



450 & 660 - Mushroom Owner's Manual & Parts Book

| |
|---------------|
| Purchase Date |
| Serial Number |
| Model Number |
| Tractor Model |
| Dealer |

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To The Owner

This manual contains information concerning the operation, adjustment, and maintenance of the 450 and 660 blade assembly. You have purchased dependable, long lasting equipment, but only by proper care and operation can you expect to receive the performance and long service built into our products. Please have all operators read this manual carefully and keep the manual available for ready reference. If you have any questions or concerns, contact Grouser Products.

Maintenance

Due to the harsh environment many of our equipment operates in, the following tasks should be performed every 10 hours or less.

- Inspect all equipment before operation for existing or potential damages.
- Lubricate all joints with high quality grease.
- Inspect and tighten all bolts to torque specifications on page 3.
- Check replaceable cutting edge for wear ensuring there is enough material to prevent permanent damage to the blade.
- Make sure all non-rotating pins are secured properly.
- Check hydraulic cylinders and hoses for damage or leaks. For replacement parts, see hydraulic pages for your specific system.
- Check skid shoes for wear and replace if necessary. For adjustment, see page 4.
- Inspect all tilt-ways for aggressive wear. See page 4 for tilt plate adjustment.

Safety Precautions

A careful operator is the best operator. Most accidents can be avoided by observing certain precautions. To help prevent accidents, read and take the following precautions before operating this equipment. In addition to these precautions, please follow all safety and operational instructions of your tractor manufacturer.

The Dozer:

1. The 450 and 660 Dozer should be operated only by those who are responsible and instructed to do so.
2. Read the owner's manual carefully before using this equipment. Lack of operating knowledge can lead to accidents.
3. Keep the dozer maintained in reliable and satisfactory condition to ensure your safety.
4. Make sure the area is clear of people before moving any equipment.
5. Do not modify or permit anyone else to modify or alter the equipment and its components without first consulting Grouser Products.

Servicing the Dozer:

1. Read and follow all safety instructions provided by the tractor manufacturer.
2. Always use proper personal safety gear when performing maintenance on equipment.
3. Before servicing, relieve hydraulic pressure, stop engine and fully engage parking brake.
4. Escaping hydraulic fluid under pressure can penetrate skin causing serious injury. If fluid is injected into skin, obtain medical attention immediately.
 - DO NOT use your hand to check for leaks. Use a piece of cardboard or paper to search for leaks.
 - Stop the engine and relieve pressure before connecting or disconnecting lines.
 - Tighten all connections before starting the engine or pressurizing lines.

Storing the Dozer:

1. Thoroughly clean the inside and outside of the dozer before storage. Use paint where necessary to prevent rust.
2. Check the dozer for worn or damaged parts. Install new parts as required.
3. Lubricate all pins and joints.

Torque Specifications

All bolts should be tightened to the specifications that are stated. If specifications are not stated, follow torque charts below.

| | Torque - Dry (ft-lbs) | | | |
|------|-----------------------|-----|-------------|------|
| | SAE Grade 5 | | SAE Grade 8 | |
| Size | UNC | UNF | UNC | UNF |
| 5/16 | 17 | 19 | 24 | 27 |
| 3/8 | 30 | 35 | 45 | 50 |
| 7/16 | 50 | 55 | 70 | 80 |
| 1/2 | 75 | 85 | 110 | 120 |
| 9/16 | 110 | 120 | 150 | 170 |
| 5/8 | 150 | 170 | 210 | 240 |
| 3/4 | 260 | 300 | 380 | 420 |
| 7/8 | 430 | 470 | 600 | 670 |
| 1 | 640 | 720 | 910 | 1020 |

| Size | Torque - Dry (ft-lbs) |
|------------|-----------------------|
| | Grade 10.9 |
| M18 x 2.50 | 284 |
| M20 x 2.50 | 401 |
| M22 x 2.50 | 547 |
| M24 x 3.00 | 694 |

Unpacking Components

Unstrap and remove the lift frame, hoses, top arms, and any boxes of hardware from the undercarriage. If any components are missing, call Grouser.

Connecting and Disconnecting the Blade

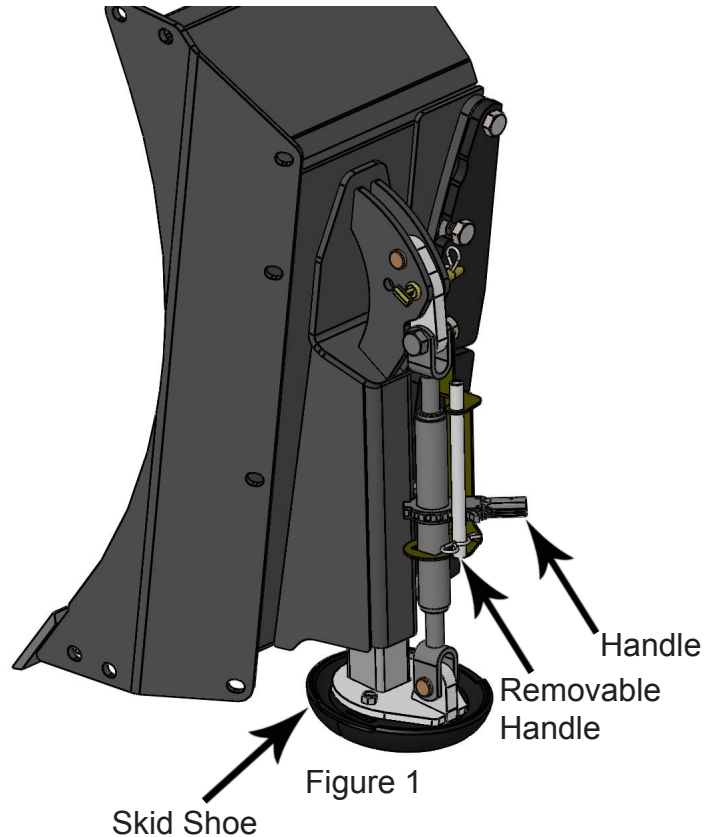
To connect the blade follow Steps #14-21 on Page 8.

To disconnect the blade, set the blade on the ground, unhook all of the couplers on the top arm and pull the 3/4" pin (Part #17 on Page 5) from the mushroom skid shoe link (#27 on Page 5) and store the pin in the empty hole on blade side of the skid shoe mount. The skid shoe link can now rotate freely. This will allow the blade to lean back further for easy disconnection and reconnection later without affecting your skid shoe height for dozing. Unlock the quick attach system with the pin pulling handle. Slowly lower the lift system and quick attaches from the blade to disconnect the blade and back away from the blade.

Skid Shoe and Tilt Plate Adjustment

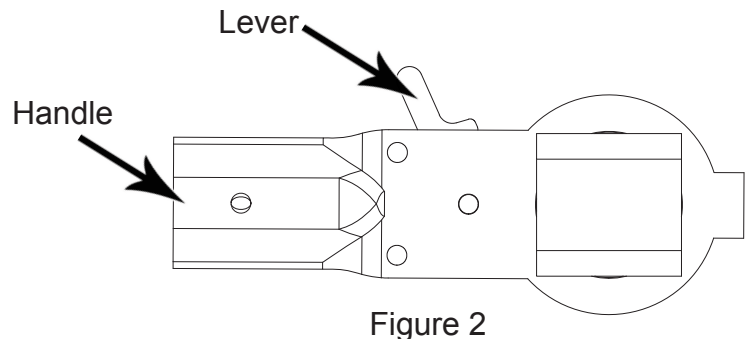
Skid Shoe Adjustment:

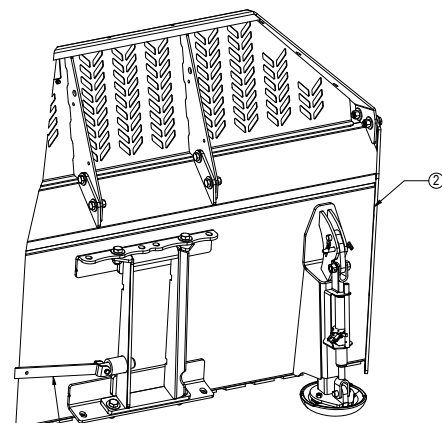
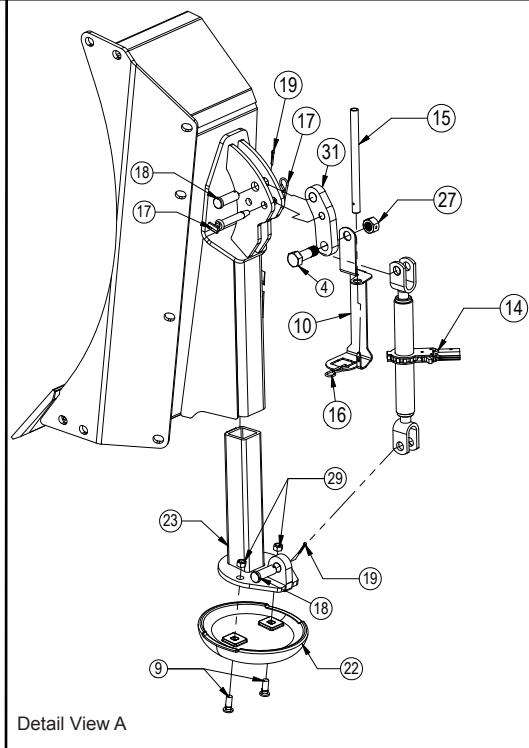
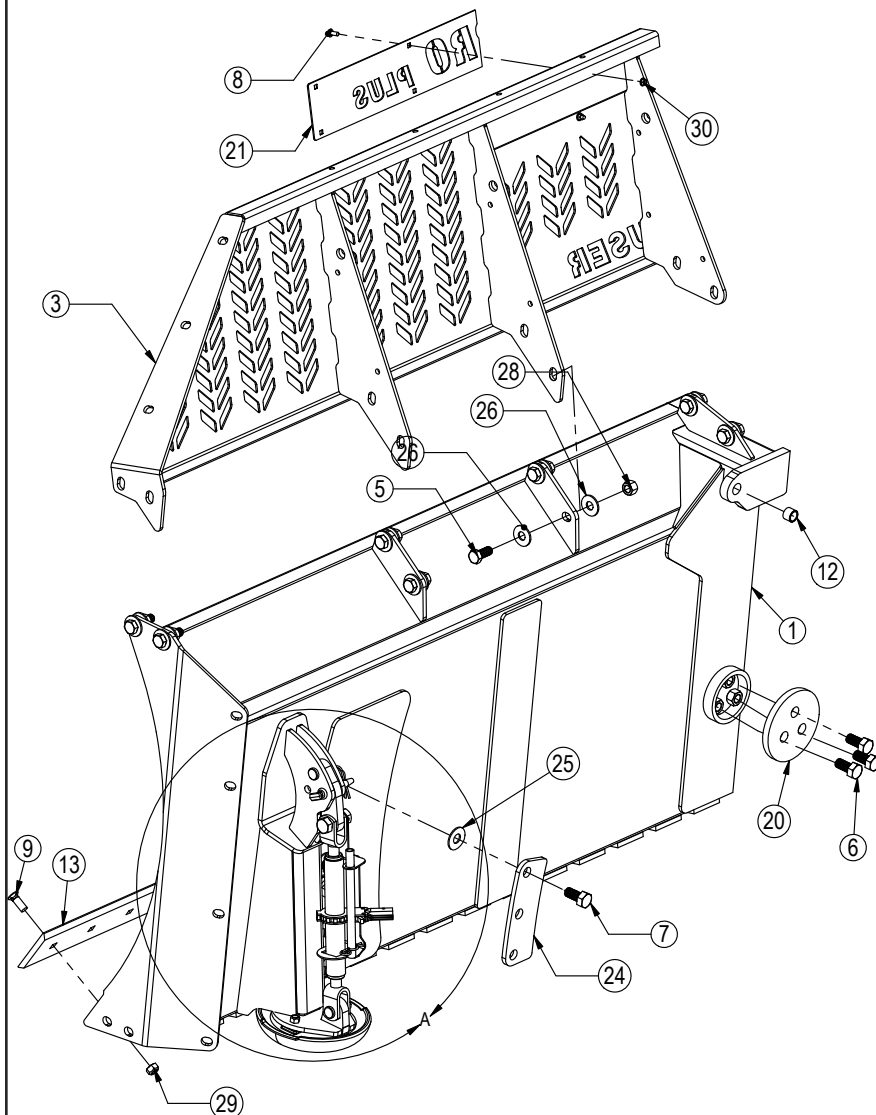
1. Remove the handle from the ratchet keeper by pulling the hitch clip pin and insert into the handle on the ratchet jack.
2. Loosen the locking nut on the ratchet jack.
3. Hold the body of the ratchet jack and rotate the ratchet jack handle to raise or lower the skid shoes.
4. If the skid shoe is not moving in the proper direction, move the forward/reverse lever on the handle (see Figure 2). Rotate the ratchet jack handle again to move the skid shoe in the direction needed.
5. After skid shoe is adjusted, rotate the ratchet jack handle until it rests up against the ratchet keeper. Return the removable handle to the ratchet keeper ensuring that the ratchet jack handle is captured by the removable handle and the ratchet keeper. Secure the handle to the ratchet keeper with a hitch clip pin.
6. Tighten the locking nut against the ratchet jack body to keep it from moving.
7. When skid shoes are worn, replace with new skid shoes.



Tilt Plate Adjustment:

1. Remove bolts and tilt plates.
- Note: Don't remove all of the bolts at the same time.
2. Add or remove washers as needed to adjust tilt-way clearance to have 1/16" - 1/8" of clearance in direction 'B' shown in Figure 2.
 3. Once the tilt-way clearance is set, tighten bolts to 640 ft-lbs.





Item #A for Custom Name Plate and Item #B for AG Pro Dozer Name Plate

| Item No. | Part No. | Description | Blade Length | | | |
|----------|-------------|---|--------------|-----|-----|-----|
| | | | 14' | 16' | 18' | 20' |
| 1 | 15-18465-XX | AG Pro Blade XX' - Slant Top | 1 | 1 | 1 | 1 |
| 2 | 15-18475-XX | AG Pro NANT Blade XX' - Slant Top | 1 | 1 | 1 | 1 |
| 3 | 15-14730-XX | 12" x 24" Bolt on Top Extension | 1 | 1 | 1 | 1 |
| 3 | 15-18520-XX | 12" x 24" Bolt on Top Extension | 1 | 1 | 1 | 1 |
| 4 | 16-18945 | 1" X 3" Hex Bolt Gr 5 NC - Short Thread | 2 | 2 | 2 | 2 |
| 5 | 16-20538 | 7/8" x 2" Hex Bolt Gr 8 NC | 14 | 18 | 18 | 22 |
| 6 | 16-20558 | 1" x 2" Hex Bolt Gr 8 NC | 3 | 3 | 3 | 3 |
| 7 | 16-20562 | 1" x 3" Hex Bolt Gr 8 NC | 12 | 12 | 12 | 12 |
| 8 | 16-21064 | 3/8" x 1" Carriage Bolt Gr 5 NC | 8 | 8 | 8 | 8 |
| 9 | 16-21666 | 5/8" x 1-3/4" Plow Bolt Gr 5 NC | 32 | 36 | 40 | 44 |
| 10 | 18-18498-L | Ratchet Keeper - Left | 1 | 1 | 1 | 1 |
| 11* | 18-18498-R | Ratchet Keeper - Right | 1 | 1 | 1 | 1 |
| 12 | 19-7774 | 1" x 1" Spring Bushing | 2 | 2 | 2 | 2 |
| 13 | 29-7950-6 | 6'- 5/8" x 6" Double Bevel Cutting Edge | - | - | 3 | 2 |
| 13 | 29-7950-7 | 7'- 5/8" x 6" Double Bevel Cutting Edge | 2 | - | - | - |
| 13 | 29-7950-8 | 8'- 5/8" x 6" Double Bevel Cutting Edge | - | 2 | - | 1 |
| 14 | 34-17565 | Ratchet Jack with Pins | 2 | 2 | 2 | 2 |
| 15 | 34-17567 | Ratchet Jack - Handle | 2 | 2 | 2 | 2 |

Refer to Pages 12-13 for Quick Attach System

| Item No. | Part No. | Description | Blade Length | | | |
|----------|----------|--|--------------|-----|-----|-----|
| | | | 14' | 16' | 18' | 20' |
| 16 | 43-7767 | Hitch Clip Pin | 2 | 2 | 2 | 2 |
| 17 | 43-15712 | 3/4" x 3-1/4" Safety Hitch Pin w/ Clip Pin | 2 | 2 | 2 | 2 |
| 18 | 43-18463 | 1" x 2.75" Pin | 4 | 4 | 4 | 4 |
| 19 | 43-18943 | 3/16" x 1-1/2" Cotter Pin | 4 | 4 | 4 | 4 |
| 20 | 44-3749 | Backdrag Brace Plate | 1 | 1 | 1 | 1 |
| 21A | 44-14830 | Custom Name Plate | 1 | 1 | 1 | 1 |
| 21B | 44-15150 | Ag Pro Dozer Name Plate | 1 | 1 | 1 | 1 |
| 22 | 50-15458 | 12" Round Mushroom Skid Shoe | 2 | 2 | 2 | 2 |
| 23 | 50-18470 | Mushroom Skid Shoe Mount | 2 | 2 | 2 | 2 |
| 24 | 52-8204 | Tilt Plate | 4 | 4 | 4 | 4 |
| 25 | 57-20749 | 1" Flat Washer | 12 | 12 | 12 | 12 |
| 26 | 57-20818 | 7/8" Flat Washer Heavy Duty Gr. 8 (USS) | 28 | 36 | 36 | 44 |
| 27 | 70-18999 | 1" Hex Center Lock Nut Gr 2 NC - YZ | 2 | 2 | 2 | 2 |
| 28 | 70-20598 | 7/8" Hex Nut Gr 8 NC | 14 | 18 | 18 | 22 |
| 29 | 70-20646 | 5/8" Hex Top Lock Nut Gr 5 NC | 32 | 36 | 40 | 44 |
| 30 | 70-20622 | 3/8" Flange Nut | 8 | 8 | 8 | 8 |
| 31 | 75-18479 | Mushroom Skid Shoe Link | 2 | 2 | 2 | 2 |

Hydraulic Instructions

Prior to operating the blade, bleed all air out of the hydraulic system. Start with the furthest location away from the remote until all air is out.

Hydraulic Angle System Operating Instructions

If your Grouser blade was purchased with the Hydraulic Angle Option, you will have the ability to angle the blade 30 degrees left or right. To achieve these angles, the two cylinders are designed to operate independently of each other through an electric diverter valve. To angle the blade to the left, actuate the tractor hydraulic control lever in the cab with the diverter valve un-powered. To angle the blade to the right, apply power to the diverter valve and then actuate the tractor hydraulic control lever.

2-Lever Angle System Operating Instructions

If your Grouser blade was purchased with the 2-Lever Hydraulic Angle Option, you will have the ability to angle the blade 30 degrees left or right. To achieve these angles, the two cylinders are designed to operate independently of each other with the use of 2 tractor hydraulic control levers and a safety relief valve. To angle the blade to the left or right, actuate the tractor hydraulic control lever corresponding to the left or right cylinder.

The safety relief valve allows the cylinder to retract if its internal pressure becomes excessive. With this safety feature in place, when either cylinder reaches the end of its stroke, the safety relief valve will reroute pressure to the opposite cylinder causing it to extend. If this occurs, refer to the Relief Valve Instructions below for possible adjustments. Only one cylinder should be extended when angled dozing.

Relief Valve Instructions

Set the safety relief valve at a higher pressure than tractor: To increase the pressure of the relief valve, install a 0-5,000 psi pressure gauge into the base end of right angle cylinder (see page 26). Loosen the jam nut on the safety valve and tighten the Allen screw 1/2 turn. Next, extend the right side cylinder out until the safety valve activates, while the safety valve is in function, record the pressure reading on the gauge. Continue to tighten the Allen screw in 1/2 turn increments and record the pressure until a high enough relief setting is obtained. **Do not exceed the 3,000-psi operating pressure of the cylinders.** Tighten the jam nut and remove the gauge. Follow the same steps for the left side cylinder.

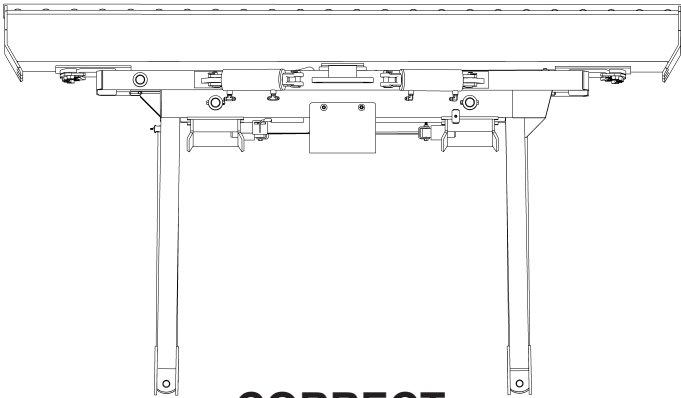
Automatic lever release: In certain newer model tractors, the hydraulic control lever will automatically release and instantly stop oil flow once the end of the stroke is reached.

CAUTION: Do not bypass the safety relief valve and plumb each cylinder to separate valves on the tractor.

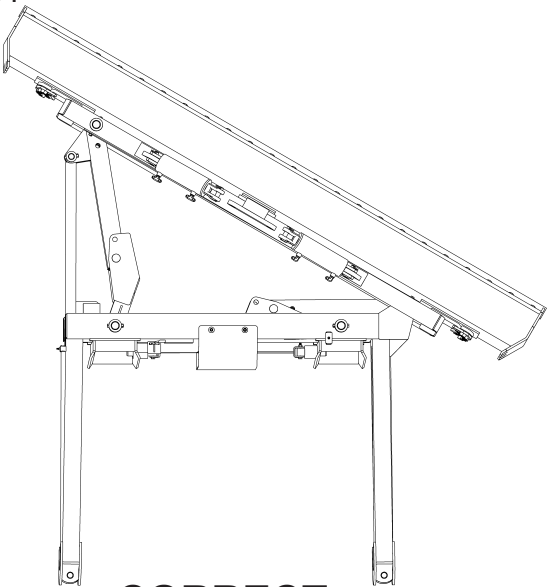
(Continued on next page)

To ensure proper use and life of equipment, it is recommended to have both cylinders closed for straight ahead dozing and only one cylinder partially or fully extended for angled dozing as shown in the diagrams below. **If the angle system is not used correctly, frame damage may occur.** Some damaged frames can be repaired, please contact Grouser Products for repair instructions if needed.

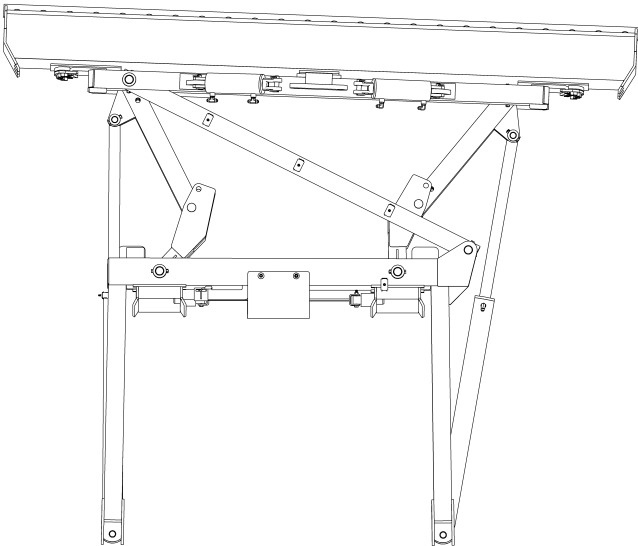
Please contact Grouser Products with any questions by:
Phone - 701-282-7710 or 800-747-6182; Fax - 701-282-8131



CORRECT



CORRECT
(Left or Right)



INCORRECT

Angle / Tilt Function Abbreviation Key

| | | |
|------|----------------------------------|-------|
| HAHT | Hydraulic Angle - Hydraulic Tilt | 6-Way |
| HANT | Hydraulic Angle - No Tilt | 4-Way |
| NAHT | No Angle - Hydraulic Tilt | 4-Way |
| NANT | No Angle - No Tilt | 2-Way |

Assembling Lift Components

Install undercarriage per the tractor specific mounting instructions. Some assembly of Lift system components is necessary. Follow the steps listed below. Refer to Page 9 for the correct hardware and orientation of parts.

1. Remove all pins on each side of the undercarriage.
2. Position the lift frame between the two plates on both sides of the undercarriage.
3. Align the lift frame to the bottom holes of the undercarriage and attach with the proper pins and hardware.
4. Lift the end of the cylinders up and attach to the undercarriage with the proper pins and hardware.
5. Attach the top arms to the top of the undercarriage with the proper pins and hardware.
6. Remove the male quick attaches that are in the female quicks on the blade, angle frame, or tilt frame.
7. Attach the male quick attaches to the lift frame and top arms with the proper pins and hardware.
8. Install lift cylinders and attach hoses to the cylinders. Refer to Page 20 for lift system hydraulics.
9. Attach the coupler mounting bracket to each top arm for Angle and Tilt connections. See pages 16-19 for correct hardware.
10. Take the long hoses and attach each one to their designated fitting from the coupler mount on the top arms and also attach some to the bulkhead tee fitting at the center of the undercarriage for lift. See pages 20, and 16-19 for the correct hose lengths.
11. Mark each hose clearly so that once the hoses are routed to the back of the tractor, it's easy to determine what cylinder base or rod end they are connected to.

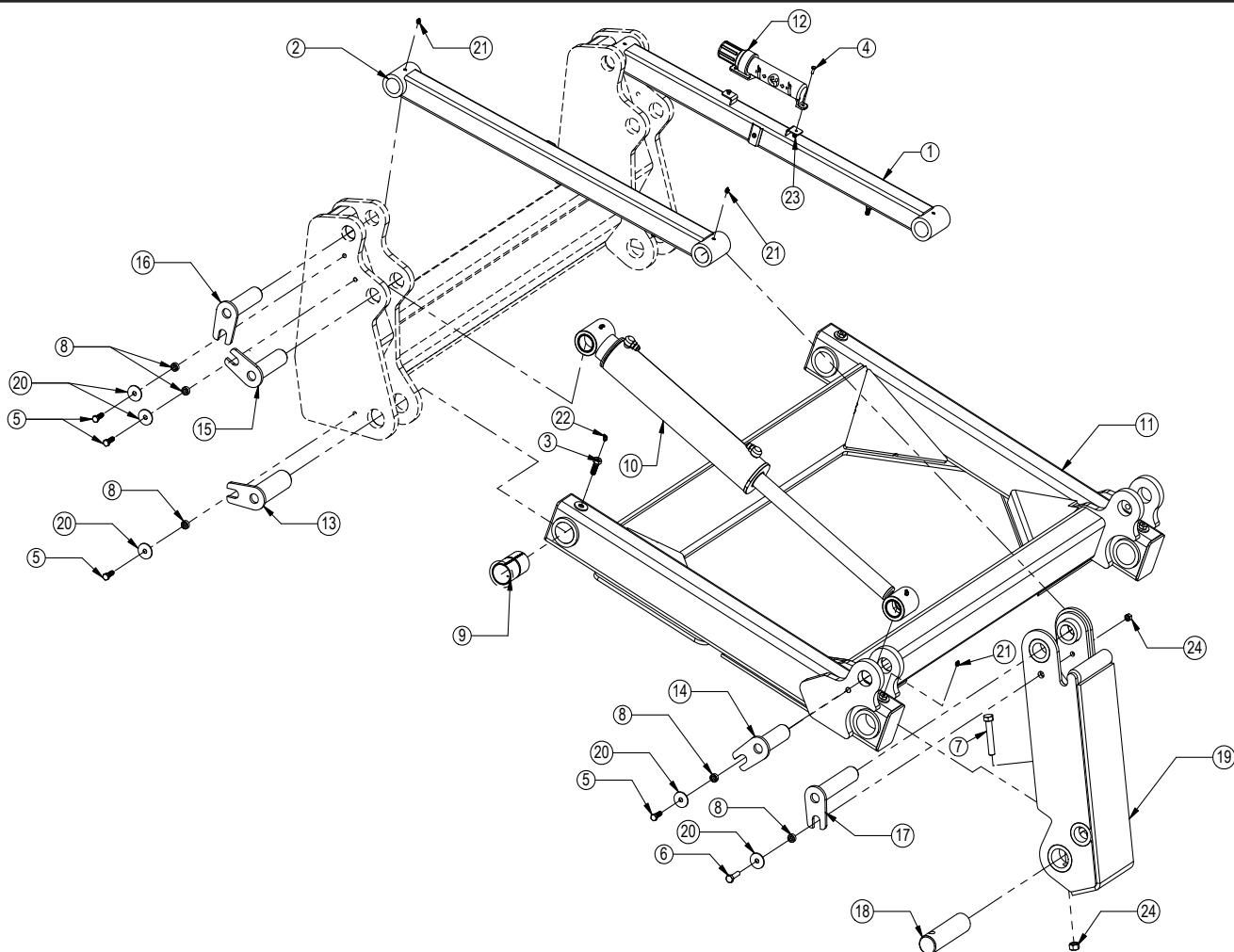
Continue to route the hoses thru the tractor. Keep away from all moving parts.

Note: Installer is responsible to route hoses in a practical manner. The hoses need to be routed away from sharp corners and moving parts and need to be secure.

12. If applicable, attach the male blade break away end of the wire harness to the coupler mount. Hold in place with a zip tie. Run the switch end of the wire harness up into the cab of the tractor.
13. Locate the keyed and fused power supply. Connect the red wire to power and the black to ground. Install provided switch into an open switch hole in the right overhead console or another convenient place in the tractor. Connect the wire harness to the switch.
14. Get the blade ready to hook up by removing the 3/4" pin (#17 on Page 5) so that the skid shoes can move freely. The blade will lean back further for easier connection onto the male quick attaches. Store the pin in the empty hole right behind the hole you just took the pin out of.
15. Pull the pin puller handle on the left side of the quick attach system towards the outside of the blade to open the quick attach system. Refer to Page #12-13 for further clarification on the quick attach system.
16. Drive the tractor forward slowly until the top edge of the male quick attach is under the top lip of the female quick attach already on the blade assembly.
17. Lift the male quick attaches up till the blade is off the ground and the female quick attaches are against the front of the male quick attaches.
18. Shut off machine and set the parking brake.
19. Move the pin puller handle on the left side of the blade assembly towards the center of the blade to lock the blade in place and use the latch to lock the handle in place. If applicable, turn up the blade stands on the blade.
20. Plug the male couplers into the female couplers on the top arms. If applicable, plug the male blade break away end of the wire harness into the female blade break away end of the wire harness on the top arm.
21. Lock the Mushroom Skid Shoe Link back in place with the 3/4" pin you moved in Step #14 above.
22. To disconnect the blade, see Page 4.

Initial System Startup

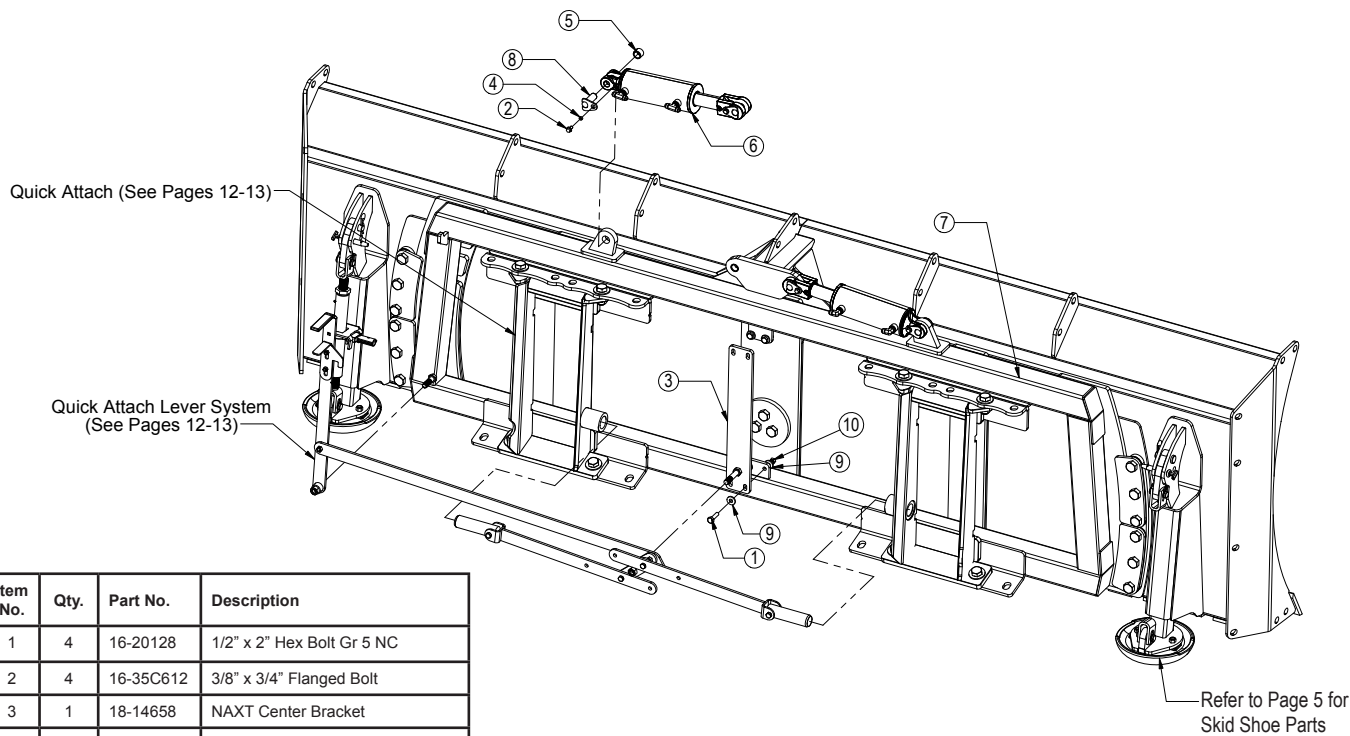
Start the tractor and run the blade thru all the functions. If any function does not work properly, bleeding of the system may be required. If problem still persists, call Grouser Products.



| Item No. | Qty. | Part No. | Description |
|----------|------|-----------|--|
| 1 | 1 | 11-5025-L | Top Arm - Left |
| 2 | 1 | 11-5025-R | Top Arm - Right |
| 3 | 4 | 16-1795 | Lift Frame Grease Bolt |
| 4 | 2 | 16-20002 | 1/4" x 3/4" Hex Bolt Gr 5 NC |
| 5 | 8 | 16-20216 | 3/4" x 1-1/2" Hex Bolt Gr 5 NC |
| 6 | 2 | 16-20220 | 3/4" x 2-1/2" Hex Bolt Gr 5 NC |
| 7 | 2 | 16-20227 | 3/4" x 4-1/2" Hex Bolt Gr 5 NC |
| 8 | 10 | 19-13515 | 3/4" ID - Non Rotating Pin Spacer Bushing |
| 9 | 4 | 19-13525 | 2.75 x 2.50 x 4.75 Spring Bushing |
| 10 | 2 | 26-34738 | 4x20 Long Cylinder - Bushed Tube Ends (647267) |
| 11A | 1 | 32-14060 | 450 LP Lift Frame |
| 11B | 1 | 32-12910 | 660 LP Lift Frame |
| 12 | 1 | 34-14961 | Manual Canister |
| 13 | 2 | 43-13025 | Pin Weld (Lift Frame / UC) |
| 14 | 2 | 43-5033 | Pin Weld (Lift Cyl. / Lift Frame) |
| 15 | 2 | 43-5035 | Pin Weld (Lift Cyl. / UC) |
| 16 | 2 | 43-5037 | Pin Weld (Top Arm / UC) |
| 17 | 2 | 43-5042 | Pin Weld (Top Arm / QA) |
| 18 | 2 | 43-8896 | QA Bottom Pin |
| 19 | 2 | 45-5075 | 450-660 Male Quick Attach |
| 20 | 10 | 57-20747 | 3/4" Flat Washer |
| 21 | 6 | 58-9369 | Grease Zerk 1/8" NPT Straight |
| 22 | 2 | 58-9371 | Grease Zerk 1/8" NPT 45° |
| 23 | 2 | 70-20610 | 1/4" Nyloc Hex Nut Gr 5 NC |
| 24 | 4 | 70-20607 | 3/4" Hex Center Lock Nut Gr 2 NC |

NOTE: When ordering cylinder seal kits, the part number on the cylinder is needed. The number is stamped on the base end of the cylinder opposite of the hydraulic ports.

| No. On Cylinder | Part No. | Description |
|-----------------|----------|---|
| 26-34738 | 49-12272 | Seal Kit 4" Bore x 2" Rod (647204) Nitrided Rod |



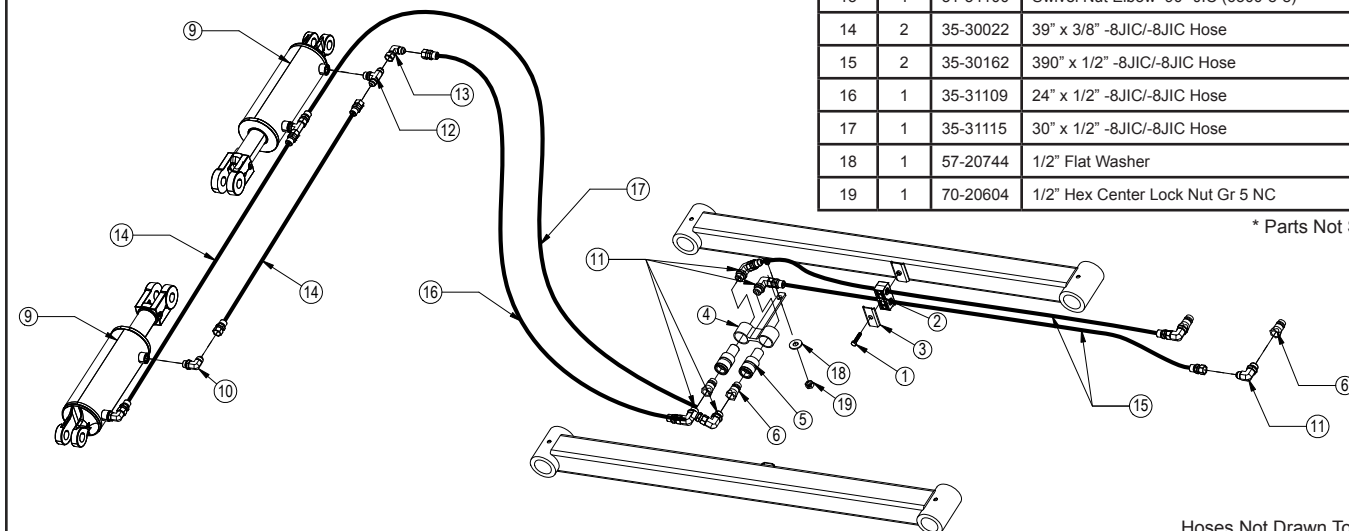
| Item No. | Qty. | Part No. | Description |
|----------|------|-----------|------------------------------------|
| 1 | 4 | 16-20128 | 1/2" x 2" Hex Bolt Gr 5 NC |
| 2 | 4 | 16-35C612 | 3/8" x 3/4" Flanged Bolt |
| 3 | 1 | 18-14658 | NAXT Center Bracket |
| 4 | 4 | 19-13577 | NR Pin Spacer Clevis End |
| 5 | 2 | 19-7774 | 1" x 1" Spring Bushing |
| 6 | 2 | 26-34711 | 4 x 8 Cylinder w/ Cast Clevis Ends |
| 7 | 1 | 32-14560 | NAHT Tilt Frame |
| 8 | 4 | 43-13580 | 1" Clevis Bolt In Pin |
| 9 | 8 | 57-20744 | 1/2" Flat Washer |
| 10 | 4 | 70-20604 | 1/2" Hex Center Lock Nut Gr 2 NC |

NOTE: When ordering cylinder seal kits, the part number on the cylinder is needed. The number is stamped on the base end of the cylinder opposite of the hydraulic ports.

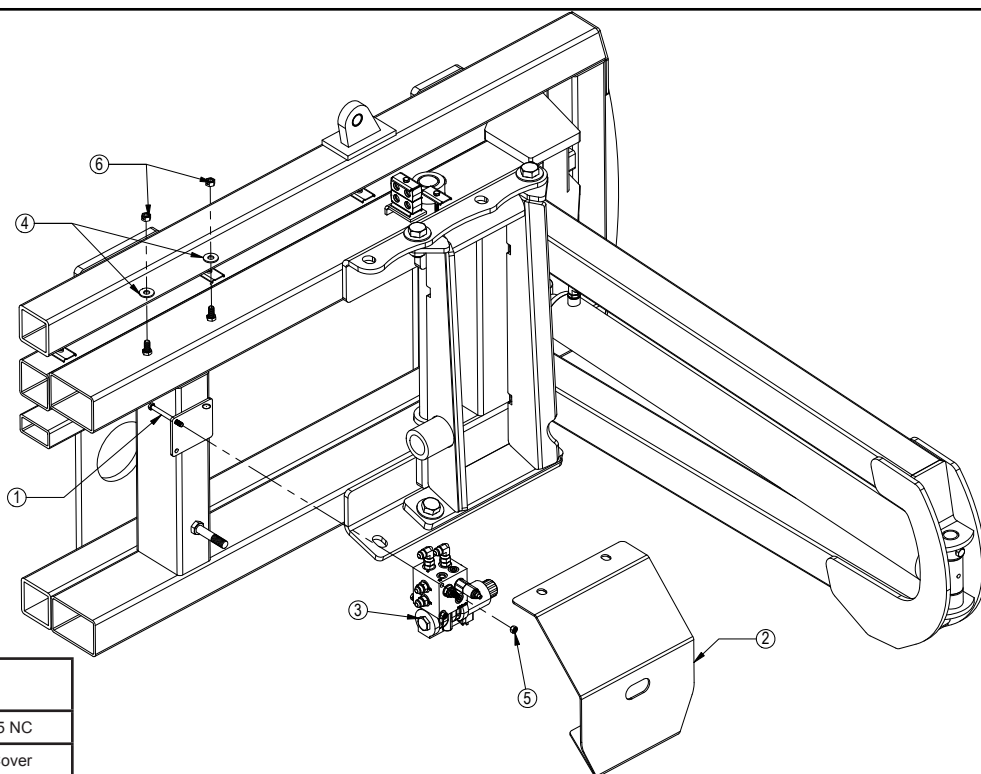
| No. On Cylinder | Part No. | Description |
|-----------------|----------|---|
| 26-34711 | 49-12271 | Seal Kit 4 x 8 (647135) Nitrided Rod, Clevis Ends |

| Item No. | Qty. | Part No. | Description |
|----------|------|----------|--|
| 1 | 1 | 16-20036 | 5/16" x 1-1/2" Hex Bolt Gr 5 NC |
| 2 | 1 | 18-3074 | Hose Hold Down Clamp |
| 3 | 1 | 18-3075 | Hose Hold Down Plate |
| 4 | 1 | 18-8973 | Coupler Mounting Bracket |
| 5 | 2 | 25-34321 | Tappet Quick Coupler Female |
| 6 | 4 | 25-34342 | Tappet Quick Coupler Male - Poppet Style |
| 7* | 4 | 25-3453 | Pioneer Dust Cap Tilt (Green) |
| 8* | 2 | 25-3454 | Pioneer Dust Plug Tilt (Green) |
| 9 | 2 | 26-34711 | 4 x 8 Cylinder W/ Cast Clevis Ends |
| 10 | 2 | 31-34050 | Straight Thread Elbow 90° JIC x O-Ring (6801-8-8) |
| 11 | 6 | 31-34051 | Straight Thread Elbow 90° JIC x O-Ring (6801-8-10) |
| 12 | 2 | 31-34060 | Branch Tee JIC x O-Ring (6803-8-8-8) |
| 13 | 1 | 31-34100 | Swivel Nut Elbow 90° JIC (6500-8-8) |
| 14 | 2 | 35-30022 | 39" x 3/8" -8JIC/-8JIC Hose |
| 15 | 2 | 35-30162 | 390" x 1/2" -8JIC/-8JIC Hose |
| 16 | 1 | 35-31109 | 24" x 1/2" -8JIC/-8JIC Hose |
| 17 | 1 | 35-31115 | 30" x 1/2" -8JIC/-8JIC Hose |
| 18 | 1 | 57-20744 | 1/2" Flat Washer |
| 19 | 1 | 70-20604 | 1/2" Hex Center Lock Nut Gr 5 NC |

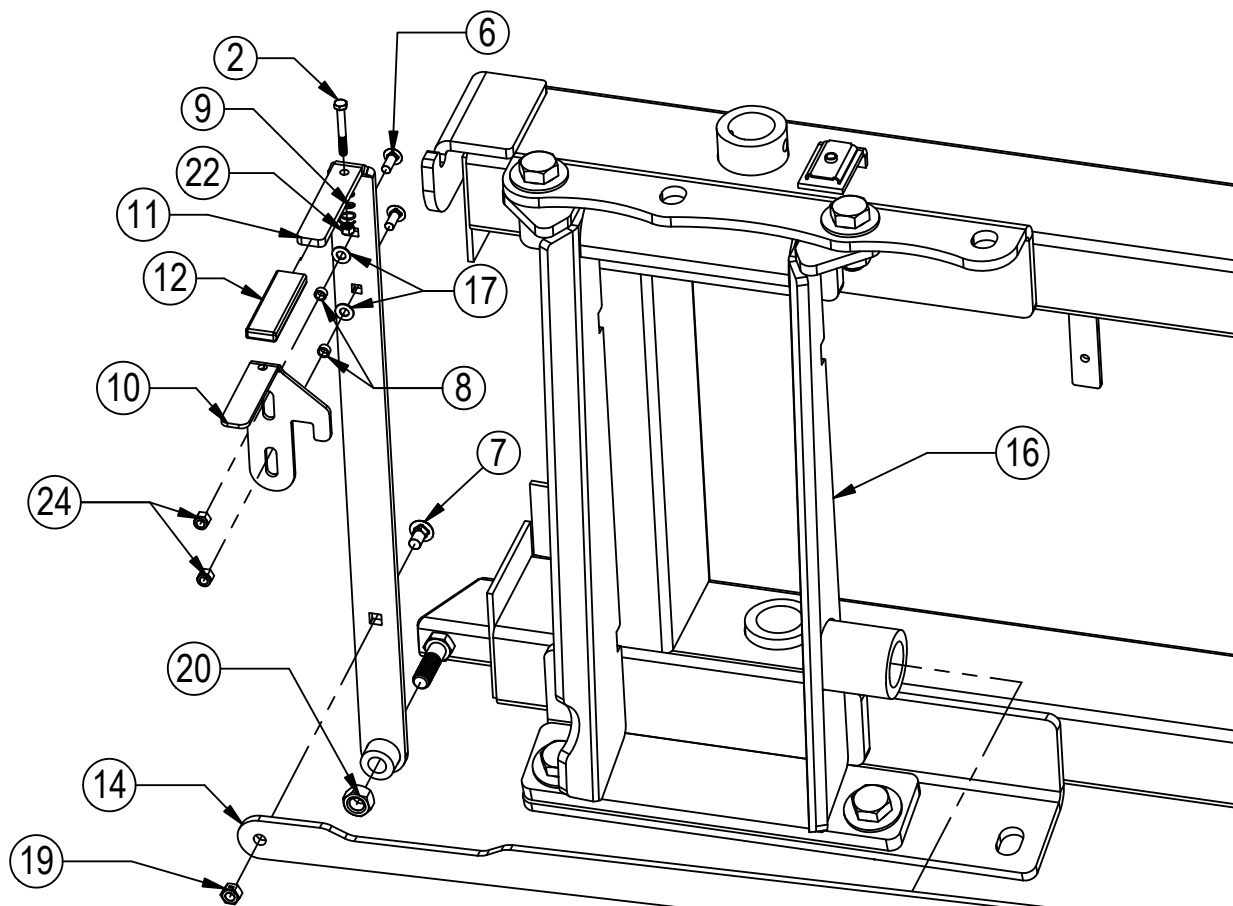
* Parts Not Shown



Hoses Not Drawn To Scale

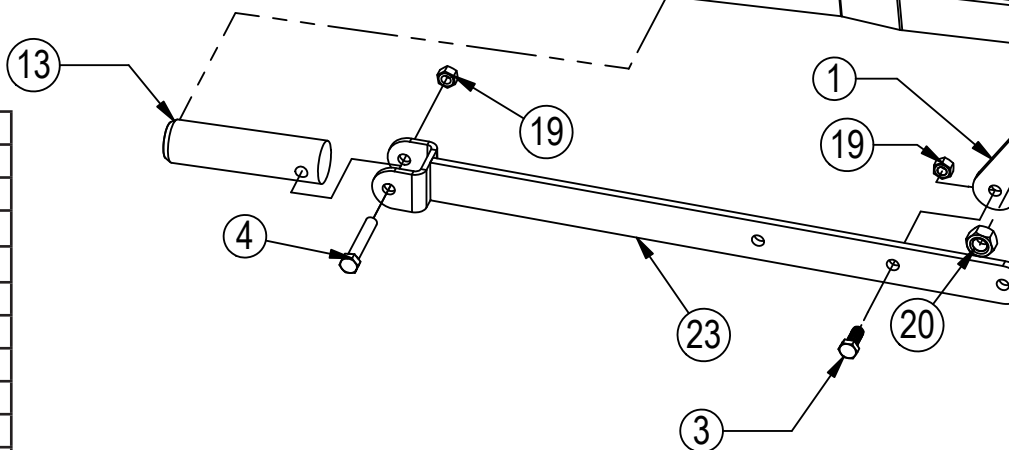


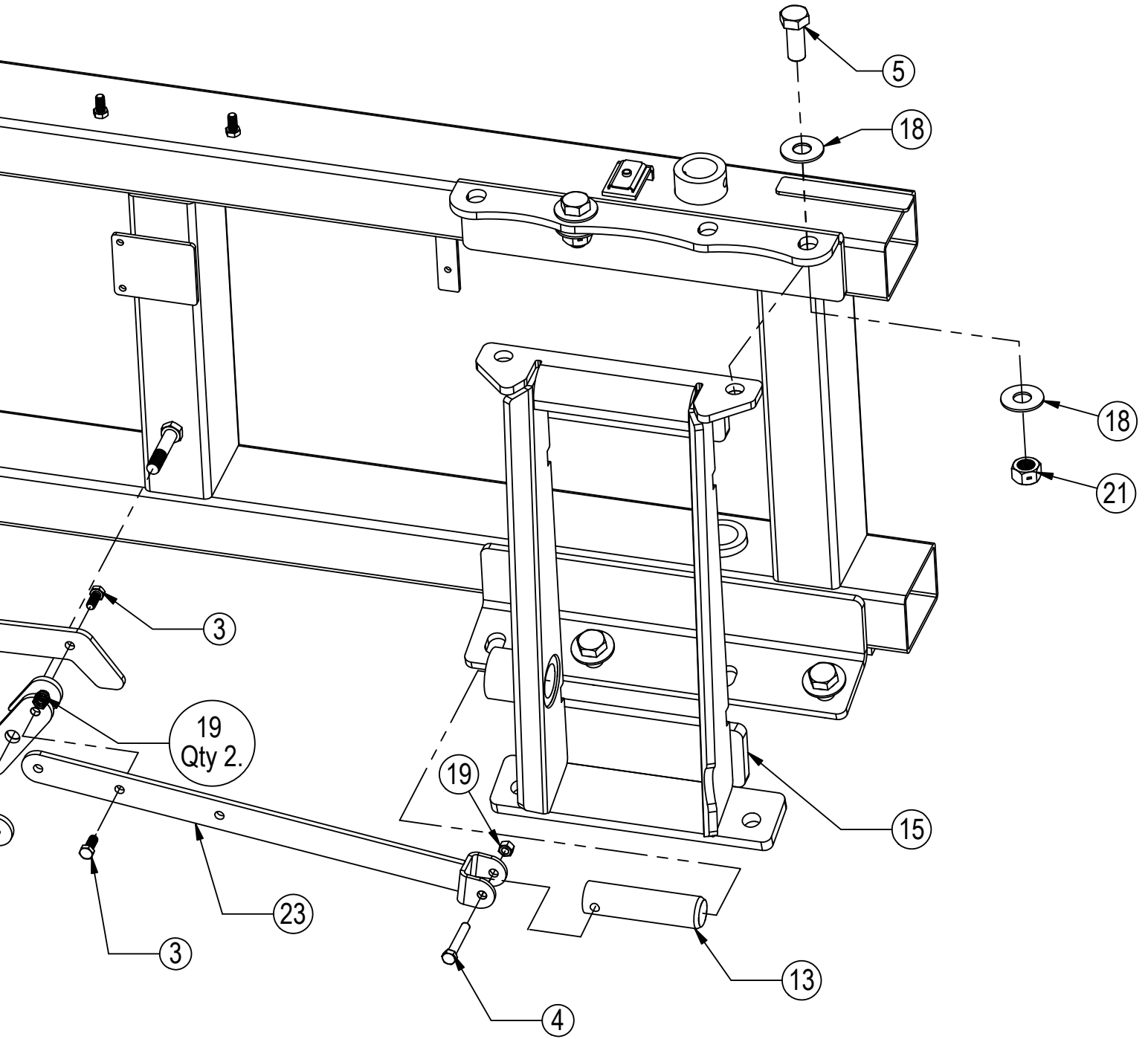
| Item No. | Qty. | Part No. | Description |
|----------|------|----------|----------------------------------|
| 1 | 2 | 16-20077 | 3/8" x 4-1/2" Hex Bolt Gr 5 NC |
| 2 | 1 | 18-1701 | AG Pro Hydraulic Valve Cover |
| 3 | 1 | 56-13305 | Hydraulic Angle Valve |
| 4 | 2 | 57-20744 | 1/2" Flat Washer |
| 5 | 2 | 70-20582 | 3/8" Hex Nut |
| 6 | 2 | 70-20604 | 1/2" Hex Center Lock Nut Gr 2 NC |



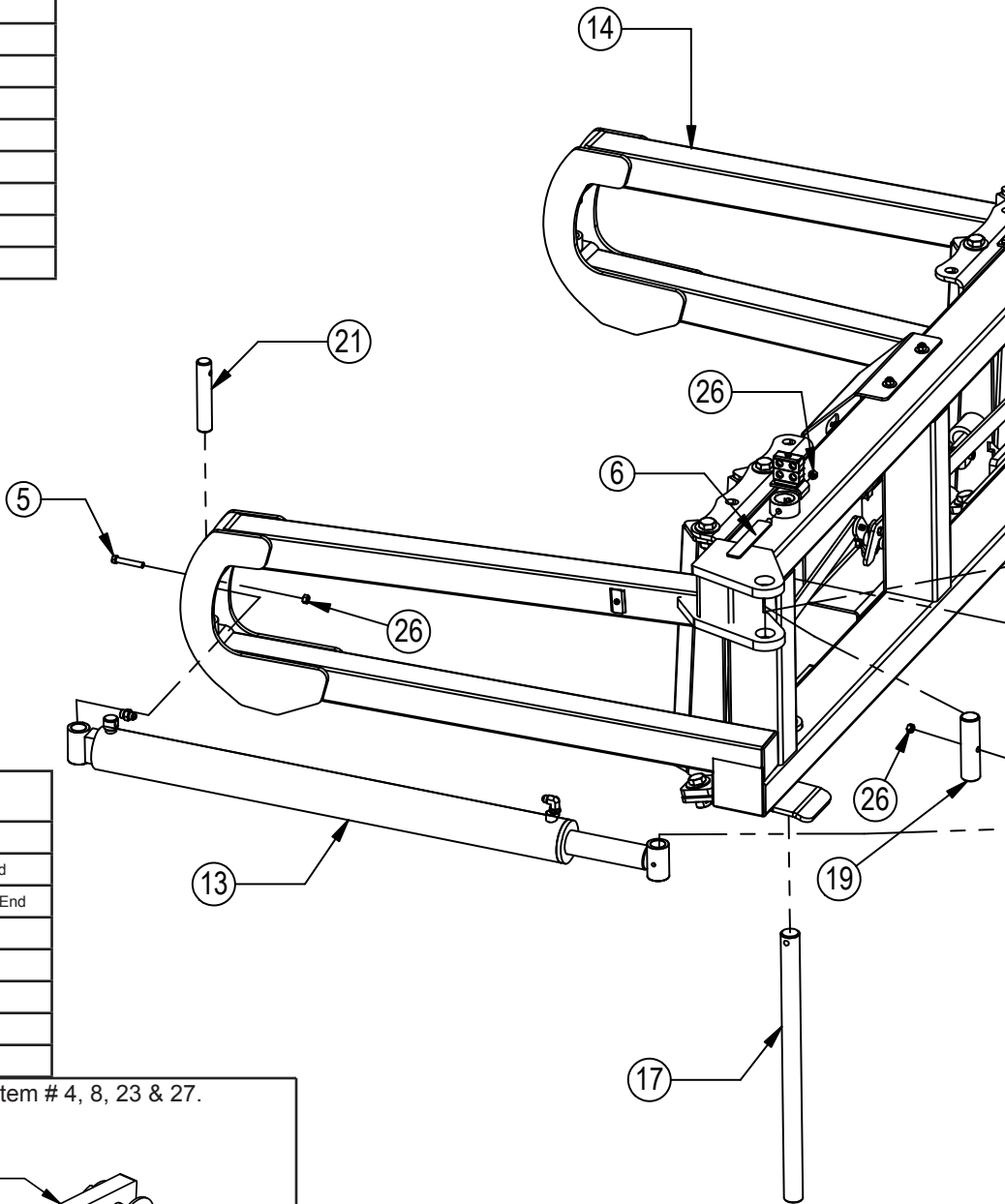
Some Parts Hidden For Clarity
Item #A for HAHT & HANT and Item #B for NAHT & NANT

| Item No. | Qty. | Part No. | Description |
|----------|------|------------|--------------------------------------|
| 1 | 1 | 11-3049 | Bell Crank Weld |
| 2 | 1 | 16-20040 | 5/16" x 2-1/2" Hex Bolt Gr 5 NC |
| 3 | 3 | 16-20125 | 1/2" x 1-1/4" Hex Bolt Gr 5 NC |
| 4 | 2 | 16-20132 | 1/2" x 3" Hex Bolt Gr 5 NC |
| 5 | 8 | 16-20560 | 1" x 2-1/2" Hex Bolt Gr 8 NC |
| 6 | 2 | 16-21064 | 3/8" x 1" Carriage Bolt |
| 7 | 1 | 16-21125 | 1/2" x 1-1/4" Carriage Bolt |
| 8 | 2 | 19-13577 | NR Pin Spacer Clevis End |
| 9 | 1 | 34-17799 | Pin Pulling Latch Spring |
| 10 | 1 | 39-14663 | AG Pro Pin Puller Latch |
| 11 | 1 | 39-14665 | AG Pro Pin Puller Handle Weld |
| 12 | 1 | 39-3072 | Handle Cover (Orange) |
| 13 | 2 | 43-3050 | QA Lock Pin |
| 14A | 1 | 44-14709 | Pin Puller Link Plate |
| 14B | 1 | 44-14662 | Pin Puller Link Plate |
| 15 | 1 | 45-14710-R | Female Bolt On Quick Attach, Right |
| 16 | 1 | 45-14710-L | Female Bolt On Quick Attach, Left |
| 17 | 2 | 57-20742 | 3/8" Flat Washer |
| 18 | 16 | 57-20819 | 1" Flat Washer Heavy Duty Gr 8 (USS) |
| 19 | 6 | 70-20604 | 1/2" Hex Center Lock Nut Gr 2 NC |
| 20 | 2 | 70-20607 | 3/4" Hex Center Lock Nut Gr 2 NC |
| 21 | 8 | 70-20609 | 1" Hex Center Lock Nut Gr 2 NC |
| 22 | 1 | 70-20611 | 5/16" Nyloc Hex Nut Gr 5 NC |
| 23 | 2 | 75-14655 | AG Pro Pin Puller Link Weld |
| 24 | 2 | 70-20622 | 3/8" Flange Nut |



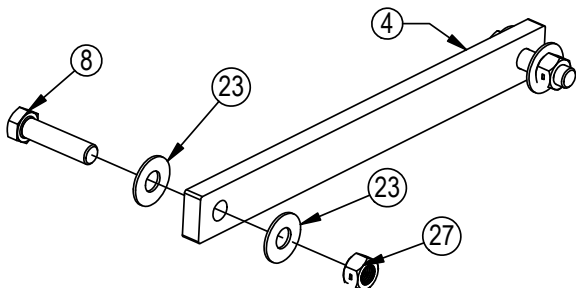


| Item No. | Qty. | Part No. | Description |
|----------|------|-----------|---------------------------------------|
| 1 | 1 | 11-5055 | Stabilizer Arm |
| 2 | 1 | 11-8082 | Angle Arm Right |
| 3 | 1 | 11-9039 | Angle Arm Left |
| 4 | 1 | 14-9366 | Non Tilt Bar |
| 5 | 4 | 16-20132 | 1/2" x 3" Hex Bolt Gr 5 NC |
| 6 | 2 | 16-20424 | 1/2" x 3-1/2" Hex Bolt Gr 8 NC |
| 7 | 3 | 16-20427 | 1/2" x 4-1/2" Hex Bolt Gr 8 NC |
| 8 | 2 | 16-20564 | 1" x 3-1/2" Hex Bolt Gr 8 NC |
| 9 | 4 | 16-35C612 | 3/8" x 3/4" Flanged Bolt |
| 10 | 2 | 19-7774 | 1" x 1" Spring Bushing |
| 11 | 4 | 19-13577 | NR Pin Spacer Clevis End |
| 12 | 2 | 26-34711 | 4 x 8 Cylinder W/ Cast Clevis Ends |
| 13 | 2 | 26-34725 | 4 x 43.5 Cylinder Tube Ends, Top Port |
| 14 | 1 | 32-14700 | Angle Frame |
| 15 | 1 | 32-14760 | HA Tilt Frame |
| 16 | 1 | 43-8130 | 1-15/16" x 23-1/4" Pin |
| 17 | 2 | 43-8131 | 1-15/16" x 31" Pin |
| 18 | 1 | 43-8132 | 1-15/16" x 35-1/2" Pin |
| 19 | 1 | 43-8133 | 1-15/16" x 7-1/8" Stabilizer Arm Pin |

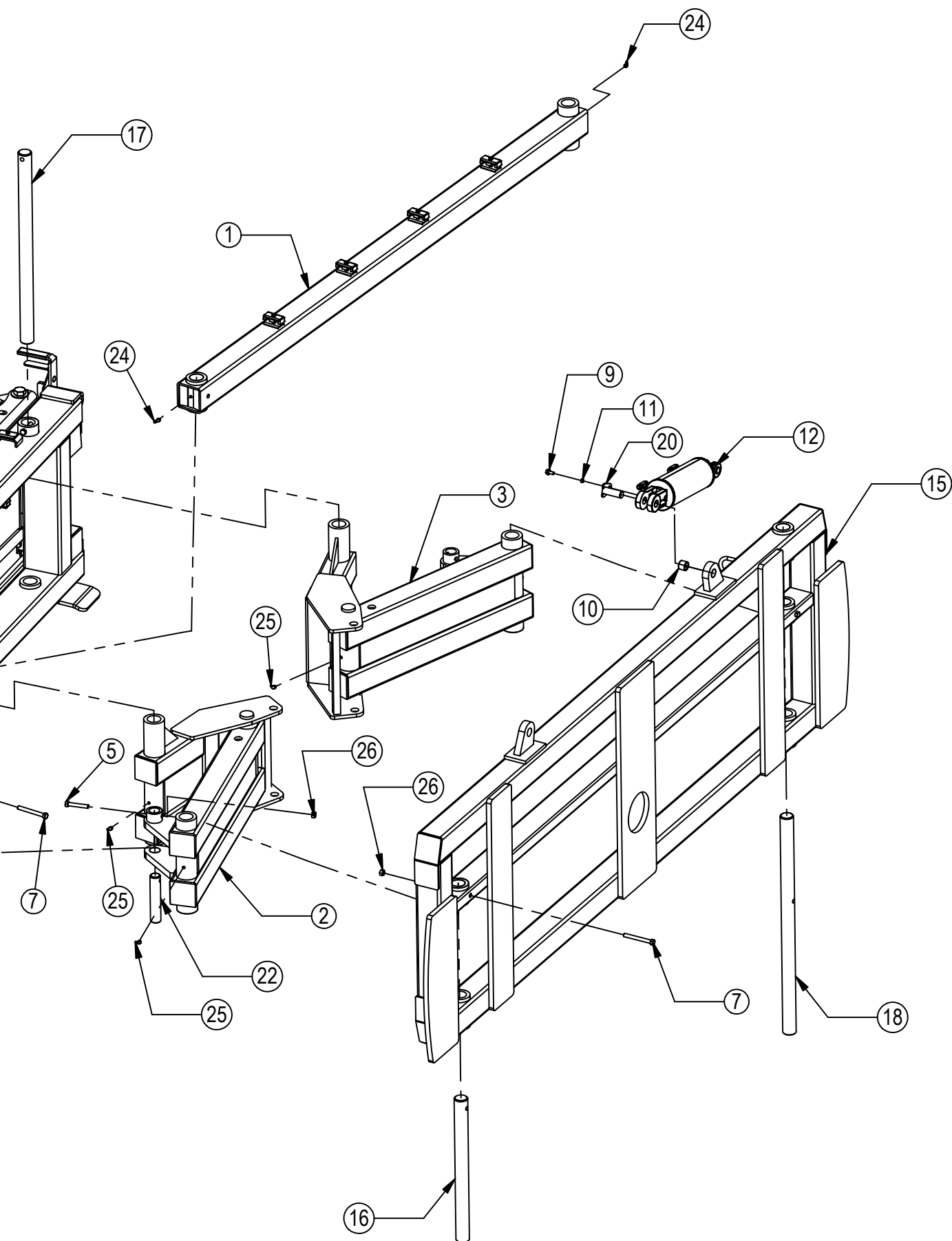


| Item No. | Qty. | Part No. | Description |
|----------|------|----------|--|
| 20 | 4 | 43-13580 | 1" Clevis Bolt In Pin |
| 21 | 2 | 43-8134 | 1-1/2" x 8" Angle Cylinder Pin Base End |
| 22 | 2 | 43-9352 | 1-1/2" x 7-1/2" Angle Cylinder Pin Rod End |
| 23 | 4 | 57-20749 | 1" Flat Washer |
| 24 | 2 | 58-9371 | Grease Zerk 1/8" NPT 45° |
| 25 | 6 | 58-9372 | Grease Zerk 1/8" NPT 90° |
| 26 | 9 | 70-20604 | 1/2" Hex Center Lock Nut Gr 2 NC |
| 27 | 2 | 70-20609 | 1" Hex Center Lock Nut Gr 2 NC |

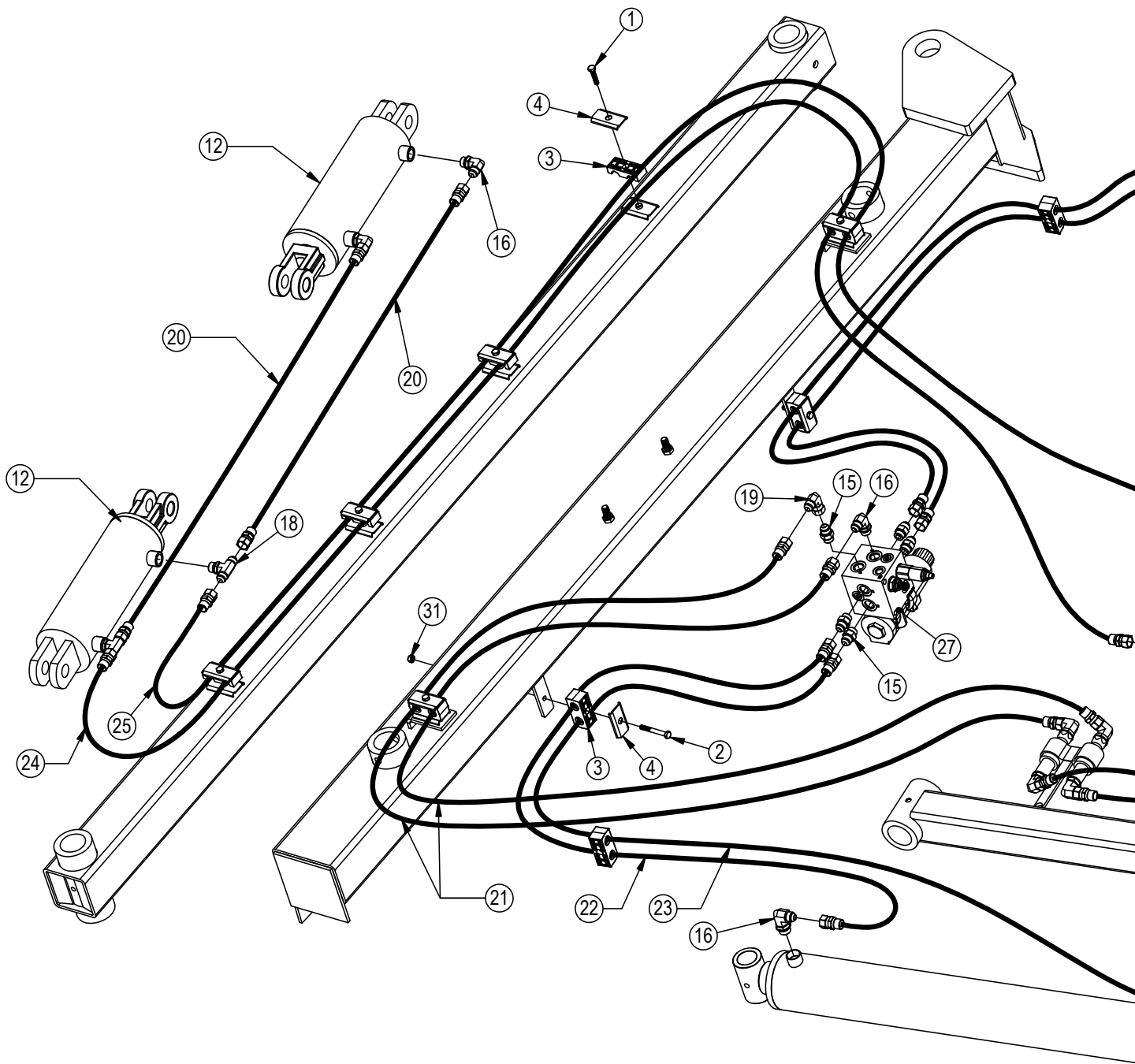
HANT - Replace item # 9, 10, 11, 12 & 20 with item # 4, 8, 23 & 27.



15

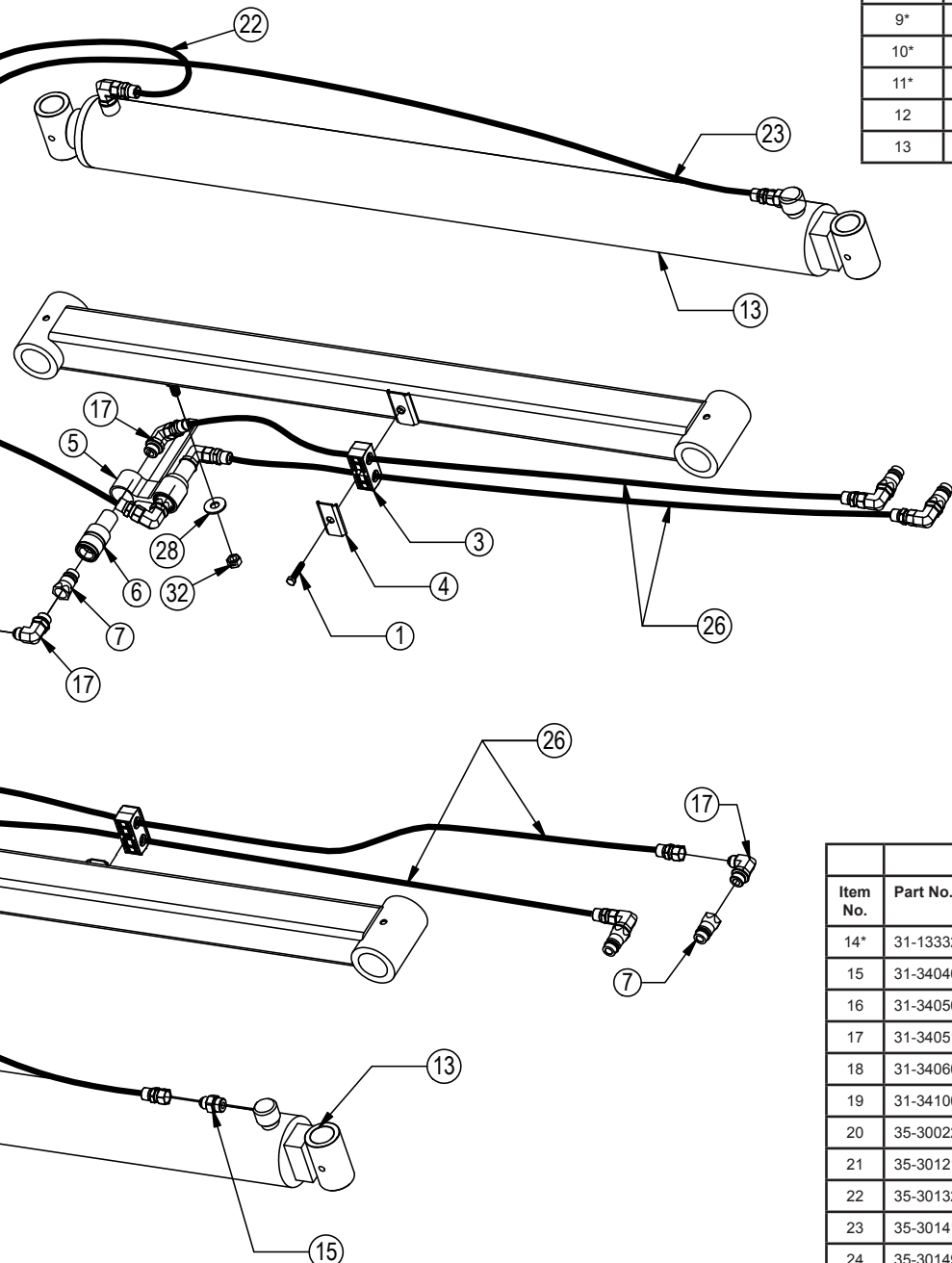


Hoses Not Drawn To Scale



| | | Configuration | HAHT | HANT |
|----------|----------|--|------|------|
| Item No. | Part No. | Description | Qty. | Qty. |
| 1 | 16-20036 | 5/16" x 1-1/2" Hex Bolt Gr 5 NC | 10 | 4 |
| 2 | 16-20040 | 5/16" x 2-1/2" Hex Bolt Gr 5 NC | 2 | 2 |
| 3 | 18-3074 | Hose Hold Down Clamp | 10 | 6 |
| 4 | 18-3075 | Hose Hold Down Clamp Plate | 12 | 6 |
| 5 | 18-8973 | Coupler Mounting Bracket | 2 | 1 |
| 6 | 25-34321 | Tappet Quick Coupler Female | 4 | 2 |
| 7 | 25-34342 | Tappet Quick Coupler Male - Poppet Style | 8 | 4 |
| 8* | 25-3453 | Pioneer Dust Cap Tilt (Green) | 4 | 4 |
| 9* | 25-3454 | Pioneer Dust Plug Tilt (Green) | 2 | - |
| 10* | 25-3455 | Pioneer Dust Cap Angle (Red) | 4 | - |
| 11* | 25-3456 | Pioneer Dust Plug Angle (Red) | 2 | 2 |
| 12 | 26-34711 | 4 x 8 Cylinder W/ Cast Clevis Ends | 2 | - |
| 13 | 26-34725 | 4 x 43.5 Cylinder Tube Ends, Top Port | 2 | 2 |

* Parts Not Shown



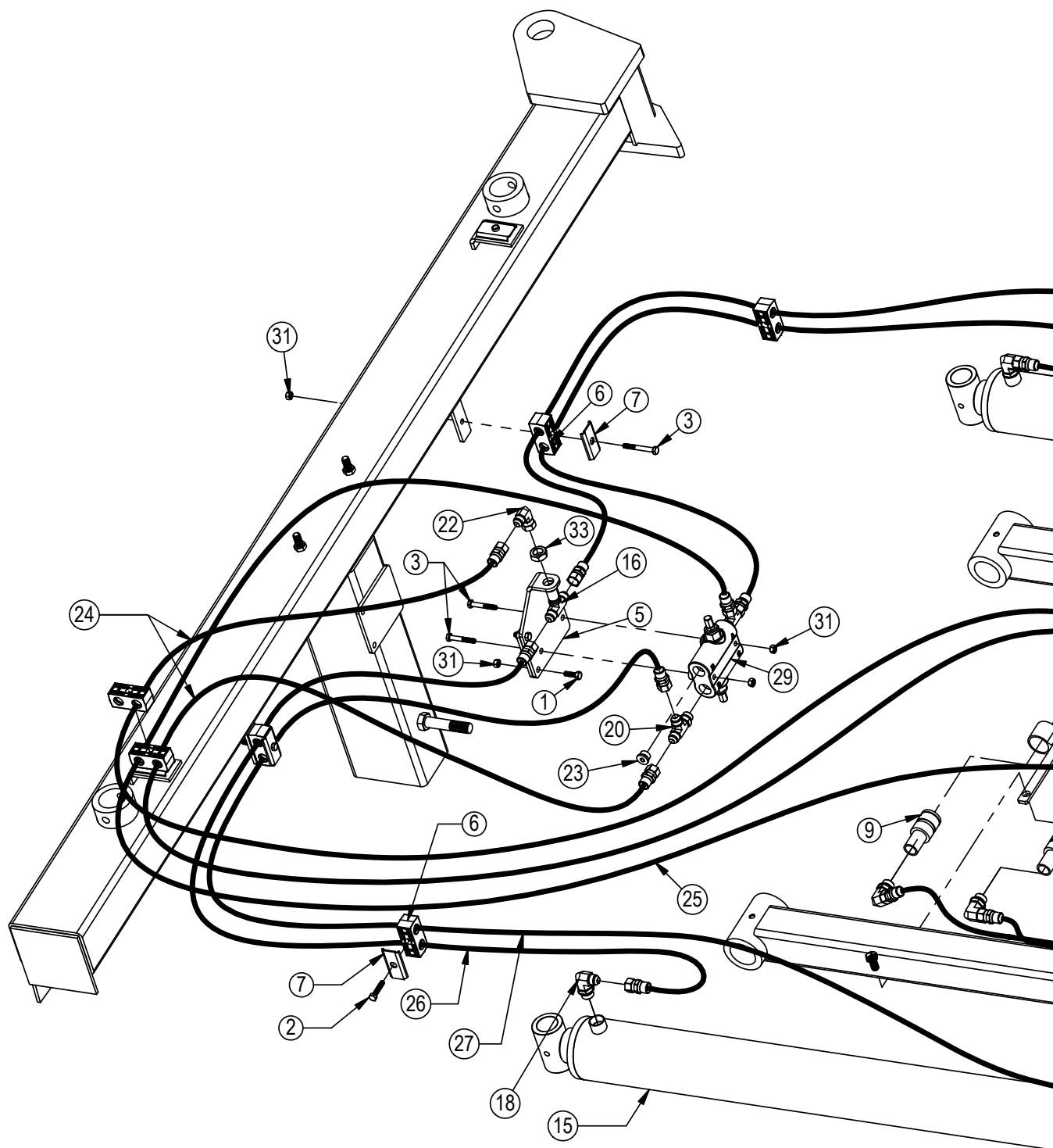
See Page 22 for hydraulic schematics.

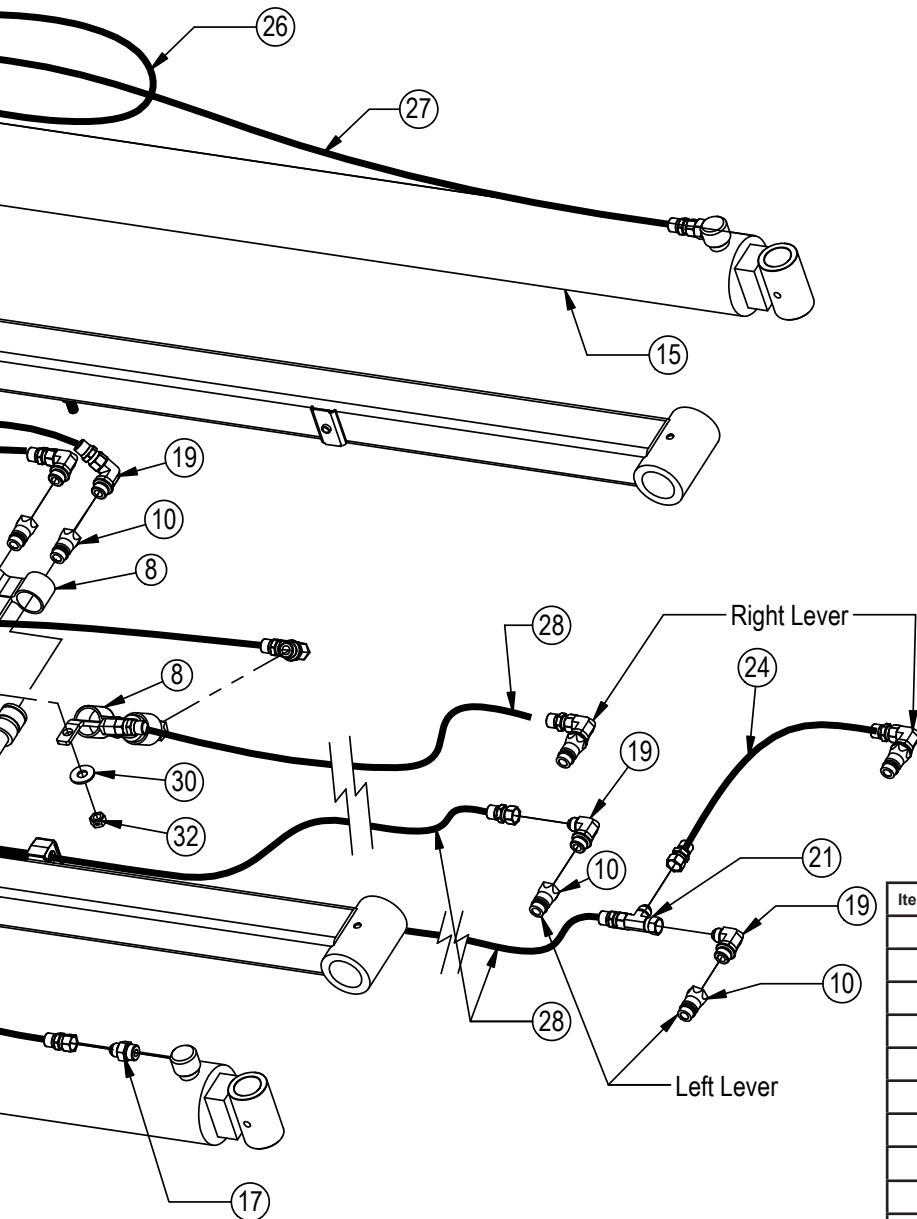
| | | Configuration | HAHT | HANT |
|----------|----------|--|------|------|
| Item No. | Part No. | Description | Qty. | Qty. |
| 14* | 31-13332 | -6 SAE Breather Fitting | 1 | 1 |
| 15 | 31-34040 | Straight JIC x O-Ring (6400-8-8) | 7 | 7 |
| 16 | 31-34050 | Straight Thread Elbow 90° JIC x O-Ring (6801-8-8) | 5 | 3 |
| 17 | 31-34051 | Straight Thread Elbow 90° JIC x O-Ring (6801-8-10) | 12 | 6 |
| 18 | 31-34060 | Branch Tee JIC x O-Ring (6803-8-8-8) | 2 | - |
| 19 | 31-34100 | Swivel Nut Elbow 90° JIC (6500-8-8) | 1 | 1 |
| 20 | 35-30022 | 39" x 3/8" -8JIC/-8JIC Hose | 2 | - |
| 21 | 35-30121 | 35" x 1/2" -8JIC/-8JIC Hose | 2 | 2 |
| 22 | 35-30132 | 69" x 1/2" -8JIC/-8JIC Hose | 2 | 2 |
| 23 | 35-30141 | 96" x 1/2" -8JIC/-8JIC Hose | 2 | 2 |
| 24 | 35-30149 | 156" x 1/2" -8JIC/-8JIC Hose | 1 | - |
| 25 | 35-30150 | 160" x 1/2" -8JIC/-8JIC Hose | 1 | - |
| 26 | 35-30162 | 390" x 1/2" -8JIC/-8JIC Hose | 4 | 2 |
| 27 | 56-13305 | Hydraulic Angle Valve | 1 | 1 |
| 28 | 57-20744 | 1/2" Flat Washer | 2 | 1 |
| 29* | 69-13351 | Wire Harness - Valve to Disconnect | 1 | 1 |
| 30* | 69-1531 | Wire Harness - Disconnect to Tractor | 1 | 1 |
| 31 | 70-20581 | 5/16" Hex Nut NC | 2 | 2 |
| 32 | 70-20604 | 1/2" Hex Center Lock Nut Gr 5 | 2 | 1 |

NOTE: When ordering cylinder seal kits, the part number on the cylinder is needed. The number is stamped on the base end of the cylinder opposite of the hydraulic ports.

| No. On Cylinder | Part No. | Description |
|-----------------|----------|---|
| 26-34711 | 49-12271 | Seal Kit 4 x 8 (647135) Nitrided Rod, Clevis Ends |
| 26-34725 | 49-12274 | Seal Kit 4 x 43.5 (647210) Nitrided Rod |

Hoses Not Drawn To Scale





| Item No. | Qty. | Part No. | Description |
|----------|------|----------|--|
| 1 | 2 | 16-20034 | 5/16" x 1" Hex Bolt Gr 5 NC |
| 2 | 3 | 16-20036 | 5/16" x 1-1/2" Hex Bolt Gr 5 NC |
| 3 | 4 | 16-20040 | 5/16" x 2-1/2" Hex Bolt Gr 5 NC |
| 4* | 4 | 16-20048 | 5/16" x 5 Hex Bolt Gr 5 NC |
| 5 | 1 | 18-14695 | Bracket, Relief Valve |
| 6 | 7 | 18-3074 | Hose Hold Down Clamp |
| 7 | 6 | 18-3075 | Hose Hold Down Clamp Plate |
| 8 | 2 | 18-8973 | Coupler Mounting Bracket |
| 9 | 3 | 25-34321 | Tappet Quick Coupler Female |
| 10 | 7 | 25-34342 | Tappet Quick Coupler Male - Poppet Style |
| 11* | 3 | 25-3401 | Pioneer Dust Cap Left Angle (Yellow) |
| 12* | 1 | 25-3402 | Pioneer Dust Plug Left Angle (Yellow) |
| 13* | 4 | 25-3455 | Pioneer Dust Cap Right Angle (Red) |
| 14* | 2 | 25-3456 | Pioneer Dust Plug Right Angle (Red) |
| 15 | 2 | 26-34725 | 4 x 43.5 Cylinder Tube Ends, Top Port |
| 16 | 1 | 31-34020 | Bulkhead Branch Tee JIC (2703-8-8) |
| 17 | 2 | 31-34040 | Straight JIC x O-Ring (6400-8-8) |

* Parts Not Shown

See Page 23 for hydraulic schematics.

| Item No. | Qty. | Part No. | Description |
|----------|------|----------|--|
| 18 | 2 | 31-34050 | Straight Thread Elbow 90° JIC x O-Ring (6801-8-8) |
| 19 | 10 | 31-34051 | Straight Thread Elbow 90° JIC x O-Ring (6801-8-10) |
| 20 | 2 | 31-34070 | Run Tee JIC x O-Ring (6804-8-8) |
| 21 | 1 | 31-34090 | Swivel Nut Run Tee JIC (6602-8-8-8) |
| 22 | 1 | 31-34100 | Swivel Nut Elbow 90° JIC (6500-8-8) |
| 23 | 2 | 31-34123 | Hex Socket O-Ring Plug (6409-8-8) |
| 24 | 3 | 35-30121 | 35" x 1/2" -8JIC/-8JIC Hose |
| 25 | 1 | 35-30127 | 54" x 1/2" -8JIC/-8JIC Hose |
| 26 | 2 | 35-30132 | 69" x 1/2" -8JIC/-8JIC Hose |
| 27 | 2 | 35-30141 | 96" x 1/2" -8JIC/-8JIC Hose |
| 28 | 3 | 35-30162 | 390" x 1/2" -8JIC/-8JIC Hose |
| 29 | 1 | 56-7772 | Relief Valve |
| 30 | 1 | 57-20744 | 1/2" Flat Washer |
| 31 | 6 | 70-20581 | 5/16" Hex Nut NC |
| 32 | 1 | 70-20604 | 1/2" Hex Center Lock Nut |
| 32 | 1 | 70-20807 | 3/4" Hex Jam Nut NF |

| No. On Cylinder | Part No. | Description |
|-----------------|----------|---|
| 26-34725 | 49-12274 | Seal Kit 4 x 43.5 (647210) Nitrided Rod |

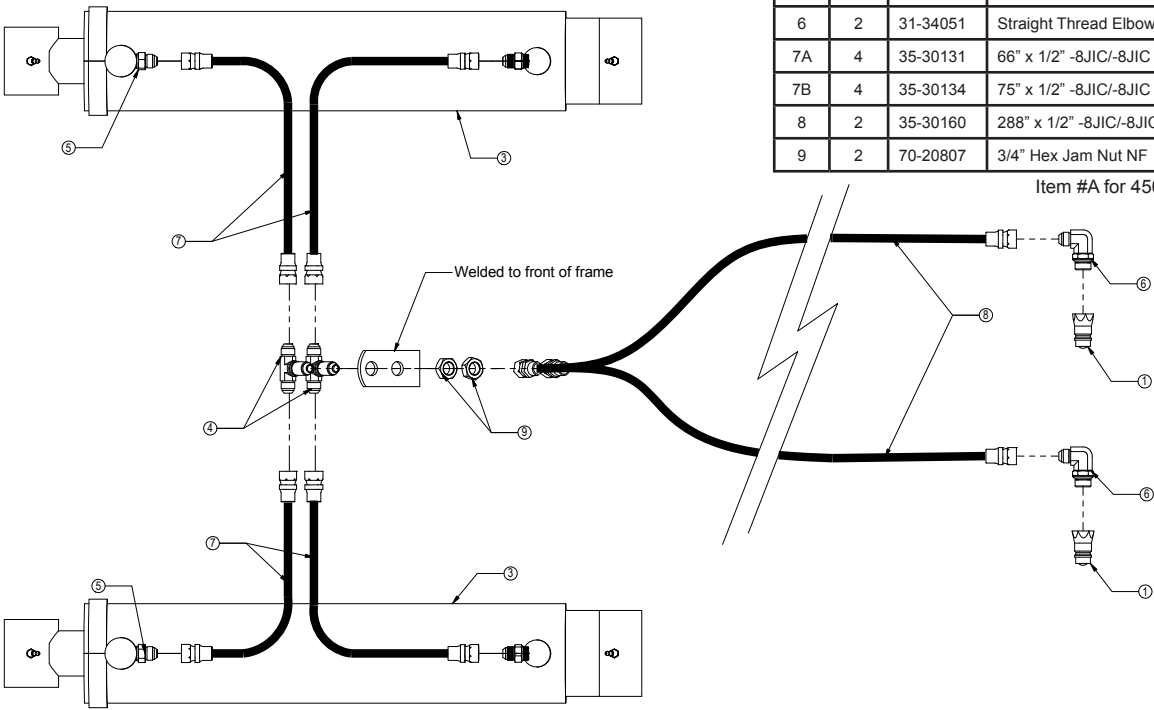
NOTE: When ordering cylinder seal kits, the part number on the cylinder is needed. The number is stamped on the base end of the cylinder opposite of the hydraulic ports.

| No. On Cylinder | Part No. | Description |
|-----------------|----------|---|
| 26-34738 | 49-12272 | Seal Kit 4" Bore x 2" Rod (647204) Nitrided Rod |

* Parts Not Shown

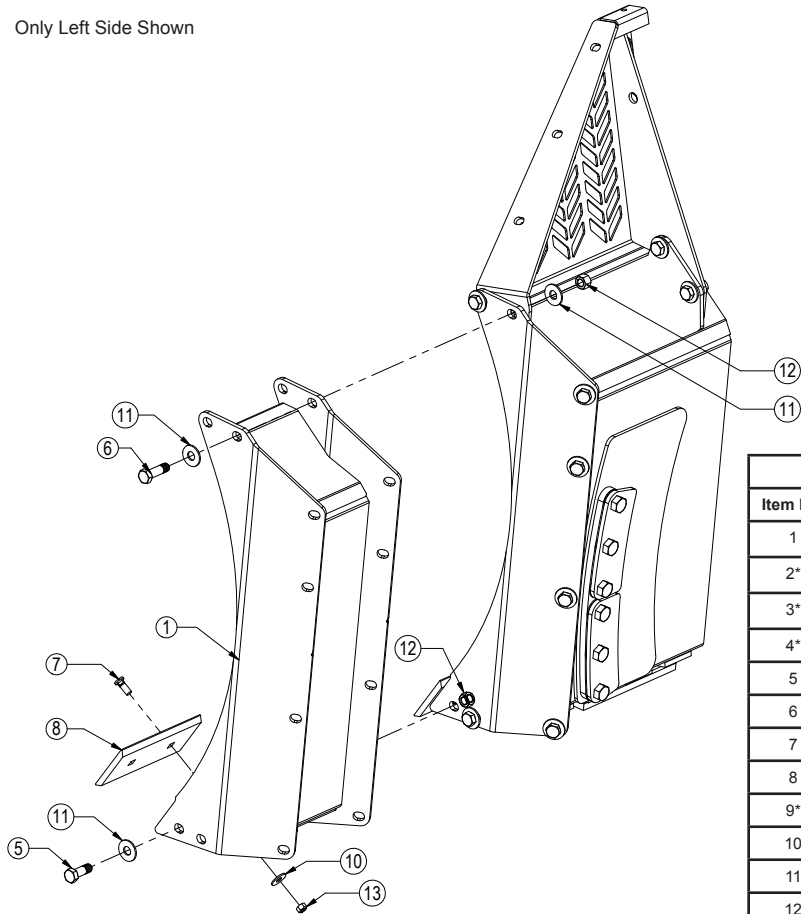
| Item No. | Qty. | Part No. | Description |
|----------|------|----------|---|
| 1 | 2 | 25-34342 | Tappet Quick Coupler Male - Poppet Style |
| 2* | 2 | 25-3457 | Pioneer Dust Cap Lift (Orange) |
| 3 | 2 | 26-34738 | 4x20 Long Cylinder - Bushed Tube Ends |
| 4 | 2 | 31-34020 | Bulkhead Branch Tee JIC (2703-8-8-8) |
| 5 | 4 | 31-34040 | Straight JIC X O-Ring (6400-8-8) |
| 6 | 2 | 31-34051 | Straight Thread Elbow 90° JIC x O-Ring (6801-08-10) |
| 7A | 4 | 35-30131 | 66" x 1/2" -8JIC/-8JIC Hose |
| 7B | 4 | 35-30134 | 75" x 1/2" -8JIC/-8JIC Hose |
| 8 | 2 | 35-30160 | 288" x 1/2" -8JIC/-8JIC Hose |
| 9 | 2 | 70-20807 | 3/4" Hex Jam Nut NF |

Item #A for 450 and Item #B for 660 Dozer



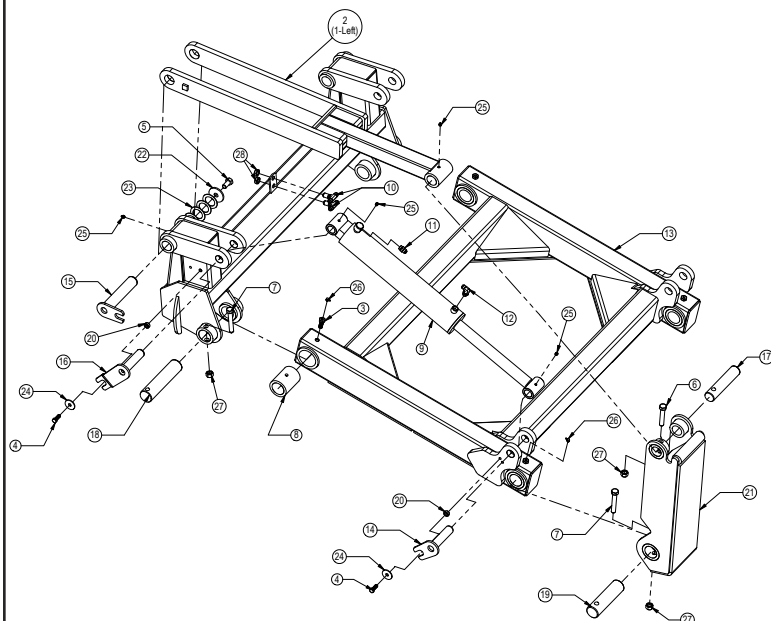
Hoses Not Drawn To Scale

Only Left Side Shown

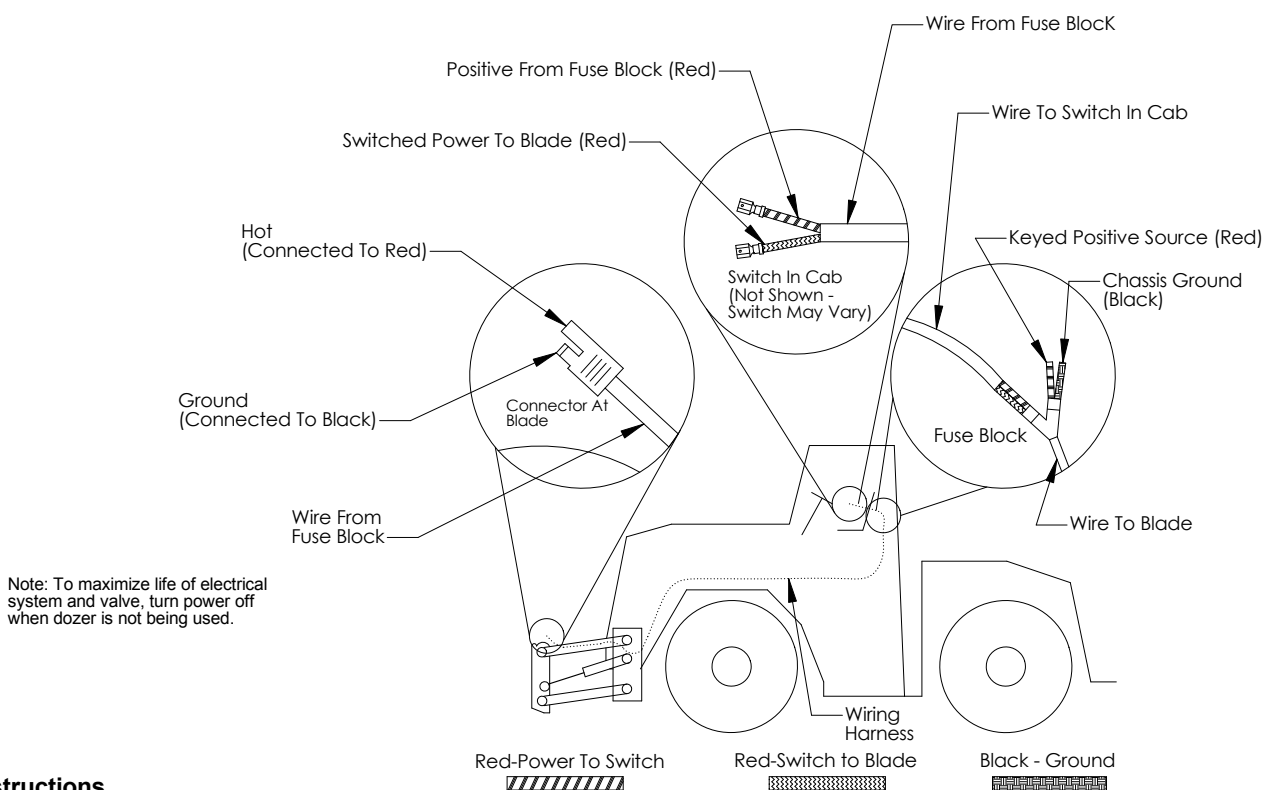


* Parts Not Shown

| Item No. | Part No. | Description | End Extension Length | |
|----------|--------------|---|----------------------|----|
| | | | 1' | 2' |
| 1 | 15-13990-1-L | Slant Top 1' End Extension cmb - Left | 1 | - |
| 2* | 15-13990-1-R | Slant Top 1' End Extension cmb - Right | 1 | - |
| 3* | 15-13990-2-L | Slant Top 2' End Extension cmb - Left | - | 1 |
| 4* | 15-13990-2-R | Slant Top 2' End Extension cmb - Right | - | 1 |
| 5 | 16-20538 | 7/8" x 2" Hex Bolt Gr 8 NC | 12 | 12 |
| 6 | 16-20540 | 7/8" x 2-1/2" Hex Bolt Gr 8 NC | 4 | 4 |
| 7 | 16-21666 | 5/8" x 1-3/4" Plow Bolt Gr 5 NC | 4 | 8 |
| 8 | 29-7950-1 | 1'- 5/8" x 6" Double Bevel Cutting Edge | 2 | - |
| 9* | 29-7950-2 | 2'- 5/8" x 6" Double Bevel Cutting Edge | - | 2 |
| 10 | 57-20816 | 5/8" Flat Washer Grade 8 (USS) | 4 | 8 |
| 11 | 57-20818 | 7/8" Flat Washer Heavy Duty Grade 8 (USS) | 20 | 20 |
| 12 | 70-20598 | 7/8" Hex Nut Gr 8 NC | 16 | 16 |
| 13 | 70-20646 | 5/8" Hex Top Lock Nut Gr 5 NC | 4 | 8 |

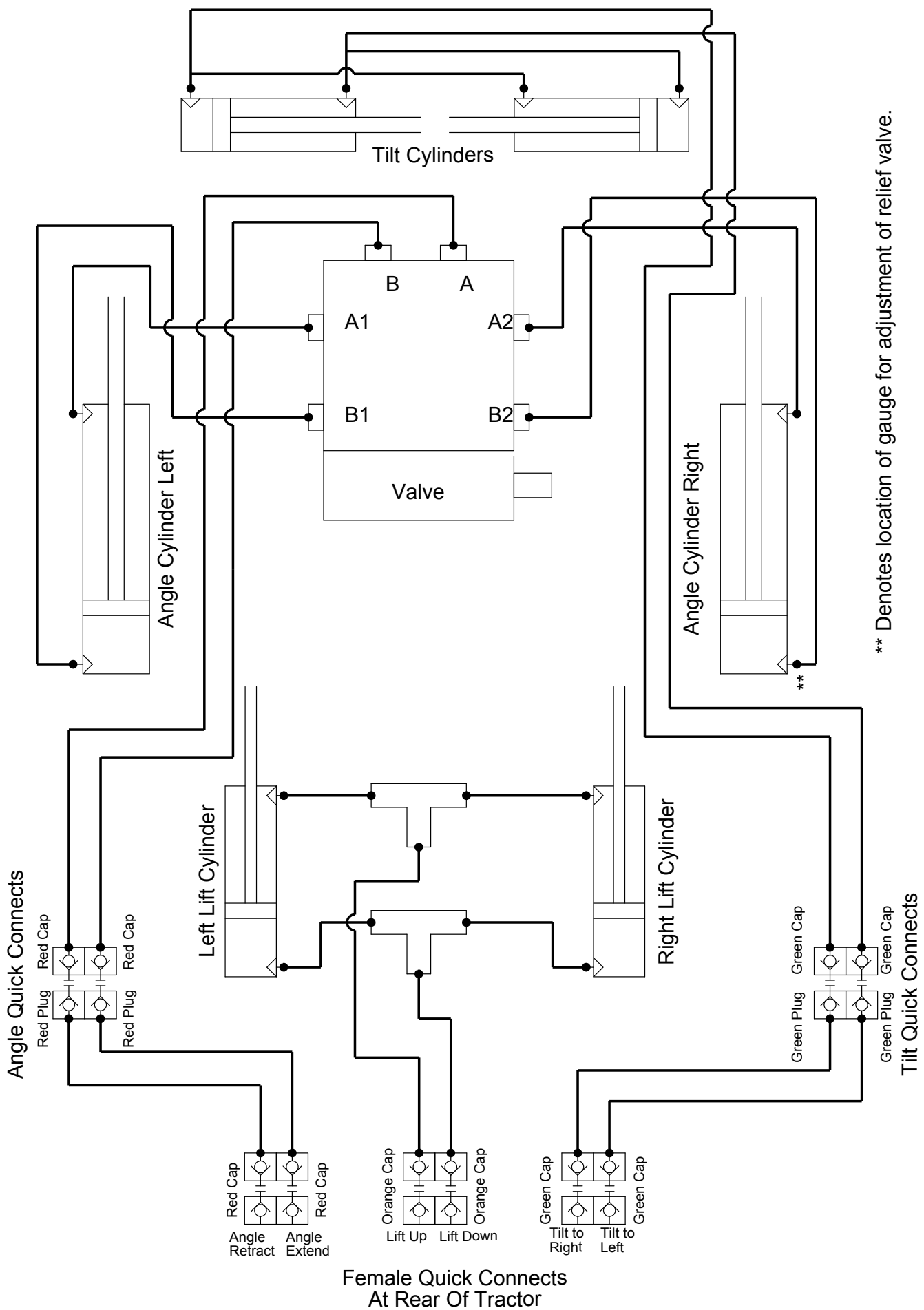


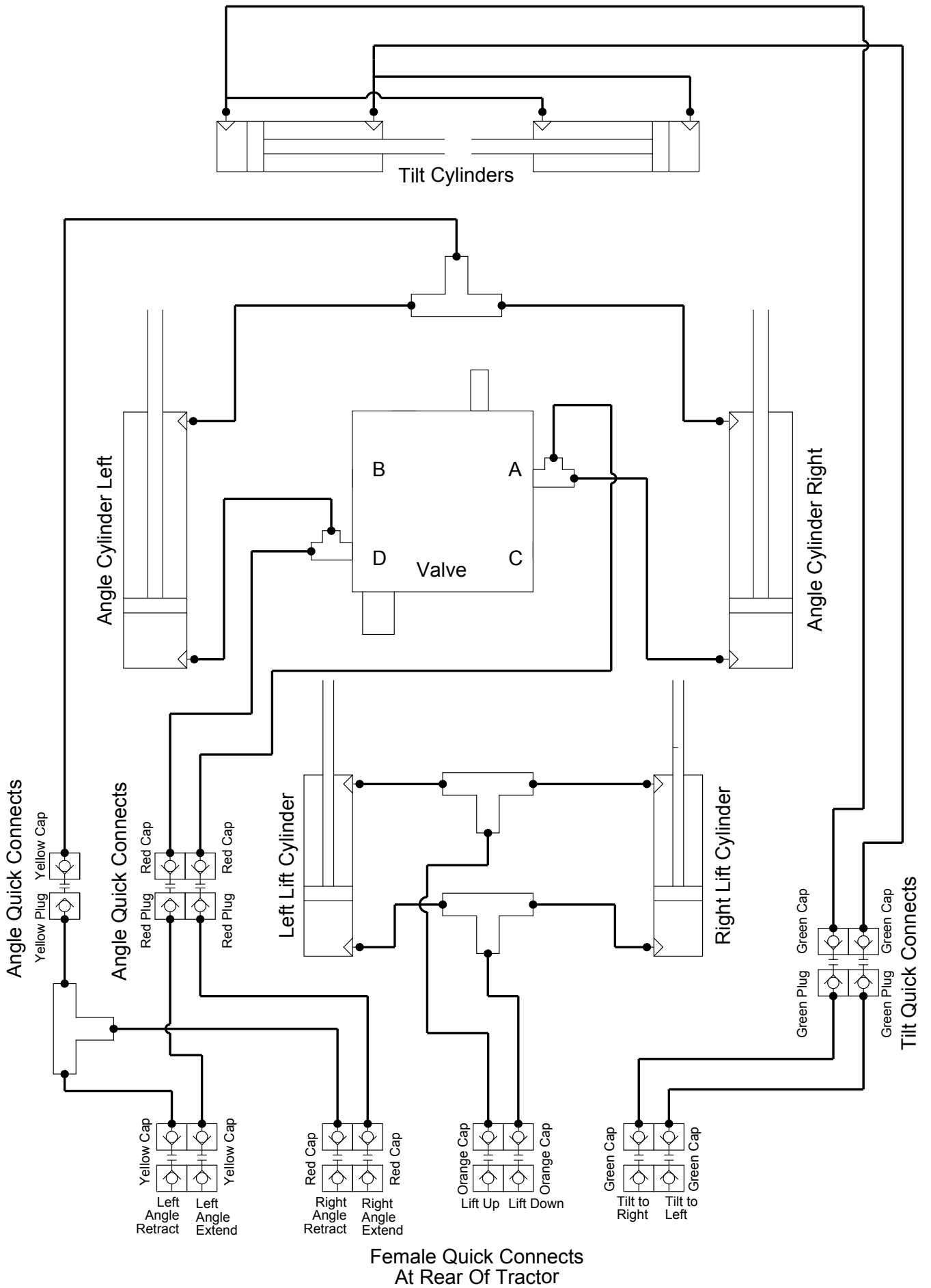
| Item No. | Qty. | Part No. | Description |
|----------|------|----------|--|
| 1 | 1 | 11-8461L | Top Arm - Left |
| 2 | 1 | 11-8461R | Top Arm - Right |
| 3 | 4 | 16-1795 | Lift Frame Grease Bolt |
| 4 | 4 | 16-20126 | 1/2" x 1-1/2" Hex Bolt Gr 5 NC |
| 5 | 2 | 16-20216 | 3/4" x 1-1/2" Hex Bolt Gr 5 NC |
| 6 | 2 | 16-20226 | 3/4" x 4" Hex Bolt Gr 5 NC |
| 7 | 4 | 16-20227 | 3/4" x 4-1/2" Hex Bolt Gr 5 NC |
| 8 | 4 | 19-13525 | 2.75 x 2.50 x 4.75 Spring Bushing |
| 9 | 2 | 26-34726 | 4x20 Long Cylinder |
| 10 | 2 | 31-34020 | Bulkhead Branch Tee JIC |
| 11 | 2 | 31-34040 | Straight JIC x O-Ring |
| 12 | 2 | 31-34050 | Straight Thread Elbow 90° JIC x O-Ring |
| 13 | 1 | 32-15690 | 4100 Lift Frame |
| 14 | 2 | 43-8466 | 1-1/2" x 6-1/4" Pin |
| 15 | 2 | 43-8469 | JD 9000 Upper Arm / UC Pin |
| 16 | 2 | 43-8471 | JD 9000 UC / Lift Cylinder Pin |
| 17 | 2 | 43-8492 | Top Arm / QA Pin |
| 18 | 2 | 43-8493 | UC / Lift Frame Pin |
| 19 | 2 | 43-8896 | QA Bottom Pin |
| 20 | 4 | 44-8490 | 1/2" NR Pin Spacer |
| 21 | 2 | 45-13250 | Male Quick Attach |
| 22 | 2 | 57-1530 | 3" OD x .75" ID JD Top Arm Washer |
| 23 | 8 | 57-1811 | 2" Narrow Rin Washer |
| 24 | 4 | 57-20794 | 1/2" Fender Washer |
| 25 | 4 | 58-9369 | Grease Zerk 1/8" NPT Straight |
| 26 | 2 | 58-9372 | Grease Zerk 1/8" NPT 90° |
| 27 | 6 | 70-20607 | 3/4" Hex Center Lock Nut Gr 2 NC |
| 28 | 2 | 70-20807 | 3/4" Hex Jam Nut NF |



Instructions

1. Locate "keyed and fused" 12 V power supply in cab of tractor.
2. Disconnect battery.
3. Connect the red wire to power and the black wire to ground.
4. Install switch in convenient place in cab.
5. Route wire harness from switch to the blade. (plug-in connector at blade)
6. Connect the switch to the wire harness.
7. Reconnect the battery.





Contact Us

As always, if you have any questions about your 450 and 660 Dozer or other products made by Grouser, feel free to contact us.

Grouser Products

755 2nd Ave NW - West Fargo, ND 58078

Phone: 1-800-747-6182

Fax: 1-701-282-8131

E-mail: grouser@grouser.com

Website: www.grouser.com



Improvements

Grouser Products Inc. is continually striving to improve its products. We reserve the right to change prices, specification, or equipment at any time without notice. We also reserve the right to make improvements or changes when it becomes practical and possible to do so without incurring any obligation to make changes or additions to the equipment sold previously.

Warranty

Grouser Products warrants to the original purchaser of each item that the product be free from defects in material and workmanship under normal use and service for a period of one year. If such equipment is found to be defective within one year, it is the obligation of Grouser Products under this warranty to repair or replace (exclusive of the cost of labor and transportation), any equipment or parts, in the judgment of Grouser Products to be defective in material or workmanship.

All equipment or parts claimed to be defective in material or workmanship must be made available for inspection at the place of business of a dealer authorized to handle the equipment covered by this warranty, or, upon request by Grouser Products, shipped to the Grouser Products factory in West Fargo, North Dakota. Grouser Products shall have no obligation to bear the cost of labor or transportation in connection with replacement or repair of any such defective parts in the setup process.

This warranty covers only defects in material and workmanship. It does not cover depreciation or damage caused by normal wear, accident, improper assembly, improper adjustments, improper maintenance including lack of proper lubrication, or improper use. Therefore, Grouser Products liability under this warranty shall not be effective or actionable unless the equipment is assembled, maintained and operated in accordance with the operating instructions accompanying the equipment. Grouser Products shall have no liability if the equipment has been altered or reworked without the written authorization of Grouser Products.

Grouser Products' parts, which are furnished under this warranty and properly installed, shall be warranted to the same extent as the original parts under this warranty if, and only if, such parts are found to be defective within the original warranty period covering the original equipment.

