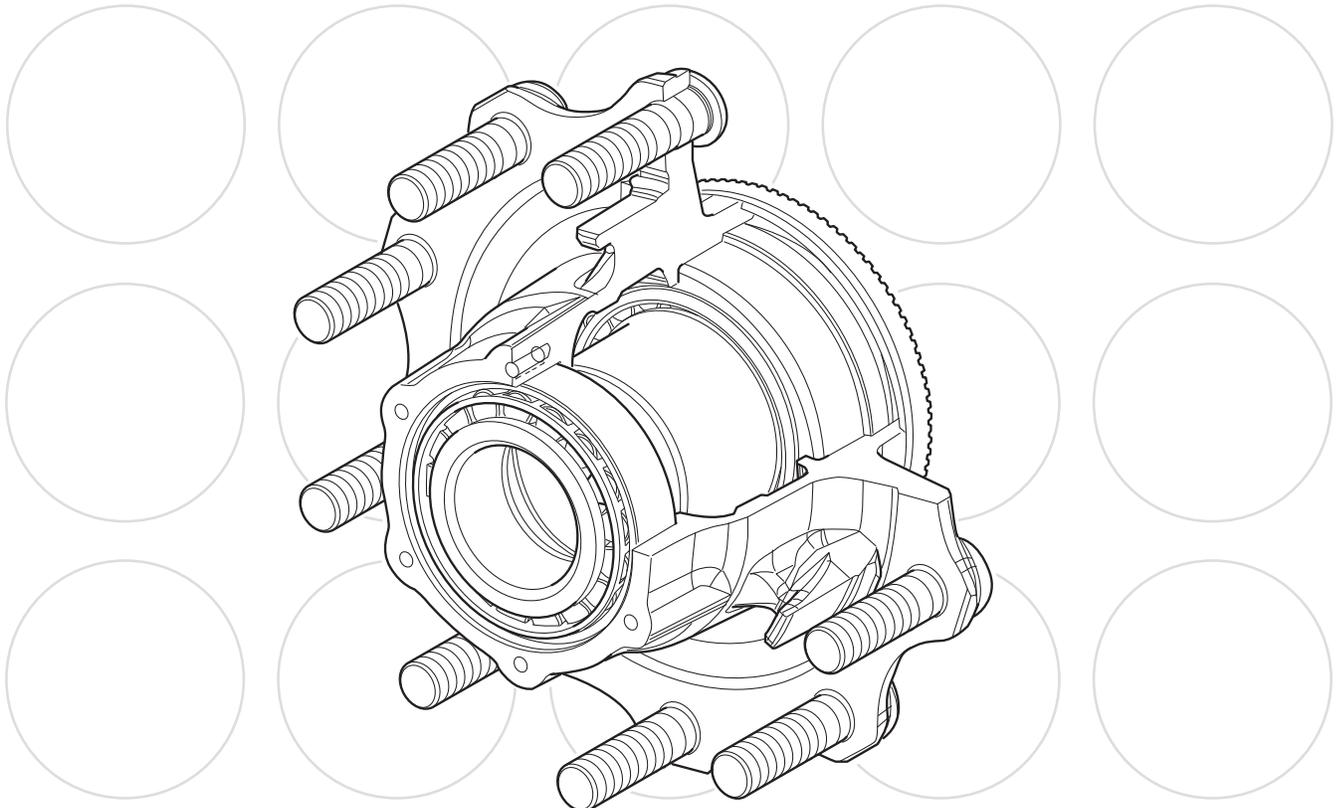


Maintenance Manual MM-0637

# PreSet<sup>®</sup> by Meritor<sup>®</sup> Hub Assemblies for Trailer Axles, and Steer and Drive Axles

Revised 07-12



# Service Notes

## About This Manual

This manual provides maintenance and service procedures for PreSet® by Meritor® hub assemblies.

## Before You Begin

1. Read and understand all instructions and procedures before you begin to service components.
2. 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.
3. Follow your company's maintenance and service, installation, and diagnostics guidelines.
4. Use special tools when required to help avoid serious personal injury and damage to components.

## Hazard Alert Messages and Torque Symbols

### **WARNING**

A Warning alerts you to an instruction or procedure that you must follow exactly to avoid serious personal injury and damage to components.

### **CAUTION**

A Caution alerts you to an instruction or procedure that you must follow exactly to avoid damage to components.

 This symbol alerts you to tighten fasteners to a specified torque value.

## How to Obtain Additional Maintenance, Service and Product Information

Visit Literature on Demand at [meritor.com](http://meritor.com) to access and order additional information.

Contact the OnTrac Customer Service Center at 866-668-7221 (United States and Canada); 001-800-889-1834 (Mexico); or email [OnTrac@meritor.com](mailto:OnTrac@meritor.com).

## If Tools and Supplies are Specified in This Manual

Contact Meritor's Commercial Vehicle Aftermarket at 888-725-9355.

## Warranty Information

Refer to brochure SP-95155, Commercial Vehicle Systems Warranty, for complete warranty information. For instructions to return warrantable parts to Meritor for reimbursement consideration, contact Meritor's OnTrac Technical Support Center at 866-668-7221 for assistance.

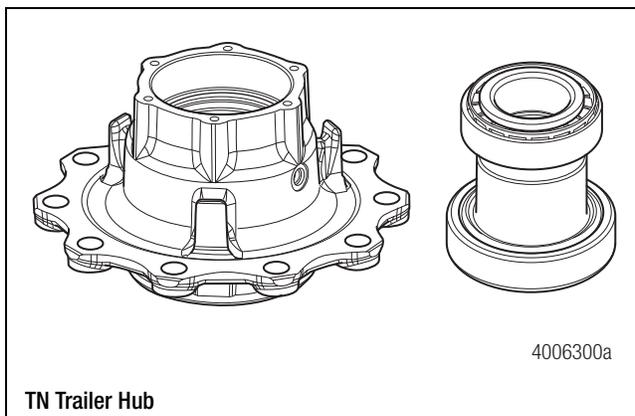
Information contained in this publication was in effect at the time the publication was approved for printing and is subject to change without notice or liability. Meritor Heavy Vehicle Systems, LLC, reserves the right to revise the information presented or to discontinue the production of parts described at any time.

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## Description

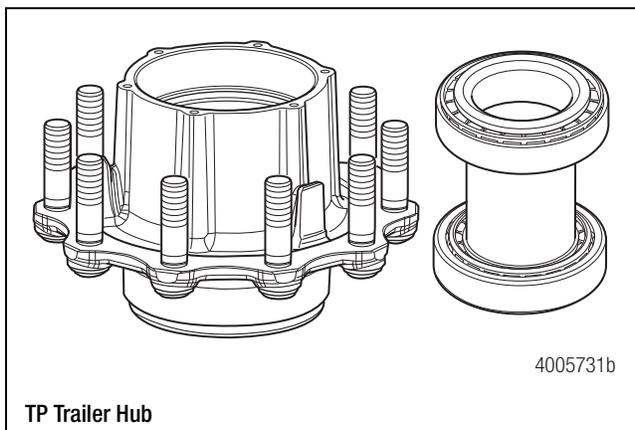
### Hub Assembly

The PreSet® by Meritor® hub is a low-maintenance hub assembly manufactured for Meritor TN, TQ and TP Series trailer axles, and steer and drive axles. The hub subassembly includes an integral tooth wheel for a vehicle equipped with an anti-lock braking system (ABS). PreSet® hub assemblies also are equipped with pre-installed bearings, cups and cones, and oil seals and studs. A precision tubular spacer between the bearings eliminates manual bearing adjustments. Figure 1.1, Figure 1.2, Figure 1.3 and Figure 1.4.



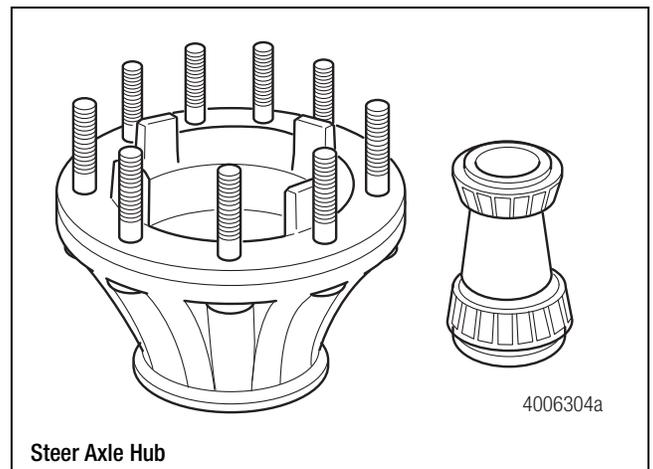
TN Trailer Hub

Figure 1.1



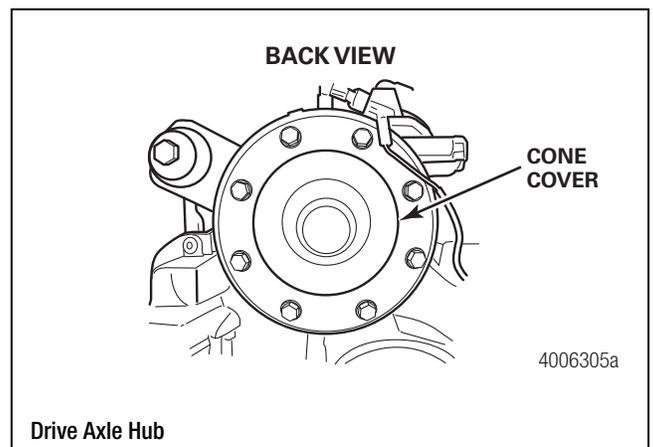
TP Trailer Hub

Figure 1.2



Steer Axle Hub

Figure 1.3



Drive Axle Hub

Figure 1.4

### Decals

Decals identify the type of wheel end installed. On trailers, the decals are located on the trailer frame.

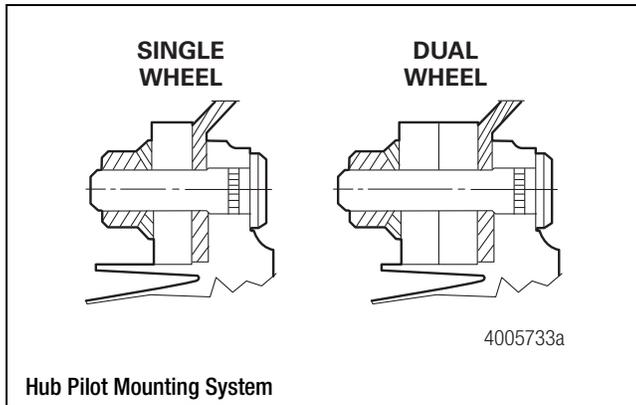
### Warranty

For warranty information, refer to SP-95155, Commercial Vehicle Systems. To obtain this publication, refer to the Service Notes page on the front inside cover of this manual.

# 1 Introduction

## Hub Pilot Wheel Mounting

The hub pilot wheel mounting system uses a single two-piece flange nut on each wheel stud for both single and dual wheel applications. The hub pilot wheel mounting system is also referred to as the Uni-Mount-10™ (10 stud), WHD-10™ (10 stud), WHD-8™ (8 stud) and ISO system. Figure 1.5.



**Figure 1.5**

## 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.**

## Inspection

### Oil-Lubricated Hubs

Action	Interval
Inspect a trailer hub assembly for leakage and contaminated lubricant.	Every 12 months or 100,000 miles (160 000 km), whichever comes first.
Inspect a tractor hub assembly for leakage and contaminated lubricant.	Every 12 months or 100,000 miles (160 000 km), whichever comes first.
Check all threaded fasteners.	After the first 1,000 miles (1609 km).
Service trailer wheel hubs.	Every 5 years or 500,000 miles (800 000 km), whichever comes first.
Service tractor wheel hubs.	Every 5 years or 500,000 miles (800 000 km), whichever comes first.
Perform preventive maintenance procedures.	Regularly-scheduled intervals.
Perform a pre-trip inspection.	Each time prior to operating the vehicle on the road.

Do not mix different types of grease. Only use lubricants approved by the original equipment manufacturer (OEM).

### Inspect for Leaks

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. Check that no oil is present around the hubcap or on the wheel.
  - **If oil is present:** Investigate the cause and take corrective action.
4. Check that no oil is present on the hub, brake hardware or brake shoes.
  - **If oil is present:** Check the inboard seal.
  - **If the seal is damaged, incorrectly installed or worn:** Replace the seal.

## 2 Maintenance

### Oil Contamination

Allow any air in the oil to escape prior to inspection. Visually inspect the lubricant for discoloration. Under normal conditions, the oil will darken slightly. A white or milky appearance indicates water contamination. If the inspection indicates contamination, service the wheel hub. Do not mix oil types. If you need to add oil, you must use the same type of oil as supplied or used by the original equipment manufacturer.

### Semi-Fluid Lubricant (Trailer Hubs Only)

Action	Interval
Inspect the hub assembly for leakage and contaminated lubricant.	Every 12 months or 100,000 miles (160 000 km), whichever comes first.
Service wheel hubs.	Every 5 years or 500,000 miles (800 000 km), whichever comes first.
Perform preventive maintenance procedures.	Regularly-scheduled intervals.
Perform a pre-trip inspection.	Each time prior to operating the vehicle on the road.

Do not mix different types of grease. Only use lubricants approved by the original equipment manufacturer (OEM).

**Table A: TP and TN Series Trailer Axles Equipped with Conventional Hub Assemblies or PreSet® by Meritor Hub Assemblies**

Trailer Axle Series, Hub Assembly Type, and Hub Part Number <sup>1</sup>	Lubricant Volume per Wheel End		
	API-GL5 Oil	NLGI 00 Semi-Fluid Grease <sup>2</sup>	NLGI 1 or 2 Grease <sup>2</sup>
TP Series PreSet® hub assembly Hub part number 16040	Hubcap Fill Line Approx. 24.55 fl. oz. (44.31 cu. in.)	35.00 fl. oz. (63.16 cu. in.)	NOT RECOMMENDED
TP Series Conventional hub assembly Hub part number 15968	Hubcap Fill Line Approx. 24.55 fl. oz. (44.31 cu. in.)	33.47 fl. oz. (60.41 cu. in.)	23.37 fl. oz. (42.17 cu. in.)
TN Series PreSet® hub assembly Hub part number 16048	Hubcap Fill Line Approx. 15.17 fl. oz. (27.37 cu. in.)	31.00 fl. oz. (55.95 cu. in.)	NOT RECOMMENDED
TN Series Conventional hub assembly Hub part number 15984	Hubcap Fill Line Approx. 15.17 fl. oz. (27.37 cu. in.)	25.57 fl. oz. (46.15 cu. in.)	21.22 fl. oz. (38.29 cu. in.)

<sup>1</sup> The hub part number is cast into the inboard side of the wheel mounting flange.

<sup>2</sup> Volume includes the lubricant volume of the bearing cones. PreSet® bearings are not greased prior to installation.

### Inspect for Leaks

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. Remove the semi-fluid grease hubcap. There is no sight window.
4. Inspect the outer bearing to verify that sufficient original equipment manufacturer grease is present and that there is no sign of contamination.
  - **If additional grease is required:** Add grease through the fill hole (on trailer hubs only) or in the barrel of the hub, until it flows from the outboard bearing. Do not mix grease types. Use the same grease specification installed by the original equipment manufacturer (OEM).

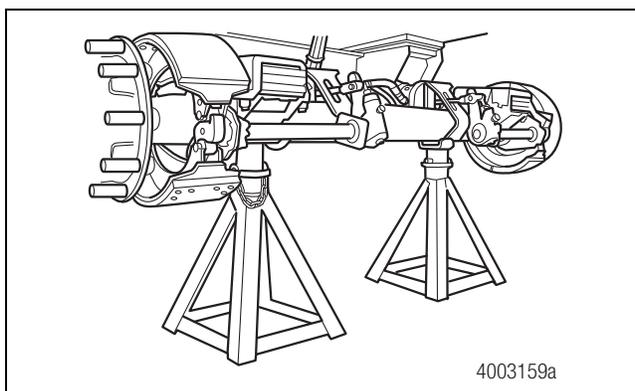
### Grease Contamination

Visually inspect the grease for discoloration. Under normal conditions the grease may darken slightly. A white or milky appearance indicates water contamination. If the inspection indicates contamination, service the hub.

### Check End Play

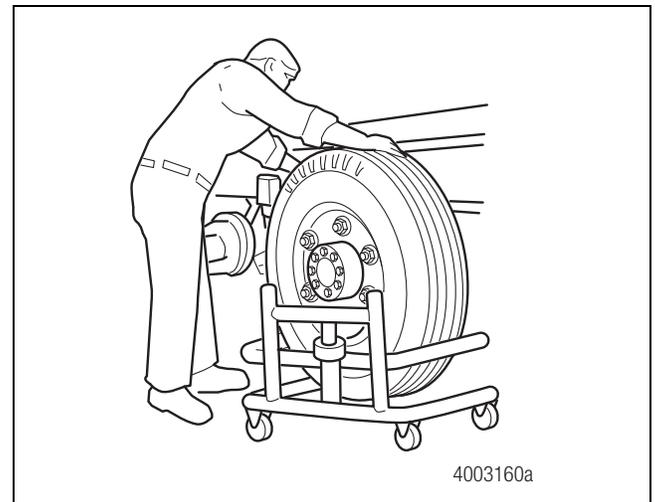
In addition to the inspection, check end play whenever the brakes or tires are serviced.

1. Wear safe eye protection.
2. Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving.
3. Raise the axle until the tires are off the floor.
4. Place safety stands under the trailer frame or under each axle spring seat. Figure 2.1.



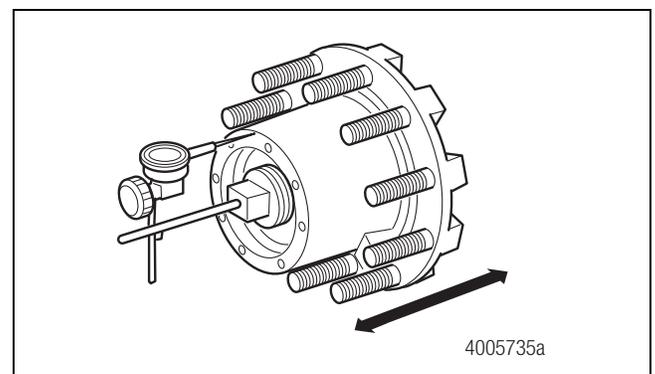
**Figure 2.1**

5. Follow the wheel manufacturer's instructions to remove the tire and wheel assembly. Figure 2.2.



**Figure 2.2**

6. Remove the hubcap. Attach the magnetic base of a dial indicator to the spindle. Touch the dial indicator stem to the hubcap mounting surface. Figure 2.3.



**Figure 2.3**

7. Grasp two wheel studs across from each other and pull and push the hub.

## 2 Maintenance

### WARNING

Do not retighten the spindle nut to adjust end play during the inspection procedure. This could cause bearing damage which can cause the wheels to loosen and separate from the vehicle. Serious personal injury and damage to components can result.

8. Measure the end play by calculating the difference between the minimum and maximum dial indicator readings.
  - **If the end play measurement does not exceed 0.006-inch (0.15 mm):** No additional service is necessary. Do not adjust or retighten the spindle nut.

### WARNING

If the spindle nut is loose prior to removing the PreSet<sup>®</sup> hub, discard the old spacer and replace it with a new spacer before you reinstall the PreSet<sup>®</sup> hub. If you do not install a new spacer, the wheel bearings can become damaged, which can cause the wheels to loosen and separate from the vehicle. Serious personal injury and damage to components can result.

- **If the end play measurement exceeds 0.006-inch (0.15 mm):** Service the hub. Refer to ConMet Service Manual for PreSet<sup>®</sup> Hub Assemblies. The manual can be accessed at [www.conmet.com/pdfs/preset\\_service\\_manual.pdf](http://www.conmet.com/pdfs/preset_service_manual.pdf).

### 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.

### Removal

#### Hub Assembly

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. Raise the axle until the tires are off the floor.
4. Place safety stands under the trailer frame or under each axle spring seat. Figure 3.1.

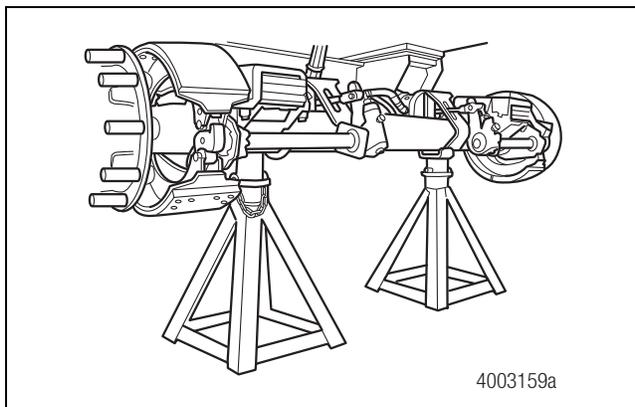


Figure 3.1

5. Remove the tire and wheel assembly, using procedures specified by the wheel manufacturer. Figure 3.2.

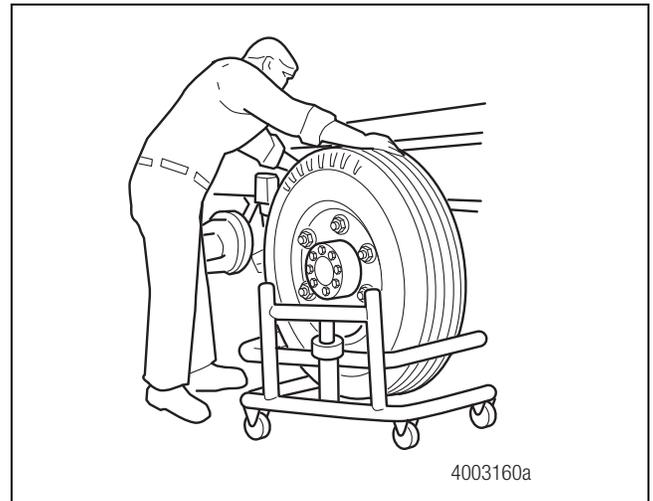


Figure 3.2

#### **⚠ WARNING**

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.

6. If the axle is equipped with spring brake chambers, carefully compress and lock the springs so that they cannot actuate. Figure 3.3.

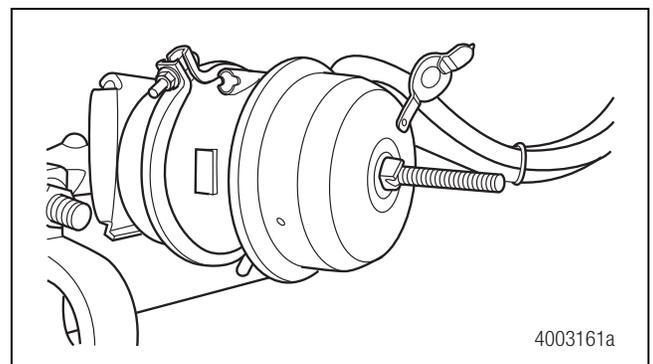


Figure 3.3

7. For drum brake applications, remove the brake drum. Support the drum during the removal process to prevent damage to the axle spindle threads.

### 3 Removal and Disassembly

8. Place a container under the hubcap, or drive axle shaft for a drive hub, to receive the draining oil, then remove the hubcap or drive axle shaft. Do not reuse the oil. Correctly dispose of the lubricant.
9. Examine the spindle nut to determine the type of locking system. Follow the manufacturer's recommended procedures to correctly disengage the locking device.
10. Use the following procedure to remove the PRO-TORQ™ nut.
  - A. Remove the keeper from the PRO-TORQ™ nut. Use a screwdriver to pry out the keeper arm from the groove on each side of the nut until the keeper is released. Discard the PRO-TORQ™ keeper. Do not reuse.
  - B. Use a socket wrench to remove the PRO-TORQ™ nut. Figure 3.4.

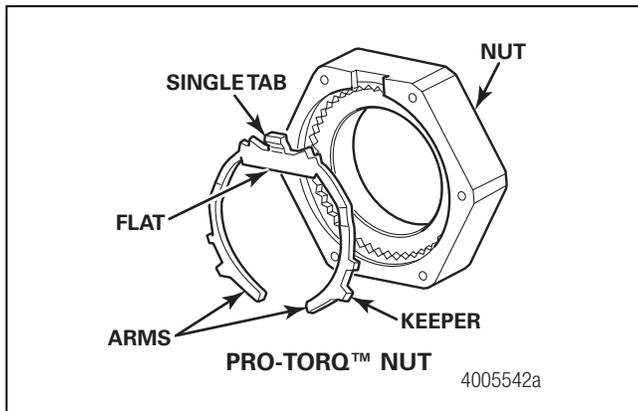


Figure 3.4

#### **⚠ 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 which can cause possible loss of axle wheel-end components and serious personal injury.

11. Remove the spindle nut system. Figure 3.5. Be careful when you remove the hub that you do not damage the outer bearing by dropping it on the floor.
  - **If part of the seal remains on the spindle:** Be careful that you do not damage the spindle when you remove it.

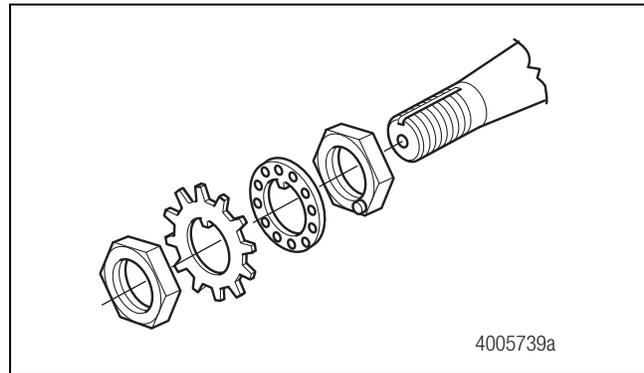


Figure 3.5

12. Slide the hub off the spindle. Remove and save the outer bearing cone.
  - **If the hub is difficult to remove because the seal is stuck on the spindle:** Use a mechanical puller to remove the hub. Figure 3.6.
  - **If part of the seal remains on the spindle:** Carefully remove the part of the seal that remains on the spindle.

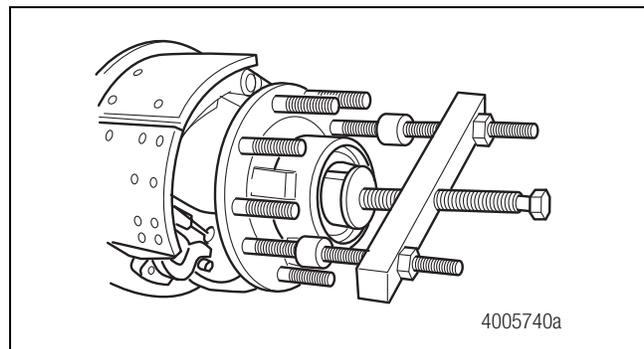


Figure 3.6

13. Place the hub on its outboard end. Remove and discard the seal. Do not reuse the seal.

### 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.**

**Observe all warnings and cautions provided by the press manufacturer to avoid damage to components and serious personal injury.**

**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.**

**Replace damaged or out-of-specification axle components. Do not bend, repair or recondition axle components by welding or heat-treating. A bent axle beam reduces axle strength, affects vehicle operation and voids Meritor's warranty. Serious personal injury and damage to components can result.**

**Solvent cleaners can be flammable, poisonous and cause burns. Examples of solvent cleaners are carbon tetrachloride, and emulsion-type and petroleum-base cleaners. Read the manufacturer's instructions before using a solvent cleaner, then carefully follow the instructions. Also follow the procedures below.**

- **Wear safe eye protection.**
- **Wear clothing that protects your skin.**
- **Work in a well-ventilated area.**
- **Do not use gasoline or solvents that contain gasoline. Gasoline can explode.**
- **You must use hot solution tanks or alkaline solutions correctly. Read the manufacturer's instructions before using hot solution tanks and alkaline solutions. Then carefully follow the instructions.**

#### **CAUTION**

**Do not use hot solution tanks or water and alkaline solutions to clean ground or polished parts. Damage to parts can result.**

### Clean, Dry and Inspect Parts

#### Worn or Damaged Parts

Do not repair or recondition wheel-end components. Replace damaged, worn or out-of-specification components. Do not mill or machine any components.

Inspect the drum pilots, wheel pilots and the mounting face on the hub for damage. A damaged drum pilot is usually caused by incorrect drum mounting. A damaged wheel pilot could be the result of incorrect wheel nut torque, which allows the wheels to slip in service. Also, inspect the wheels and brake drum for damage.

#### Ground or Polished Parts

1. Use a cleaning solvent to clean the ground or polished parts and surfaces. Kerosene or diesel fuel can be used for this purpose. **DO NOT USE GASOLINE.**
2. Do NOT clean ground or polished parts in a hot solution tank or with water, steam or alkaline solutions. These solutions will cause corrosion of the parts.
3. Thoroughly clean the hub cavity with spray degreaser. The cavity must be free of any contaminants.
4. To remove grease from a wheel end, use a stiff fiber brush, not steel, and kerosene or diesel fuel, not gasoline. Allow the parts to dry. Note that any solvent residue must be completely wiped dry since it may either dilute the grease or oil or prevent the lubricant from correctly adhering to the wheel-end components.
5. Clean and inspect the wheel bearings, race, spindle bearing journals and hub. Bearings should be cleaned in a suitable non-flammable solvent and dried with either compressed air or a lint-free rag.

If compressed air is used, do not spin dry the bearings as the rollers may score due to lack of lubricant. Ensure that the air line is moisture free.

#### Rough Parts

Rough parts, those without smooth or machined surfaces, can be cleaned with the ground or polished parts. Rough parts also can be cleaned in hot solution tanks with a weak alkaline solution. Parts must remain in the hot solution tanks until they are completely cleaned and heated.

## 4 Prepare Parts for Assembly

### Dry Cleaned Parts

Parts must be dried immediately after cleaning. Dry parts with clean paper or rags, or compressed air. Do not dry bearings by spinning with compressed air.

### Prevent Corrosion on Cleaned Parts

Apply a light oil to cleaned and dried parts that are not damaged and are to be immediately assembled. Use only the type of oil used by the manufacturer. Do NOT apply oil to the brake linings or the brake drums.

If the parts are to be stored, apply a good corrosion preventative to all surfaces. Do NOT apply the material to the brake linings, the brake drums or the rotors. Store the parts inside special paper or other material that prevents corrosion.

## Inspection and Troubleshooting

### Bearing Cups and Cones

1. Wear safe eye protection.
2. Use a press to remove the bearing cup.
  - **If a press is not available:** Use a large hammer and heavy drift. Do not damage the bearing or hub.
3. Inspect the bearing cup bore for evidence of cup rotation or spun cups.
  - **If cup rotation exists:** Replace the hub.
4. Inspect the spindle journals, hub and wheel bearings for signs of wear and damage.
  - **If there is damage to either the wheel bearing or race:** Replace bearings and races as a set.
5. Inspect the cup, cone, rollers and cage of the wheel bearings for the following conditions.

If any of the following conditions exist, you must replace the bearing.

- Cracked or broken separators
- Broken or cracked rollers
- Flaked areas on rollers or races
- Spalled rollers or races
- Overheated bearings
- Brinelled races

- Scored or etched rollers or races
- Pitting of rollers or races
- Wear bands on critical surfaces
- Rust or corrosion on critical surfaces
- The center of the large diameter end of the rollers is worn level or below the outer surface. Figure 4.1.
- The radius at the large diameter end of the rollers is worn to a sharp edge. Figure 4.1.
- There is a visible roller groove in the cup or the cone inner race surfaces. The groove can be seen at the small or large diameter end of both parts. Figure 4.2.
- There are deep cracks or breaks in the cup, cone inner race or roller surfaces. Figure 4.2.
- There are bright wear marks on the outer surface of the roller cage. Figure 4.3.
- There is damage on the rollers and on the surfaces of the cup and cone inner race that touch the rollers. Figure 4.4.
- There is damage on the cup and cone inner surfaces that touch the rollers. Figure 4.5.

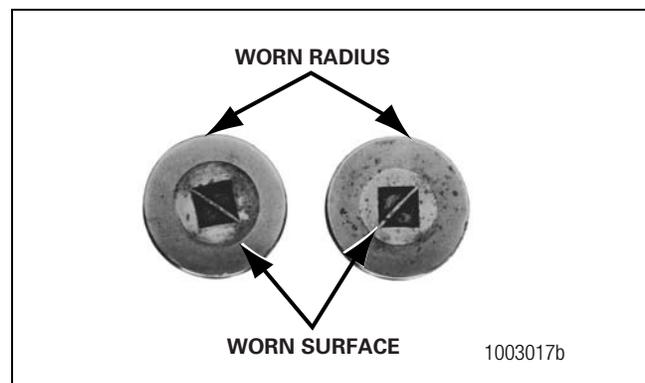


Figure 4.1

## 4 Prepare Parts for Assembly

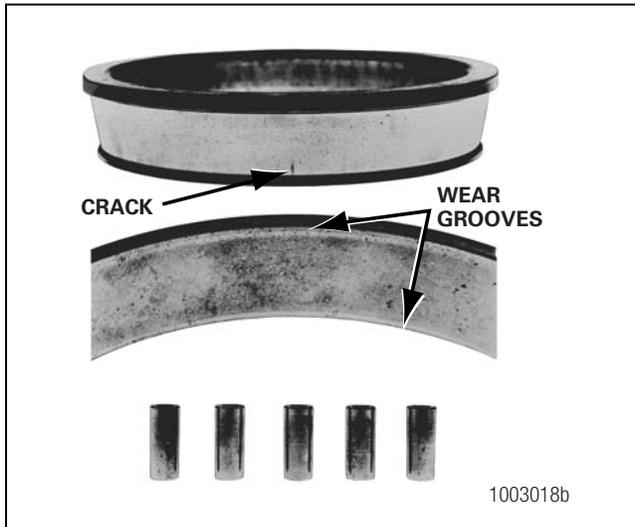


Figure 4.2

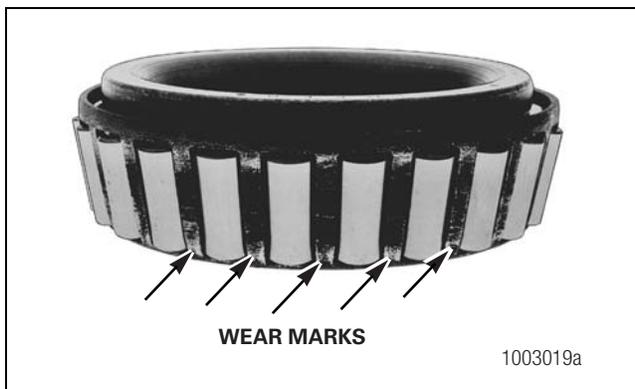


Figure 4.3

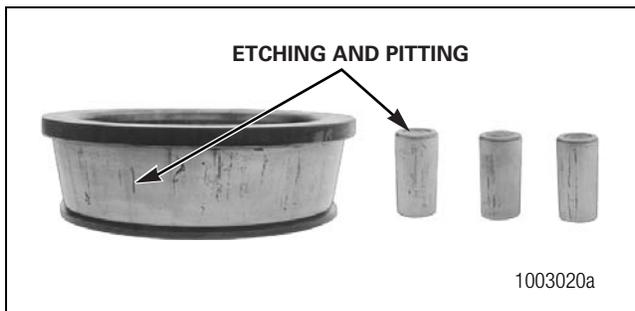


Figure 4.4

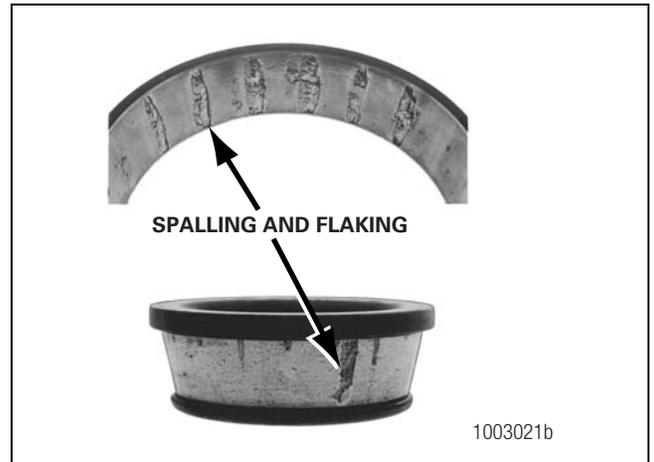


Figure 4.5

6. Observe the following guidelines when servicing the bearings.
  - Do not clean bearing cones. Replace them.
  - Use the same type fluid or grease from the original equipment manufacturer.
  - Replace with half tolerance bearings provided by the original equipment manufacturer.
7. Use a press to install the bearing cup into the hub. Verify that the cup is fully pressed against the seat. Do not over press. Figure 4.6.

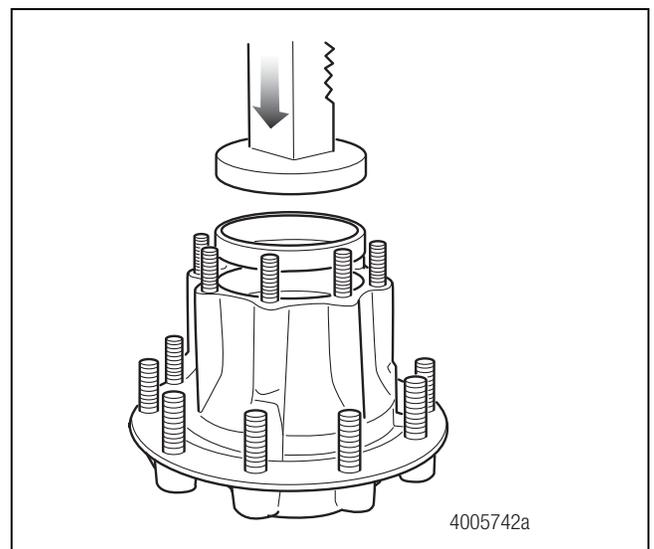


Figure 4.6

## 4 Prepare Parts for Assembly

### Wheel Studs

Replace all wheel studs that have damaged or distorted threads. Replace broken or bent studs, and studs that are badly corroded. Also replace the stud on each side of the damaged stud. If two or more studs in the hub are damaged, replace all the studs in the hub. Broken studs are usually an indication of either excessive or inadequate wheel nut torque.

#### WARNING

**Take care that you do not damage stud threads. Studs with damaged threads can strip or cross-thread, which will reduce clamp load, loosen studs and cause a wheel to separate from the vehicle. Serious personal injury and damage to components can result.**

**Replace bent, loose, broken or stripped studs. When you replace a stripped stud, always replace the stud on each side of the stripped stud as well. Even if the adjoining studs are not cracked, they have sustained fatigue damage, which can cause the wheels to loosen and separate from the vehicle. Serious personal injury and damage to components can result.**

**You must correctly support the hub when you remove or install a stud. If you do not support the hub correctly, serious personal injury and damage to components can result.**

**Do not use a hammer to remove or install studs while the hub is on bearings. A hammer can cause impact damage to the bearing raceway, which will reduce bearing life. Serious personal injury and damage to components can result.**

**Ensure that you do not damage stud threads during installation procedures. Damaged threads will not allow the stud to provide the required clamp to support the wheel retention system. The wheels can loosen and separate from the vehicle. Serious personal injury and damage to components can result.**

### Stud Removal

1. Wear safe eye protection.
2. Place the clean hub in a shop press.
3. Support the inboard side of the flange adjacent to the stud head and perpendicular to the press cylinder.
4. Use a press on the threaded end of the stud to force the stud out of the flange.

### Stud Installation

1. Wear safe eye protection.
2. Support the outboard side of the flange close to the stud hole and perpendicular to the press cylinder.

#### CAUTION

**Always replace the studs with the same part number as those removed. Damage to components can result.**

3. Always replace the studs with the same part number as those removed. Damage to components can result. Press the new stud all the way into the hub. Verify that the stud is fully seated and that the stud head is not embedded into the hub.
  - **If the stud head is embedded into the hub:** Replace the hub.
4. Examine the hub flange to verify the studs are not damaged, and make sure the flange was not damaged during the stud installation process.
  - **If the flange is damaged:** Replace the hub.

### Anti-Lock Braking System (ABS) Tooth Wheel

1. Wear safe eye protection.
2. Inspect the ABS tooth wheel for any damage that may have occurred during operation or hub removal.
  - **If the ABS tooth wheel is damaged:** Identify the cause and correct the problem. Use the following procedure to remove the damaged wheel and install a new wheel.
3. Be careful while using a small pry bar or hammer to remove the wheel from the hub. It could bend and damage both components. Use a circular pattern around the wheel to remove it from the hub. Figure 4.7.

## 4 Prepare Parts for Assembly

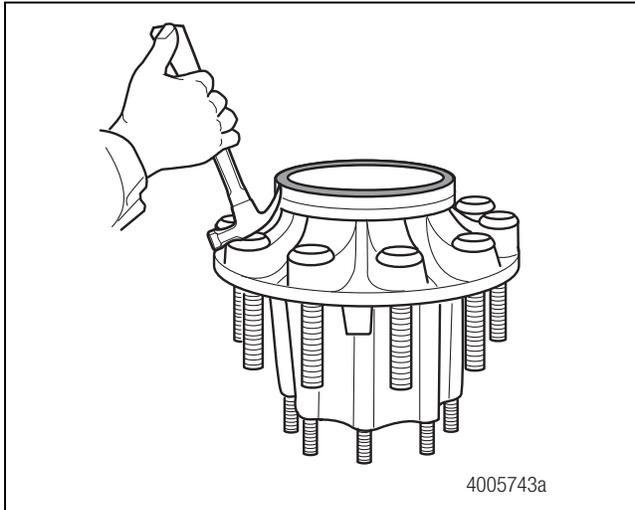


Figure 4.7

4. Thoroughly clean and degrease the ABS tooth wheel seat on the hub with a nonflammable solvent.
  - **If the ABS tooth wheel seat on the hub is damaged:**  
Replace the hub.
5. Place the hub into a press and place the new ABS tooth wheel onto the hub ABS tooth wheel seat.
6. Center the appropriate driver over the ABS tooth wheel.  
Figure 4.8.

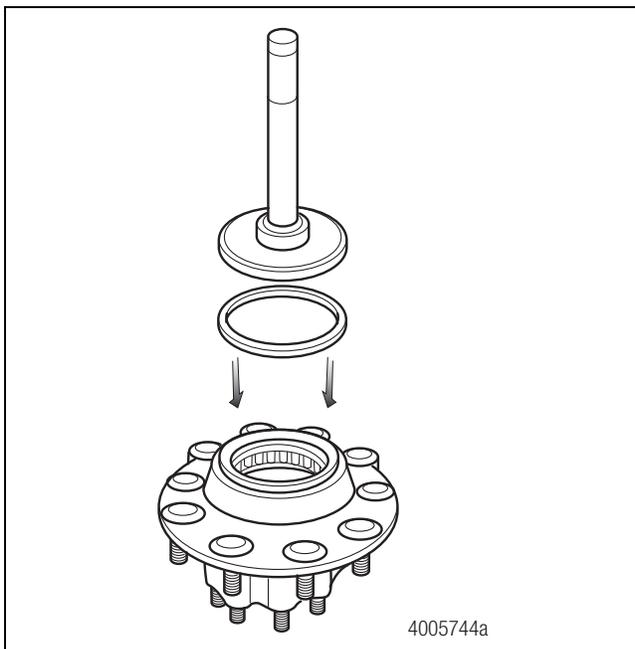


Figure 4.8

7. Press the ABS tooth wheel onto the hub.
  - **If a press is not available:** Use a brass or synthetic mallet to drive the tooth wheel onto the hub until it is on the hub. Use care to ensure the tooth wheel is not damaged.  
Figure 4.9.

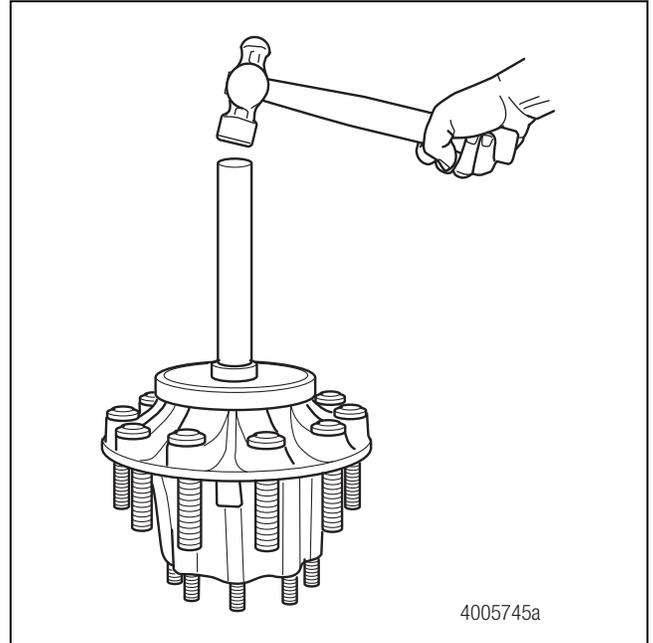


Figure 4.9

8. Inspect the ABS tooth wheel to verify that the wheel is completely seated on the hub.
  - **If the ABS tooth wheel is not completely seated:**  
Continue to press or drive the tooth wheel onto the hub until it is completely seated.

## 5 Assembly and Installation

### 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.

Tighten fasteners to the correct torque specifications. Do not over-tighten or under-tighten fasteners, which can cause the wheels to separate from the vehicle. Serious personal injury and damage to components can result.

### Assembly

#### Wheel Hub

1. Wear safe eye protection.
2. Place the hub onto a clean work bench with the seal end UP.
3. Wear gloves to lubricate the inner bearing cone with the correct lubricant. Install the cone into the inner bearing cup.  
Figure 5.1.

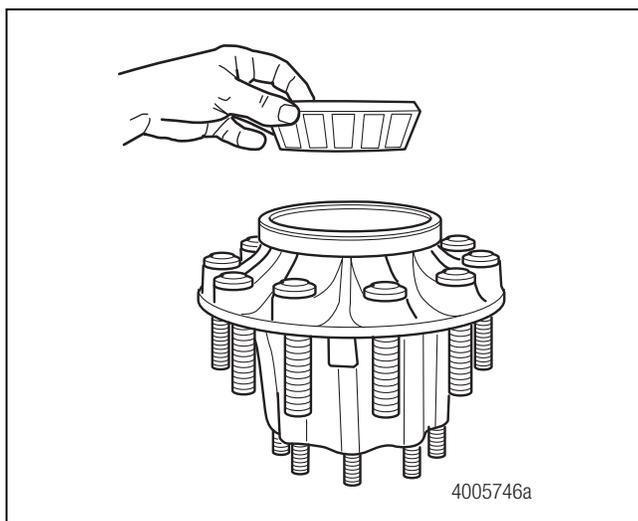


Figure 5.1

4. Lubricate the seal outer diameter and hub seal bore with wheel-end lubricant. Do not apply gasket sealant to the seal outer or inner diameter. Gasket sealant is not required.
5. Position the new seal into the hub bore. Do not reuse the old seal. Replace the seal each time the hub is removed from the spindle.
6. Use a seal driver to press the wheel seal evenly into the bore. Follow the seal manufacturer's recommended instructions. Figure 5.2.
  - **If additional force is required:** Use an appropriate seal driver, if available, and a small mallet to install the seal. If a seal driver is not available, use a flat plate and a small mallet to install the seal.

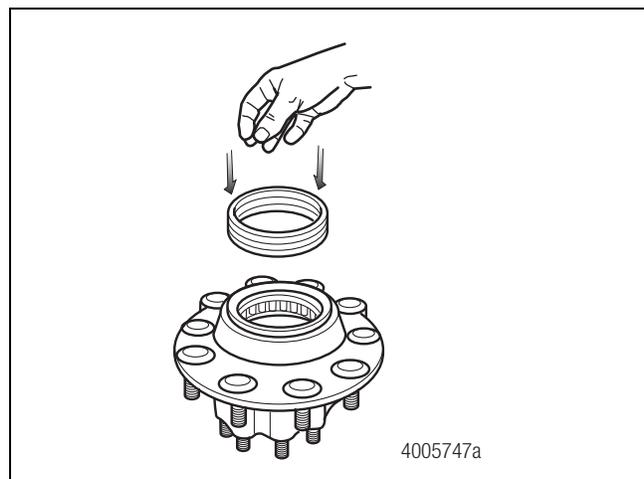


Figure 5.2

#### **⚠ CAUTION**

Verify that the seal is installed evenly into the hub. Also verify that the seal inner diameter and the inner bearing turn freely to prevent damage to components.

7. Verify that the seal is installed evenly into the hub. Also verify that the seal inner diameter and the inner bearing turn freely.

#### **⚠ CAUTION**

You must lubricate the inner diameter of the seal and the seal journal to prevent damage to components.

8. Lubricate the inner diameter of the seal with a light film of clean wheel-end lubricant.

9. Place the hub onto a clean work bench with the seal end DOWN. Install the spacer.
  - **If the spacer has a tapered end:** The tapered end should face TOWARD the outboard end of the hub. Figure 5.3.

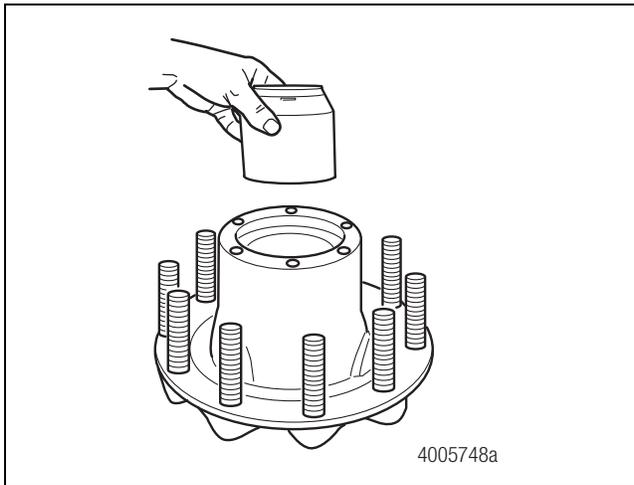


Figure 5.3

10. Before installing a wheel hub, ensure that all debris has been removed.
11. Lubricate the outer bearing cone with the correct wheel-end lubricant. Install the cone into the hub assembly. Figure 5.4.

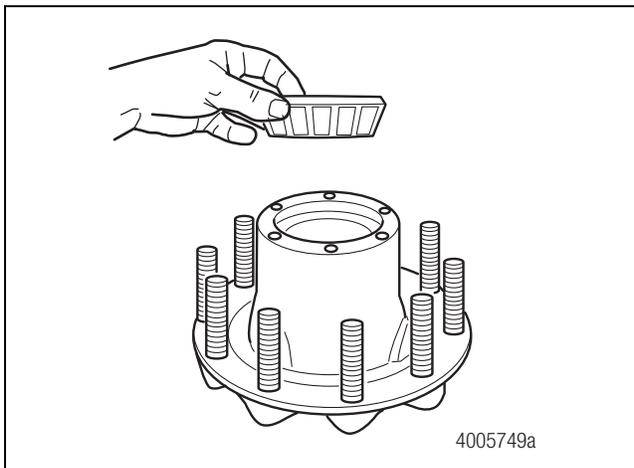


Figure 5.4

### **CAUTION**

You must apply grease to the bearing journals to prevent fretting corrosion, which could result in damage to components.

12. Use a fine abrasive to remove any light corrosion fretting on the spindle. Clean and wipe with an oily rag. Cover the spindle with standard Grade 2 grease. Both the bearing journals and the seal journal must be well-coated. In severe environments, use a Moly-grease to provide added protection.

## Installation

### Wheel Hub

#### **WARNING**

Fill the oil reservoir to the correct level. If the oil reservoir is low, damage to the bearings can result, which can cause a fire in the wheel-end assembly, or the assembly can separate from the vehicle. Serious personal injury and damage to components will result.

#### **CAUTION**

Do not support the hub on the spindle with only the inner bearing and seal. Damage to the seal can result.

1. For drive hub installation only, place the hub horizontally and remove the outer cone and spacer. Fill the oil reservoir with as much oil as possible through the end of the hub with the axle flange studs. Install the spacer and outer cone into the hub. Use only lubricant approved by the component manufacturer. Figure 5.5.

- **If a lubricant fill hole is available:** Lubricant can be installed after assembly.

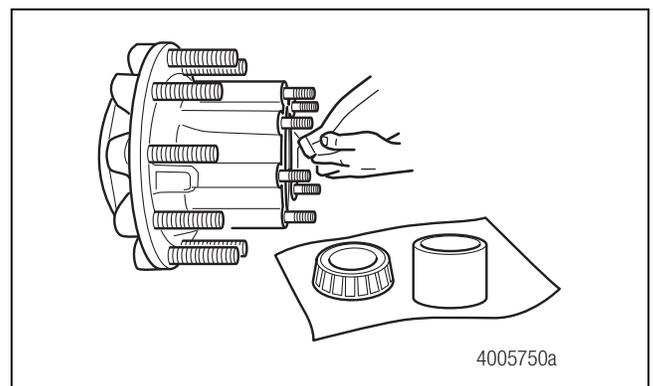


Figure 5.5

## 5 Assembly and Installation

### ⚠ CAUTION

Once the hub is on the spindle, do not remove the outer bearing, which can misalign the seal. Damage to the seal can result.

2. Once the hub is on the spindle, do not remove the outer bearing, which can misalign the seal. Mount the hub assembly onto the axle spindle with a smooth, firm motion while holding the outer bearing in place. Use care to maintain alignment between the bearing cones, spacer and spindle to avoid seal damage. Figure 5.6.

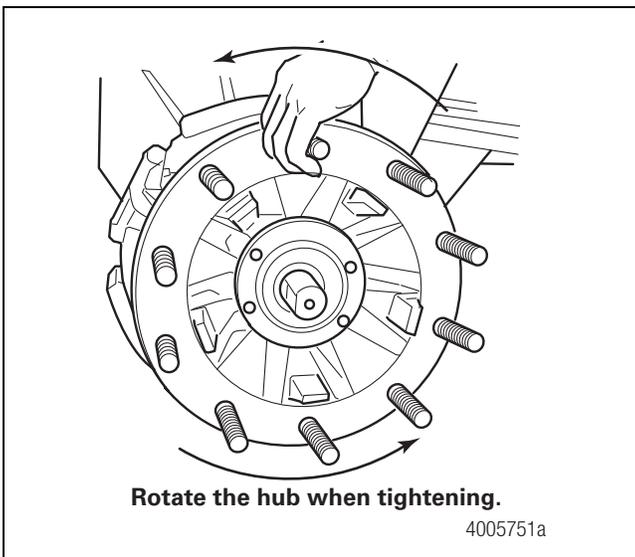


Figure 5.6

### Models with a Double Nut Pack

### ⚠ WARNING

Tighten fasteners to the correct torque specifications. Do not over-tighten or under-tighten fasteners, which can cause the wheels to separate from the vehicle. Serious personal injury and damage to components can result.

1. Install the inner spindle nut. Tighten it to 300 lb-ft (400 N•m). Do not back off the spindle nut. Figure 5.7. 

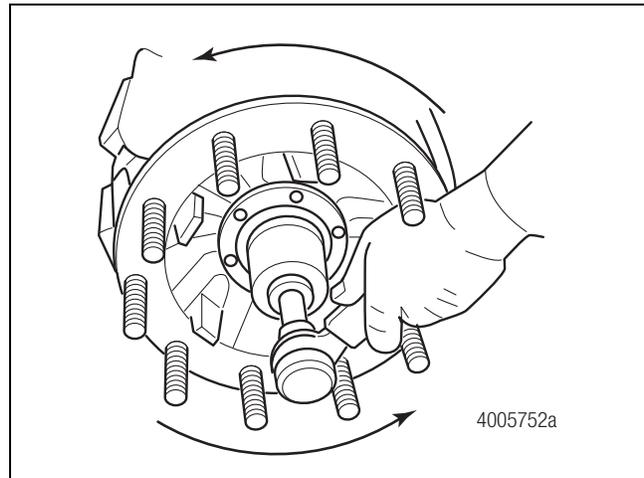


Figure 5.7

2. Engage the spindle nut system locking device.
  - If the locking system cannot be engaged with the nut tightened to 300 lb-ft (400 N•m): Advance the nut until the nut locks.
  - If a double nut or jam nut system is used: Bend the lock tab or install the set screw after the outer nut is tightened to 200 lb-ft (270 N•m). 
  - Rotate the hub when tightening.

### Models with a PRO-TORQ™ Nut

### ⚠ CAUTION

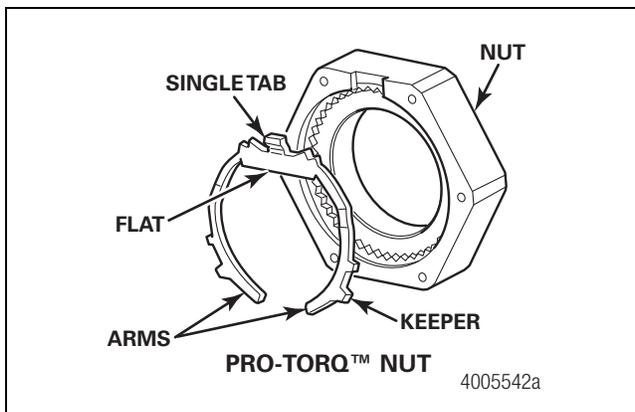
Remove the keeper from the PRO-TORQ™ nut before you attach the nut to the axle spindle or tighten and loosen the nut to prevent damage to the nut and axle spindle.

1. Remove the keeper from the PRO-TORQ™ nut before you attach the nut to the axle spindle. Install the PRO-TORQ™ nut onto the spindle. Tighten the nut to 300 lb-ft (400 N•m). 

### **⚠ WARNING**

Use a new keeper when you install the PRO-TORQ™ nut. Discard the original keeper. Do not reuse it. A used keeper can loosen during operation and cause the wheel to separate. Serious personal injury and damage to components can result.

2. Install a new keeper against the nut with the orange side facing OUT. Do not reuse the original keeper. Replace the original with the new keeper supplied in the field service kit. Align the flat of the keeper with the flat on the spindle. Insert the single keeper tab into the undercut groove on the nut. Engage the mating teeth. Figure 5.8.



**Figure 5.8**

### **⚠ WARNING**

Do not bend or manipulate the keyway tang in any way to force the keeper onto the spindle and into the PRO-TORQ™ nut. Rotate the nut to obtain correct alignment. Do not modify the keeper arms in any way when you install the keeper onto the PRO-TORQ™ nut. A bent keyway tang or modified keeper arms can cause the wheel to separate from the vehicle during operation. Serious personal injury and damage to components can result.

3. Use a screwdriver to compress and insert the keeper arms one at a time into the undercut groove on the nut. Ensure that the keeper tab and arms are fully seated into the undercut groove. Figure 5.8.

## Hubcap

### **⚠ CAUTION**

Before you install the PreSet® by Meritor® hubcap, inspect it for contaminants, such as silicone gasket sealant, grease or mud. If necessary, use a wire brush to remove contaminants from the hubcap. Contaminants in the hubcap can prevent the bolts from tightening correctly, which can result in leaks and damage to components.

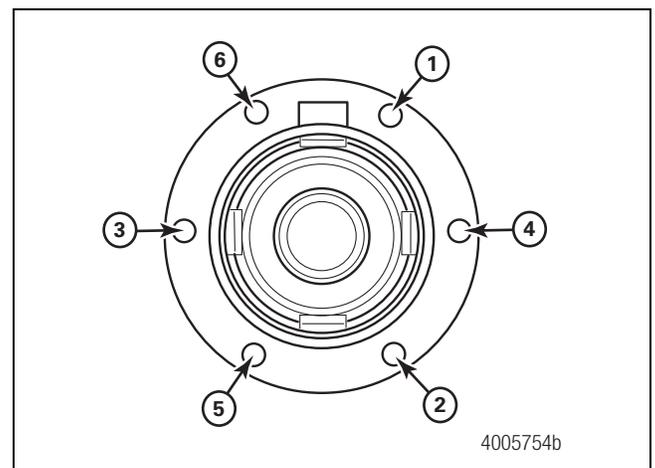
You must install a PreSet® by Meritor® hubcap to qualify for Meritor's warranty. Refer to brochure SP-95155, Commercial Vehicle Systems Warranty, for specific information.

1. Inspect the PreSet® by Meritor® hubcap for contaminants. Use a wire brush to remove contaminants, burrs and sharp edges. Ensure the hubcap vent is free of debris. Always install new gaskets.

### **⚠ CAUTION**

Only install SAE Grade 5 bolts or stronger into the hubcap. Only install flat washers with no locking features. Do not use star washers or split-lock washers, which will enable contaminants to corrode the hubcap threads. Damage to components will result.

2. Install the hubcap. Only install flat washers with no locking features. Do not use star washers or split-lock washers, which will enable contaminants to corrode the hubcap threads. Use a star pattern to tighten the SAE Grade 5 or stronger hubcap bolts to 12-18 lb-ft (15-25 N•m). Figure 5.9. **🔧**



**Figure 5.9**

## 5 Assembly and Installation

### Oil-Lubricated Hubs

1. Fill the hub with oil through the hubcap or the fill hole if present. It may be necessary to add lubricant more than once to completely fill the hub. Use the oil approved by the component manufacturer for use with manually-adjusted bearings. Refer to the trailer or vehicle manufacturer for oil recommendations. Some hubs have a fill hole located in the barrel for adding lubricant. Figure 5.10.

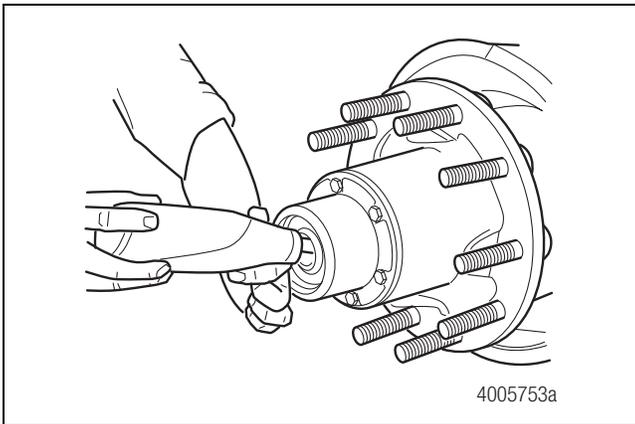


Figure 5.10

2. Verify that the hubcap is filled to the oil level mark on the face of the cap. Refer to the original equipment manufacturer's specification if the fill hole is not available. Figure 5.11.

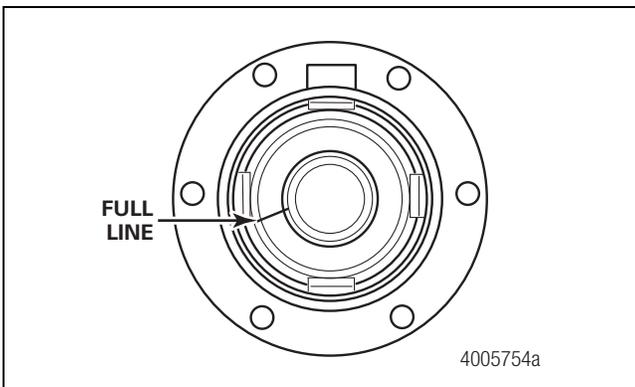


Figure 5.11

### Grease or Semi-Fluid Lubricant (Trailer Hubs Only)

#### ⚠ CAUTION

You must fill and maintain the hub with the correct amount of grease or semi-fluid lubricant. Operating the vehicle with an incorrect amount of grease can cause damage to the wheel hub system, bearings and wheel, and void Meritor's warranty.

1. If the hub is equipped with a fill hole, remove the fill hole plug.
2. Fill the hub with the original equipment manufacturer's recommended amount of grease or semi-fluid lubricant. The grease must be room temperature, or 60°F (15°C). Figure 5.12.

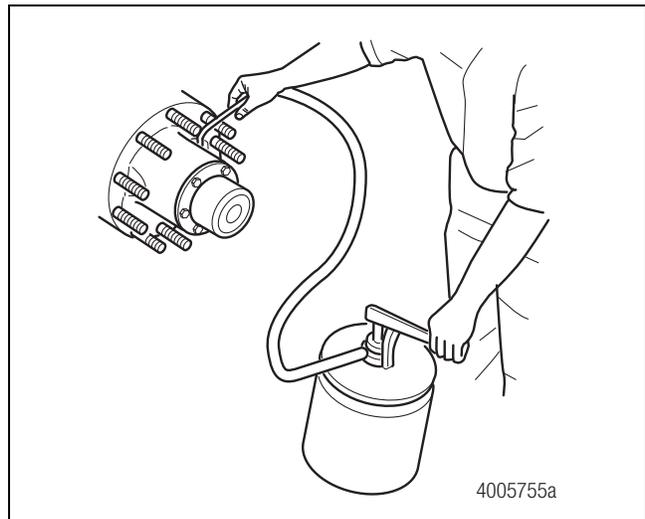


Figure 5.12

3. Install the fill plug and tighten to 20-25 lb-ft (25-35 N•m). 

### Brake Drums and Wheels

#### Hub-Piloted Wheel Mounting System

#### ⚠ WARNING

Before you perform assembly procedures, thoroughly clean mounting surfaces to remove paint and contaminants, which can decrease clamp load and loosen fasteners. If this occurs, the wheels can separate from the vehicle. Serious personal injury and damage to components can result.

1. Remove all contaminants from mounting surfaces, so that the drum fits the drum pilot correctly and seats fully against the hub mounting face.

### **⚠ WARNING**

Check that stud standout is correct for stud-piloted wheels. If standout exceeds specifications even though the correct torque is used, the cap nut can bottom out against the hub stud and loosen both wheels and the brake drum, which will cause the wheels to separate from the vehicle. If standout is too short, the cap nut will overload and crack, causing the inner and dual wheels to separate from the vehicle. Serious personal injury and damage to components can result.

2. If you replace a wheel or brake drum, you must check stud standout. The studs must be long enough for the threads to be exposed beyond the installed wheel nut. If you replace the brake drum, verify that the new drum has the same drum diameter as the one that you removed.
3. Ensure the hub and drum are correctly seated.

### **⚠ WARNING**

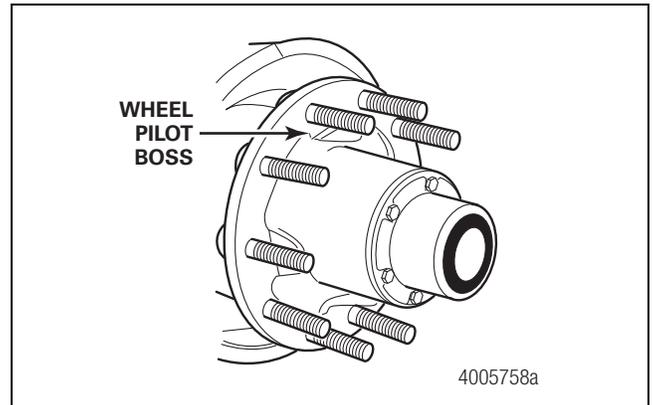
Apply two drops of oil between the nut flange and the hex portion of the swivel area at each installation if you reinstall the two-piece flange nuts that have been in service. Without lubricant, the fasteners may not produce adequate clamp load, and a wheel can loosen and separate from the vehicle. Serious personal injury and damage to components can result.

4. Apply two drops of oil between the nut flange and the hex portion of the swivel area at each installation if you reinstall the two-piece flange nuts that have been in service.
5. Apply two drops of oil to the last two or three threads at the end of each stud.

### **⚠ WARNING**

Lightly lubricate the hub pilots to ease wheel installation and removal. Do not lubricate the mounting face of the drum or wheel. Lubricant on the drum or wheel mating surfaces can reduce friction and cause the components to slip during operation. Serious personal injury and damage to components can result.

6. Lightly lubricate the hub pilots to ease wheel installation and removal. Do not lubricate the mounting face of the drum or wheel.
7. Rotate the hub so that one of the wheel pilot bosses is at the 12 o'clock position. Figure 5.13.



**Figure 5.13**

8. Position the brake drum over the hub so that it seats onto the drum pilot and against the hub face.

### **⚠ WARNING**

Install nuts with the correct thread size on the studs. A nut with an incorrect thread size will not turn freely on the stud or will fit loosely on the stud. The thread can strip, which can cause loss of clamp load. The wheels can loosen and separate from the vehicle. Serious personal injury and damage to components can result.

9. Place the wheels into position on the hub. Install one or more nuts to hold the wheels and drum in position.

### **⚠ WARNING**

When you install the brake drum onto the brake drum pilot, first tighten the top wheel nut to 50 lb-ft (65 N•m) to fully-seat the brake drum onto the brake drum pilot and against the hub face. Verify that the drum is fully-seated before and after you install the wheels to prevent serious personal injury and damage to components.

10. Tighten the top nut first to fully seat the brake drum on the drum pilot and against the hub face. Tighten the nut to 50 lb-ft (65 N•m). Figure 5.14. **ⓘ**

## 5 Assembly and Installation

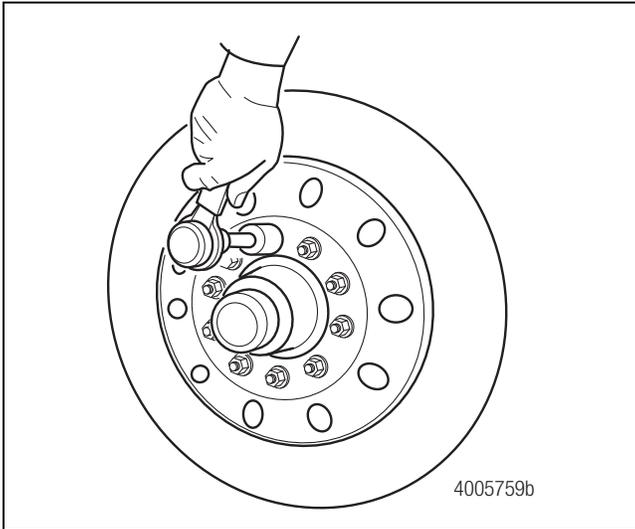
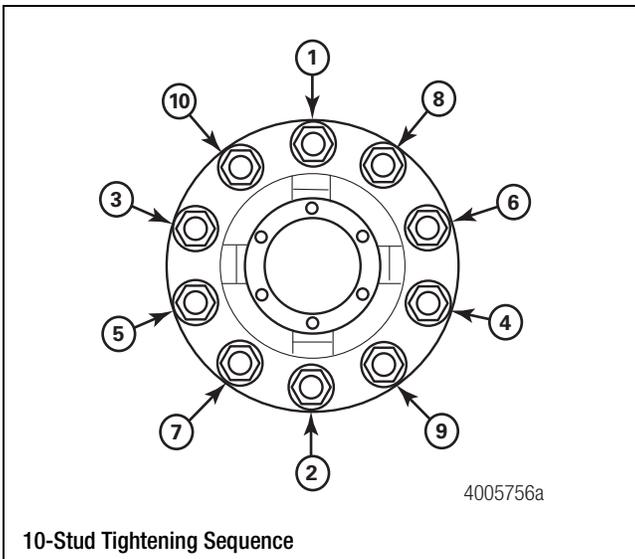


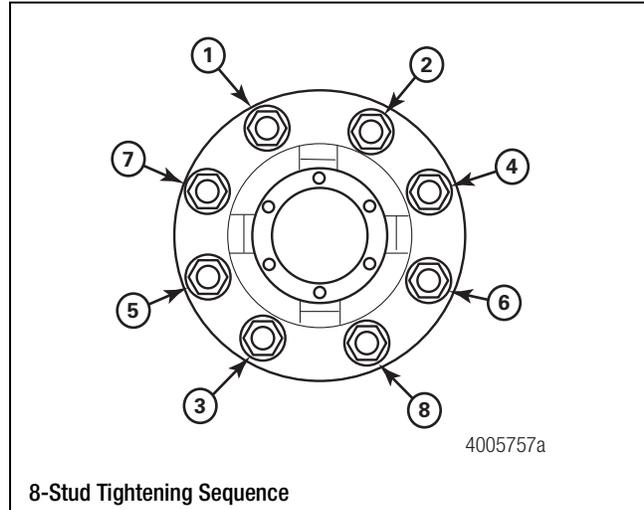
Figure 5.14

11. Install the remaining wheel nuts and tighten in the sequence shown. Figure 5.15 and Figure 5.16. Tighten all the nuts to 50 lb-ft (65 N•m). Then use a calibrated torque wrench to tighten all the nuts to 450-500 lb-ft (610-680 N•m) following the same sequence. 



10-Stud Tightening Sequence

Figure 5.15



8-Stud Tightening Sequence

Figure 5.16

### WARNING

Inspect the brake drum and wheel to verify that the brake drum is fully-seated on the drum pilot. Rotate the wheel to ensure it doesn't interfere with the brake drum, which can affect wheel and drum performance. Serious personal injury and damage to components can result.

Tighten fasteners to the correct torque specifications. Do not over-tighten or under-tighten fasteners, which can cause wheels to separate from the vehicle. Serious personal injury or damage to components can result.

12. Inspect the brake drum and wheel to verify that the brake drum is fully-seated on the drum pilot. Rotate the wheel to ensure it doesn't interfere with the brake drum, which can affect wheel and drum performance.
13. After the first 50 to 100 miles (80 to 160 km), retighten all the nuts to 450-500 lb-ft (610-680 N•m). Remove the load from the wheels when retightening. 

## Torque Specifications

Description	Fastener	Torque Range	Notes
Hub Pilot Wheel Nut	22 mm x 1.5 mm	450-500 lb-ft (610-680 N•m)	Always tighten the top nut first. Apply two drops of oil between the nut and nut flange. Apply two or three drops to the outermost two or three threads of the wheel studs. Lightly lubricate the wheel pilots on the hub.
Drive Studs	3/4-16	40-60 lb-ft (55-80 N•m)	Consult the manufacturer's instructions for drive axle shaft installation for all drive studs.
	5/8-18		
Hubcap	5/16-18	12-18 lb-ft (15-25 N•m)	Minimum SAE Grade 5 fasteners, flat washers only
Oil Fill Plug	1/4 NPT	20-25 lb-ft (25-35 N•m)	O-ring style
	3/8 NPT		
	9/16-18		
Disc Brake Rotor			Refer to the brake manufacturer.

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