



ZONE-BUILDER SUBSOILER TILLAGE TOOL



ZONE-BUILDER®
SUBSOILER

MODEL 112, 122 AND 132 SUBSOILER TILLAGE TOOL MAINTENANCE

**INNOVATING
THE FUTURE OF
AGRICULTURE**

SUBSOILERS

UNVERFERTH MFG. CO., INC.
P.O. BOX 357 KALIDA, OH 45853 • UNVERFERTH.COM • 419.532.3121

SECTION IV

Maintenance

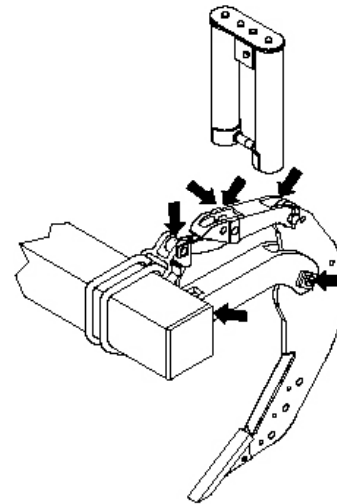
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Lubrication Points

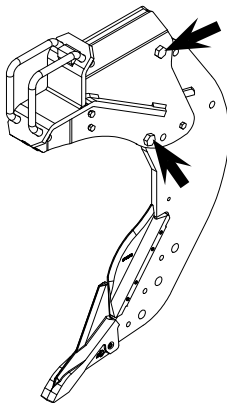
LOCATION	SEASON		HOURS
	BEGINNING	END	
AUTO-RESET SHANK (Model 132) - 6 lube fittings; grease gun	✓	✓	8*
SHEAR-BOLT SHANK (Model 112) - 2 pivot pins; oil can	✓	✓	8*
SPRING-CUSHION SHANK (Model 122) - 2 lube fittings; grease gun	✓	✓	8*
BASE WING HINGE POINTS - 4 lube fitting; grease gun	✓		
STABILIZER WHEEL HUB - repack bearings	✓		
COMBO® COULTER ARM - 1 lube fitting; grease gun - repack bearings	✓	✓	8
COULTER HUB - repack bearings	✓		50
ROLLING HARROW FRAME - 1 lube fitting; grease gun	✓	✓	8*

* This figure can vary depending on the frequency of shanks tripping.
The figure shown is based on normal conditions.

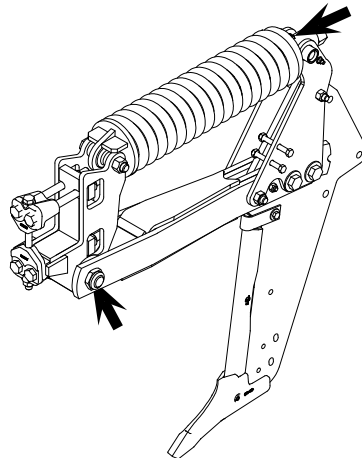
AUTO-RESET SHANK



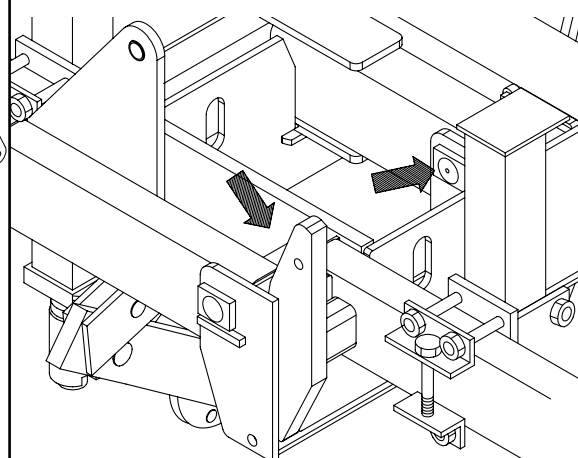
SHEAR-BOLT SHANK



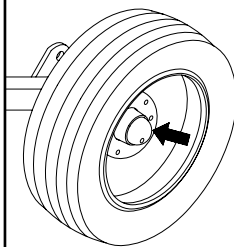
SPRING-CUSHION SHANK



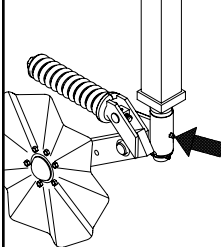
BASE WING HINGE POINTS



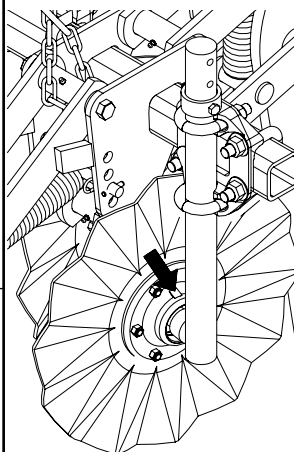
STABILIZER WHEEL HUB



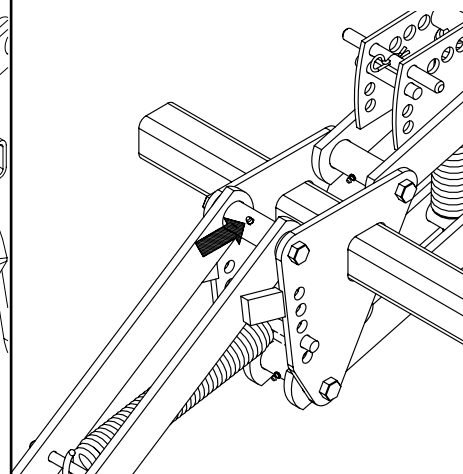
COMBO COULTER



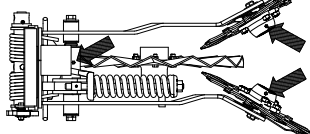
COULTER HUB



ROLLING HARROW FRAME



ROW CLEANER



Daily Service

Beginning of Day

NOTE: Before initial use, ensure all lubrication points have been greased.

Check all U-bolts and bolts for tightness. This is especially important during the first days of operation. See “Torque Chart” in this section.

IMPORTANT

- *Inspect mast pins for any wear or damage. Replace any worn or damaged pins.*

Perform any daily lubrication outlined in “Lubrication” in this section.

Check stabilizer tire air pressure and inflate to correct pressure, if necessary.

IMPORTANT

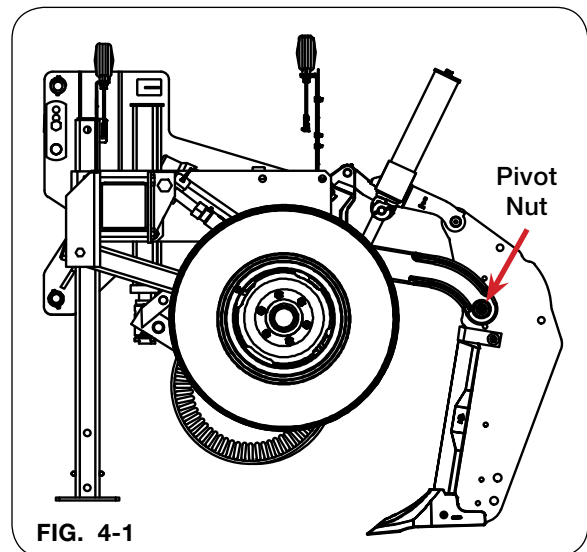
- *To assure level penetration of shanks, both tires must be inflated to the same pressure.*

Tighten deep till pivot bolts/nuts after the initial 50 acres to remove side play (Fig 4-1).

Tighten until side-to-side play in shank is eliminated. Do not over-tighten. Over-tightening will prevent shank from freely resetting after tripping.

Before adjusting see OPERATION section for procedures.

NOTE: Re-check torque of pivot nuts (225-275 ft.-lbs.) on shank assembly after initial 20 acres, again daily during the first week of operation, due to initial wear in casting. After first week, check annually.



End of Day

Clean off dirt and residue which may have accumulated on implement during operation.

Check implement for damage which could have occurred during operation, and repair.

Annual Service

Beginning of Season



- **READ AND UNDERSTAND SAFETY RULES BEFORE OPERATING OR SERVICING THIS MACHINE. REVIEW "SAFETY" SECTION IN THIS MANUAL IF NECESSARY.**

Check all bolts, U-bolts, and wheel bolts for tightness. Refer to “Torque Chart” in this section.

Lubricate implement (see “Lubrication” in this section).

Check air pressure in tires and inflate to correct pressure if necessary (see “Daily Service” in this section).

End of Season

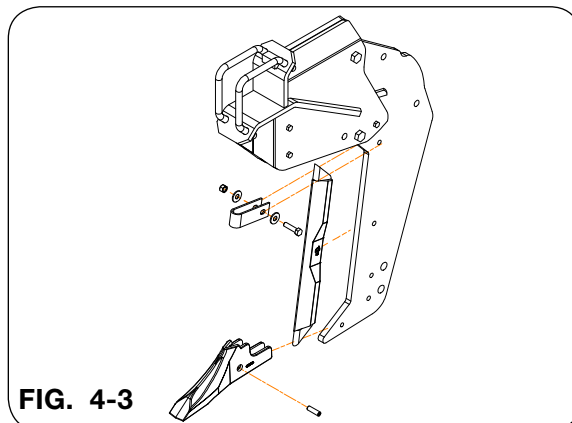
Your implement is an important investment. Spend a little time to protect it from destructive rust and corrosion. You will be repaid in longer service life and better performance.

Perform the following before placing the implement in storage:

1. Remove dirt and residue which could cause rusting.
2. Repaint any chipped or scraped areas.
3. Lubricate implement (see “Lubrication” in this section).
4. Coat all earth moving surfaces with grease or suitable rust preventatives.
5. Inspect for damaged parts. Replace before next season.
6. Store implement inside, away from livestock.
7. Use blocking to keep implement tires and points up off bare ground.
8. Replace all worn, torn or faded decals and reflectors.

Wear Bar & Point Replacement - All Models

The shanks have a replaceable wear bar and point which, after a period of time, will need to be replaced (Fig. 4-3). To replace these components on your machine, refer to the following guidelines:



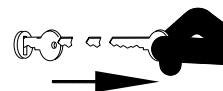
WARNING

- BE SURE THAT THE IMPLEMENT IS SECURELY BLOCKED TO PREVENT FALLING. FAILURE TO DO SO COULD RESULT IN INJURY OR DEATH. CHANGE ONLY ONE SHANK AT A TIME. IF PRESSURE IS RELIEVED ON ALL SHANKS, UNIT COULD TIP OVER BACKWARDS.

CAUTION

- WEAR BAR IS RETAINED TO THE SHANK BY THE POINT. SECURE THE WEAR BAR AS THE POINT IS BEING REMOVED TO PREVENT PERSONAL INJURY.

With Zone-Builder implement attached to a tractor, find a firm level surface and unfold the wings if applicable. Lower the unit's jack stands until they are 1-2 inches below the points, and lower machine to the ground so that the stands support the entire implement and all points are off ground. Shut off tractor engine, set parking brake, and remove the ignition key.



Wear Bar Replacement

1. Remove the capscrew, flat washers, strap, and locknut in order to remove the wear bar.

NOTE: The wear bar is locked into the point. Remove the point roll pin. Hold onto the wear bar and remove the point first, then the wear bar. (Reverse procedure for assembly.)

2. Replace with new wear bar (67034B) and secure into top of point and mounting strap on top.

NOTE: The wear bars are reversible and should be rotated or replaced often for maximum life of shank.

Point Replacement

1. Drive out the spiral pin that secures the point.
2. Replace worn point with new point (67949B or 67948B) and install new spiral pin (91144-234) to securely hold point in place.

IMPORTANT

- Periodically check the lower half of the shank for wear - excessive shank wear will occur if point and wear bar are not replaced (or reversed).

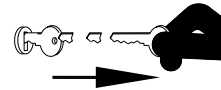
Auto-Reset Shank Replacement — Model 132

The Auto-Reset shank consists of 3 important components: Spring Mechanism Toggle Components, Shank Weldments, and Lower Pull-Arm. If service is required to any of these components, proceed as follows:

WARNING

- **FALLING OBJECTS CAN CAUSE SERIOUS INJURY OR DEATH. DO NOT WORK UNDER THE MACHINE AT ANY TIME WHILE BEING HOISTED. BE SURE ALL LIFTING DEVICES AND SUPPORTS ARE RATED FOR THE LOADS BEING HOISTED. THESE ASSEMBLY INSTRUCTIONS WILL REQUIRE SAFE LIFTING DEVICES UP TO 300 LBS. SPECIFIC LOAD RATINGS FOR INDIVIDUAL LOADS WILL BE GIVEN AT THE APPROPRIATE TIME IN THE INSTRUCTIONS.**
- **EYE PROTECTION AND OTHER APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT MUST BE WORN WHILE SERVICING IMPLEMENT.**
- **KEEP HANDS CLEAR OF PINCH POINT AREAS.**
- **STORED ENERGY HAZARD. WHEN SPRING PRESSURE IS RELEASED, THE SPRING TUBES CAN PIVOT CAUSING SERIOUS INJURY. ALLOW SPRING CANS TO ROTATE BACKWARDS AND REST INTO POSITION.**

1. With Zone-BUILDER implement attached to a tractor, find a firm level surface and unfold the wings if applicable. Set the unit's jack stands so they are 1-2 inches below the points, and lower machine to the ground so that the stands support the entire implement and all points are off ground. Shut off tractor engine, set parking brake, and remove the ignition key.



2. If attachments are on back of the shanks, remove them before proceeding. See Attachment sections of this operator manual.

NOTE: Grease all lubrication points after servicing components.

IMPORTANT

- *After disassembly of all shank components, clean and inspect all parts for damage or wear. Replace any damaged or worn parts before reassembly. Refer to "Auto-Reset Shank" in Parts Section.*

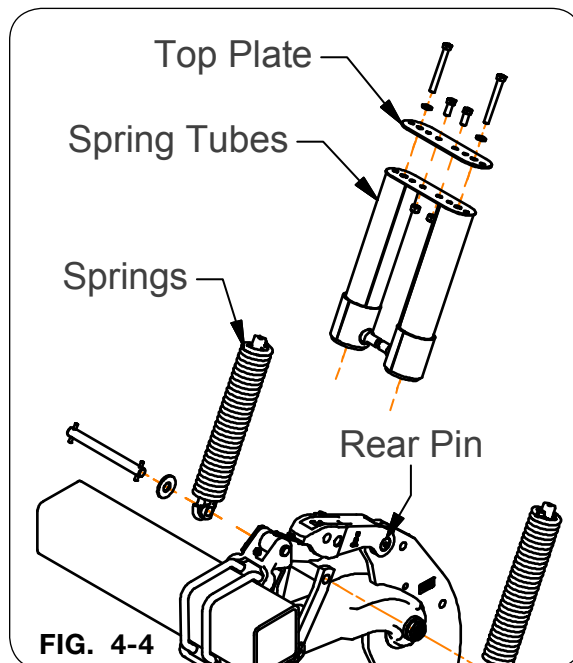
Auto-Reset Shank Replacement — Model 132 (continued)

SPRING MECHANISM TOGGLE COMPONENTS:

3. Remove all tension from springs by removing capscrews.

IMPORTANT

- *To prevent binding and possible damage, remove spring pressure equally and evenly from side to side.*
4. Remove capscrews holding top plate. Remove top plate and set aside.
 5. Remove pin holding lower end of spring (use caution, springs may fall to the ground). Observe the position and location of parts along with the direction the spring guide tubes are positioned inside the springs before removing pin.
 6. Remove springs, note washer position.
 7. Remove spring tubes from toggles by spreading tubes.



8. If no other service is required, reassemble as follows:
9. Reverse procedures for reassembly. Tighten springs equally and evenly to prevent damage. Capscrew should draw the spring completely to the top of the canister.

TOGGLE COMPONENTS:

If service is required to toggle components, refer to steps 1 - 7 under Spring Mechanism Components for disassembly of spring components.

WARNING

- **CRUSH HAZARD - BE SURE SHANK IS SUPPORTED BEFORE REMOVING TOGGLE ASSEMBLY. REMOVE ALL SHANK ATTACHMENTS BEFORE PROCEEDING.**
10. Remove pin (66926B) from the outer toggle. Remove pin (63157B) from the inner toggle. Then remove the toggle assembly.
 11. Remove toggle assembly components and replace components as required. If no other service is required, reverse procedures for reassembly.

Auto-Reset Shank Replacement — Model 132 (continued)

SHANK WELDMENT:

If replacement of shank weldment is required, refer to steps 1 - 7 under Spring Mechanism Components and steps 8 & 9 under Toggle Components for removal.

WARNING

- **CRUSH HAZARD - BE SURE SHANK IS SUPPORTED BEFORE REMOVING TOGGLE ASSEMBLY. REMOVE ALL SHANK ATTACHMENTS BEFORE PROCEEDING.**

12. Using a safe lifting device rated at a minimum of 300 lbs. secure the shank and remove the rear pin. Remove rear pin and shank and replace as required.

If no other service is required, reverse procedure for reassembly.

LOWER PULL-ARM:

If replacement of lower pull-arm is required, refer to steps 1 - 7 under Spring Mechanism Components and steps 8 & 9 under Toggle Components and step 10 under Shank Weldment for removal.

NOTE: Before inserting the front pull arm pin, check the clearance between the pull arm and mounting bracket. Install the shims as required (63098B/66834B) to fill the gap. Install equally from side to side, if possible.

11. Remove Lower Pull-Arm by removing front pin.

12. Reverse procedure for reassembly.

IMPORTANT

- *Torque 1 1/4"-12UNF locknuts used with the pivot pin on the pull arms to maximum 250-300 ft.-lbs.*

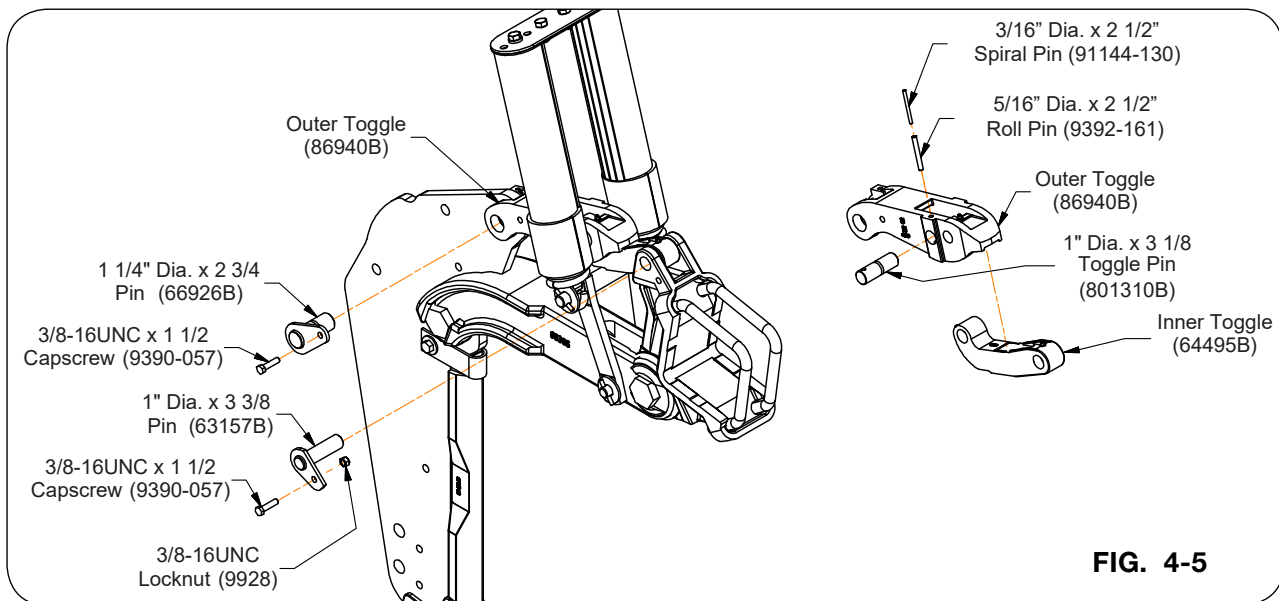


FIG. 4-5

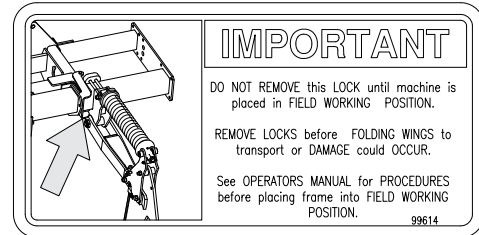
Spring-Cushioned Shanks — Model 122

Spring Replacement

The spring assembly in the spring-cushioned shank is factory pre-loaded and individual components are not designed to be serviced in the field.

WARNING

- **DISASSEMBLING SPRING CAN RESULT IN SERIOUS INJURY OR DEATH. THE SPRING IS UNDER COMPRESSION WHEN ASSEMBLED. NEVER ATTEMPT TO DISASSEMBLE SPRING.**



NOTE: Grease all lubrication points after servicing components.

If attachments are on back of the shanks, remove them before proceeding. See Attachment Section of this operator manual.

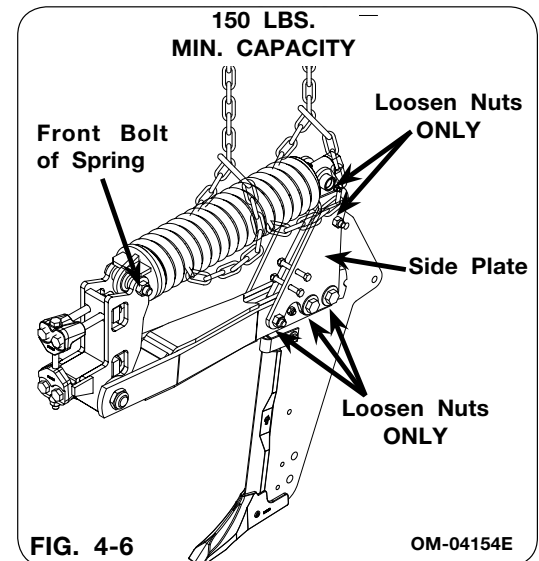
The spring assembly must be replaced as a whole, individual component parts are not available.

Carefully dispose of a worn or damaged assembly to avoid release of spring tension.

WARNING

- **FALLING OBJECTS CAN CAUSE SERIOUS INJURY OR DEATH. DO NOT WORK UNDER THE MACHINE AT ANY TIME WHILE BEING HOISTED. BE SURE ALL LIFTING DEVICES AND SUPPORTS ARE RATED FOR THE LOADS BEING HOISTED. THESE ASSEMBLY INSTRUCTIONS WILL REQUIRE SAFE LIFTING DEVICES UP TO 300 LBS. SPECIFIC LOAD RATINGS FOR INDIVIDUAL LOADS WILL BE GIVEN AT THE APPROPRIATE TIME IN THE INSTRUCTIONS.**
- **KEEP HANDS CLEAR OF PINCH POINT AREAS.**
- **EYE PROTECTION AND OTHER APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT MUST BE WORN WHILE SERVICING IMPLEMENT.**

1. With Zone Builder implement attached to a tractor, find a firm level surface and unfold the wings if applicable. Lower the unit's jack stands until they are 1-2 inches below the points, and lower machine to the ground so that the stands support the entire subsoiler and all points are off the ground. Shut off tractor engine, set parking brake, and remove the ignition key.
2. Use lifting device with a minimum capacity of 150 lbs to support the spring.
3. Loosen nuts on **ONLY** one side plate. Spread plate to remove the spring from the back.
4. Once the back of the spring is free, remove the front bolt of the spring and remove spring.
5. Replace spring by attaching lifting device to spring and attach front bolt of spring. Once secure attach back of spring and tighten plate. Tighten hardware according to torque chart in MAINTENANCE section.



Spring-Cushioned Shanks — Model 122 (continued)

Shank Replacement

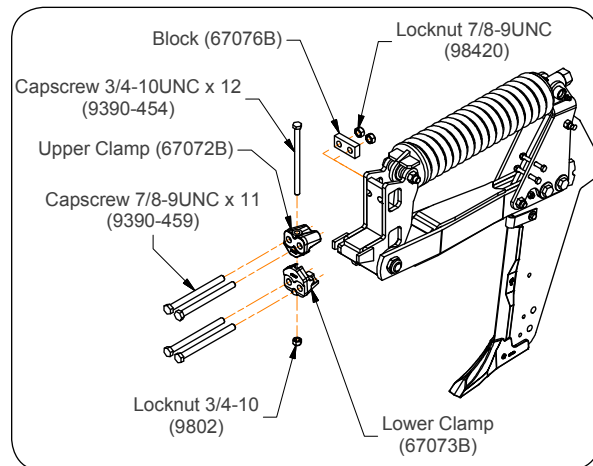
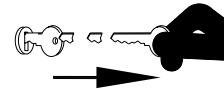
Follow these procedures to remove or replace the entire shank assembly from the Zone-Builder frame:

If attachments are on back of the shanks, remove them before proceeding. See Attachment Section of this operator manual.

Spring-cushioned shanks are installed and aligned at the factory. The shank clamps have a unique design that pulls the shank onto all four sides of the frame tube. When properly tightened, all sides of the shank mount will firmly be seated against all the sides of the frame tube.

To move or replace a spring-cushioned shank:

1. With Zone Builder subsoiler attached to a tractor, find a firm level surface and unfold the wings if applicable. Lower the unit's jack stands until they are 1-2 inches below the points, and lower machine to the ground so that the stands support the entire Zone Builder implement and all points are off the ground. Shut off tractor engine, set parking brake, and remove the ignition key.
2. Use a safe lifting device with a minimum capacity of 500 lbs to support the shank.
3. Loosen or remove the capscrews (9390-454 and 9390-459) in the clamps.
4. Remove or relocate the shank as required.
5. Position shank on bar and attach clamps (67072B and 67073B) to the tube and shank using capscrews (9390-459), spacer blocks (67076B) and locknuts (98420), tighten lightly.
6. Secure the clamps to shank using capscrew (9390-454) and locknuts (9802).
7. Torque 7/8" & 3/4" capscrews to 240 ft-lbs.
8. Do not substitute other hardware for the UNVERFERTH supplied parts.



Spring-Cushioned Shanks — Model 122 (continued)

Shank & Pull Arm Replacement

Follow these procedures to replace or repair the shank and/or pull arm:

IMPORTANT

- *The procedures for assembling this unit are intended for two or more people.*

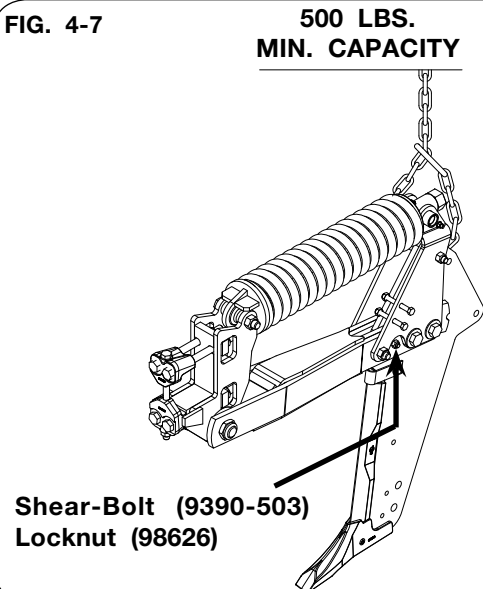
If attachments are on back of the shanks, remove them before proceeding. See Attachment Section of this operator manual.

All shank assembly illustrations are shown loose for illustration purposes only.

With Zone Builder implement attached to a tractor, find a firm level surface and unfold the wings if applicable. Lower the unit's jack stands until they are 1-2 inches below the points, and lower machine to the ground so that the stands support the entire Zone Builder implement and all points are off the ground. Shut off tractor engine, set parking brake, and remove the ignition key.

1. Support the back of the spring with a safe lifting device rated at a minimum of 500 lbs. (Fig. 4-7).
2. Remove the shear-bolt 9/16"-12UNC x 4 1/2" (9390-503) and locknut 9/16"-12UNC (98626) as shown in Fig. 4-7.

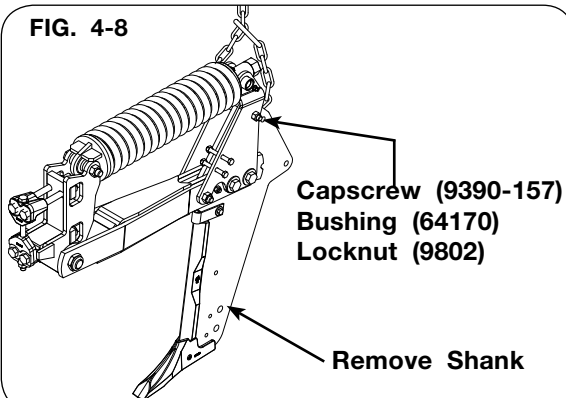
FIG. 4-7



Spring-Cushioned Shanks — Model 122 (continued)

- Support the shank and remove the 3/4"-10UNC x 6" capscREW (9390-157), tube/bushing (64170) and 3/4"-10UNC locknut (9802) as shown in Fig. 4-8. Then remove the shank.

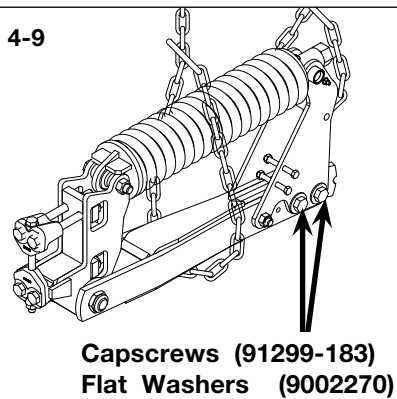
FIG. 4-8



- Support the pull arm as shown in Fig. 4-9 and remove the 1"-8UNC x 2" capscREWS (91299-183) grade 8 and flat washers (9002270).

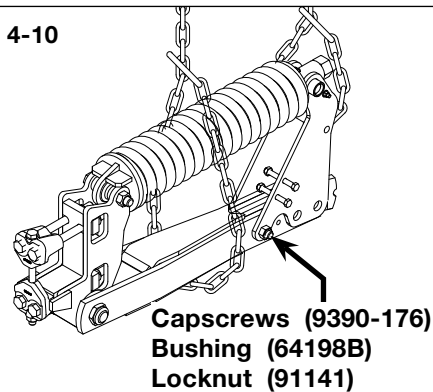
NOTE: Parts will fall at this point if spring is not supported.

FIG. 4-9



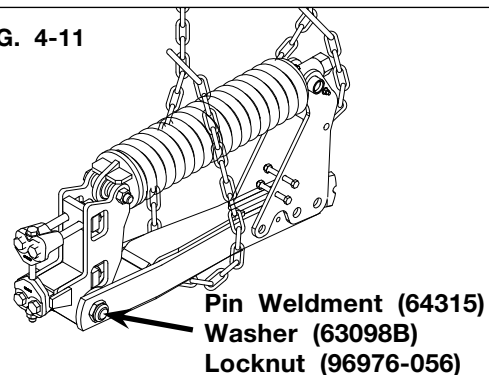
- Next, remove the 7/8"-9UNC x 6" capscREW (9390-176), tube/bushing (64198B), and 7/8"-9UNC locknut (91141) as shown in Fig. 4-10.

FIG. 4-10



- After you remove the pin weldment (64315), washer (63098B) and 1/2"-12UNF locknut (96976-056) the pull arm will be loose as shown in Fig. 4-11.
- Replace the pull arm using steps in reverse order as for the removal process. Position the pull arm as shown in Fig. 4-11. Reinsert the pin weldment (64315), washer (63098B) and 1/2"-12UNF locknut (96976-056). Torque hardware to 250-300 ft.-lbs.

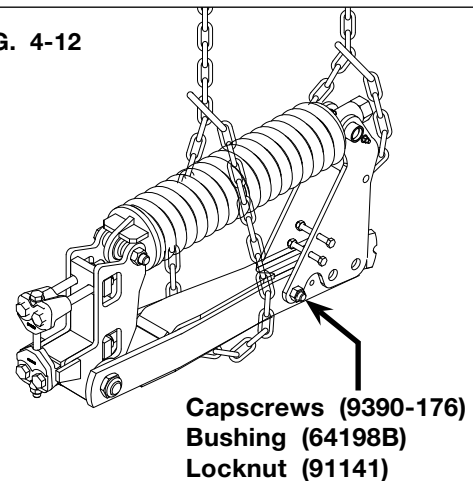
FIG. 4-11



Spring-Cushioned Shanks — Model 122 (continued)

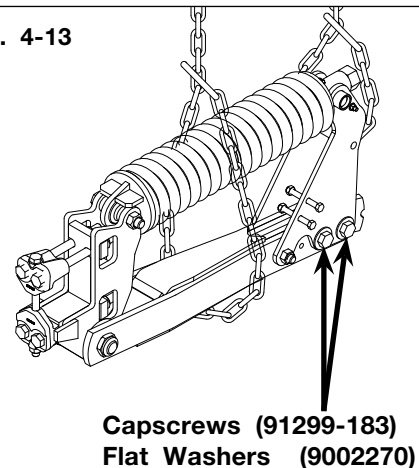
8. Insert the 7/8"-9UNC x 6" capscrew (9390-176), tube/bushing (64198B), and 7/8"-9UNC locknut (91141) as shown in Fig. 4-12. Torque hardware to 330-350 ft.-lbs.

FIG. 4-12



9. Insert the 1"-8UNC x 2" capscrews (91299-183) grade 8 and flat washers (9002270) as shown in Fig. 4-13. Torque hardware to 500-520 ft.-lbs. Then remove the pull arm support.

FIG. 4-13



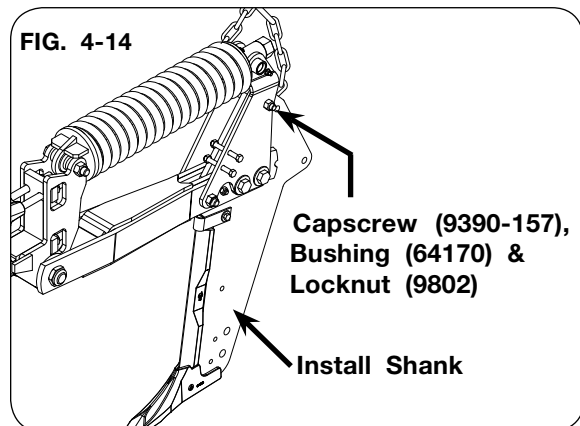
10. Position the shank as shown in Fig. 4-14 and secure using 3/4"-10UNC x 6" capscrew (9390-157), tube/bushing (64170) and 3/4"-10UNC locknut (9802). Torque hardware to 200-220 ft.-lbs.

11. Insert the 9/16"-12UNC x 4 1/2" shear-bolt (9390-503) and 9/16"-12UNC locknut (98626) as shown in Fig. 2-7. Torque hardware to 90-98 ft.-lbs.

IMPORTANT

- Tighten shear-bolt as indicated after all other hardware has been torqued as specified.

FIG. 4-14



12. Remove the support from the back of the spring.

13. Reattach optional attachment if applicable. See attachment section of this manual.

Spring-Cushioned Shanks — Model 122 (continued)

Shear-Bolt Replacement

The shear-bolt in the spring-cushioned shank is a redundant protection mechanism for the shank. The shear-bolt should shear only when the shank encounters an obstacle so large that it cannot trip over it or there has been a failure in the shank pivot mechanism that prevents the shank from tripping.

1. With Zone Builder implement attached to a tractor, find a firm level surface and unfold the wings if applicable. Lower the unit's jack stands until they are 1-2 inches below the points, and lower machine to the ground so that the stands support the entire Zone Builder subsoiler and all points are off ground. Shut off tractor engine, set parking brake, and remove the ignition key.
2. Remove any remaining portions of the shear-bolt from the shank assembly. Inspect shear-bolt holes in the shank and the pull arm weldments. Severely distorted holes will result in shorter shear-bolt life and should be repaired or replaced. The hole in the outer portion of the pull arm weldment is oversized for easier shear-bolt installation. The inner portion of the hole is properly sized for shearing action.
3. The shank should pass through the pull arm and contact the front stop (A) with slight pressure applied to back of shank. If the shank will not contact the front stop, loosen the front stop bolt 1/4 turn (A), see Fig. 4-15. Repeat procedure until the holes align. If shank stops too far forward to allow for shear-bolt installation, use a pry bar on front of shank to help align holes, see Fig. 4-16.
4. Align the holes with a 9/16" diameter drift pin and install UNVERFERTH shear-bolt (9390-503) and locknut (98626). Additional shear-bolts are stored in the left side formed plate of the shank assembly. Do not use a different size or different grade of shear-bolt; unsatisfactory performance and or shank damage may occur. Tighten the nut to 90-98 ft.-lbs, see Figure 4-15.

NOTE: Refer to PARTS section for serviceable hardened bushings (66281 or 98795).



FIG. 4-15

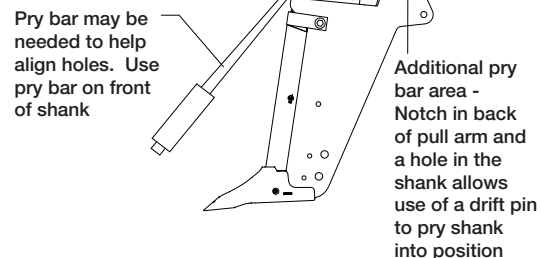
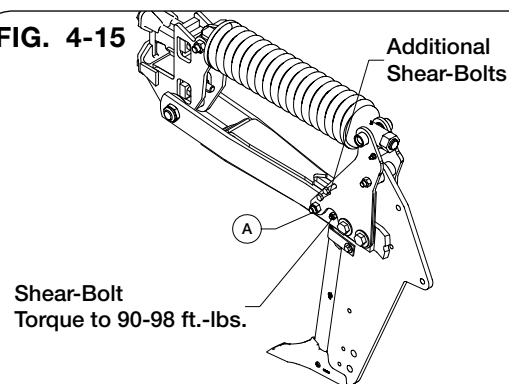


FIG. 4-16

Shear-Bolt Shanks — Model 112

Shear-Bolt Replacement

The shear-bolt should shear only when the shank encounters an obstacle.

WARNING

- **KEEP HANDS CLEAR OF PINCH POINT AREAS.**
- **EYE PROTECTION AND OTHER APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT MUST BE WORN WHILE SERVICING IMPLEMENT.**

IMPORTANT

- *On wing fold units, be sure to replace the shear-bolt on shanks on wing before folding wings. Damage to equipment could occur.*

1. With Zone Builder implement attached to a tractor, find a firm level surface and unfold the wings if applicable. Lower the unit's jack stands until they are 1-2 inches below the points, and lower machine to the ground so that the stands support the entire implement and all points are off ground. Shut off tractor engine, set parking brake, and remove the ignition key.
2. Remove any remaining portions of the shear-bolt from the shank assembly. Inspect shear-bolt holes in the shank and the pull arm weldments. Severely distorted holes will result in shorter shear-bolt life and should be repaired or replaced.
3. Align the holes with 7/16" diameter drift pin and install UNVERFERTH shear-bolt (9390-151) and locknut (9802). Do not use a different size or different grade of shear-bolt; unsatisfactory performance and or shank damage may occur. Tighten the nut to 55 ft.-lbs.

NOTE: Additional shear-bolts are stored in the front of the shank.

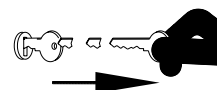
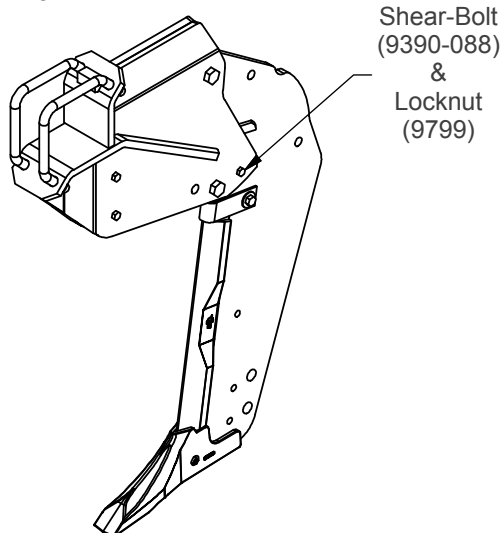


FIG. 4-17

Torque to 55 FT.-LBS.



Combo® Coulter Spring Replacement

The following guidelines are for replacing the spring on the coulters.

WARNING

- KEEP HANDS CLEAR OF PINCH POINT AREAS.
- EYE PROTECTION AND OTHER APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT MUST BE WORN WHILE SERVICING IMPLEMENT.

CAUTION

- SHARP EDGES ON COULTER BLADES CAN CAUSE SERIOUS INJURY. BE CAREFUL WHEN WORKING AROUND COULTER BLADES.

IMPORTANT

- *The spring should only be adjusted when repairs are being made. The springs have been preset before leaving the factory.*

1. Loosen the set screw retaining the spring bolt on the coulter arm (Fig. 4-18).
2. Slowly unscrew the spring bolt which will relieve spring pressure (Fig. 4-18).
3. Once the bolt is removed, replace with new spring and re-insert bolt.

4. Tighten bolt until a deflection of 1" is obtained on spring (Fig. 4-19).

The coulter springs are preset at the factory to 9 3/8". This measurement is the total amount of exposed spring.

NOTE: Adjusting the spring below 9 3/8" could cause premature part failure and void any warranty considerations.

5. Tighten set screw to secure bolt.

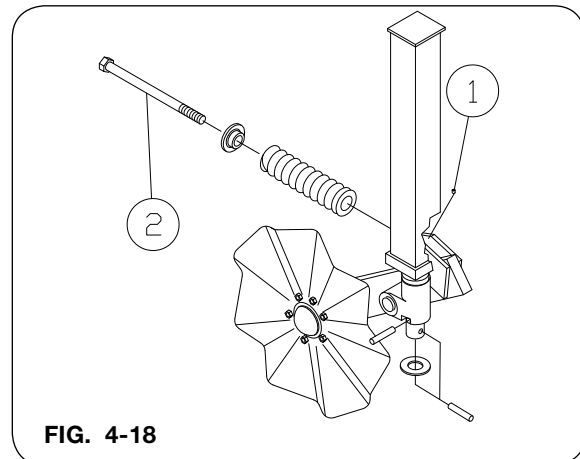


FIG. 4-18

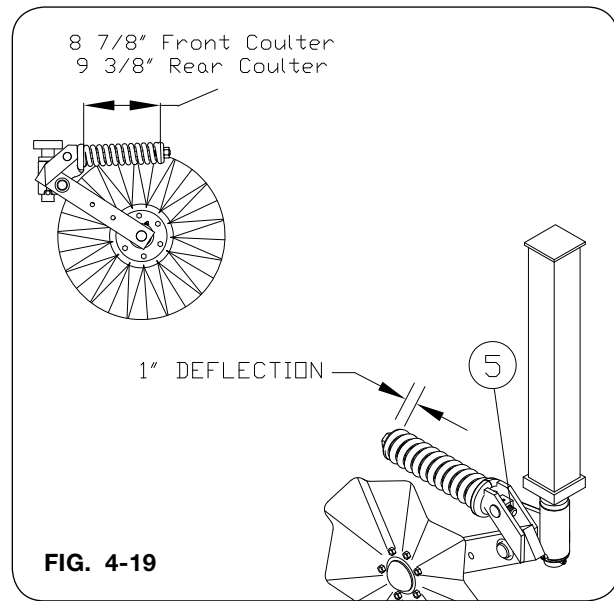


FIG. 4-19

Hub Adjustment and Replacement For Combo® Coulters and Rear Coulters

After the first 100 acres, the hubs should be checked for tightness and wear.

WARNING

- BE SURE THAT THE IMPLEMENT IS SECURELY BLOCKED TO PREVENT FALLING. FAILURE TO DO SO COULD RESULT IN INJURY OR DEATH.
- EYE PROTECTION AND OTHER APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT MUST BE WORN WHILE SERVICING THE IMPLEMENT.

CAUTION

- SHARP EDGES ON COULTER BLADES CAN CAUSE INJURY. BE CAREFUL WHEN WORKING AROUND COULTER BLADES.

IMPORTANT

- Do not allow dirt and debris to contaminate the hub and its internal components. Neglecting to do so could result in failure of the hub and its components due to excessive wear.
1. Check the coulters hub and bearing for looseness or wobble by gripping the ends of the blade. Rotate and laterally push and pull on the coulters blade. A tight hub will have no wobble and will rotate smoothly with a slight resistance.
 2. If there is wobble in the hub, the hub must be tightened to the spindle. To do this, remove retaining ring and the hub cap. Remove the nut retainer and tighten the slotted nut. The nut should be torqued to 40-45 foot-pounds. Increase the tightness to reinsert the c-ring.
 3. After tightening, retest the hub for wobble by repeating Step #1. If wobble still exists, continue with the following guidelines.

IMPORTANT

- When tightening slotted nut onto spindle, rotate hub back and forth so that flats do not form on bearings.
4. Turn the blade and feel for any roughness in the rotation. Also, check the base of the hub to see if the seal is intact and in position. If either problem exists, the hub must be dismantled, cleaned, inspected for damage, and repacked with grease. Refer to the following guidelines for this procedure.

A. Remove the blade and hub cap. Remove the C-ring securing the slotted nut.

IMPORTANT

- Removal of C-ring is best accomplished by using two screwdrivers or similar tools and prying on the outside ends to spread ring. If ring is damaged discard and replace.
- When removing the hub and its components, be sure to keep them free of debris and dirt. Failure to do so will result in contamination of hub and bearing failure.

B. Unscrew the nut and carefully remove the hub from the spindle.

C. Remove the components, clean, and inspect for any damage or wear. If even the slightest imperfection exists, replace the component(s). Once the hub is dismantled, always replace the bearing and seal assembly, o-ring, and triple lip seal.

Hub Adjustment and Replacement For Combo® Coulters and Rear Coulters (continued)

IMPORTANT

- *Always replace the “O”-ring and seal if dismantling the hub. Failure to do so could result in premature failure of hub and its components.*
- D. Replace any damaged parts before reassembling the components. Be sure to remove any debris or dirt and repack bearings with an SAE approved hub grease.
- E. Assemble O-ring (95565) to spindle, use grease to lubricate seal.
- G. While rotating hub, slide the hub, seal, and bearing onto spindle. Make sure not to damage seal. Be sure outer bearing and washer slide on the spindle and bearing seats in the cup.
- H. Assemble nut to spindle. While rotating hub, torque nut to 40 ft-lbs.

IMPORTANT

- *Rotate coulters when torquing slotted nut. Doing this will prevent flats from forming on bearings.*
- I. Back nut off and finger tighten. Tighten nut to align the next notch with hole in the spindle without rotating hub.
- J. Check for looseness in the hub. It should not wiggle. If it does, tighten the nut one more slot and repeat step 8.
- K. Check hub rotation for excessive drag. There should be slight resistance. If there is excessive drag, repeat procedure starting at step I.
- L. Install Retaining Spring (9504825).

IMPORTANT

- *Assembly of C-ring is best accomplished by the use of a hog ring type pliers or similar tool. After installation be sure C-ring will lay flat against the spindle retaining nut to allow for proper installation of hub cap.*
- M. Add moly #2 grease through hub zerk until grease extends above the washer all around cavity. Also add grease to pivot arm zerk.
- N. Install O-ring, hub cap & retaining ring. Paint hub cap and retaining ring if necessary.

Hub Adjustment and Replacement For Combo® Coulters and Rear Coulters (continued)

NOTE: Be sure to re-pack bearings with an SAE approved grease and keep it and its components free of dust and debris.

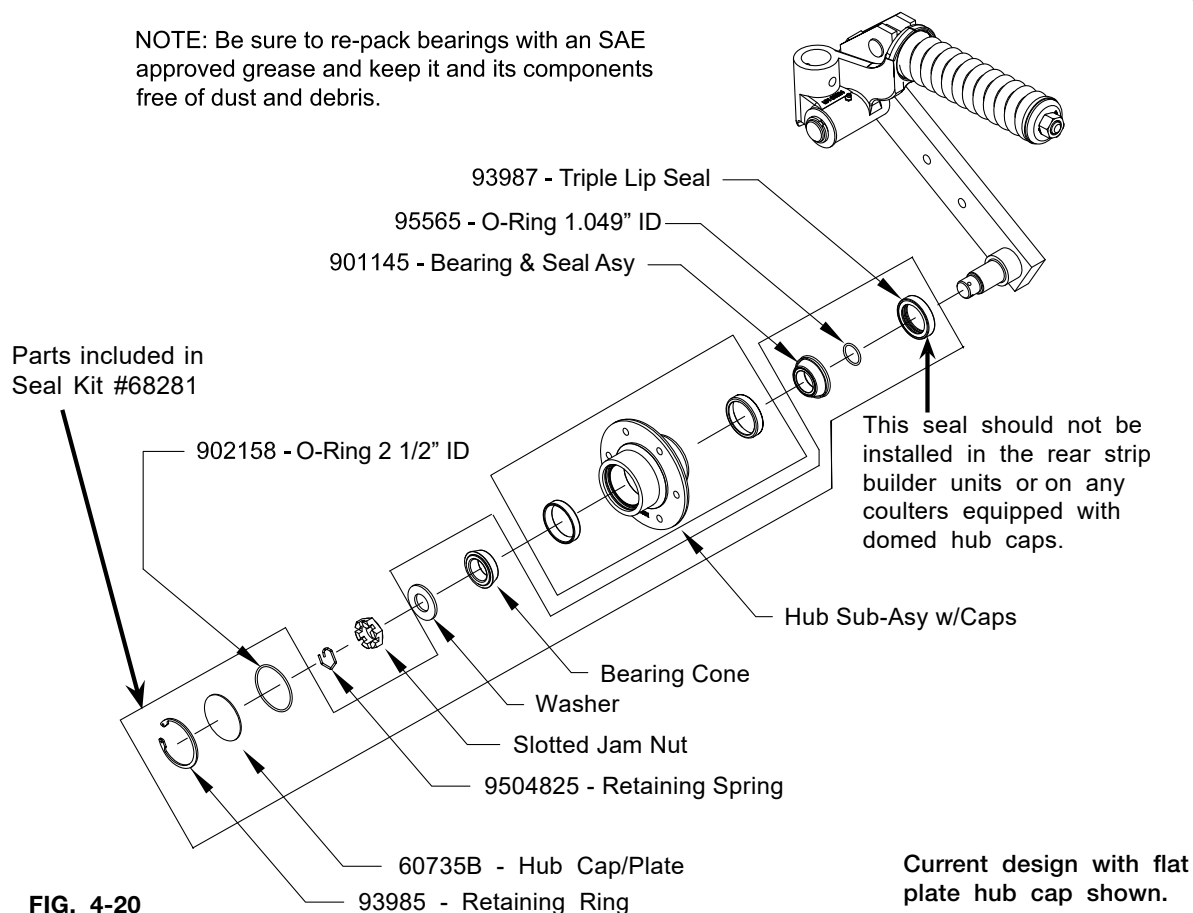


FIG. 4-20

Replacing Bearings In Rolling Harrow Baskets

WARNING

- **EYE PROTECTION AND OTHER APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT MUST BE WORN WHILE SERVICING IMPLEMENT.**

1. Lower implement unit to the ground and securely block to prevent tipping, or moving. Shut off tractor, set parking brake, and remove ignition key.
2. Install block under each basket to support weight of basket.
3. Remove the three 5/16"-18UNC carriage bolts or capscrews and the clip which hold the bearing on.
4. Use a pry bar to pry the end of the basket out of the basket frame slot.
5. Loosen the set screw in the lock collar. Loosen lock collar by turning with punch in opposite direction of basket travel.
6. Place a punch through the hole in the end plate on the basket and use a hammer to remove the bearing. If the bearing is still tight on the shaft, use a bearing puller to remove the bearing.
7. File off any burrs left on the shaft. Finish with a strip of emery cloth. Make sure bearing will slide on the shaft.
8. Slide a new bearing (87181) on the shaft with the lock collar on the outside (Fig. 4-21).
9. Pry the end of the basket into the slot of the frame (Fig 4-21).
10. Assemble the new 5/16"-18UNC capscrews through the holes in the frame and into the bearing housing (Fig. 4-21).

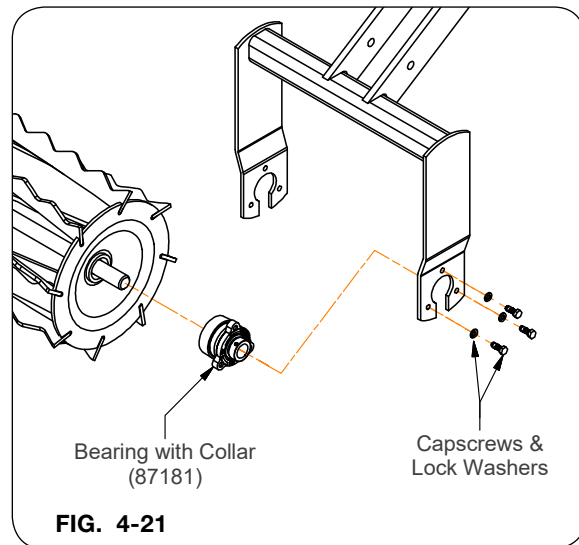
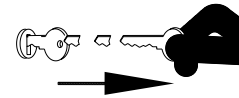


FIG. 4-21

IMPORTANT

- *Tighten screws in bearing before tightening setscrew in lock collar. Tighten lock collar on shaft in direction of rotation. Tighten screws according to Torque Chart, in this section.*

Use UNVERFERTH bearings (87181) with triple lip seals for maximum life.

Notes

Troubleshooting

PROBABLE CAUSE

CORRECTION

Poor Penetration

Frame is not level	See the OPERATION section "Leveling Frame" for instructions
Ground is too hard for hitch control setting	Adjust the hitch control position. See the OPERATION section "Load and Depth control"
Worn or dull tool points	Replace with new tool points

Plugging

Coulters are not spaced correctly	See "Overhead Layouts" for correct spacing of shanks in SETUP section
Poor field conditions	Wait until the field is dry enough to till properly without excessive slippage
Machine not level	Level Machine
Coulters are not penetrating deep enough	Lower the coulters
Coulter blades not cutting residue	Wait until the field is dry enough to allow blades to cut through residue

Implement Running Crooked In Field

Shanks are not spaced correctly	See "Overhead Layouts" for correct spacing of the shanks
Stabilizer wheels are not adjusted equally from side-to-side	Check the side-to-side adjustment and correct
Tractor tires are not properly spaced or equally inflated	Find the cause and correct. See OPERATION section "Wheel Spacing"
Tractor 3-point lift linkage is not adjusted for level operation	Re-level Zone-Builder frame. See OPERATION section "Leveling Frame"
Tractor 3-point lift linkage lateral float pins are not set properly	Check the position of the lateral float pins. See OPERATION section "Left Link Lateral Float"

Shank Leading Off Row Center

Main pivots not properly tightened	Tighten until side-to-side play in shank is eliminated. Take care not to over-tighten, not allowing shank to freely reset after tripping.
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Troubleshooting (continued)

PROBABLE CAUSE	CORRECTION
Shanks Not Resetting Into Ground After Tripping	
Ground conditions hard or the unit is being operated very deep	While moving, raise Zone-Builder slightly to reset, then lower and resume operation
Pivot nuts on front and rear of pull arm are overtightened	Refer to OPERATION section for adjustment procedure
Excessive Soil Disturbance	
Shanks are operating at shallow depths	Operate at depth to get under hardpan. This may require larger tractor or smaller tool.
Dry soil conditions	Wait for additional rain
Running implement too fast	Slower speeds create less disturbances
Too much sealing	Decrease down pressure, decrease coulter angle, raise coulters, or move coulters apart
Not enough sealing	Increase down pressure, increase coulter angle, increase coulter depth, or move coulters closer
Coulter not moving	Decrease coulter angle, decrease spring pressure, decrease coulter depth, or move coulters apart

Wheels and Tires

Wheel Nut Torque

CAUTION

- IMPROPERLY TORQUED WHEEL NUTS/BOLTS CAN CAUSE A LOSS OF IMPLEMENT CONTROL AND MACHINE DAMAGE. TORQUE WHEEL NUTS/BOLTS TO VALUES IN TABLE. CHECK TORQUE BEFORE INITIAL USE, AFTER ONE HOUR OF USE, AND EACH HOUR UNTIL WHEEL NUTS/BOLTS MAINTAIN TORQUE VALUE. CHECK TORQUE EVERY 10 HOURS OF USE THEREAFTER. AFTER EACH WHEEL REMOVAL START TORQUE PROCESS FROM BEGINNING. WARRANTY DOES NOT COVER FAILURES CAUSED BY IMPROPERLY TORQUED WHEEL NUTS/BOLTS.

- Failure to check torque before first use may damage wheel nut/bolt seats. Once seats are damaged, it will become impossible to keep nuts/bolts tight. Tighten nuts/bolts to applicable torque value shown in table. Start all nuts/bolts by hand to prevent cross threading. Torque nuts in the recommended sequence as shown in Fig. 4-2.

WHEEL HARDWARE	
SIZE	FOOT-POUNDS
1/2-20 (UNF)	75 Ft.-Lbs.

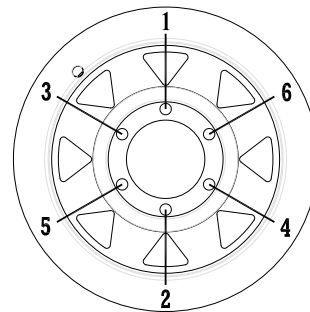


Fig. 4-2 - 6 Bolt

Tire Pressure

- The following is to be used as a general guide for tire inflation and figures can vary depending on specific brand of tire used. **It is important that tires are inspected after unit is loaded.** Start with minimum pressure indicated. The tire should stand up with no side-wall buckling or distress as tire rolls. Record the pressure needed to support the full load and maintain this pressure to achieve proper tire life. **Do not exceed maximum recommended tire pressure.**

TIRE	INFLATION
7.60 x 15 - 8 Ply	max. 52 PSI
9.5 x 15 - 8 Ply	max. 44 PSI
12.5 x 15 - 10 Ply	max. 44 PSI

Wheels and Tires (continued)

Tire Warranty

For questions regarding new tire warranty, please contact your local original equipment tire dealer. Used tires carry no warranty. Following are phone numbers and Websites for your convenience:

Firestone www.firestoneag.com
Phone 800-847-3364

Carlisle www.carlisletire.com
Phone 800-260-7959
Fax 800-352-0075

Greenball www.greenball.com
Phone 866-767-9637

Complete Torque Chart

U-BOLTS - GRADE 7

Torque 3/4"-10UNC U-Bolts to 240 Ft.-Lbs.

Torque 3/4"-10UNC Shank Mount V-bolts to 240 Ft.-Lbs.

EXTENSION HARDWARE

Model 122 - Vertical Bolts: Torque 3/4"-10UNC to 240 ft.-lbs.

Model 122 - Horizontal Bolts: Torque 7/8"-9UNC to 240 ft.-lbs.

PULL-ARM HARDWARE

Model 122 Pull Arm Front Pin: Locknut 1 1/2"-12UNF torque to 250-300 ft.-lbs.

Model 122 Pull Arm Rear Screws: Capscrews (1"-8UNC x 2" Grade 8) torque to 500-520 ft.-lbs.

Model 132 Pull Arm Pins: Thin Collar Locknut 1 1/4"-12UNF torque to 225-275 ft.-lbs.

Complete Torque Chart

Capscrews - Grade 5

NOTE:

- Grade 5 capscrews can be identified by three radial dashes on the head.
- For wheel torque requirements, refer to Wheels and Tires.
- Tighten U-bolts evenly and equally to have the same number of threads exposed on each end.



SIZE	FOOT POUNDS	NEWTON METERS
1/4-20	8-10	11-13
1/4-28	9-11	12-15
5/16-18	15-17	20-23
5/16-24	17-19	23-26
3/8-16	25-28	34-38
3/8-24	28-31	38-42
7/16-14	40-45	54-61
7/16-20	45-50	61-68
1/2-13	62-68	84-92
1/2-20	68-75	92-102
9/16-12	90-98	122-133
9/16-18	100-110	134-148
5/8-11	120-135	162-183
5/8-18	124-137	168-186
3/4-10	200-220	270-300
3/4-16	210-230	285-310
7/8-9	330-350	425-475
7/8-14	360-380	460-515
1-8	500-525	675-710
1-14	540-560	730-760
1 1/8-7	600-635	815-860
1 1/8-12	665-700	920-950
1 1/4-7	850-895	1150-1215
1 1/4-12	940-990	1275-1340
1 3/8-6	1125-1175	1525-1590
1 3/8-12	1280-1335	1735-1810
1 1/2-6	1500-1560	2035-2115
1 1/2-12	1685-1755	2285-2380

IMPORTANT

- Follow these torque recommendations except when specified in text.

Complete Torque Chart

Capscrews - Grade 8

NOTE:

- Grade 8 capscrews can be identified by six radial dashes on the head.
- For wheel torque requirements, refer to Wheels and Tires.
- Tighten U-bolts evenly and equally to have the same number of threads exposed on each end.



SIZE	FOOT POUNDS	NEWTON METERS
5/16-18	20-22	27-30
5/16-24	21-23	28-31
3/8-16	35-39	47-53
3/8-24	36-41	49-55
7/16-14	54-58	73-78
7/16-20	55-60	75-80
1/2-13	82-88	110-120
1/2-20	94-99	125-135
9/16-12	127-134	170-180
9/16-18	147-155	199-210
5/8-11	160-170	215-230
5/8-18	165-175	225-235
3/4-10	280-295	380-400
3/4-16	330-365	445-495
7/8-9	410-430	555-580
7/8-14	420-440	570-595
1-8	630-650	850-880
1-14	680-700	920-950
1 1/8-7	900-930	1220-1260
1 1/8-12	930-950	1260-1290
1 1/4-7	1250-1300	1695-1760
1 1/4-12	1280-1320	1735-1790

IMPORTANT

- Follow these torque recommendations except when specified in text.

Hydraulic Fittings

Tightening O-Ring Fittings

1. Inspect components for damage or contamination. Do not connect any other type of fitting to an O-ring fitting.
2. For adjustable fittings, insure the jam nut and washer are fully backed up.
3. Lubricate the O-ring and threads on the fitting.
4. Turn the fitting into the port until it is finger tight.
5. For adjustable fittings, set in the desired position.
6. Using a wrench, torque the fitting to the value in the below table. For adjustable fittings the jam nut will be tightened.

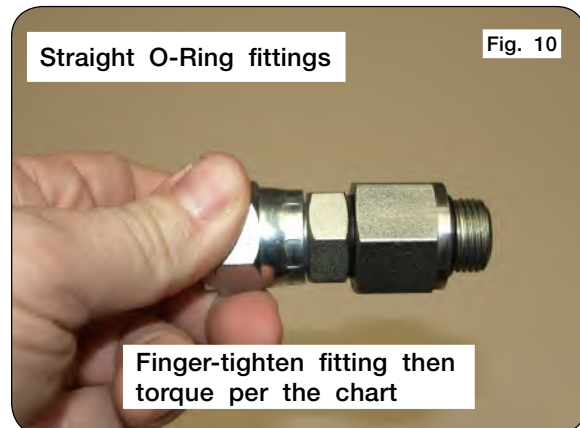
Note: Never use a power tool to install a fitting.

Dash Size	Thread Size	Straight Stud Torque (Ft-Lbs)	Adjustable Stud Torque (Ft-Lbs)
-5	1/2-20	14-19	10-14
-6	9/16-18	18-24	12-16
-8	3/4-16	27-43	20-30
-10	7/8-14	36-48	30-36
-12	1-1/16-12	65-75	44-54
-14	1-3/16-12	75-99	53-70
-16	1-5/16-12	85-123	59-80
-20	1-5/8"-12	115-161	75-100
-24	1-7/8"-12	125-170	105-125



O-Ring fittings

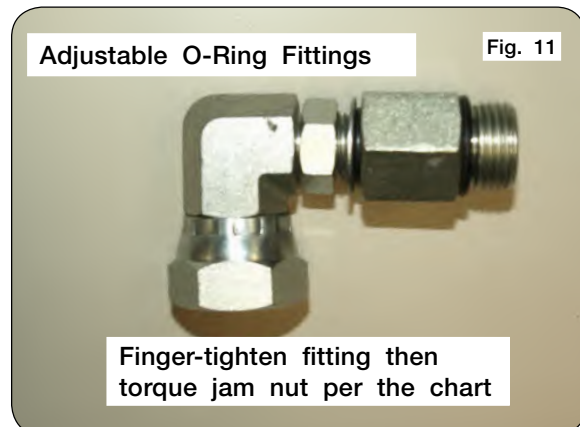
Fig. 9



Straight O-Ring fittings

Fig. 10

Finger-tighten fitting then torque per the chart



Adjustable O-Ring Fittings

Fig. 11

Finger-tighten fitting then torque jam nut per the chart

Hydraulic Fittings

Tightening JIC Fittings

1. Inspect all components for damage or contamination. Do not connect any other type of fitting to a JIC fitting.
2. Lubricate the threads.
3. Turn the fitting into the port until it bottoms out.
4. Use one wrench on the fixed hex on the hose to prevent twisting and a second on the swivel. Tighten the fitting another 60 degrees (or one flat).

Note: Never use a power tool to install a fitting.

