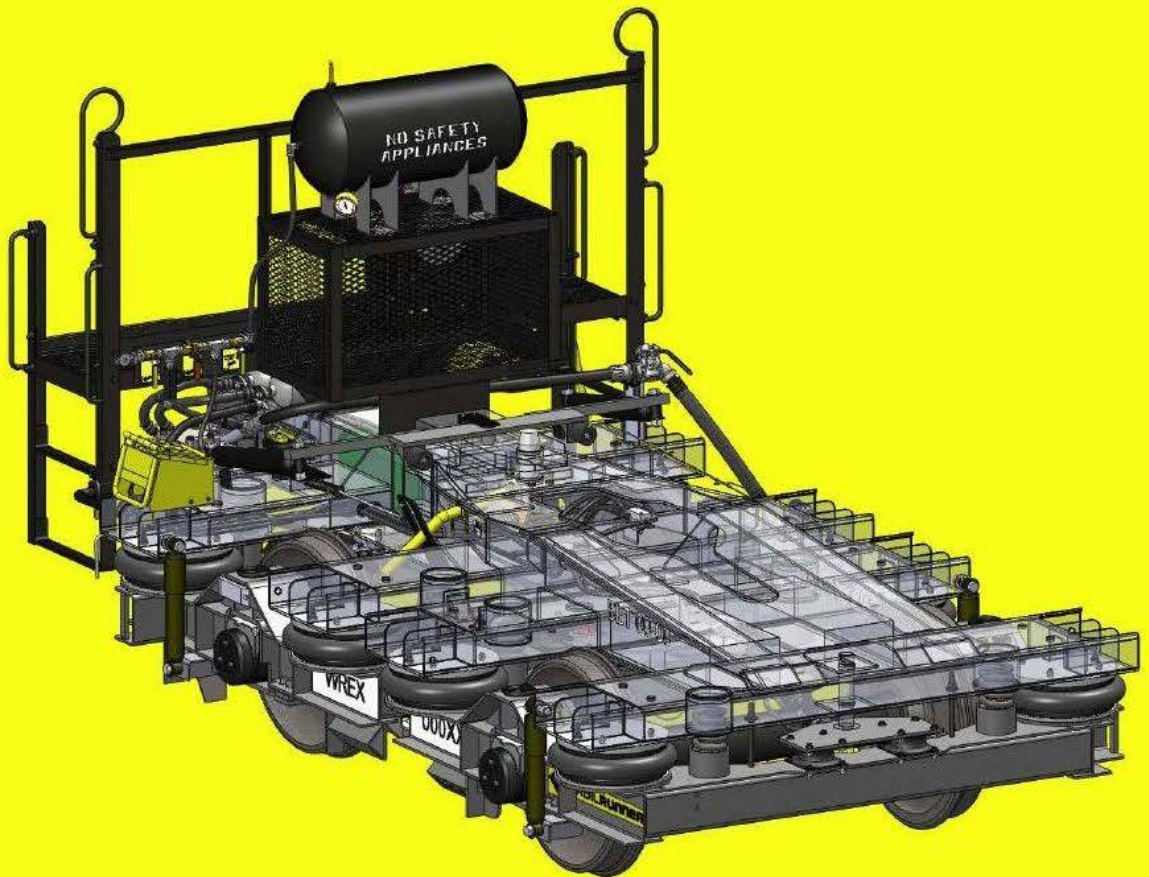




Maintenance and Repair Manual



Document no:	M0003			
Revision	Date	Author	Approved	Remarks
1	07/11/2009	Mike DiLuigi	Wolfgang Graaff	
2	11/30/2017	Gelu Ciucă	John Grube	Updated address, manual no

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1. SAFETY

1.1 Safety Alert Symbol and Signal Words

This Owner's Manual covers Transition Units and Intermediate Units produced by Rail Runner. Before repairing or servicing any Rail Runner equipment, you must read, understand and follow the instructions and safety warnings in this manual.

The safety information in this manual is denoted by the safety alert symbol: **^**

The level of risk is indicated by the following signal words.

^ DANGER

DANGER – Indicates a hazardous situation, which, if not avoided, will result in death or serious injury.

^ WARNING

WARNING – Indicates a hazardous situation, which, if not avoided, could result in death or serious injury.

^ CAUTION

CAUTION – Indicates a hazardous situation, which, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE – Indicates a situation that could result in damage to the equipment or other property.

1.2 Hazards

1.2.1 Personal Protective Equipment

Required personal protective equipment:

- Steel toe work boots
- Safety glasses
- Hard hat
- Reflective vest

1.2.2 Center Pin Removal

The lower frames must be supported with properly rated and placed stands before removing the center pin.

^ WARNING

Risk of serious injury or death.

The lower frames will drop when center pin is removed.

Use an adequate lifting devices and support stands prevent lower frames from dropping.

1.2.3 Train Line/Brake Line Pressure Relief

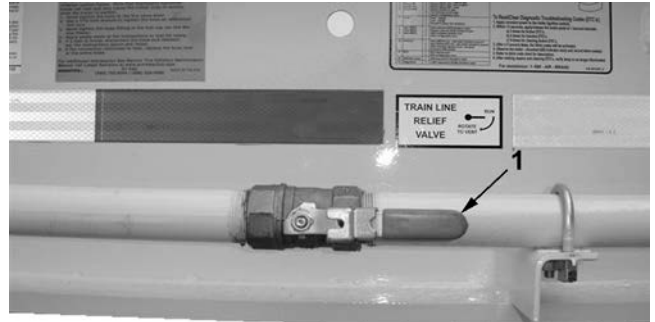
Relieve air pressure by opening a valve before performing maintenance and service work.

^ WARNING

Flying debris hazard.

Relieve air pressure before performing any service work.

RailRunner chassis are equipped with a vent valve to relieve train line brake pipe pressure. The train line brake pipe pressure must be vented prior to disconnecting the train line hoses.



1.2.4 Raising or Lifting Equipment

Be certain that the lifting devices you are using are rated for the weight you are lifting. Never enter the area under a raise unit. You may be crushed if the item falls.

^ WARNING

Risk of serious injury or death.

Use an adequate lifting device or devices to raise and move unit.

If using a forklift, it must be rated for 35,000 lbs. to carry TU or IU bogie.

Never enter the area under the raised equipment.

If two or more people are used for the function, use radio head sets to coordinate movement.

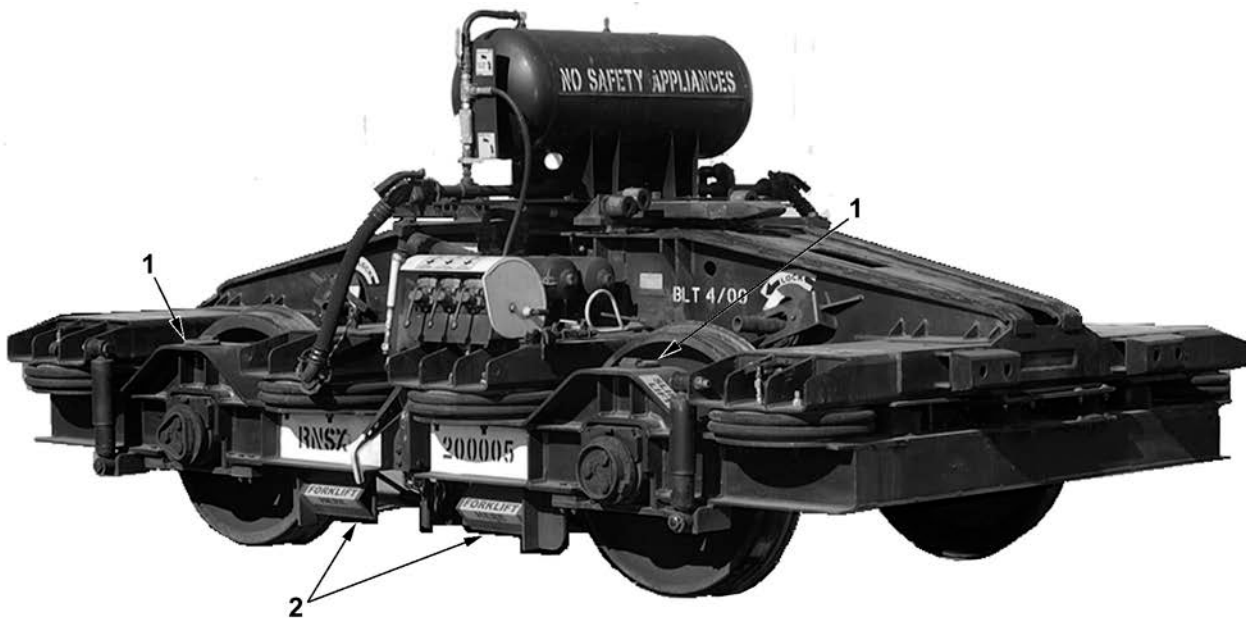


Weight of the units:

- Intermediate – 15,000 lbs.
- Intermediate Upper Frame – 10,000 lbs.
- Transition – 18,500 lbs.
- Transition Upper Frame – 13,500 lbs.

Safety

The chassis is equipped with two “D” rings (1) on each side for over head crane lifting and fork lift pockets (2) on lower frame.



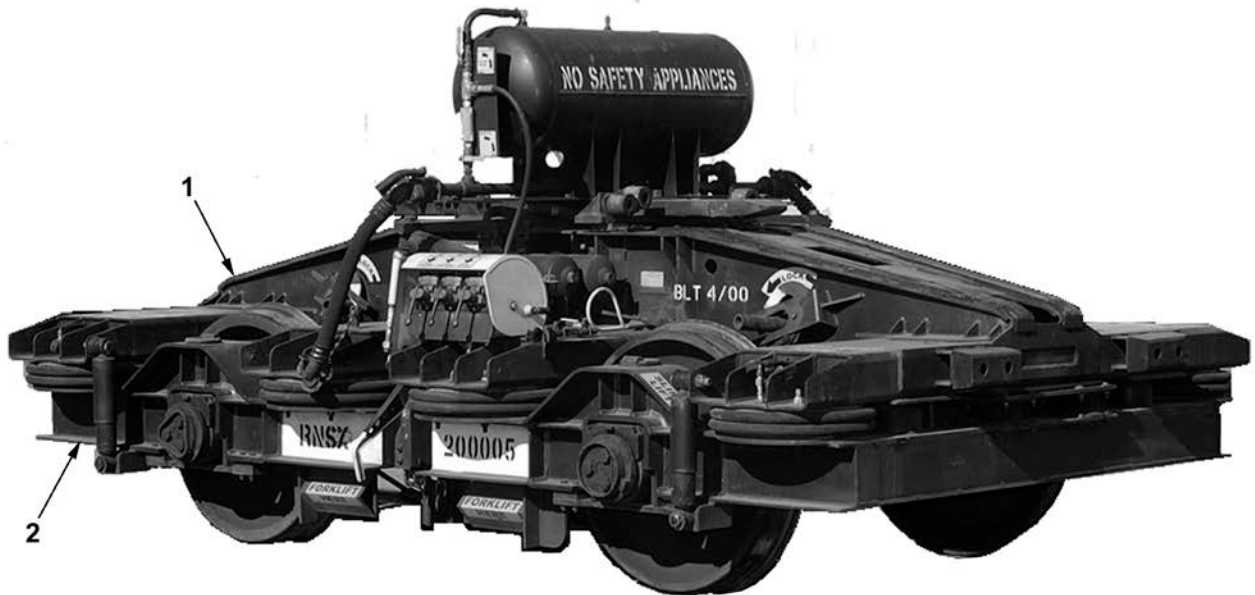
1.3 Hazards from Modifying Equipment

Before making any alteration to your Rail Runner Transition Unit or Intermediate Unit, contact Rail Runner and describe the alteration you are contemplating. **You must have permission from Rail Runner before performing any alterations to the equipment. Altering may cause your equipment to be unsafe and may void the manufacturers' warranty.**

2. SEPARATE FRAMES

2.1 Component Identification

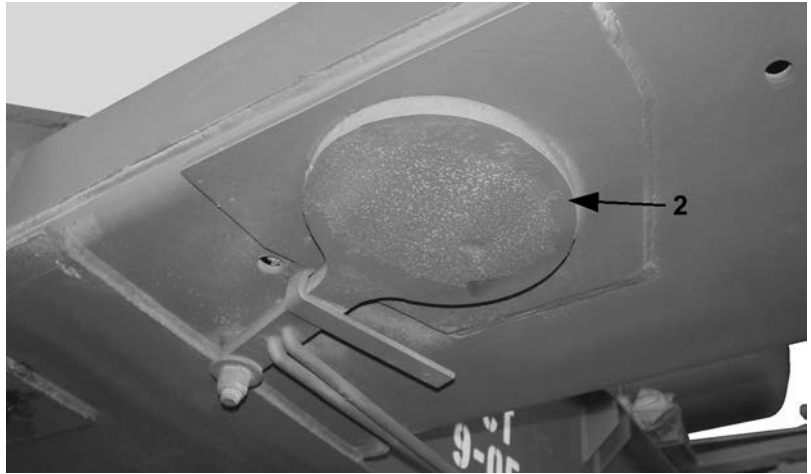
Note: To remove the upper unit from the transition unit, you must first remove the crossover platform (3), then follow the steps in section 2.2.



- 1 – Upper Frame
- 2 – Lower Frame
- 3 – Crossover Platform

2.2 Remove Upper Frame

1. Park the unit on a flat surface and block all wheels.
2. Open the control box cover and push the raise/lower valve (1) to fully raise the upper frame.



3. Verify that all four paddles (2) on bottom of the upper frame are covering the coil spring wells.

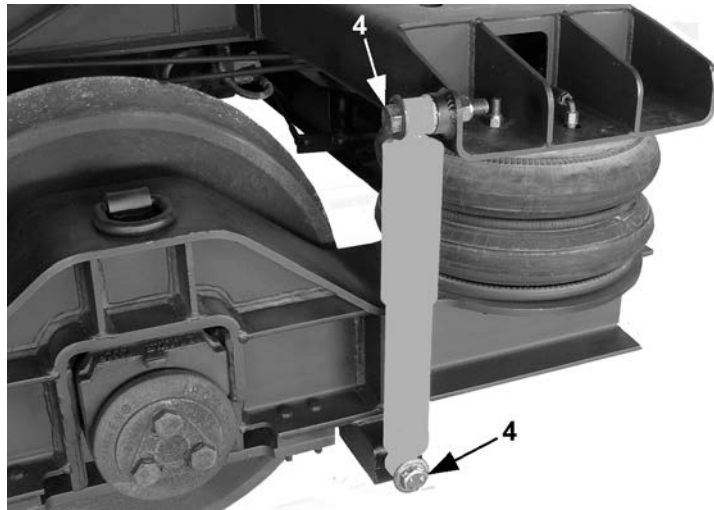


4. Pull the raise/lower valve (1) to lower the upper frame. The coil springs will now be supporting the upper frame.
5. Open drain valve (3) to drain air system.

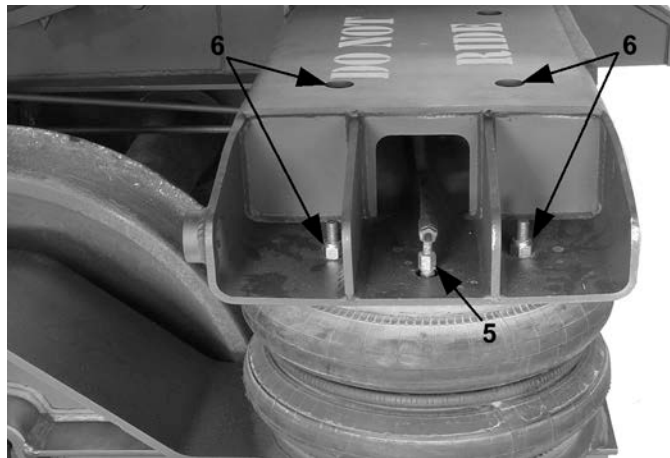


Separate Frames

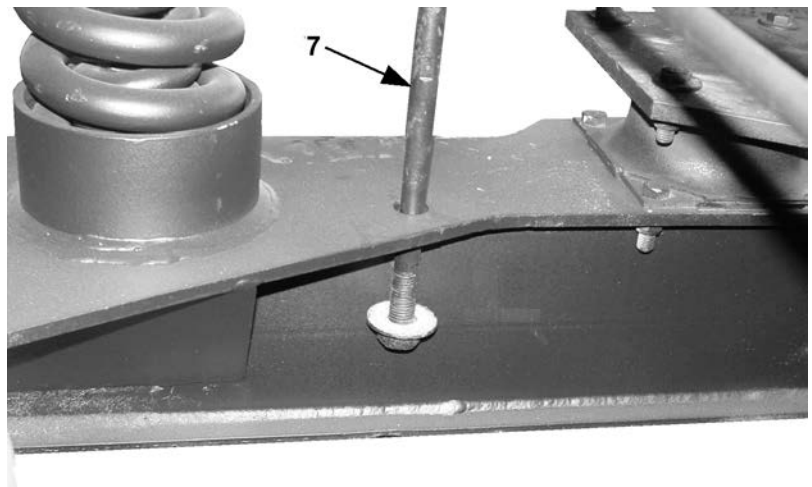
6. Remove cap screws (4), washers and lock nuts from each shock absorber. Remove all four shock absorbers.



7. Remove air line (5) from air suspension studs.
8. Remove four lock nuts (6) from air suspension studs. Repeat steps 7 and 8 for the other seven air suspension springs.

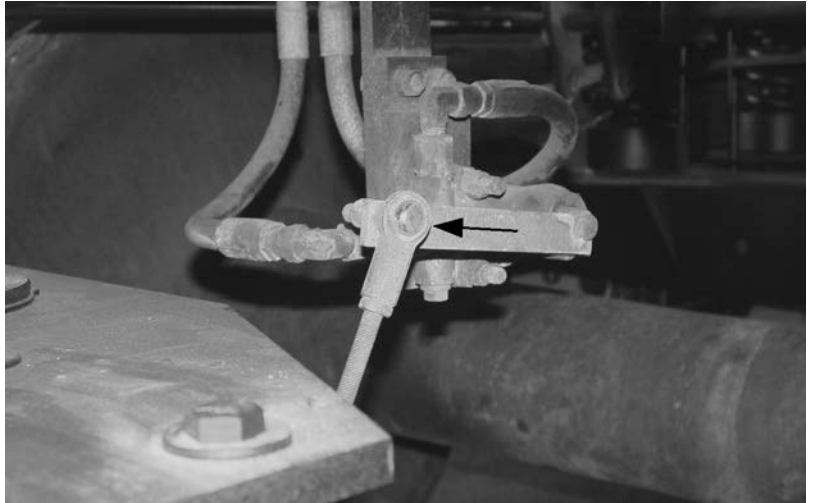


9. Remove the eight over extension rods (7).
10. Disconnect all air hoses that run from the upper frame to the lower frame.



Separate Frames

11. Disconnect leveling valve lower linkage from both leveling valves.



12. Support lower frames with a floor jack. Use the jack to keep the lower frames level while the upper frame is removed.



^ WARNING

Risk of serious injury or death.

The weight of the intermediate unit upper frame is 10,000 lbs.

The weight of the transition unit upper frame is 13,500 lbs.

Use an adequate lifting device or devices to raise and move unit.

Never enter the area under the raised equipment.

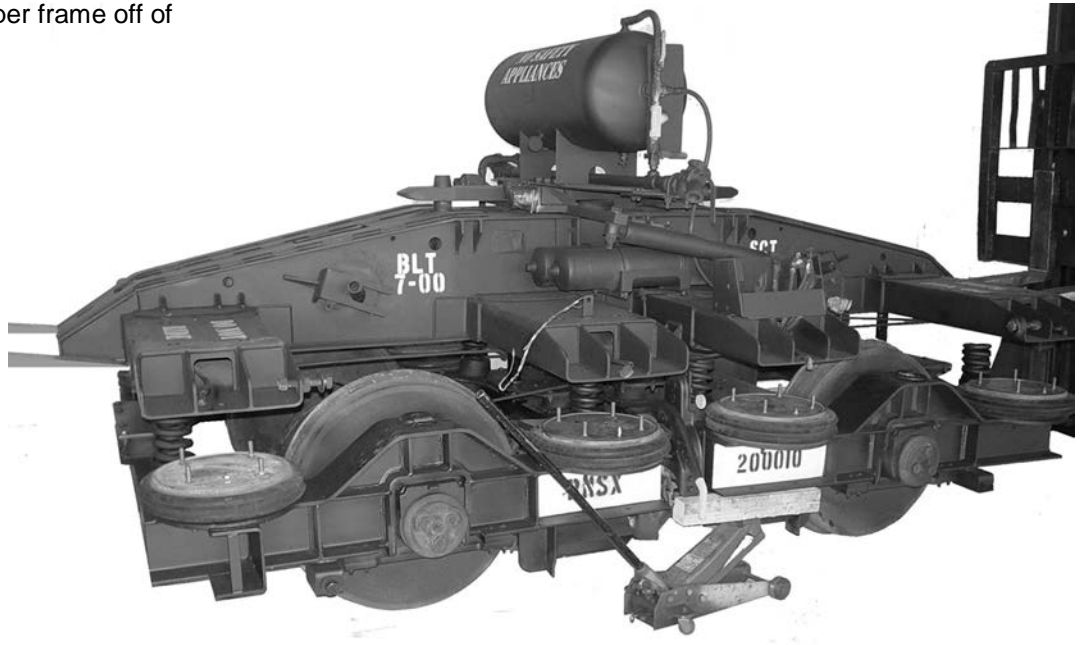
If two or more people are used for the function, use radio head sets to coordinate movement.

•

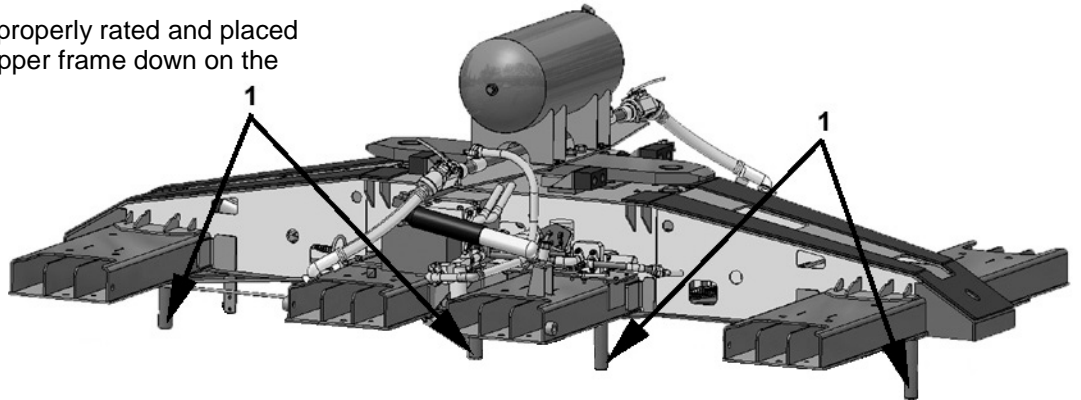


Separate Frames

13. Carefully raise the upper frame off of the lower frames.

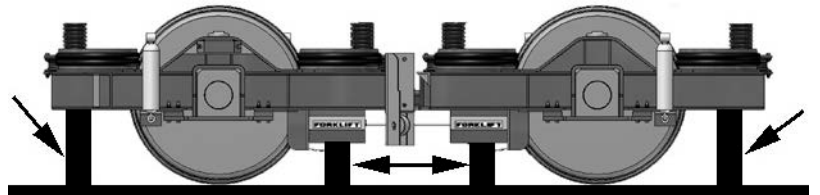


14. Set the upper frame on properly rated and placed stands. Do not set the upper frame down on the four steering pins (1).



2.3 Separate Lower Frames

1. Place eight properly rated stands under the corners of each lower frame.



Separate Frames

2. Remove self locking cotter pins (1) from brake beam pivot pins on secondary brake beam.

Note: View of cotter pins taken from the underside of the beam.



3. Remove pin (2) from both secondary brake push rods.

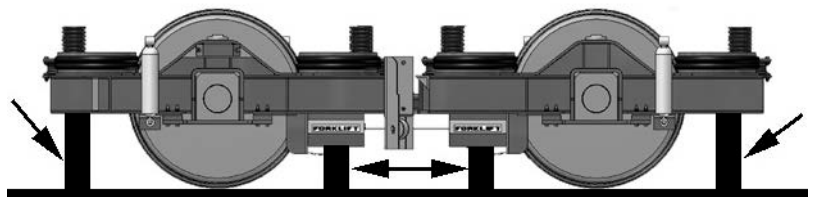


^ WARNING

Risk of serious injury or death.

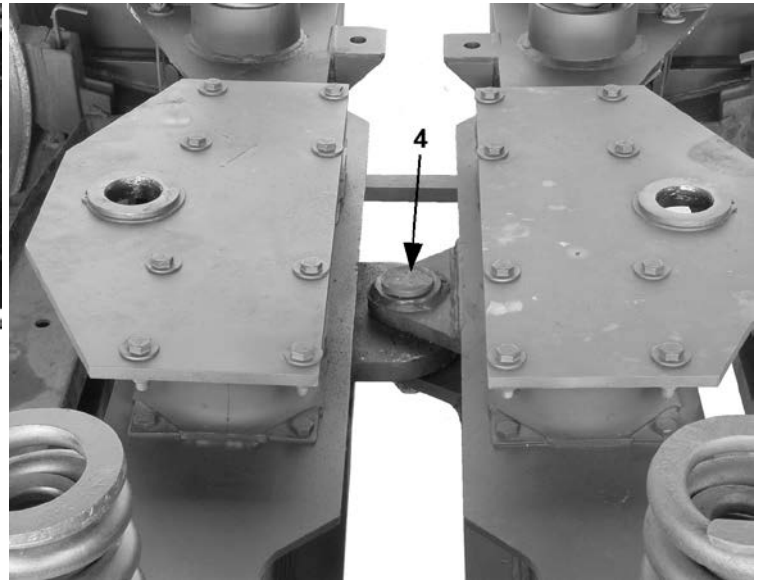
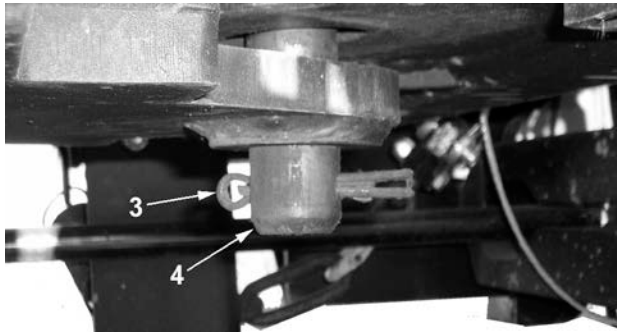
The lower frames will drop when center pin is removed.

Use an adequate lifting devices and support stands to prevent lower frames from dropping.

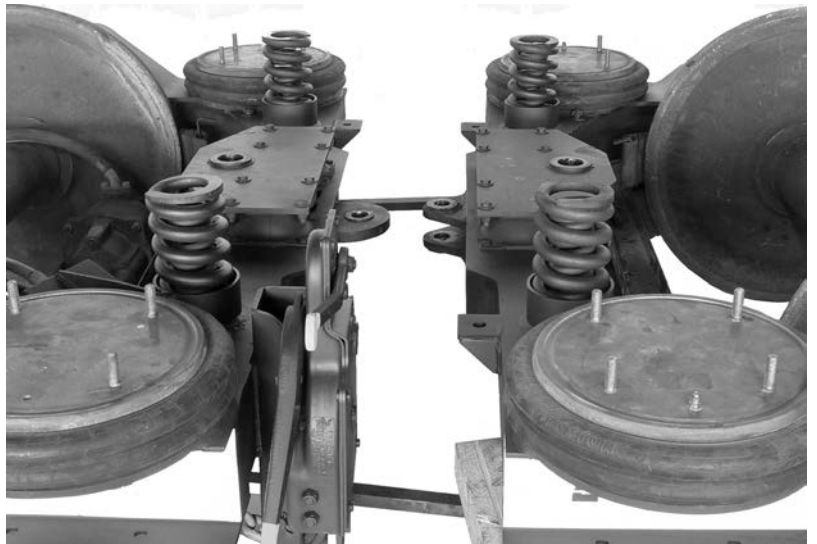


Separate Frames

- Level lower frames with lifting devices and support with properly rated and placed stands. Remove cotter pin (3) from bottom of center pin (4). Remove center pin (4)



- Separate lower frames.
- See **Section 3** for component disassembly and repair.



3. COMPONENT DISASSEMBLY AND REPAIR

3.1 Lower Frame Components

3.1.1 Lower Frame Inspection

1. Inspect the following components on the lower frames for damage, wear and broken parts:

- Air Suspension
- Coil Springs
- Brakes
- Frame Members
- Bushings
- Leveling Valve Linkages

Replace any damaged, worn or broken parts.

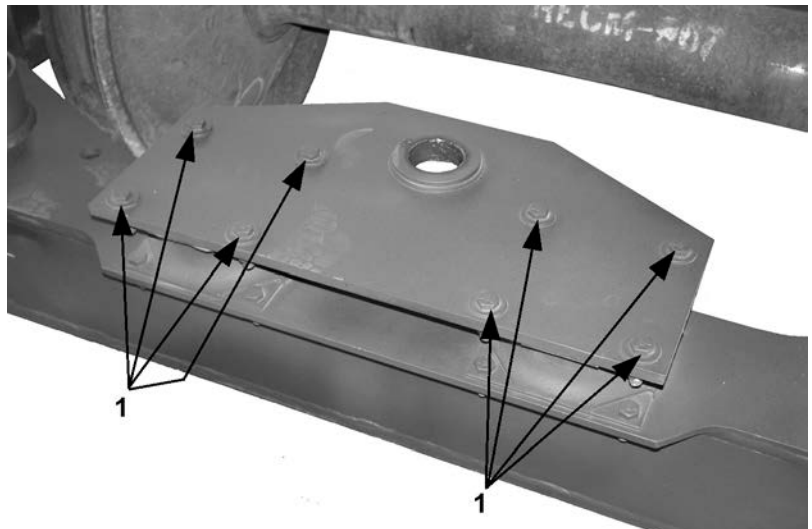
Note: Refer to General Arrangement and sub-assembly drawings located on back pages of manual when identifying replacement parts. Replace any damaged, worn or broken parts.

3.1.2 Shear Pad Plates

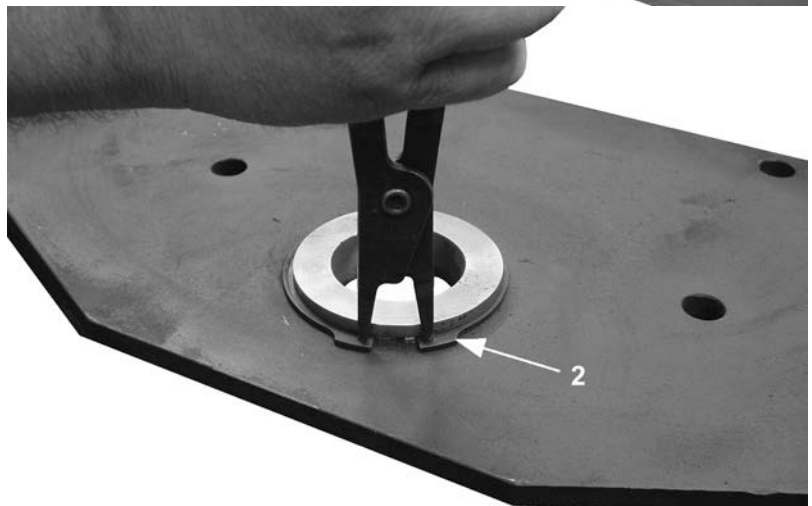
1. Remove upper frame. See section 2.

2. Separate lower frames. See section 2.

3. Remove eight 1/2 x 1-1/4" cap screws (1), lock nuts and washers and remove shear plate.

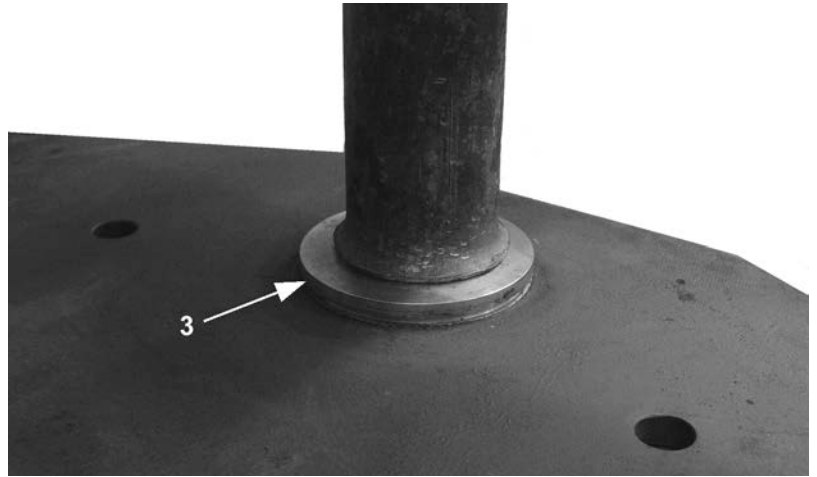


4. Remove snap ring (2) from bushing.

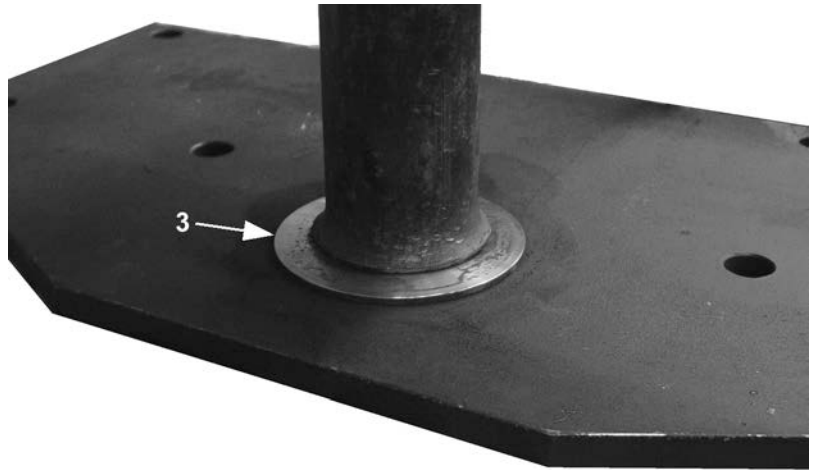


Component Disassembly And Repair

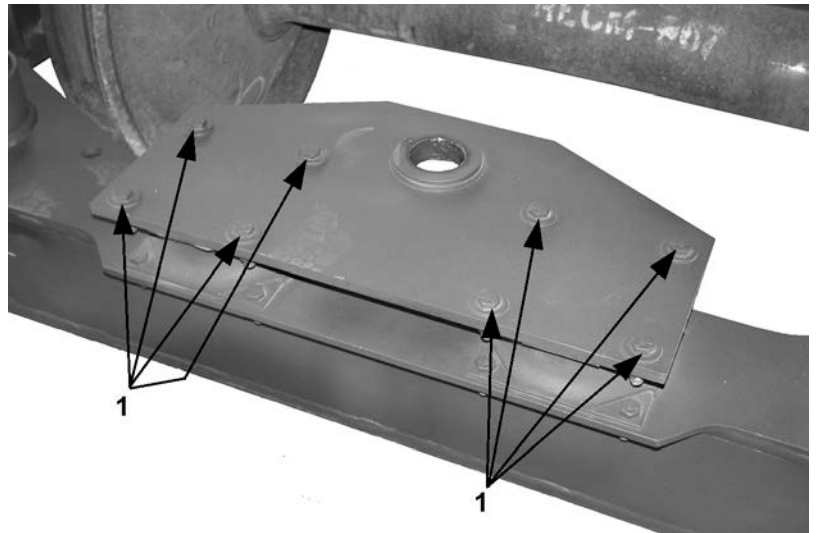
5. Press the bushing (3) out of the shear plate from the snap ring side.



6. Clean and inspect shear plate for damage. Replace if damaged.
7. Press new bushing (3) into shear plate until bushing bottoms out against plate.

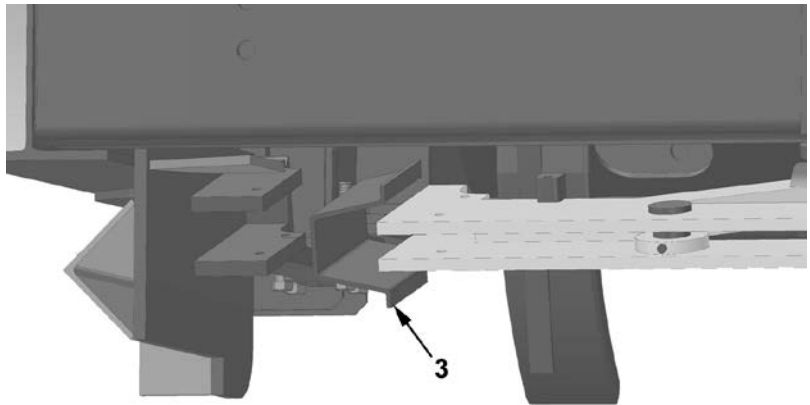
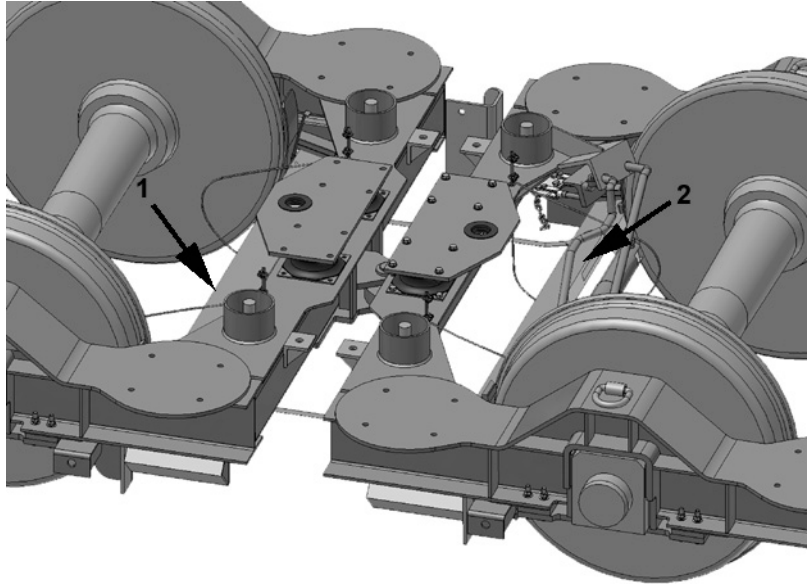


8. Install shear plate and attach with eight 1/2 x 1-1/4" grade five cap screws (1), lock nuts and washers. Tighten cap screws to XX lb-ft of torque.
9. Repeat steps 1-9 for other three shear plates.
10. Assemble lower frames. See **Section 4**.
11. Install upper frame. See **Section 4**.



3.1.3 Brake Beams

1. Remove secondary brake beam (1) from lower frame.
2. Disconnect air lines and remove primary brake beam (2) from lower frame.
3. Inspect brake beams, pins and brake shoes for damage or wear. Replace any damaged or worn parts. Install new beam pocket wear liners (3).
4. Install primary brake beam (2) into lower frame. Connect air lines.
5. Install secondary brake beam (1) into lower frame.



View from Under Unit

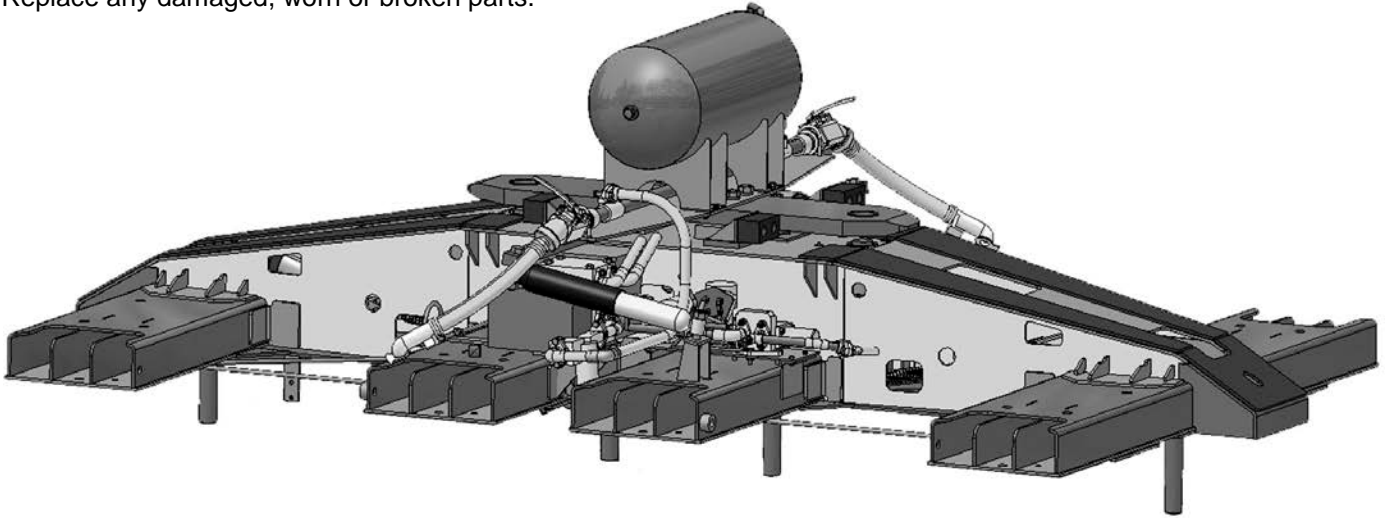
3.2 Upper Frame Components

3.2.1 Upper Frame Inspection

1. Inspect the following components on the upper frame for damage, wear and broken parts:

- Air Hoses and Lines
- Coil Spring Paddles and Linkages
- Frame Members
- Steering Pins
- Lock Pin Linkages
- Leveling Valve and Linkages

Replace any damaged, worn or broken parts.



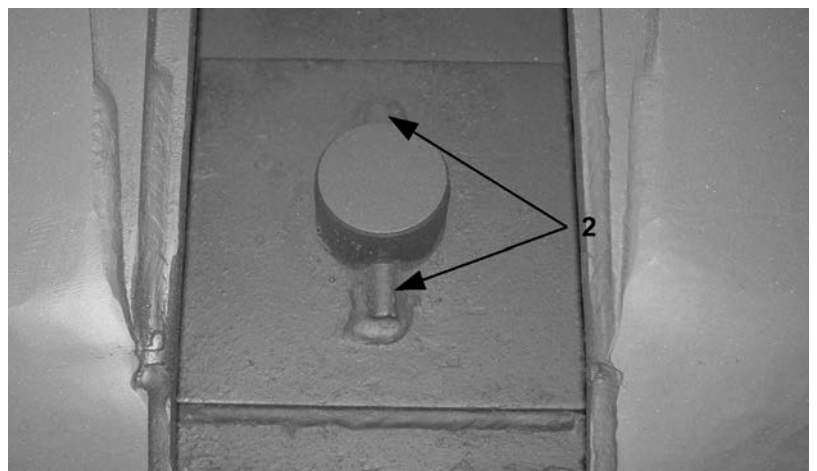
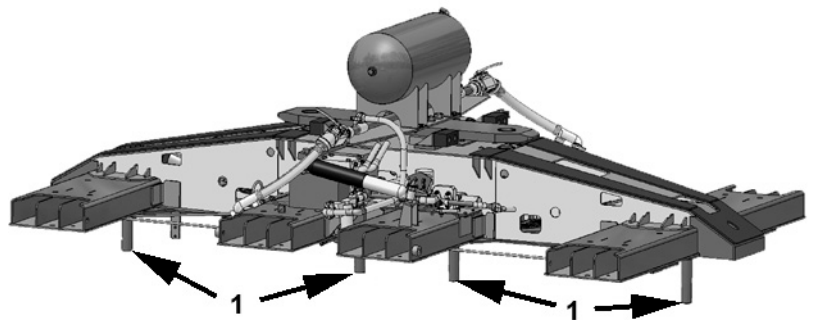
3.2.2 Replace Steering Pin

^ WARNING

Flying debris hazard.

Wear personal protective equipment appropriate for the job.

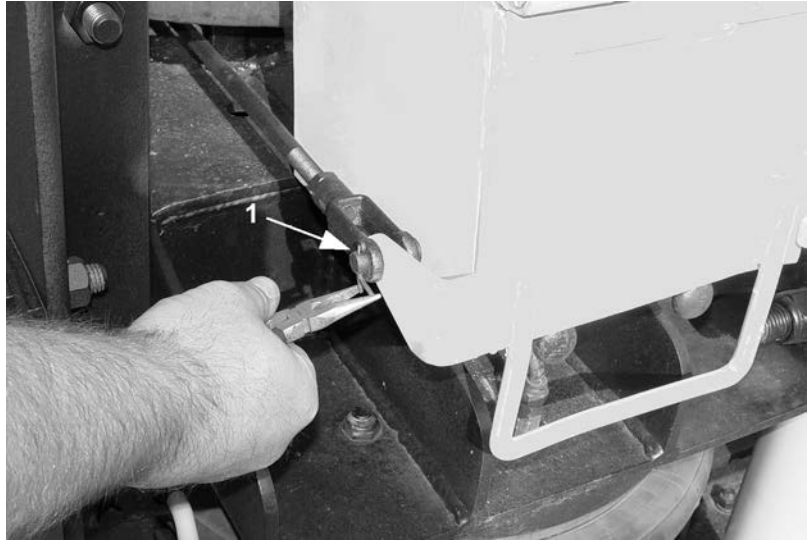
1. Grind or cut the retaining pin (2) on each side of the steering pin (1). The retaining pin must be flush with the pin for ease of removal. Drive pin out. Grind the remaining retaining pin and weld from the mounting plate.
2. Drive in new pin and retaining pin. Retaining pin (1) must be touching the frame plate. Weld retaining pin to frame plate.



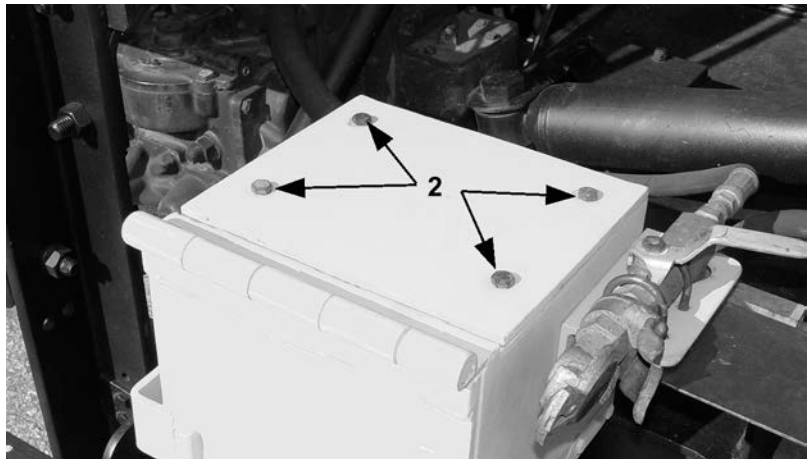
3.3 Transition Unit Control Valve

3.3.1 Remove Control Valve

1. Open vent valve on air reservoir to release pressure in the air system.
2. Remove cotter pin (1) from control box cover.

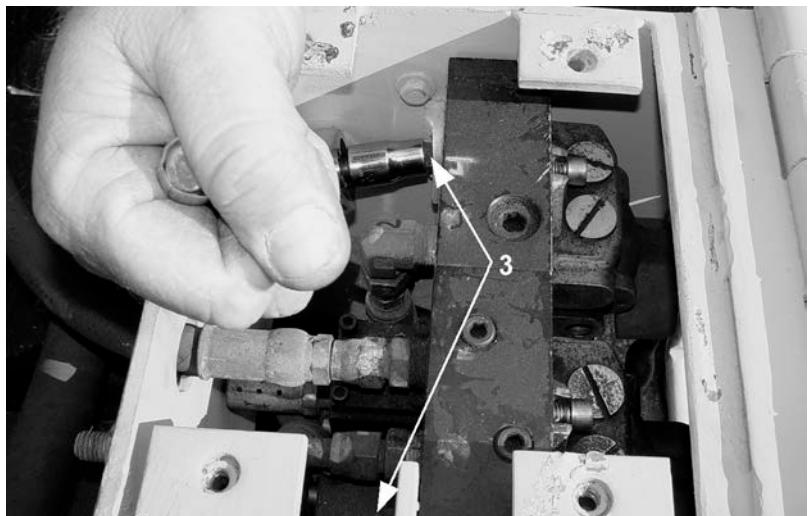


3. Remove four cap screws (2) and remove top/side cover.



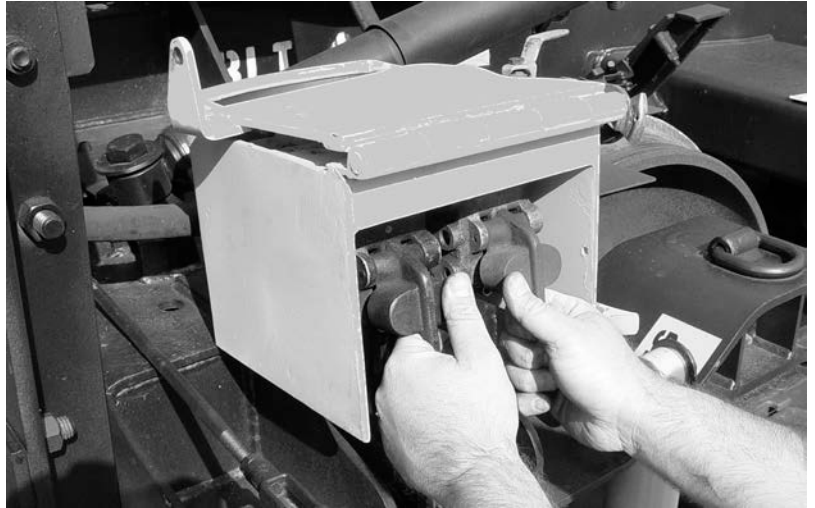
4. Remove two lock nuts (3) from the socket head cap screws securing the valve body to the control box frame.
5. Label hose and disconnect hoses from valve.

Note: Refer to General Arrangement and sub-assembly drawings located on back pages of manual to identifying hose connections.



Component Disassembly And Repair

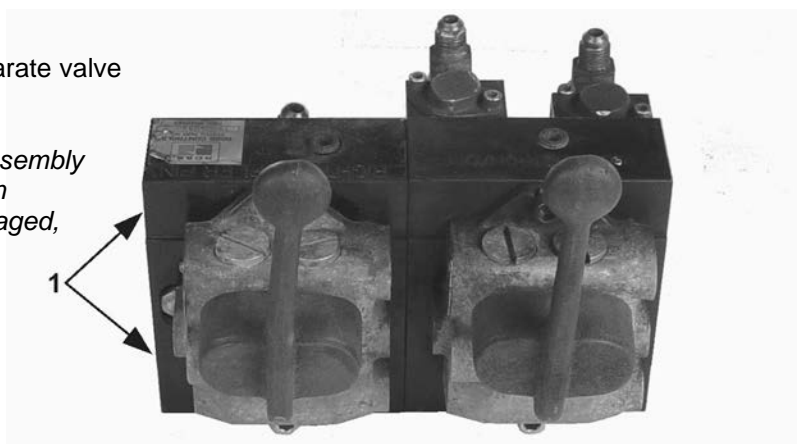
6. Grasp the control valve handles and remove valve.



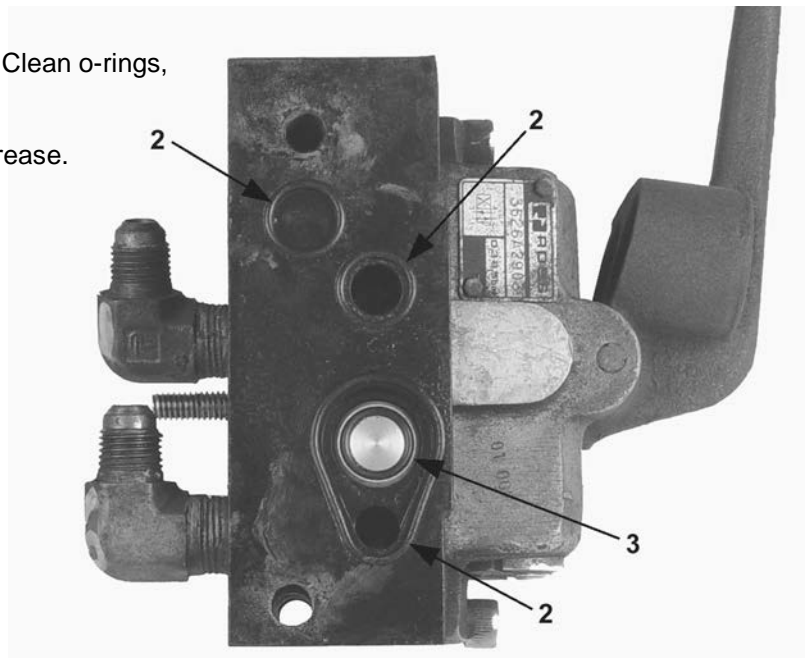
3.3.2 Clean And Inspect Shuttle Valve

1. Remove two socket head screws (1) and separate valve body.

Note: Refer to General Arrangement and sub-assembly drawings located on back pages of manual when identifying replacement parts. Replace any damaged, worn or broken parts.

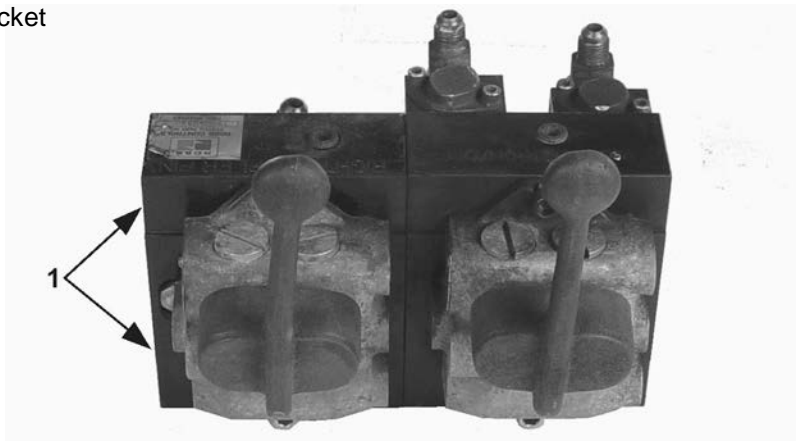


2. Remove and inspect o-rings (2) and shuttle (3). Clean o-rings, shuttle and valve bores with solvent.
3. Allow all parts to dry and lubricate with Teflon grease.
4. Install o-rings (2) and shuttle (3).



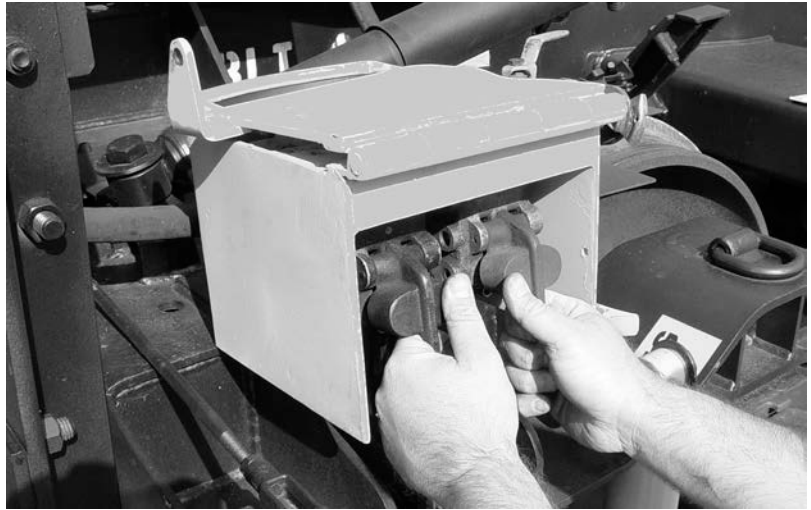
Component Disassembly And Repair

5. Place valve bodies together and install two socket head screws (1). Tighten screws to 8 lb-ft of torque.



3.3.3 Install Control Valve

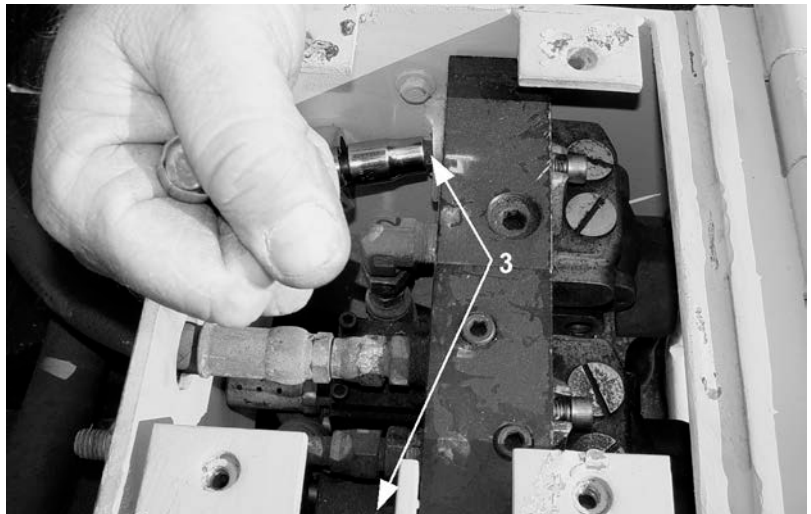
1. Grasp the control valve handles and install valve into control box.



2. Connect hoses to control valve.

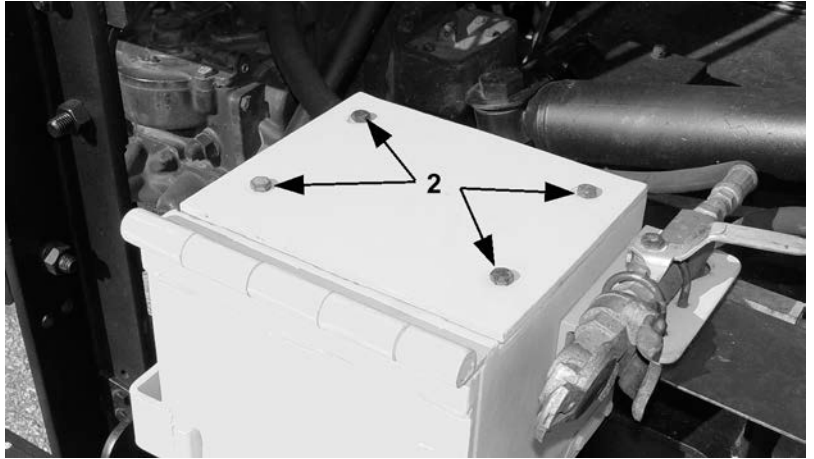
3. Install two lock nuts (3) to valve mounting cap screws. Tighten to 8 lb-ft of torque.

Note: Refer to General Arrangement and sub-assembly drawings located on back pages of manual to identifying hose connections.

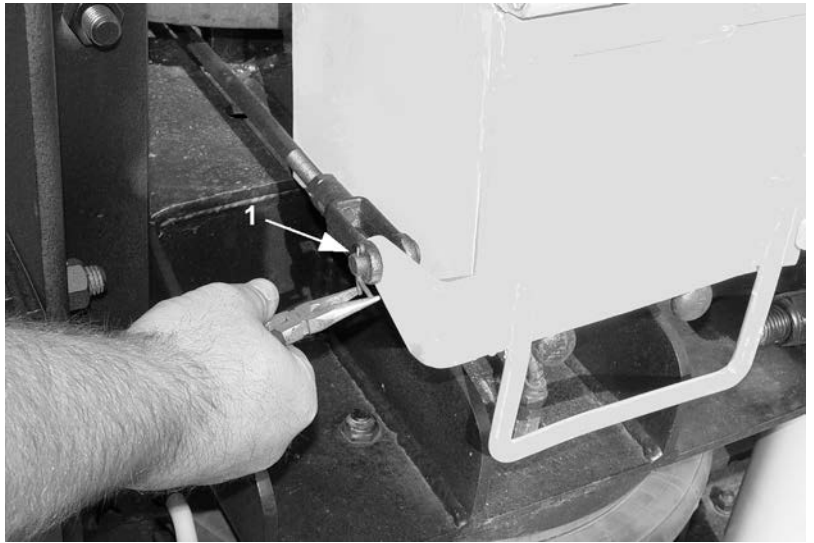


Component Disassembly And Repair

4. Install top/side cover and four cap screws (2). Tighten cap screws to 4 lb-ft of torque.



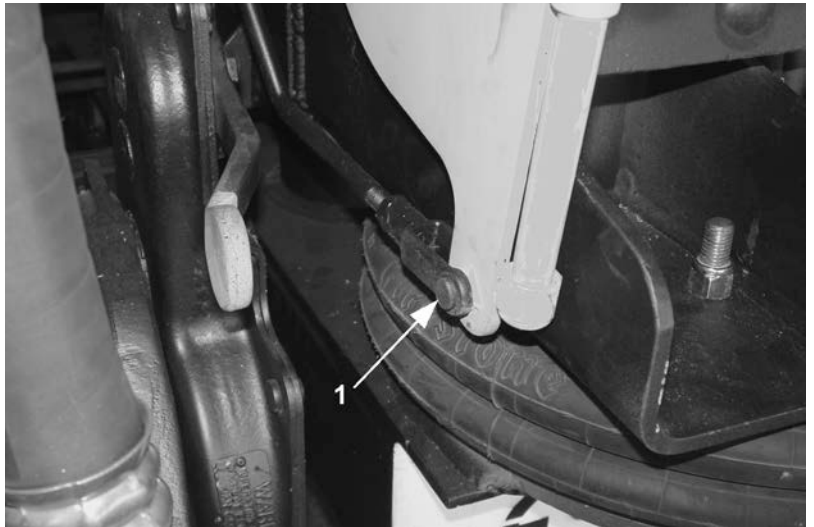
5. Install pin and cotter pin (1) on control box cover. Spread cotter pin.



3.4 Intermediate Unit Control Valve

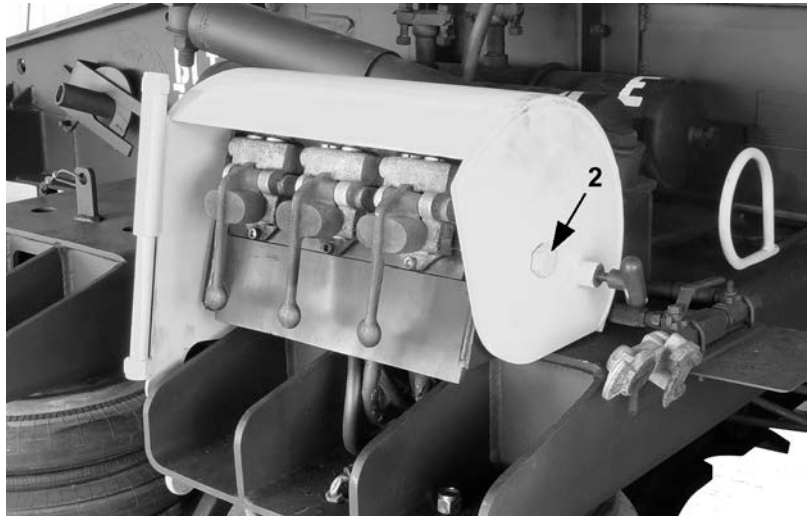
3.4.1 Remove Control Valve

1. Open vent valve on air reservoir to release pressure in the air system.
2. Remove cotter pin and pin (1) from control box cover.

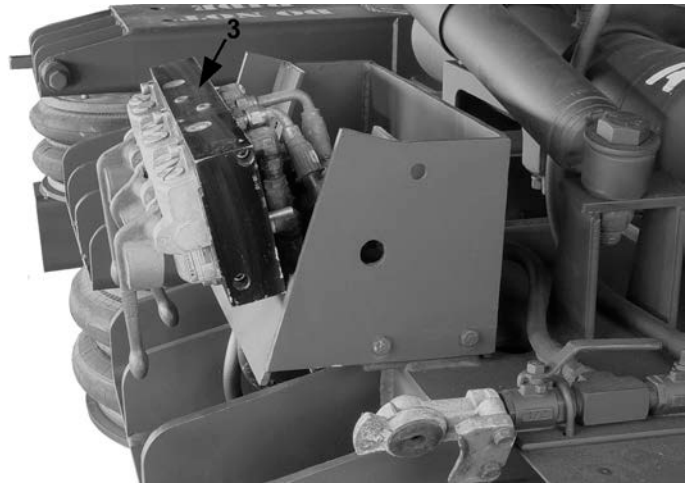


Component Disassembly And Repair

3. Remove cap screws (2) from each side of cover and remove valve cover.



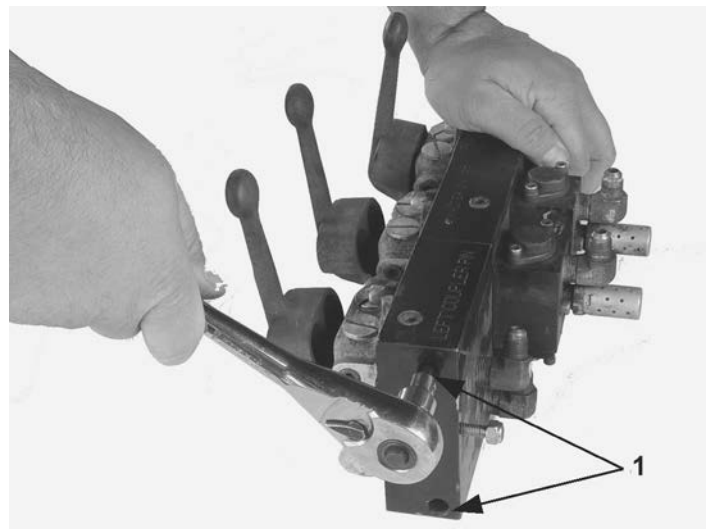
4. Remove two lock nuts (3) from the socket head cap screws fastening the valve body to the control box frame.
5. Label hoses and disconnect hoses from valve (3).
6. Grasp the control valve handles and remove valve.



3.4.2 Clean and Inspect Shuttle Valve

1. Remove four socket head screws (1) on each end of valve and separate valve body.

Note: Refer to General Arrangement and sub-assembly drawings located on back pages of manual when identifying replacement parts. Replace any damaged, worn or broken parts.

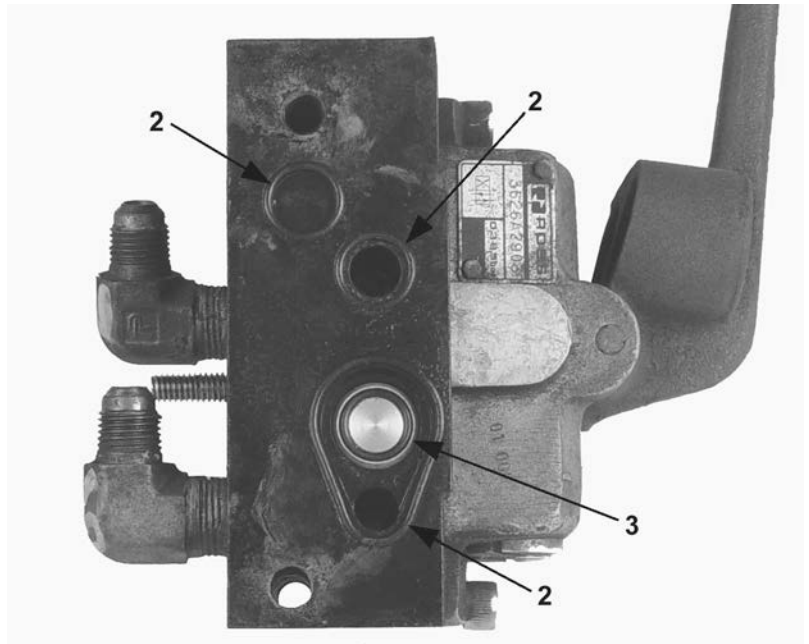


Component Disassembly And Repair

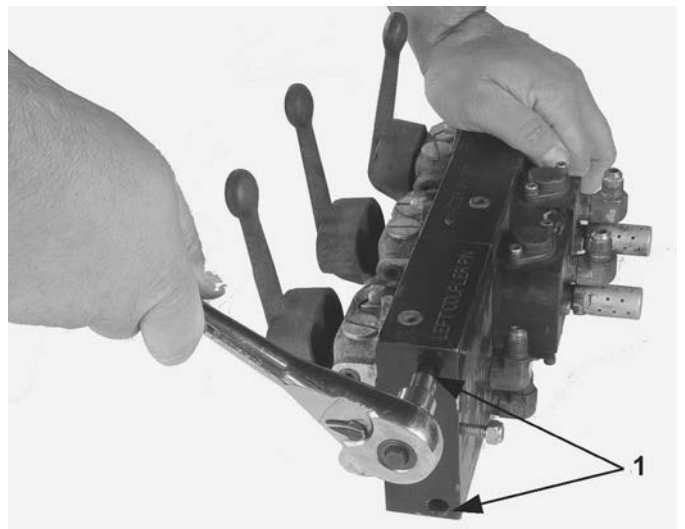
2. Remove and inspect o-rings (2) and shuttle (3) in each valve body. Clean o-rings, shuttle and valve bores with solvent.

3. Allow all parts to dry and lubricate with Teflon grease.

4. Install o-rings (2) and shuttle (3) in each valve body.



5. Place valve bodies together and install two socket head screws (1) on each end of valve. Tighten screws to 8 lb-ft of torque.



6. Grasp the control valve handles and install valve into control box.

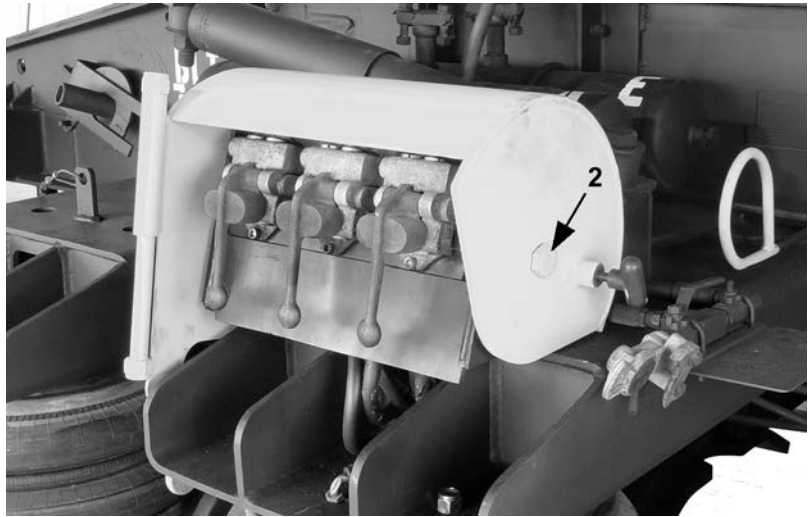
7. Connect hoses to control valve (3).

8. Position valve in mounting frame and install two lock nuts to valve mounting cap screws. Tighten to 4 lb-ft of torque.

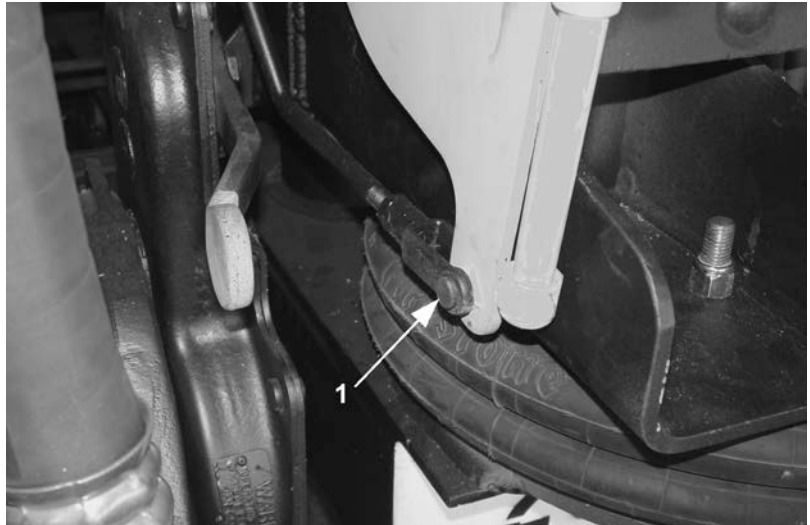


Component Disassembly And Repair

9. Install cover and two cap screws (2).
Tighten cap screws to 30 lb-ft of torque.



10. Install pin (1) and cotter pin on control box cover.

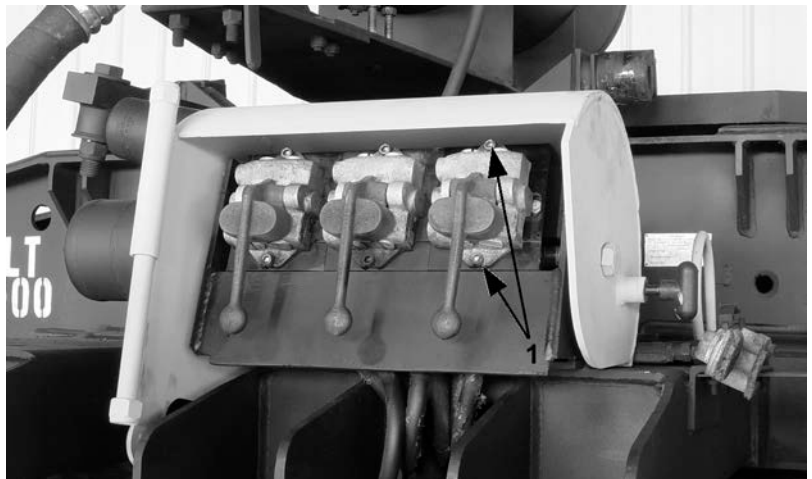


3.5 Clean and Inspect Poppet Valves

3.5.1 Remove, Clean and Inspect

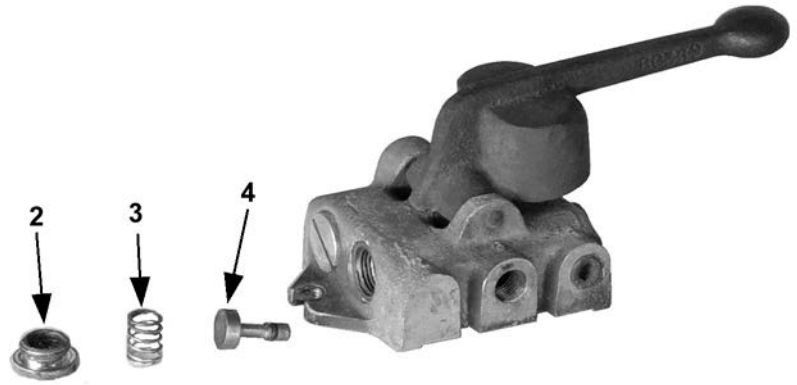
Note: The valve block does not need to be removed to access poppet valves. The removal is illustrated on a Intermediate Unit, the procedure is the same for a Transition Unit.

1. Open vent valve on air reservoir to release pressure in the air system.
2. Open control valve cover.
3. Loosen one socket head screw (1) and remove the other.
4. Remove valve from valve block.

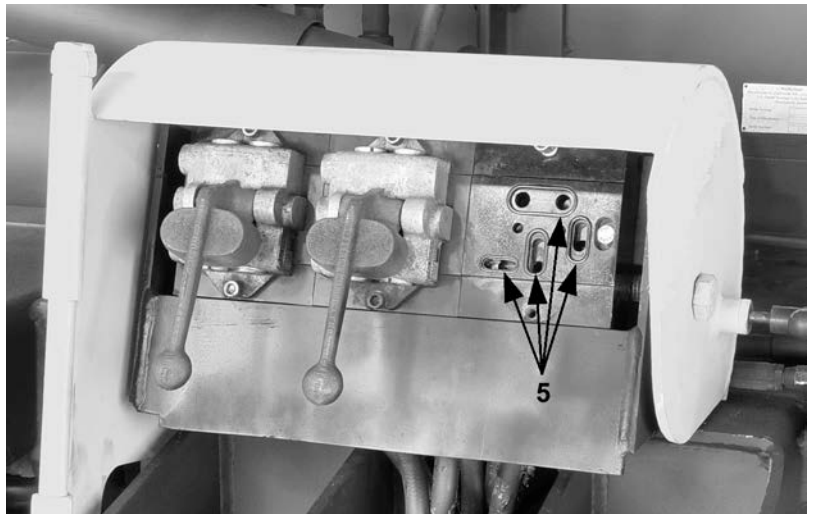


5. Remove cap (2), spring (3) and poppet (4).
6. Clean poppet and poppet bore with solvent. Replace damaged or worn parts.
7. Allow all parts to dry and lubricate with Teflon grease.
8. Install poppet (4) into valve bore (small end first), spring (3) and cap (2). Tighten cap.

Note: Refer to General Arrangement and sub-assembly drawings located on back pages of manual when identifying replacement parts. Replace any damaged, worn or broken parts.

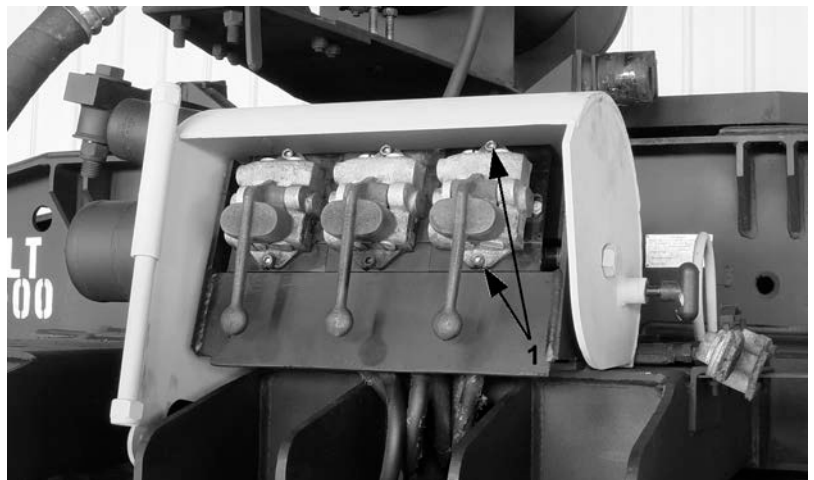


9. Remove, clean and inspect o-rings (5) on valve block. Replace damaged or worn parts.
10. Lubricate o-rings with Teflon grease and install o-rings on valve block.
11. Repeat steps 5-8 for remaining three poppets on this valve.
12. Repeat steps 3-11 if necessary for other valve(s) on valve block.



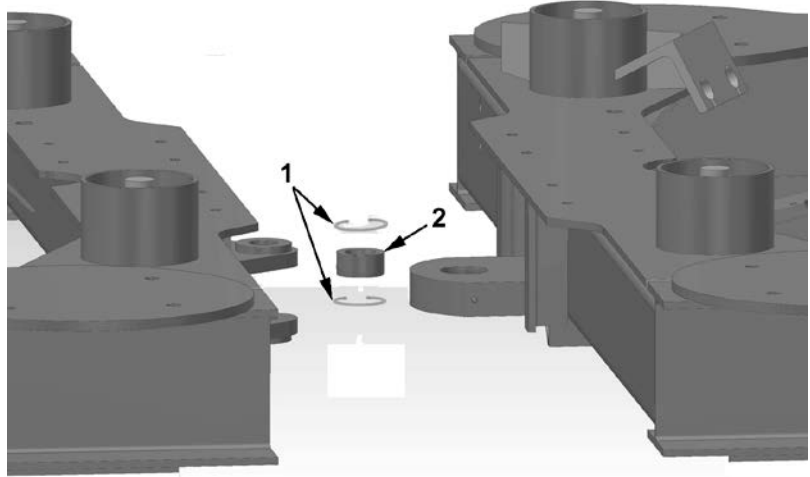
3.5.2 Install Valve to Valve Block

1. Install valve on valve block.
2. Install and tighten socket head screws (1) to 8 lb-ft of torque.
3. Close control valve cover.



3.6 Remove and Replace Lower Frame Connection Bushing

1. Remove upper frame. See section 2.
2. Separate lower frames. See section 2.
3. Remove snap rings (1) from top and bottom of bushing.
4. Remove bushing (2) from leading frame link.
5. Insert new bushing and check fit. Bushing must not be loose in leading frame link. If bushing is loose, contact Rail Runner for assistance.
6. Install snap rings on top and bottom of bushing.
7. Assemble lower frame units. See section 2.
8. Install upper frame. See section 2.
9. Pump grease into the grease fitting (2) to lubricate bushing.



3.7 Replace Air Spring

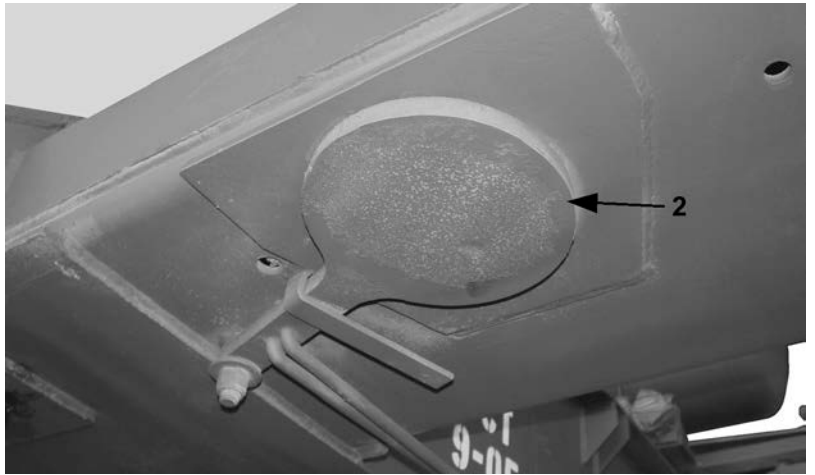
3.7.1 Remove Air Spring

1. Park the unit on a flat surface and block all wheels.
2. Open the control box cover and push the raise/lower valve (1) to fully raise the upper frame.



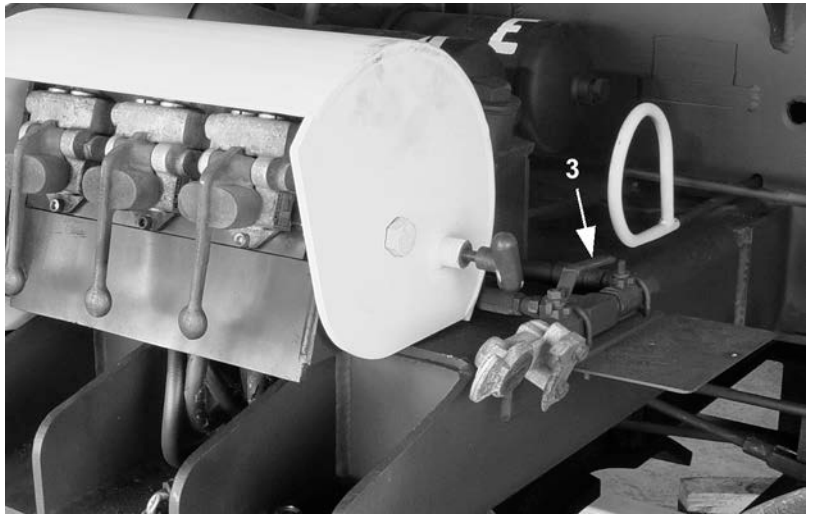
Component Disassembly And Repair

3. Close the control box lid, this will activate the paddles to cover the spring pocket openings. Verify that all eight paddles (2) on bottom of the upper frame are covering the coil spring wells.



4. Pull outward on the raise/lower valve (1) to lower the upper frame. The coil springs will now be supporting the upper frame.

5. Open vent valve (3) on air reservoir to release pressure in the air system.

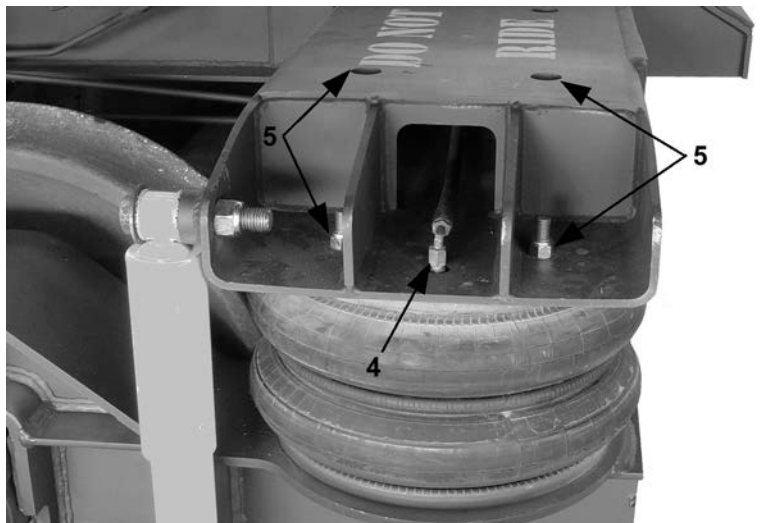


6. Disconnect air line (4).

7. Remove four lock nuts (5) from top air spring studs.

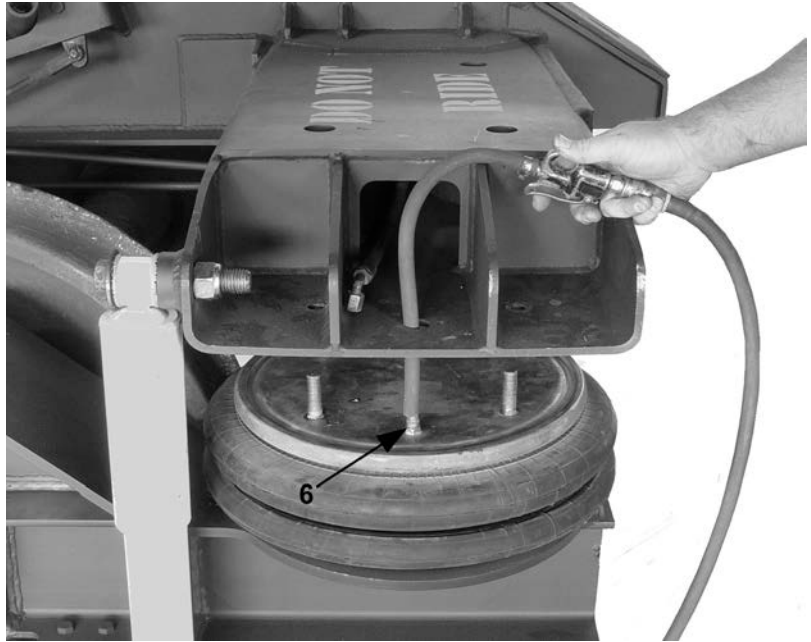
8. Remove four lock nuts from the bottom air spring studs.

9. Remove air spring.

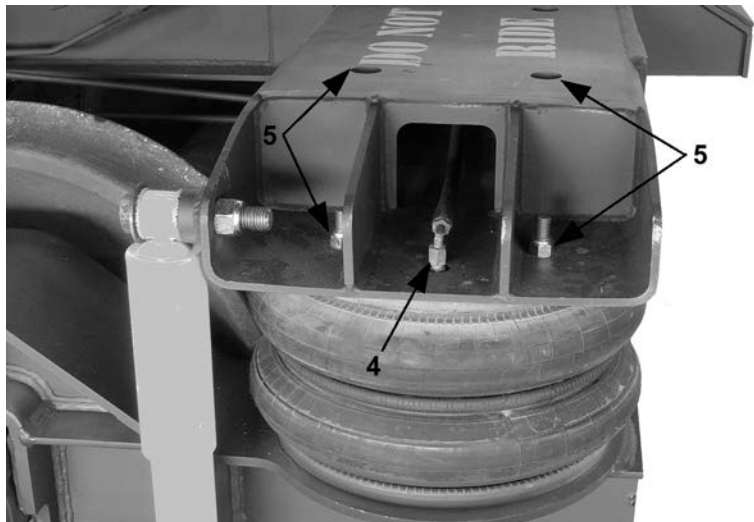


3.7.2 Install Air Spring

1. Install air spring and install four lower lock nuts.
2. Inflate air spring using an air chuck and a short piece of 3/8" hose. Place the hose over the air spring fitting (6) and apply air to the air spring.



3. While the spring is inflated, start two of the lock nuts (5) on the air spring studs. Connect air hose (4). Install the remaining two lock nuts on the air spring studs. Tighten lock nuts (5) to 60 lb-ft of torque.
4. Charge the main air reservoir to 100 psi.
5. Inflate the air spring suspension system to raise the upper frame off of the coil springs to free up the paddle movement.
6. Open the control box.
7. Pull the center valve to deflate the air spring suspension to lower the upper frame.



4. ASSEMBLE FRAMES

4.1 Assemble Lower Frames

^ WARNING

Risk of serious injury or death.

The weight of each lower frame is approximately 3,000 lbs.

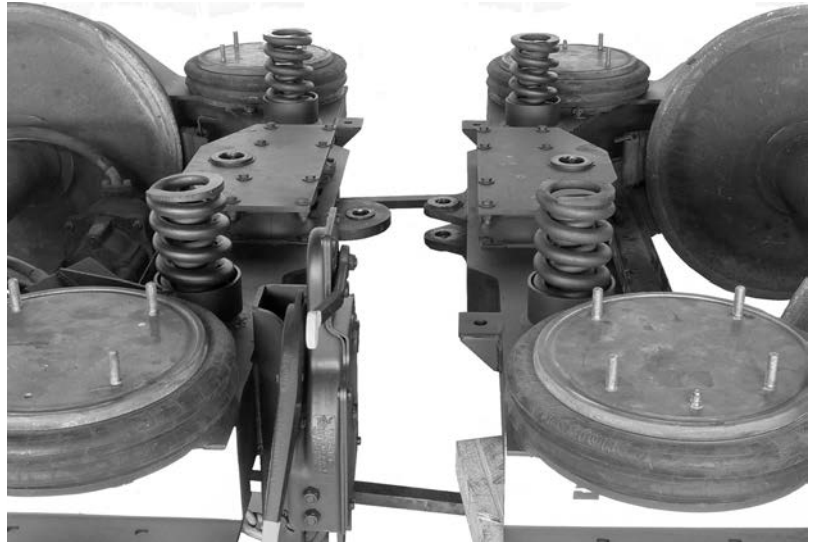
Use an adequate lifting device or devices to raise and move unit.

Use an adequate lifting device or devices to move lower frames.

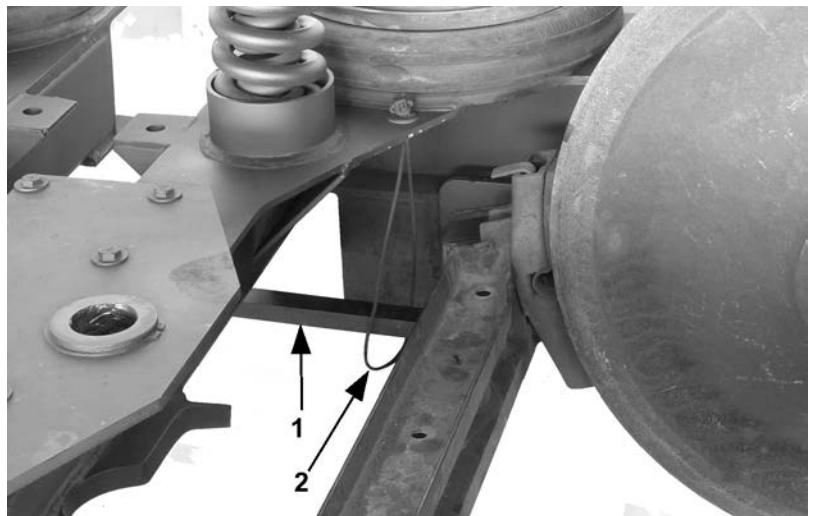
Never enter the area under raised equipment.



1. The lower frame units must be level. Square both lower frames so they are in perfect alignment. Level the lower frames with a floor jack and support one lower frame with properly rated and placed jack stands. The other lower frame must be supported by a device that will allow movement to assemble the two frames.

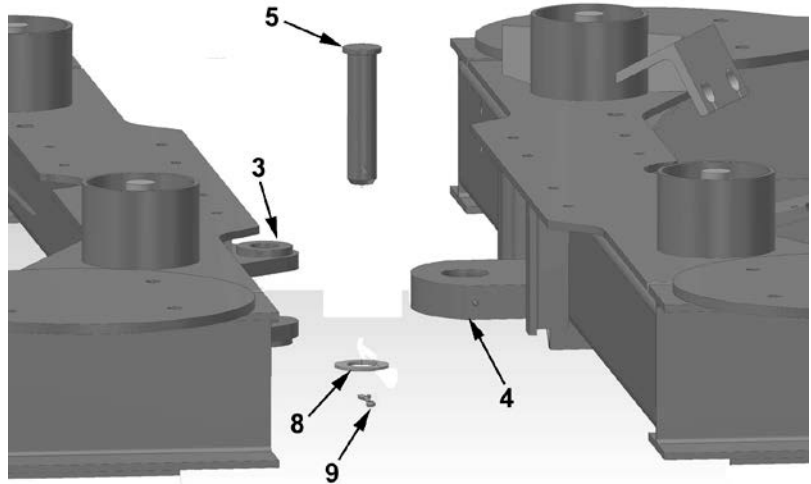


2. Slowly move the frames together while inserting the brake push rods (1) through the retaining cables (2) and into the secondary brake beam.

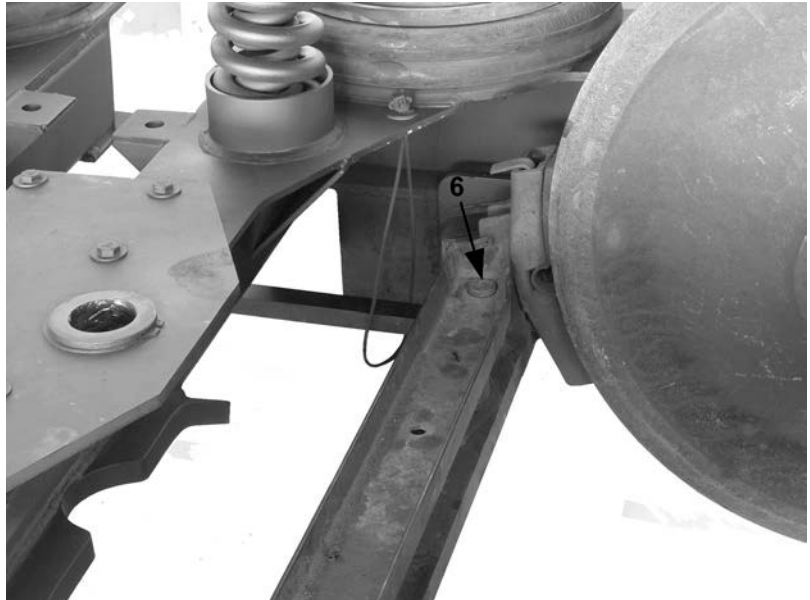


Assemble Frames

3. Move lower frames together so the trailing link (3) and lead link (4) are aligned. Apply an anti-seize compound to the pin (5) and insert pin through links. Fully insert pin until head on pin bottoms against the lead link. Install washer (8) and cotter pin (9) on bottom of pin (5).



4. Apply an anti-seize compound to the brake pin (6) and install brake pin through secondary brake beam and push rod assembly.



5. Install self-locking cotter pins (7) on the secondary brake beam. Self-locking, hammer in, cotter pins are required by FRA for this brake application.

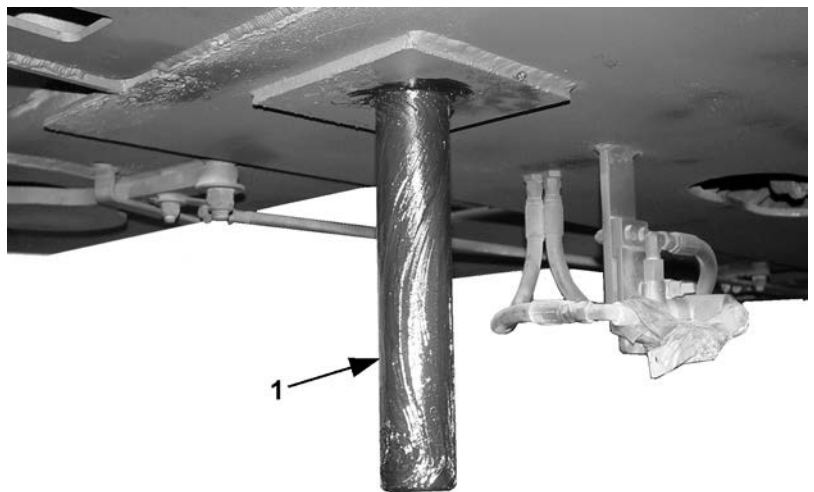


4.2 Install Upper Frame to Lower Frames

1. The lower frame units must be level and square for pin alignment. Square both lower frames so they are in perfect alignment. Level the lower frames with a floor jack and support with properly rated and placed jack stands.



2. Apply grease to the four steering pins on the upper frame.



^ WARNING

Risk of crushing.

The weight of the upper frame is 10,000 lbs.

Use an adequate lifting device or devices to raise and move upper frame.

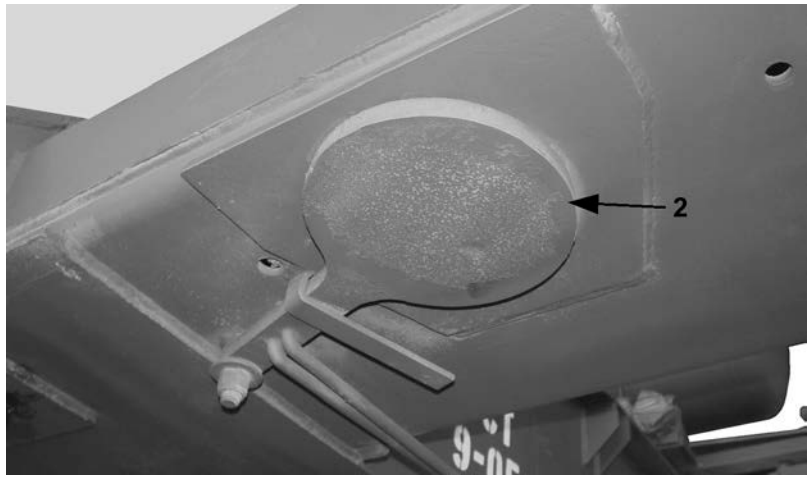
Never enter the area under the raised equipment.

If two or more people are used for the function, use radio head sets to coordinate movement.

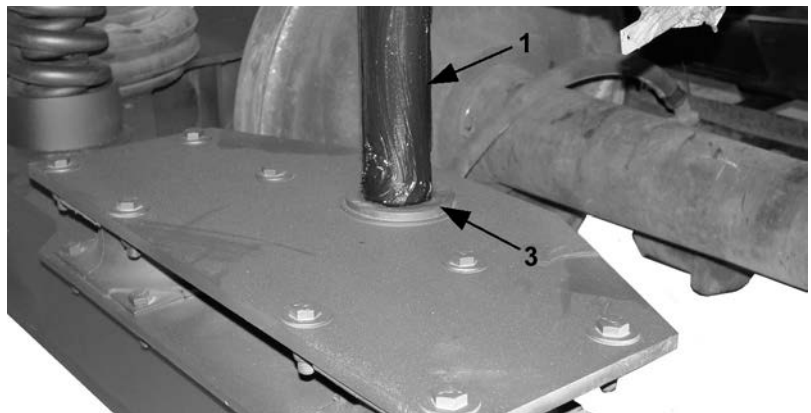
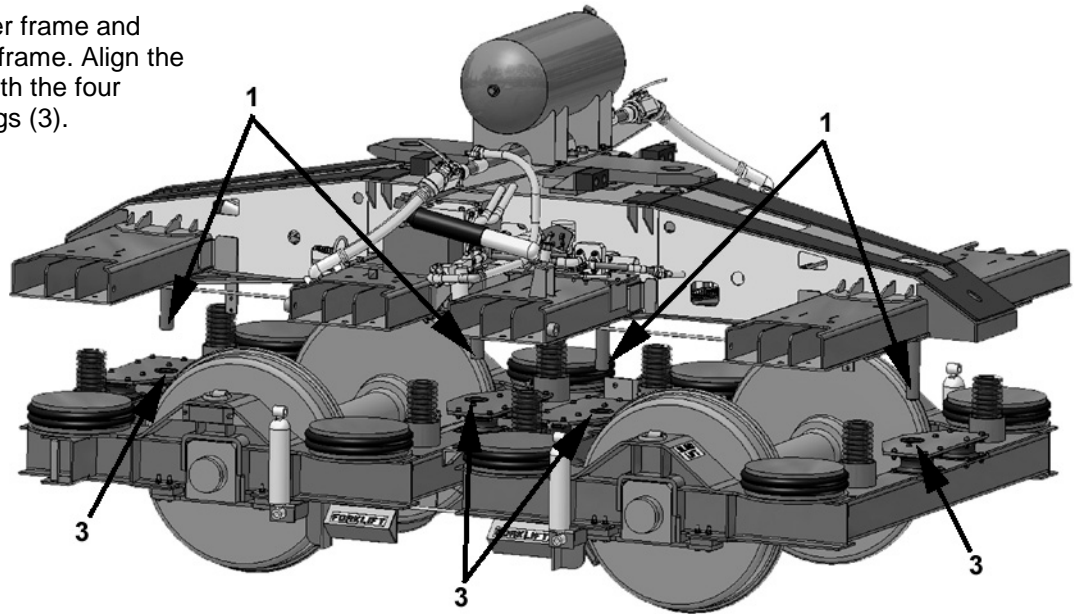


Assemble Frames

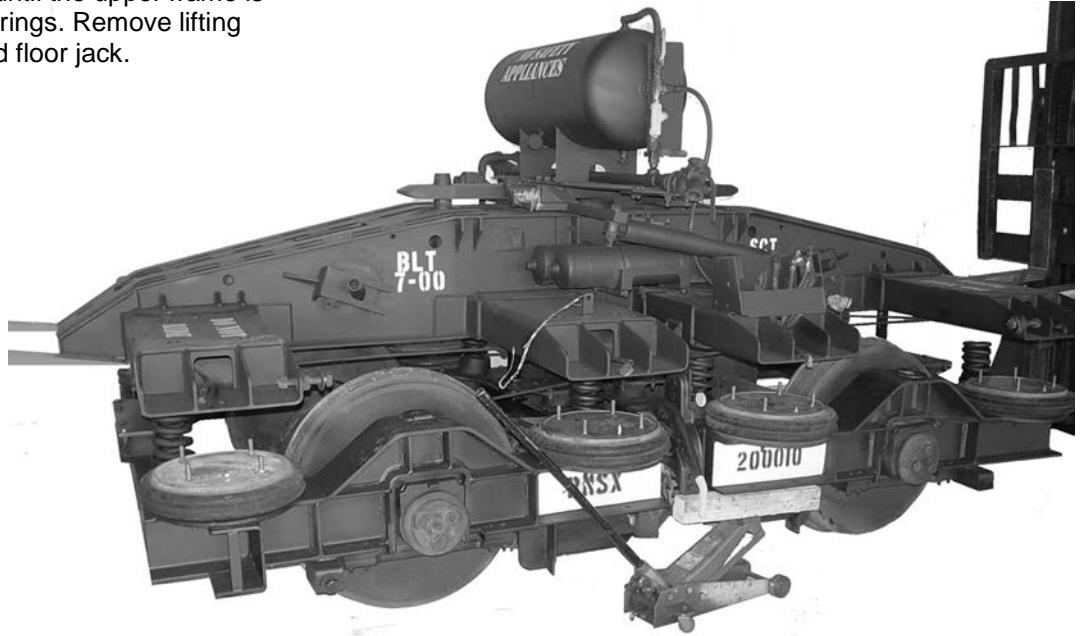
3. Verify that all eight paddles (2) on bottom of the upper frame are covering the coil spring wells.



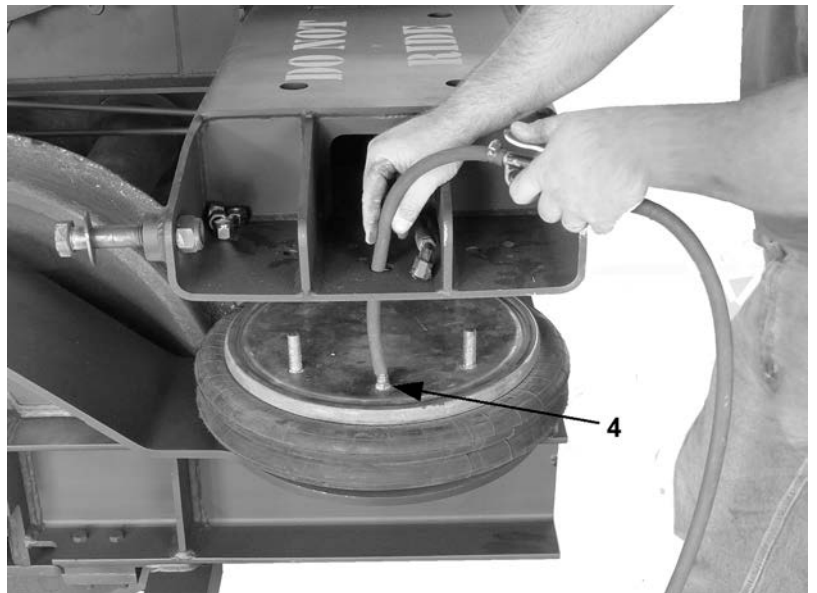
4. Carefully raise the upper frame and position over the lower frame. Align the four steering pins (1) with the four shear pad plate bushings (3).



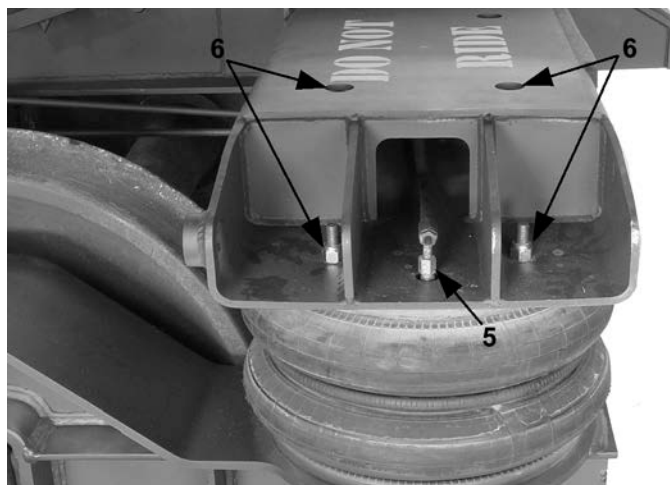
5. Lower the upper frame until the upper frame is supported by the coil springs. Remove lifting devices, jack stands and floor jack.



6. Inflate air spring using an air chuck and a short piece of 3/8" hose. Place the hose over the air spring fitting (4) and apply air to the air spring. See **Section 3.7**.

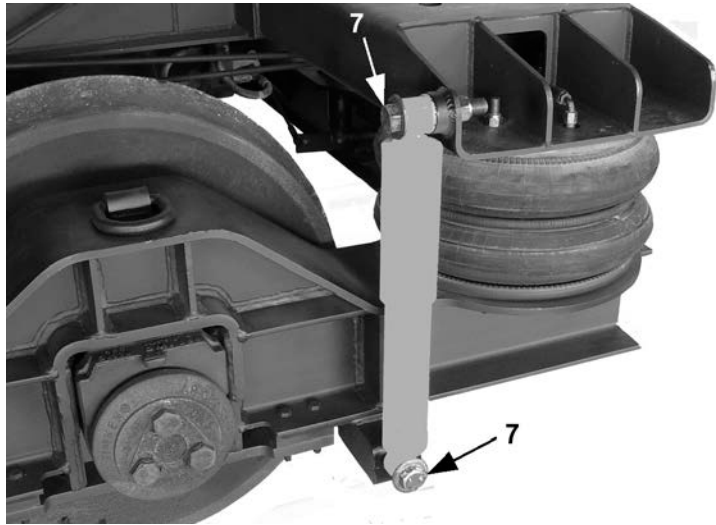


7. While the spring is inflated, start two of the lock nuts on the air spring studs. Connect air hose (5). Install the remaining two lock nuts on the air spring studs. Tighten lock nuts to 60 lb-ft of torque.



Assemble Frames

8. Install shock absorber and 1 x 4" cap screws (7), washers and lock nuts. Tighten lock nuts to 60 lb-ft of torque.



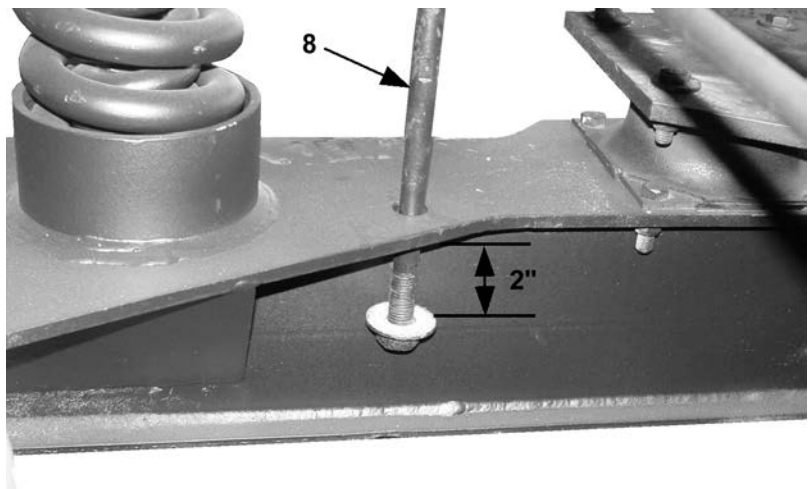
9. Connect leveling valve lower linkage to the leveling valves at the front and rear of the unit.



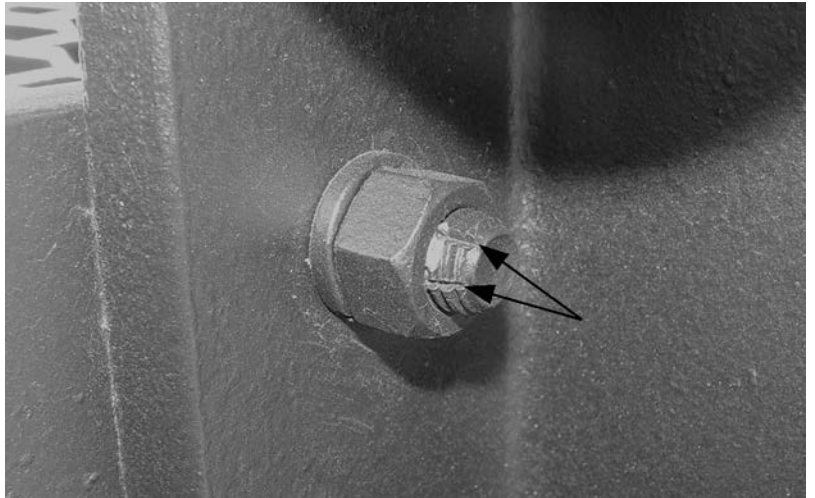
10. Connect all air hoses that run from the upper frame to the lower frame.

11. Install the eight over extension rods (8). Air up the system so the upper frame is supported by the air springs. Position the lower nut on the over extension rods so there is 2" between the top of the washer and the bottom of the frame.

12. For Transition Units, install the crossover platform.

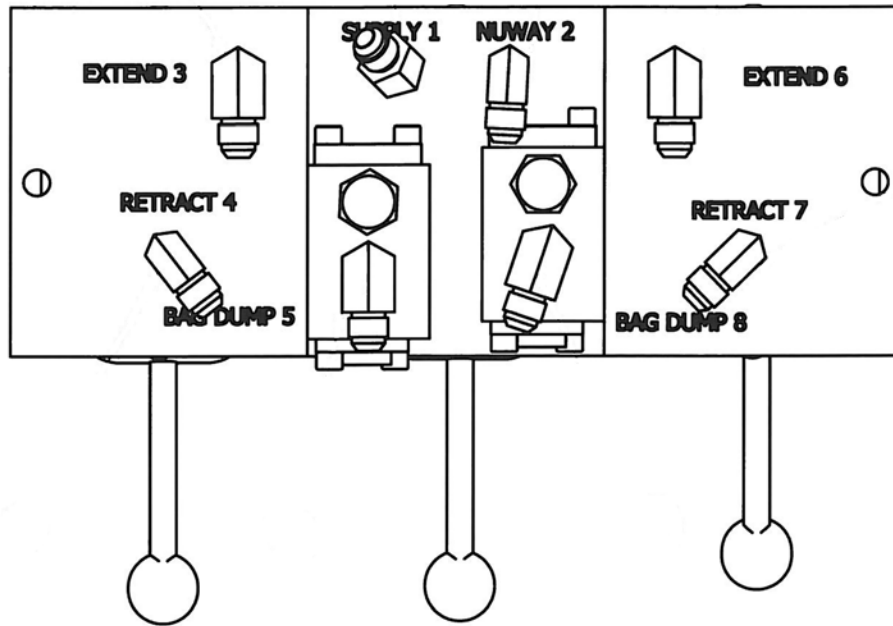


13. All cap screws on safety appliances must be chisel checked after assembly to prevent the fastener from loosening. Using a chisel and hammer, "check" the cap screw threads on the outside of the nut in two places.

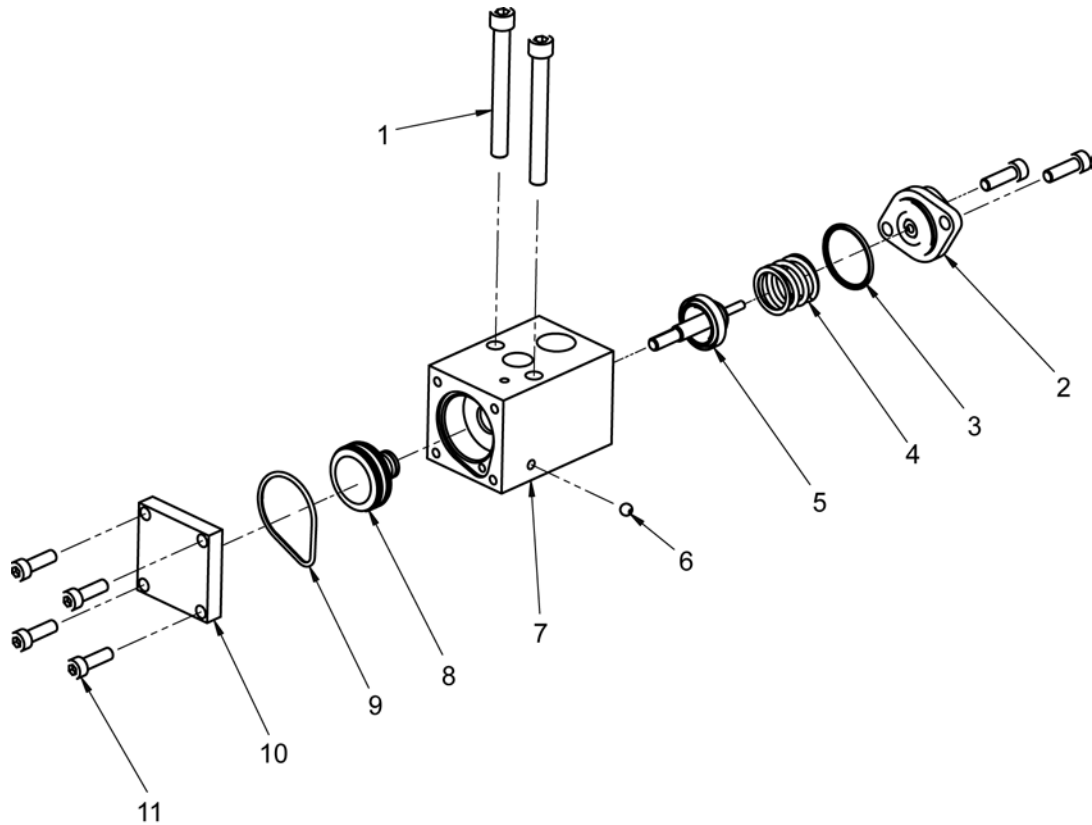


5. ASSEMBLY DRAWINGS

5.1 Control Manifold Connections

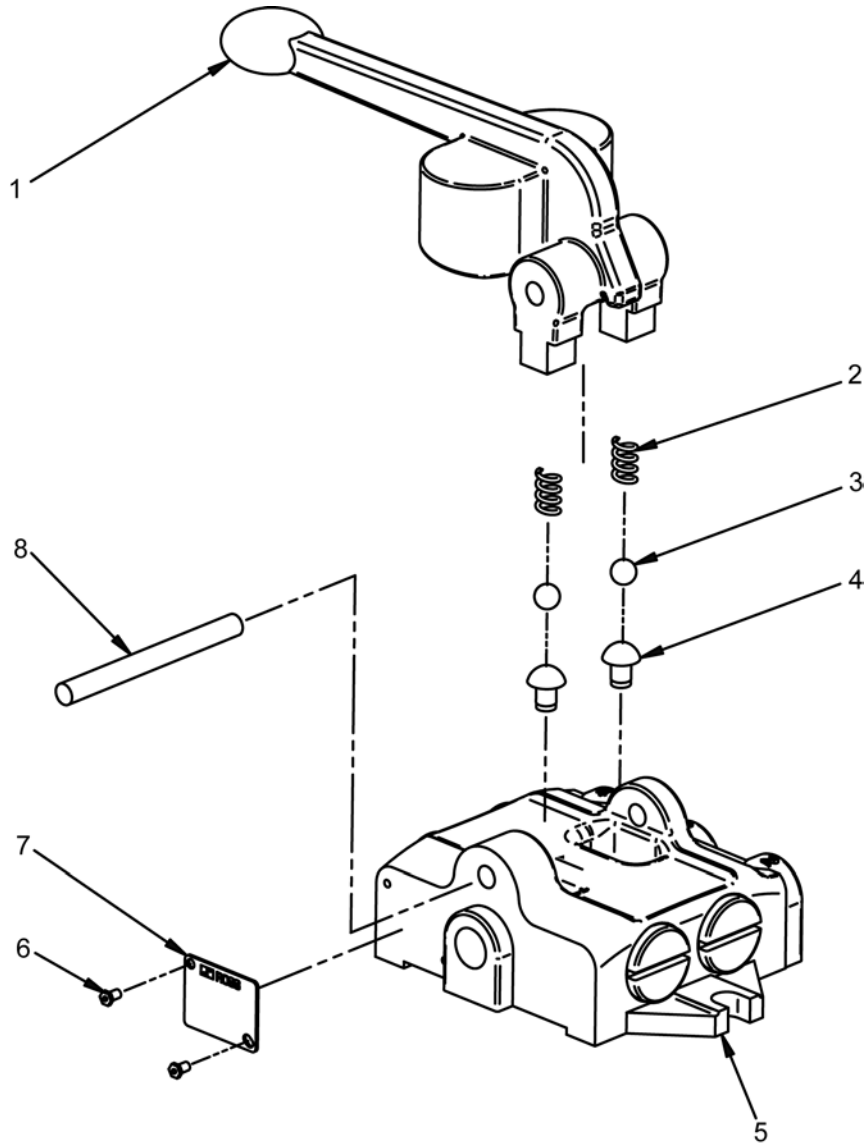


5.2 Check Valve



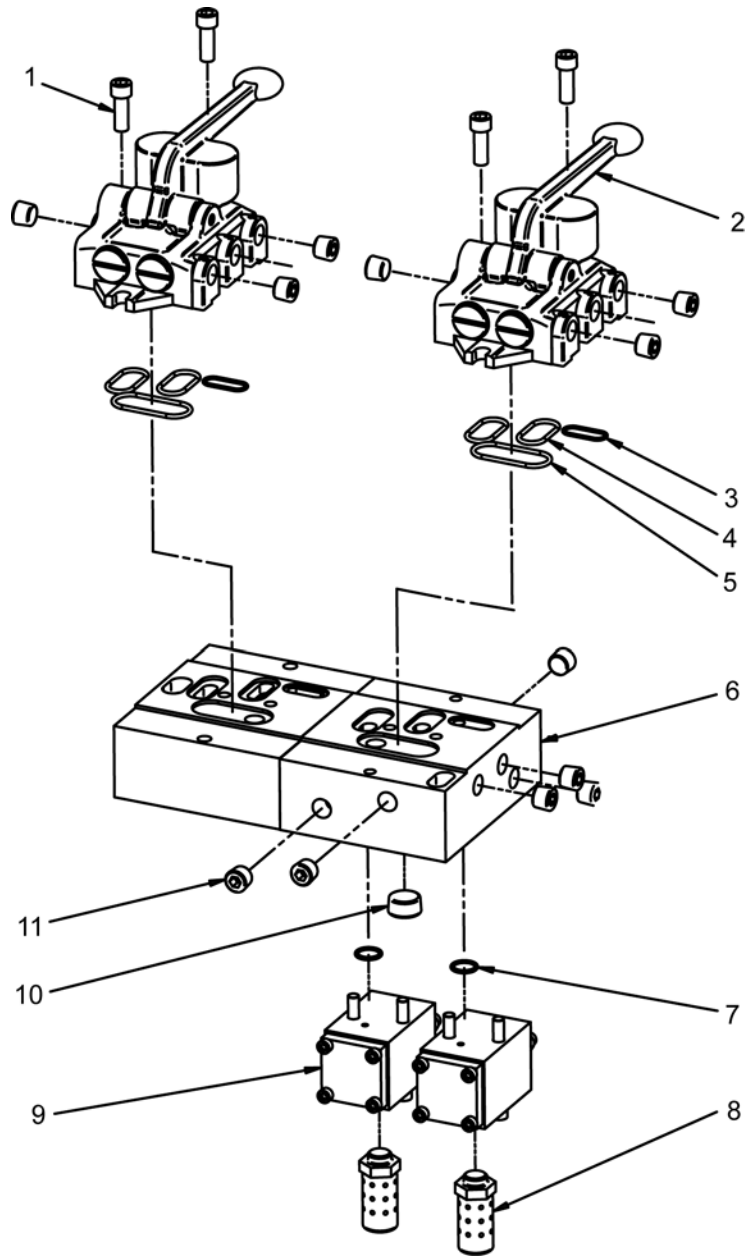
- 1 – 1/4 x 2-1/4 Screws
- 2 – Base Plate
- 3 – O-Ring
- 4 – Spring
- 5 – Poppet & Stem Assembly
- 6 – 3/16" Ball
- 7 – Single PO Check Bag Dump
- 8 – Piston Assembly
- 9 – O-Ring
- 10 – Cover Plate
- 11 – Screws

5.3 Valve Lever



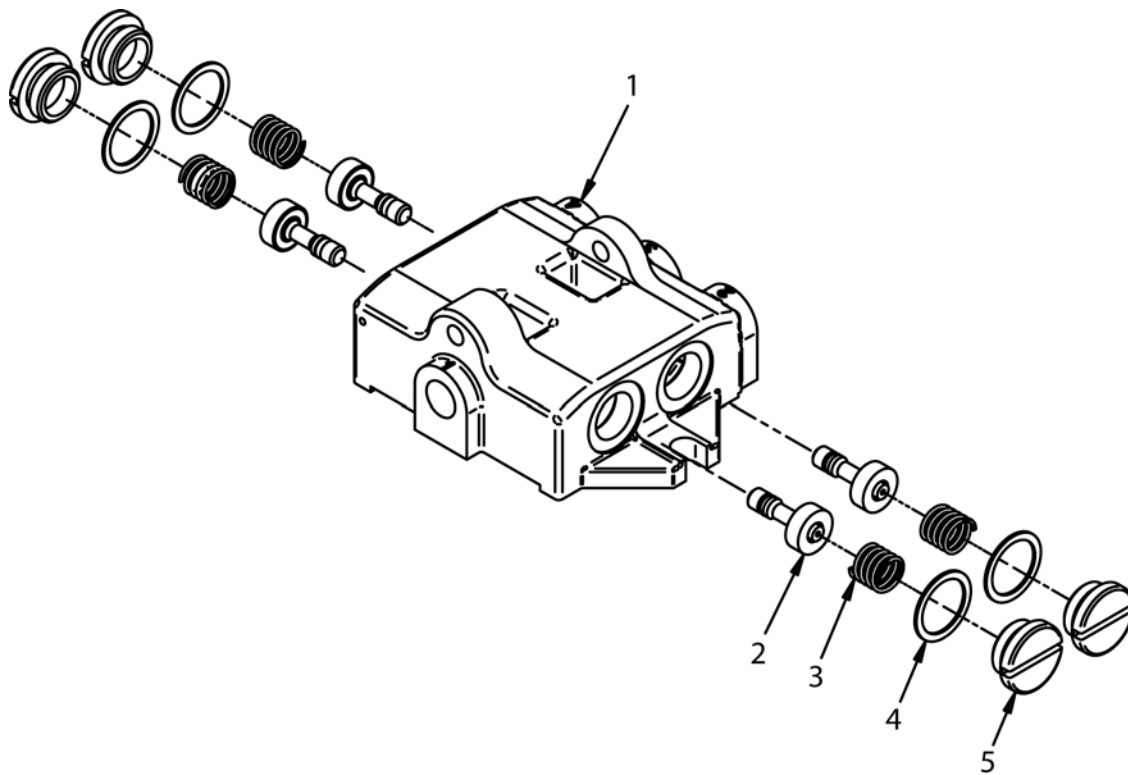
- 1 – Lever
- 2 – Spring
- 3 – Check Ball
- 4 – Detent Rivet
- 5 – Valve
- 6 – No 3 x 3/16 Screw
- 7 – Nametag
- 8 – Drive Lock Pin

5.4 Valve Block



- 1 – 5/16 x 7/8 Screws
- 2 – Valve Lever
- 3 – O-Ring 018
- 4 – O-Ring 118
- 5 – O-Ring 126
- 6 – Valve Block
- 7 – O-Ring
- 8 – Muffler
- 9 – Check Base
- 10 – 3/8 Pipe Plug
- 11 – 1/4 Pipe Plug

5.5 Lever Valve Block



- 1 – Lever Valve
- 2 – Poppet Assembly
- 3 – Spring
- 4 – Gasket
- 5 – Plug

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