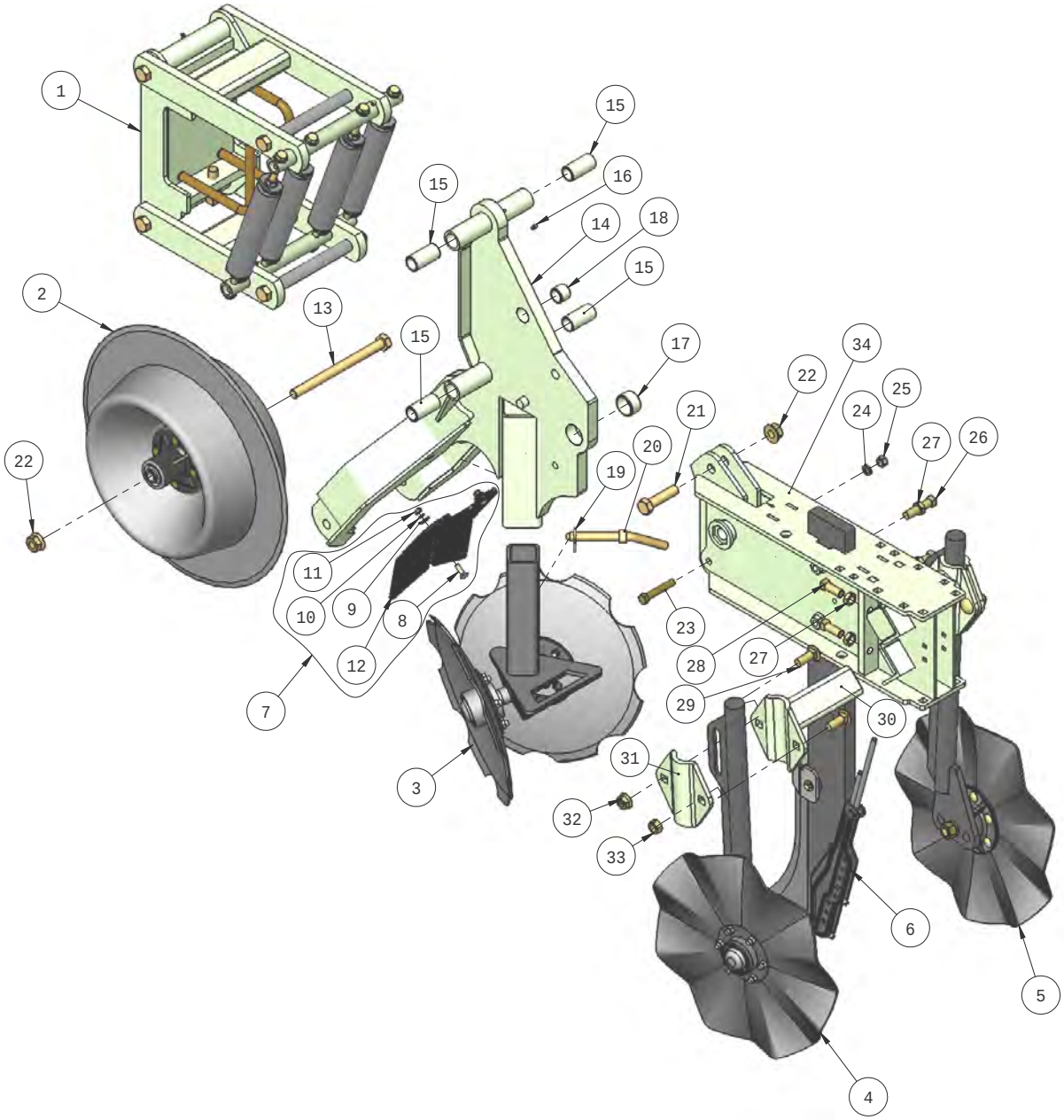


1. Row unit does not trip or trips too easily.
   A. Check to see it ftipping mechanism is installed correctly (pg. 4 - 9 to 4-13).
   B. Reference field settings on (pg. 5 - 17 to 5 - 20).

2. Shear bolt will not shear or shears too easily.
   A. Reference field settings on (pg. 5 - 11 to 5 - 12).

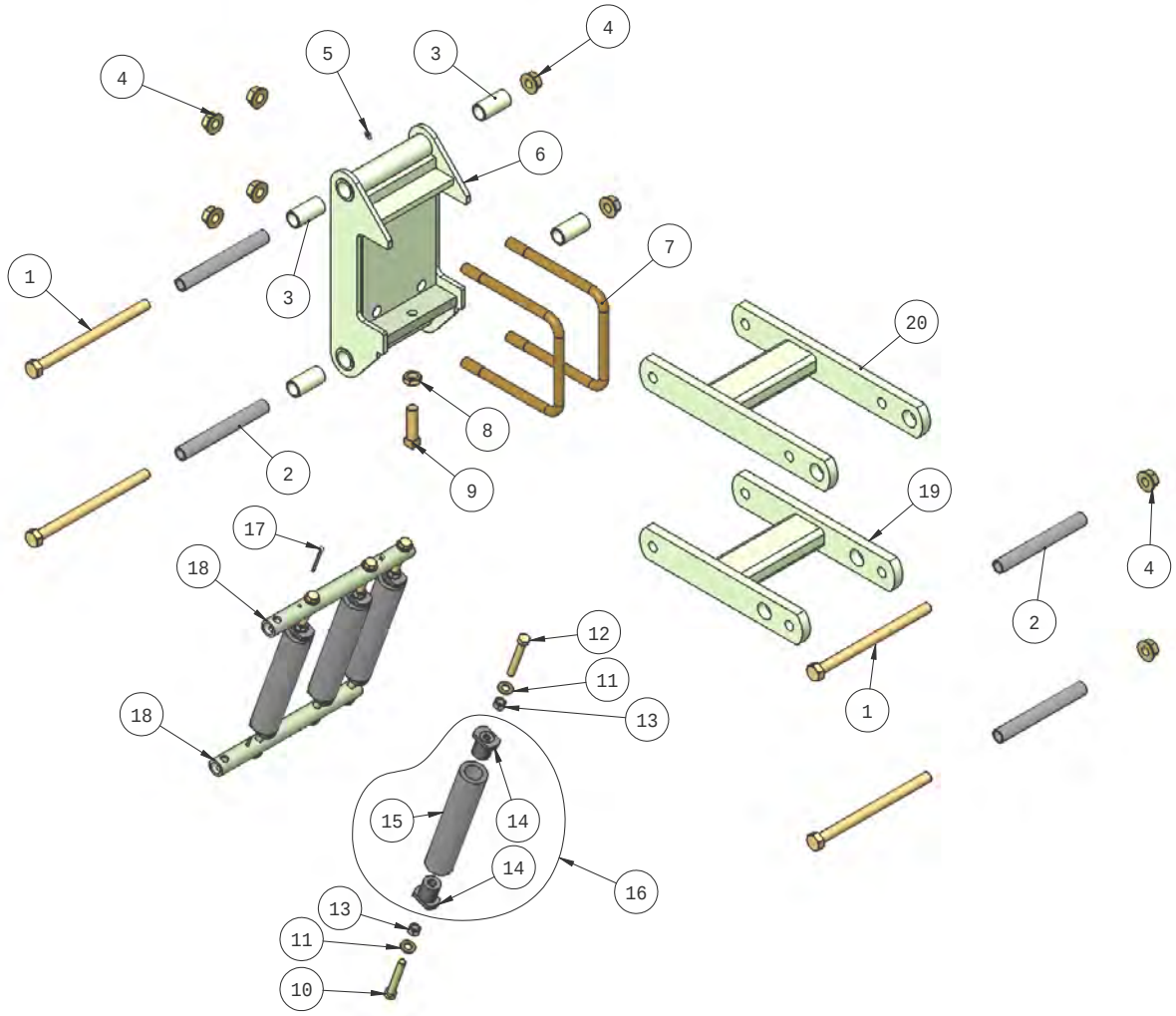
ROW UNIT ASSEMBLY

(parts list on next page)



ROW UNIT ASSEMBLY *(diagram on previous page)*

Key	Part #	Description	Qty.	Notes
1	387-070	Mount & Parallel Linkage Assembly	1	see breakdown on page 7 - 3
2	385-943	Depth Band Coulter & Hub Assembly	1	see breakdown on page 7 - 4
3	387-051	Row Cleaner Assembly	1	see breakdown on page 7 - 5
4	385-498	Wavy Coulter and Shank Right Assembly	1	see breakdown on page 7 - 8
5	385-498	Wavy Coulter and Shank Left Assembly	1	see breakdown on page 7 - 8
6	387-050	Mole Shank Assembly	1	see breakdown on page 7 - 6
7	385-854	Scraper Assembly	1	Includes items #8 thru #12
8	100-003	Carriage bolt	2	5/16" x 1", Grade 5
9	108-006	Flat washer	2	5/16"
10	108-017	Lock washer	2	5/16"
12	102-004	Nut	2	5/16"
13	100-274	Bolt	1	3/4" x 9 1/2", Grade 8
14	387-150	Main Frame	1	Includes #15 thru 18
15	134-067	Bushing	4	1 1/4" OD x 1" ID x 2 1/2" long
16	110-001	Grease Zerk	2	1/4" Straight
17	134-017	Bushing	1	1 3/4 OD x 1 1/2 ID x 1" long
18	134-034	Bushing	1	1 1/4" OD x 1" ID x 1" long
19	104-094	Hair Pin	1	5/32" x 3 1/4"
20	313-469	Pin	1	
21	100-160	Bolt	1	3/4" x 3", Grade 5
22	102-121	Flanged nut	2	3/4" x 3", Grade 5
23	100-122	Bolt	1	1/2" x 3", Grade 5
24	108-020	Lock washer	1	1/2"
25	102-007	Nut	1	1/2"
26	106-160	Set screw	2	5/8" x 2 1/2", Square head
27	102-016	Jam nut	6	5/18"
28	106-149	Set screw	4	5/8" x 1 1/2", Square head
29	100-031	Carriage bolt	4	5/8" x 1 3/4", Grade 5
30	387-115	Cross Tube	2	
31	313-293	Cap	2	
32	102-108	Flanged nut	2	3/4"
33	102-029	Lock nut	2	5/8"

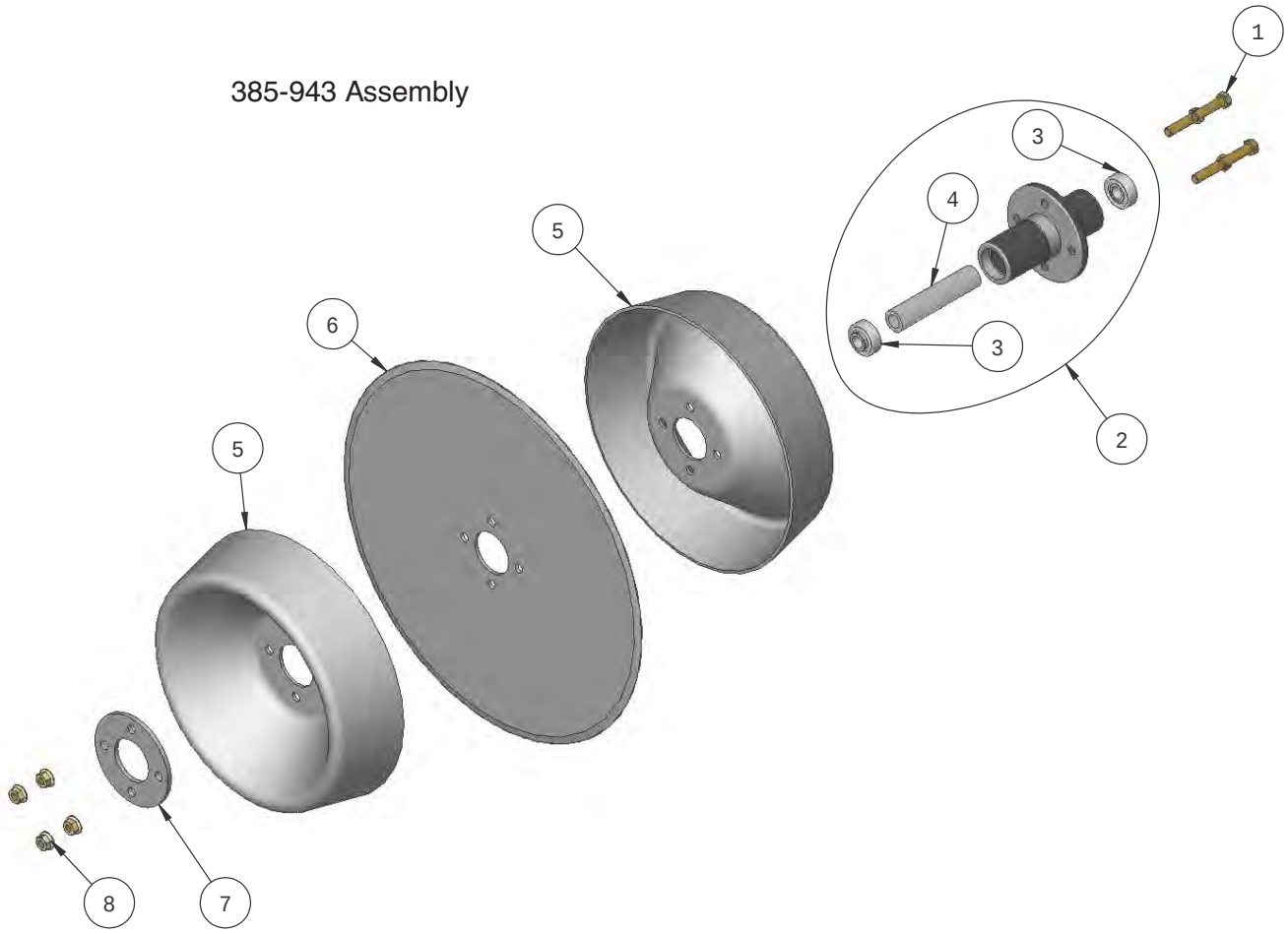


MOUNT AND PARALLEL LINKAGE ASSEMBLY

Key	Part #	Description	Qty.	Notes
1	100-176	Bolt	4	3/4" x 10 1/2", Grade 8
2	385-140	Bushing	4	1"OD x 3/4"ID x 8"
3	134-067	Bushing	8	1" x 1 1/4" x 2 1/2", Split
4	102-121	Lock nut	9	3/4" Serrated flange
5	110-001	Grease fitting	3	1/4"-28, straight
6	314-026	Mount	1	Includes items #3 & 5
7	315-031	U-bolt	2	3/4", For 7" x 7" bar
8	102-018	Jam nut	1	3/4"
9	106-130	Set screw	1	3/4" x 2 1/2", Square head
10	100-124	Bolt	4	1/2" x 3 1/4", Grade 5
11	108-001	Flat washer	8	1/2" SAE

Key	Part #	Description	Qty.	Notes
12	100-288	Bolt	4	1/2" x 3 1/2" Full thread,
13	102-007	Nut	8	1/2"
14	340-029	Spring plug	8	---
15	317-925	Spring	4	2"OD x 10" spring
16	311-401	Spring assembly	4	Includes items #14 & 15
17	104-030	Cotter pin	4	3/16" x 2"
18	387-310 385-310	Trunion tube Trunion tube	2 2	Upper & Lower (13 3/8 long) Upper & Lower (14 7/8 long)
19	385-095	Parallel linkage	1	Lower
20	385-093	Parallel linkage	1	Upper

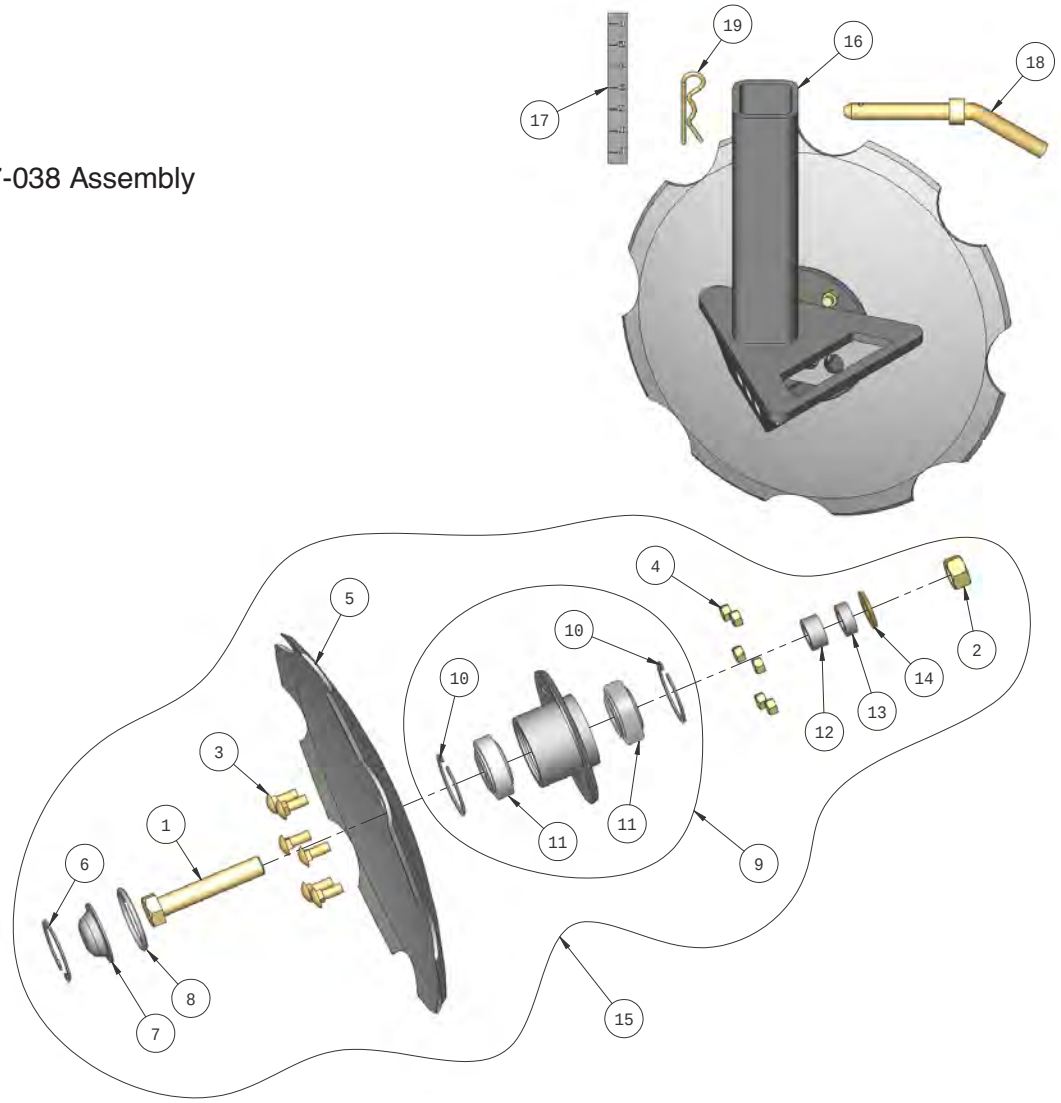
385-943 Assembly



DEPTH BAND COULTER ASSEMBLY

Key	Part #	Description	Qty.	Notes
1	100-118	Bolt	4	1/2" x 2", Grade 5
2	385-950	Hub assembly	1	4 bolt, 3/4 bolt hub Includes items # 3 and 4
3	120-041	Bearing	2	3/4" ID x 1.8505 OD bearing
4	385-945	Spacer	1	1 1/4 OD x .813 ID x 5.768 long
5	385-167	Depth band	2	15 1/4" Diameter, conical
6	166-033	Disc	1	22" Smooth
7	312-131	Plate	1	Depth band reinforcing plate
8	102-119	Lock nut	4	1/2", Smooth flange

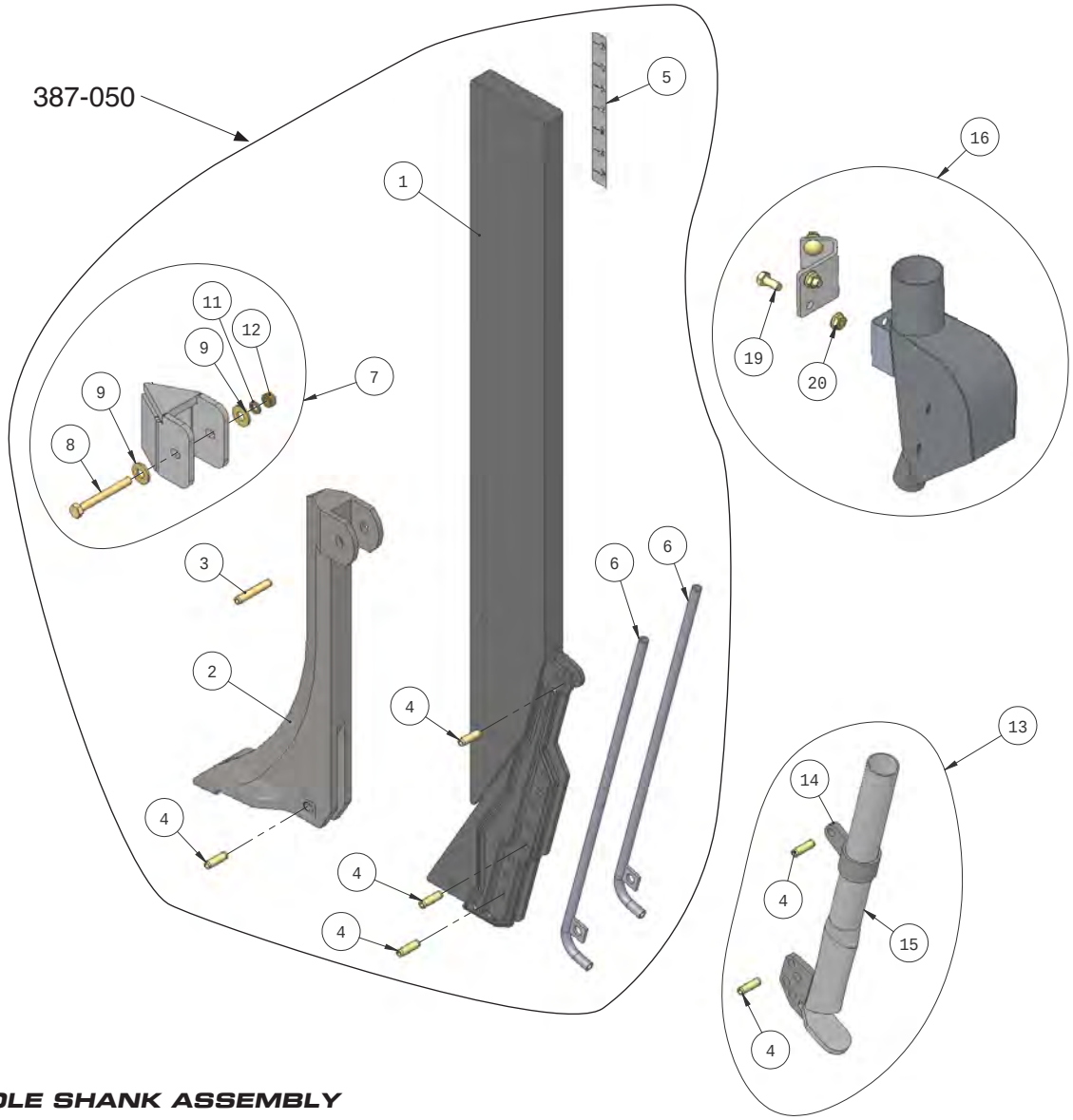
387-038 Assembly



ROW CLEANER ASSEMBLY

Key	Part #	Description	Qty.	Notes
1	100-472	Bolt	2	3/4" x 4 1/4", Grade 5
2	102-031	Lock Nut	2	3/4"
3	100-004	Carriage Bolt	12	3/8" x 1", Grade 5
4	102-027	Lock Nut	12	3/8"
5	166-042	Knotched Disc	2	16"
6	104-105	Snap Ring	2	2 3/8" Internal (plated)
7	319-126	Hub Cap	2	---
8	150-018	O-ring	2	2 1/2" x 2 3/8" x 3/16"
9	312-321	Hub Assembly	2	Includes items #10 & 11
10	120-164	Bearing	2	3/4" bore cylin OD

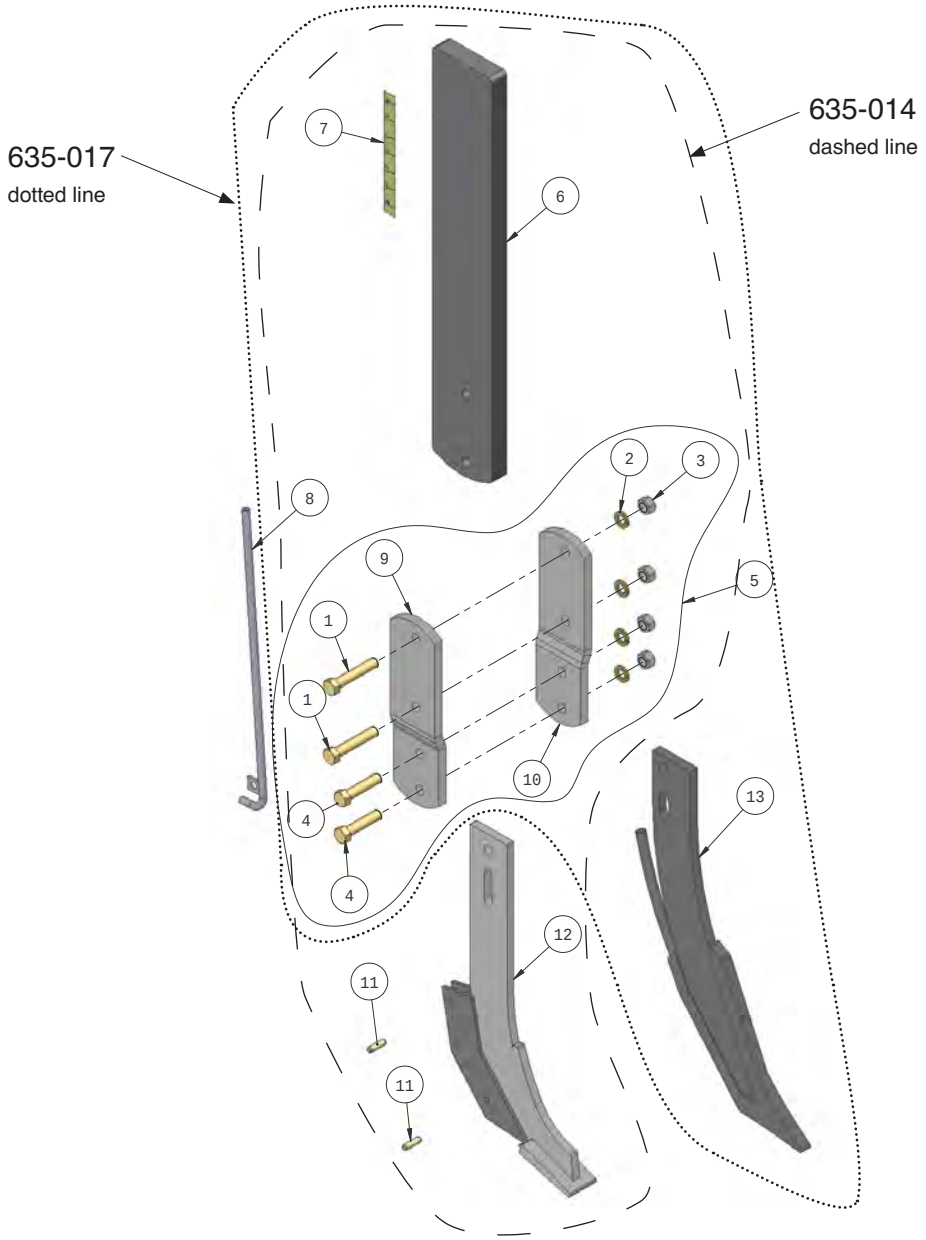
Key	Part #	Description	Qty.	Notes
11	104-061	Snap ring	2	2 3/8" Internal housing
12	387-127	Bushing	1	5/8" long
13	387-128	Bushing	1	7/16 long
14	108-003	Flat Washer	1	3/4" SAE
15	385-590	Disc & Hub Assembly	1	Includes items #1 thru 14
16	385-831	Mount	1	Standard
17	153-152	Decal	1	Depth indicator
18	313-469	Pin	1	---
19	104-094	Hair Pin	1	5/32" x 3 1/4"



MOLE SHANK ASSEMBLY

Key	Part #	Description	Qty.	Notes
1	387-130	Shank	1	1" x 4" Mole Shank
2	164-054	Mole Point	1	1 1/16" Wide Footpiece
3	104-008	Roll Pin	1	5/16 x 1 3/4 Spiral
4	104-117	Roll Pin	4	5/16" x 1"
5	153-152	Decal	1	Depth Indicator
6	385-552	Chemical Tube	2	---
7	387-060	Shin Cap Pkg	1	Includes Items #8 - 12
8	100-094	Bolt	1	5/16" x 2 3/4", Grade 5
9	108-006	Flat washer	2	5/16"

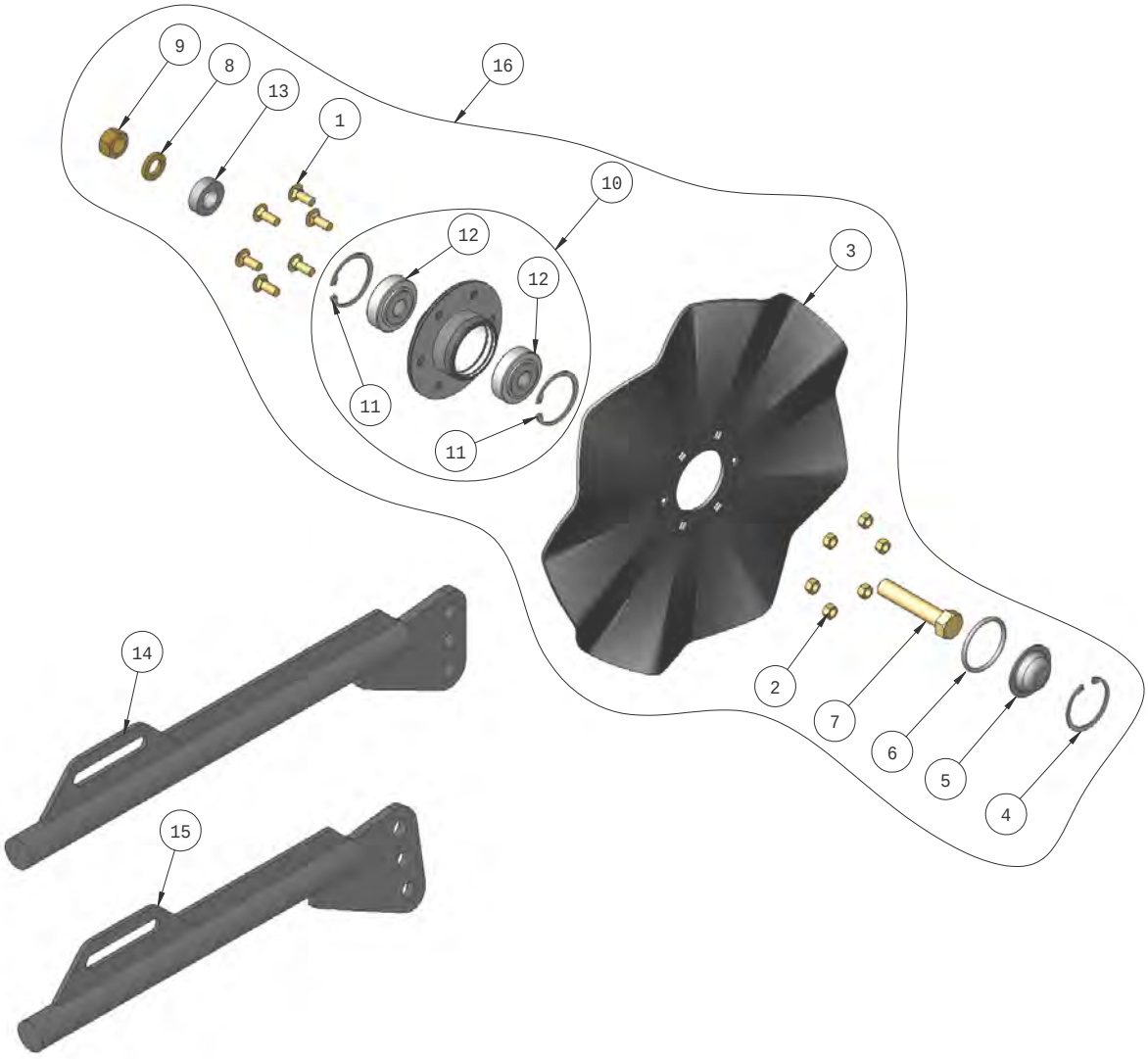
Key	Part #	Description	Qty.	Notes
11	108-017	Lock washer	1	5/16"
12	102-004	Nut	1	5/16"
13	635-016	Dry Boot Package	1	Includes Items #4, 14 & 15
14		Boot Tube	1	Stainless Steel
15		Boot Holder	1	---
16	387-142	Diffuser & Mount	1	ASSEMBLY
19	100-100	Bolt	4	5/16" x 3/4", Grade 5
20	102-107	Flange Nut	4	5/16" serrated



MOLE KNIFE ASSEMBLY

Key	Part #	Description	Qty.	Notes
1	100-121	Bolt	2	1/2" x 2 3/4", Grade 5
2	108-020	Lock Washer	4	1/2"
3	102-007	Nut	4	1/2"
4	100-119	Bolt	2	1/2" x 2 1/4", Grade 5
5	310-012	Clamp Package	1	Includes Items # 1 - 4 and 9 - 10
6	311-047	Shank	1	1x4
7	153-152	Decal	1	Depth Indicator

Key	Part #	Description	Qty.	Notes
8	385-552	Chemical Tube	1	---
9	317-301	Adaptor plate	1	Left (only available in pkg #14)
10	317-212	Adaptor plate	1	Right (only available in pkg #14)
11	104-117	Roll pin	2	5/16"
12	385-577	Mole Knife	1	B-33 Fertilizer Mole Knife
13	176-003	Knife	1	NH3

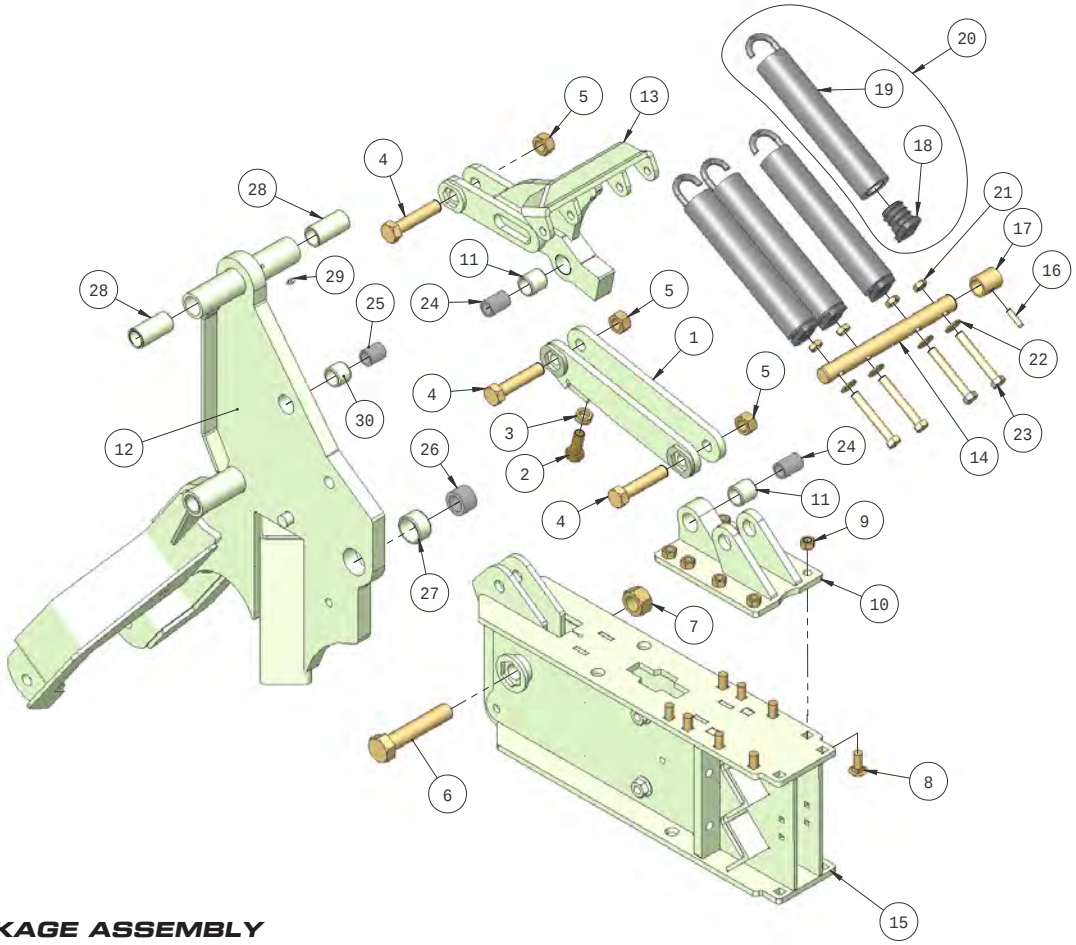


WAVY COULTER ASSEMBLY

Key	Part #	Description	Qty.	Notes
1	100-004	Carriage Bolt	6	3/8" x 1", Grade 5
2	102-027	Lock Nut	6	3/8"
3	166-040	Wavy Coulter	1	17 1/2"
4	104-105	Snap Ring	1	2 3/8" Internal (plated)
5	319-126	Hub Cap	1	---
6	150-018	O-ring	1	2 1/2" x 2 3/8" x 3/16"
7	100-202	Bolt	1	3/4" x 3 3/4", Grade 5
8	108-022	Lock washer	1	3/4"

Key	Part #	Description	Qty.	Notes
9	102-009	Nut	1	3/4", Grade 5
10	312-319	Hub Assembly	1	Includes items #11 & 12
11	104-061	Snap Ring	2	2 3/8" Internal housing
12	120-070	Bearing	2	3/4" bore cylin OD
13	312-057	Spacer	1	---
14	312-096	Shank	1	Right Side (longer shank 23" shaft)
15	312-097	Shank	1	Left Side (shorter shank 19" shaft)
16	385-545	Hub & Disc Assy.	1	Includes items #1 - 13

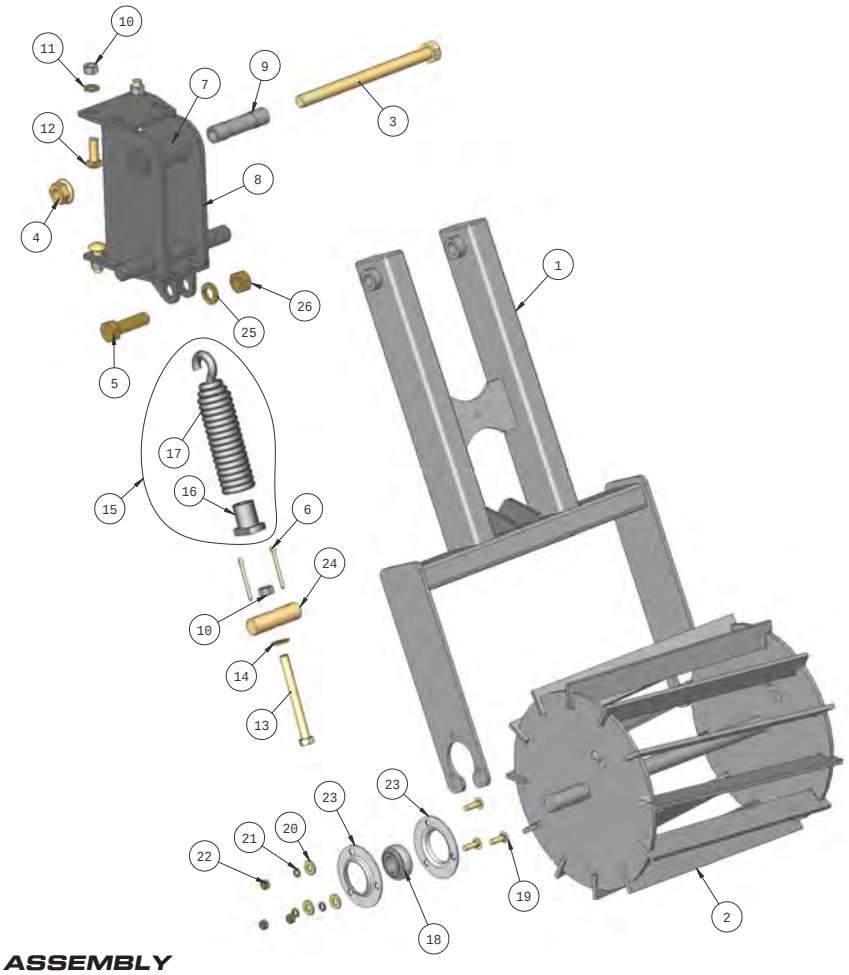
PARTS IDENTIFICATION



TRIP LINKAGE ASSEMBLY

Key	Part #	Description	Qty.	Notes
1	385-808	Bottom linkage	1	---
2	100-602	Bolt	1	5/8 Fine thread x 1 1/2" Full thread
3	102-163	Jam nut	1	5/8 Fine thread
4	100-323	Bolt	3	3/4" x 3 1/2", Grade 8
5	102-031	Lock nut	3	3/4"
6	100-187	Bolt	1	1" x 5", Grade 5
7	102-020	Lock nut	1	1" Nylock, Grade 2
8	100-012	Carriage bolt	8	1/2" x 1 1/4", Grade 5
9	102-028	Lock nut	8	1/2"
10	387-082	Mount	1	Includes #11
11	134-111	Bushing	2	1 1/4" OD x 1" ID x 1 1/4" long
12	387-150	Main Frame	1	Includes #27 - 30
13	387-080	Top linkage	1	Includes #11
14	385-829	Pin	1	---
15	387-100	Tail	1	---

Key	Part #	Description	Qty.	Notes
16	104-039	Roll pin	1	5/16" x 1 1/4" Spiral
17	385-843	Sleeve	1	---
18	340-029	Plug	1	---
19	317-921	Spring	1	---
20	317-920	Spring & Plug	4	INCLUDES 18 & 19
21	102-015	Jam nut	4	---
22	108-001	Washer	4	---
23	100-288	Bolt	4	---
24	387-085	Crush Sleeve	2	.995 OD x .760 ID x 1.469 long
25	387-084	Crush Sleeve	1	.995 OD x .760 ID x 1.188 long
26	387-086	Crush Sleeve	1	1.495 OD x 1.005 ID x 1.038 long
27	134-017	Bushing	1	1 3/4 OD x 1 1/2 ID x 1" long
28	134-067	Bushing	4	1 1/4" OD x 1" ID x 2 1/2" long
29	110-001	Grease Zerk	2	1/4" Straight
30	134-034	Bushing	1	1 1/4" OD x 1" ID x 1" long



ROLLING BASKET ASSEMBLY

Key	Part #	Description	Qty.	Notes
1	327-201	Basket Frame	1	Standard frame for 14" W basket
	327-212			Wide basket frame for 20" W basket
	327-211			Narrow basket frame for 8" W basket
2	327-050	Basket	1	Standard 14" W basket with flat bars
	327-133			20" W basket with flat bars (for wide row beds)
	327-178			8" W basket with flat bars (for narrow rows)
	327-171			14" W basket with round bars (for Eastern corn belt)
3	100-289	Bolt	1	3/4" x 10", Grade 8
4	102-121	Flange Nut	1	3/4" locking
5	100-158	Bolt	1	3/4" x 2 1/2", Grade 5
6	104-030	Cotter pin	4	3/16" x 2"
7	110-001	Grease fitting	1	1/4"
8	327-207	Basket Mount	1	---
9	327-154	Bushing	1	---
10	102-007	Nut	5	1/2"
11	108-020	Lock washer	4	1/2"

Key	Part #	Description	Qty.	Notes
12	100-058	Carriage bolt	4	1/2" x 1 1/2", Grade 5
13	100-226	Bolt	1	1/2" x 5", Grade 5
14	108-001	Flat washer	1	1/2" SAE
15	327-205	Spring	1	Includes #16-17
16	340-029	Plug	1	Spring Drilled
17	327-206	Spring	3	.362 Wire
18	120-010	Bearing	2	1" bore
19	100-003	Carriage bolt	6	5/16" x 1", Grade 5
20	108-006	Flat washer	6	5/16"
21	108-017	Lock washer	6	5/16"
22	102-004	Nut	6	5/16"
23	120-012	Flangette	4	3 Bolt - 2 3/8" diameter
24	327-155	Trunion Shaft	1	---
25	108-022	Lock washer	1	3/4"
26	102-009	Nut	1	3/4"

⚠ PRACTICE SAFE MAINTENANCE

Proper maintenance is your responsibility. Maintenance neglect and/or poor maintenance practices can result in injury or death. Always use the proper tools to maintain implement.

AVOID CRUSHING. Make sure all personnel are clear of the implement. Lower implement to the ground, place tractor in park, turn off engine, and remove key.

USE BAR STANDS AND CYLINDER STOPS TO SUPPORT THE IMPLEMENT. Park implement on a clean, dry, and level surface. An uneven surface could cause implement to shift or fall, resulting in injury or death, as well as implement damage. Securely support all implement components that must be raised. Remove buildup of grease, oil, or debris prior to maintaining implement.

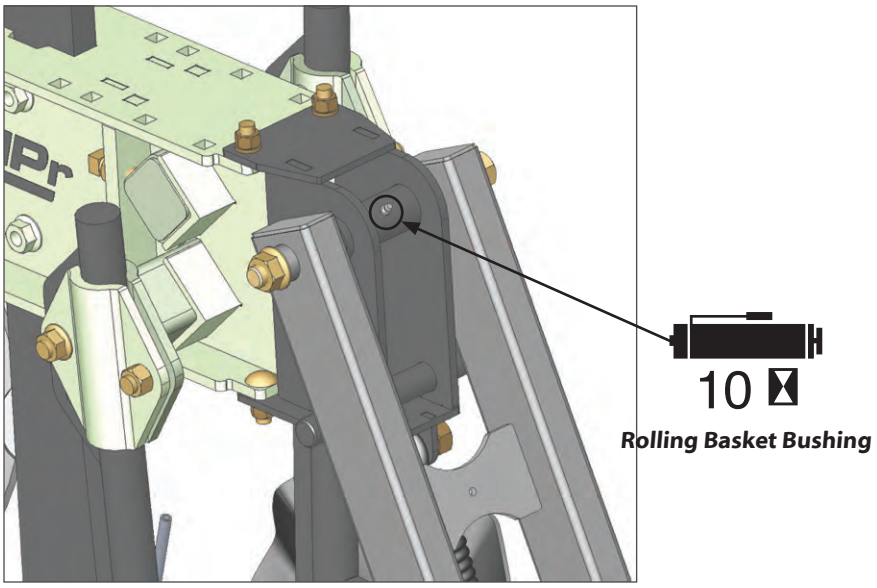
AVOID ENTANGLEMENT. Never lubricate or service implement in motion. Keep away from power driven parts when in motion. Disengage power sources prior to maintaining implement. Injury or death can result from contact with power driven parts when in motion.

AVOID CRUSHING. Do not stand between the tractor and implement when connecting or disconnecting implement. Injury or death can result from being trapped between the tractor and implement.

Escaping pressurized hydraulic fluid can penetrate skin, resulting in injury or death. Relieve hydraulic system pressure before connecting or disconnecting tractor. Use cardboard or wood, **NOT BODY PARTS**, to check for suspected hydraulic leaks. Wear protective gloves and safety glasses or goggles when working with hydraulic systems. If an accident occurs, see a doctor immediately for proper treatment.

LUBRICATION

- Grease - use high quality multi-purpose grease.
- Follow recommended 10 hour service interval illustrated below.



IMPLEMENT INSPECTION

- When replacement parts are necessary for periodic maintenance and servicing, genuine factory replacement parts must be used to restore implement to original specifications. Replace broken or worn parts immediately. Contact your Orthman dealer for replacement parts.

- During break-in (40 hours), check hardware for proper torque every 10 to 20 hours. (pg. 8 - 4)

- Before each use, check hardware for wear and proper torque. (pg. 8 - 4) Replace damaged or missing hardware with hardware of an identical grade to restore implement to original specifications.

- Do not allow debris to buildup on any surface of the implement.

- Replace all shields and guards. Be sure all tools, parts, and service equipment are removed prior to transporting equipment.

TORQUE SPECIFICATIONS

RECOMMENDED DRY BOLT TORQUE

SAE GRADE 5

Bolt Size	ft. - lb.
3/8	32
7/16	52
1/2	80
9/16	115
5/8	160
3/4	280
7/8	455
1	680
1-1/8	850
1-1/4	1200

SAE GRADE 8

Bolt Size	ft. - lb.
3/8	36
7/16	59
1/2	88
9/16	130
5/8	175
3/4	315
7/8	510
1	760
1-1/8	1075
1-1/4	1500

⚠ IMPLEMENT STORAGE

- Clean and touch up paint seasonally to avoid corrosion and rust. Contact your Orthman dealer for touch up paint.
- Inspect all safety and Orthman decals and replace if missing or damaged. Contact your Orthman dealer for replacement decals. (pg. 2 - 8, 2-9)
- Grease all zerks regardless of hourly interval prior to storage. (pg. 7-2)
- Check all hardware according to torque specifications prior to storage. (pg. 7-4)
- Replace all worn or damaged parts prior to storage.
- Store inside if possible. Storing implement inside will prolong the life of the components.

⚠ **AVOID CRUSHING.** Make sure all personnel are clear of the implement. Lower implement to the ground, place tractor in park, turn off engine, and remove key.

Storing implement on the ground will relieve the tractor three point hitch of hydraulic pressure. Hydraulic systems tend to settle, endangering anything underneath the implement.

USE BAR STANDS TO SUPPORT THE IMPLEMENT. Store implement on a clean, dry, and level surface. An uneven surface could cause implement to shift or fall, resulting in injury or death, as well as implement damage. Securely support all implement components that must be raised. Store implement away from human activity.