

The ConMet Connection

A Quarterly Publication of Consolidated Metco, Inc.

Fall 2009 Volume 6

Part Three of a Three-Part Series on Preventative Maintenance for Hub Assemblies

Servicing PreSet® Hubs at 5 Years/ 500,000 Miles or Every 2nd Brake Job

Part three of the ConMet Connection's three-part series on preventative maintenance for hub assemblies outlines proper servicing at five years/500,000 miles or every second brake job for on highway vocations. In more severe duty applications, this service may be required more often. Your 12 month inspection criteria (see the Summer, 2009 issue of The ConMet Connection) will provide an indication of whether this service is required.

In order to ensure optimum wheel hub performance, ConMet recommends that only approved PreSet service parts be used to replace all critical components of the system. Refer to the back of the PreSet service manual for a listing of approved parts.

HUB REMOVAL AND DISASSEMBLY

1. Remove the tires and wheels by following the steps outlined in the previous issue of The ConMet Connection or refer to the PreSet service manual available at www.conmet.com.

WARNING

Sudden release of compressed air can cause serious personal injury and damage to components. 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.

2. If the axle is equipped with spring brake chambers, carefully compress and lock the springs so that they cannot actuate (see figure 1).

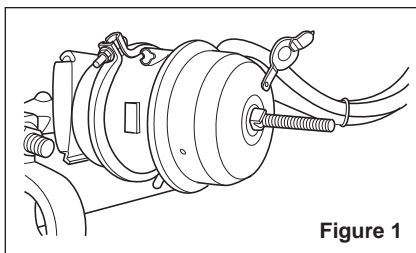


Figure 1

3. Remove the brake drum. Support the drum during the removal process to prevent damage to the axle spindle threads.

NOTE

If the hub to be disassembled is a drive hub, remove the drive axle shaft, and capture the oil (see figure 2).

4. 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.

5. Examine the spindle nut to determine the type of locking system. Disengage the locking device.

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.

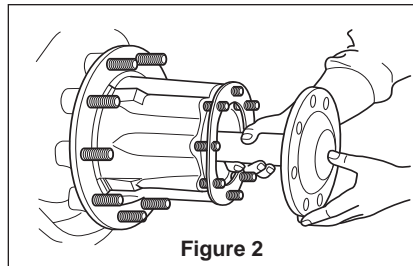


Figure 2

6. Remove the spindle nut system.

7. Slide the hub off the spindle. Remove and save the outer bearing cone. Be careful when you remove the hub that you do not damage the outer bearing by dropping it on the floor.

- If the hub is difficult to remove because the seal is stuck on the spindle, use a mechanical puller to remove the hub (see figure 3).

- If part of the seal remains on the spindle, carefully remove the part of the seal that remains on the spindle.

8. Place the hub on its outboard end and remove and discard the seal.

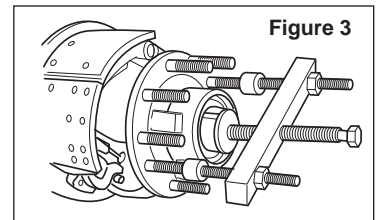


Figure 3

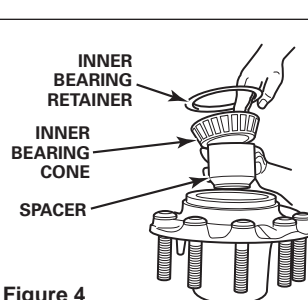


Figure 4

9. If present, remove and discard the inner bearing retainer. The stamped steel retainer secures the inner cone during shipment and has no purpose in service (see figure 4). Be careful not to damage the inner bearing and spacer during the removal process.

10. Remove the inner bearing and spacer.

**COMPONENT INSPECTION AND REPLACEMENT
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. 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. Use a brass or synthetic mallet for assembly and disassembly procedures.

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 AND DRY AND COMPONENTS

Worn or Damaged Components

WARNING

Do not repair or recondition wheel-end components. Replace damaged, worn or out-of-specification components. Do not mill or machine any components. Using repaired, reconditioned, damaged or worn components can cause wheel end failure, which can result in serious injury and property damage.

Hub and Component Cleaning

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 and seal 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.

6. Parts must be dried immediately after cleaning. Dry parts with clean paper towels or rags, or compressed air. Do not dry bearings by spinning with compressed air.
7. 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.
8. If the parts are to be stored, apply a good corrosion preventative to all surfaces. Do **NOT** apply the material to the brake linings or the brake drums. Store the parts inside special paper or other material that prevents corrosion.

INSPECTING BEARING CUPS, CONES AND SPACER

NOTE

PreSet hubs use a precision-machined spacer in conjunction with specially toleranced bearings to control wheel end play. ConMet recommends installing a new PreSet bearing kit at this service interval to ensure proper bearing adjustment and optimum bearing life. The PreSet bearing kit consists of both bearing sets and a bearing spacer. PreSet bearing kits are available from ConMet and other approved bearing suppliers.

CAUTION

If you choose to reuse existing bearings at this service, they must be inspected in accordance with the bearing manufacturers recommended guidelines.

CAUTION

If this inspection indicates that existing bearing component(s) must be replaced, bearing cups and cones must be replaced as a set. Whenever new bearings are installed, replacement of the bearing spacer is also recommended.

1. After components have been properly cleaned, visually inspect the cups, cones and spacer for any wear or damage. Reference materials for proper inspection procedures are available from the bearing manufacturers.
2. If removal or replacement is required, follow the steps outlined below.

REMOVING CUPS IN ALUMINUM HUBS

1. If required on an aluminum hub, remove the bearing cup by welding a large bead around the bearing surface of the steel cup, letting the assembly cool, and removing the bearing cup (see figure 5).

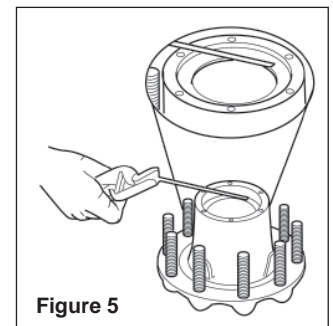


Figure 5

NOTE

If a welder is not available, heat the hub to 300°F and pound out the bearing cups with a hammer and drift, being careful not to damage the hub.

2. Inspect the bearing cup bore for evidence of cup rotation or spun cups.
 - If cup rotation exists, replace the hub.

INSTALLING A NEW CUP IN ALUMINUM HUBS

To install a new cup in an aluminum hub, it is recommended that the hub be heated evenly throughout in an oven to 175°–205° F or in boiling water. Cooling the cup in a freezer to 32°F or below will further ease the installation, if desired.



Do not overheat the hub as it may degrade the heat-treated strength of the hub.

Remove the aluminum hub from the oven or water and carefully drop in the new bearing cup being certain it is fully seated. If the cup is loose, allow a few seconds for it to heat up and secure itself before moving the hub. Use a 0.001" to 0.002" feeler gauge to ensure the cup is fully seated against the shoulder of the bearing bore.

INSTALLING A NEW CUP IN IRON HUBS

Iron hubs do not need to be heated for bearing cup installation. Press the bearing cup into the hub, being certain that it is fully seated (see figure 6). Use a 0.001" to 0.002" feeler gauge to ensure the cup is fully seated against the shoulder of the bearing bore.

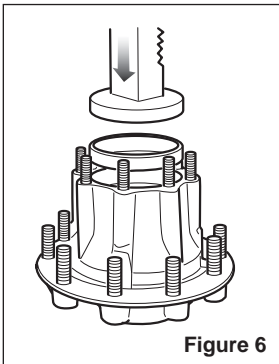


Figure 6

WHEEL STUDS

Replace all wheel studs that have damaged or distorted threads, are broken or bent, or are badly

corroded. Also, replace both studs adjacent to the damaged stud. If two or more studs have damage, replace all the studs in the hub. Broken studs are usually an indication of excessive or inadequate wheel nut torque.

STUD REMOVAL



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

1. Place the clean hub in a shop press with the hub supported evenly around and adjacent to the stud being removed.



Failure to adequately support the hub can result in physical injury and/or damage to the hub. Some hubs are configured so it is impractical to have supports to prevent the hub from tipping when force is applied to the stud. In this case, support the hub on wood blocks on the floor and use a heavy hammer to drive the studs out with several sharp blows. Be careful to avoid damaging the hub and components, particularly the seal bore and the ABS tone ring.

2. Press the stud out of the hub.

STUD REPLACEMENT



On the ball seat wheel mounting system, always use left-handed threaded studs on left-handed hubs, and use right-handed threaded studs on right-handed hubs. The ConMet part number is located on the head of the stud. The same part number must be used for replacement unless changing the drum or wheel type.

1. To install a new stud, support the hub evenly around and adjacent to the stud being installed.
2. Press the new stud all the way into the hub. Be sure the stud is fully seated and that the stud head is not embedded into the hub.



Excessive force can cause the stud head to be embedded into the hub, which can create a crack in the hub, resulting in serious injury and property damage. If a stud head is imbedded in a hub, replace the hub.

HUB, DRUM AND WHEEL INSPECTION

1. Inspect the drum pilots, wheel pilots, and mounting face on the hub for damage. A damaged drum pilot is usually caused by improper drum mounting. A damaged wheel pilot could be the result of inadequate wheel nut torque, allowing the wheels to slip in service. Also, inspect other surfaces of the hub for signs of cracks or damage.
2. Inspect the wheels and brake drum for damage.



Do not repair or recondition wheel-end components. Replace damaged, worn or out-of-specification components. Do not mill or machine any components. Using repaired, reconditioned, damaged or worn components can cause wheel end failure, which can result in serious injury and property damage.

ABS TONE RING INSPECTION (AS APPLICABLE)

The Anti-Lock Braking System (ABS) signals acts like any signal generator where the magnet passes a coil and generates a current. On hubs, the toothed ring passes a sensor and generates a signal that is sent to the ABS computer. There are two types of ABS rings used on ConMet hubs — powdered metal and stamped steel (see figure 7).

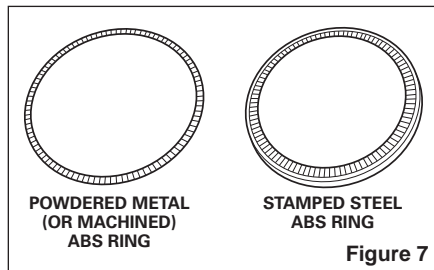


Figure 7

If the tone ring is damaged (for example, if it is dropped, bent, chipped or dinged), it must be replaced.

REMOVAL AND INSTALLATION OF POWDERED METAL ABS TONE RING

For a powdered metal ring, remove using a chisel, making sure not to damage the hub (see figure 8). Reinstall by heating the ring to 350°F in an oven and installing it on the hub.

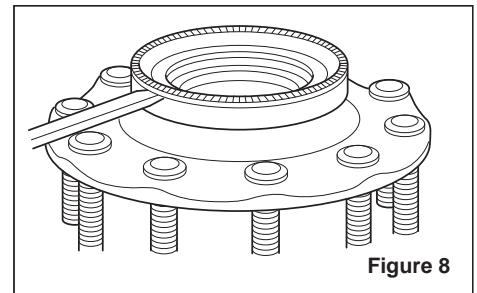


Figure 8

REMOVAL AND INSTALLATION OF STAMPED STEEL ABS TONE RING

1. The steer axle tone ring can be removed by gripping the ring with a pair of locking pliers and tapping the pliers upward with a rubber mallet. Work around the ring to keep the ring from cocking (see figure 9). Drive axle and trailer tone rings can be removed by gripping the ring with a pair of locking pliers and prying against the head of a wheel stud to lift the ring off the hub. Work around the ring to prevent cocking (see figure 10).

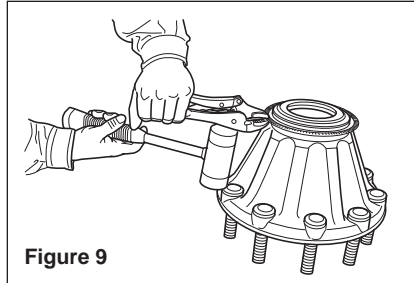


Figure 9

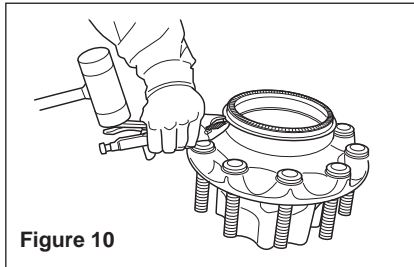


Figure 10

2. Thoroughly clean and degrease the ABS ring seat on the hub with a nonflammable solvent.

CAUTION

Replace the hub if the ABS ring seat is damaged. The ABS ring must be fully seated with a maximum of 0.008" axial runout to ensure the ABS system functions properly.

NOTE

For steer hubs, be certain the inside diameter flange is facing up.

- Place the hub in a press and place the ABS ring on the hub ring seat.
- Using ConMet ring installation tool (part number 107119) center the tool over the ABS ring. Each type of ring fits a corresponding diameter on the tool (see figure 11).
- Press the ring on the hub. If a press is not available, drive the ring on with a hammer or mallet until the ring seats on the hub (see figure 12). A swift initial blow with an 8-lb. hammer may be necessary to start the ring onto the hub.
- Inspect the ring to ensure proper seating. If the ring is not completely seated, continue to drive the ring with the ring installation tool until it is completely seated.

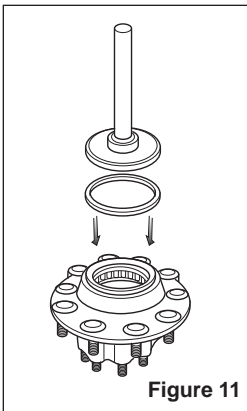


Figure 11

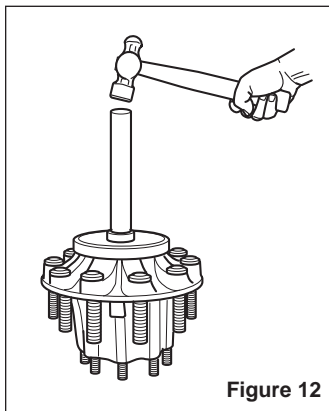


Figure 12

NOTE

Follow the steps outlined in the PreSet service manual for hub reassembly and reinstallation onto the spindle.