



S-Series  
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## SAFETY NOTICE

**VSR-TSB-039**

NHTSA Campaign Number: 22E-073

# Vehicle Safety Recall - Technical Service Bulletin

## ***PROMPT ACTION REQUIRED***

**Attention:** Oshkosh Product Owner  
**Subject:** Sheppard™ Steering Gear  
**Models Affected:** Legacy Oshkosh S-Series Front Discharge Mixer  
**Equipment Affected:** Sheppard Steering Gear purchased between 06/2021 and 10/2022  
**Date:** October 2022

### **Purpose:**

A concern affecting safety exists in some legacy Oshkosh S-Series Front Discharge Mixers. Sheppard steering gears have been identified that may have a potential defect and need replacing. The suspect steering gears were sold through aftermarket, installed at a service center, or installed on a refurbished vehicle. This bulletin provides instruction on inspecting the steering gear and steps required if the steering gear requires replacement.

### **Affected Vehicles:**

The affected equipment population was sold or installed between June 2021 and September 2022.

Please refer to the attached serial number list of affected steering gears . **Perform the procedure to and make a warranty claim against only the vehicles on this steering gear serial number list.**

### **Time Completion:**

Complete the enclosed procedure for each affected truck. The time of accomplishment may vary due to a number of factors; however, the estimated time for steering gear inspection is 1.0 hour, and if required 4.0 hours for steering gear replacement.

### **Required Action:**

Review your equipment and verify your ownership of affected steering gear(s) or vehicle serial number(s). Oshkosh records indicate that you are the owner of one or more vehicles with an affected steering gear, or have purchased one or more affected steering gears. A list of affected vehicle Serial Numbers or order numbers is enclosed **Please be reminded that it is a violation of Federal law for you to sell or lease the vehicles covered by this notification until this recall has been performed on these vehicles. Substantial civil penalties apply to violations of this law.**

### **Reimbursement of Costs:**

Affected trucks shall be inspected using the customer's own qualified service technicians - at no cost to the owner. The inspection should take approximately 1.0 hour. Replacement of affected steering gear should take approximately 4.0 hours.

### **Parts/Labor Reimbursement:**

In order to receive credit, claims are to be submitted through the normal warranty claim system. Claims must be received within 30 days of the repair. Claims must include the Oshkosh VIN of the vehicle, the customer asset number, and the number of this bulletin.

**Contacts:**

If you have questions or need further information, please contact S-Series Service Support at 888-686-7278

**Enclosures:**

Procedure

Serial Number List of Affected Steering Gears

**Reference Part Numbers**

Item	Part Number	Description	Qty.
1	111317A	SCR,FLG,HEX 0.62-11X2.25 G8 PO	3
2	120622A	SCR,FLG,HEX 0.62-11X2.50 G8 PO	3
3	110311A	NUT,FLG,LKSP .62-11 G8 PO	6
4	3875726	STEERING GEAR,XD120,NP SHAFT	1

**SAFETY NOTICE**

Perform your company’s Lockout/Tagout procedure. If your company does not have a Lockout/Tagout procedure, follow OSHA 1910.147 and 1910.146 Confined Space as appropriate.

**SAFETY NOTICE**

Use appropriate Personal Protective Equipment (PPE) as required by your company.

**WARNING**

Hydraulic systems are hot. **DO NOT TOUCH!** Serious personal injury may result from hot oil. When you have completed working on the hydraulic systems, thoroughly clean any spilled oil from the equipment. Do not spill any hydraulic fluids on the ground. Clean any hydraulic fluids from your skin as soon as you have completed your maintenance and repairs. Dispose of used oil and filters as required by law.

**WARNING**

Hydraulic systems operate under high pressure—only experienced persons should attempt repairs or troubleshooting on hydraulic systems.

**WARNING**

Never remove hydraulic pipes/tubing, fittings, and adapters until all pressure has been relieved from the hydraulic system.

**WARNING**

All hydraulic pressures must be relieved from the hydraulic system prior to removing any components from the system to prevent oil from spraying or functions and systems from failing.

**PROCEDURE**

***Preparation and Inspection***

1. Park vehicle on flat, level surface. Perform your company’s Lockout/Tagout procedure. If your company does not have a Lockout/Tagout procedure, follow OSHA 1910.147 and 1910.146 Confined Space as appropriate. Chock wheels.
2. Battery Disconnect Switch  
 The vehicle’s BATTERY DISCONNECT switch is located on the left-hand side of the battery box. Use the battery disconnect switch when performing any maintenance so the vehicle cannot accidentally be started. If the vehicle is not equipped with a battery disconnect switch, disconnect the engine starting batteries.
  - a. Turn the battery disconnect switch (Figure A, Item 1) counterclockwise so the hole on the switch aligns with the hole in the bracket (Figure A, Item 2).

- b. Install the safety lockout device ring (Figure B, Item 1) through the holes on the battery disconnect switch and the bracket.
- c. Install a padlock (Figure B, Item 2) onto the safety lockout device ring, lock it, and put the key in your pocket. If more than one person is working on the vehicle, each person must install his or her own padlock.

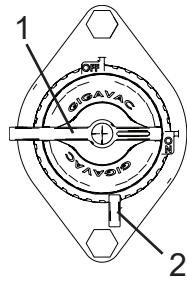


Figure A

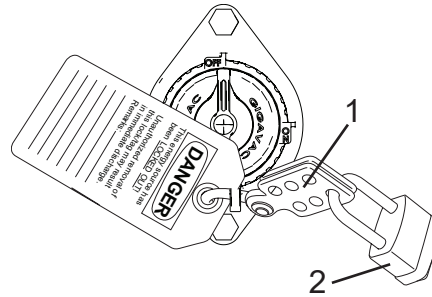


Figure B

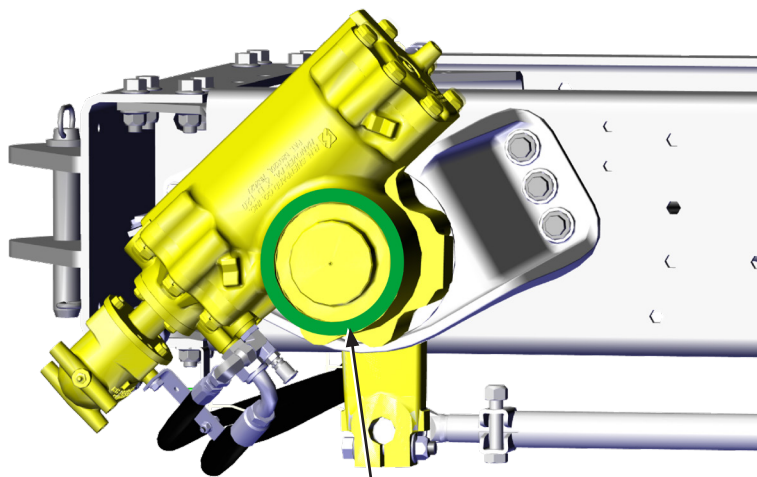
### NOTE

If the serial number cannot be easily read due to paint, gently scrape the number(s) with a flathead screw driver, wire brush, emery cloth, or apply acetone.

- 3. Locate the steering gear serial number engraved into the steering gear housing. See Figure 1. Sheppard specific information can be found at <https://recall.rhsheppard.com/USA/en/USD>.

If the steering gear serial number matches one of the serial numbers in the Figure 1 table continue to Step 4.

If the steering gear serial number does not match one of the serial numbers in the Figure 1 table the inspection is complete and no further action is required.



SD110PAU3 21E08036  
Part Number Serial Number

Figure 1

Steering Gear Serial Numbers	
21E08036	21G08991
21E08047	21G08992
21E04193	21G08995
21E08046	21G08987
21F13807	21G08988
21F13813	21G08990
21F13816	21J05621
21G08983	21J05618
21G08985	21J13027
21G08986	21J13033
21G08989	

### **Steering Gear Removal**

4. Loosen and remove nut and screw securing drag link to pitman arm. See Figure 2.
5. Remove drag link from pitman arm. Swing drag link away from steering gear.
6. Slightly loosen the two hydraulic lines connected to steering gear to relieve any pressure that may be in the lines. See Figure 2.
7. Loosen and remove two hydraulic lines connected to steering gear. See Figure 2. Cap or seal ends of hydraulic lines to prevent hydraulic system contamination.

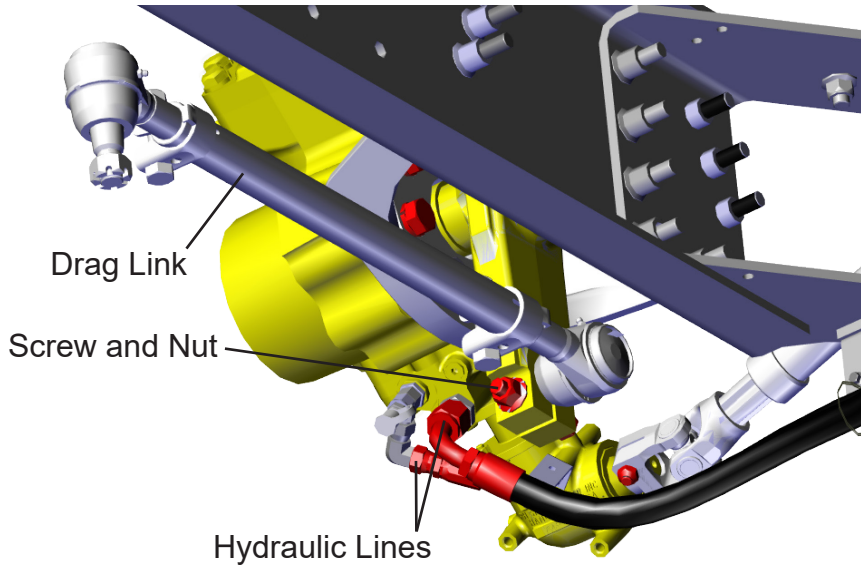


Figure 2

8. Loosen and remove screw and nut securing yoke to steering gear output shaft. See Figure 3.
9. Slide yoke off steering gear output shaft.

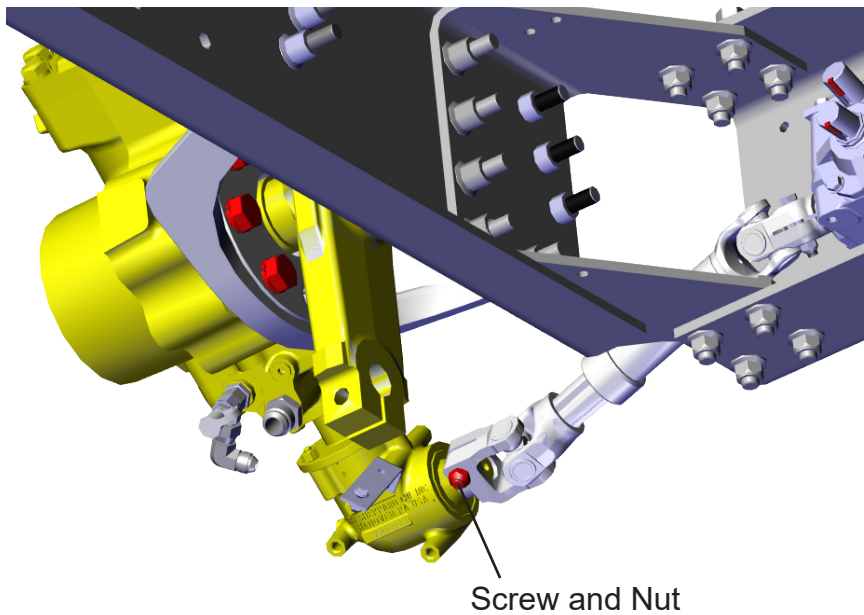


Figure 3

**CAUTION**

The steering gear and bracket weigh approximately 210 lbs. Use a lifting device and support steering gear before removing bracket mounting bolts. Failure to comply could cause personal injury and damage to equipment.

10. Remove the six huck bolts securing steering gear and bracket to frame rail. See Figure 4.

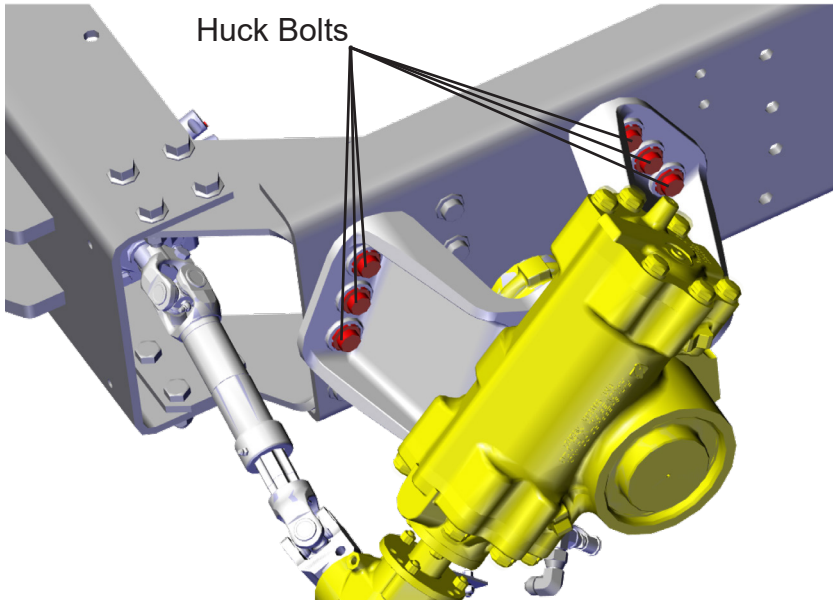


Figure 4

11. Remove steering gear and bracket from vehicle and place on workbench with bracket up. See Figure 5.

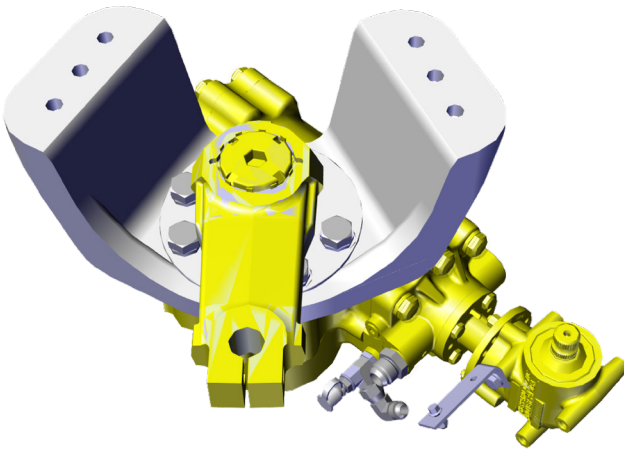


Figure 5

**CAUTION**

The pitman arm will be extremely tight. Do not use a hammer or apply heat to the arm. Damage to the sector shaft, pitman arm or seals can result.

12. Bend the restraining tabs out of the pitman arm retainer using a punch. See Figure 6.
13. Lubricate face of the retainer with clean chassis lube to aid in removal. See Figure 6.
14. Slide pitman arm puller over pitman arm. Make sure to align the hole in the puller to the retainer Allen socket.
15. Insert Allen drive socket through puller and into retainer socket.
16. Back off the retainer using an impact wrench. Removing the retainer will act as a jack screw to remove the pitman arm. Save pitman arm for installation on new steering gear.

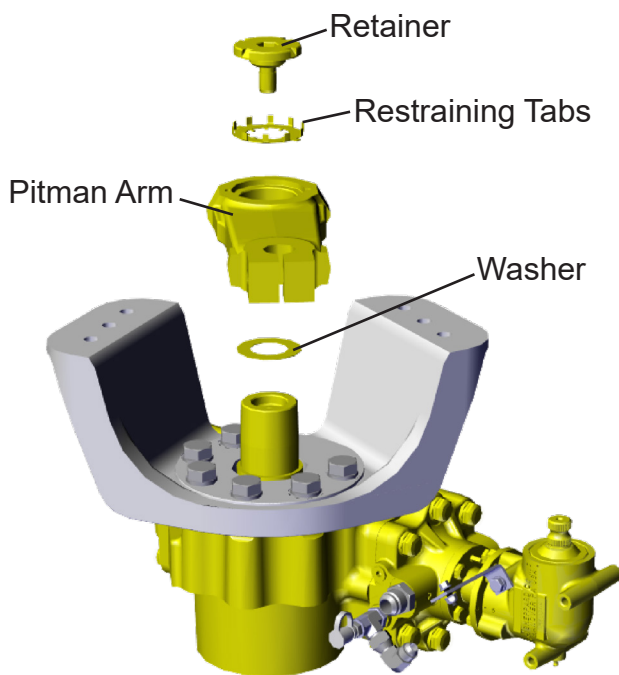


Figure 6

17. Loosen and remove the six bolts and washers securing mounting bracket to steering gear. See Figure 7. Save bolts and washers and mounting bracket.
18. Remove hydraulic fittings and bracket from steering gear. See Figure 7. Save hydraulic fittings and bracket.

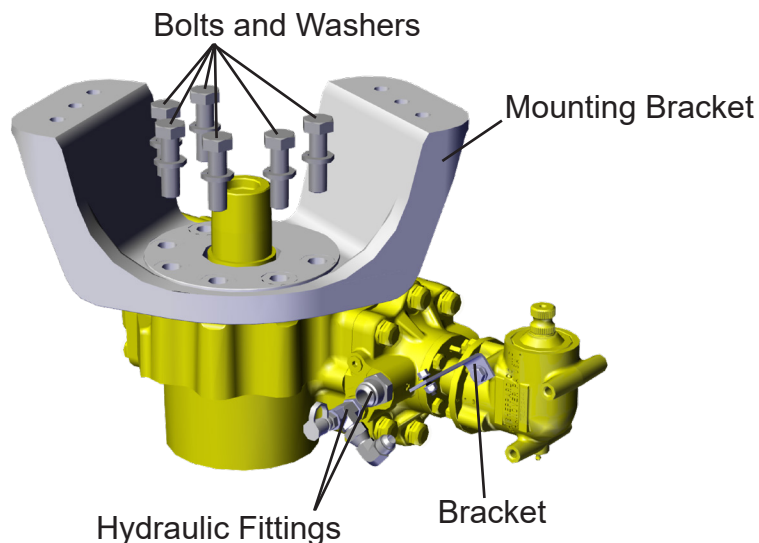


Figure 7

### ***Steering Gear Installation***

19. Install hydraulic fittings and bracket removed in Step 18 in new steering gear. See Figure 7.
20. Install mounting bracket removed in Step 17 on new steering gear.
21. Clean threads of mounting bolts removed in Step 17 and apply Loctite® 242 to threads of six bolts.
22. Secure mounting bracket to steering gear with six bolts and washers removed in Step 17. See Figure 7. Final tighten mounting bolts to 330 ft. lbs. using torque sequence in Figure 8.

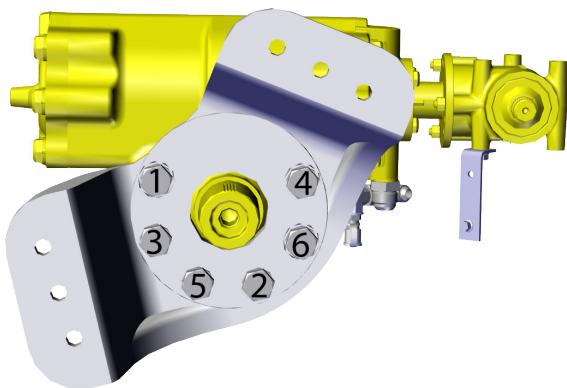


Figure 8

23. Install washer on sector shaft. See Figure 9.
24. Install pitman arm on steering gear. Align timing mark on steering shaft with pitman arm timing mark labeled "F" when pitman arm is installed. See Figure 9.
25. Apply never-seize to threads of pitman arm retainer, both sides of tab washer, and mating face of retainer.



26. Install tab washer. See Figure 9.

27. Install retainer and final tighten to 550 ft. lbs. using a torque wrench. See Figure 9. Do not use an impact wrench to final tighten retainer.

**⚠ WARNING**

Do not back off the torque value to align the tabs. Backing off from the specified torque value could result in a loose pitman arm or loss of steering control resulting in serious injury or death.

28. Continue torquing retainer past 550 ft. lbs. until two of the notches in the retainer align with the tabs of the washer.

29. Use a punch and hammer to bend restraining tabs of the washer into the notches of the retainer.

**⚠ WARNING**

Once the retainer is torqued DO NOT re-torque the retainer. Constant torquing of the retainer can cause a loose pitman arm or loss of steering control resulting in serious injury or death.

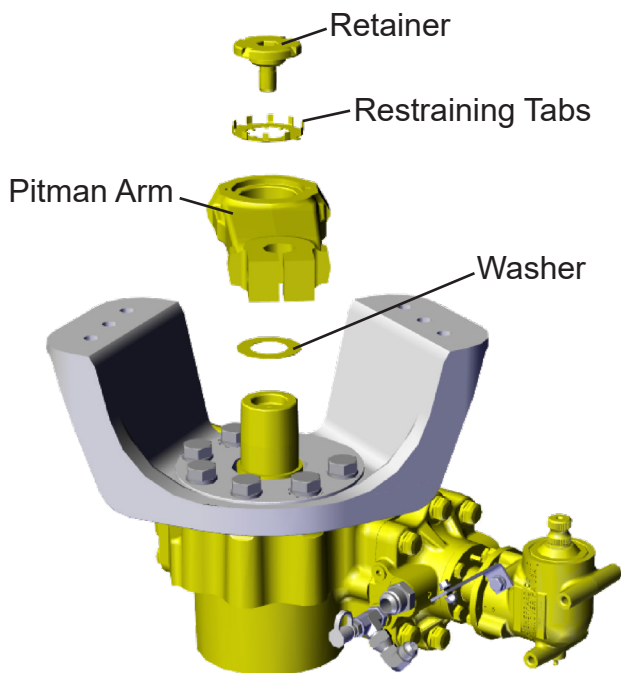


Figure 9



**CAUTION**

The steering gear and bracket weigh approximately 210 lbs. Use a lifting device and support steering gear when installing mounting bracket mounting bolts. Failure to comply could cause personal injury and damage to equipment.

30. Mount steering gear assembly to frame rail with three 0.62-11 x 2.25 inch (111317A) and three 0.62-11 x 2.50 inch (120622A) grade 8 bolts and six spiral lock nuts (110311A). See Figure 10. Using a torque wrench, final tighten mounting hardware to 210 ft lbs.

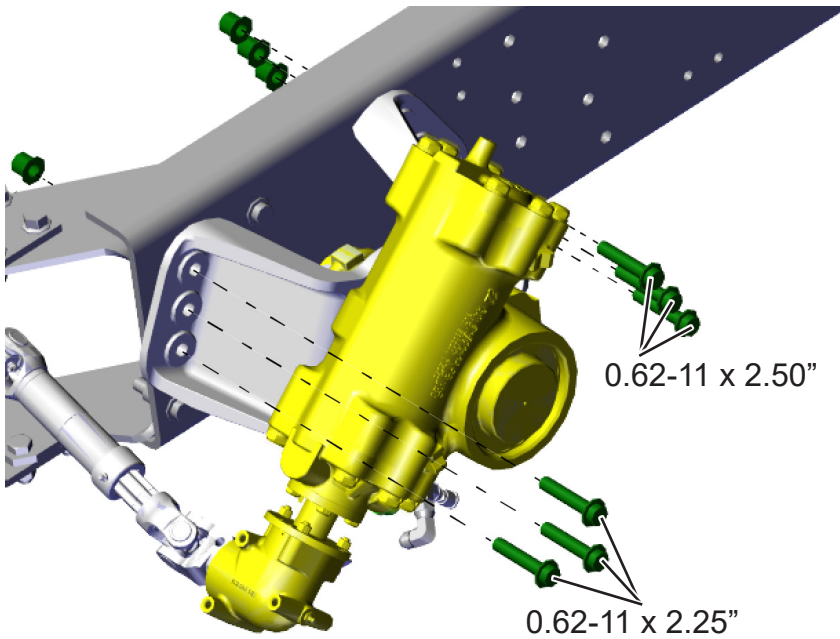


Figure 10

31. Reinstall yoke on steering gear output shaft. See Figure 11.

32. Install screw and nut removed in Step 8 in yoke on output shaft. See Figure 11. Final tighten to 75 ft. lbs.

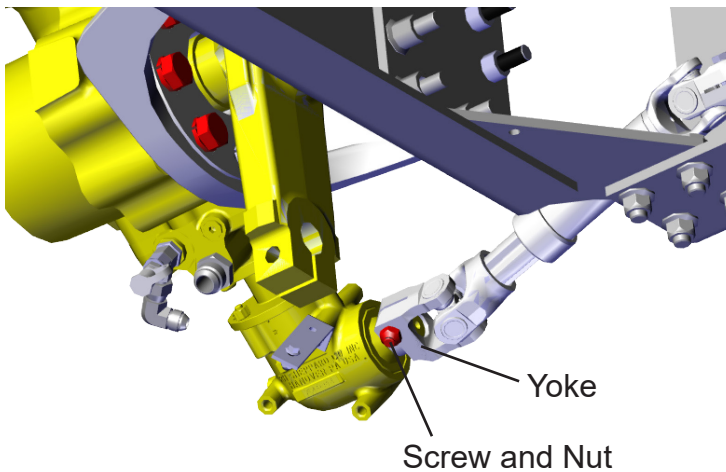


Figure 11

33. Connect the two hydraulic lines disconnected in Step 7 to steering gear. See Figure 12.

34. Install drag link to pitman arm. See Figure 12.

35. Install screw and nut in pitman arm to secure drag link. See Figure 12. Final tighten to 170 ft. lbs.

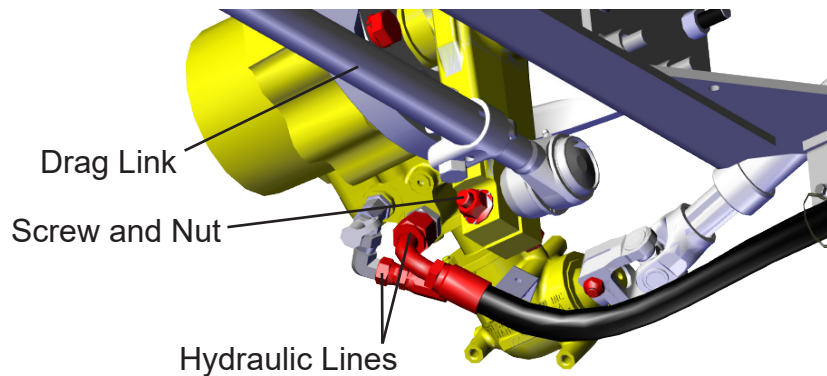


Figure 12

36. Remove lockout/tagout and wheel chocks.

### ***Steering Gear Relief Valve Plunger Adjustment Procedure***

#### **NOTE**

Turning the plungers in will increase the space between the axle and the stops. Turning the plungers out will decrease the clearance. Do not turn the slotted plunger out beyond flush with the plunger boss or a leak will occur. If necessary, lengthen or shorten the drag link and repeat the procedure.

1. Connect a pressure gauge capable of 2,200 PSI (15,168 KPA) to the inlet side of the steering gear.
2. Verify plungers are turned all the way in. The gear should be shipped in this configuration. Start engine and operate at idle speed.
3. With vehicle weight on the front tires (put LSTA equipped vehicles in Down-Empty setting.) Turn the wheel fully in one direction until the axle stop is contacted in that direction. Note the pressure, this will be the relief pressure of the gear. Back the appropriate plunger out until the gauge reads 1000 psi (DO NOT exceed this pressure).  
If the axle stops cannot be contacted, note the pressure when the wheels stop turning. This will be the relief pressure of the gear. Back the appropriate plunger out until the axle stop makes contact. Continue backing the plunger out until the gauge reads 1000 psi (DO NOT exceed this pressure).
4. While maintaining steering effort, start to turn the plunger back in. The pressure will drop as the plunger is turned. Stop when the pressure noted in Step 3 (the relief pressure) is reached, then turn the plunger in two more full turns.

5. Turn the wheels fully in the other direction and repeat steps 3 and 4 for the other plunger.
6. The axle stops will now be set. Contact of the axle stops may still be possible with the vehicle in the unloaded condition. When loaded, proper axle stop gaps of approximately 1/8" will exist.

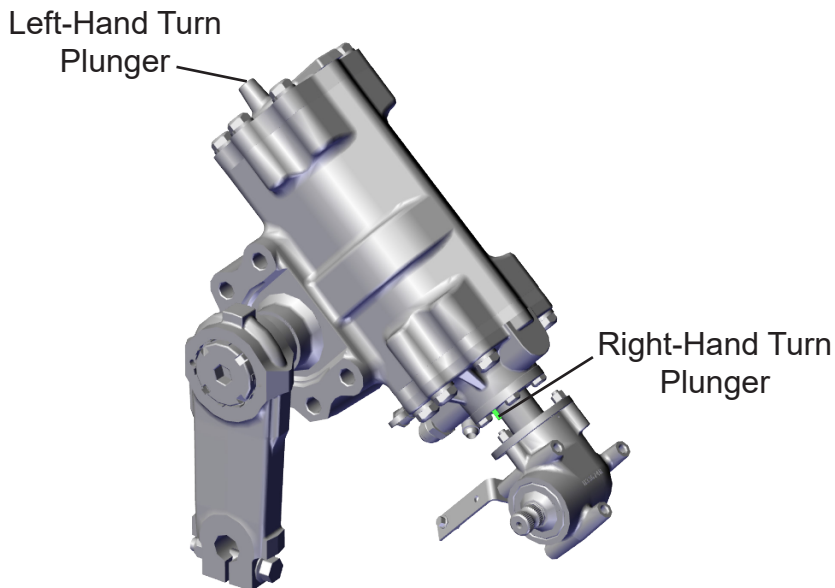


Figure 13

### ***Steering Gear Bleeding Procedure***

1. Park vehicle on a clean, dry, solid surface, preferably concrete.
2. Place transmission in neutral (N), set the parking brake, turn engine off, and chock the rear wheels.
3. Make sure hydraulic fluid level in the hydraulic tank is at the full mark.
4. Start engine, let it idle for two minutes without steering the steering wheel then shut the engine off.
5. Make sure the steering hard stops are in place.
6. Start the engine and steer the steering wheel from full left to full right several times.
7. Point the vehicle's wheels in the straight ahead position.

<b>NOTE</b>
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<b>Do not turn the steering wheel with the bleeder screw open.</b>
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8. Loosen the manual bleed screw 2-3 turns.

9. Allow air and aerated fluid to bleed out until the fluid appears without bubbles. If the bleed screw is not visible, allow the system to bleed until fluid drains from the bleed screw.
10. Close the bleed screw.
11. Repeat Step 6-10 until no aeration is found in the bleed oil.
12. Check the hydraulic reservoir fluid level and refill if required.
13. Turn vehicle engine off and remove wheel chocks.

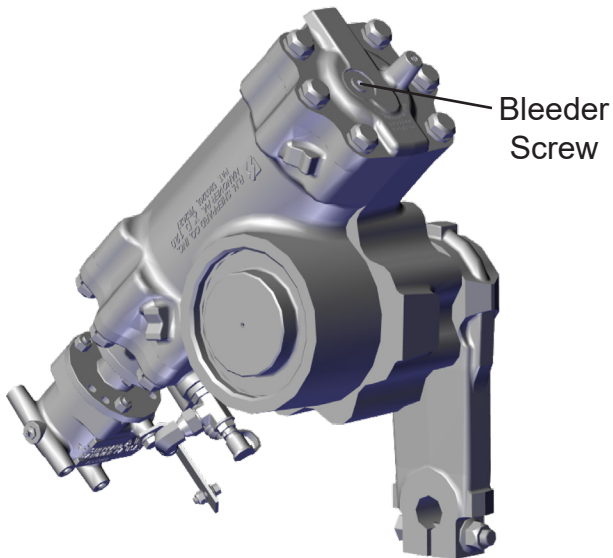


Figure 14

### **Continuous Improvement:**

The change included in this document is part of the McNeilus Continuous Improvement Process.

*McNeilus's quality policy is providing customer satisfaction through innovative products, dedicated service, and a constant focus on continuous improvement.*



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