Vehicles Equipped With Bendix Or Meritor Drum Brakes - Steer Axle Brake Noise

Internal Content

Bendix Brakes

Prior to proceeding with the steps below, Technical Service Bulletin 514-001 Brake S-Cam, Replacement should be reviewed and followed, and the problem verified to still exist.

- Technical Service Bulletin 514-001 can be found under the Service tab in Impact.

1. Navigate to the Service tab.

2. In the Info Type box, make sure Technical Service Bulletins is selected.

3. In the Additional search values box select Keyword

4. Enter 514-001 into the text entry box, press the Search button.

5. A link for the article will be shown in the results. Click on the title, then choose one of the options from the window that opens.

1. Create an eService case titled "**Recurring Brake Noise Bendix Brakes**". Add the SR# of the prior eService case where Technical Service Bulletin 514-001 was completed if available. Add results of all the steps listed below into the eService case.

2. Verify and record video or audio brake noise by heat cycling the brakes as explained below. Add a video or audio recording into the eService case. This step needs to be done on all new shoes and drums.

NOTE: Most Bendix brake noise complaints can be duplicated after the brakes are heat cycled and then test-driven using 15-25 psi brake applications.

2.1. To verify the Bendix brake noise, the truck may need to be test driven to heat cycle the brakes:

Live UI

2.2.1. Heat the front steer axle brakes to 300° F (150 °C).
2.2.2. Let the brakes cool to 150° Fahrenheit (65 °C).

3. Verify and record the slack stroke measurement.

4. Check and record brake camshaft endplay.

- Max endplay of 0.045 in (1.15 mm) is the allowable tolerance.

5. Perform a steer axle air brake balance pressure test. see attached Air Pressure Balance Test for reference.

6. If there was nothing found to be wrong in steps 3-5: Remove the steer axle shoes and drums and take pictures (look at example photos for reference). Attach the pictures to the eService case.



Live UI



Meritor Brakes

Prior to proceeding with the steps below, the Meritor Brake Burnishing Process must be completed and the problem verified to still exist.

PDF	Meritor_Burnish_Process.pdf

1. Create a new eService case titled "**Recurring Brake Noise Meritor Brakes**" Add the SR# of the eService case where the **Meritor Burnish** **s** was completed if available. Add the results of all the steps listed .nto the eService case.

Live UI

2. Verify and record video or audio of brake noise add to eService case.

3. Verify and record stroke measurement in eService case. .

4. Check and record brake camshaft endplay.

- Max endplay of 0.045 in (1.15 mm) is the allowable tolerance.

5. Verify and record steer axle air pressure balance test. See attached Air Pressure Balance Test for reference.

6. If there was nothing found to be wrong in steps 3-5: Remove the steer axle shoes and drums and take pictures (look at example photos for reference). Attach the pictures to the eService case.



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Tags

steer axle brake squeal brake noise brake squeal

bendix brakes meritor brakes volvo fsb 514-001

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Related links and attachments

FSB 514-001

Air Pressure Balance Test

Meritor Burnish Process

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to help improve the content of this article

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Brake S-Cam, Replacement

M-514-001

(June 2018)

Valid for

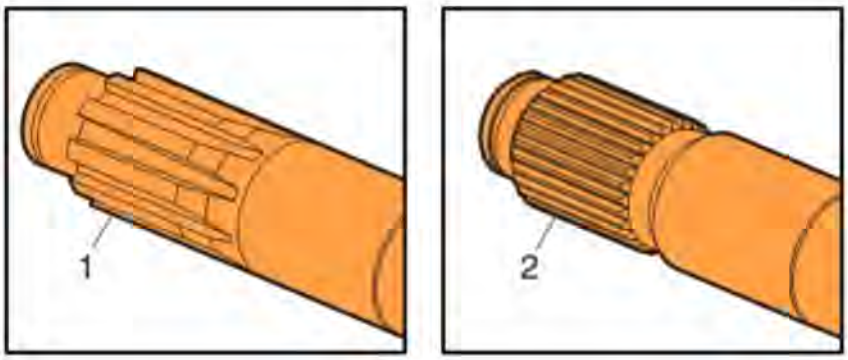
Mack trucks built after 05/13/2013, equipped with Bendix Brake S-Cams on the steer axle

Case description

Some trucks may experience excessive noise during breaking. The repair procedure includes installation of a new tuned brake S-Cam shaft, spring & roller kit, and seal & shim kit. Follow the S-Cam replacement procedure outlined in this docuemnt.

Note: For replacement, use the 10 spline Brake S-Cam shaft for trucks built from 05/13/2013 to 07/09/2017. See reference image of 10 spline brake S-Cam (I) in figure below.

Note: For replacement, use the 28 spline Brake S-Cam shaft for trucks built from 07/10/2017. See reference image of 28 spline brake S-Cam (2) in figure below.

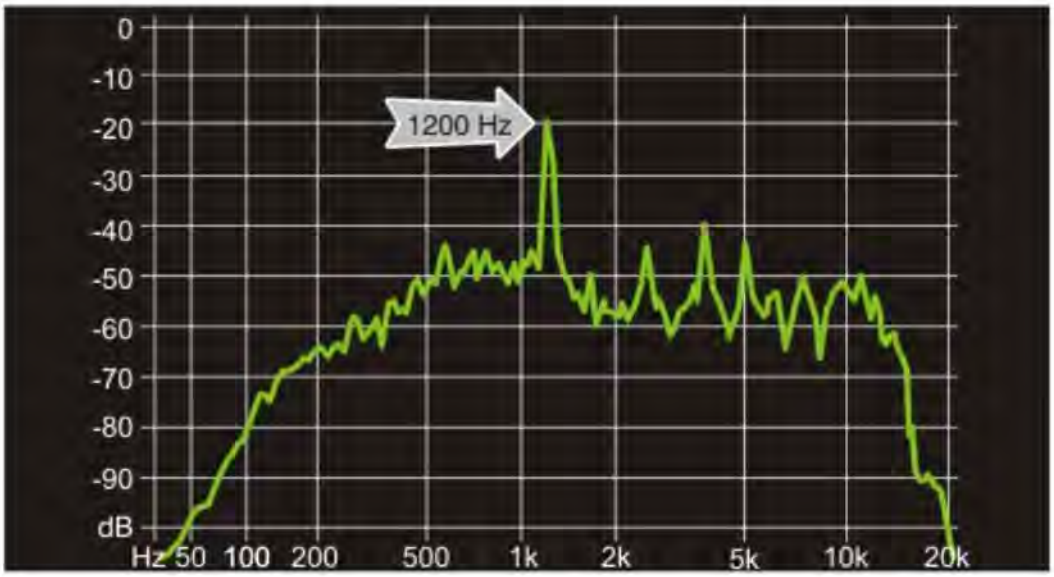


Bendix Tuned S-Cam Description

Note: The Bendix Tuned S-Cam shaft is “Only” designed to reduce/or eliminate brake noise heard within the 1200 to 1500 Hertz frequency range. Submission of a video or audio file with the tech support case will assist in the diagnosis of any brake noise concern.

The Bendix Tuned S-Cam is designed to reduce and/or eliminate brake noise heard within the 1200-1500 Hertz frequency range. Although the tuned S-Cam may help reduce brake noise heard in other frequency ranges, it is only designed to effectively reduce the noise range between 1200-1500 Hz. Proper installation and clearance of the Bendix tuned S-Cam is very important. To ensure the best results in noise reduction follow all steps within this FSB. Below is an example Hertz graph of the Bendix brake noise.

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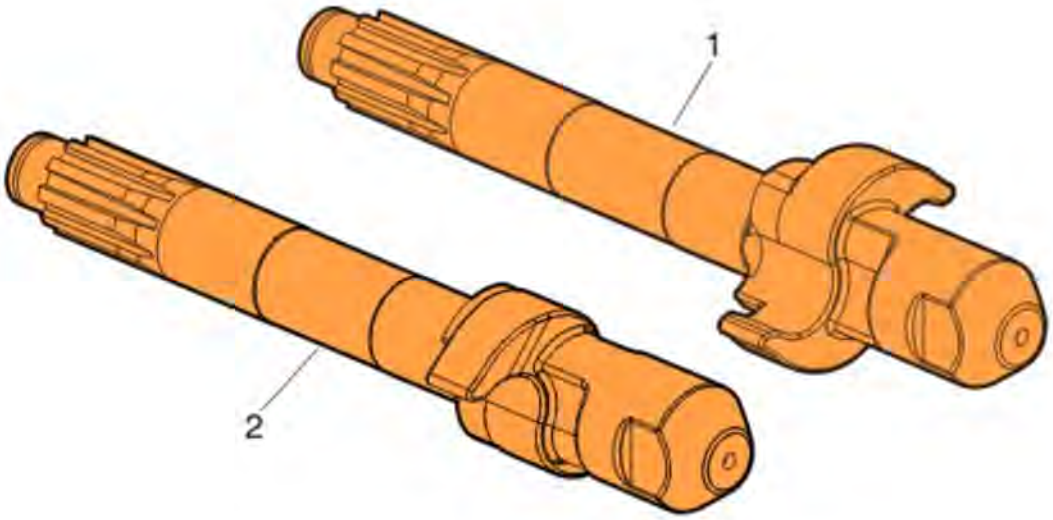
Verifying Noise

A Tech Support/E-Service case will need to be submitted to verify that the Bendix brake noise is within the Frequency Range that the new tuned S-Cam is designed to correct. To verify the Bendix brake noise the truck may need to be test driven and the front steer axle brakes heated up to 300° Fahrenheit then let cool to 150° Fahrenheit. Most Bendix brake noise complaints can be duplicated after brakes are heat cycled and then test driven using 15-25 psi brake applications. Tech Support may ask that a video or sound file be taken and uploaded to the case for verification. A valid Tech Support/E-Service case number will be needed when ordering parts.

Parts Ordering

To schedule parts orders and repairs, please call (877) 986-5862 with a valid Tech Support/E-Service case number and VIN number of the vehicle in need of this repair.

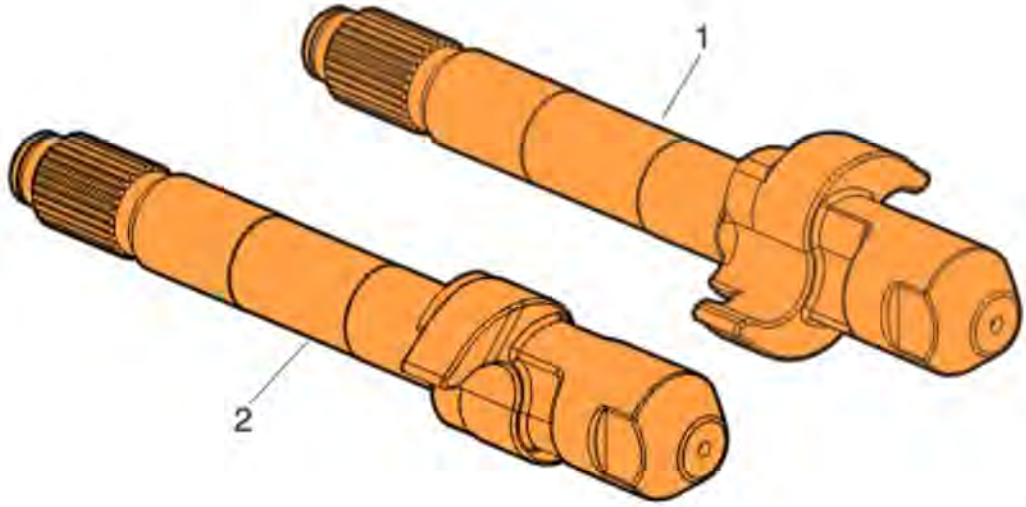
Note: Example Tech Support/E-Service Case Number (1-XXXXXXXXXX).



10-Spline Camshaft (For Trucks Built From 05/13/2013 to 07/09/2017)			
Item	Description	Part	Qty

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		Number	
1	Camshaft, Tuned Mass, CW, 10SPLINE	85150135	1
2	Camshaft, Tuned Mass, CCW , 10SPLINE	85150134	1
3	Spring Kit	85153537	2
4	Hardware Module Kit	85153464	1



28-Spline Camshaft (For Trucks Built From 07/10/2017)			
Item	Description	Part Number	Qty
1	Camshaft, Tuned Mass, CW, 28SPLINE	22880282	1
2	Camshaft, Tuned Mass, CCW , 28SPLINE	22880283	1
3	Spring Kit	85153537	2
4	Hardware Module Kit	85153464	1

Decommissioning the Truck for Repair

You must read and understand the precautions and guidelines in Service Information, group 50, "General Safety Practices, Brakes" before performing this procedure. If you are not properly trained and certified in this procedure, ask your supervisor for training before you perform it.

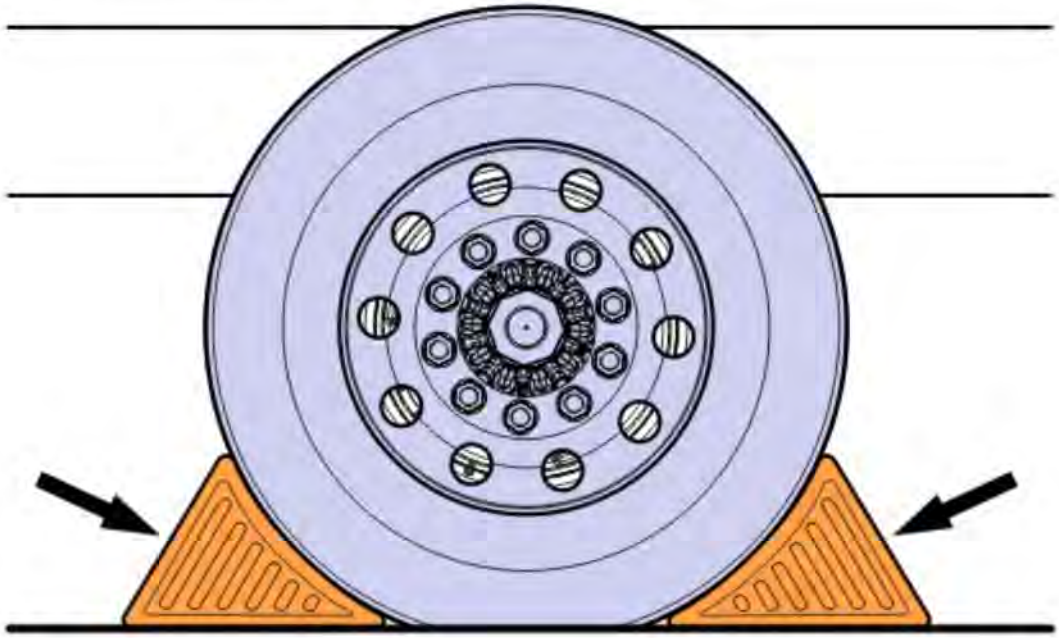
NOTE: Information is subject to change without notice. Illustrations are used for reference only and can differ slightly from the actual vehicle being serviced. However, key components addressed in this information are represented as

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accurately as possible.

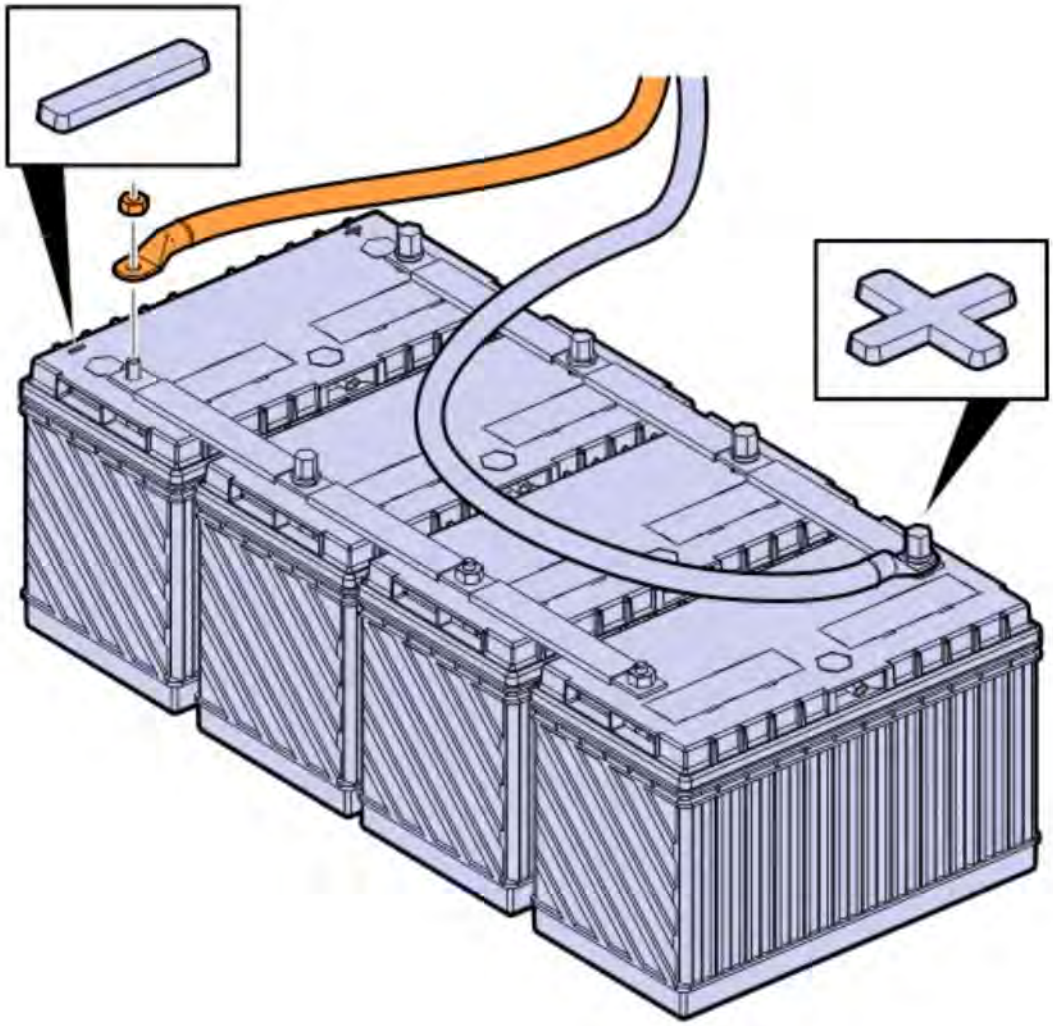
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1. Park the vehicle on a flat and level surface.
2. Apply the parking brake.
3. Place the transmission in neutral or park.
4. Install the wheel chocks.



5. Disconnect the cable from the battery's negative terminal.

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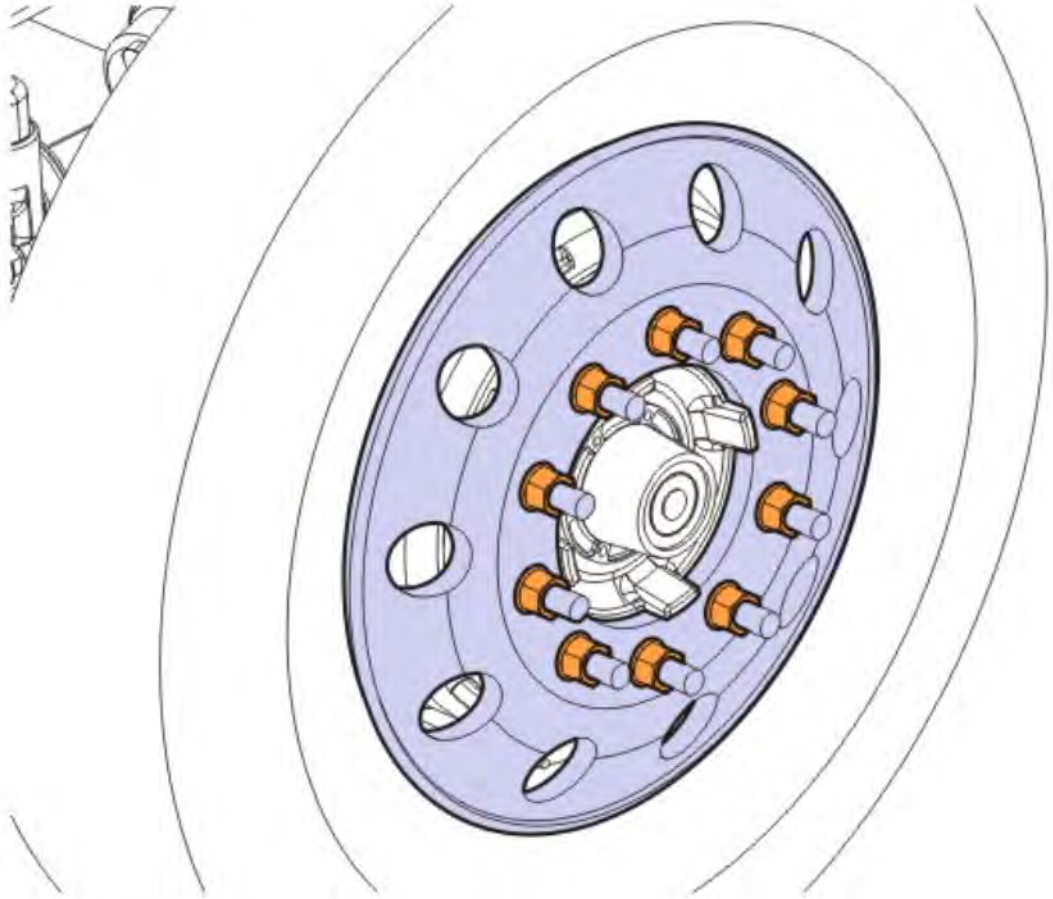
Brake S-Cam Removal

Note: The left side is shown for instructional purposes.

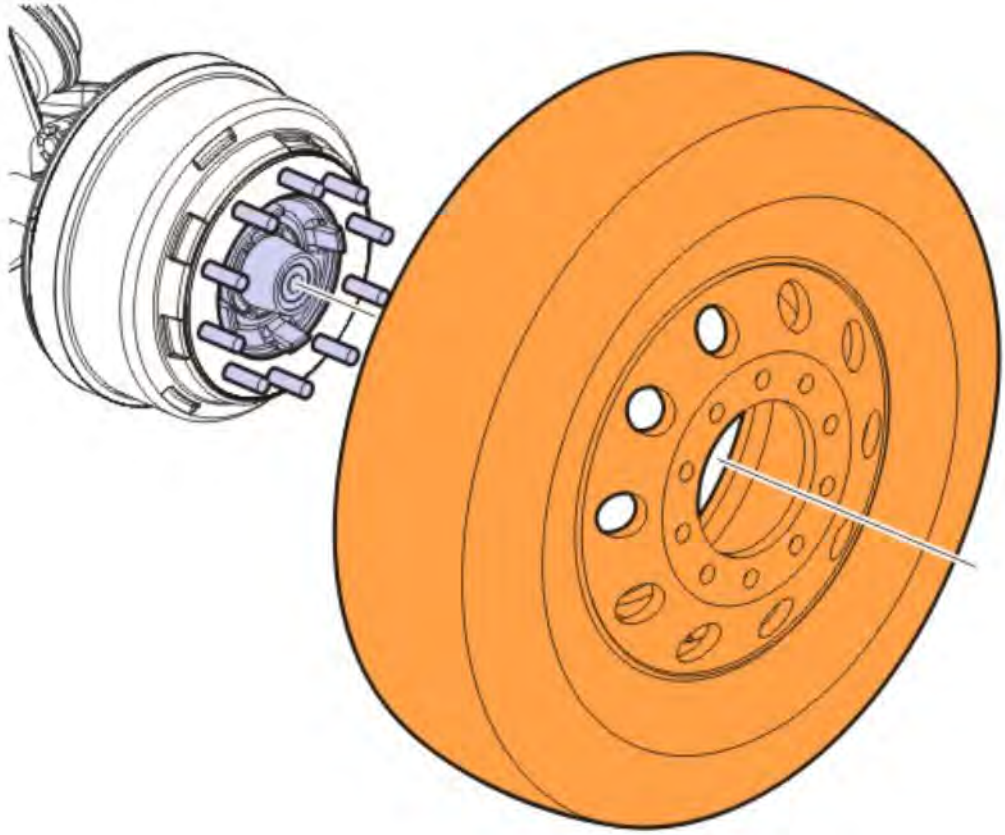
1. Lift the steer axle with a jack, place the truck on jack stands, and remove the jack.
2. Remove the wheel nuts.

   Note: Before removing the wheel, mark the end of one wheel stud with a paint marker and mark the wheel at the stud to ensure the wheel is reinstalled in the same position.

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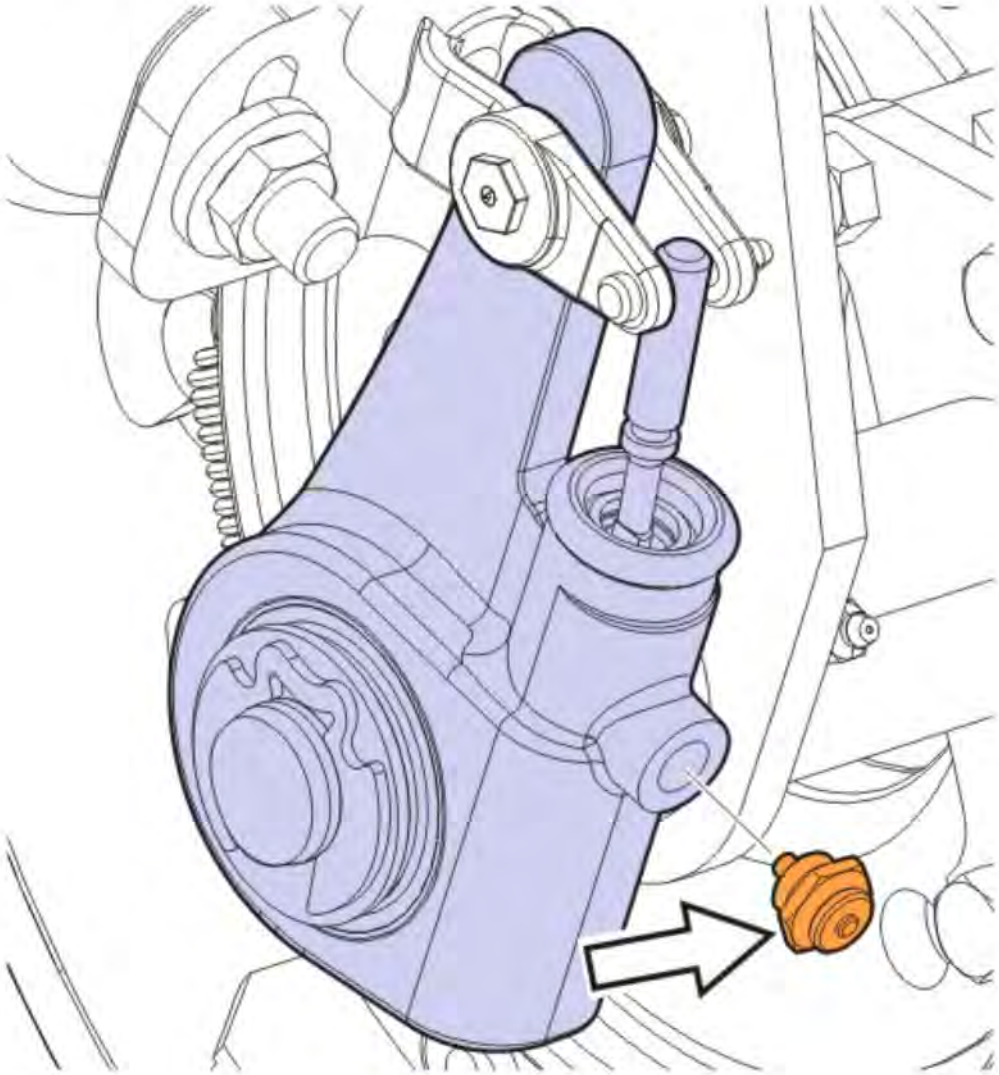
3. Remove the wheel.



4. With the wheel removed, match mark the drum to the wheel stud to ensure the drum can be reinstalled in the same position.
5. Mark the brake shoes to ensure they can be reinstalled in the same position (top or bottom).

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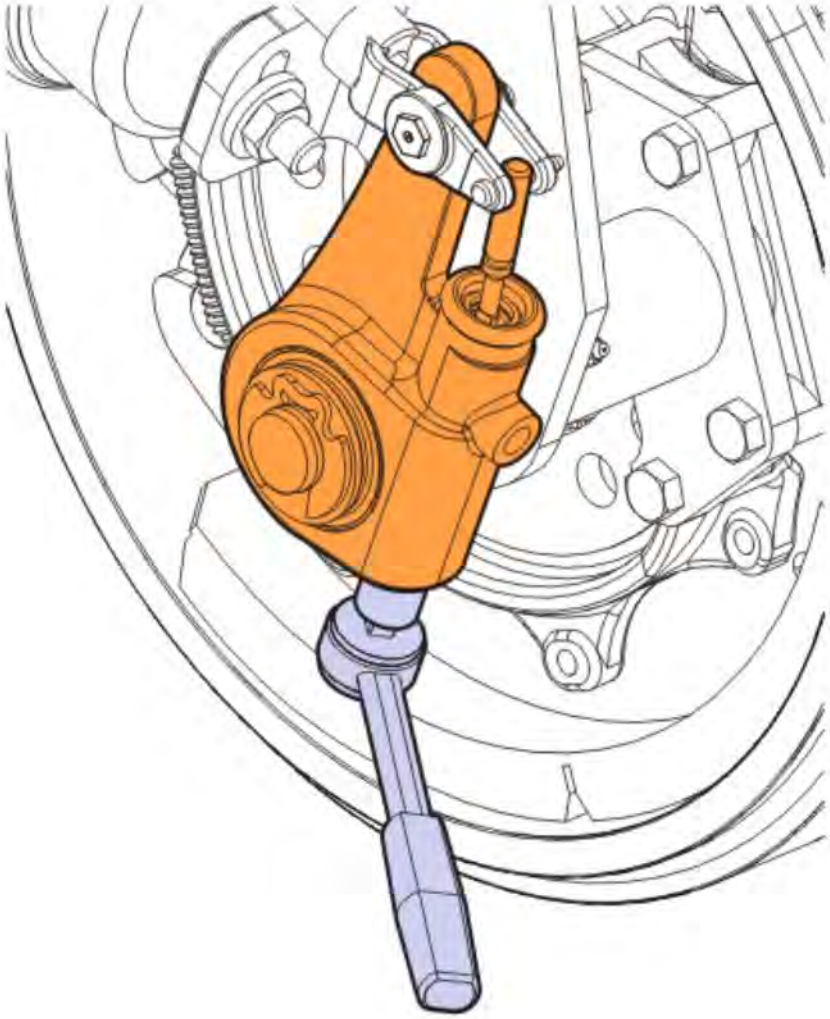
6. If applicable, remove the slack adjuster pawl.



7. Back off of the brake (slack adjuster).

   Note: The Meritor slack adjuster is shown in this procedure for backing off the brakes. However, this procedure is similar for other brands.

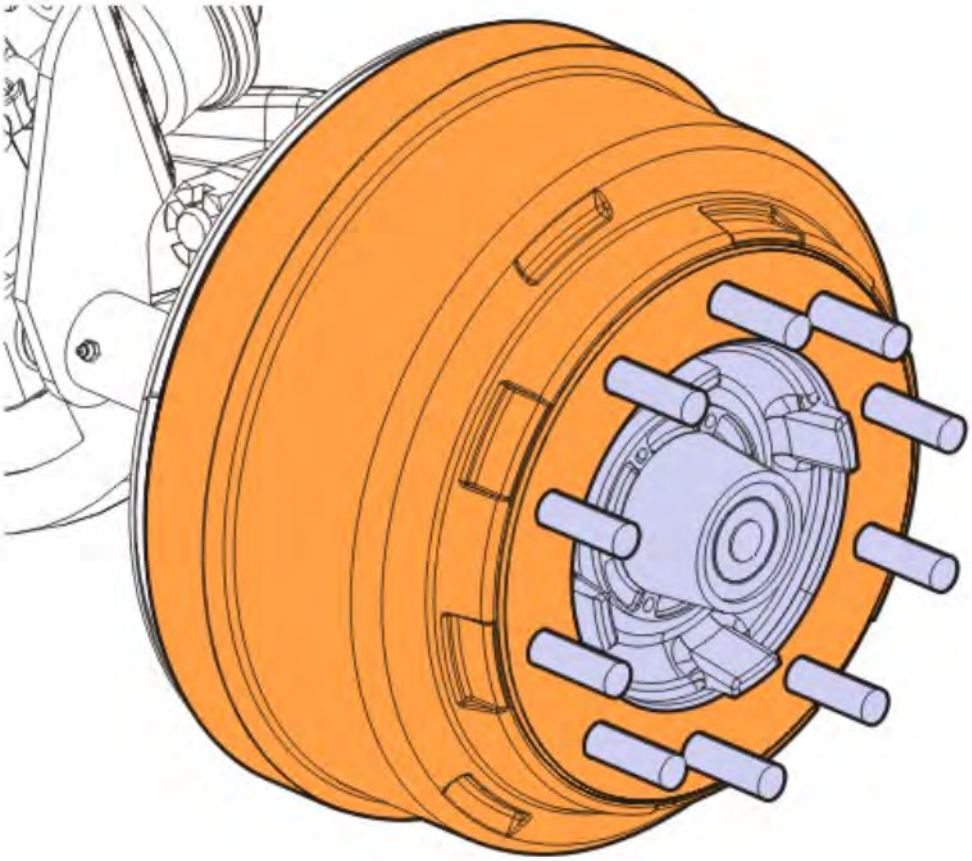
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8. Remove the brake drum.

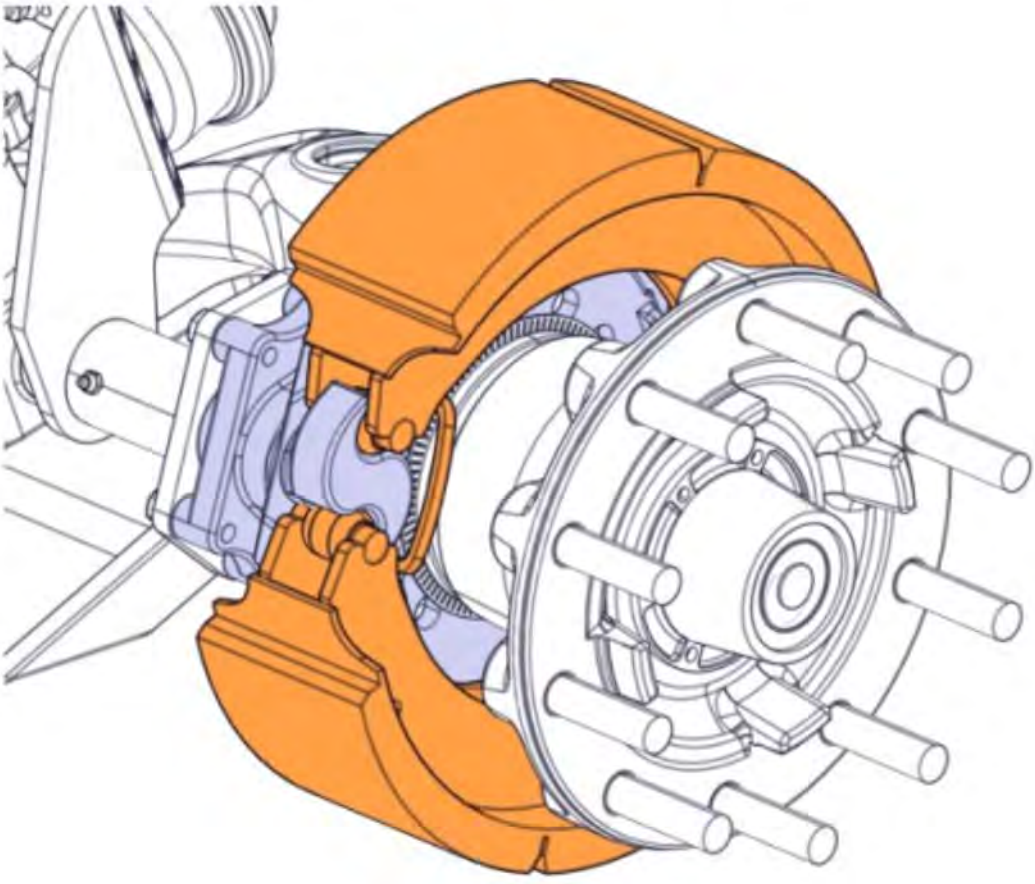
   Note: Clean the brake drum of any dust or debris and store for installation.

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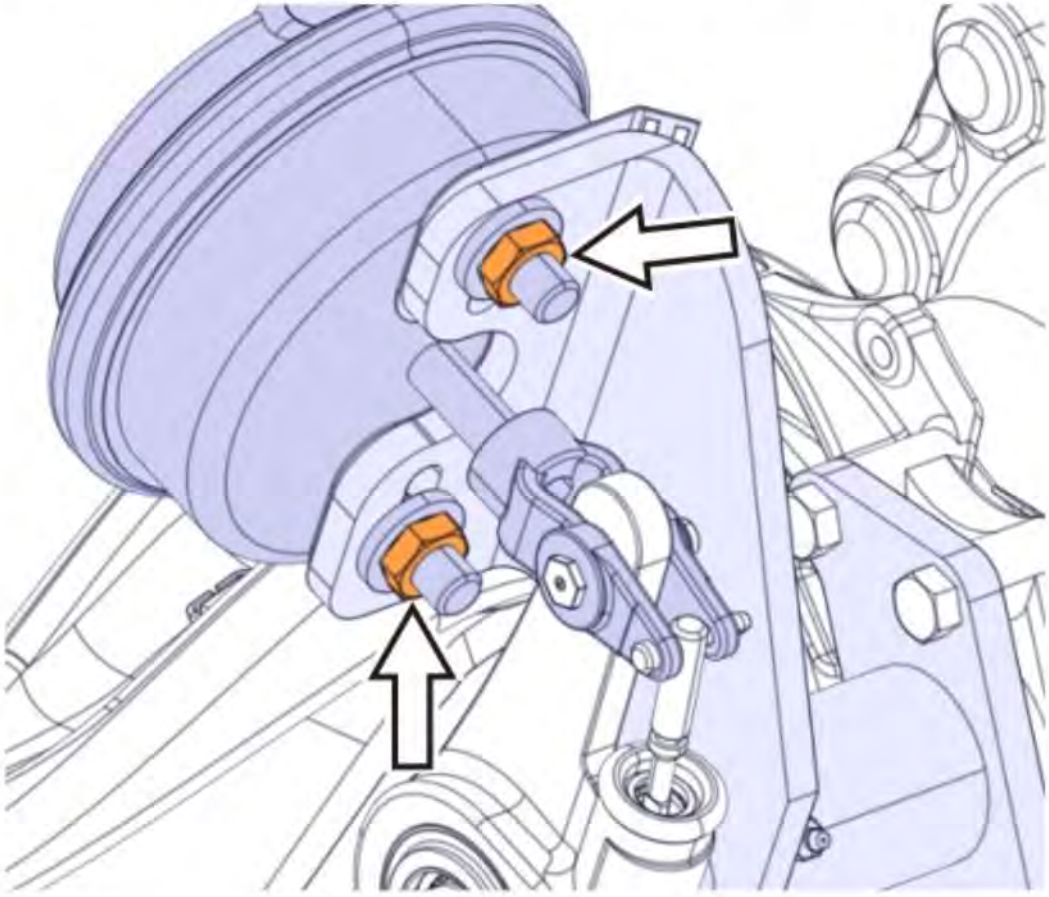
9. Remove the brake shoes, brake springs, and rollers.

   Note: Clean the brake shoes of any dust or debris and store for installation.

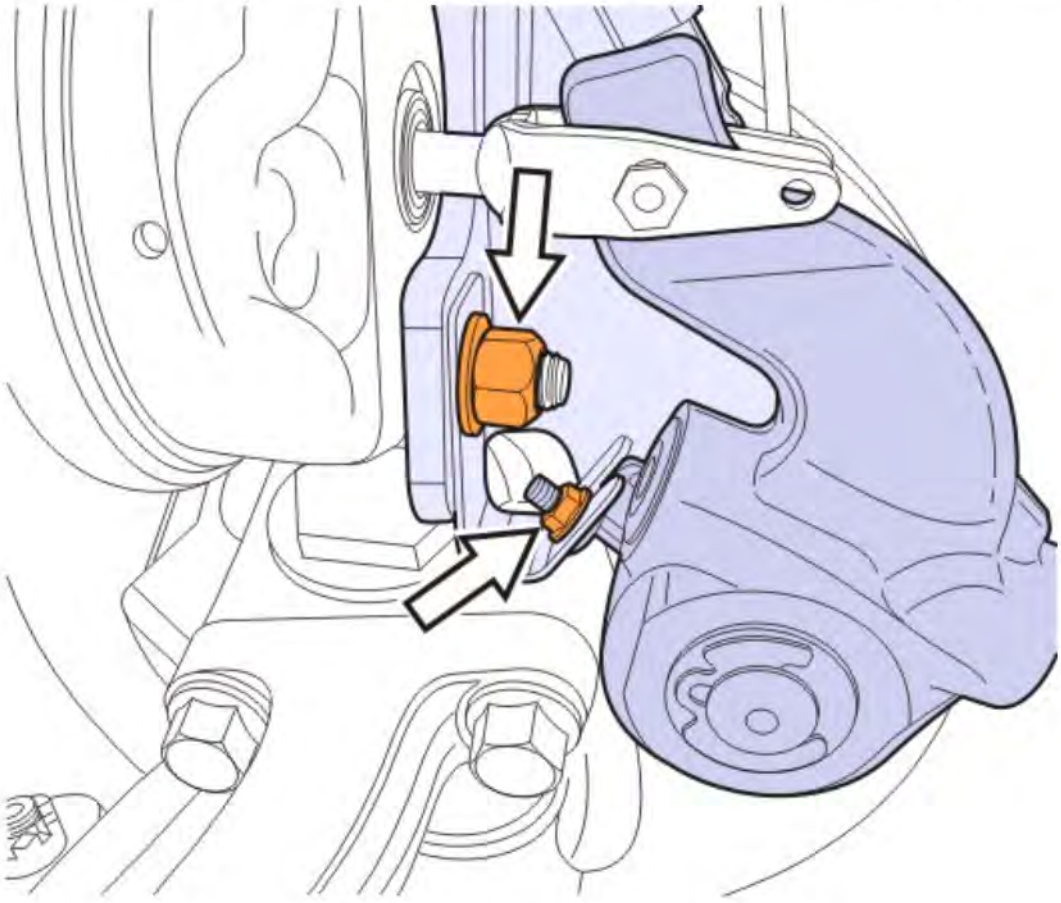


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10. Loosen the two nuts securing the brake chamber to the cam tube mounting bracket.

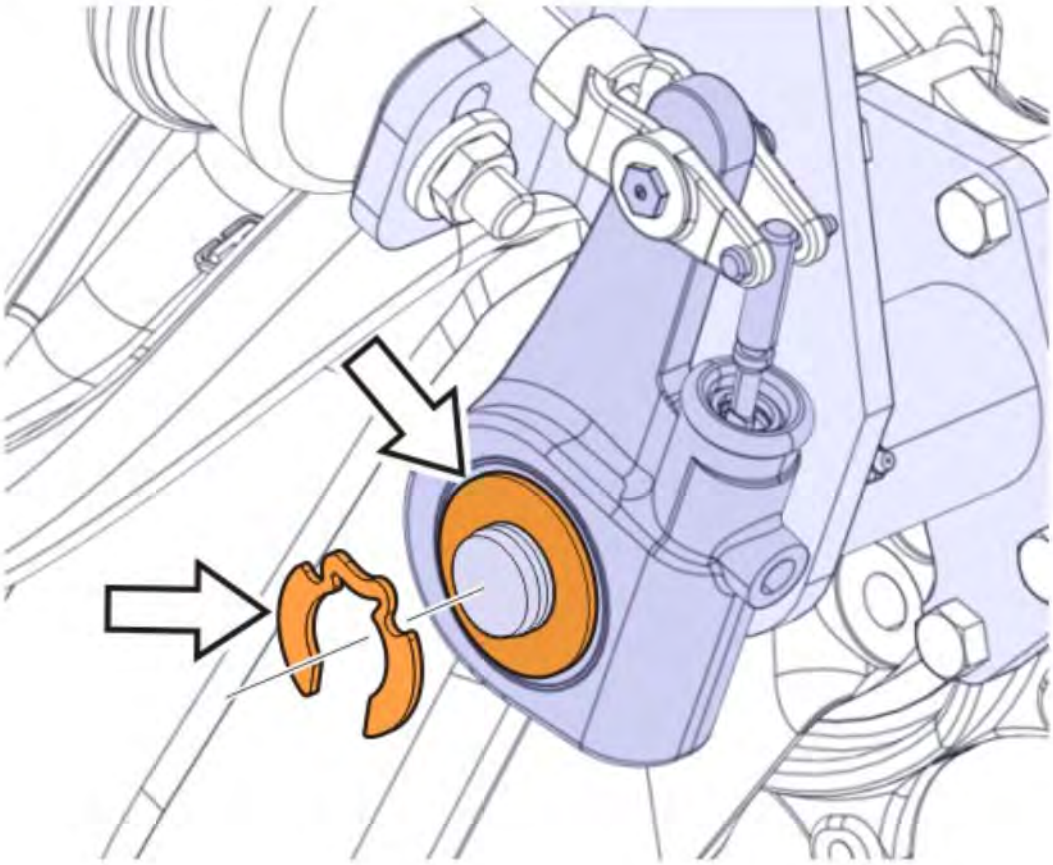


11. For Haldex slack adjusters, remove the fasteners securing the slack adjuster to the cam tube mounting bracket.

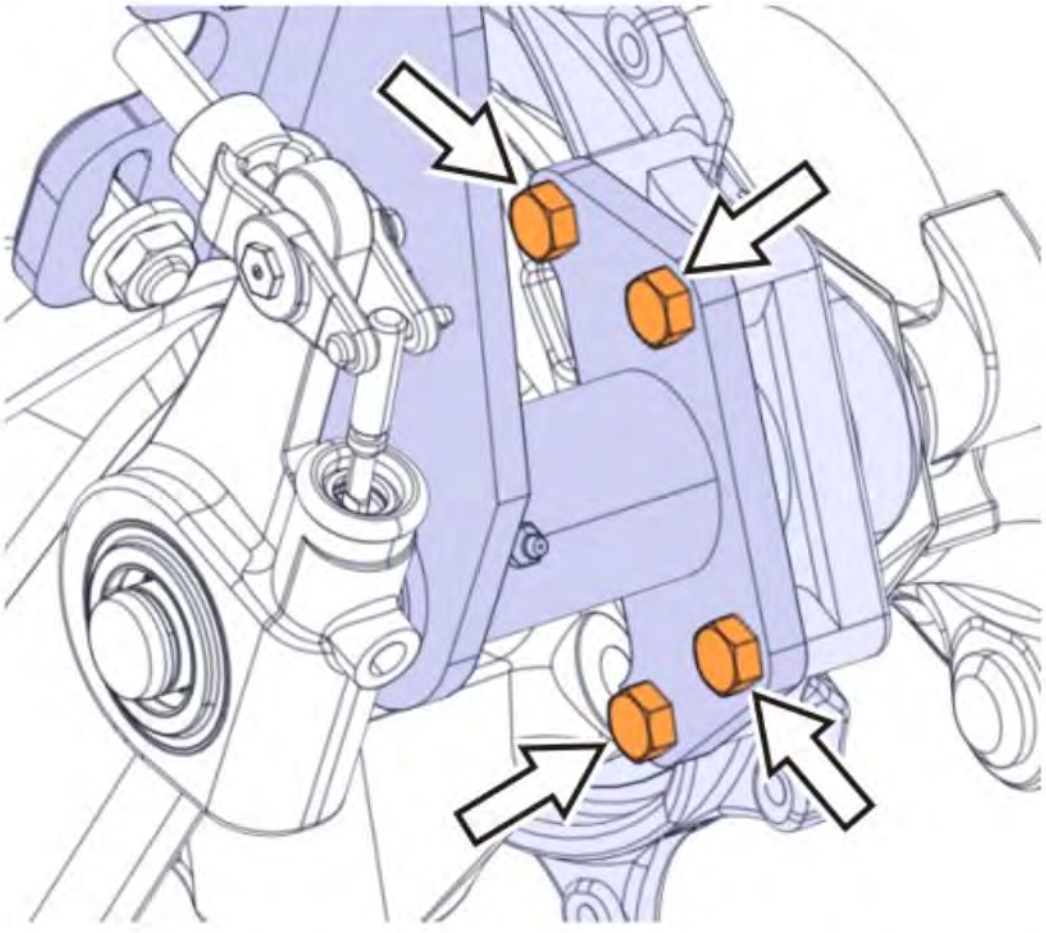


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12. Remove the snap ring and washers securing the slack adjuster to the brake S-Cam.



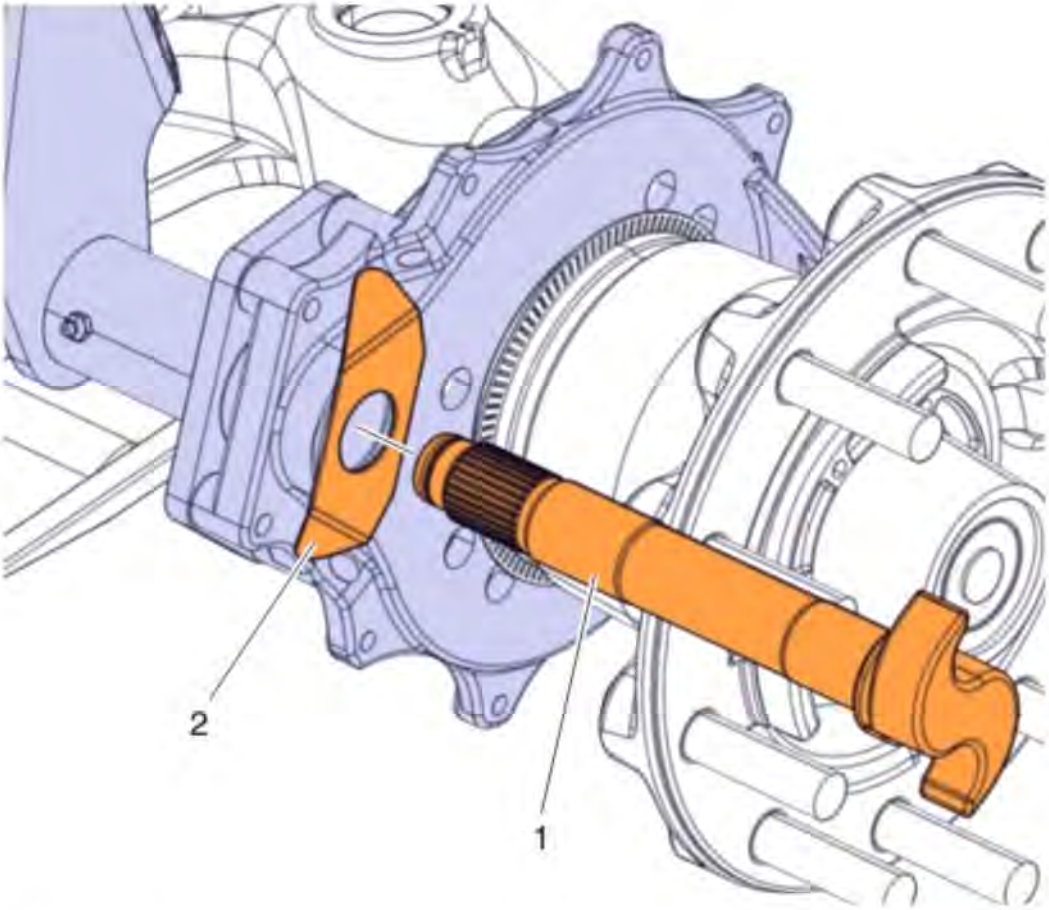
13. Remove the four nuts and washers securing the cam tube to the brake spider.



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14. Remove the brake S-Cam by pulling the S-Cam clear of the cam tube and brake spider.

    Note: Remove brake S-Cam head washer (2) from the removed S-Cam (1). Clean the head washer and store it for reuse.



15. Follow steps 2 through 14 for the right side of the truck.

Brake S-Cam Installation

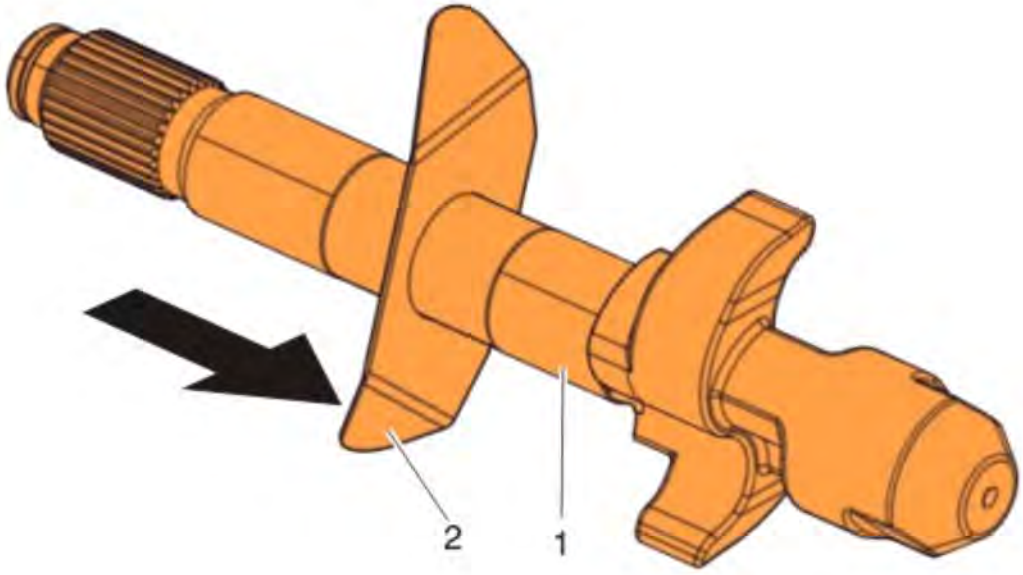
Note: The left side is shown for instructional purposes.

1. Inspect the cam tube. Ensure the grease seals and bushing are good.

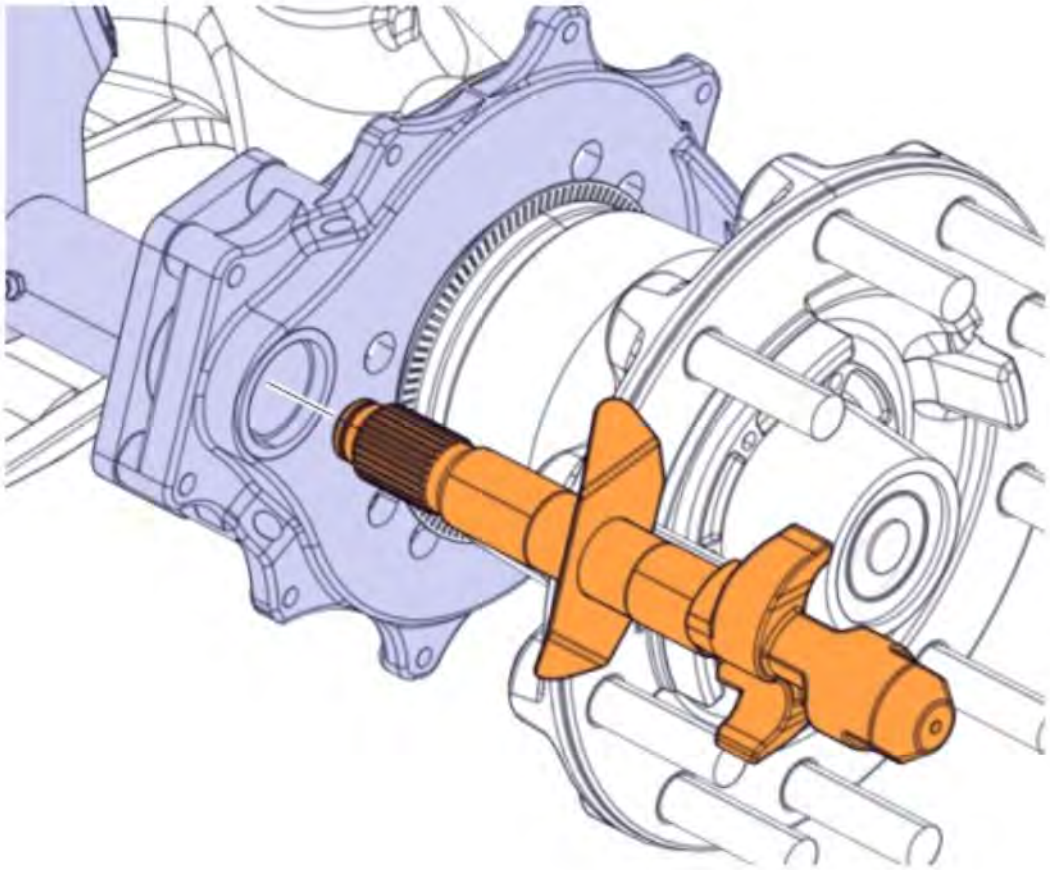
   Note: Replace the grease seals and/or bushings if needed.

2. Retrieve the stored S-Cam head washer (2) and install it on the replacement S-Cam (1) in the proper direction.

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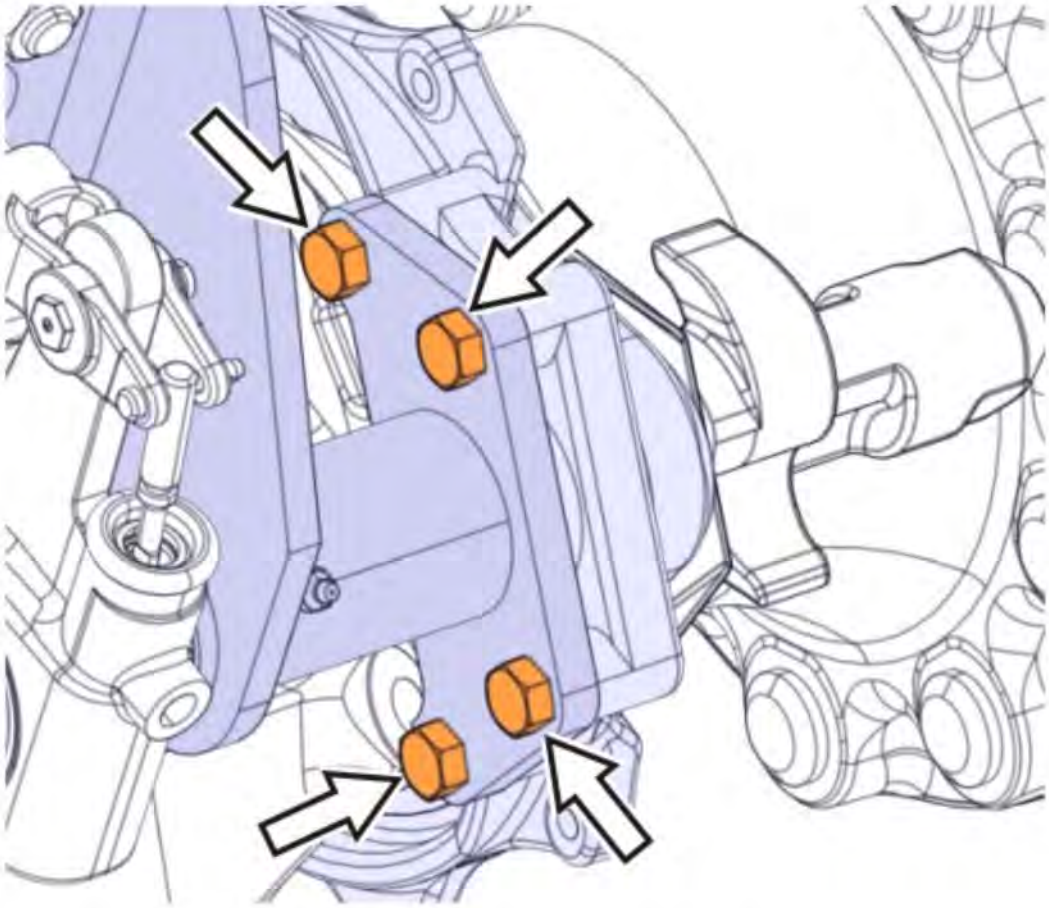


3. Lube the replacement S-Cam before installing it in the cam tube.
4. Position the S-Cam in the cam tube and slide it into the brake spider.



5. Install the four nuts securing the cam-tube and brake S-Cam to the brake spider.
6. Tighten the four nuts to 75 ft-lbs (102 N m).

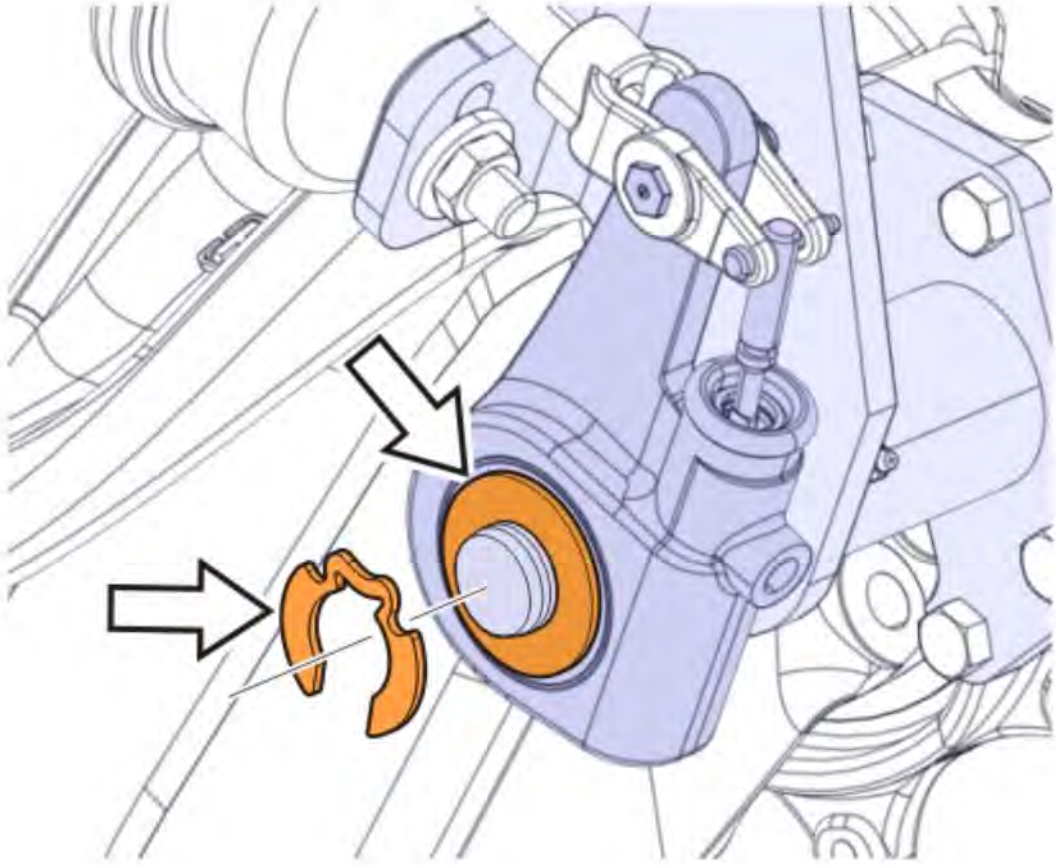
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7. Properly position the slack adjuster on the replacement S-Cam.
8. Install the shim washer on the S-Cam, slack adjuster, and shim S-Cam to set the lateral end play 0.127 – 0.635 mm (.005-.025 in).
9. Install the E-clip.

   Note: Ensure the E-clip is in the groove at the end of the S-Cam.

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10. Measure the cam bushing play.

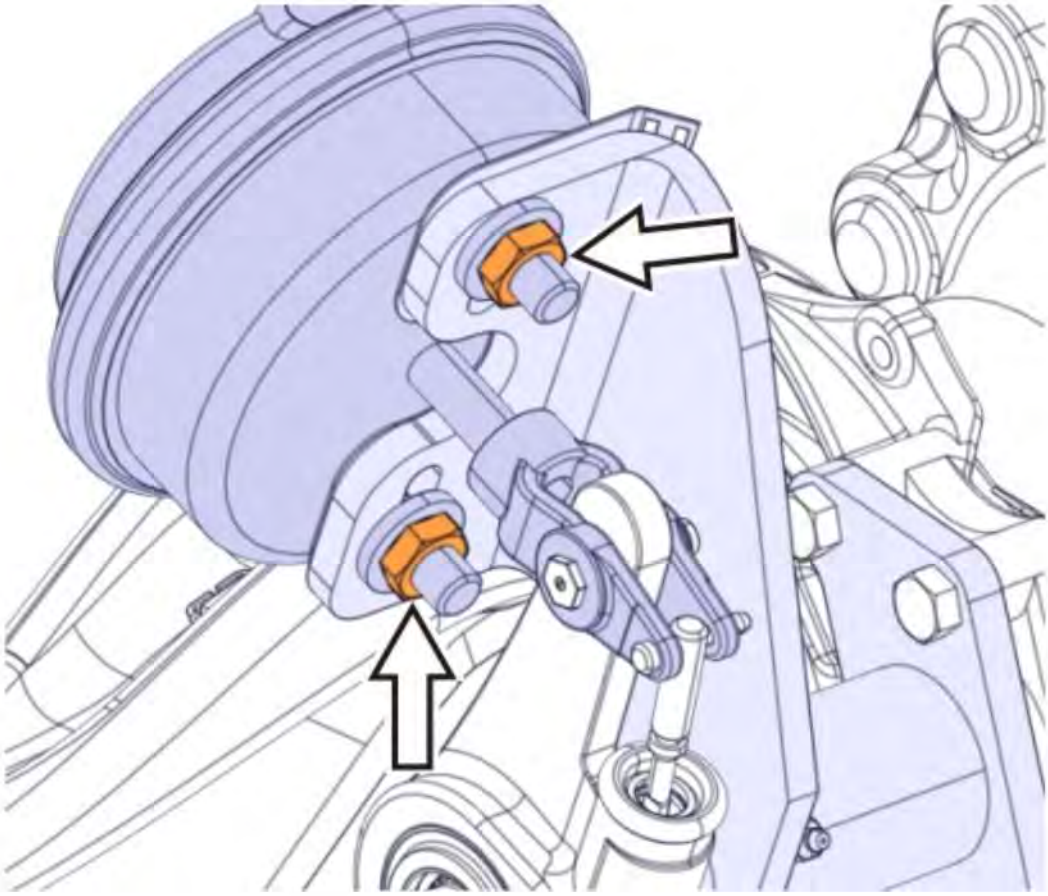
    Note: The maximum S-Cam bushing vertical end play permitted is (0.035 in).

11. Tighten the two nuts securing the brake chamber to the cam tube mounting bracket.

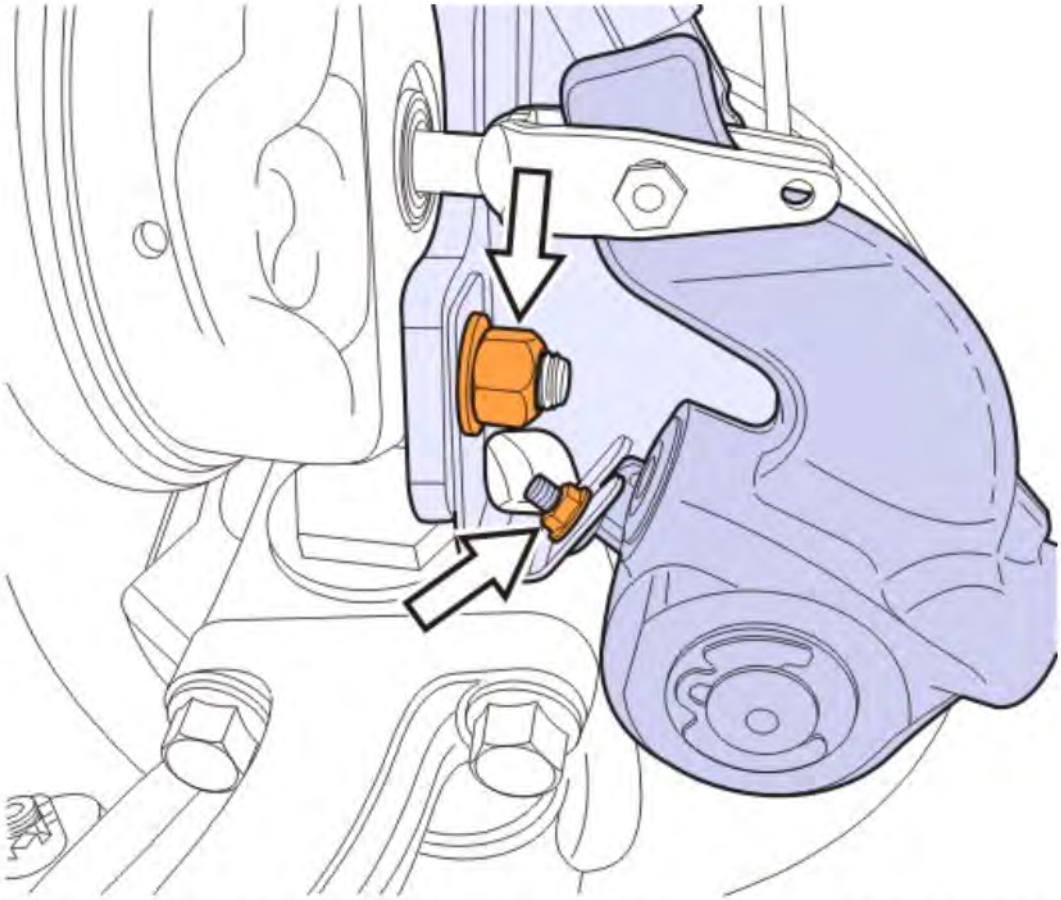
    Note: On the first pass, tighten the two nuts to 34 Nm (25 ft-lb).

    Note: On the second pass, tighten the two nuts to 180 – 210 Nm (133 – 154 ft-lb).

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12. For Haldex slack adjusters, install the fasteners securing the slack adjuster to the cam tube bracket.
13. Tighten the slack mounting strap fastener to 11 – 16 Nm (8 – 12 ft-lb).

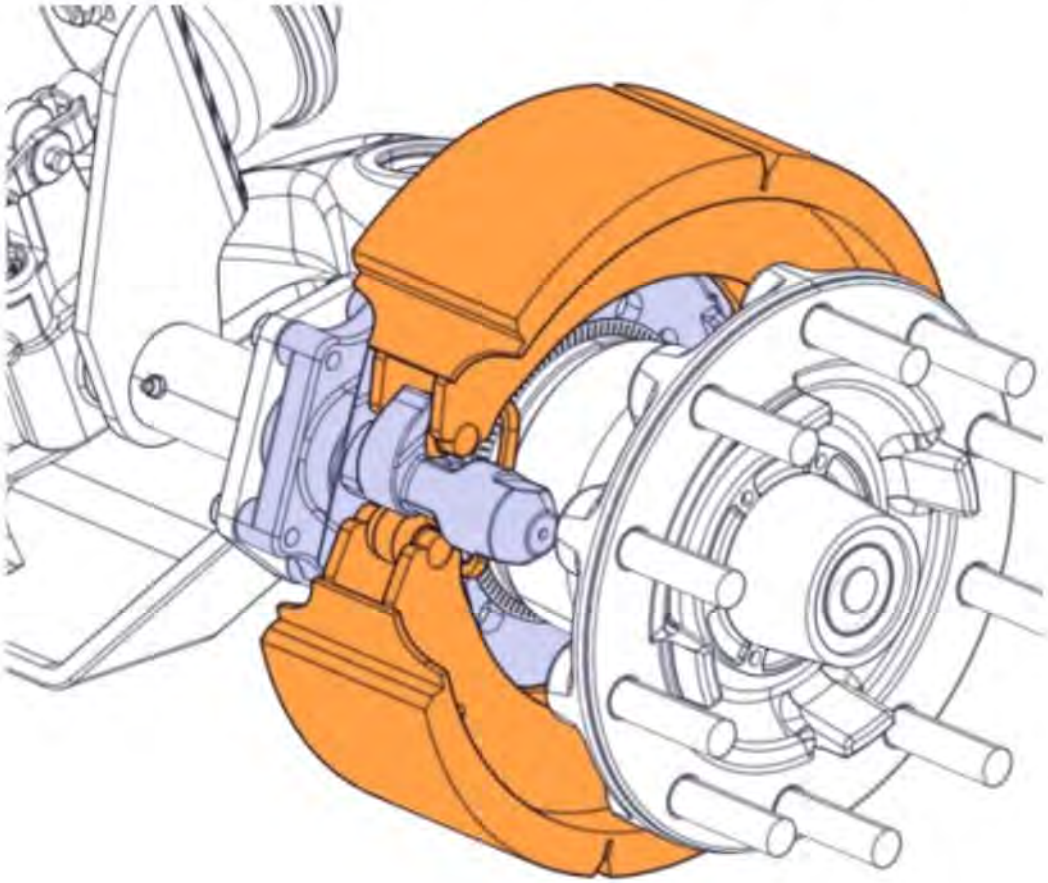


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14. Using a grease gun, grease the cam tube and slack adjuster until they purge.

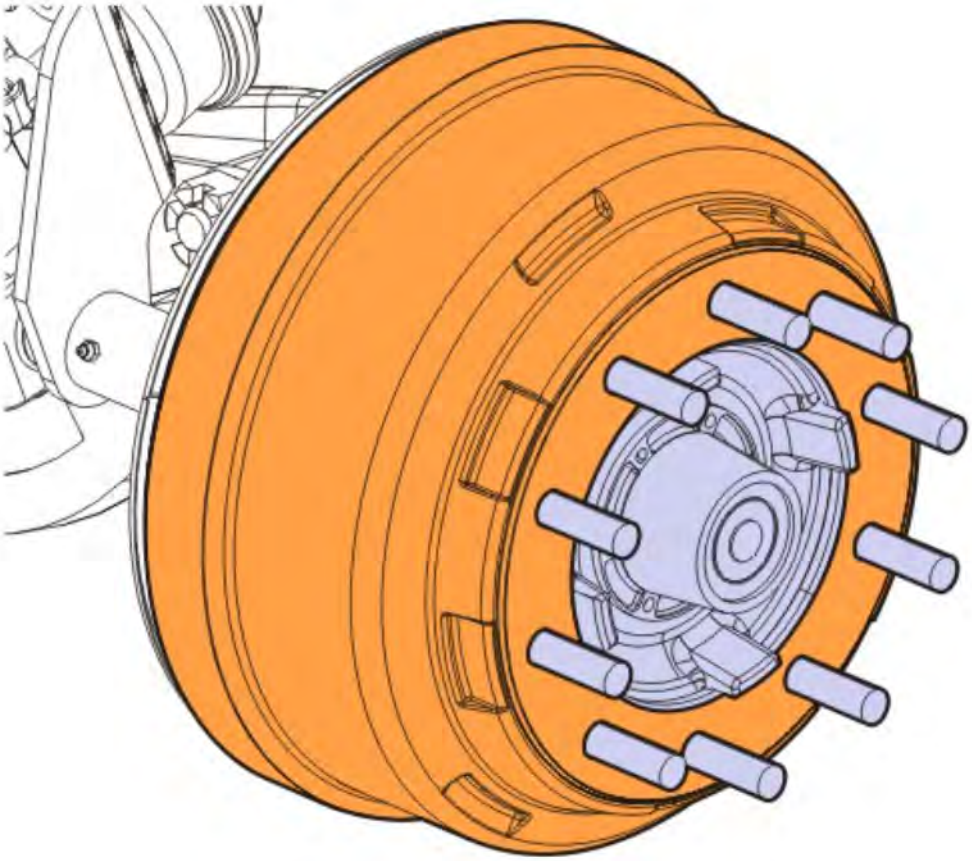
    Note: Ensure the grease seal at the S-Cam head does not leak. If it does leak, replace the seal.

15. Pre-lube the rollers and anchor pin pockets on the brakes before installing brake shoes.
16. Install the brake shoes, springs and rollers in the same position (top or bottom) as previously recorded.

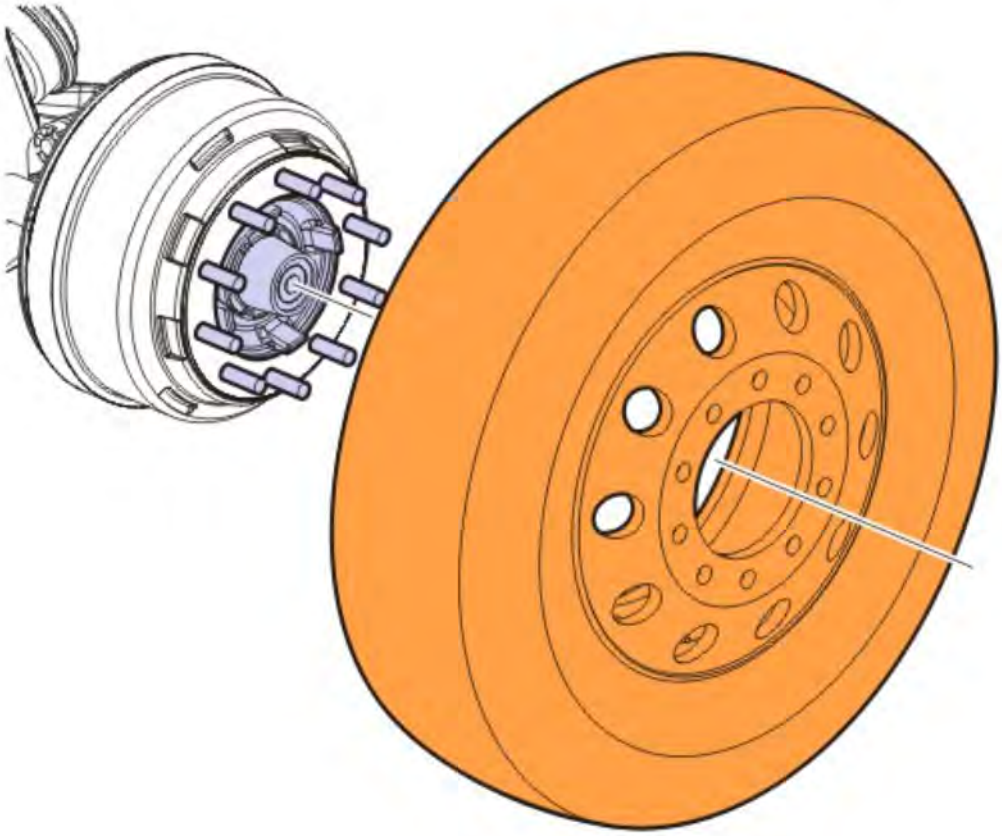


17. Install the brake drum as previously recorded on the drum and wheel stud during the removal procedure.

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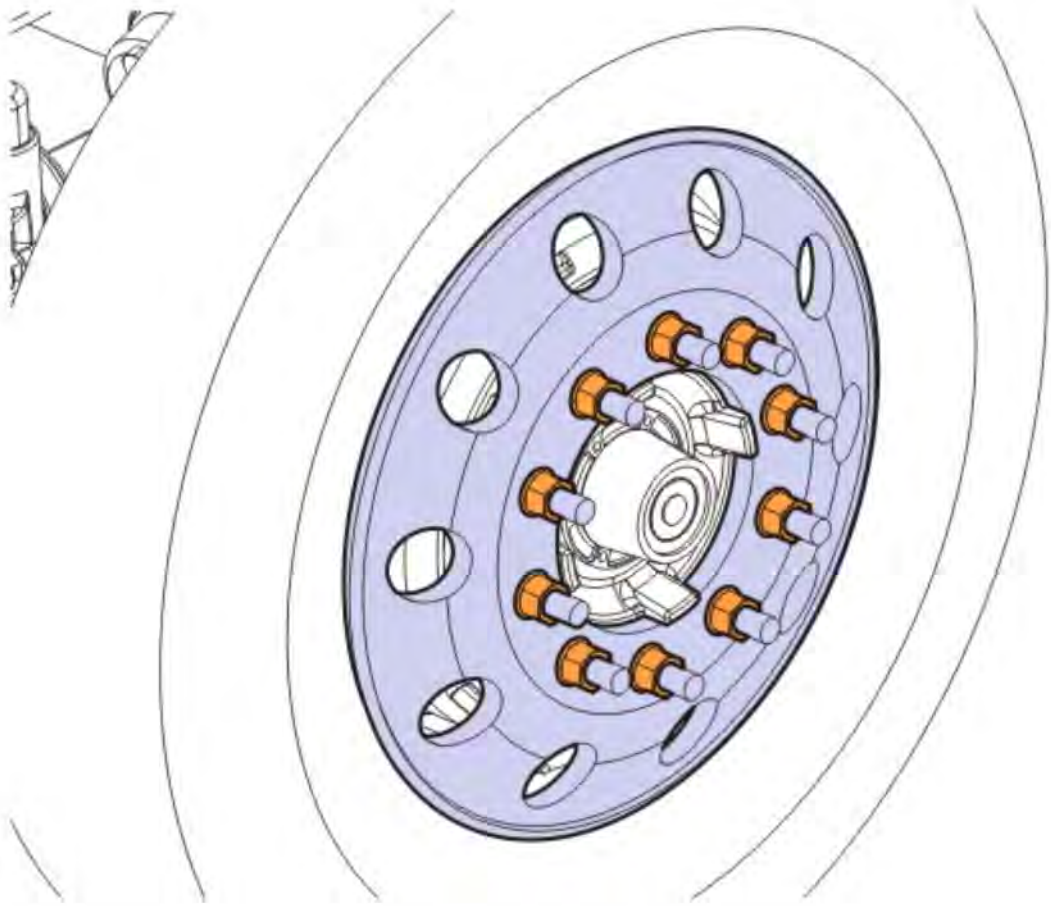


18. Install the wheel using the reference marks made on the wheel and the wheel stud during the removal procedure.



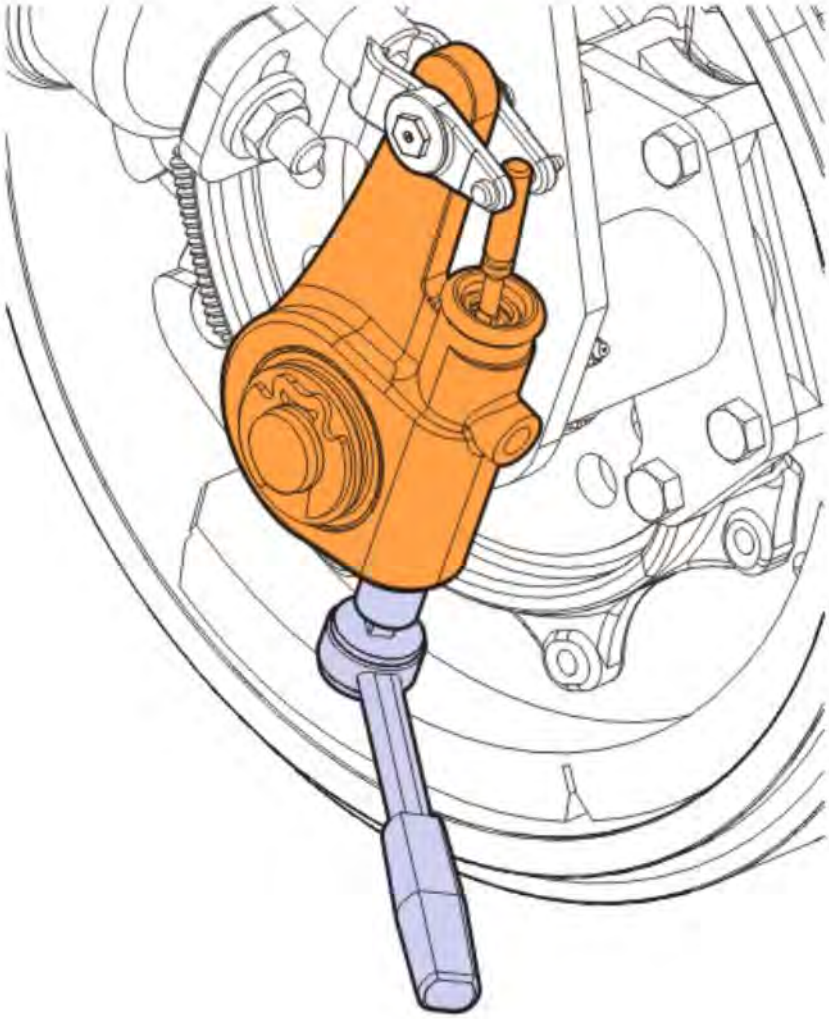
19. Install the wheel nuts.
20. Tighten the wheel nuts to 610 Nm (450 ft-lb).

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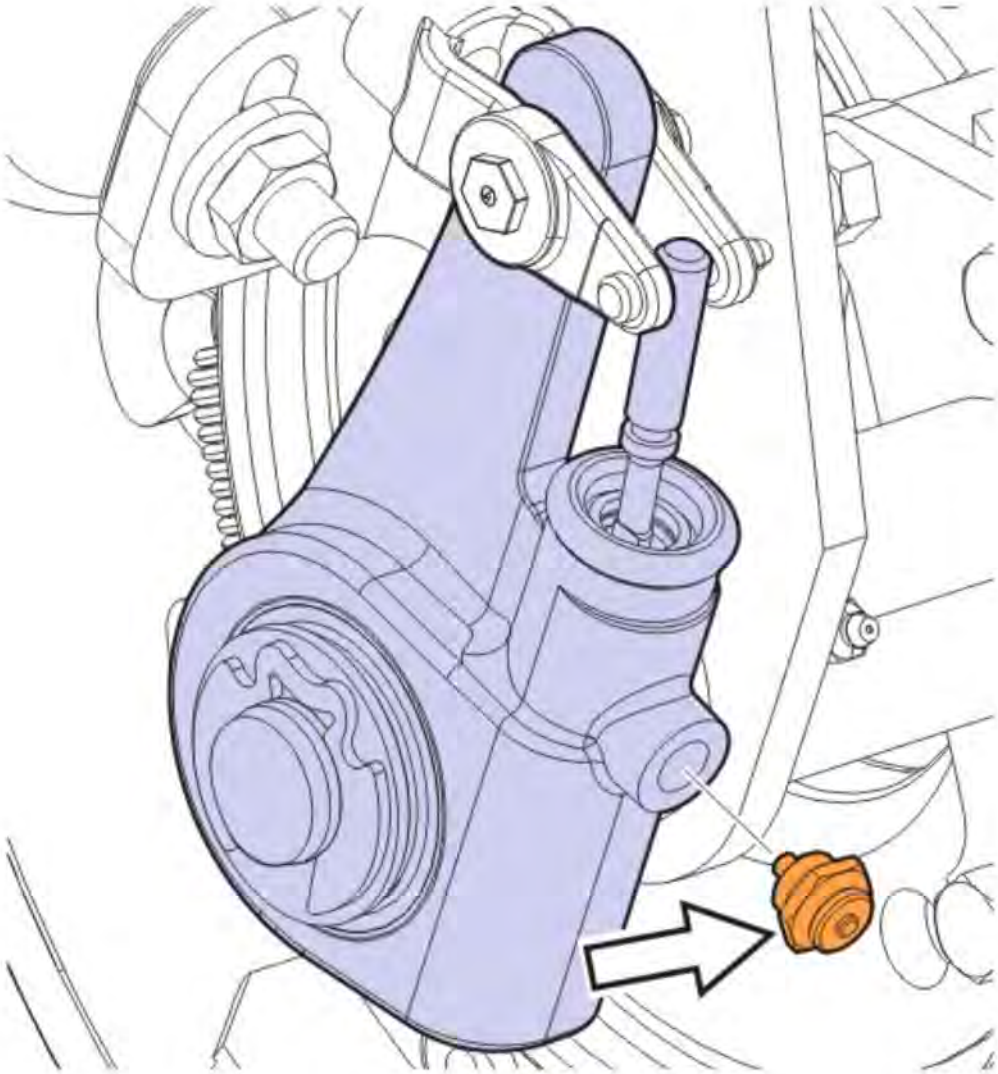
21. Adjust the brake as recommended per (slack adjuster) manufacturer.

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22. If applicable, install the slack adjuster pawl.

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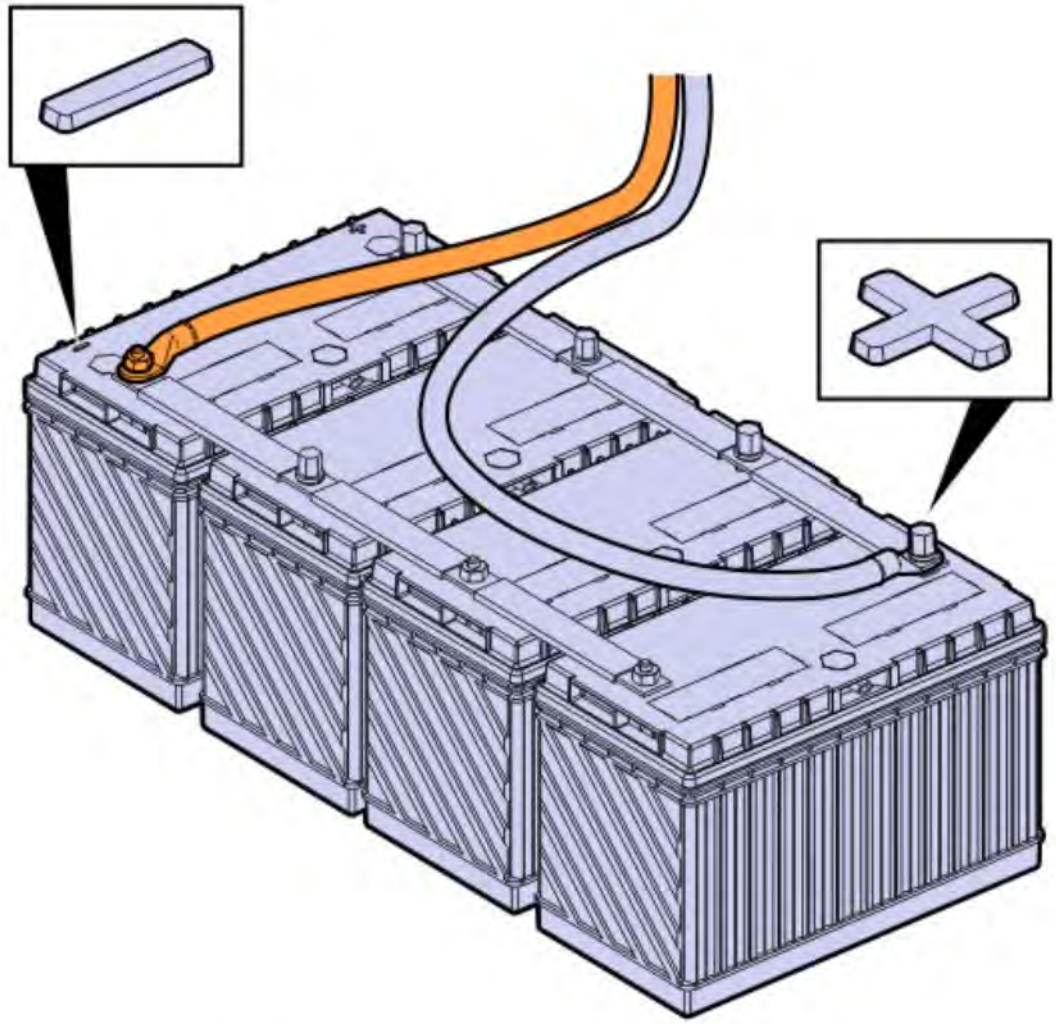


23. After brake the adjustment, rotate the wheel and ensure the brake is not dragging or the drum is not out of round.
24. Repeat steps 1 through 21 for the right side of the truck.
25. Lift the steer axle with a jack, remove the jack stands, and lower the axle.
26. Go to Commissioning the Truck for Operation.

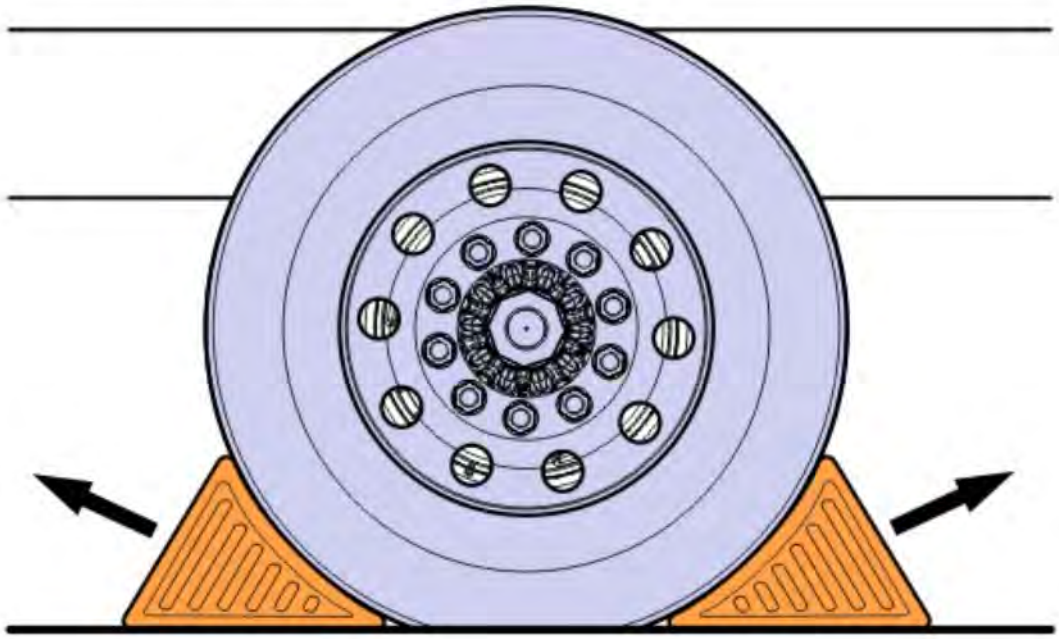
Commissioning the Truck for Operation

1. Connect the battery cable to the negative (ground) terminal.

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2. Remove the wheel chocks.



Warranty information

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Reimbursement

This repair may be eligible for reimbursement if a product failure was experienced within time and mileage limits of the applicable Warranty coverage. Reimbursement is obtained via the normal claim handling process.	UCHP Reimbursement
Claim Type (used only when uploading from the Dealer Bus. Sys.)	01
Labor Code	
Primary Labor Code (Brake S-Cam, Replacement)	5143-03-09-01 3.0 hrs.
Causal Part	85137267

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Technical Service

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