

Subject: Medium Duty Axle Spindle Nuts

Models Affected: Specific Freightliner Business Class and Business Class M2 vehicles; Sterling Acterra vehicles; and Freightliner Custom Chassis FS65 and B2 school bus chassis (Thomas Built Buses C2 Saf-T-Liner) and FB65 shuttle bus chassis manufactured between January 26, 2000, and March 24, 2008, by ArvinMeritor or Axle Alliance Company with 6,000 or 8,000 pound front axles and a four-piece spindle nut set.

General Information

Daimler Trucks North America LLC, on behalf of its Freightliner Trucks Division and its wholly owned subsidiaries, Sterling Truck Corporation and Freightliner Custom Chassis Corporation, has decided that a defect that relates to motor vehicle safety exists on the vehicles mentioned above.

There are approximately 29,000 vehicles involved in this campaign.

Installation of a four-piece spindle nut set with a thin spindle nut may lead to damage of the wheel end, including incorrect end play, degradation of lubrication, wear of the spindle nut and bearing journal, oil contamination with metal shavings, and premature bearing failure. Outer wheel bearing failure will cause noise and vibration that will be noticeable to the driver and the Antilock Braking System warning light will illuminate. Continued operation with the warning light illuminated may result in wheel separation and a possible vehicle crash.

The existing four-piece spindle nut set will be replaced with a more robust nut set using a thicker, harder inner nut and a new hub cap will be installed. In addition, a hub oil and adjusting nut inspection will be done to determine whether replacement of the wheel bearings is also required. Bearings will be replaced as needed.

Additional Repairs

Dealers must complete all outstanding recall and field service campaigns prior to the sale or delivery of a vehicle. A Dealer will be liable for any progressive damage that results from its failure to complete campaigns before sale or delivery of a vehicle.

Owners may be liable for any progressive damage that results from its failure to complete campaigns within a reasonable time after receiving notification.

Work Instructions

Please refer to the attached work instructions. Prior to performing the campaign, check the vehicle for a completion sticker (Form WAR260).

Replacement Parts

Replacement kits are now available and can be obtained by ordering the kit number(s) listed below from your facing Parts Distribution Center.

If our records show your dealership has ordered any vehicles involved in campaign number FL527AB, a list of the customers and vehicle identification numbers will be available on AccessFreightliner.com. Please refer to this list when ordering parts for this recall.

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Table 1 - Replacement Parts for FL527

Campaign Number	Kit Number	Part Description	Part Number	Qty. per Kit	Suggested Wholesale*
FL527AB	25-FL527-000	Wheel End Hardware Kit	TDA KIT14001	2 ea	\$96.18 U.S. \$113.49 CAN
		Oil Seal	NA 370150BG1	2 ea	
		Hub Cap, Aluminum, Window	STM 346 5110	2 ea	
		Magnetic Hub Cap Plug	23-13618-006	2 ea	
		Hub Cap Gasket	STM 330 3040	2 ea	
		Completion Sticker	WAR260	1 ea	
FL527AB	25-FL527-001	Bearing	SBN JM207010HYT	1 ea	\$23.58 U.S. \$27.82 CAN
		Bearing	SBN 25820HYT	1 ea	
		Bearing	SBN 25877HYT	1 ea	
		Bearing	SBN JM207049AHYT	1 ea	

* Please charge all Direct Warranty Customers the above-listed price for the kit, as they are authorized to perform their own Recalls.

Table 1

Removed Parts

Please follow Warranty Failed Parts Tracking shipping instructions for the disposition of all removed parts.

Labor Allowance

Table 2 - Labor Allowance

Campaign Number	Procedure	Time Allowed (hours)	SRT Code	Damage Code
FL527AB	Replace 4-piece nut set and hub cap - both sides	1.7	996-0761A (Air Brakes)	000-Modifiedx
		2.3	996-0761B (Hydraulic Brakes)	000-Modifiedx
	Replace 4-piece nut set and hub cap - both sides / Replace bearings - one side	2.1	996-0761C (Air Brakes)	000-Modifiedx
		2.7	996-0761D (Hydraulic Brakes)	000-Modifiedx
	Replace 4-piece nut set and hub cap - both sides / Replace bearings - both sides	2.5	996-0761E (Air Brakes)	000-Modifiedx
		3.1	996-0761F (Hydraulic Brakes)	000-Modifiedx

Table 2

IMPORTANT: When the recall has been completed, locate the base completion label in the appropriate location on the vehicle, and attach the red completion sticker provided in the recall kit (Form WAR260). If the vehicle does not have a base completion label, clean a spot on the appropriate location of the vehicle and first attach the base completion label (Form WAR259). If a recall kit is not required or there is no completion sticker in the kit, write the recall number on a blank sticker and attach it to the base completion label.

Claims for Credit

You will be reimbursed for your parts, labor, and handling by submitting your claim through the Warranty system within 30 days of completing this campaign. Please reference the following information in QuickClaim®:

- Claim type is **Recall**.
- In the FTL Authorization field, enter the campaign number and appropriate condition code (**FL527A** or **FL527B**).
- In the Primary Failed Part Number field, enter **25-FL527-000**.
- In the Parts field, enter the appropriate kit number(s) as shown in the Replacement Parts Table. Up to two quarts of oil may be included on claims as a miscellaneous part without additional authorization.
- If axle spindles or wheel hubs are replaced per the Work Instructions, the appropriate part number for the vehicle may be claimed without additional authorization. The need for replacement must be explained in the claim story in order to be paid.
- In the Labor field, first enter the appropriate SRT from the Labor Allowance Table. For administrative time, enter SRT 939-0010A for 0.3 hours. If an axle spindle is replaced per the Work Instructions, an additional 1.0 hour per spindle may be claimed with 996-0000T without additional authorization. The need for the replacement must be explained in the claim story. Time for hub replacement is already included in the recall SRTs.
- **Reimbursement for Prior Repairs.** When a customer asks about reimbursement, please do the following.
 - Accept the documentation of the previous repair.
 - Make a brief check of the customer's paperwork to see if the repair may be eligible for reimbursement. (See the "Copy of Owner Letter" section of this bulletin for reimbursement guidelines for this recall.)
 - Contact the Warranty Campaigns Department for a decision and authorization number.
 - Include the approved amount on your claim in sublet/outside purchases.
 - In the claim story, first note the authorization number and that the claim includes a reimbursement request.
 - Retain the documentation and provide it to Warranty Campaigns or Claims Processing if requested.
 - When your claim is paid, reimburse the customer the appropriate amount.

IMPORTANT: ServicePro® must be viewed prior to performing the recall to ensure the vehicle is involved and the campaign has not been previously completed. Also, check for a completion sticker prior to beginning work.

Contact the Warranty Campaigns Department at (800) 547-0712, from 7:00 a.m. to 4:00 p.m. Pacific Time, Monday through Friday, Web inquiry at AccessFreightliner.com / Support / Submit an Inquiry, or the Customer Assistance Center at (800) 385-4357, after normal business hours, if you have any questions or need additional information.

To return excess kit inventory related to this campaign, U.S. dealers must submit a Parts Authorization Return (PAR) to the Memphis PDC. Canadian dealers must submit a PAR to their facing PDC. All kits must be in resalable condition. PAR requests must include the original purchase invoice number.

The letter notifying vehicle owners is included for your reference.

Please note that the National Traffic and Motor Vehicle Safety Act, as amended (Title 49, United States Code, Chapter 301), requires the owner's vehicle(s) be corrected within a reasonable time after parts are available to you. The Act states that failure to repair a vehicle within 60 days after tender for repair shall be prima facie evidence of an unreasonable time. However, circumstances of a particular situation may reduce the 60 day period. Failure to repair a vehicle within a reasonable time can result in either the obligation to (a) replace the vehicle with an

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identical or reasonably equivalent vehicle, without charge, or (b) refund the purchase price in full, less a reasonable allowance for depreciation. The Act further prohibits dealers from selling a vehicle unless all outstanding recalls are performed. Any lessor is required to send a copy of the recall notification to the lessee within 10 days. Any subsequent stage manufacturer is required to forward this notice to its distributors and retail outlets within five working days.

Copy of Letter to Owner

Subject: Medium Duty Axle Spindle Nuts

This notice is sent to you in accordance with the requirements of the National Traffic and Motor Vehicle Safety Act. This notice is also sent in accordance with the Canadian Motor Vehicles Safety Act.

Daimler Trucks North America LLC, on behalf of its Freightliner Trucks Division and its wholly owned subsidiaries, Sterling Truck Corporation and Freightliner Custom Chassis Corporation, has decided that a defect which relates to motor vehicle safety exists on specific Freightliner Business Class and Business Class M2; Sterling Acterra; and Freightliner Custom Chassis FS65 and B2 school bus chassis and FB65 shuttle bus chassis manufactured between January 26, 2000, and March 24, 2008, by ArvinMeritor or Axle Alliance Company with 6,000 or 8,000 pound front axles and a four-piece spindle nut set.

Installation of a four-piece spindle nut set with a thin spindle nut may lead to damage of the wheel end, including incorrect end play, degradation of lubrication, wear of the spindle nut and bearing journal, oil contamination with metal shavings, and premature bearing failure. Outer wheel bearing failure will cause noise and vibration that will be noticeable to the driver and the Antilock Braking System warning light will illuminate. Continued operation with the warning light illuminated may result in wheel separation and a possible vehicle crash.

The existing four-piece spindle nut set will be replaced with a more robust nut set using a thicker, harder inner nut and a new hub cap will be installed.

Parts are now available for authorized dealers to order. Contact your authorized dealer to arrange to have your vehicle(s) modified and to assure that parts are available at the dealer. To locate a dealer, search online at www.FreightlinerTrucks.com, www.SterlingTrucks.com, or contact the Warranty Campaigns Department for assistance.

When you contact your dealer, refer to campaign number **FL527AB**. Once parts are received at the dealership, the recall will take approximately two to three and a half hours, depending on the work needed, and will be performed at no charge to you.

IMPORTANT: When the Recall has been completed, please ensure that a label has been affixed to your vehicle referencing **FL527AB**.

If you do not own the vehicle that corresponds to the identification number(s) which appears on the Recall Notification, please return the notification to the Warranty Campaigns Department with any information you can furnish that will assist us in locating the present owner. If you have leased this vehicle, Federal law requires that you forward this notice to the lessee within 10 days. If you are a subsequent stage manufacturer, Federal law requires that you forward this notice to your distributors and retail outlets within five working days. If you have paid to have this recall condition corrected prior to this notice, you may be eligible to receive reimbursement. Please see the reverse side of this notice for details.

If you are not able to have the defect remedied without charge and within a reasonable time, which is not longer than 60 days after you tender the vehicle for repair, please contact the Warranty Campaigns Department at (800) 547-0712, 7:00 a.m. to 4:00 p.m. Pacific Time, Monday through Friday, e-mail address DTNA.Warranty.Campaigns@Daimler.com, or the Customer Assistance Center at (800) FTL-HELP or (800) STL-HELP, after normal business hours. You may also wish to submit a complaint to the Administrator, National Highway Traffic Safety Administration, 1200 New Jersey Avenue, SE., Washington, DC 20590; or call the Vehicle Safety Hotline at (888) 327-4236 (TTY: 800-424-9153); or to <http://www.safercar.gov>. If your vehicle is involved in the Canadian portion, you may wish to notify Transport Canada, ASFAD, Place de Ville Tower C, 330 Sparks Street, Ottawa, ON K1A 0N5, or phone (800) 333-0510.

We regret any inconvenience this action may cause but feel certain you understand our interest in motor vehicle safety.

WARRANTY CAMPAIGNS DEPARTMENT

Enclosure

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Reimbursement to Customers for Repairs Performed Prior to Recall

If you have already paid to have this recall condition corrected you may be eligible to receive reimbursement.

Requests for reimbursement may include parts and labor. Reimbursement may be limited to the amount the repair would have cost if completed by an authorized Daimler Trucks North America LLC dealer. The following documentation must be presented to your dealer for consideration for reimbursement.

Please provide original or clear copies of all receipts, invoices, and repair orders that show:

- The name and address of the person who paid for the repair.
- The Vehicle Identification Number (VIN) of the vehicle that was repaired.
- What problem occurred, what repair was done, when the repair was done.
- Who repaired the vehicle.
- The total cost of the repair expense that is being claimed.
- Proof of payment for the repair (such as the front and back of a cancelled check or a credit card receipt).

Reimbursement will be made by check from your Daimler Trucks North America LLC dealer.

Please speak with your Daimler Trucks North America LLC authorized dealer concerning this matter.

Work Instructions

Subject: Medium Duty Axle Spindle Nuts

Models Affected: Specific Freightliner Business Class and Business Class M2; Sterling Acterra; and Freightliner Custom Chassis FS65 and B2 school bus chassis and FB65 shuttle bus chassis manufactured between January 26, 2000, and March 24, 2008, by ArvinMeritor or Axle Alliance Company with 6,000 or 8,000 pound front axles and a four-piece spindle nut set.

NOTE: Up to two quarts of oil may be included on claims as a miscellaneous part without additional authorization. If axle spindles or wheel hubs are replaced per the Work Instructions below, the appropriate part number for the vehicle may be claimed and an additional 1.0 hour per spindle may be claimed with 996-0000T without additional authorization. The need for replacement must be explained in the claim story in order to be paid.

General Procedure

1. Check the base label (Form WAR259) for a completion sticker for FL527 (Form WAR260) indicating this work has been done. The base label is usually located on the passenger-side door about 12 inches (30 cm) below the door latch on trucks and over the driver's windows in school buses. If a completion sticker is present, no further work is needed. If there is no completion sticker, go to the next step.
2. Park the vehicle on a level surface. Shut down the engine, set the parking brake, and chock the tires.
3. Raise the front of the vehicle just enough to take the weight from the wheels, but with the tires still touching the ground.
4. Loosen the wheel nuts.

WARNING

Use safety stands to support the vehicle. Never work under a vehicle that is supported only by jacks. Jacks can slip, causing the vehicle to fall, which could result in serious injury or death.

5. Raise the vehicle until the tires clear the ground and support it with safety stands.
6. Remove the tire-and-wheel assemblies from the vehicle.

WARNING

Wear a respirator at all times when working around the brakes. Breathing brake lining dust (asbestos or non-asbestos) could cause lung cancer or lung disease. OSHA has set maximum levels of exposure and requires workers to wear an air purifying respirator approved by MSHA or NIOSH.

7. To minimize the possibility of creating airborne brake lining dust, clean the dust from the brake drum, brake backing plate, and brake assembly using an industrial-type vacuum cleaner equipped with a high-efficiency filter system. Using a rag soaked in water and wrung until nearly dry, remove any remaining dust. Do not use compressed air or dry brushing to clean the brake assembly.
8. Go to "Hub Oil and Adjusting Nut Inspection."

Hub Oil and Adjusting Nut Inspection

1. On one side of the vehicle, remove the brake drum (air brakes) or brake caliper (hydraulic brakes). For instructions, see **Group 42** of the applicable vehicle service/workshop manual.
2. Drain the hub oil into a plastic container that is free of debris, especially any metallic particles.

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3. Use a magnet to probe the hub oil. Note whether or not there is substantial metallic debris found and continue to the next step.
4. Remove the hub cap and gasket.

NOTE: Once the spindle nut set is removed, the jam nut will be used to hold the hub on the wheel bearings, protecting the oil seal and spindle threads from damage while the adjusting nut is inspected.

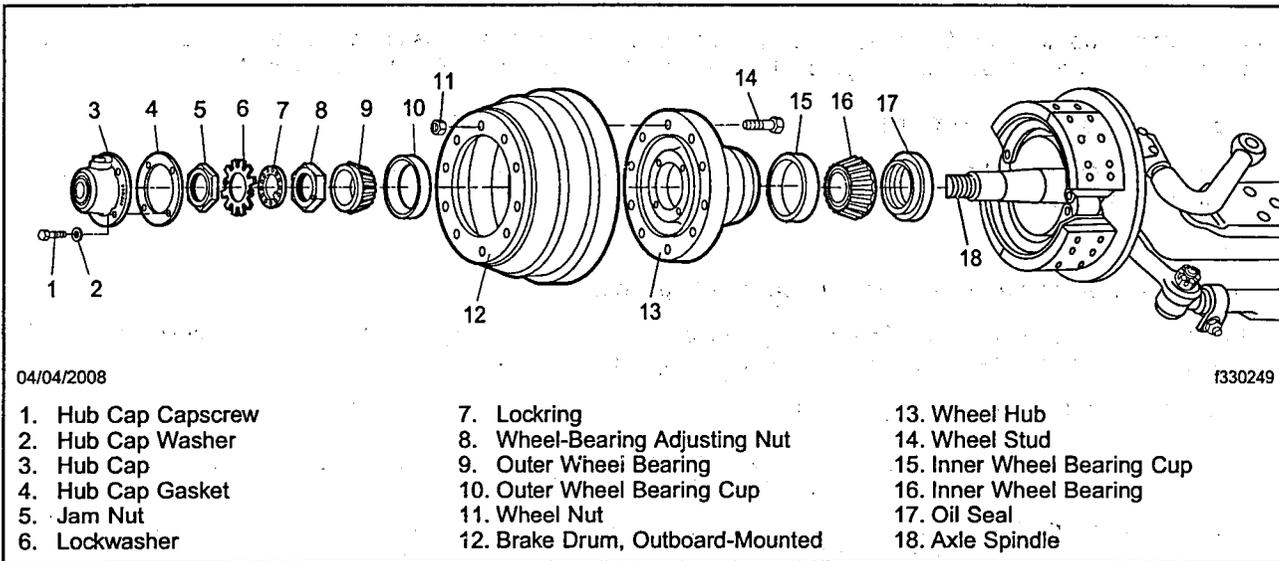


Fig. 1, Front Axle Assembly, Drum Brakes (New Spindle Nut Set Shown)

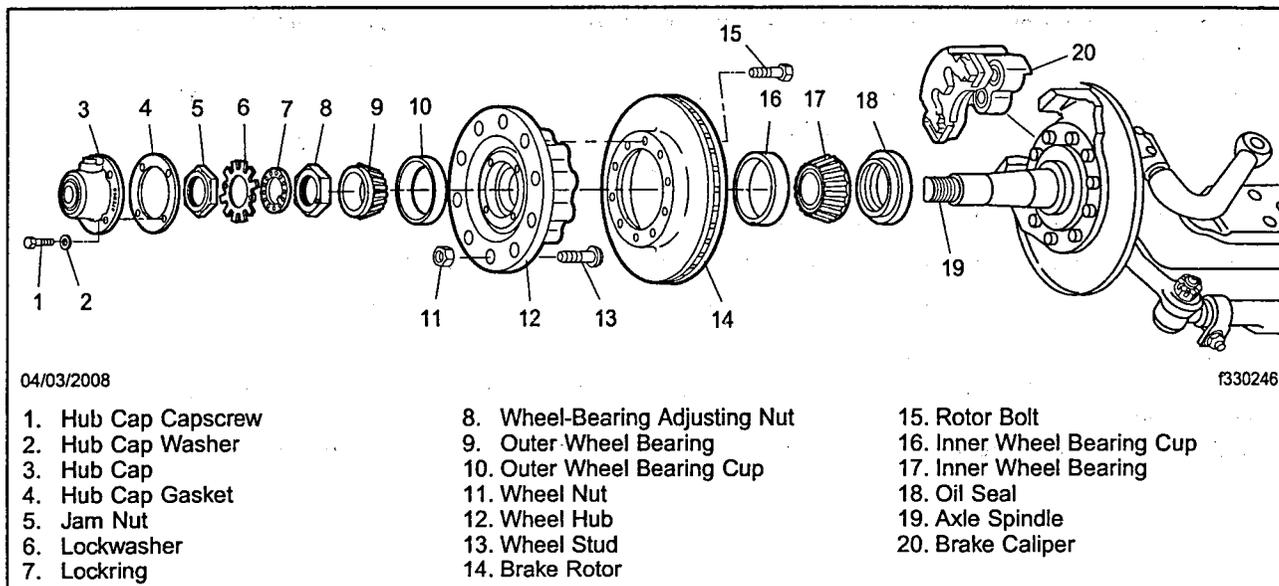


Fig. 2, Front Axle Assembly, Disc Brakes (New Spindle Nut Set Shown)

5. Remove the jam nut, lockwasher, lockring, and wheel-bearing adjusting nut. See **Fig. 1** and **Fig. 2** for assembly diagrams.
6. To hold the hub on the wheel bearings and protect the oil seal and spindle threads from damage, install and hand tighten the jam nut.
7. Inspect the back side (bearing contact side) of the adjusting nut for signs of scoring.

If there are signs of scoring or substantial metallic debris found in the hub oil (as noted above in Step 3), the inner and outer bearings and cups need to be replaced. Go to "Wheel Bearing Replacement."

If the bearings do not need to be replaced (no signs of scoring on the adjusting nut or no substantial metallic debris found in the hub oil), go to "Spindle Nut Set Installation and End Play Measurement."

Wheel Bearing Replacement

NOTE: Replace the wheel bearings only if the hub oil was contaminated with metallic debris or if the adjusting nut was defaced where it contacts the bearing.

1. Remove the jam nut.
2. Wrap the axle-spindle threads with friction tape to protect them.
3. Move the hub about 1/2 inch (13 mm) to jar loose the outer wheel bearing (allow the hub-only assembly to rest on the axle spindle; but be careful not to damage the axle-spindle threads).
4. Remove the outer wheel bearing and cup.

CAUTION

On vehicles equipped with WABCO ABS, use care when handling the hubs. The ABS tone wheel is permanently pressed onto the hub and cannot be repaired. The tone wheel and the hub must be replaced as a unit if either is damaged. To prevent damage to the tone wheel, do not drop the hub or lay it down in a way that would damage the tone wheel.

5. Remove the hub from the axle spindle. Be careful not to damage the axle-spindle threads as the assembly is removed.
6. Inspect the hub for scoring, burnt oil, galling, excessive debris, and other damage. If damaged, replace it.
7. Inspect the spindle for scoring, burnt oil, galling, excessive debris, and distorted or damaged threads. If the spindle is damaged, or there is any wear in the area where it contacts the bearing, replace it.
8. Remove the inner wheel bearing and cup.
9. Remove the oil seal from the hub or axle spindle, as applicable, and discard it.

WARNING

The outboard end of the axle-stop bolt should not protrude beyond the surface of the axle spindle flange. Such a protrusion can cause damage to the oil seal, resulting in oil leaks, wheel bearing damage, and possible loss of the wheel and hub assembly, resulting in an accident causing serious injury or property damage.

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10. Verify whether the end of the axle-stop bolt is flush with the outboard surface of the axle-spindle flange by placing a straight edge on the surface of the flange to see if the axle-stop bolt end protrudes.

If the bolt end is flush with the axle-spindle flange (see Fig. 3), go to the next step.

If the bolt end protrudes at all, adjust the length of the axle-stop bolt on the outboard side of the axle flange, following the instructions in **Group 33** of the applicable vehicle service/workshop manual.

Adjust the length of the bolt just enough so that the outboard bolt end is flush with the outboard surface of the axle-spindle flange. Keep in mind the minimum clearance between the axle stop and other components:

- 1/2 inch (13 mm) from stationary components
- 3/4 inch (19 mm) from moving components

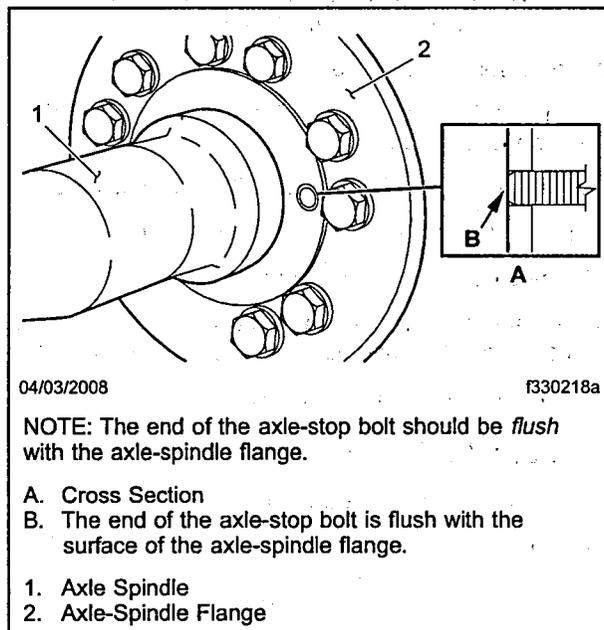


Fig. 3, End of Axle-Stop Bolt Installed Flush with Axle-Spindle Flange

IMPORTANT: Changing the length of the axle-stop bolt may require resetting the steering gear poppet valves. After the hubs and new oil seals are installed and the wheel bearings are adjusted, you will need to do a pressure test of the steering gear to determine if the poppet valves need to be reset.

11. Inspect the hub chamfer and bore for burrs, nicks, roughness, deep scratches, and other imperfections. Clean any imperfections with an emery cloth. Wipe the surface clean.

WARNING

Wear a respirator at all times when servicing the brakes, continuing through installation of the wheels. Breathing brake lining dust (asbestos or non-asbestos) could cause lung cancer or lung disease. OSHA has set maximum levels of exposure and requires workers to wear an air purifying respirator approved by MSHA or NIOSH.

12. Inspect and clean the axle components following the instructions in **Group 33** of the applicable vehicle service/workshop manual.

CAUTION

When coating the bearing assemblies with oil, do not use old oil, which could be contaminated with dirt or water. Both are corrosives and could damage the wheel bearings and hub.

13. Coat all the bearings for one hub with fresh oil. For lubricant specifications, see **Table 3**.

Lubricant Type	Lubricant SAE Viscosity Grade
Synthetic Drive Axle Lubricants or Equivalent with SAE Specification or Military Specification MIL-L-2105E	75W-90

Table 3, Lubricant Specifications

14. Wipe a film of axle oil on the axle spindle to prevent rust from forming behind the inner wheel bearing.
15. Install the inner wheel bearing into the hub. Handle the bearing assembly with clean, dry hands. Do not damage the bearing while seating it in the cup.
16. Install the new oil seal. For instructions, see **Group 33** of the applicable vehicle service/workshop manual.
17. Fill the hub bore with about 6 oz (175 mL) of approved oil. See **Table 3** for approved lubricants.
18. Carefully mount the hub onto the axle spindle. Do not unseat the inner wheel bearing or oil seal.
19. Install the outer wheel bearing. Handle the bearing assembly with clean, dry hands. Use care not to damage the bearing while seating it in the cup. Remove the friction tape from the axle-spindle threads.
20. Go to "Spindle Nut Set Installation and End Play Measurement."

Spindle Nut Set Installation and End Play Measurement

1. If the wheel bearings were replaced, go to the next step.

If the wheel bearings were **not** replaced, prepare the axle components as follows.

WARNING

The outboard end of the axle-stop bolt should not protrude beyond the surface of the axle spindle flange. Such a protrusion can cause damage to the oil seal, resulting in oil leaks, wheel bearing damage, and possible loss of the wheel and hub assembly, resulting in an accident causing serious injury or property damage.

- 1.1 Measure the distance between the axle-stop bolt nut and the stop bolt head. See **Fig. 4**.

If the gap is 1/4 inch (6.5 mm) or more, go to the next substep.

If the gap is less than 1/4 inch (6.5 mm), back off the axle-stop bolt until the gap is at least 1/4 inch (6.5 mm).

IMPORTANT: Changing the length of the axle-stop bolt may require resetting the steering gear poppet valves. After the new oil seals and hubs are installed and the wheel bearings are adjusted, you will need to do a pressure test of the steering gear to determine if the poppet valves need to be reset.

- 1.2 Inspect the hub chamfer and bore for burrs, nicks, roughness, deep scratches, and other imperfections. Clean any imperfections with an emery cloth. Wipe the surface clean.

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⚠ WARNING

Wear a respirator at all times when servicing the brakes, continuing through installation of the wheels. Breathing brake lining dust (asbestos or non-asbestos) could cause lung cancer or lung disease. OSHA has set maximum levels of exposure and requires workers to wear an air purifying respirator approved by MSHA or NIOSH.

- 1.3 Inspect and clean the axle components following the instructions in **Group 33** of the applicable vehicle service/workshop manual.
- 1.4 Remove the jam nut.

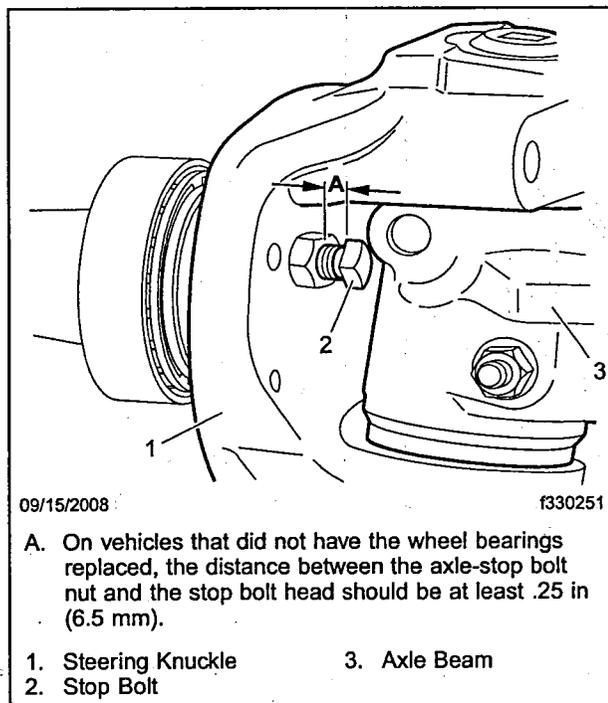


Fig. 4, Stop Bolt, Gap Between the Nut and Head

⚠ WARNING

Follow the wheel-bearing adjustment and checking instructions exactly, including the use of a dial indicator to measure wheel-bearing end play. If the wheel-bearing end play is not correct, the wheel bearings could fail. This could cause the loss of the wheel and hub assembly, resulting in an accident causing serious injury or property damage.

2. Install the new spindle nut set, which includes the thicker wheel-bearing adjusting nut. See Fig. 5 and Fig. 6.
IMPORTANT: For vehicles with air brakes, be sure there is sufficient clearance between the brake shoe and the brake drum, so brake shoe drag will not interfere with bearing adjustment.
 - 2.1 Install the wheel-bearing adjusting nut finger-tight. Ensure the bearings are properly adjusted and not cocked.
 - 2.2 Tighten the adjusting nut 100 lbf-ft (136 N·m) while rotating the wheel hub assembly.

- 2.3 Loosen the adjusting nut completely, then tighten it 20 lbf-ft (27 N-m) while rotating the wheel hub assembly.
- 2.4 Back off the adjusting nut about 1/3 turn (120 to 145 degrees).

NOTE: The gaps between holes in the lockring are spaced unevenly, so to fit the tab on the adjusting nut into one of the holes with minimal turning of the adjusting nut, gauge the distance on one side of the lockring, then the other, and choose the side that requires the adjusting nut to be turned the least.

- 2.5 Install the lockring (as described in the note above), bend-type locking washer, and jam nut. See Fig. 5.

Tighten the jam nut 175 lbf-ft (237 N-m) [range: 150 to 225 lbf-ft (203 to 305 N-m)].

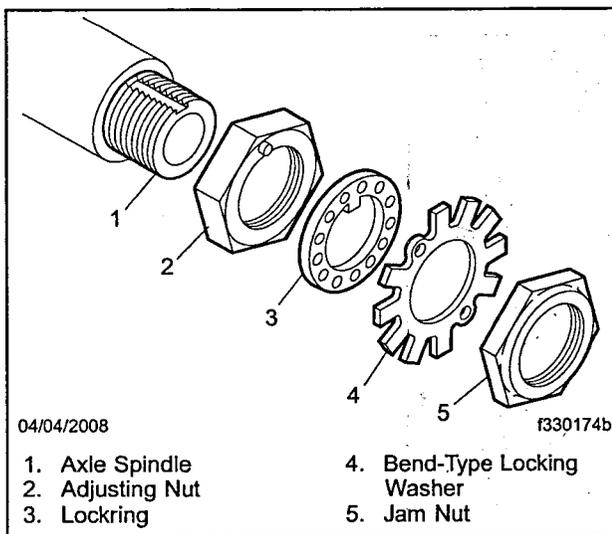


Fig. 5, New Four-Piece Spindle Nut Set

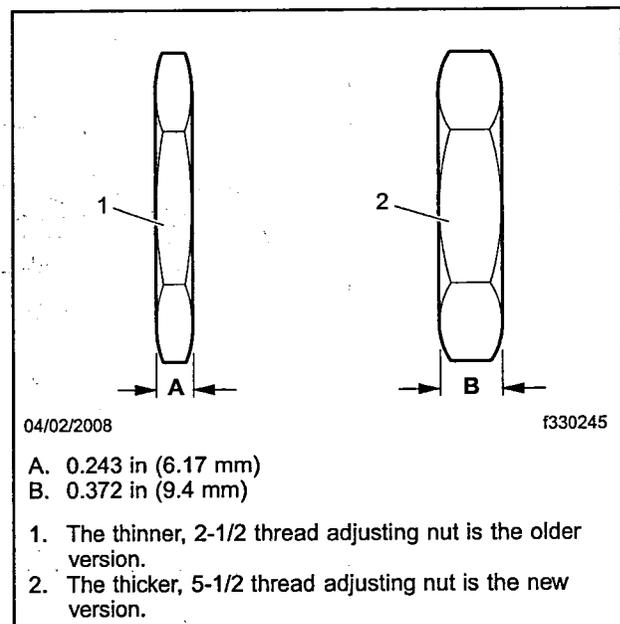


Fig. 6, Wheel-Bearing Adjusting Nuts

3. Attach a dial indicator to the hub, and set the point of the indicator in line with the end of the axle spindle. The point of the indicator should be parallel to the spindle axis. See Fig. 7.

NOTE: If equipped with aluminum hubs and air brakes, it may be necessary to install the brake drum onto the hub to provide a steel base for the magnet of the dial indicator. Mount the drum on the hub's drum pilot. Adjust the brake or have someone apply the brakes to hold the drum secure. Secure the drum using the stud at the 12 o'clock position. Then secure the studs at about the 4 o'clock and 8 o'clock positions.

If using a stud-piloted hub and a steel drum, install 1-1/4-inch washers between the nuts and the drum.

4. If the brakes were used to hold the drum during installation, release them.
5. Seat the bearings. There are two roller bearings between the hub and the axle spindle, each of which consists of four basic parts: the cone (inner race), cage, rollers, and cup (outer race). See Fig. 8 and Fig. 9. To achieve the correct end play, the rollers must be rolled into position against the large rib of the cone as follows.

Grasp the wheel hub at the 3 o'clock and 9 o'clock positions and push the hub toward the vehicle while rotating it 90 degrees back and forth. Rotating the hub in this manner forces the rollers into position against the large rib of the cone. See Fig. 10. *This is absolutely necessary to seat the bearings correctly.*

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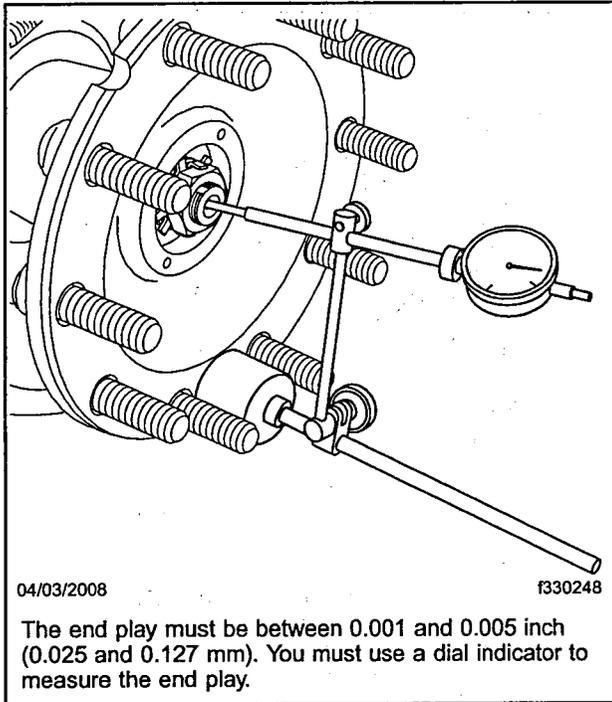


Fig. 7, Using the Dial Indicator

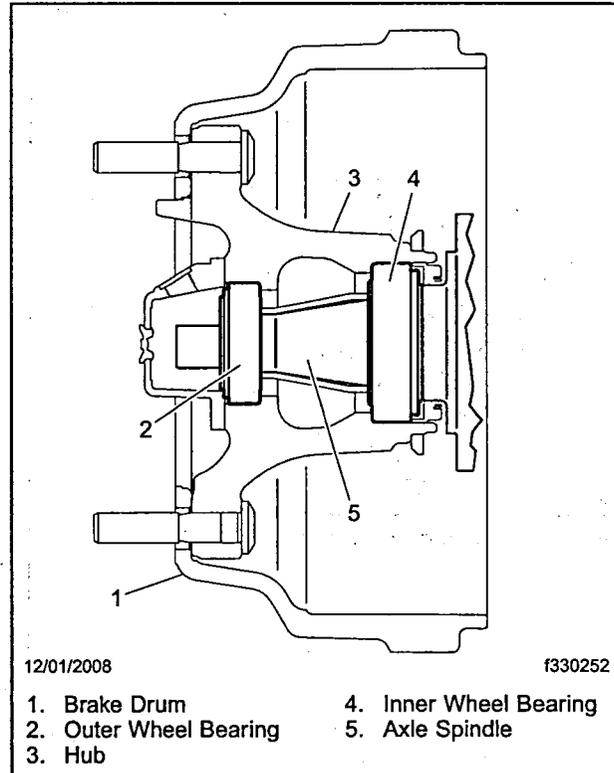


Fig. 8, Bearings Between the Hub and Axle Spindle

WARNING

The wheel bearings must be installed as described in these instructions to secure the hub assemblies to the axle. Negligent installations could result in the hub separating from the axle, resulting in severe personal injury or death.

6. Using the dial indicator, verify the end play measurement is between 0.001 and 0.005 inch (0.025 and 0.127 mm).
 - 6.1 Set the dial indicator to zero.
 - 6.2 Grasping the hub at the 3 o'clock and 9 o'clock positions, pull the hub toward you while rotating it 90 degrees back and forth.
 - 6.3 Record the measurement for comparison.
 - 6.4 With the hub grasped at the 3 o'clock and 9 o'clock positions, push the hub toward the vehicle while rotating it 90 degrees back and forth, and verify that the dial indicator returns to zero. If it does not, repeat these substeps.
 - 6.5 To validate the accuracy of the initial reading, grasp the hub as before and pull it toward you while rotating it 90 degrees back and forth. If this measurement is within 0.001 inch (0.025 mm) of the first reading, continue to the next step; if it is not, repeat these substeps.

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9. Bend the tabs on the locking washer at 6 o'clock and 12 o'clock to lock the jam nut in place. See Fig. 11.

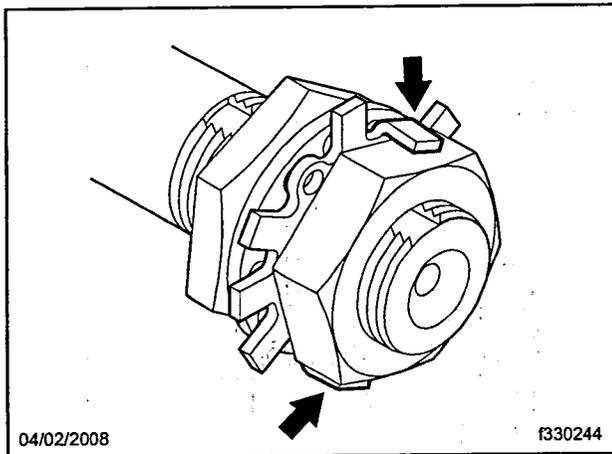


Fig. 11, Tabs Bent to Lock the Jam Nut

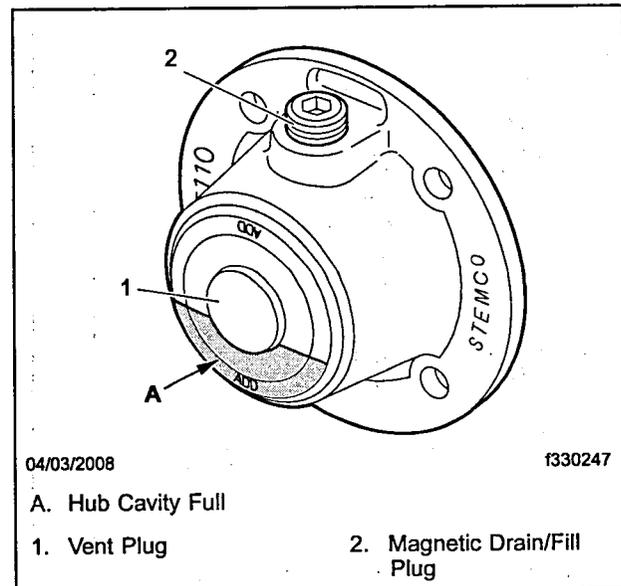


Fig. 12, Stemco Hub Cap

10. Rotate the hub in both directions. It should turn freely with no dragging or binding.
11. Install the new Stemco metal hub cap and gasket, and tighten the fasteners 15 to 20 lbf·ft (20 to 27 N·m).

WARNING

Failure to add oil to the wheel hub after the hub has been serviced will cause the wheel bearings to overheat and seize during vehicle operation. Seized bearing rollers can cause sudden damage to the tire or axle, possibly resulting in personal injury due to loss of vehicle control.

12. Fill the hub cavity with approved oil. See Table 3 for approved lubricants.
- 12.1 Turn the hub until the magnetic drain/fill plug on the hub cap is at the top of the hub.
 - 12.2 Remove the magnetic drain/fill plug and put a funnel into the hole.
 - 12.3 Add enough oil (about 2 oz or 60 mL) to the hub to bring the level up to the bottom of the vent cap. See Fig. 12.
 - 12.4 Install the magnetic drain/fill plug and rotate the hub several times to distribute the oil.
 - 12.5 Once the oil level has stabilized in the hub cap, check the level in the window and, if needed, add enough oil to bring the level up to the bottom of the vent plug. See Fig. 12.
13. Install the brake drum or caliper onto the wheel hub. See Group 42 of the applicable vehicle service/workshop manual for instructions.
14. Repeat the inspection and replacement procedures on the other side of the vehicle.
15. Install the wheel-and-tire assemblies. See Group 40 in the applicable vehicle service/workshop manual for instructions.

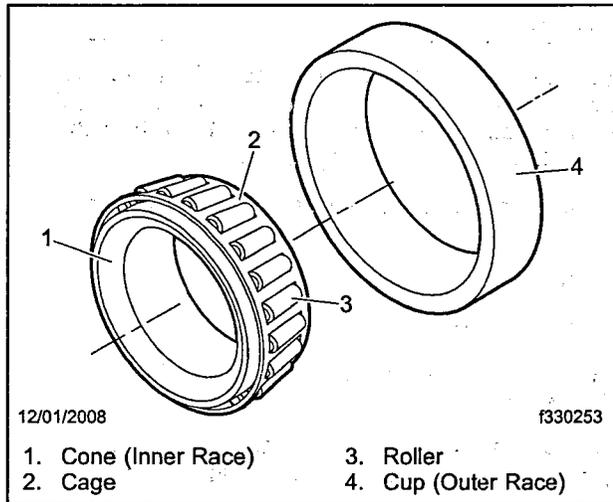


Fig. 9, Wheel Bearing

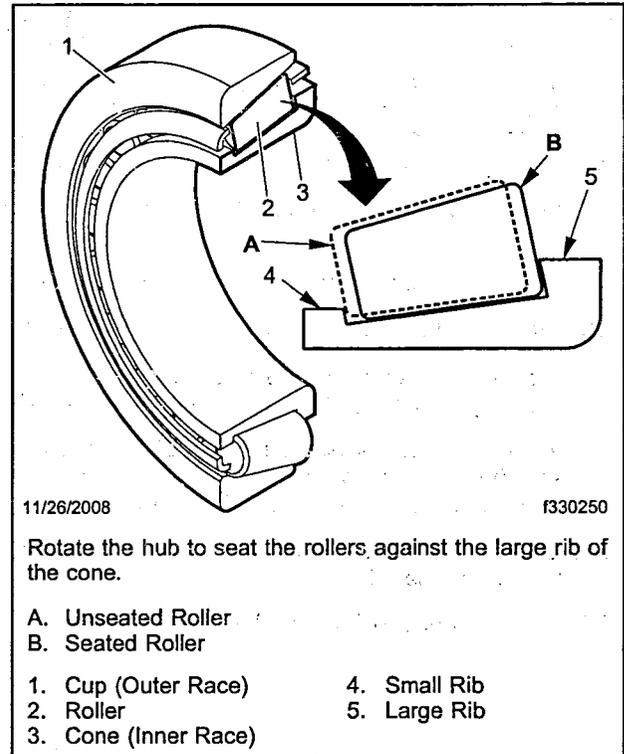


Fig. 10, Seated Roller, Wheel Bearing

IMPORTANT: The end play must be between 0.001 and 0.005 inch (0.025 and 0.127 mm). *Use the dial indicator to measure this.* Correct end play is crucial.

7. Adjust the end play with the dial indicator, and ensure it is correct.

If it is between 0.001 and 0.005 inch (0.025 and 0.127 mm), the end play is correct; go to the next step. If it is not, do the following substeps.

7.1 Remove the jam nut and locking device, and back off or tighten the adjusting nut to adjust the end play.

NOTE: The gaps between holes in the lockring are spaced unevenly. In one position, turning the adjusting nut one lockring hole will change the end play about 0.005 inch (0.127 mm). In the reverse position, turning the adjusting nut to the next hole will change the end play about 0.0025 inch (0.0635 mm).

7.2 Install the locking device and jam nut as described earlier.

7.3 *Using the dial indicator*, measure the end play. If the end play does not measure between 0.001 and 0.005 inch (0.025 and 0.127 mm), readjust the adjusting nut until the end play is correct. Once the end play is correct, go to the next step.

NOTE: If you cannot achieve the correct wheel-bearing end play after several attempts, the axle-spindle threads may be worn or damaged. If this is the case, contact Warranty Campaigns for further instructions.

8. Record the end play measurement so it can be included in the claim.

IMPORTANT: Do not attempt the next step until the wheel-bearing end play is correct as measured by a dial indicator.

 **WARNING**

If the wheel nuts cannot be tightened to minimum torque values, the wheel studs have lost their locking action, and the wheel hub flange is probably damaged. In this case, replace it with a new wheel hub assembly. Failure to replace the wheel hub assembly when these conditions exist could result in the loss of a wheel or loss of vehicle control and possible personal injury and property damage.

16. Adjust the front axle brakes. For instructions, see **Group 42** in the applicable vehicle service/workshop manual for instructions.
17. Remove the safety stands from under the axle and lower the vehicle.
18. After the hubs have set for about 30 minutes check the oil level again. Add oil as needed.
19. If either axle-stop bolt has been lengthened, perform a pressure test on the steering gear to determine if the steering gear poppets need to be reset; otherwise, go to the next step.

A steering-gear pressure reading above 1200 psi (8200 kPa) indicates the poppets need to be reset. For instructions on pressure testing, see the troubleshooting section for the applicable steering gear in **Group 46** of the applicable vehicle service/workshop manual.
20. Clean a spot on the base label (Form WAR259). Attach a completion sticker for recall FL527 (Form WAR260) to the base label.
21. Remove the chocks from the rear tires.