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MERITOR®
an ***ArvinMeritor*** brand

Technical Bulletin

Replace Meritor TN and TQ Series Trailer Axles Equipped with Grotnes Wheel Ends on Reman Chassis

Hazard Alert Messages

Read and observe all Warning and Caution hazard alert messages in this publication. They provide information that can help prevent serious personal injury, damage to components, or both.

⚠ WARNING

To prevent serious eye injury, always wear safe eye protection when you perform vehicle maintenance or service.

Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving. Support the vehicle with safety stands. Do not work under a vehicle supported only by jacks. Jacks can slip and fall over. Serious personal injury and damage to components can result.

Before you service a spring chamber, carefully follow the manufacturer's instructions to compress and lock the spring to completely release the brake. Verify that no air pressure remains in the service chamber before you proceed. Sudden release of compressed air can cause serious personal injury and damage to components.

Use a brass or synthetic mallet for assembly and disassembly procedures. Do not hit steel parts with a steel hammer. Pieces of a part can break off. Serious personal injury and damage to components can result.

⚠ ASBESTOS AND NON-ASBESTOS FIBERS WARNING

Some brake linings contain asbestos fibers, a cancer and lung disease hazard. Some brake linings contain non-asbestos fibers, whose long-term effects to health are unknown. You must use caution when you handle both asbestos and non-asbestos materials.

⚠ CAUTION

You must disengage a pull pawl or remove a conventional pawl before rotating the manual adjusting nut, or you will damage the pawl teeth. A damaged pawl will not allow the slack adjuster to automatically adjust brake clearance. Replace damaged pawls before putting the vehicle in service.

How to Obtain Additional Maintenance and Service Information

Refer to Maintenance Manual 14, Trailer Axles; and Maintenance Manual 4, Cam Brakes and Automatic Slack Adjusters. To obtain these publications, visit Literature on Demand at arvinmeritor.com.

Call the ArvinMeritor OnTrac Customer Service Center

If you have questions about the procedures in this bulletin, contact ArvinMeritor's OnTrac Customer Service Center at 866-668-7221 (US and Canada) between 8:00 AM and 8:00 PM ET Monday through Friday, and between 9:00 AM and 6:00 PM ET on Saturday. After selecting "preferred language," select "Option 5" and refer to Program Number C8AG.

How to Obtain Tools and Supplies Specified in This Technical Bulletin

The following parts and tools will be provided to inspection sites. If you did not receive these parts and tools, please call ArvinMeritor's OnTrac Customer Service Center at the above number.

Parts

Part
Hubcap screws (part number 10x1348)
Inner bearing cup (part number HM218210)
Inner bearing cone (part number HM218248)
Outer bearing cup (part number HM212011 GB)
Outer bearing cone (part number HM212049 GB)
Hubcap gasket (part number E03009)
Wheel seal (part number A1205X1662)
Adjusting nut (part number 1227C549)
Lock washer (part number 1229W2545)
Lock washer set screw (part number 1199K3859)
Jam nut (NA)
Primed hubcaps (part number E975)
3/4-inch nut to hold clamp to rim (part number E4963)
Brake shoes (part number SF5204515Q)
Drums (part number 03122222002)
Brake shoe hardware kits (part number 4515Q)
S-Cam bushing kit (part number KIT8091)
30/30 chambers (part number W77 3276D30)
ASA 28-spline (part number R803112)
ASA Clevis (part number 1245Z1066)
ASA large clevis pin (part number 19X116)
Clevis cotter pin (part number K248)
ASA small clevis pin (part number 19X127)
Clevis cotter pin (part number K258)
Replacement axle BAR (part number TN2671N7888)
Replacement axle BAF (part number TN2671N7889)
Flange locknut, 1-14 UNS, GRF, phosphate and oil (part number 719-02)
Radius rod bolt, hex bolt, 1-14 UNS x 5 inch (part number E-2891)
ASA template (part number TP4748)
U-bolt kit (part number E-UB5161-14) includes: • One std. 7/8 dia. x 3 rd. x 11-1/4" length U-bolt • Two PL, 15/16 ID x 1-3/4 OD washers • Two hex nuts, 7/8″-14 UNF

Tools

Tool
Portable bearing grease packer
Grease gun
Pressure washer
Shell 5067715 RETINAX grease LX2
Loctite® 242 threadlocker
Degreaser solution or Brake Clean
Torque wrench with 3/8-inch drive/50 lb-ft (certified calibration)
Torque wrench with 1/2-inch drive/100 lb-ft (certified calibration)
Torque wrench with 3/4-inch drive/500 lb-ft (certified calibration)
6-inch extension with 3/4-inch drive
Impact wrench with 3/8-inch drive
1/2-inch drive to 3/8-inch drive socket adaptor
3-3/4-inch (8 sided) socket with 3/4-inch drive for inner adjusting nut
3-1/4-inch (8 sided) socket with 3/4-inch drive for outer jam nut
1/2-inch socket with 3/8-inch drive for hubcap bolts
1-5/16-inch socket with 3/4-inch drive for U-bolts (may vary depending on manufacturer)
1-1/2-inch socket with 3/4-inch drive for trailing arms (may vary depending on manufacturer)
15/16-inch socket with 1/2-inch drive for clamp bolts on suspension adjustment rod (may vary depending on manufacturer)
15/16-inch socket with 1/2-inch drive for spring brake mounting nuts (may vary depending on manufacturer)
1/2-inch socket with 1/2-inch drive for S-cam inner bracket (9/16-inch socket with 1/2-inch drive for Meritor S-cam inner bracket) (may vary depending on manufacturer)
Allen wrench, number 2 metric
Dial indicator with magnetic base (certified calibration)
Wheel seal installer/driver (Stemco part number 552-236)
Drift
Hammer
Rubber mallet
Air compressor or plant air, 150 psi maximum
Air hose
Trammel bar
Tape measure
Appropriate size jack
Appropriate size jack stands
Transmission floor jack

Labor Time

- Replace one axle — 4 hours (includes wheel end)
- Replace grease only, two wheels — 2 hours (assembly and disassembly)
- Axle alignment — 20 minutes per chassis
- Fill out inspection form — 5 minutes
- Raise and lower chassis — 20 minutes

Chassis Axle Identification

NOTE: The ID tag may be painted over and not visible.

Before beginning the service procedure, use the ID tag located in the center of the axle between the brake chamber brackets to determine if the chassis axle is a remanufactured axle.

All of the information necessary to identify a particular chassis axle is located on the ID tag, including the axle model number, serial number, vehicle identification number (VIN) and date of manufacture. Figure 1.

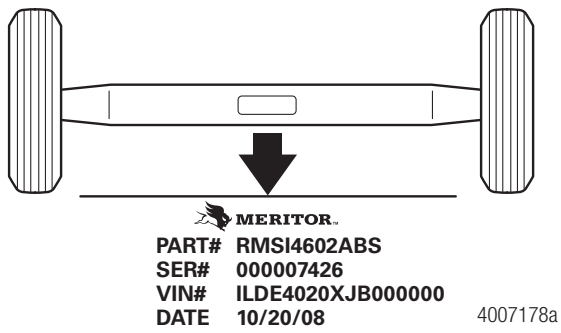

Figure 1

- The model number is composed of letters and digits (for example, RMS14602ABS). This number is used to identify the axle assembly when ordering replacement parts.
- The serial number is composed of letters and digits (for example, 000007426). This number is used to identify a particular chassis axle, and the material and components used to build the axle.
- The vehicle identification number (VIN) is composed of letters and digits (for example, ILDE4020XJB000000). This number is used to identify the chassis on which the axle assembly was installed.
- The date of manufacture is indicated by a conventional date (for example, 10/03/08).

Remove the Wheel Ends

1. Wear safe eye protection.
2. Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving. Set the parking brake.
3. If applicable, check to ensure the sliding suspension pins are engaged in the holes.
4. Raise the chassis until the tires are off the floor.
5. Place safety stands under the chassis frame or under each axle spring seat. Figure 2.

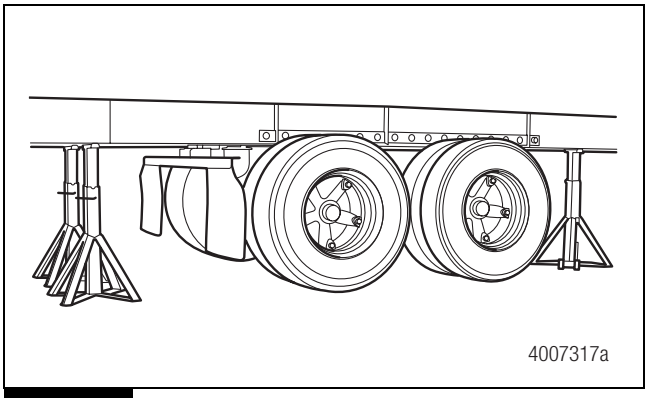

Figure 2

6. If the axle is equipped with spring brake chambers, carefully compress and lock the springs so that they cannot actuate. Figure 3.

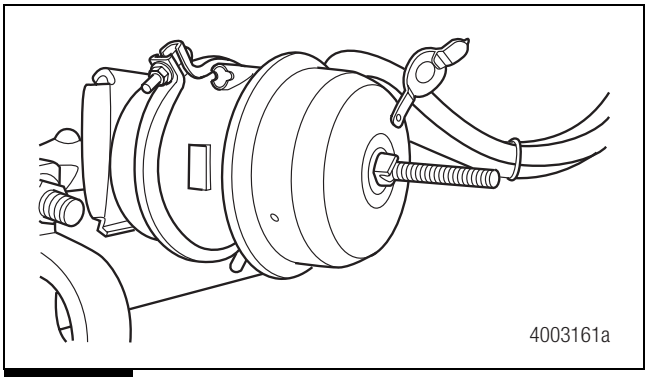

Figure 3

7. Rotate the manual adjusting nut CLOCKWISE until the linings clear the drums. Disengage the pawl.
   - **For a conventional pawl:** Remove the pawl from the slack adjuster. Replace a conventional pawl with a pull pawl.
   - **For a pull pawl:** Pry the pawl at least 1/32-inch (0.794 mm) to disengage the teeth. Figure 4.

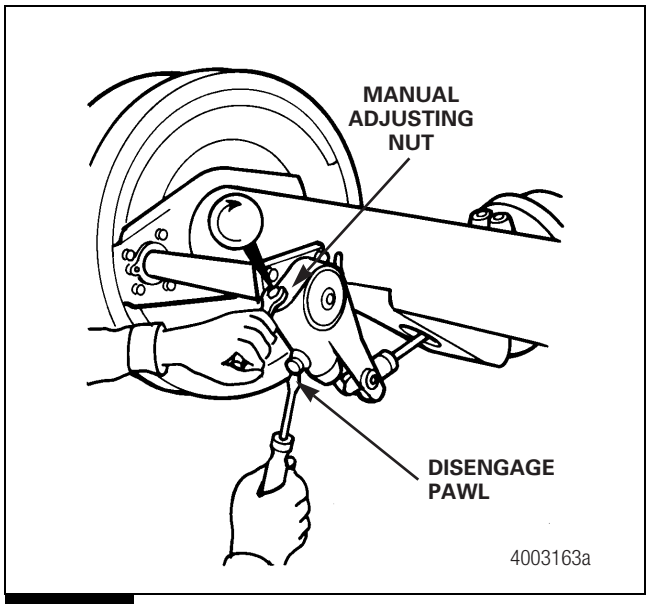

Figure 4

8. Use a 1/2-inch socket to remove the hubcap bolts. Remove the hubcap and hubcap gasket. Do not reuse either the hubcap gasket or grease. Figure 5.

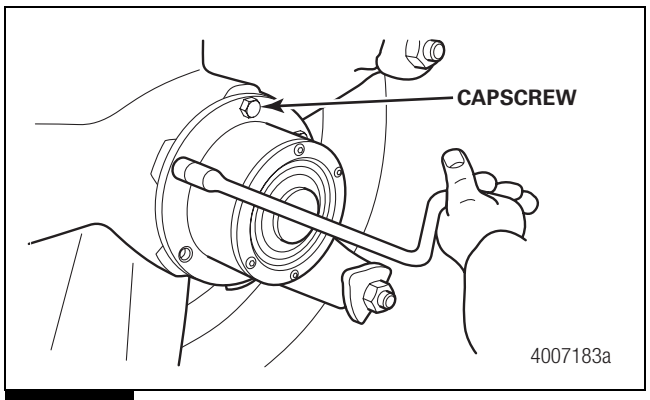

Figure 5

⚠ WARNING

Do not loosen the axle spindle nuts by either striking them directly with a hammer, or striking a drift or chisel placed against them. Damage to the parts will occur causing possible loss of axle wheel-end components and serious personal injury.

9. Remove the nut pack as follows.
   A. Use a number 2 metric Allen-wrench to remove the set screw from the lock washer. Figure 6.
   B. Use a 3-1/4-inch socket to remove the outer jam nut. Figure 7.
   C. Remove the lock washer. Figure 8.
   D. Install a wheel dolly to support the hub assembly weight.
   E. Use a 3-3/4-inch socket to remove the inner adjusting nut. Figure 9.

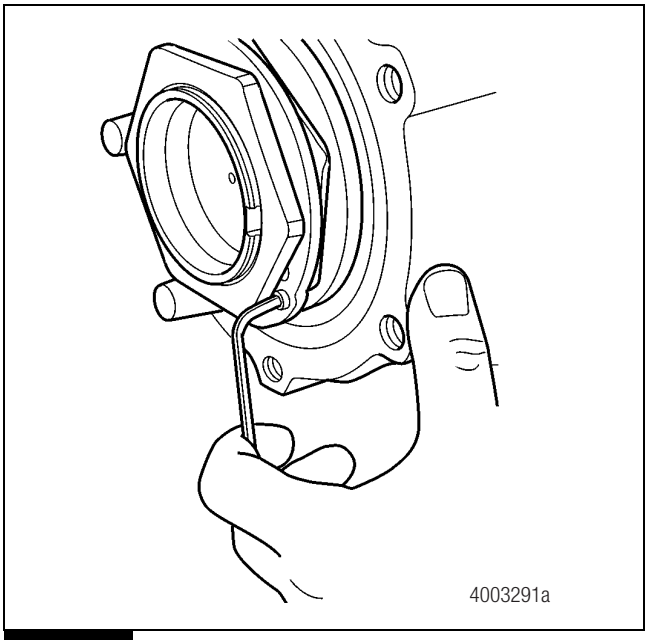

Figure 6

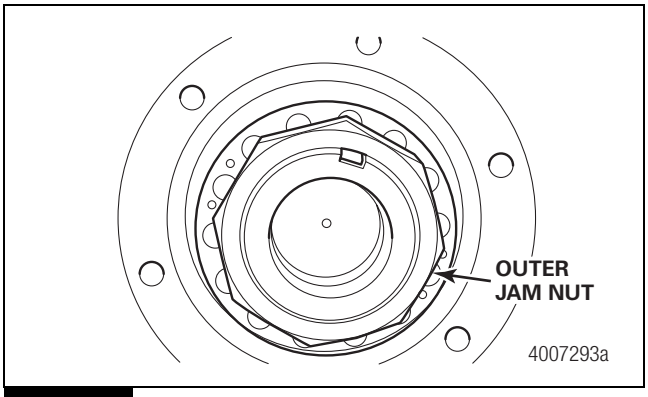

Figure 7

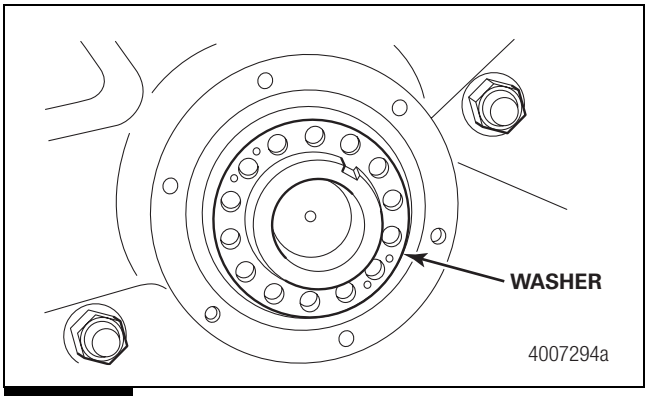

Figure 8

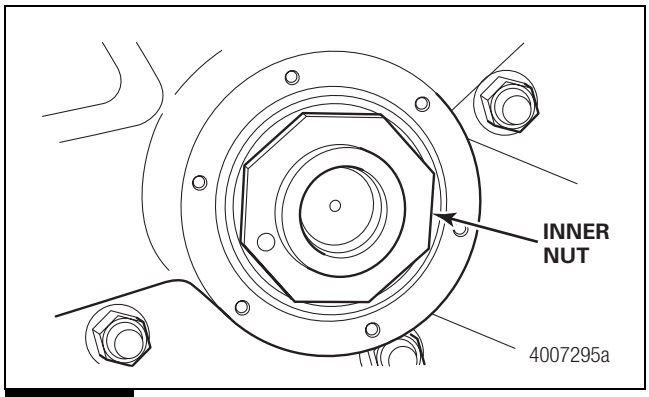

Figure 9

10. Remove the outer bearing cone. Figure 10.

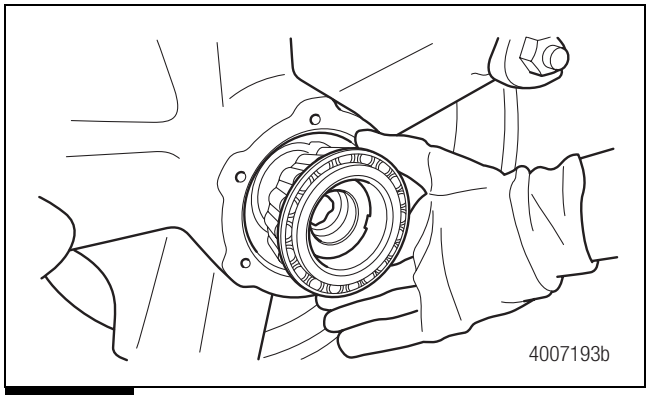

Figure 10

11. Use a wheel dolly to remove the wheels, tires and hubs/drums as an assembly. Figure 11.

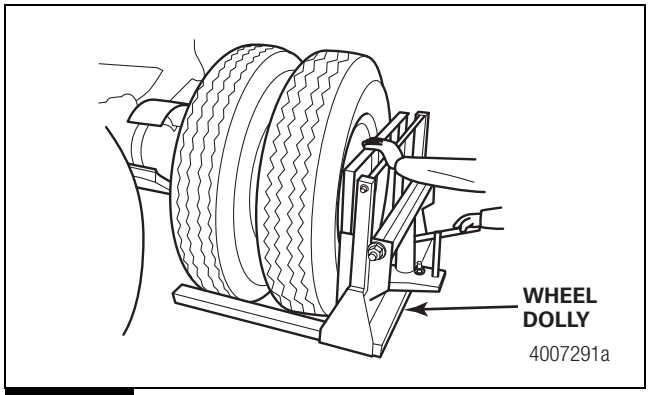

Figure 11

12. Remove the wheel and hub assembly from the wheel dolly. Install wheel blocks to keep it from rolling.
13. From inside the drum, use a crowfoot pry bar to pry out the inner bearing and wheel seal. Figure 12.

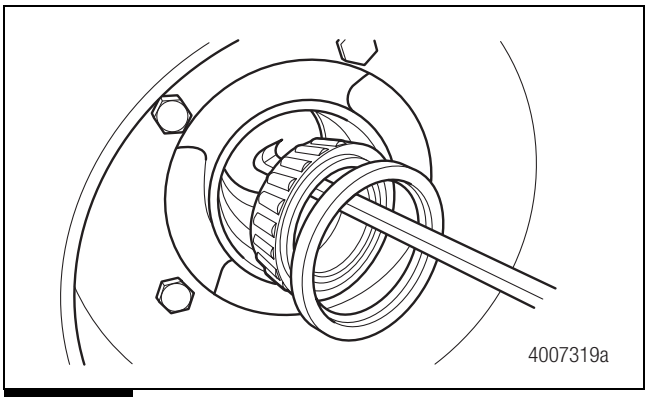

Figure 12

⚠ CAUTION

Use a slide hammer with a hook on the end of the tool to remove the whiper seal. Do not use a hammer and chisel or other sharp tool. Damage to the axle spindle will result.

14. Use a slide hammer with a hook on the end of the tool to remove the wiper seal. Discard the seal. Figure 13.

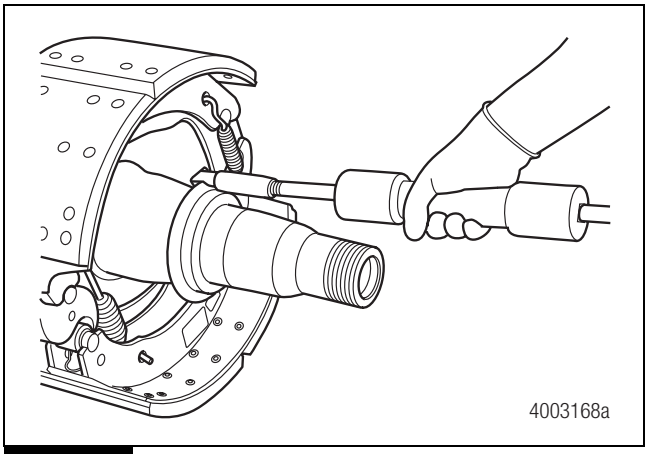

Figure 13

15. Inspect the brake shoes and drum and replace if necessary.
16. Inspect the bearing cups for bruising or damage.
    - **If no bruising or damage is found:** The bearing cups can be reused.
    - **If the outer bearing cup is bruised or damaged:** Remove the bearing cup and replace it with a new cup. Install the bearing cup removal/installation tool, OTC part number 7180, through the drum onto the outer bearing cup. Strike the tool with a hammer and drive the outer bearing cup out of the hub assembly. Figure 14.
    - **If the inner bearing cup is bruised or damaged:** Remove the bearing cup and replace it with a new cup. Use a hammer and drift to loosen and remove the inner bearing cup. Figure 15.

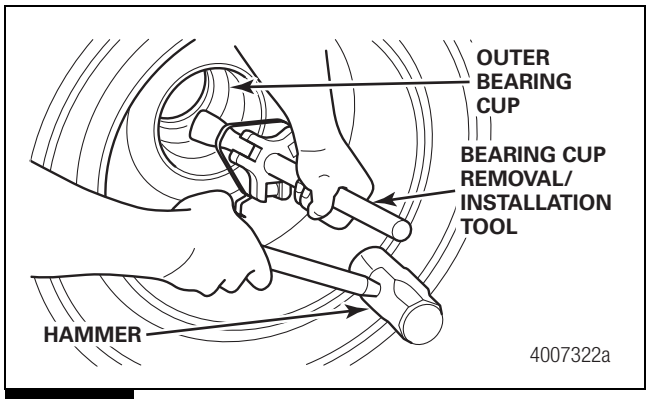

Figure 14

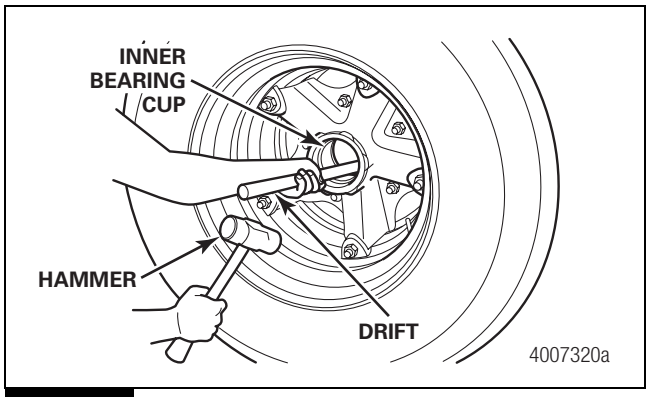

Figure 15

Determine Parts for Reuse or Replacement

- Discard the wheel seal and hubcap gasket.
- Discard any grease from the wheel end. Note if there is any metal or debris contamination in the grease.
- If metal or other debris is found in the grease, then replace the bearing cones and cups in the wheel end. It will be too difficult to clean all debris from the bearings.
- If no metal or other debris is found in the grease, then clean and inspect the bearing cones and cups. If no damage is found, the bearing cones and cups can be reused.
- Inspect the bearing cups before removing them from the hubs. If no damage is found, the bearing cups do not need to be removed from the hub.
- The nut pack components may be cleaned and reinstalled if they are in good condition.

Clean the Parts

⚠ WARNING

Do not use gasoline to clean parts. Gasoline can explode or burn and cause serious personal injury.

1. Use a stiff fiber brush, not steel, and kerosene or diesel fuel oil, not gasoline to remove grease from a wheel end.
2. Allow clean parts to dry, then wipe them with a clean, absorbent cloth. Any solvent residue must be completely wiped dry since it may either dilute the grease or prevent it from correctly adhering to the wheel-end components.
3. Wipe out the bulk of the grease in the wheel-end cavity. Dispose of the grease.
4. Use a pressure washer to clean the inside of the wheel-end cavity of grease. Wash the cavity with Brake Clean or mineral spirits regardless of whether contaminants are found or not. Wipe the cavity with a clean cloth to ensure it is clean and dry.
5. Clean the spindle off with a clean cloth. Wash it with Brake Clean or mineral spirits. The entire spindle from the collar to the end must be cleaned correctly.

Disassemble the Brakes

1. Mark the position of the brake shoes (top and bottom, left and right) so they can be reinstalled in the same position during reassembly.
2. Push DOWN on the bottom brake shoe and remove the bottom roller by the clip. Figure 16. Pull UP on the top brake shoe and remove the top roller by the clip. Figure 17. Remove the retainer springs and pull the brake shoes off the brake spider. Figure 18.

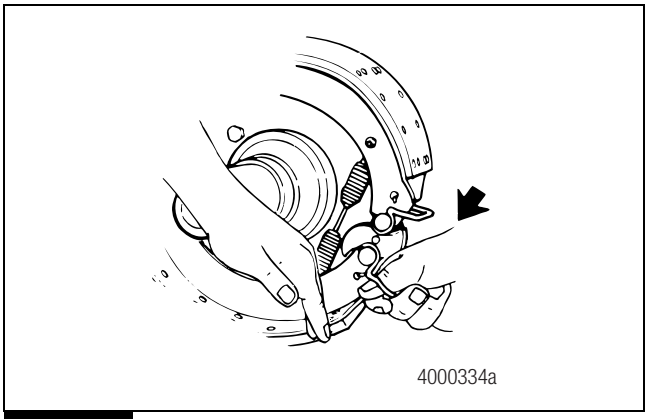

Figure 16

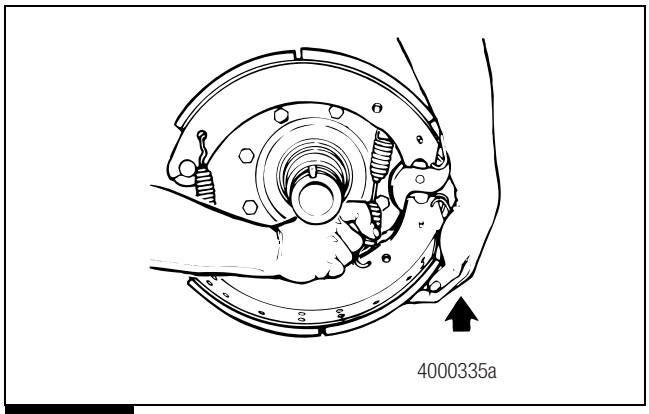

Figure 17

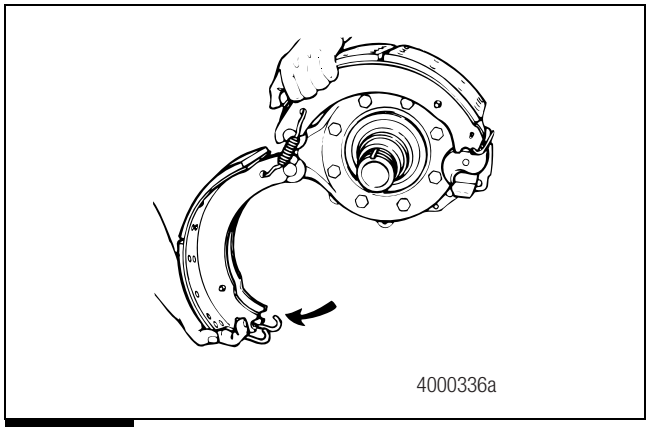

Figure 18

3. Remove the large and small clevis pins from the automatic slack adjuster. Disconnect the automatic slack adjuster from the pushrod clevis. Figure 19.

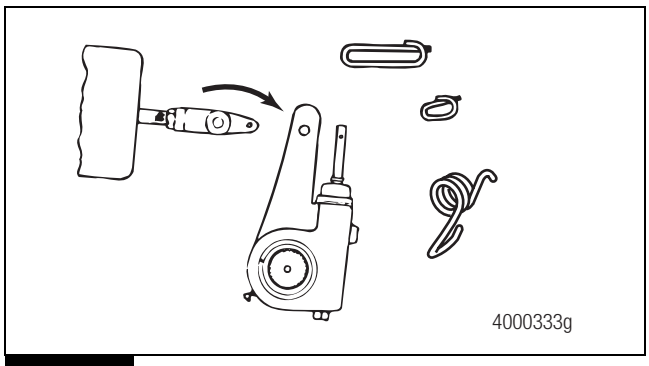

Figure 19

4. Remove the snap rings and washers from the automatic slack adjusters. Remove the automatic slack adjusters from the S-camshafts. Figure 20.

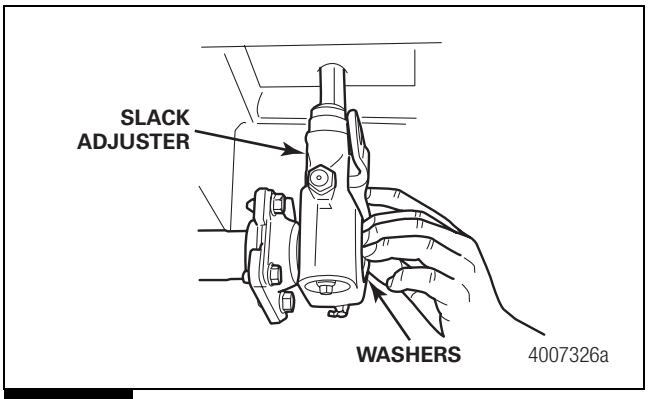

Figure 20

5. Mark the position of the air lines on the spring brakes so they can be reconnected in the same positions during reassembly. Disconnect the brake lines from the spring brakes. Figure 21.

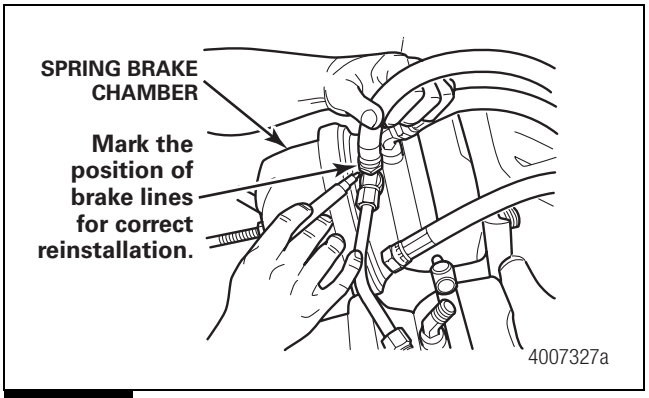

Figure 21

6. Remove the snap rings and clips from the S-camshaft. Slide the S-camshaft out of the brake spider and inner camshaft bracket. Clean the S-camshaft before reinstallation. Figure 22.

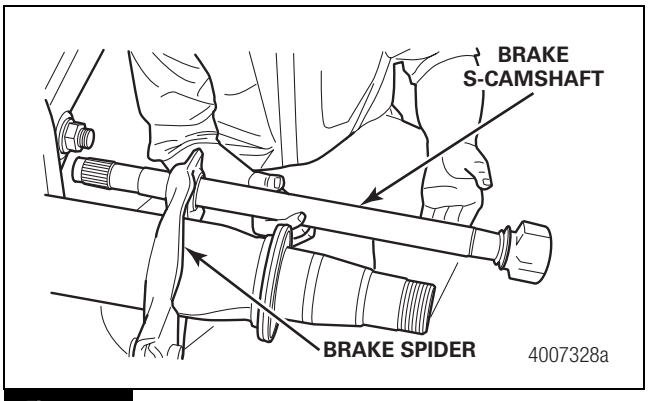

Figure 22

7. Note the routing and tie-down locations of the ABS sensor before you remove the sensor. They should be in the same position for reassembly.

8. Remove the ABS sensor and sensor retainer. Position each sensor according to the front and rear axles, and the left and right wheel ends.

Remove the Axle

1. Raise the axle with a transmission floor jack. Secure the axle with straps. Figure 23.

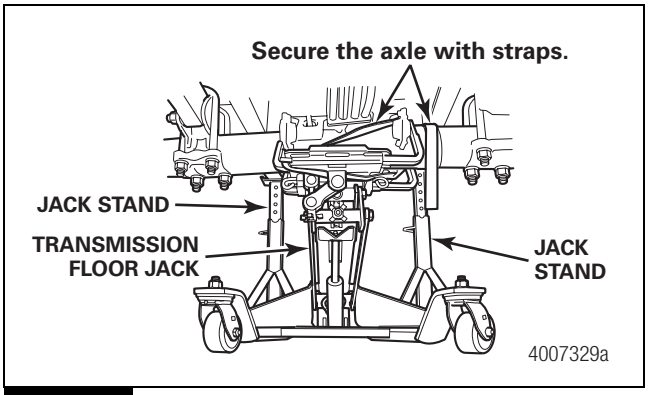

Figure 23

2. Clean the paint off the trailing arm bolt threads. Remove the nuts and bolts from the trailing arms. Pry the trailing arms free from the spring seats. Figure 24.

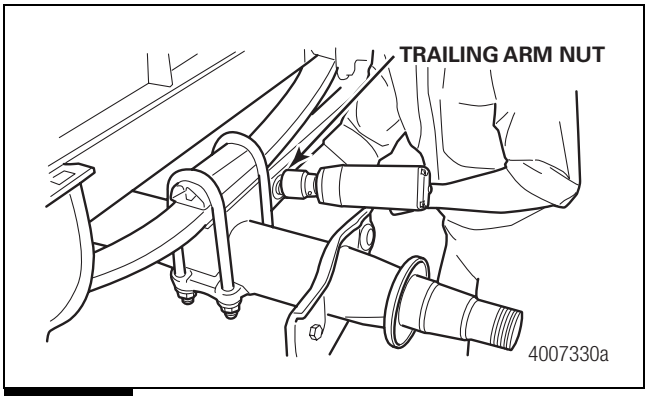

Figure 24

3. Use a wire brush to clean the U-bolt threads. Remove the nuts from the U-bolts. Figure 25.

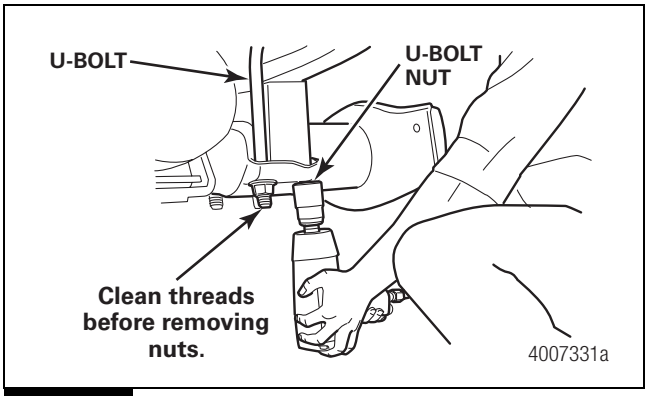

Figure 25

4. Lower the axle on the floor jack. If necessary, pry it free from the U-bolts and trailing arms. Figure 26.

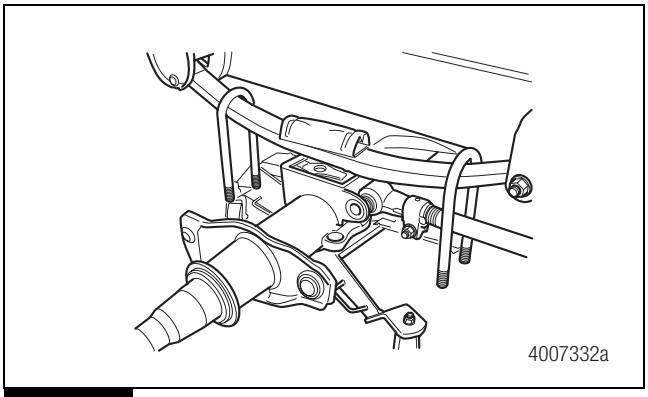

Figure 26

5. Move the axle out from under the chassis to a cleared work space.
6. Use a drift and hammer to remove the S-cam bushing from the brake spider. Figure 27. Remove the seal. Figure 28. Verify the seal is oriented correctly during installation.

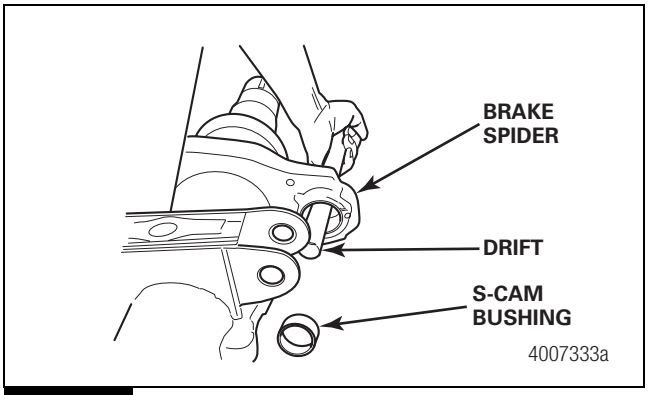

Figure 27

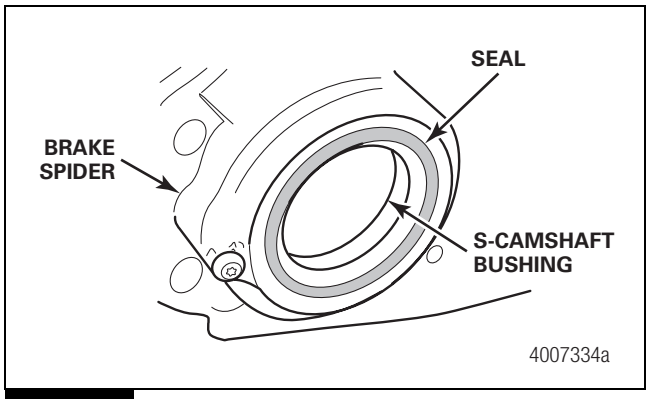

Figure 28

7. Use a 3/8-inch drive impact wrench to remove the capscrews on the S-cam shaft inner bracket. Remove the bushing and O-rings. Clean with a wire wheel. Use Loctite® threadlocker when you reinstall the capscrews. Figure 29.

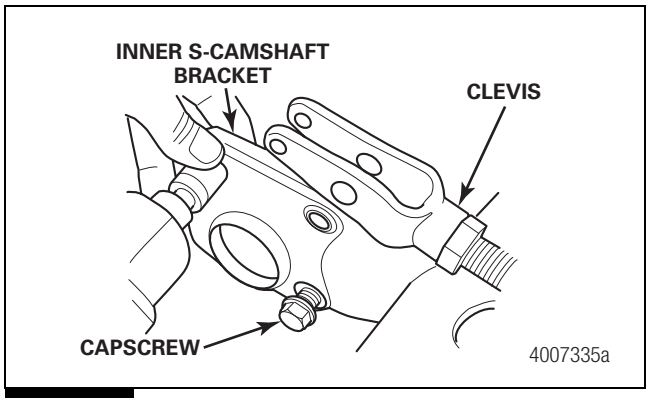

Figure 29

8. Loosen the fitting and disconnect the air crossover tube between the two spring brakes. Figure 30.

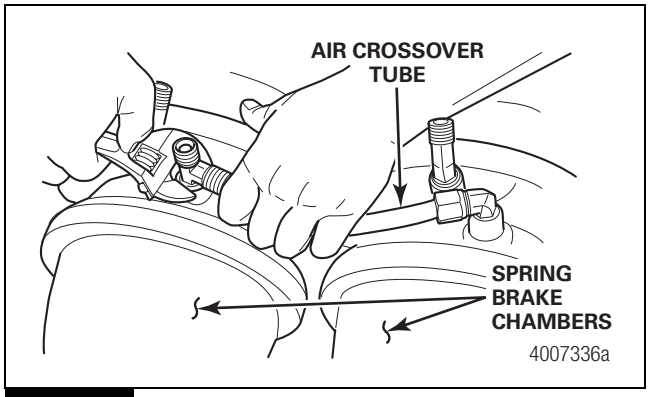

Figure 30

9. Remove the nuts on the spring brake mounting studs. Note which holes the mounting studs run through on the bracket. Make sure to reinstall the mounting studs through the same holes during reassembly. Loosen and remove the spring brake chambers from the brackets. Figure 31.

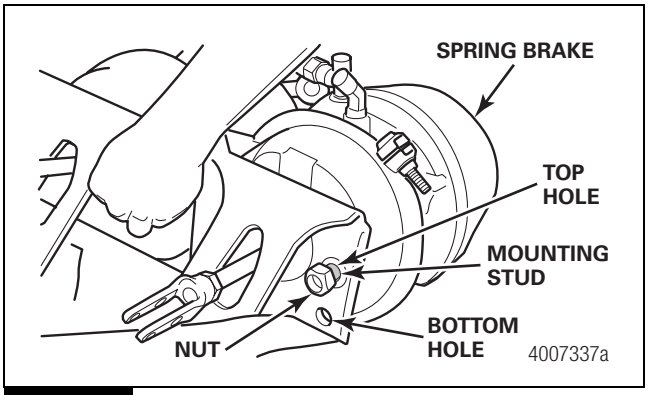

Figure 31

10. Clean the clevises on the spring brakes.

Install the Axle

Install the replacement axle using the following procedure. Make sure to clean all parts as necessary before beginning the procedures.

1. Place the new axle on a transmission floor jack.
2. Install the spring brake chamber mounting studs onto the replacement axle bracket through the same holes they were originally installed. Install the nuts and tighten them to 80-125 lb-ft (108-169 N•m). Figure 32.

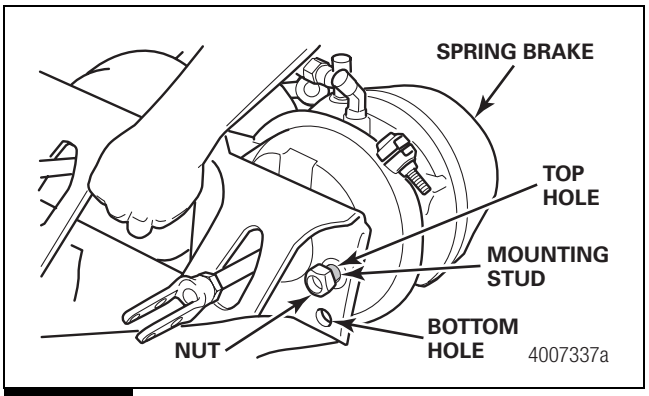

Figure 32

3. Move the axle under the chassis and raise it into position. Figure 33.

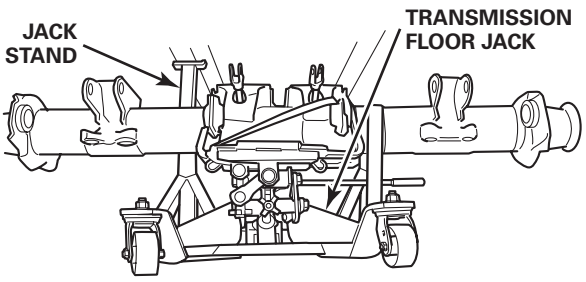

Figure 33

4. Install the trailing arms into the spring seats. Install the trailing arm bolts and nuts, but do not tighten. Figure 34.

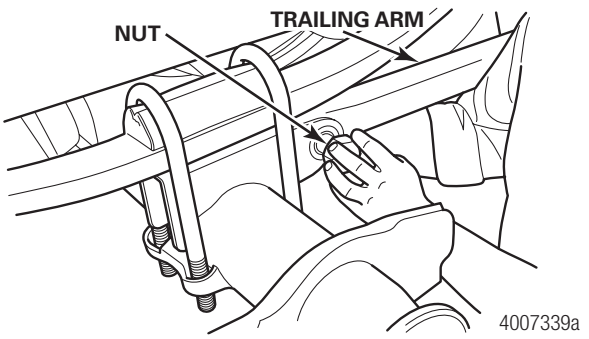

Figure 34

5. Install the U-bolts into the holes on the axle. Install and tighten the nuts in an alternating pattern to the correct torque. Refer to the following suspension torque table or measure the fastener size to determine the correct torque. Figure 35.

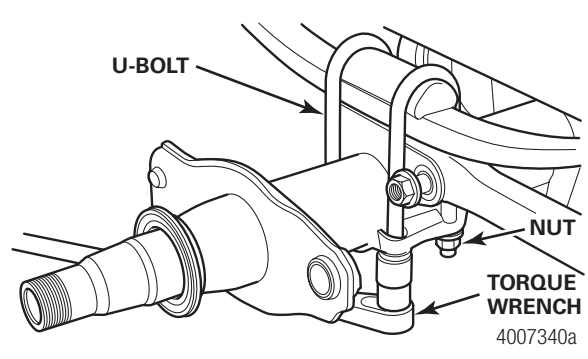

Figure 35

Fasteners	Oiled	Dry
1-14 Radius Rod Bolt (Hutch and Saejin)	540 lb-ft	720 lb-ft
7/8-14 Axle U-Bolt (Hutch and Saejin)	350 lb-ft	470 lb-ft
3/4-16 Axle U-Bolt (Hutch and Saejin)	310 lb-ft	420 lb-ft
5/8-18 Radius Rod Clamp Bolt (Hutch and Saejin)	130 lb-ft	170 lb-ft
3/4-16 Axle U-Bolt (Holland Binkley)	275-300 lb-ft	
7/8-14 Radius Rod Bolt (Holland Binkley)	275-300 lb-ft	
5/8-18 Radius Rod Clamp Bolt (Holland Binkley)	85-95 lb-ft	

6. Tighten the trailing arm nuts and bolts to the correct torque. Refer to the suspension torque table above or measure the fastener size to determine the correct torque. Figure 36.

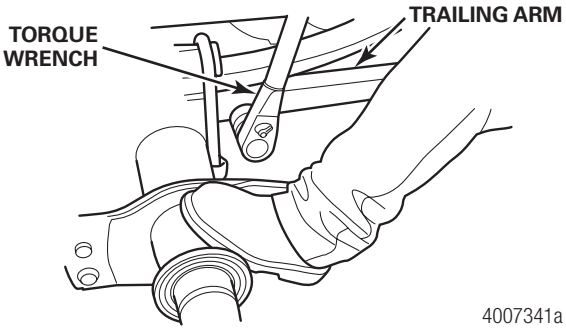

Figure 36

Assemble the Brakes

1. Connect the air lines to the spring brake chambers. Tighten the fittings to the manufacturer's specification.

NOTE: The replacement axle will come with the S-camshaft bushings in the brake spider and inner S-camshaft bracket. Figure 37.

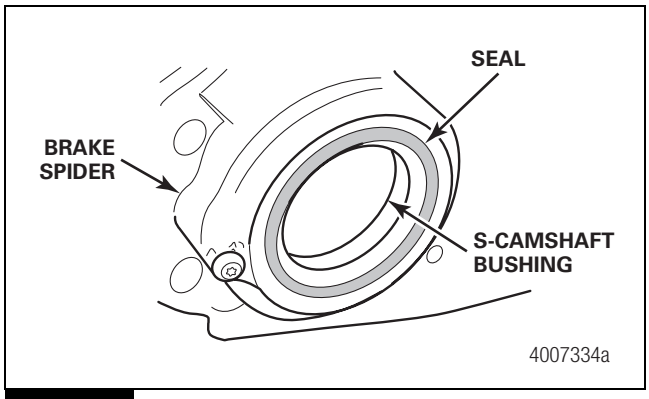

Figure 37

2. The replacement axle may come with the S-camshaft and automatic slack adjuster already installed. If these components are installed, proceed to Step 6.
3. Install the S-camshaft with the washer through the brake spider and inner S-camshaft bracket. Install the circlip and the washer. Figure 38 and Figure 39.

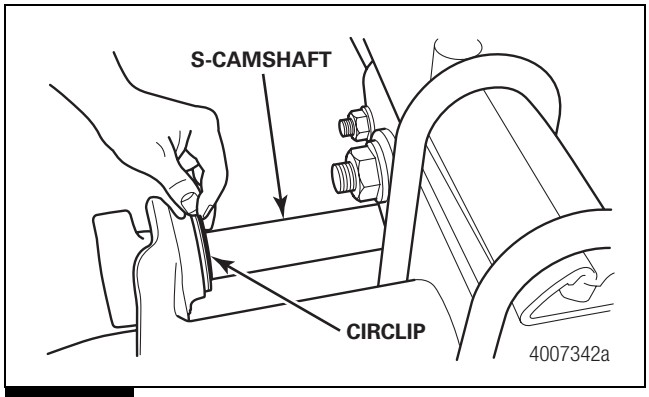

Figure 38

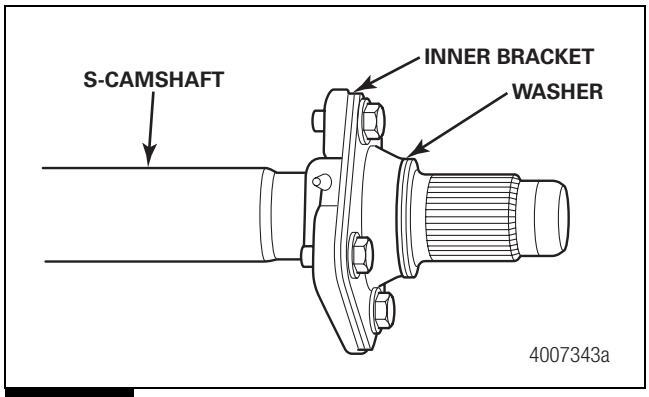

Figure 39

4. Install the O-ring, then slide the slack adjuster onto the S-camshaft splines. Secure it with the snap ring. Figure 40.

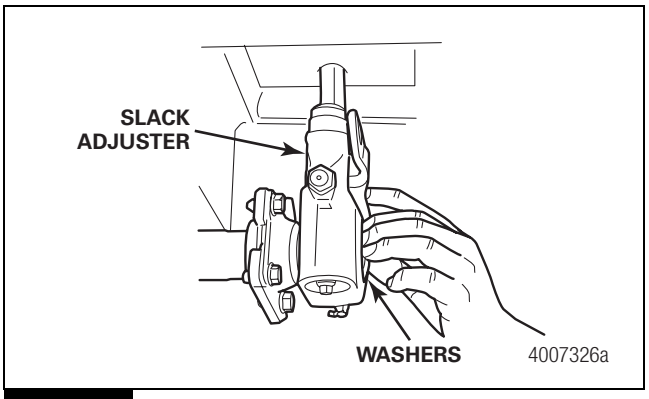

Figure 40

5. Install a dial indicator on the head of the S-camshaft. Pull it by hand to check the end play. End play should be 0.005-0.060-inch (0.127-1.52 mm). If necessary, install or remove shims (washers) to achieve the correct end play. Figure 41.

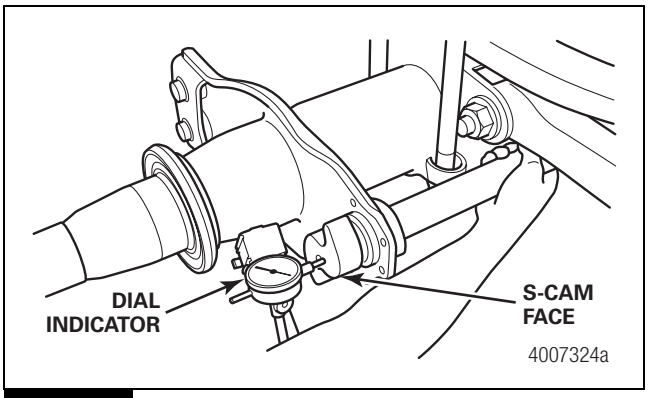

Figure 41

6. Set the automatic slack adjuster position using the Template Method procedure in this bulletin.
7. After you set the automatic slack adjuster position, install the pushrod clevis onto the automatic slack adjuster. Clean and lubricate the clevis pins. Install the clevis pins through the automatic slack adjuster and secure them with clips.
8. Inspect the brake hardware for damage and to determine if the springs are stetched.
   - **If the springs are stretched:** Replace the springs.
9. Install the brake shoes onto the anchor pins. Make sure to install them into the same positions from which they were removed. Attach the retainer springs. Figure 42 and Figure 43. Use a pry bar to install the roller pins. Figure 44.

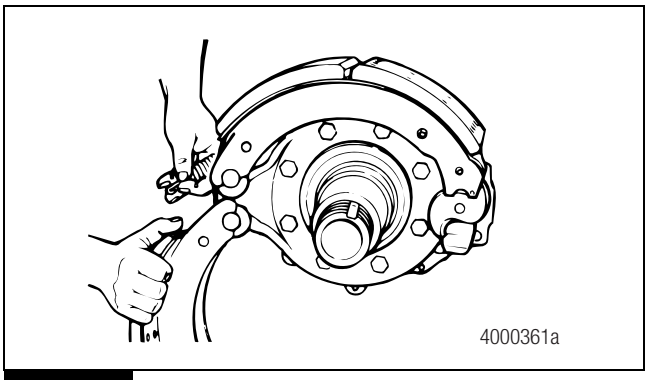

Figure 42

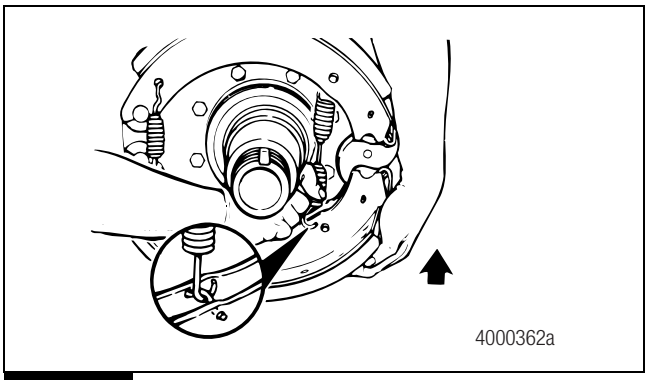

Figure 43

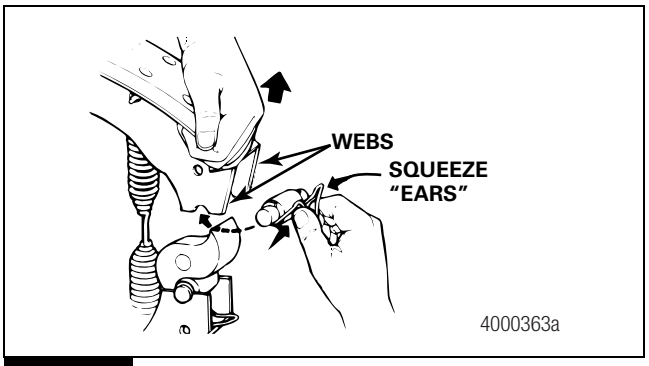

Figure 44

Important Information

Meritor automatic slack adjusters (ASAs) should not need to be manually adjusted in service. ASAs should not have to be adjusted to correct excessive push rod stroke. The excessive stroke may be an indication that a problem exists with the foundation brake, ASA, brake actuator or other system components.

Meritor recommends troubleshooting the problem, replacing suspect components and then confirming proper brake operation prior to returning the vehicle into service.

In the event that a manual adjustment must be made (although not a common practice), a service appointment and full foundation brake, ASA, and other system component inspection should be conducted as soon as possible to ensure integrity of the overall brake system.

For Meritor brake adjustment, refer to the brake adjustment tables in this bulletin. For non-Meritor brake adjusters, refer to the brake manufacturer's service procedures.

Set the Automatic Slack Adjuster Position

Air Chambers and Automatic Slack Adjusters

When Meritor automatic slack adjusters and cam brakes are installed onto a trailer axle, there must be a 105-degree angle between the air chamber pushrod and the automatic slack adjuster. Figure 45.

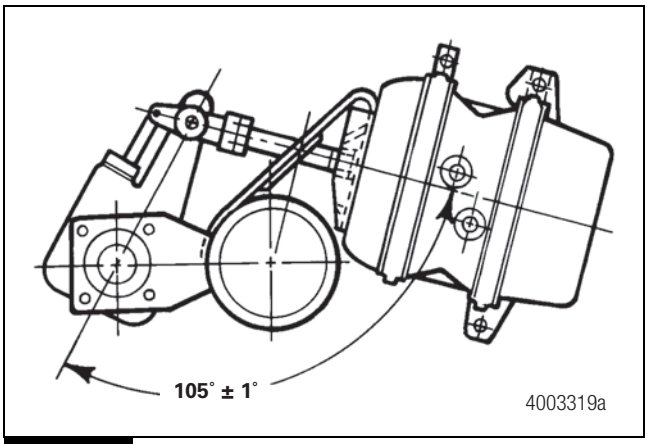

Figure 45

NOTE: This angle is with the service and spring brakes in the fully-released or "Brakes Off" position.

Template Method

⚠ CAUTION

There are three different installation templates for Meritor automatic slack adjusters. The templates are not interchangeable. You must use the correct template and clevis pin spacing and you must adjust the clevis position as described below. If you use the wrong combination and install the clevis in the wrong position, the slack adjuster will not adjust the brake correctly. If the slack adjuster underadjusts, then stopping distances are increased. If the slack adjuster overadjusts, then the linings may drag and damage the brake.

1. To set up the required 105-degree angle between the air chamber pushrod and the automatic slack adjuster, use the tan-colored Meritor slack adjuster template, Meritor part number TP-4787. Figure 46.

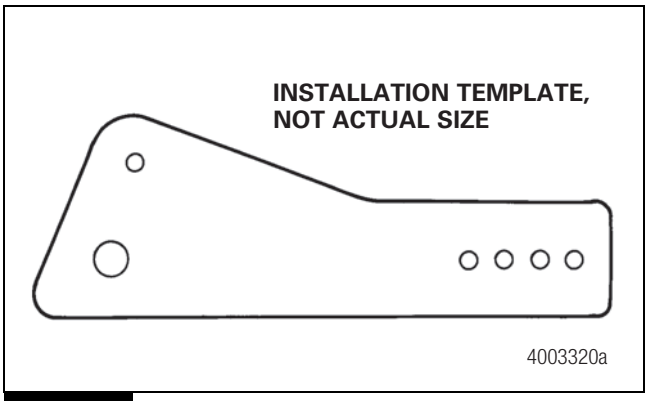

Figure 46

2. To use the template, insert the two automatic slack adjuster clevis pins into the matching template holes. Adjust the automatic slack adjuster until the bottom hole aligns with the cam centerline. Refer to the brake adjustment procedure in this bulletin for detailed instructions. Figure 47.

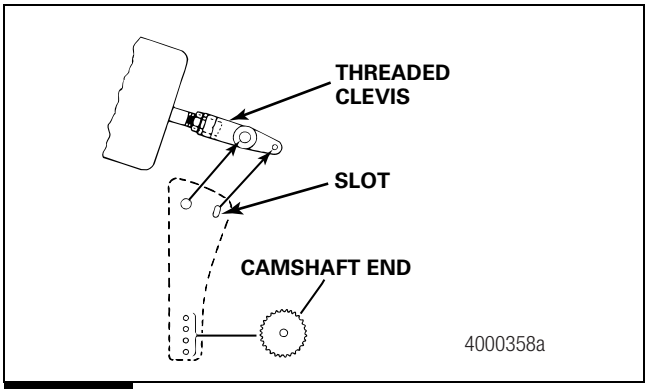

Figure 47

3. Verify that the thread engagement between the clevis and pushrod is 0.5-0.625-inch (12.7-15.9 mm). Figure 48.

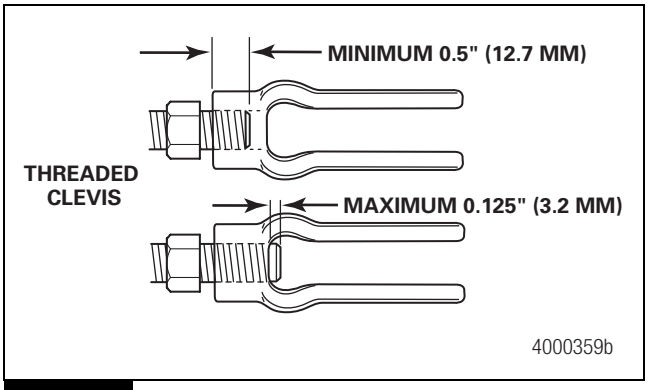

Figure 48

4. Verify that the pushrod does not extend through the clevis more than 0.125-inch (3.2 mm).
   - **If the pushrod extends through the clevis more than 0.125-inch (3.2 mm):** Cut the pushrod or install a new air chamber and pushrod.
5. Tighten the jam nut against the clevis to the torque specification in Table A.

Table A: Jam Nut Torque Specifications

Threads	Torque
1/2-20	20-30 lb-ft (27-41 N•m)
5/8-18	35-50 lb-ft (48-68 N•m)

ABS Equipment

An ABS-equipped trailer axle will be installed with the wheel speed monitoring components located at the axle spindle. Figure 49.

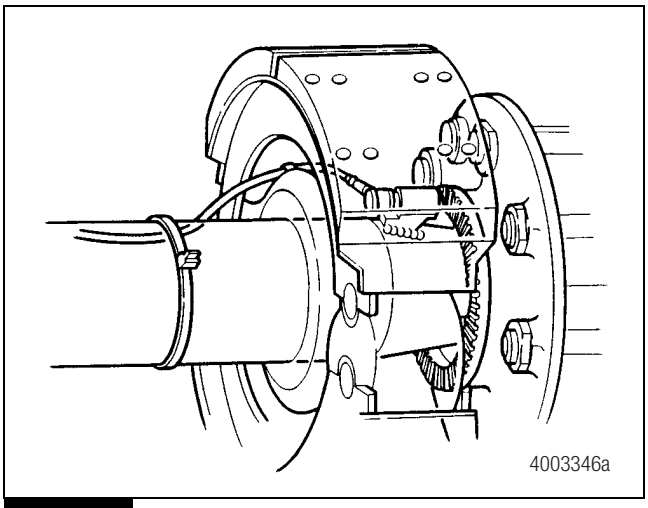

Figure 49

ABS Sensor Gap

The sensor should contact the tooth wheel at the initial installation. A gap may develop during trailer operations. If this gap exceeds 0.040-inch (1 mm), the system may not function correctly. To readjust, push the sensor through the sensor block until it contacts the tooth wheel. Figure 50.

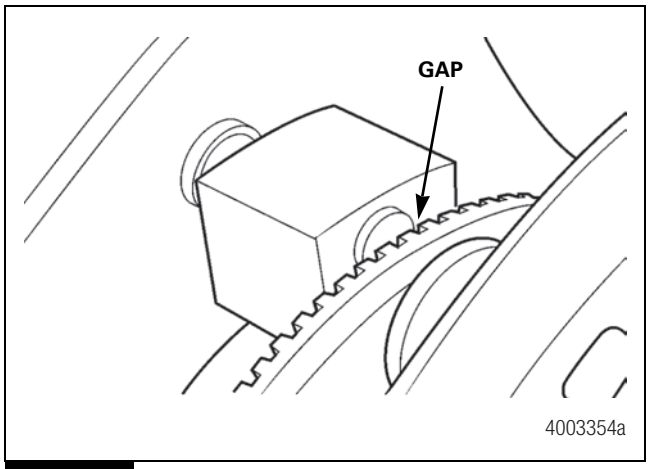

Figure 50

You can make a special tool to reach the back of the sensor through the brake equipment. Be careful not to damage the sensor when pushing on it. Figure 51.

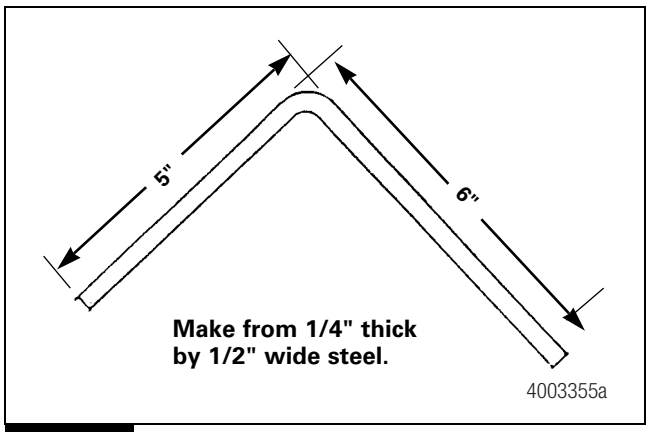

Figure 51

Wire Routing

This section details the correct methods for routing wiring within the brake cavity so that the correct clearance between the ABS wiring and brake equipment is provided.

Note the following in regard to this information.

- If the sensor is to be located at the bottom of an axle, first route the sensor wire to the top of the axle within the brake cavity. Then route it through the brake equipment. Figure 52.
- Refer to the appropriate ABS maintenance manuals for information on routing wires beyond the areas shown here.
- Information shown is for typical applications. Alternate routing may be used if either improved clearances can be obtained or if optional equipment is installed which requires different routing.
- In order to route ABS wiring on trailer axles equipped with 12.25 x 7.5 inch cam brakes, modifications must be made to the brake structural components. Therefore, this installation must be performed at the Meritor manufacturing plant.

1. Current production cam brakes are built with a hole in the spider for routing the ABS wire. Figure 52.

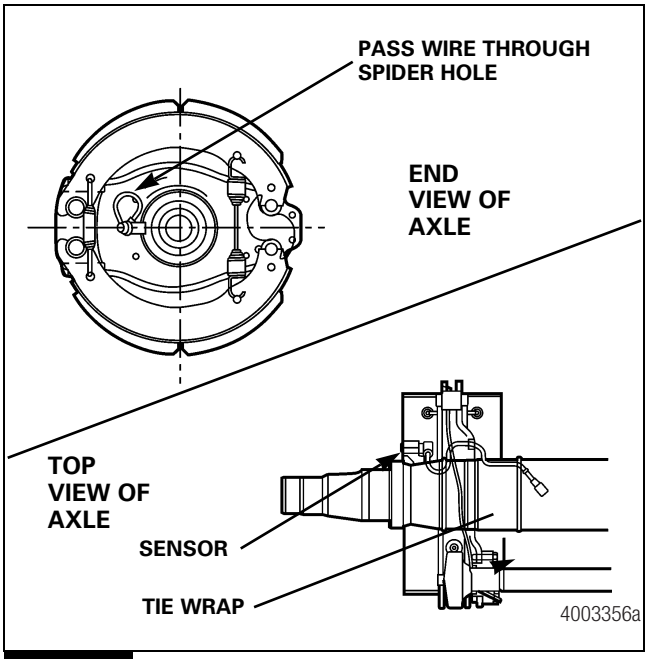

Figure 52

2. Route the ABS wires on TN and TQ model axles equipped with cam brakes without an ABS spider hole as follows. Figure 53.

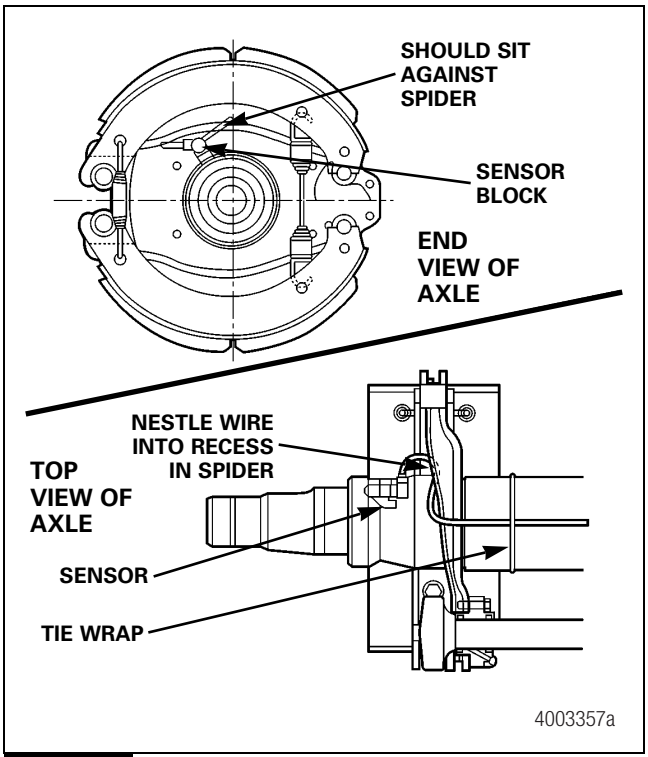

Figure 53

3. Route the ABS wires on TP and TR model axles equipped with cam brakes without an ABS spider hole as follows. Figure 54.

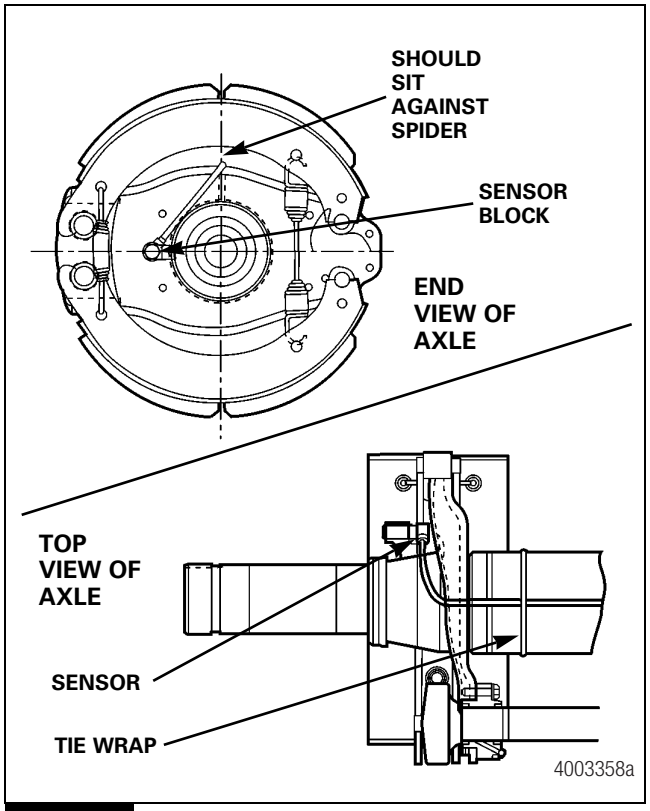

Figure 54

Assemble the Wheel Ends

1. Install the wheel seal on the spindle. Make sure to position the seal wiper first on the spindle end. Use a wheel seal installer/driver, Stemco part number 552-236, and mallet to drive the wheel seal on the spindle end until correctly seated. Figure 55.

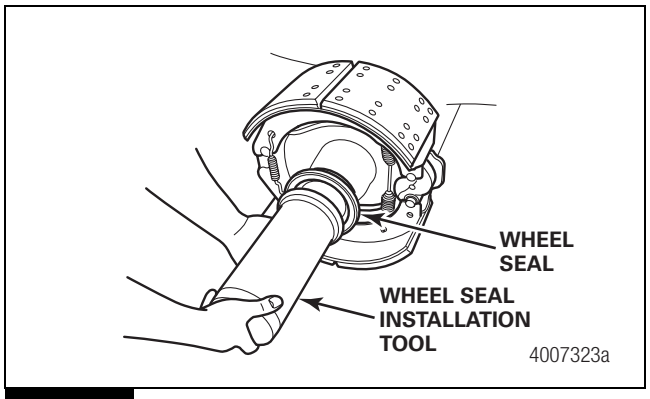

Figure 55

2. Place your thumbs on the seal assembly and push back to ensure the two components are mated together.
3. Coat the outside diameter of the seal with a thin layer of grease.
4. Use a grease barrel pump kit to pack the bearing cones with new Shell RETINAX LX2 grease by forcing grease into the cavities between the rollers and cage.
5. Apply a light coat of grease to the spindle bearing journals.
6. Install a prelubricated inner bearing cone onto the spindle. Figure 56.

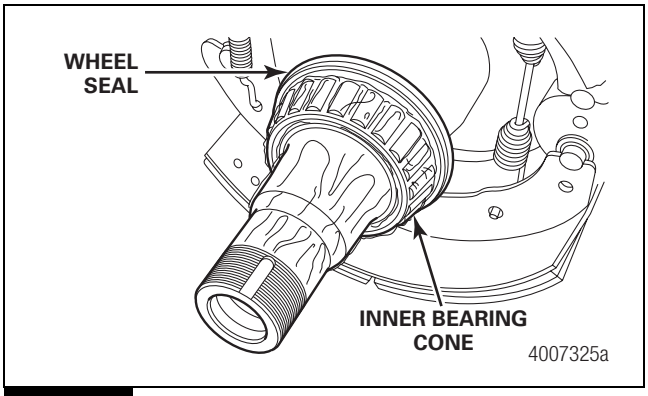

Figure 56

7. If removed, use the bearing cup removal/installation tool, OTC 7180, and hammer to install the inner and outer bearing cups into the hub assembly. Figure 57.

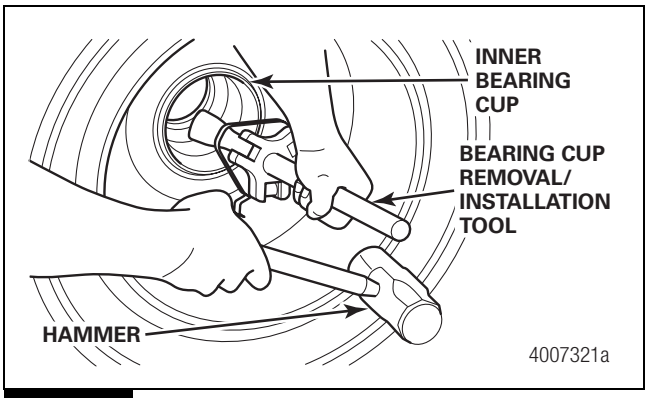

Figure 57

⚠ CAUTION

When you lubricate the wheel end, pack the hub cavity with approved grease only up to the smallest diameter of the bearing cups. Do not install too much grease in the wheel-end cavity. Remove excess grease, which can contaminate the brakes and affect bearing life and braking performance. Damage to components can result.

8. Pack the hub cavity by hand with new Shell RETINAX LX2 grease up to the smallest diameter of the outer bearing cup. Remove excess grease. Figure 58.

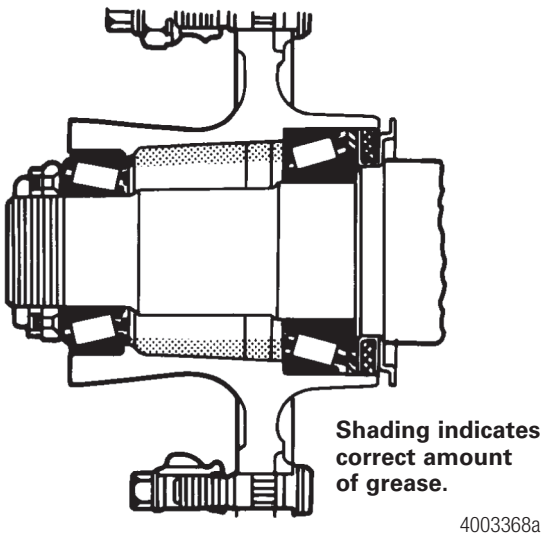

Figure 58

9. Remove the blocks from the tires and install the wheel dolly.

⚠ CAUTION

When you tighten the spindle nuts, the hub and drum assembly will seat to the correct position. Do not try to completely seat the hub and drum assembly by hand. Damage to components can result.

10. Align the hub bore with the spindle. Push the hub assembly onto the spindle until it bottoms out against the wheel seal. Use care to avoid damaging the spindle threads and seal. Keep the wheel dolly in place. Figure 59.

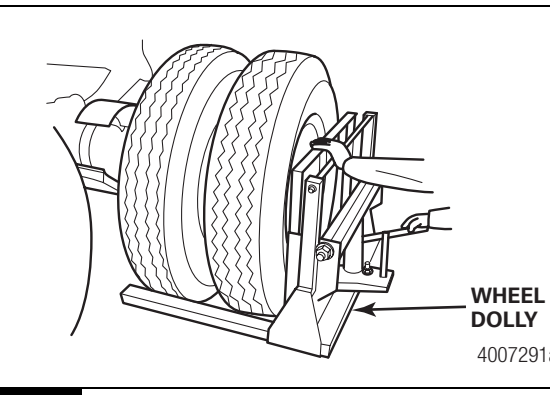

Figure 59

11. Install the prelubricated outer bearing cone. Figure 60.

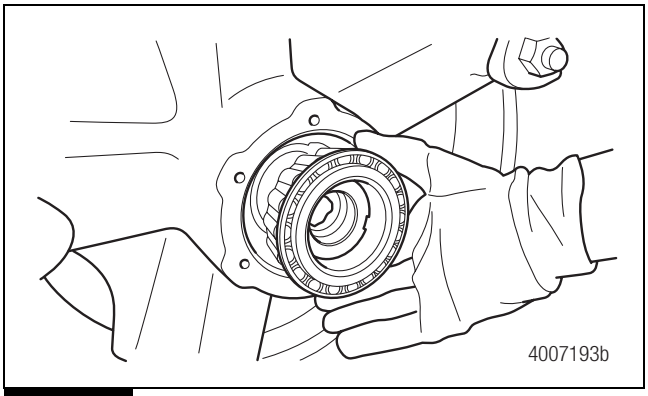

Figure 60

NOTE: Do not remove the wheel dolly until the adjusting nut is threaded onto the spindle far enough to prevent the outer bearing from moving outward.

12. Adjust the wheel end using the double nut adjusting procedure.

Double Nut Adjustment Procedure

1. Install the inner adjusting nut so that the pin on the nut faces away from the wheel-end equipment. Once the inner adjusting nut is threaded onto the spindle far enough to prevent the outer bearing from moving outward, you may remove the wheel dolly. Use a 3-3/4-inch socket to tighten the nut to 200 lb-ft (271 N•m) while rotating the wheel end in both directions. Figure 61 and Figure 62.

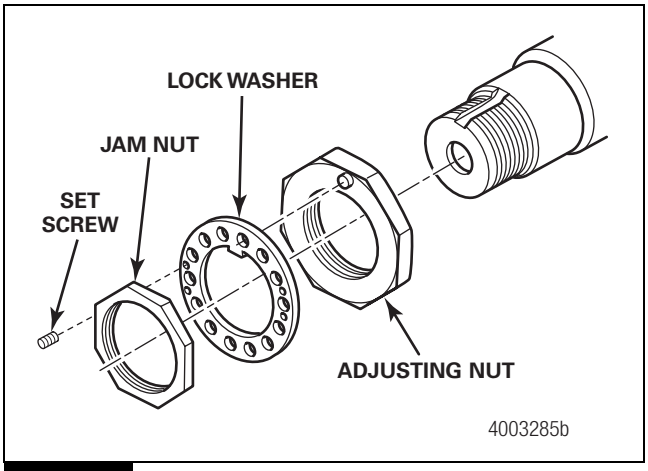

Figure 61

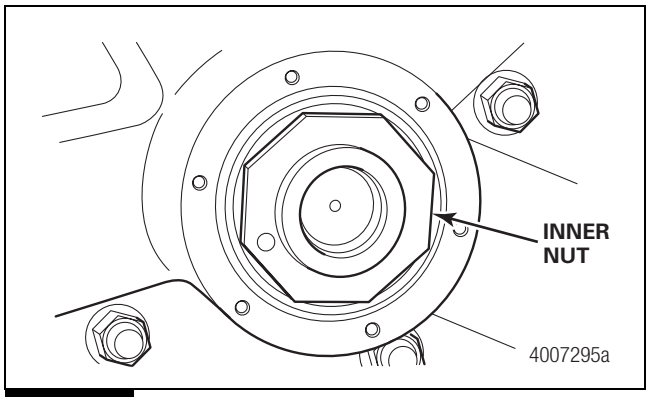

Figure 62

2. Completely loosen the nut one full turn, then tighten it to 50 lb-ft (68 N•m) while rotating the wheel end.
3. Back off the nut 1/4 to 1/3 turn COUNTERCLOCKWISE. Do not include socket backlash in the 1/4 to 1/3 turn.
4. Install the lock washer. If the hole in the washer is not aligned with the adjusting nut pin, remove the washer, turn it over and reinstall. The pin and hole should now be aligned. If not, slightly adjust the parts to align them. Figure 63.

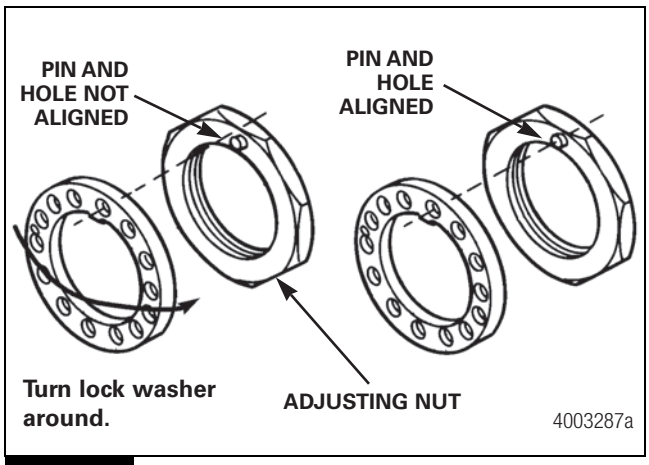

Figure 63

5. Install the outer jam nut. Use a 3-1/4-inch socket to tighten the nut to 250-300 lb-ft (340-408 N•m). Figure 64.

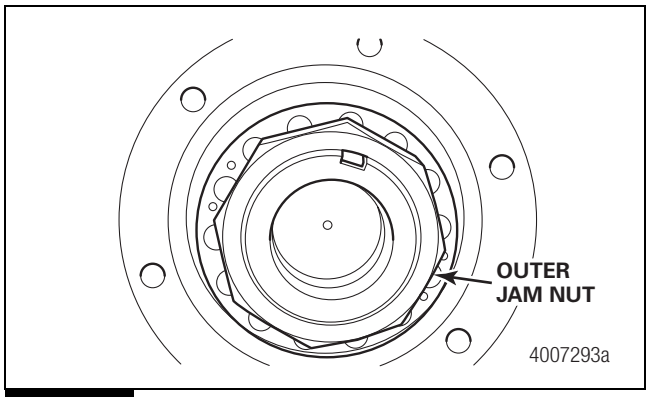

Figure 64

6. Check the wheel bearing end play. End play must be within 0.002-0.005-inch.
   A. Attach the magnetic base of a dial indicator to the spindle. Touch the dial indicator stem to the hubcap gasket face at the 12 o'clock position. Figure 65.

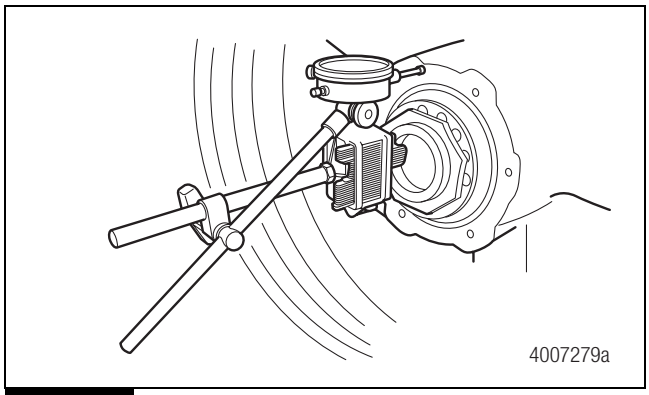

Figure 65

   B. Push inward at the top of the tire until the dial indicator does not change. Read the dial indicator. Figure 66.

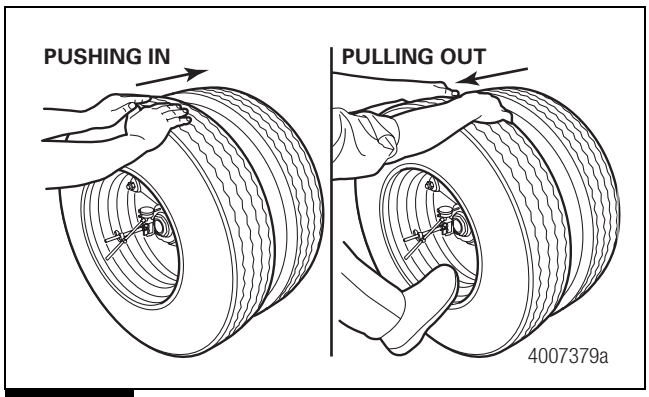

Figure 66

C. Push in at the bottom of the rim while pulling/holding the top of the tire with both hands until the dial indicator does not change. Check the end play reading. End play must be within 0.002-0.005-inch. Figure 66.

⚠ WARNING

You must adjust wheel bearing end play to within 0.002-0.005-inch (0.025-0.127 mm). An adjustment that is too loose will reduce wheel-end bearing life, increase spindle wear and cause seal leakage. An adjustment that is too tight can affect wheel-end bearing performance. Loss of wheel-end components, serious personal injury and damage to components can result.

7. If necessary, readjust the end play as follows.
   A. Remove the outer jam nut and lock washer.
   B. Back off the adjusting nut COUNTERCLOCKWISE one full turn.
   C. Repeat Steps 1-5 of the double nut adjustment procedure.
   D. Check end play.
   E. Continue to adjust until end play meets specifications.
   F. Record the wheel-end end play. You will need to provide this measurement to OnTrac once you complete these service procedures. Continue to Step 8.
8. Using a number 2 metric Allen wrench, tighten the set screw into the lock washer until it is seated. Figure 67.

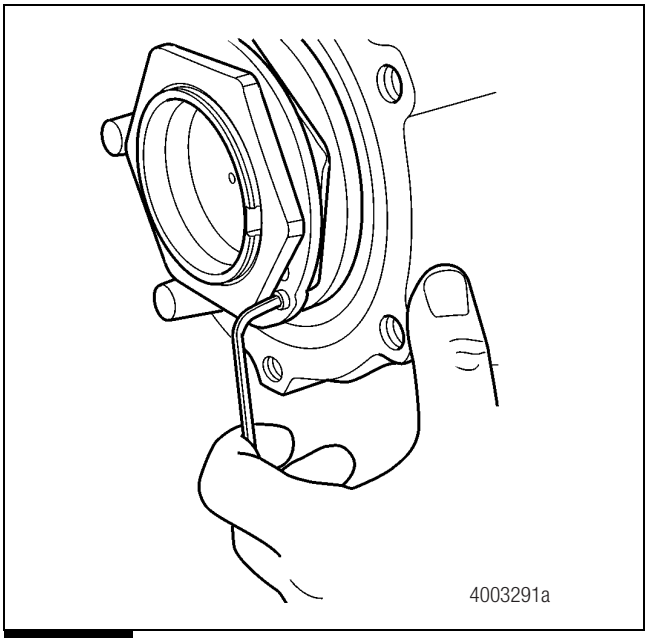

Figure 67

9. Clean the hubcap flange and hubcap mounting surface before you install the hubcap gasket.
10. Apply a film of grease on the inside of the hubcap to prevent rust.

⚠ WARNING

Take care when you use Loctite® adhesive to avoid serious personal injury. Read the manufacturer's instructions before using this product. Follow the instructions carefully to prevent irritation to the eyes and skin. If Loctite® adhesive material gets into your eyes, follow the manufacturer's emergency procedures. Have your eyes checked by a physician as soon as possible.

11. Install the new hubcap gasket on the hubcap. Make sure to orient the gasket to the correct bolt hole pattern on the hubcap. Apply Loctite® 242 threadlocker to the hubcap bolts.

NOTE: Make sure the hubcap mounting surface is clean before you install the hubcap.

12. Install the hubcap and tighten the hubcap bolts to 15-30 lb-ft (20-41N•m) in a criss-cross pattern. ❶
13. Adjust the brakes according to the adjustment procedure.
14. Repeat these procedures for all wheel ends on the chassis.

Brake Adjustment Procedure

Measure Free Stroke

When you perform preventive maintenance procedures on an in-service brake, check the free stroke and adjusted chamber stroke.

Free stroke sets the clearance between the linings and drum. The in-service free stroke may be slightly longer than 0.5-0.625-inch (12.7-15.9 mm) specified in this procedure. This is acceptable if the adjusted chamber stroke is within the limits shown in Table B and Table C.

1. Disengage a pull pawl. Use a screwdriver or equivalent tool to pry the pull pawl at least 1/32-inch (0.8 mm) to disengage the teeth.
2. Use a wrench to turn the adjusting nut COUNTERCLOCKWISE until the brake shoes contact the drum. Figure 68. Then back off the adjusting nut in the opposite direction 1/2 turn for drum brakes or 3/4 turn for disc brakes.

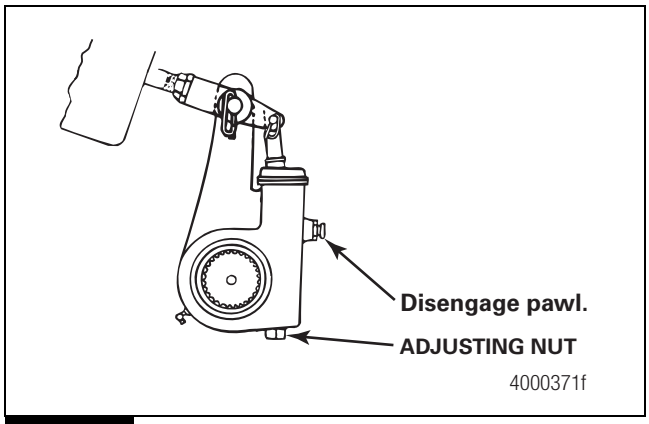

Figure 68

3. Measure the distance from the center of the large clevis pin to the bottom of the air chamber while the brake is released. The measurement you obtain is X in Figure 69.

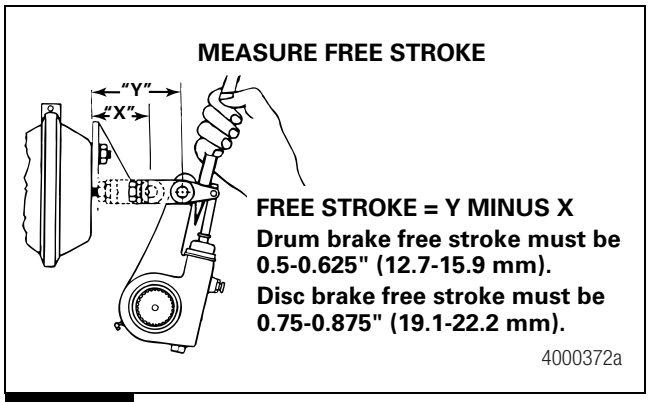

Figure 69

4. Use a pry bar to move the slack adjuster and position the linings against the drum, brakes applied. Measure the same distance again while the brakes are applied. The measurement you obtain is Y in Figure 69.

⚠ CAUTION

Do not set free stroke shorter than 0.5-0.625-inch (12.7-15.9 mm) for drum brakes. If the measurement is too short, linings can drag. Damage to components can result.

5. Subtract X from Y to obtain the in-service free stroke. The measurement must be 0.5-0.625-inch (12.7-15.9 mm) for drum brakes. Figure 69.
   - **If the free stroke measurement is not within specification:** Turn the adjusting nut 1/8 turn in the direction shown in Figure 70 and check the free stroke again. Continue to measure and adjust the stroke until the measurement is within specification.

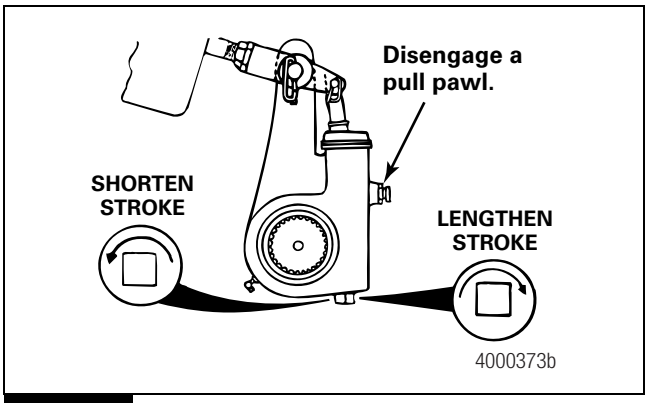

Figure 70

6. Re-engage the pull pawl by removing the screwdriver or equivalent tool. The pull pawl will re-engage automatically.
7. If the brakes have spring chambers, carefully release the springs. Test the vehicle before you return it to service.

Table B: Standard-Stroke Clamp-Type Brake Chamber Data

Type	Outside Diameter (inches)	Brake Adjustment Limit (inches)
6	4-1/2	1-1/4
9	5-1/4	1-3/8
12	5-4/16	1-3/8
16	6-3/8	1-3/4
20	6-25/32	1-3/4
24	7-7/32	1-3/4
30	8-3/32	2
36	9	2-1/4

Table C: Long-Stroke Clamp-Type Brake Chamber Data

Type	Outside Diameter (inches)	Brake Adjustment Limit (inches)
16	6-3/8	2.0
20	6-25/32	2.0
24	7-7/32	2.0
24*	7-7/32	2.5
30	8-3/32	2.5

* For 3" maximum stroke type 24 chambers.

Align the Chassis Axles

1. Use a hoist to take the weight off the chassis. Remove the safety stands and lower the wheels to the ground.
2. Release the parking brake. Do not hook up the air supply lines to the chassis. Move the vehicle back and forth several times and apply the tractor brakes to stop the vehicle. Make sure the last movement is forward.
3. Choose an acceptable gauge point for measuring “A” and “B” is the edge of the wheel rim. This measurement should be made at the height of the axle spindles. Verify that the rim is not damaged, the same tires and rims are mounted on each side of the vehicle and the tires are correctly inflated.
4. Attach a steel measuring tape to a hook. Attach the hook to the kingpin and measure distance “A” on the roadside and “B” on the curbside of the trailer. The difference between these dimensions must not exceed 3/16-inch (4.763 mm). Adjust the axle, if necessary, to bring this difference within specification. Figure 71 and Figure 72.

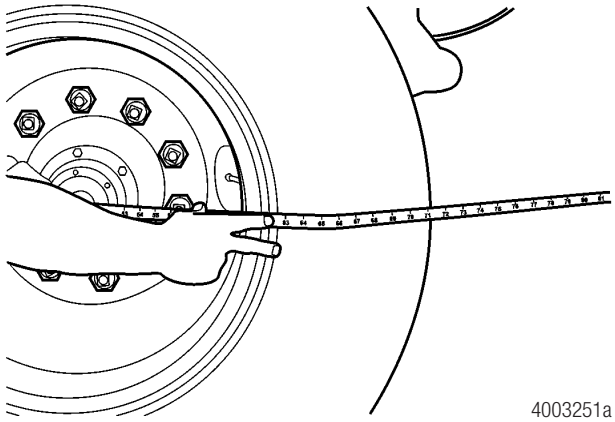

Figure 71

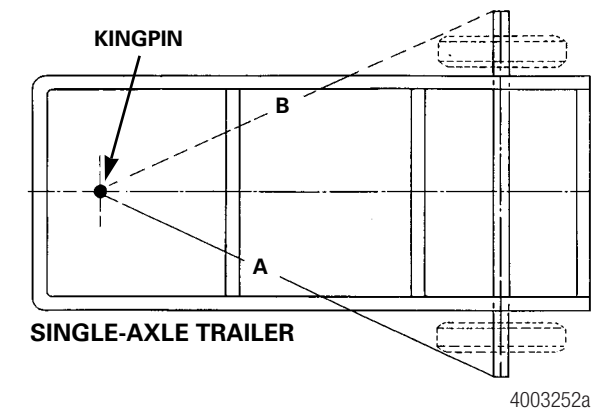

Figure 72

5. For multiple axle chassis, hold a trammel bar next to the axle on the non-adjustable side “D” of the suspension. Move the indicators to the hubcap center dimples on each axle and record the measurement. Move the trammel bar to the adjustable side “C” and compare the measurements between axles. The difference between the “C” and “D” dimensions must not exceed 1/8-inch (3.175 mm). Figure 73 and Figure 74.
   - **If the chassis is a tridem axle:** Use this step for the additional axle.

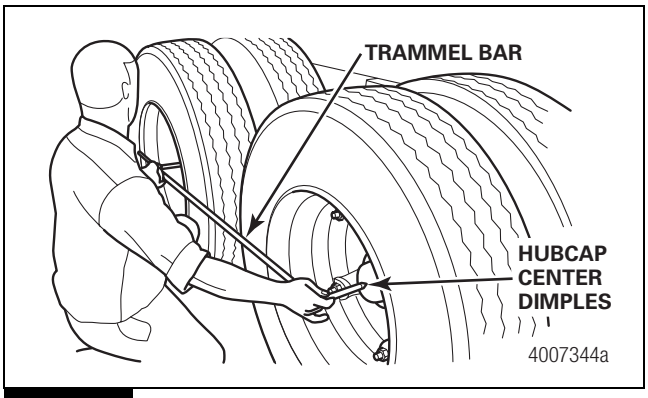

Figure 73

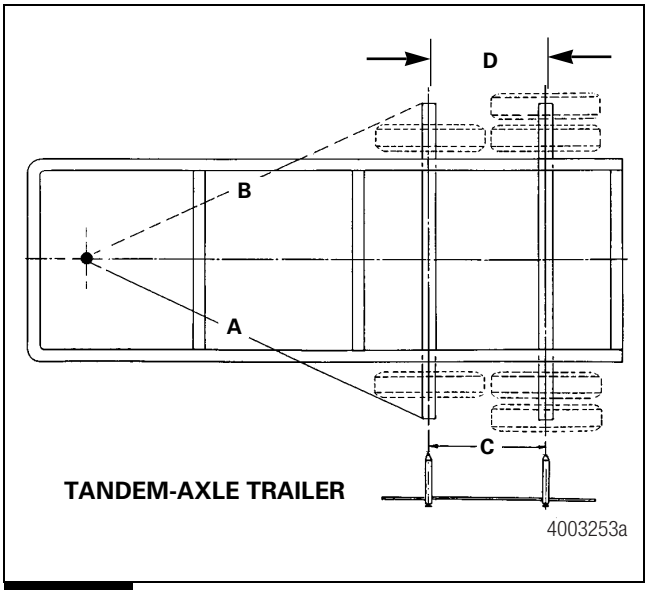

Figure 74

6. To adjust the suspension, loosen the clamp bolts on the adjustable trailing arm (radius rod). Adjust the length of the trailing arm as required and retighten the clamp bolts. Make sure the trailing arm nut and bolt are tightened to specification. Refer to the torque specifications table in Step 5 of the installation procedure.
7. Test the operation of the brakes before you return it to service.

Call the ArvinMeritor OnTrac Customer Service Center Upon Completion of This Repair

If you have questions about the procedures in this bulletin, contact ArvinMeritor's OnTrac Customer Service Center at 866-668-7221 (US and Canada) between 8:00 AM and 8:00 PM ET Monday through Friday, and between 9:00 AM and 6:00 PM ET on Saturday. After selecting "preferred language," select "Option 5" and refer to Program Number C8AG.

The repair facility or end user will be paid directly by ArvinMeritor. Once the inspection has been completed, call ArvinMeritor's OnTrac Customer Service Center with the following information to receive payment.

- Reference to ArvinMeritor's campaign number: C8AG
- Complete 17-digit vehicle identification number (VIN)
- Chassis number
- Repair facility's name, address and telephone number
- Repair facility's hourly rate
- Chassis in-service date
- Chassis repair date
- Repair facility work order number
- Total labor hours required to perform the inspection
- Wheel-end end play measurement for each wheel end
- Axle alignment measurement for each axle
- Description of work completed

This information can also be faxed at 248-435-5580 or emailed to ontrac@arvinmeritor.com in an Excel spreadsheet format.

You may contact ArvinMeritor's OnTrac Customer Service Center if you have any questions on the above reimbursement or inspection process.

Notes

ArvinMeritor™

Meritor Heavy Vehicle Systems, LLC
2135 West Maple Road
Troy, MI 48084 USA
800-535-5560
arvinmeritor.com

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