



450 & 660

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.

Size	Torque - Dry (ft-lbs)			
	SAE Grade 5		SAE Grade 8	
	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

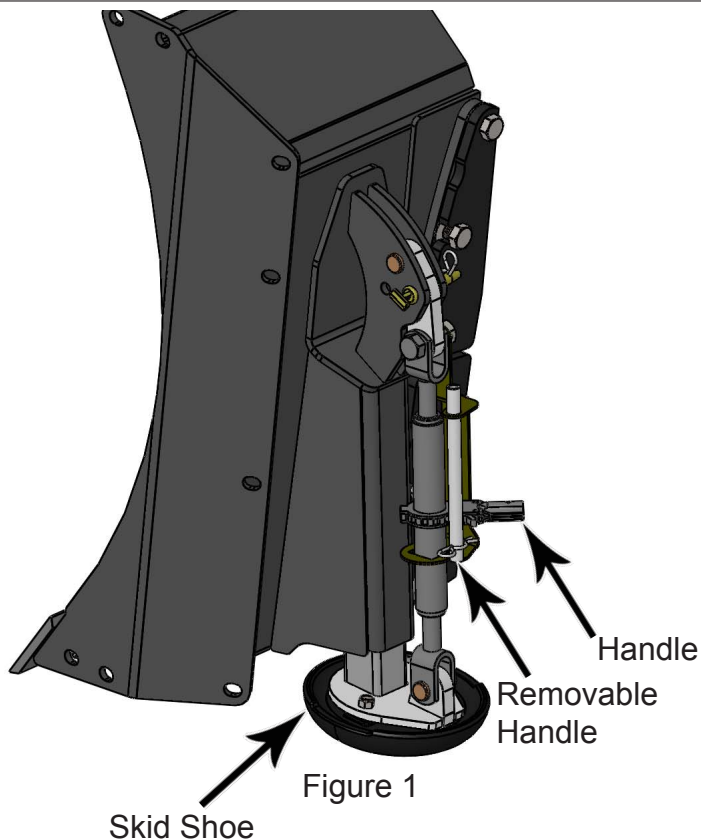
To connect the blade follow Steps #14-21 on Page 8.

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 #20 on Page 5) from the mushroom skid shoe link (#35 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

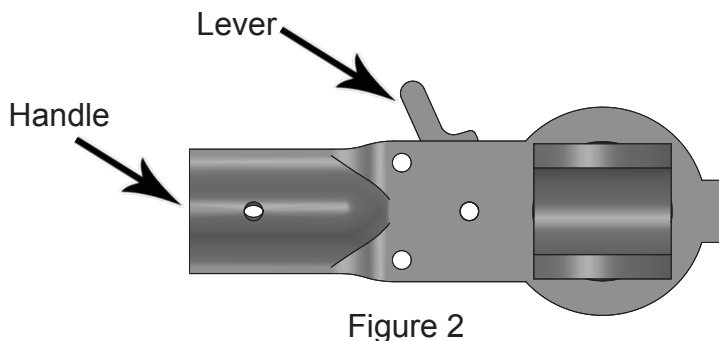
Skid Shoe Adjustment:

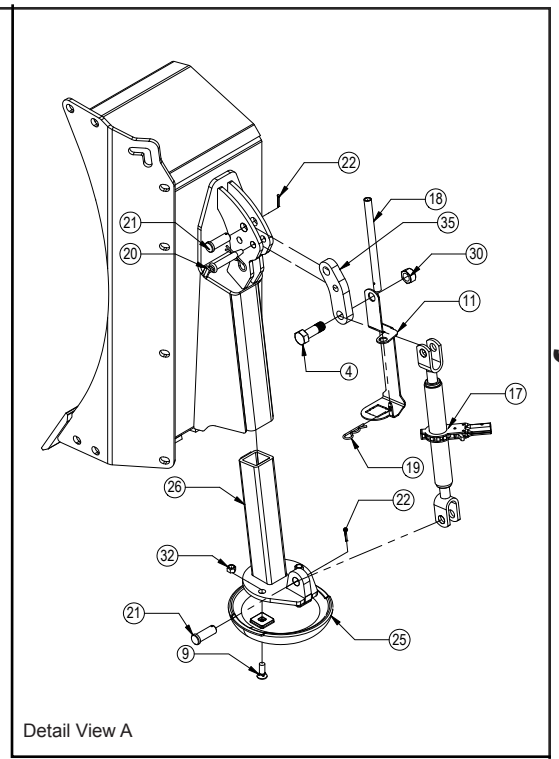
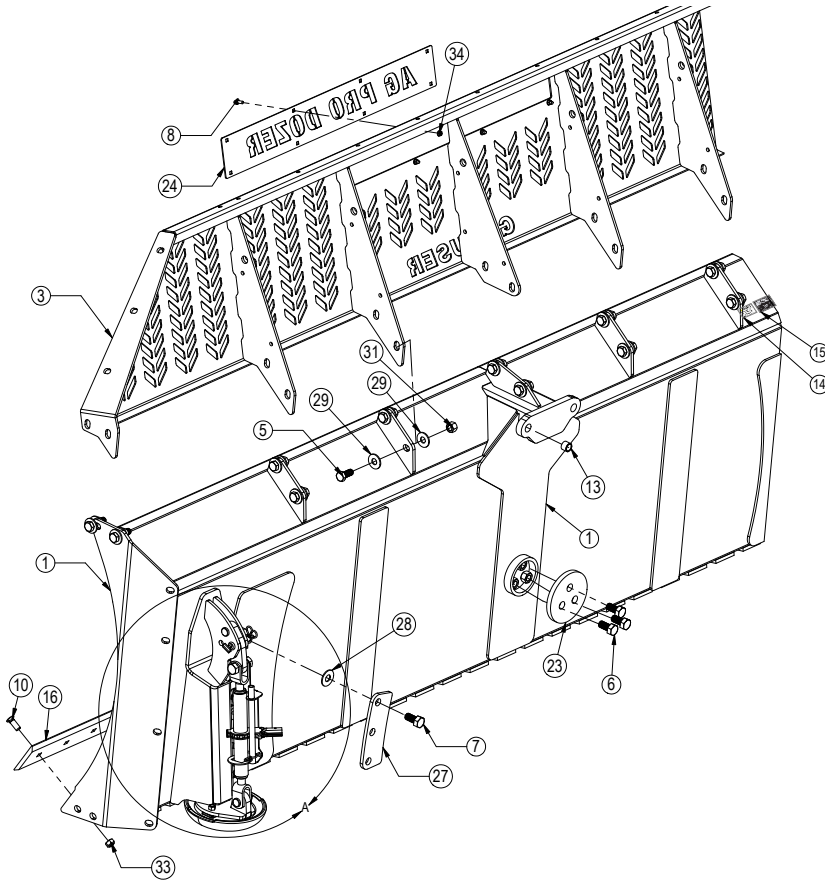
1. Remove the handle from the ratchet keeper by pulling the hitch clip pin and insert into the handle on the ratchet jack.
2. Loosen the locking nut on the ratchet jack.
3. Hold the body of the ratchet jack and rotate the ratchet jack handle to raise or lower the skid shoes.
4. If the skid shoe is not 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.



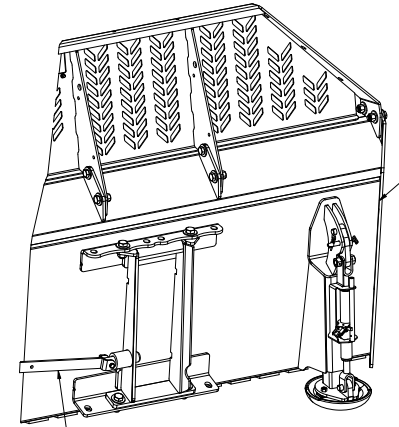
Tilt Plate Adjustment:

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.





Detail View A



Refer to Pages 12-13 for Quick Attach System

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	15-18520-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	4	4	4	4
10	16-21748	3/4" X 2" Plow Bolt Gr 8 NC	28	32	36	40
11	18-18498-L	Ratchet Keeper - Left	1	1	1	1
12*	18-18498-R	Ratchet Keeper - Right	1	1	1	1
13	19-7774	1" x 1" Spring Bushing	2	2	2	2
14	27-40962	Warning Prop 65 Decal	1	1	1	1
15	NA	Grouser Dozer Metal Serial Tag	1	1	1	1
16	29-11118-6	6'- 3/4" x 8" Double Bevel Cutting Edge	-	-	3	2
16	29-11118-7	7'- 3/4" x 8" Double Bevel Cutting Edge	2	-	-	-
16	29-11118-8	8'- 3/4" x 8" Double Bevel Cutting Edge	-	2	-	1
17	34-17565	Ratchet Jack with Pins	2	2	2	2
18	34-17567	Ratchet Jack - Handle	2	2	2	2
19	43-7767	Hitch Clip Pin	2	2	2	2

Item No.	Part No.	Description	Blade Length			
			14'	16'	18'	20'
20	43-15712	3/4" x 3-1/4" Safety Hitch Pin w/ Clip Pin	2	2	2	2
21	43-18463	1" x 2.75" Pin	4	4	4	4
22	43-18943	3/16" x 1-1/2" Cotter Pin	4	4	4	4
23	44-3749	Backdrag Brace Plate	1	1	1	1
24A	44-14830	Custom Name Plate	1	1	1	1
24B	44-15150	Ag Pro Dozer Name Plate	1	1	1	1
25	50-15458	12" Round Mushroom Skid Shoe	2	2	2	2
26	50-18470	Mushroom Skid Shoe Mount	2	2	2	2
27	52-8204	Tilt Plate	4	4	4	4
28	57-20749	1" Flat Washer	12	12	12	12
29	57-20818	7/8" Flat Washer Heavy Duty Gr. 8 (USS)	28	36	36	44
30	70-18999	1" Hex Center Lock Nut Gr 2 NC - YZ	2	2	2	2
31	70-20598	7/8" Hex Nut Gr 8 NC	14	18	18	22
32	70-20646	5/8" Hex Top Lock Nut Gr 5 NC	4	4	4	4
33	70-20647	3/4" Hex Top Lock Nut Gr 5 NC	28	32	36	40
34	70-20622	3/8" Flange Nut	8	8	8	8
35	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.

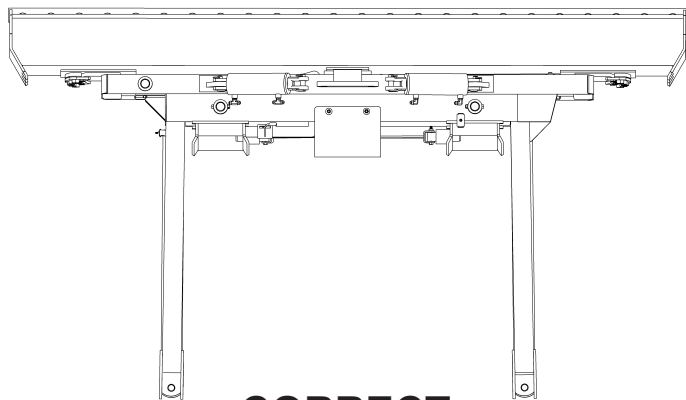
Automatic lever release: In certain newer model tractors, the hydraulic control lever will automatically release and instantly stop oil flow once the end of the stroke is reached.

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

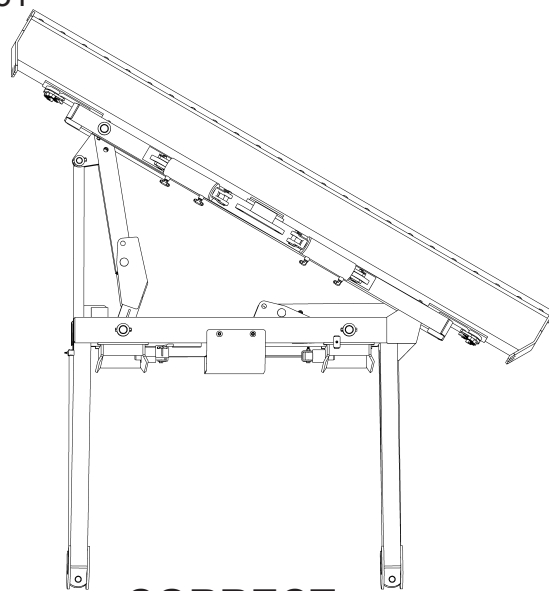
(Continued on next page)

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.

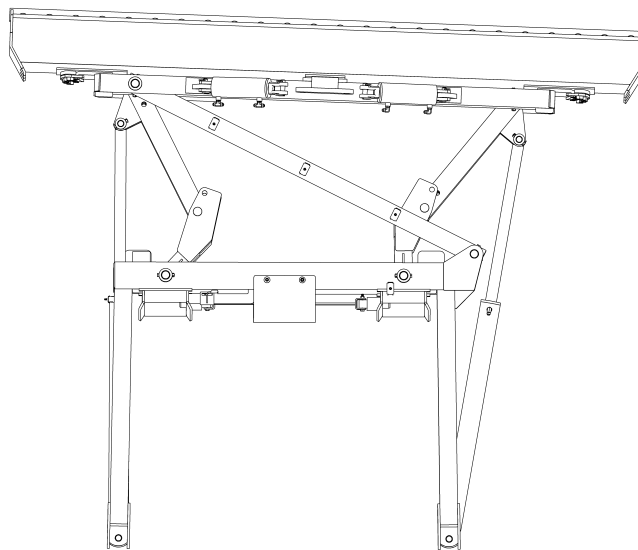
Please contact Grouser Products with any questions by:
Phone - 701-282-7710 or 800-747-6182; Fax - 701-282-8131



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.

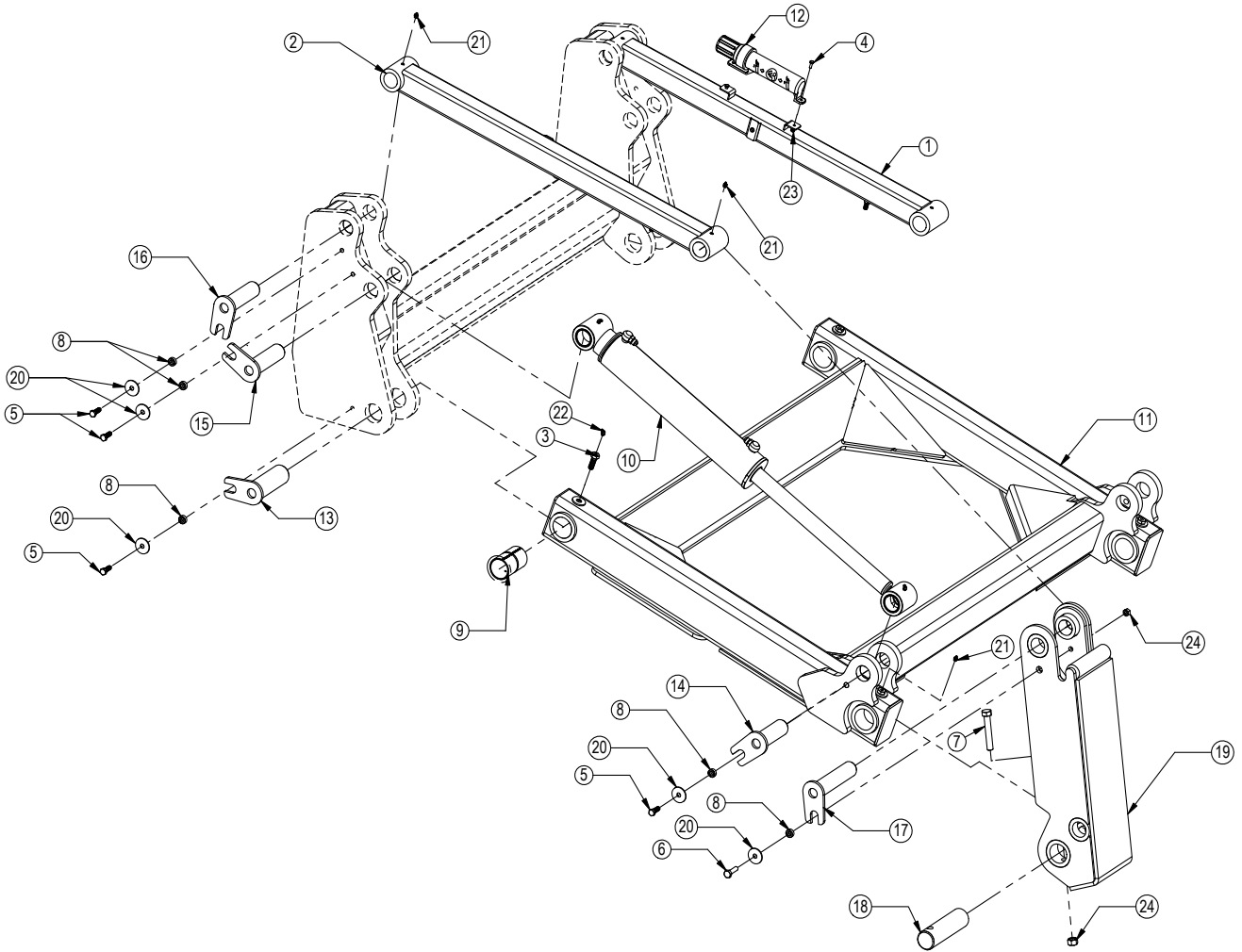
Continue to route the hoses thru the tractor. Keep away from all moving parts.

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 (#20 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 the 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

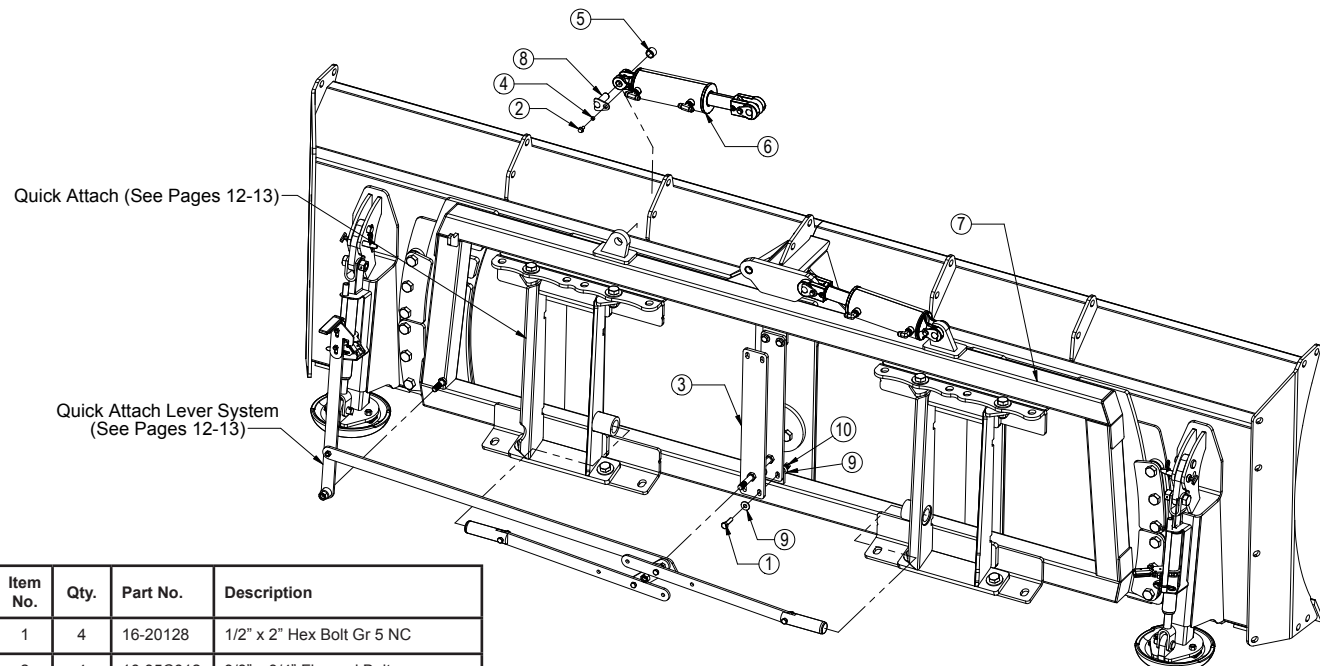
Start the tractor and run the blade thru all the functions. If any function does not work properly, bleeding of the system may be required. If problem still persists, call Grouser Products.



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

Refer to Page 5 for Skid Shoe Parts

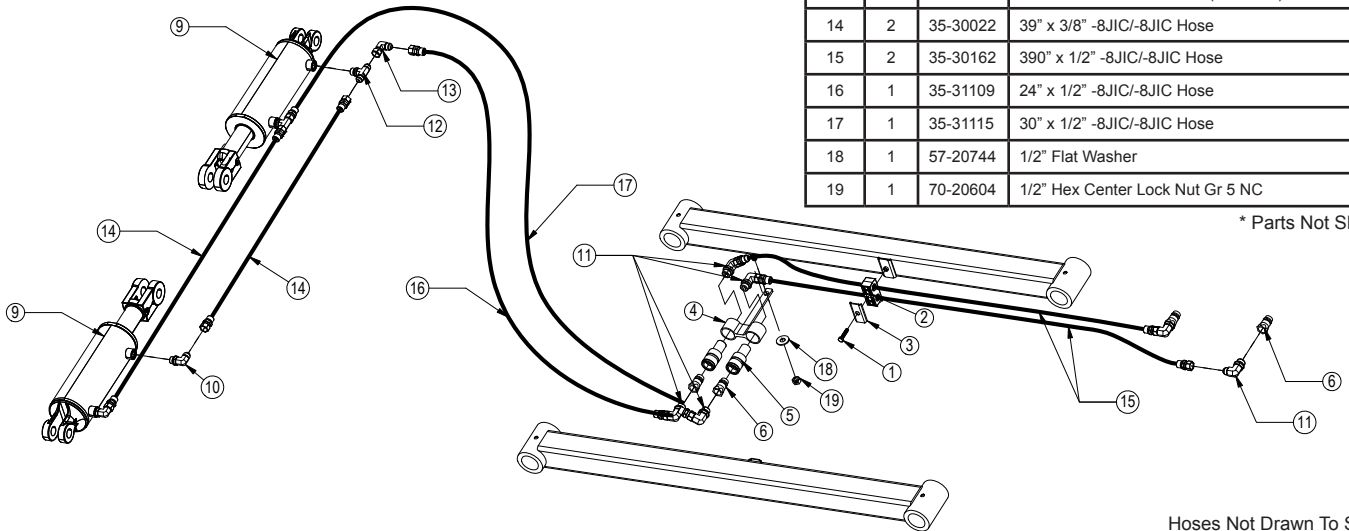
NOTE: When ordering cylinder seal kits, the part number on the cylinder is needed. The number is stamped on the base end of the cylinder opposite of the hydraulic ports.

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

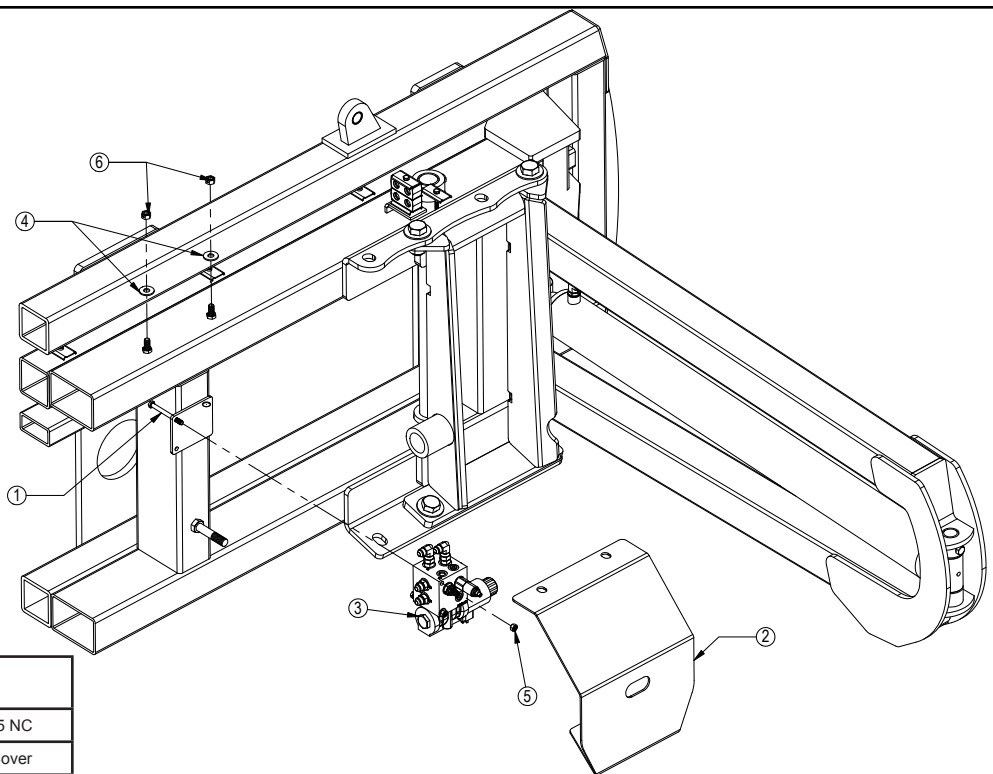
See Pages 24-27 for Multi-Coupler Option.

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

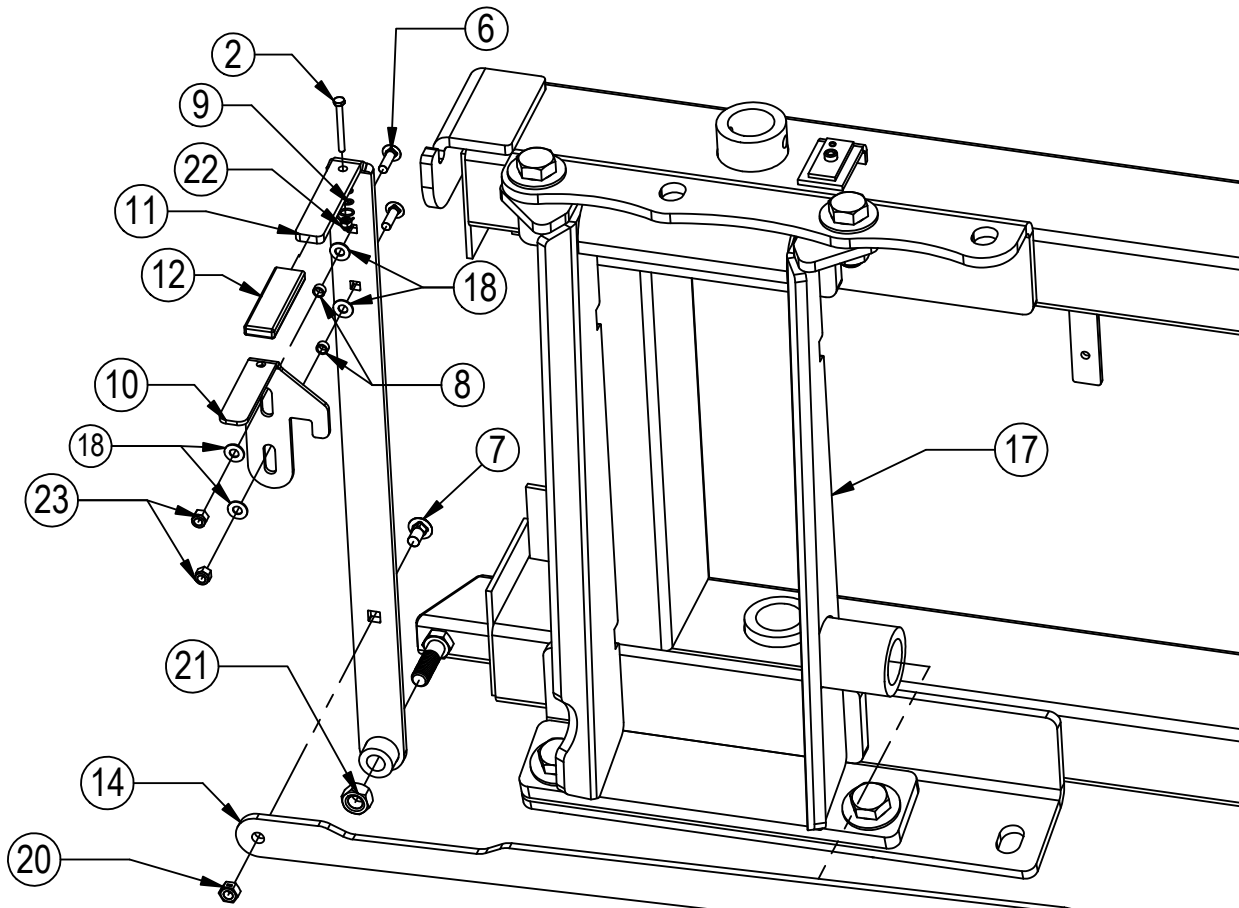
* Parts Not Shown



Hoses Not Drawn To Scale

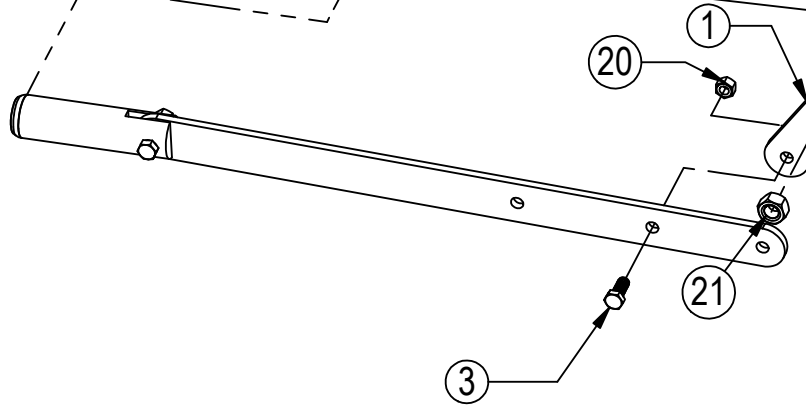


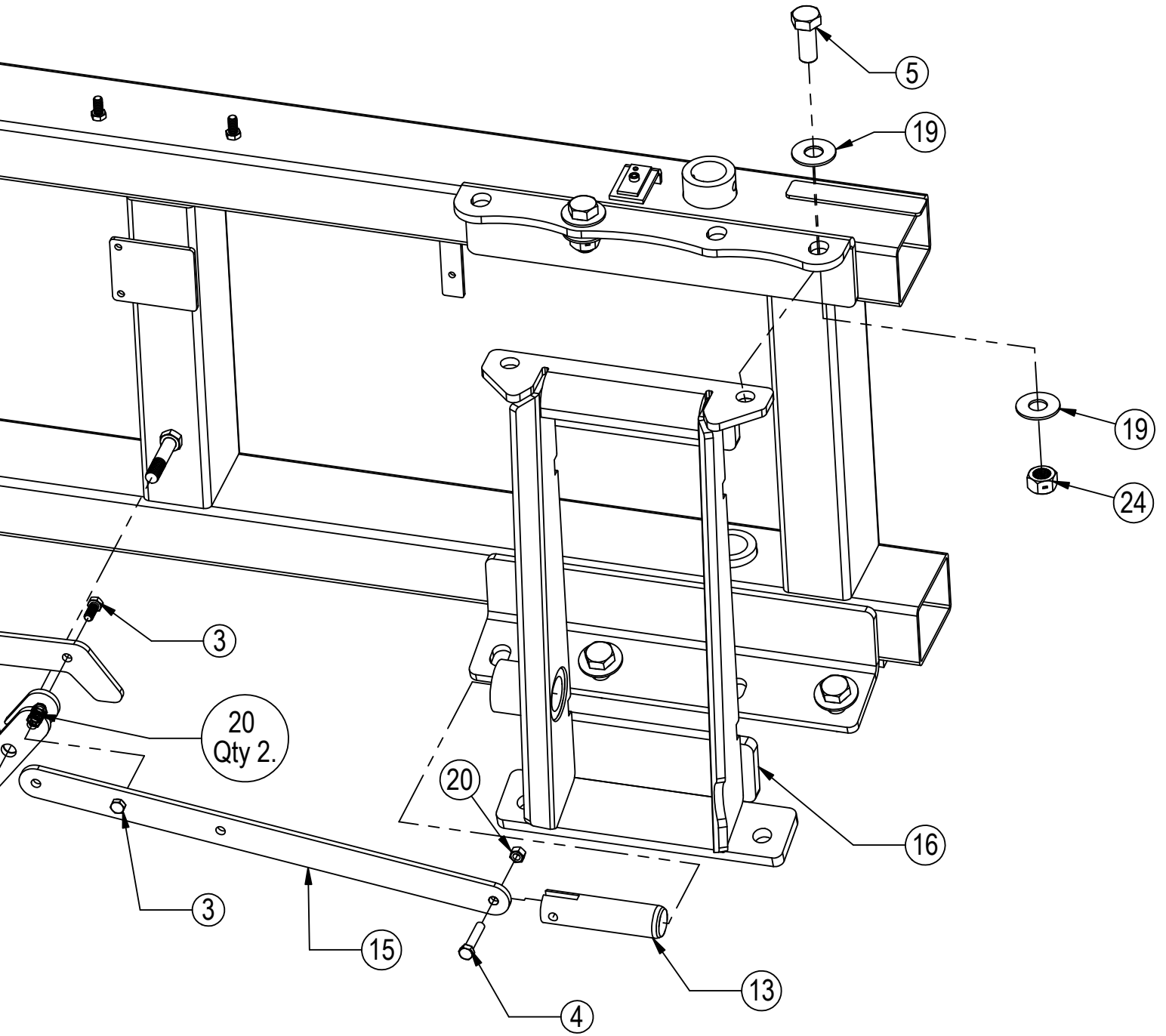
Item No.	Qty.	Part No.	Description
1	2	16-20077	3/8" x 4-1/2" Hex Bolt Gr 5 NC
2	1	18-1701	AG Pro Hydraulic Valve Cover
3	1	56-13305	Hydraulic Angle Valve
4	2	57-20744	1/2" Flat Washer
5	2	70-20582	3/8" Hex Nut
6	2	70-20604	1/2" Hex Center Lock Nut Gr 2 NC



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

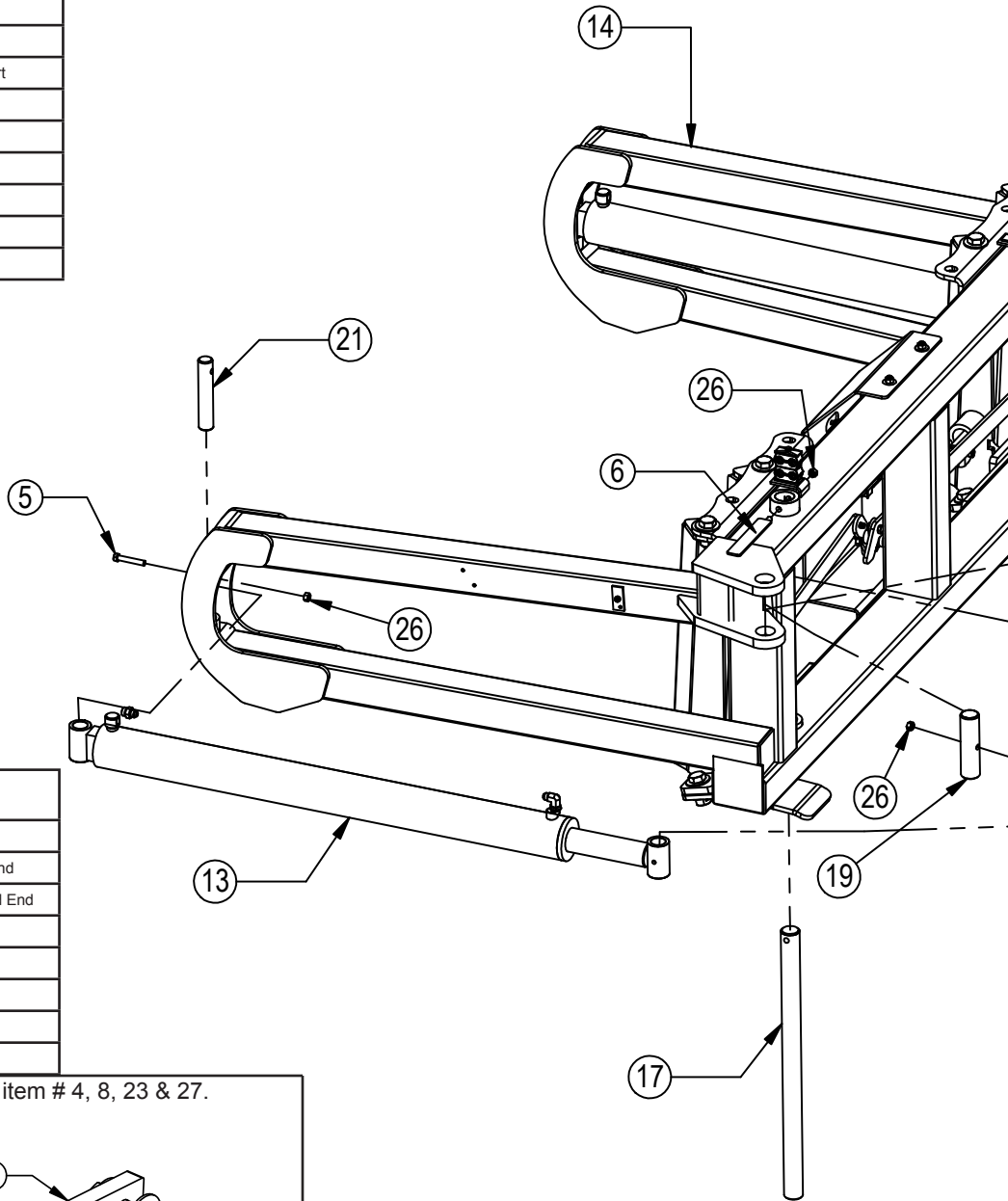
Item No.	Qty.	Part No.	Description
1	1	11-3049	Bell Crank Weld
2	1	16-20040	5/16" x 2-1/2" Hex Bolt Gr 5 NC
3	3	16-20125	1/2" x 1-1/4" Hex Bolt Gr 5 NC
4	1	16-20130	1/2" x 2-1/2" Hex Bolt Gr 5 NC
5	8	16-20560	1" x 2-1/2" Hex Bolt Gr 8 NC
6	2	16-21064	3/8" x 1" Carriage Bolt
7	1	16-21125	1/2" x 1-1/4" 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	43-18965	QA Lock Pin
14A	1	44-14709	Pin Puller Link Plate
14B	1	44-14662	Pin Puller Link Plate
15		44-18970	AG Pro Pin Puller Arm
16	1	45-14710-R	Female Bolt On Quick Attach, Right
17	1	45-14710-L	Female Bolt On Quick Attach, Left
18	2	57-20742	3/8" Flat Washer
19	16	57-20819	1" Flat Washer Heavy Duty Gr 8 (USS)
20	6	70-20604	1/2" Hex Center Lock Nut Gr 2 NC
21	2	70-20607	3/4" Hex Center Lock Nut Gr 2 NC
22	1	70-20611	5/16" Nyloc Hex Nut Gr 5 NC
23	2	70-20622	3/8" Flange Nut
24	8	70-20609	1" Hex Center Lock Nut Gr 2 NC





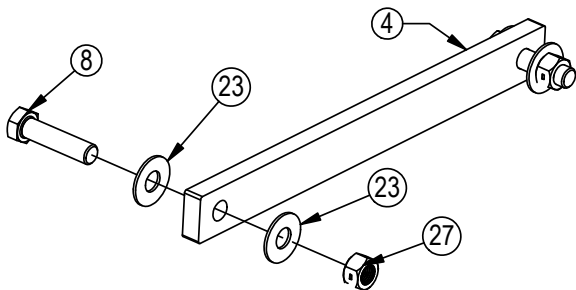
Hydraulic Angle - Hydraulic Tilt Or Hydraulic Angle - No Tilt

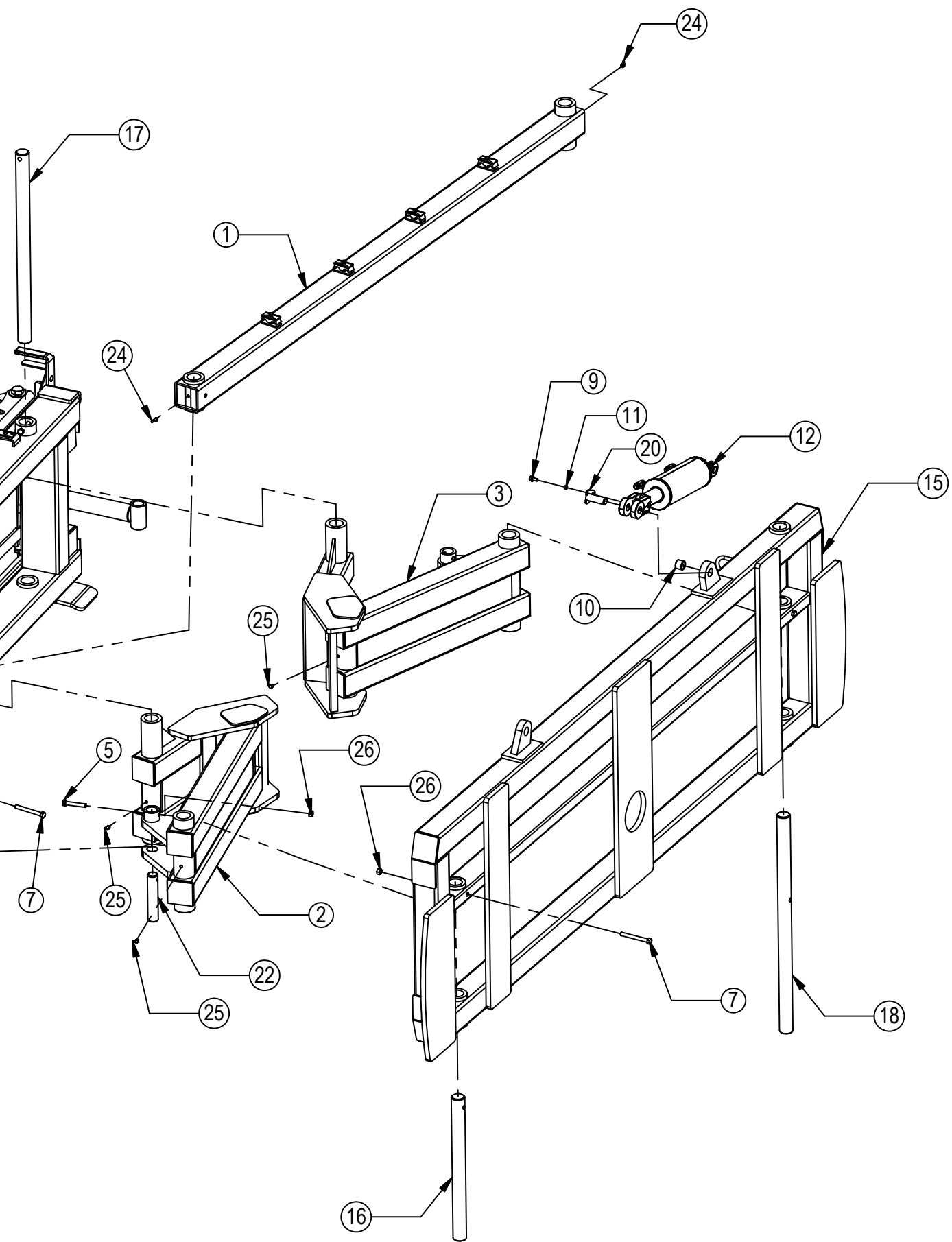
Item No.	Qty.	Part No.	Description
1	1	11-19670	Stabilizer Arm
2	1	11-19685	Angle Arm Right
3	1	11-19690	Angle Arm Left
4	1	14-9366	Non Tilt Bar
5	4	16-20132	1/2" x 3" Hex Bolt Gr 5 NC
6	2	16-20424	1/2" x 3-1/2" Hex Bolt Gr 8 NC
7	3	16-20427	1/2" x 4-1/2" Hex Bolt Gr 8 NC
8	2	16-20564	1" x 3-1/2" Hex 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	32-19675	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

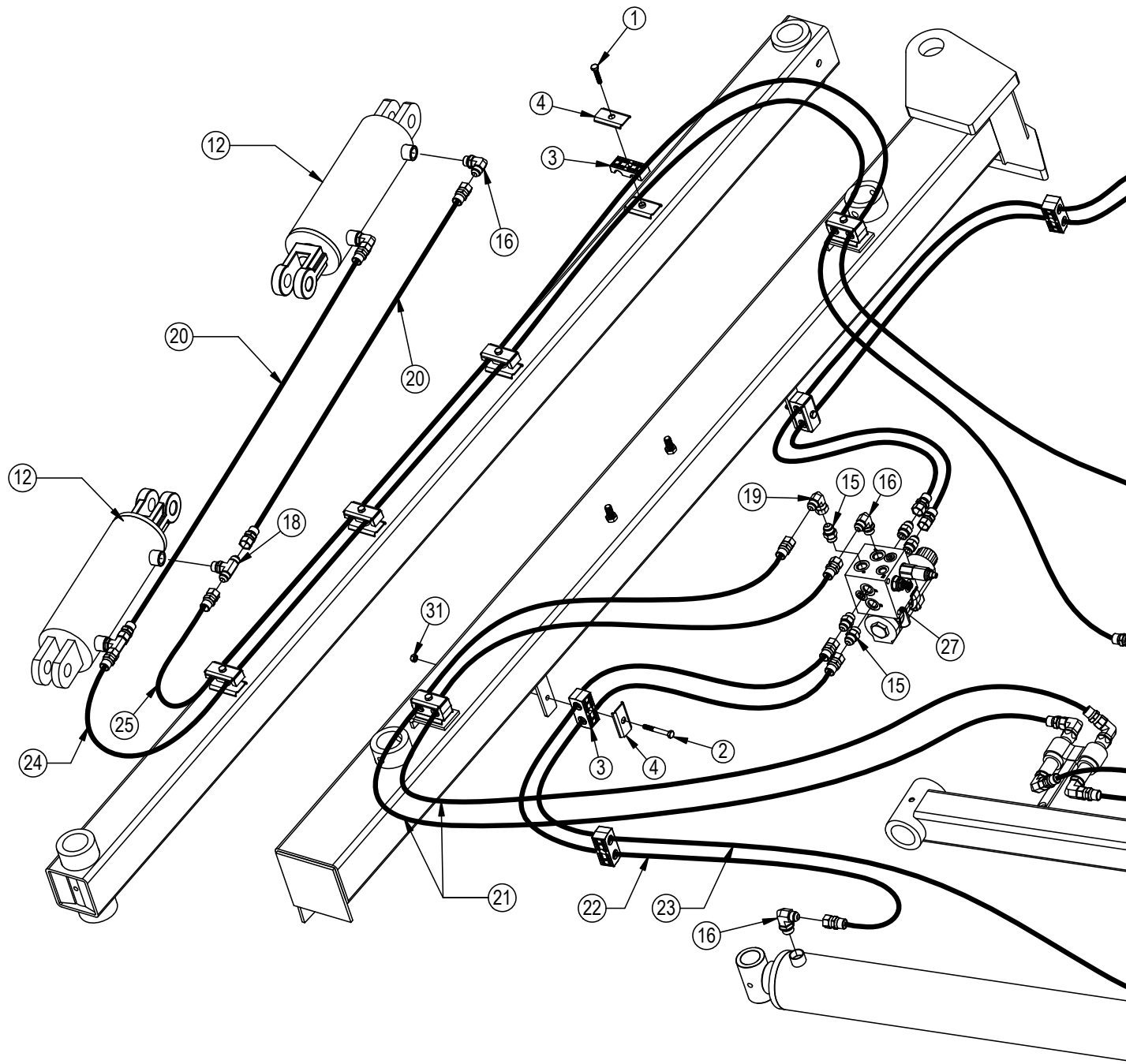
HANT - Replace item # 9, 10, 11, 12 & 20 with item # 4, 8, 23 & 27.





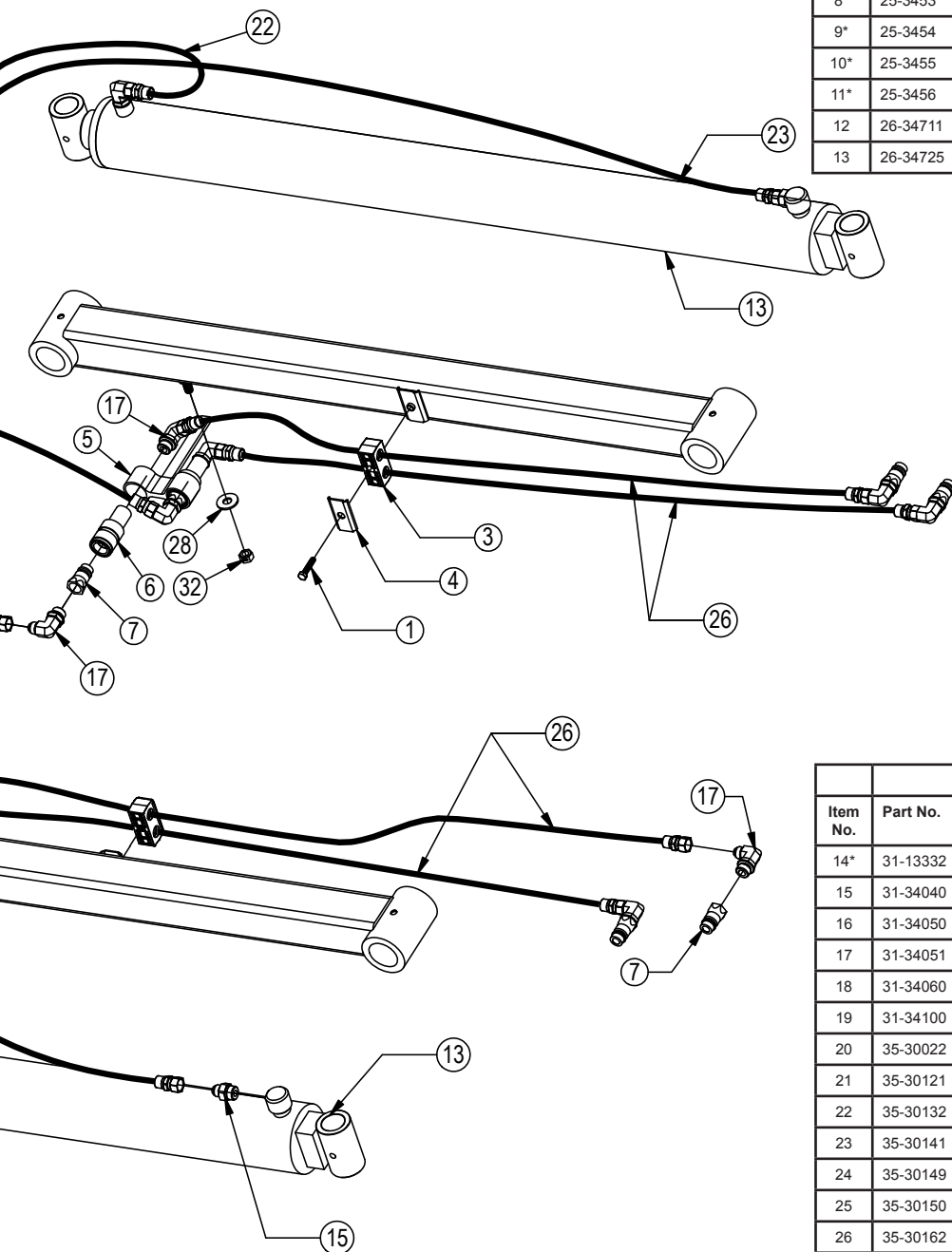
Hydraulic Tilt Or Hydraulic Angle - No Tilt Hose Routing

Hoses Not Drawn To Scale



Item No.	Part No.	Description	Configuration	HAHT	HANT
			Qty.	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
3A	18-19311-02-P-062	Hose Clamp (TS-CLH-02-P-062)		3	0
3B	18-19311-03-P-087	Hose Clamp (TS-CLH-03-P-087)		7	6
4A	18-19312-02	Twin Cover Plate (TS-TCP-02-Z)		5	0
4B	18-19312-03	Twin Cover Plate (TS-TCP-03-Z)		5	5
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.
See Page 24-27 for Multi-Coupler Option.

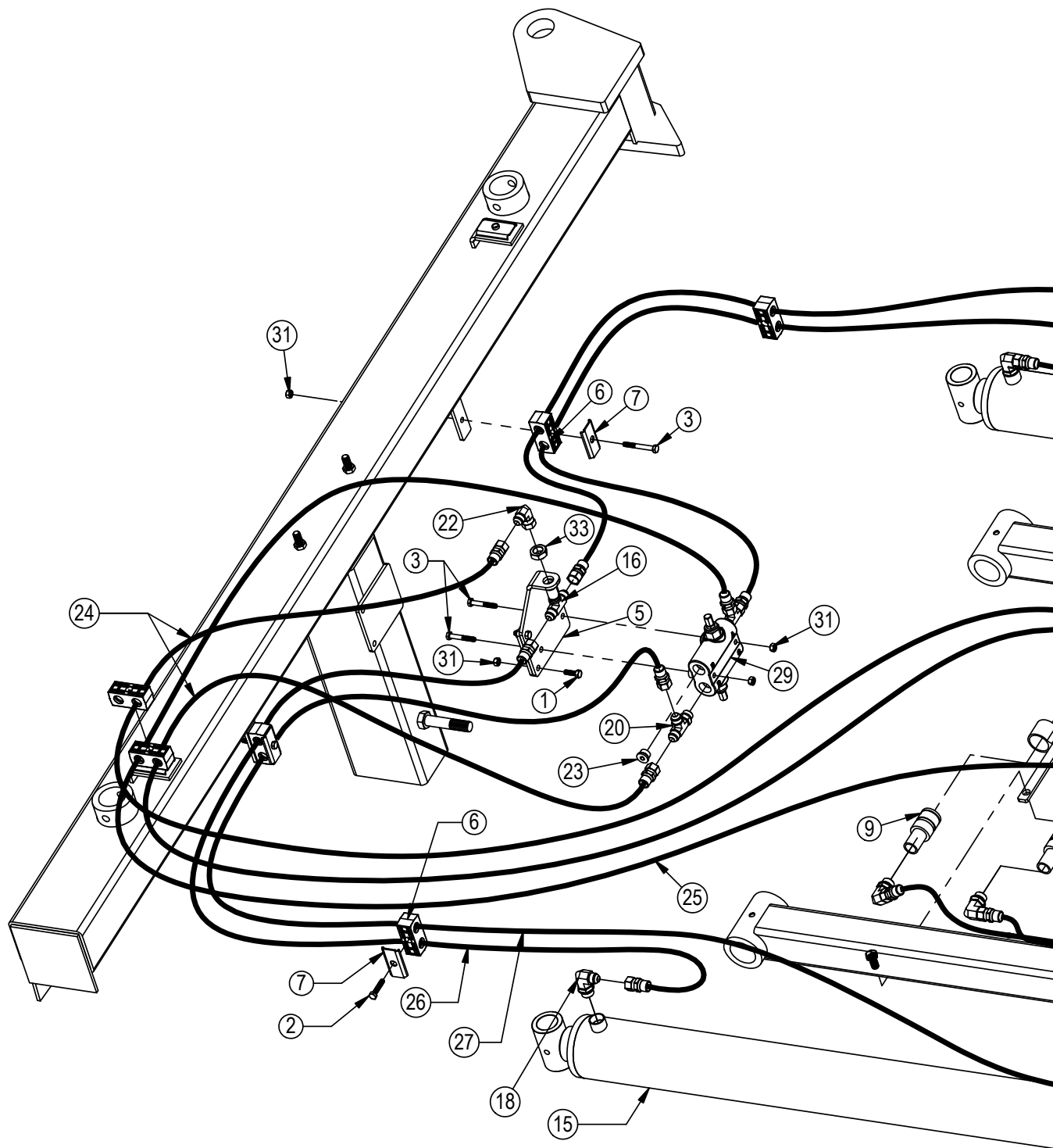
Item No.	Part No.	Description	Configuration	HAHT	HANT
			Qty.	Qty.	Qty.
14*	31-13332	-6 SAE Breather Fitting		1	1
15	31-34040	Straight JIC x O-Ring (6400-8-8)		7	7
16	31-34050	Straight Thread Elbow 90° JIC x O-Ring (6801-8-8)		5	3
17	31-34051	Straight Thread Elbow 90° JIC x O-Ring (6801-8-10)		12	6
18	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

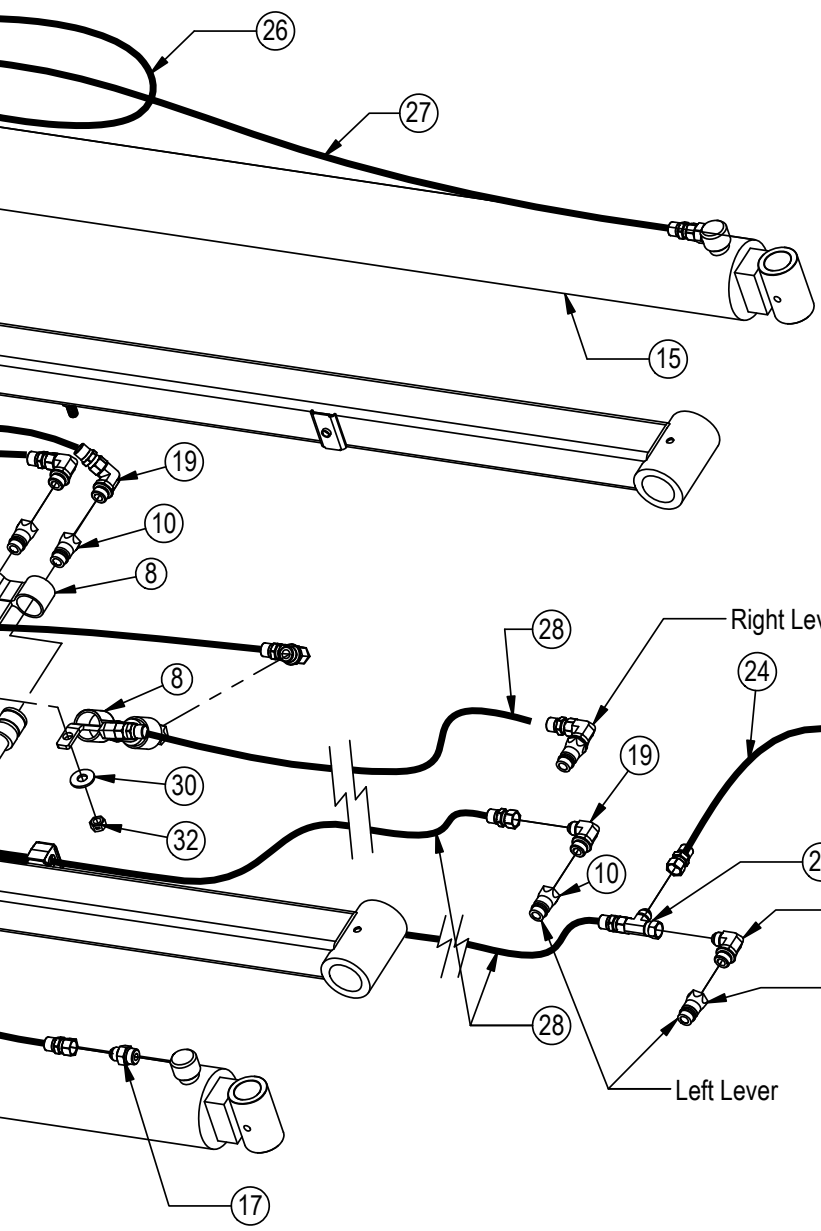
NOTE: When ordering cylinder seal kits, the part number on the cylinder is needed. The number is stamped on the base end of the cylinder opposite of the hydraulic ports.

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

Hydraulic Angle - 2 Lever System Hose Routing

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	6	18-19311-03-P-087	Hose Clamp (TS-CLH-03-P-087)
7	5	18-19312-03	Twin Cover Plate (TS-TCP-03-Z)
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.
See Page 24-27 for Multi-Coupler Option.

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
26-34725	49-12274	Seal Kit 4 x 43.5 (647210) Nitrided Rod

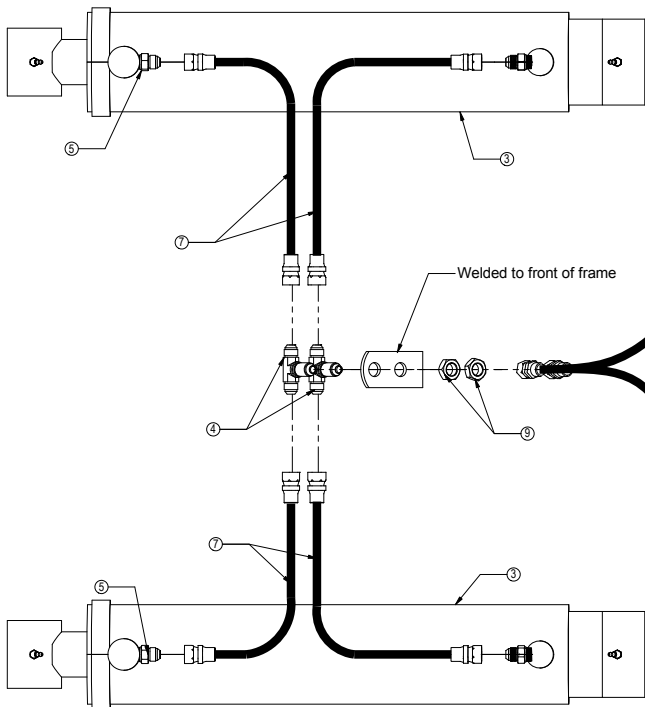
Item No.	Qty.	Part No.	Description
18	2	31-34050	Straight Thread Elbow 90° JIC x O-Ring (6801-8-8)
19	10	31-34051	Straight Thread Elbow 90° JIC x O-Ring (6801-8-10)
20	2	31-34070	Run Tee JIC x O-Ring (6804-8-8)
21	1	31-34090	Swivel Nut Run Tee JIC (6602-8-8-8)
22	1	31-34100	Swivel Nut Elbow 90° JIC (6500-8-8)
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

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.

* Parts Not Shown

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

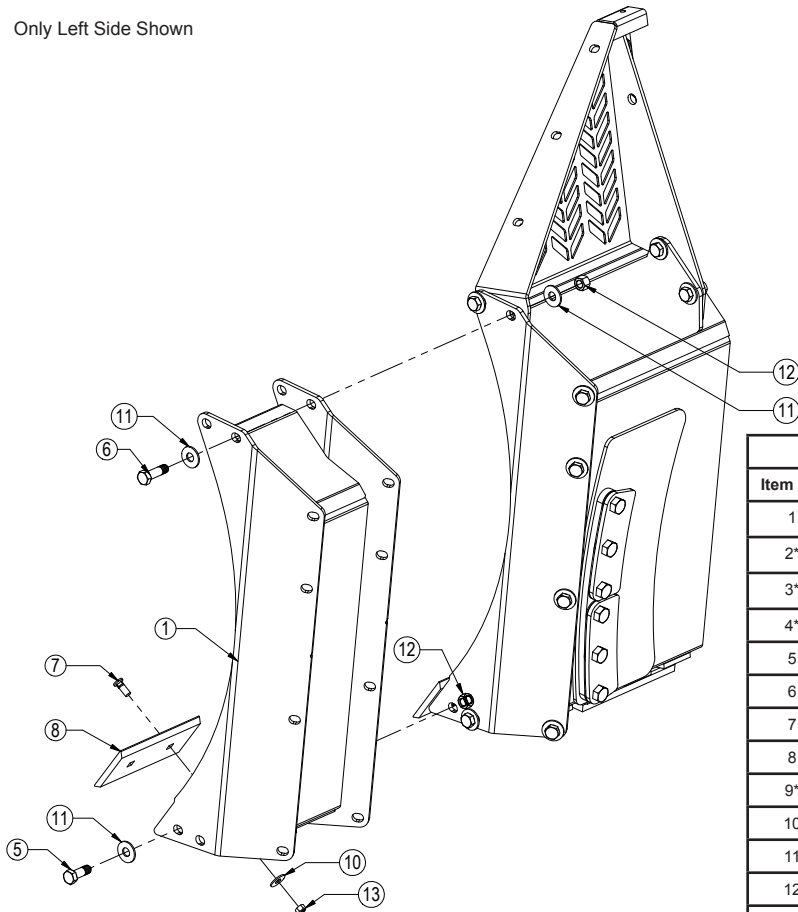
Item No.	Qty.	Part No.	Description
1	2	25-34342	Tappet Quick Coupler Male - Poppet Style
2*	2	25-3457	Pioneer Dust Cap Lift (Orange)
3	2	26-34738	4x20 Long Cylinder - Bushed Tube Ends
4	2	31-34020	Bulkhead Branch Tee JIC (2703-8-8-8)
5	4	31-34040	Straight JIC X O-Ring (6400-8-8)
6	2	31-34051	Straight 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
7C	4	35-30138	87" x 1/2" -8JIC/-8JIC Hose
8	2	35-30160	288" x 1/2" -8JIC/-8JIC Hose
8C	2	35-30157	252" x 1/2" -8JIC/-8JIC Hose
9	2	70-20807	3/4" Hex Jam Nut NF



Item #A for 450
Item #B for 660 Dozer
Item #C for Cat MT 800

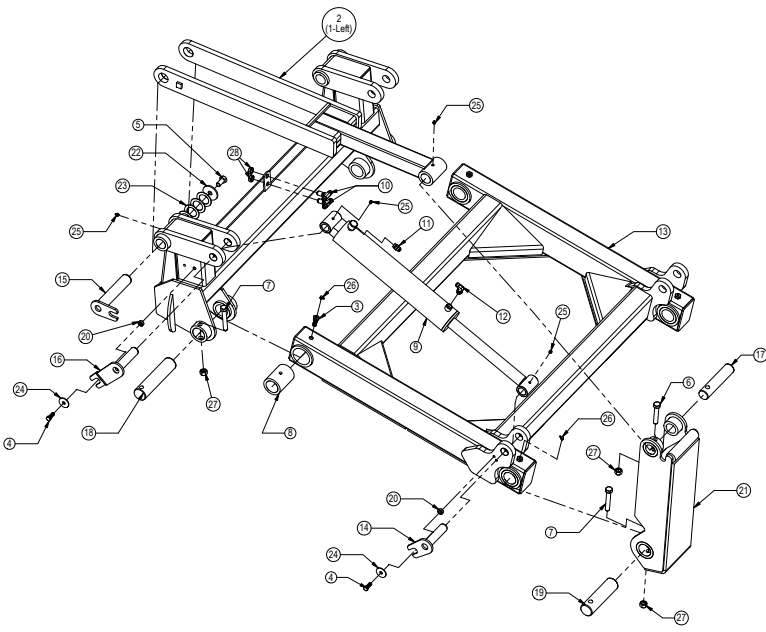
Hoses Not Drawn To Scale

Only Left Side Shown

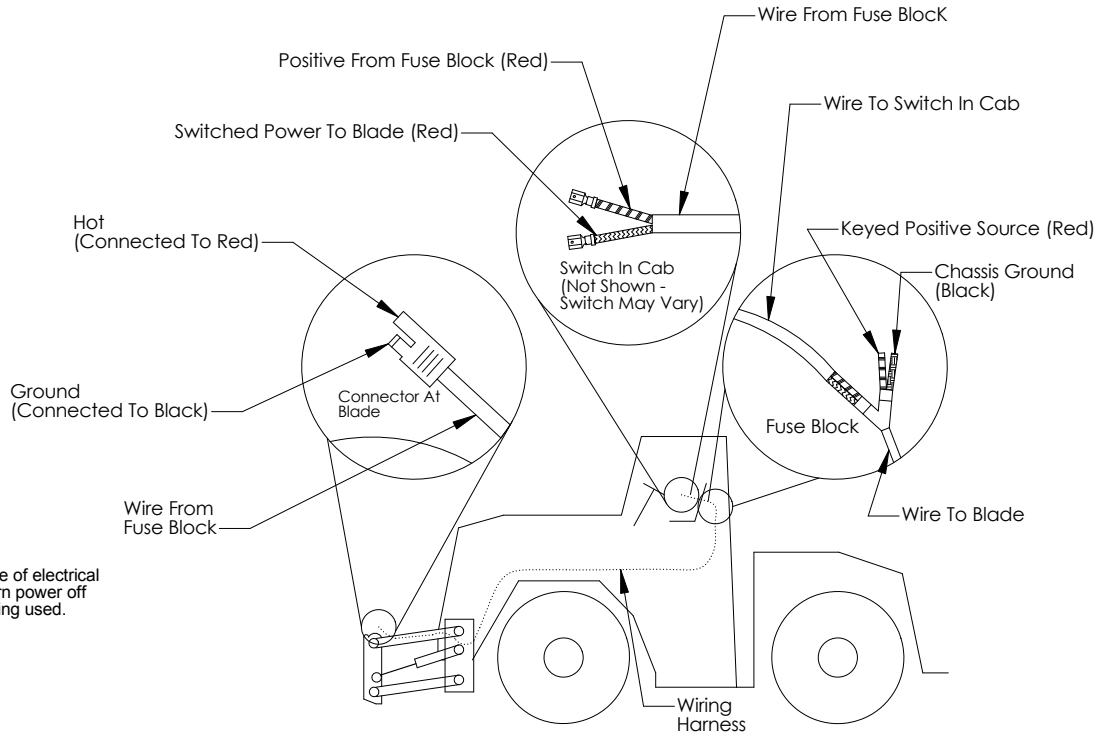


* Parts Not Shown

Item No.	Part No.	Description	End Extension Length	
			1'	2'
			Qty.	Qty.
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	16-21750	3/4" x 2-1/4" Plow Bolt Gr 5 NC	4	8
8	29-11118-1	1'- 3/4" x 8" Double Bevel Cutting Edge	2	-
9*	29-11118-2	2'- 3/4" x 8" 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	70-20647	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

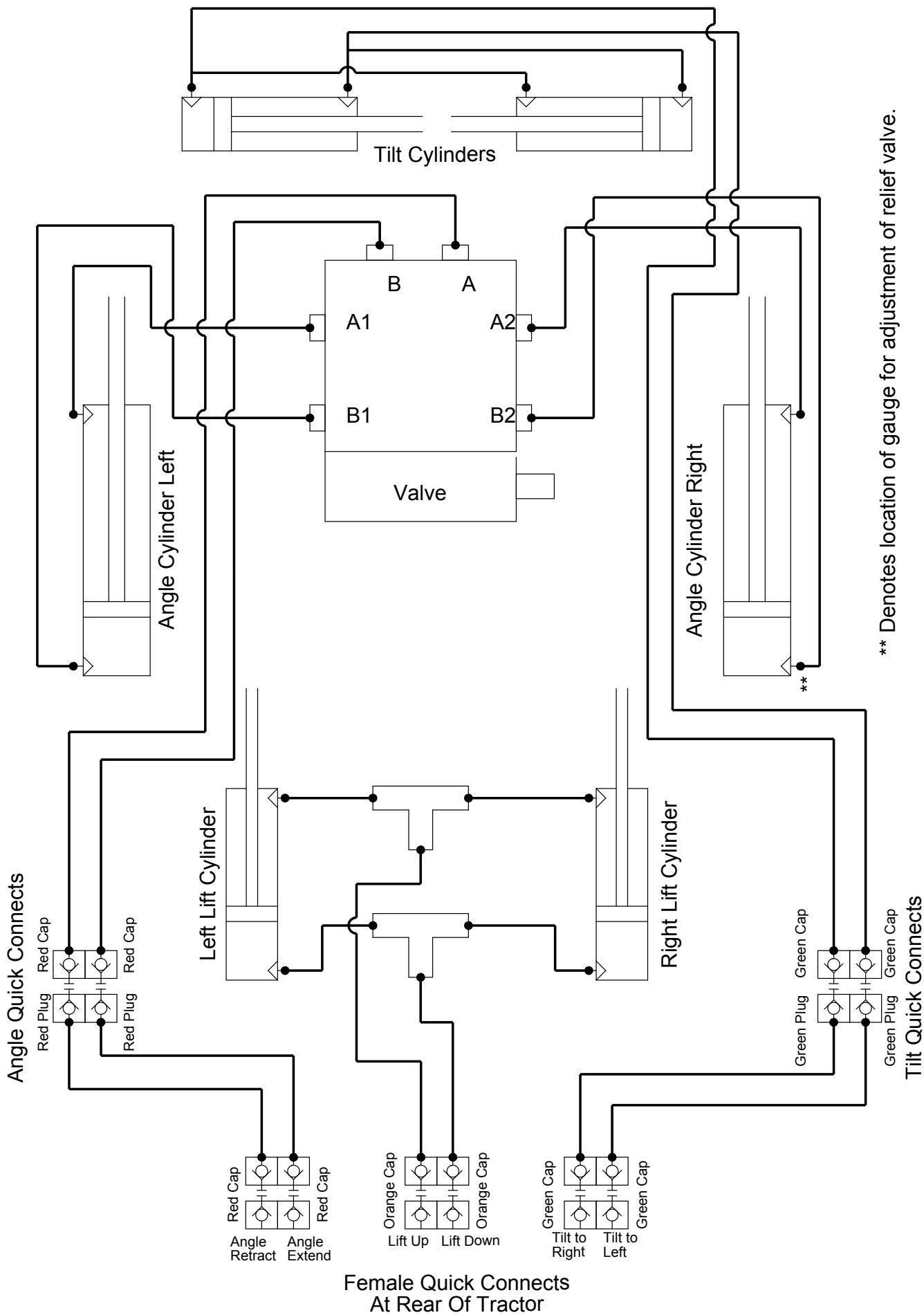


Note: To maximize life of electrical system and valve, turn power off when dozer is not being used.

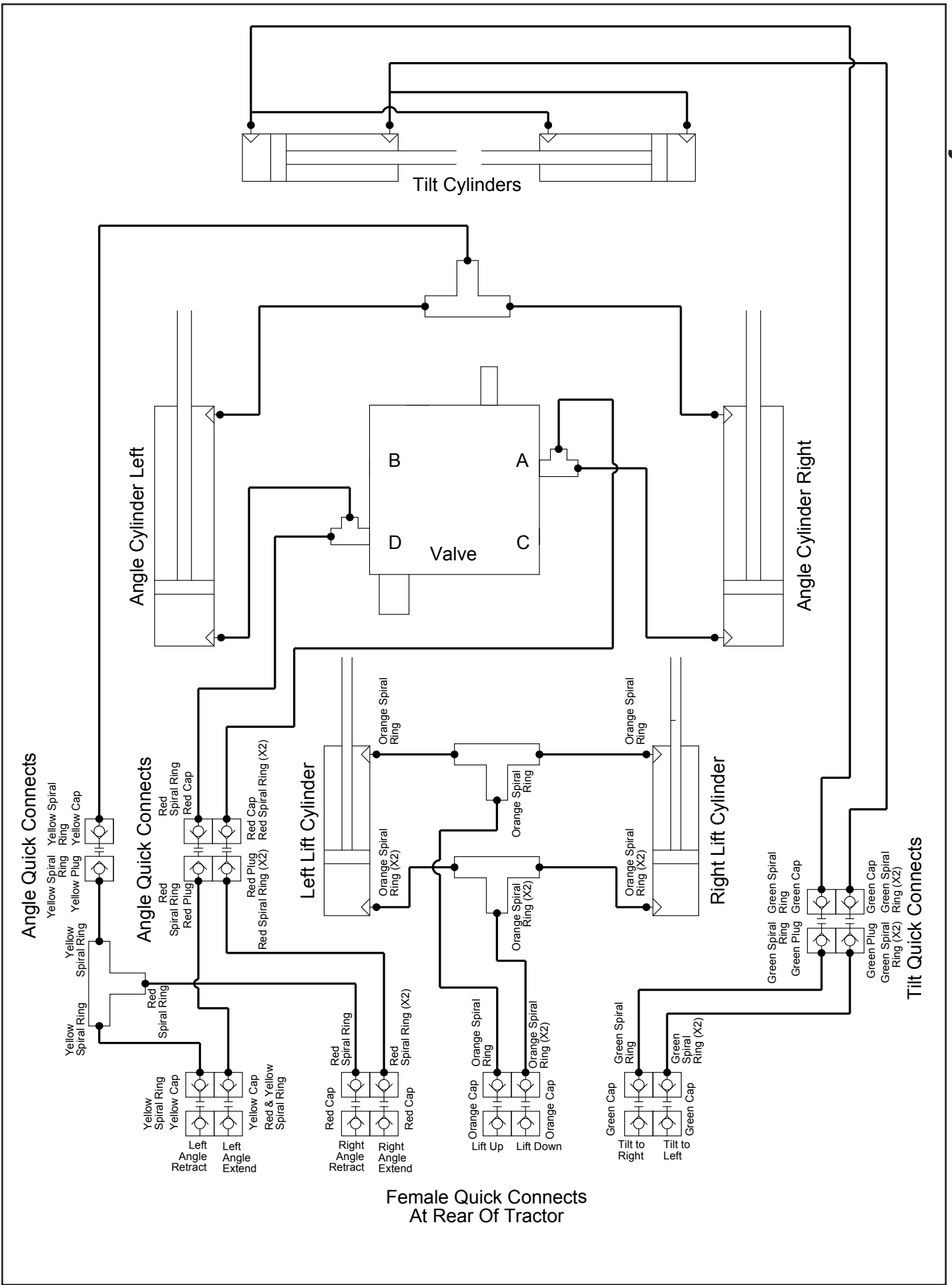
Instructions

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.

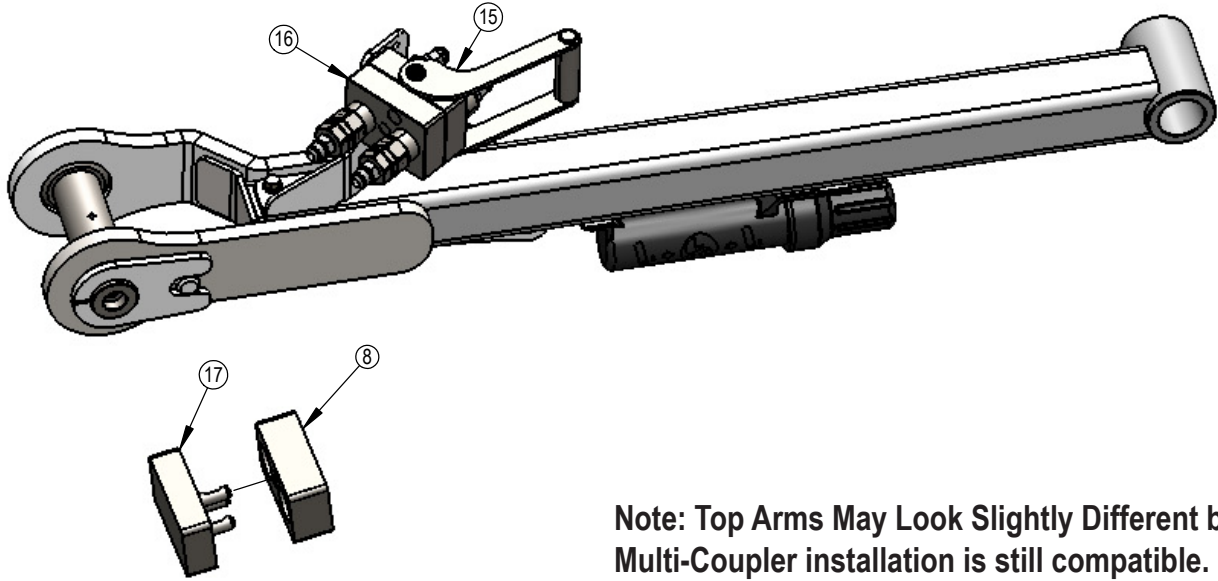




** Denotes location of gauge for adjustment of relief valve.

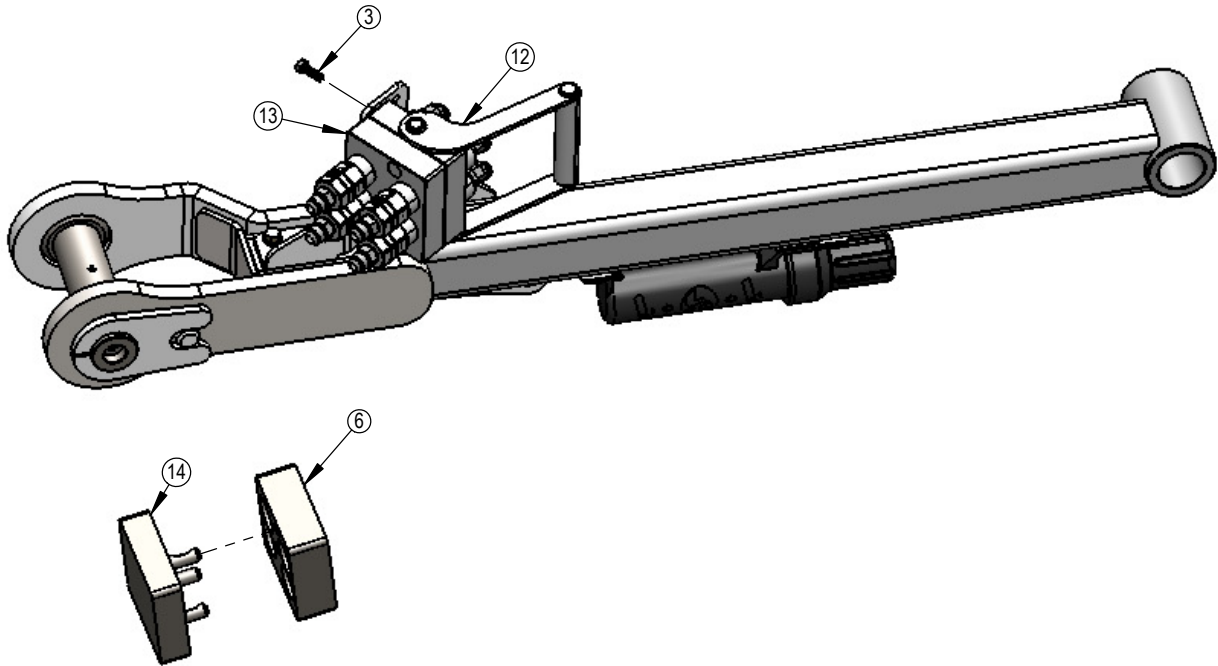


2 Port Multi Coupler - NAHT or HANT Electric

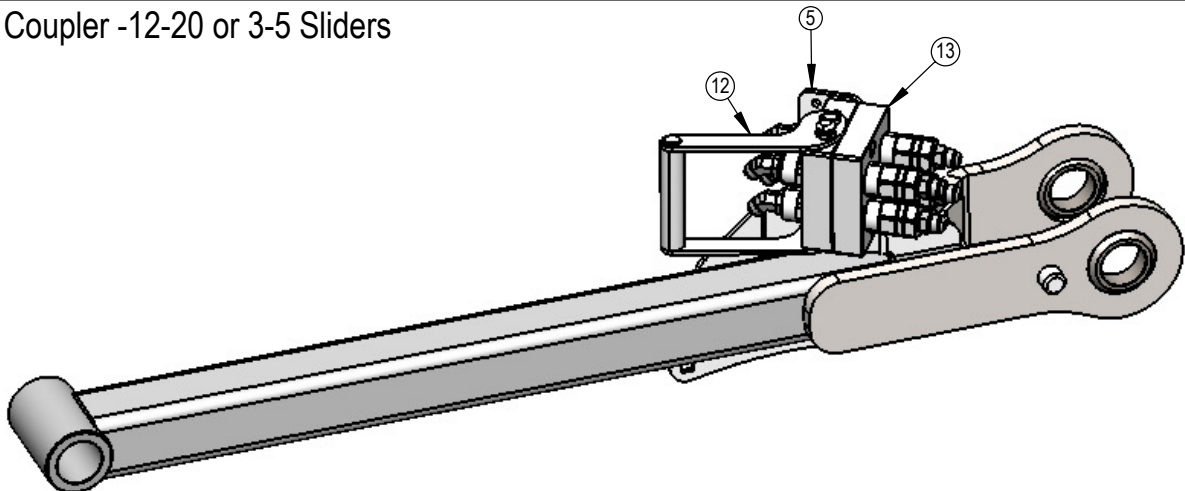


Note: Top Arms May Look Slightly Different but Multi-Coupler installation is still compatible.

4 Port Multi Coupler -HANT 2-Stick or HAHT Electric



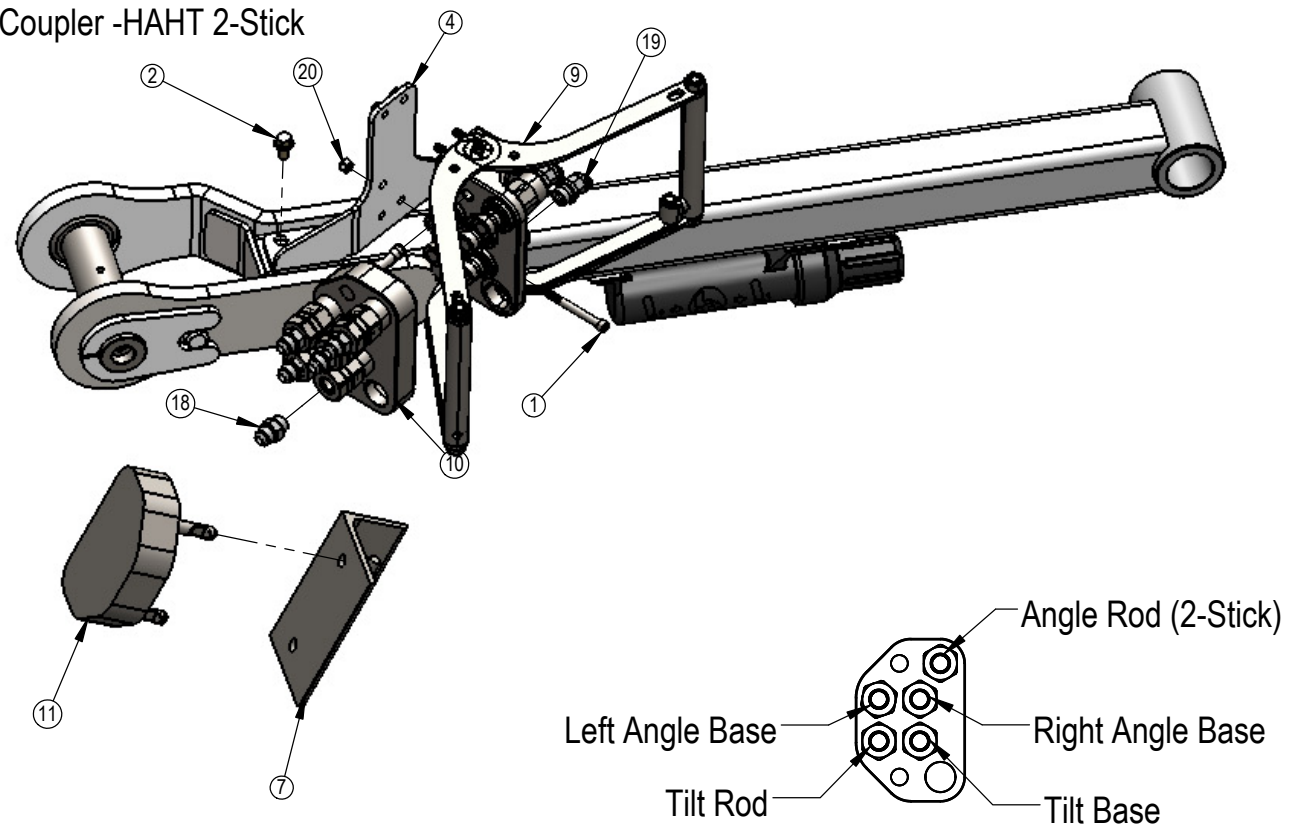
4 Port Multi Coupler -12-20 or 3-5 Sliders



ITEM NO.	PART NO.	HAHT 2-Stick	HANT 2-Stick or HAHT Electric	NAHT or HANT Electric	12-20 or 3-5 Blades	DESCRIPTION
1	16-18957	4	-	-	-	5/16" x 3-1/4" Allen Head Screw
2	16-35C612	3	3	3	3	3/8" x 3/4" Flange Bolt
3	16-812525	-	2	2	2	8mm x 1.25mm x 25mm Metric Hex Bolt Gr 10.9
4	18-18430R1	1	1	1	-	Quick Coupler Mount
5	18-18514	-	-	-	1	Quick Coupler Mount
6	25-18956	-	1	-	1	Multi-Coupling Plate - 4 Port Parking Station
7	25-18961	1	-	-	-	Multi-Coupling Plate - 5/6 Port Parking Station
8	25-19657	-	-	1	-	Multi-Coupling Plate - 2 Port Parking Station
9	25-19861	1	-	-	-	Multi-Coupling Plate - 5 Port - Fixed
10	25-19862	1	-	-	-	Multi-Coupling Plate - 5 Port - Mobile
11	25-19863	1	-	-	-	Multi-Coupling Plate - 5 Port - Cap
12	25-19864	-	1	-	1	Multi-Coupling Plate - 4 Port Fixed
13	25-19866	-	1	-	1	Multi-Coupling Plate - 4 Port Mobile
14	25-19867	-	1	-	1	Multi-Coupling Plate - 4 Port - Cap
15	25-19868	-	-	1	-	Multi-Coupling Plate - 2 Port - Fixed
16	25-19869	-	-	1	-	Multi-Coupling Plate - 2 Port - Mobile
17	25-19871	-	-	1	-	Multi-Coupling Plate - 2 Port - Cap
18	31-34040	5	4	2	4	Straight JIC x O-Ring
19	31-34150	5	4	2	4	Straight Thread Elbow 45° JIC x O-Ring (6802-8-8)
20	70-20611	4	-	-	-	5/16" Nyloc Hex Nut Gr 5 NC

1. Parking Stations are located on the angle frames or blades. Place the Cap in the Parking Stations when blade is in use. When disconnecting the blade, place the Cover on the Fixed Multi-Coupler and the Mobile Multi-Coupler in the Parking Station.
2. Apply a heavy duty silicone spray lubricant to pins to protect from corrosion.

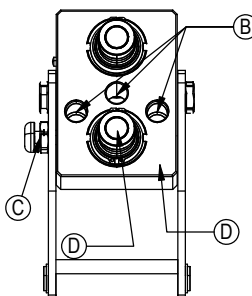
5 Port Multi Coupler -HAHT 2-Stick



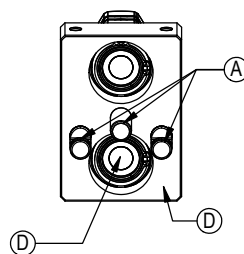
Before Each Use:

1. Disconnect the mobile half from the parking station and the cap from the fixed half.
2. Check that there is no contamination (salt, sand, dirt, etc.):
 - A. On the pins.
 - B. Inside the cam.
 - C. In the locking mechanism area.
 - D. On the face of the plates and couplings.
3. In case of contamination, remove it with a cloth and/or compressed air.
4. Check that there is still a lubricant/anti-corrosion (grease or silicone - see Note 1):
 - A. On the pins.
 - B. Inside the cam.
 - C. In the locking mechanism area.
5. Connect the mobile and fixed halves together.

Fixed Half



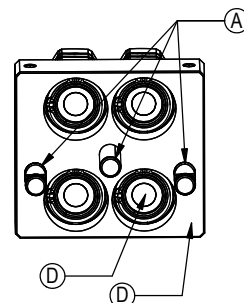
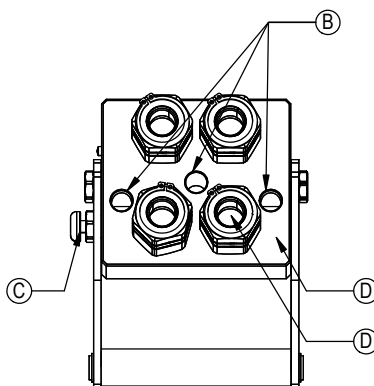
Mobile Half



After Each Use:

1. Disconnect the mobile half from the fixed half.
2. Clean all contamination (salt, sand, dirt, etc.) from the following areas:
 - A. On the pins.
 - B. Inside the cam.
 - C. In the locking mechanism area.
 - D. On the face of the plates and couplings.

*Use a cloth or compressed air. It is advised to not use water to clean these surfaces
3. Apply a lubricant/anti-corrosion (grease or silicone - see Note 1):
 - A. On the pins.
 - B. Inside the cam.
 - C. In the locking mechanism area.
4. Connect the cap to the fixed half and the mobile half to the parking station.

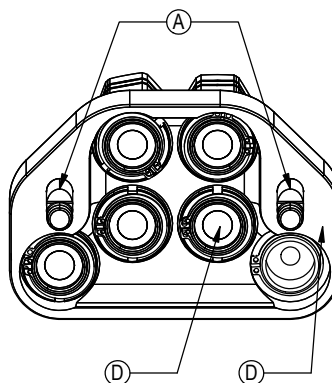
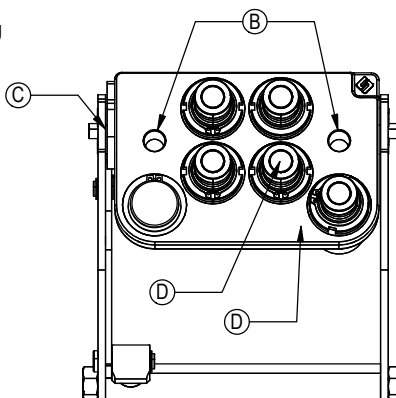


Note 1:

When sand and salt are present, or the plates under go a washdown, a heavy duty silicone spray lubricant should be used to replace grease from the factory. The lubricant should help protect from corrosion without collecting dust and contaminants, and will resist washing off when exposed to water.

Recommended Lubricant Brands:

Fluid Film (Aerosol or Non-Aerosol), LPS-2 Heavy Duty Lubricant, or CRC 3-36.



Cleaning The Male Interface Seal:



1. Make sure the coupling is securely fastened into the plate or place in a vice.
2. Using a blunt, non-marring tool, depress the valve face until the seal is exposed. Insert a bent metal wire between the valve face and the body of the coupling. Use caution not to damage or scratch the seal when inserting the wire.
3. Inspect the seal and interior surfaces for contamination.
4. In case of contamination, carefully wipe surfaces with a soft cloth, or use compressed air to blow the contamination out. Do Not press hard on the seal as contamination can scratch the seal surface.
5. Using a non-marring tool, depress the valve face and remove the metal wire. Release the valve to the flush position.

Cleaning The Female Bushing:



1. Make sure the coupling is securely fastened into the plate or place in a vice.
2. Using a non-marring tool, depress the outer ring to expose the bushing. There is no need to expose the valve seal, so stop pressing before the valve is opened.
3. Inspect the interior body and bushing surfaces for contamination.
4. In case of contamination, carefully wipe surfaces with a soft cloth, or use compressed air to blow the contamination out.
5. Release the outer ring so that it returns to the flush position.

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.

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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 two years. If such equipment is found to be defective within two years, 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.

