Hub Service Manual

Manually Adjusted Bearings

Steer, Drive, and Trailer Applications

Table of Contents

IMPORTANT REMINDERS

Read this manual carefully, providing extra attention to its explanations and instructions. To ensure safe, continuous, trouble-free operation, understand your wheel hub system, and keep all components in proper operating condition. Pay particular attention to all NOTES, CAUTIONS, WARNINGS, and DANGERS to avoid the risk of personal injury or property damage, and realize these statements are not exhaustive. ConMet cannot possibly know or evaluate all conceivable methods in which service may be performed or the possibly hazardous consequences of each method. Accordingly, those who use a procedure not recommended by ConMet must first satisfy themselves that neither their safety nor the safety of the product will be jeopardized by the service method selected. Use only ConMet approved replacement parts. Do not attempt to use damaged parts. DISC WHEEL INSTALLATION PROCEDURES (ConMet part number 103282), are available upon request.

Notes

These activities include additional information that may assist the technician in service procedures (see figure 1).

FIGURE 1

Cautions

These activities indicate that product damage may result from failing to heed the stated advisory (see figure 2).

FIGURE 2

Warnings

Associated activities indicate that personal injury may result from failing to heed the advisory. (see figure 3).

FIGURE 3

Dangers

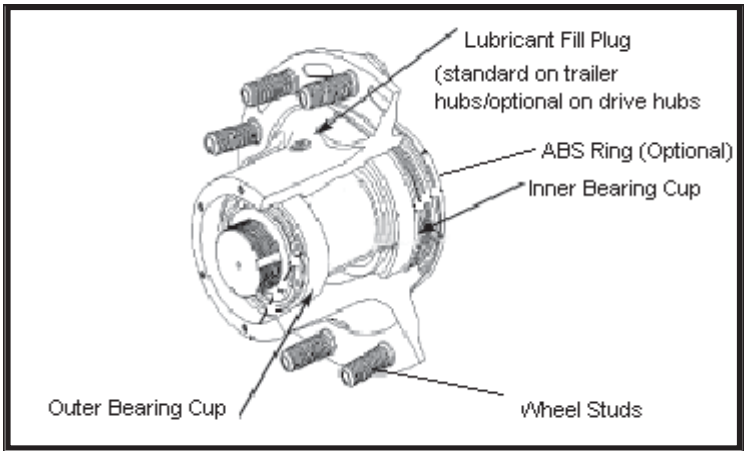
Associated activities indicate that death or serious personal injury may result from failing to heed the stated advisory. (see figure 4).

FIGURE 4

INTRODUCTION

Consolidated Metco, Inc. is recognized as the leader in the design and manufacture of lightweight components for the heavy truck industry. With the addition of ductile iron hubs to our family of products, ConMet now offers complete range of disc wheel hubs for heavy truck, tractor, and trailer applications.

For information on ConMet PreSet® Hubs with pre-adjusted bearings refer to the corresponding service manual (see table 1). Contact ConMet at 1-800-547-9473 for other available technical or product information, or visit our web site at www.conmet.com.



TN Trailer Hub
FIGURE 5

Contact ConMet at 1-800-547-9473 or
www.ConMet.com

Literature #	Description
10005642	PreSet Hub Service Manual
10008647	ConMet Hub Service Manual

Corresponding Literature
TABLE 1

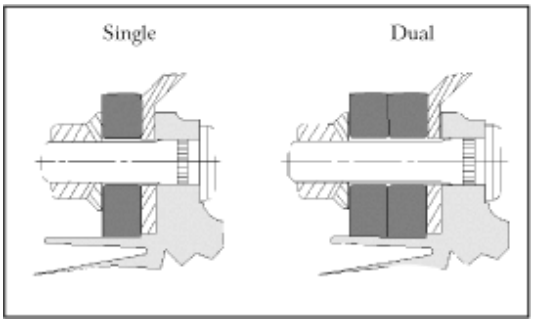
IDENTIFICATION

WHEEL MOUNTING SYSTEMS

ConMet Hubs are available in both hub

Hub Pilot Wheel Mounting

The hub pilot wheel mounting system makes use of a single two-piece flange nut on each wheel stud for both single and dual wheel applications (see figure 6).
The hub pilot wheel mounting system is also known as the Uni-Mount-10™ (10 stud), WHD-10™ (10 stud), WHD-8™ (8 stud), and ISO system.

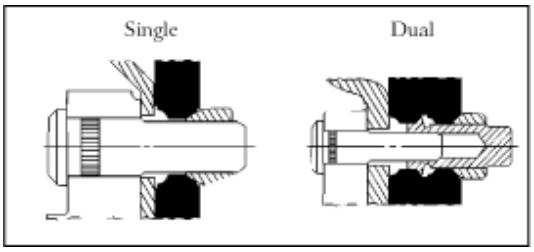


Hub Pilot Mounting Systems
FIGURE 6

Ball Seat Wheel Mounting System

The ball seat wheel mounting system makes use of the spherical contact area between the nut and wheel to both locate the wheel and hold the wheel tight against the brake drum (see figure 7).

The ball seat wheel mounting system is also known as the stud piloted, ball seat cap nut (BCN) and double cap nut (DCN) system.



Ball Seat Mounting Systems
FIGURE 7

PERIODIC INSPECTION AND PREVENTIVE MAINTENANCE

ConMet requires a visual inspection of the wheel hub system every 12 months or 100,000 miles.

NOTE

In addition to the annual visual inspection, you should maintain current shop preventive maintenance and pre-trip inspection practices.

VISUAL INSPECTION

OIL LUBRICATED

Visually inspect for leakage and oil contamination.

Leakage Indicators

1. Check to be certain that no oil is present around the hubcap or on the wheel.

⚠ CAUTION

If oil is present, investigate the cause and take corrective action.

2. Check to be certain that no oil is present on the hub, brake hardware, or brake shoes.

⚠ CAUTION

If oil is present, the seal may be defective, improperly installed, or worn out. Replace the seal by following the instructions as outlined in this manual.

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, completely service the wheel hub by following the instructions as outlined in this manual.

⚠ CAUTION

Do not mix oil types. If oil needs to be added, make sure you use the same type of oil.

SEMI- FLUID GREASE LUBRICANT

Visually inspect for leakage and grease contamination.

Leakage Indicators

1. Remove hubcaps.

2. Inspect the outer bearing to make sure sufficient grease is present and that there is no sign of contamination.

3. If additional grease is required, follow the OEMs recommendations for adding lubricant.

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, completely service the wheel hub by following the instructions in the manual.

NOTE

Do not mix grease types. If grease needs to be added, make sure you use the same type of grease as installed by the OEM.

PERIODIC INSPECTION AND PREVENTIVE MAINTENANCE

FUNCTIONAL CHECKS

In addition to the Annual Inspection, the following functional checks should be done in conjunction with brake or tire service.

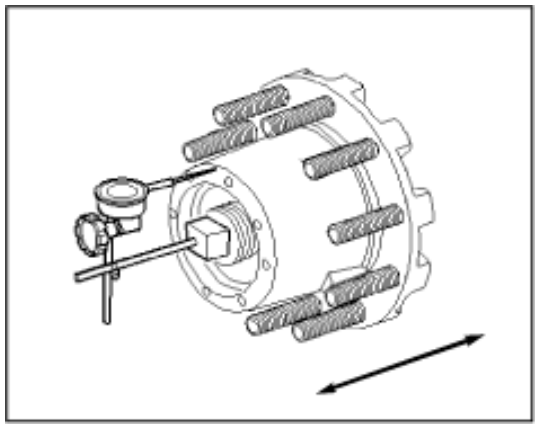
NOTE

Conduct the following inspections with the wheel(s) and drum removed.

⚠ WARNING

Never work under a vehicle supported by a jack without supporting the vechicle with stands and blocking the wheels.

Rotate the hub and check for free, smooth, and quiet rotation. If rotation is hampered, hubs should be serviced immediately.



Checking for End Play
FIGURE 8

Measure End Play

1. Remove the hubcap, and use a dial indicator with a magnetic base mounted on the spindle end, to read the travel at the hub cap mounting surface (see figure 8).

2. Grasp two wheel studs across from each other and pull and push the hub while oscillating it.

3. Measure the end play by the difference between the minimum and maximum dial indicator readings.

⚠ CAUTION

Hubs should be serviced if end play exceeds 0.006".

HUB REMOVAL AND DISASSEMBLY

⚠ WARNING

Never work under a vehicle supported by a jack without supporting the vechicle with stands and blocking the wheels.

1. Prepare the axle for disassembly by using a jack to raise the axle until the wheels are off the ground, and the axle is properly supported.

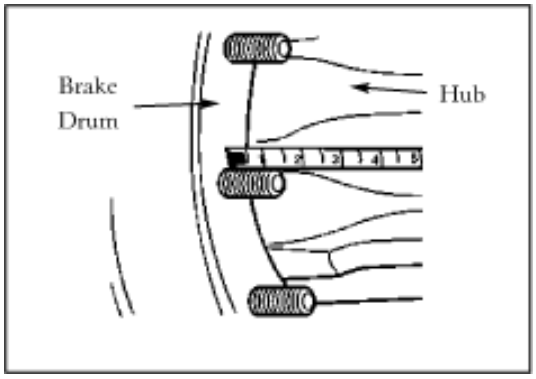
⚠ CAUTION

Care should be taken to avoid damaging the hub or other components.

NOTE

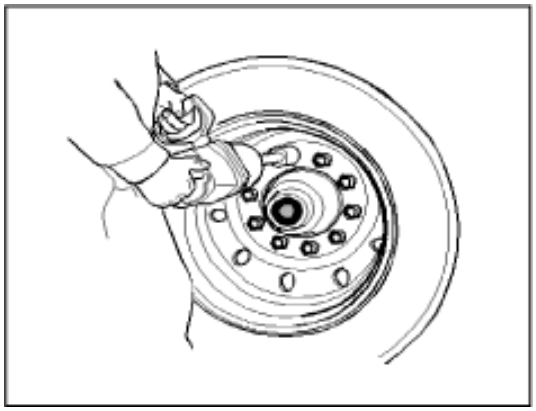
If you plan to replace the brake drum (i.e., cast in place of Centrifuse™ or wheels (i.e., aluminum in place of steel), measure stud standout (see figure 9). In hub piloted mounting systems, the studs must be long enough for the threads to be exposed beyond the installed wheel nut. In the ball seat mounting system, the stud length beyond the brake drum should be from 1.31" - 1.44" as measured from the brake drum to the end of the stud. Call ConMet at 1-800-547-9473 for the correct stud part number for your application.

If you plan to replace the brake drum, verify the new drum has the same drum pilot diameter as the one that has been removed.



Measuring Stud Standout
FIGURE 9

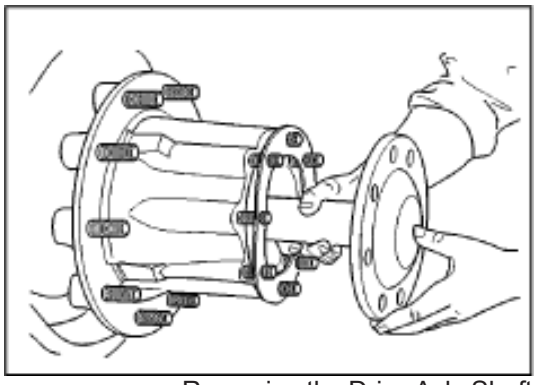
2. Remove the wheels and brake drum (see Figure 10).



Removing the Wheels
FIGURE 10

NOTE

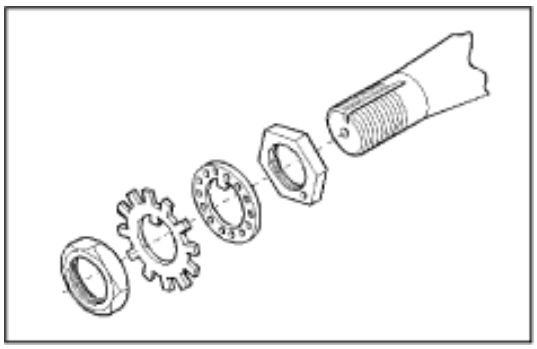
If the hub to be disassembled is a drive hub, remove the drive axle shaft, and capture the oil (see figure 11).



Removing the Drive Axle Shaft
FIGURE 11

3. Examine the spindle nut to determine the locking system, and disengage the locking device.

4. Remove the spindle nut system (see figure12).

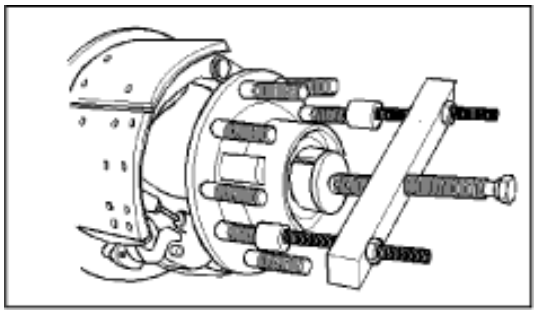


Typical Spindle Nut System
FIGURE 12

5. Slide the hub off the spindle, being careful to protect the outer bearing cone from falling. Remove and save the outer bearing cone.

⚠ CAUTION

Occasionally, the seal can become stuck on the spindle, making the hub difficult to remove. If mechanical assistance is required to remove the hub, care should be used to avoid damage to hub components (see figure 13). In some cases, part of the seal will remain on the spindle. When removing this portion of the seal, care should be taken not to damage the spindle or seal journal.



Mechanical Puller
FIGURE 13

HUB REMOVAL AND DISASSEMBLY

NOTE

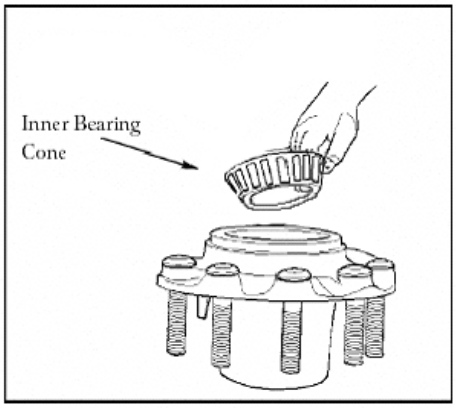
ConMet makes several tools to assist in the removal of hubs. These tools are available for purchase and are listed in the back of this manual (see tables 5 and 6).

6. Place the hub on its outboard end and remove and discard the seal (if it does not need to be retained for warranty rembursement).

7. Remove and save the inner bearing cone (see figure 14).

NOTE

All components replaced under warranty must be returned for consideration of reimbursement. Contact the OEM manufacturer for their warranty return policy.



Hub Disassembly
FIGURE 14

INSPECTION, REPAIR AND REPLACEMENT

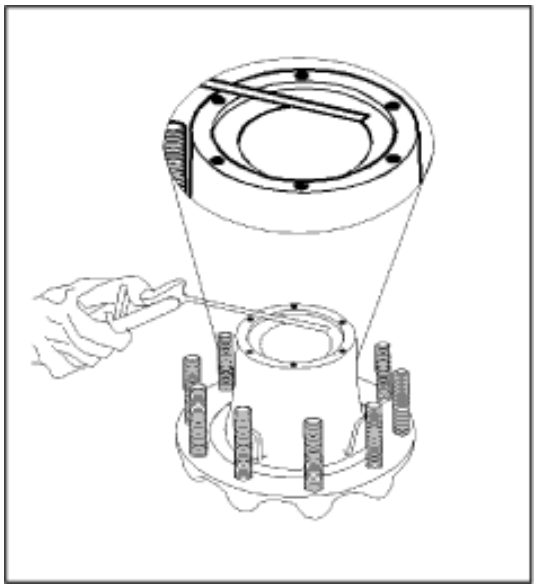
BEARING CUPS AND CONES

⚠ CAUTION

If a bearing cup or cone shows signs of deterioration, replace the suspect part along with the mating component. When reinstalling cups, be certain they are pressed fully against their seats. Use appropriate replacement parts, see Table 4.

1. Thoroughly clean and degrease all components with a nonflammable solvent.

2. 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 15).



Welding Bead
FIGURE 15

On an iron hub, remove the bearing cup using a large hammer and a heavy drift, along with the appropriate cup knockout tool, as listed in the back of this manual (see table 6). Take precaution to avoid damaging the bearing cup bore and shoulder.

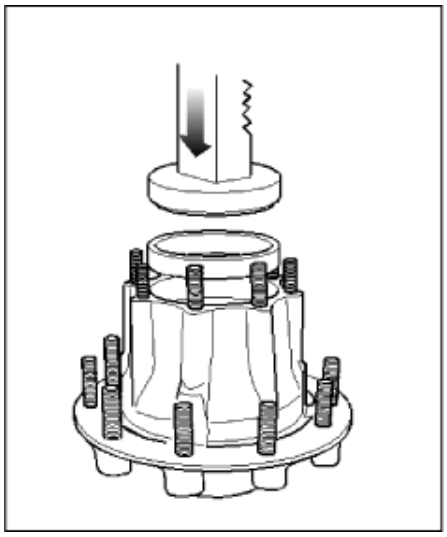
3. Inspect the bearing cup bore for evidence of cup rotation (spun cups). If noted, replace the hub.

4. To install a new cup in an aluminum hub, it is recommended that the hub be heated evenly throughout in an oven or in boiling water to 175-215° F. Cooling the cup in a freezer will further ease the installation, if desired.

⚠ CAUTION

Do not overheat 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. Variations within tolerances of materials and oven temperatures may require the bearing cup to be pressed in to the hub (see figure 16) using the appropriate assembly aids, as listed in the back of this manual (see table 5). If the cup is loose, allow a few seconds for it to heat up and secure itself before moving the hub.



Bearing Cup Pressed into Hub
FIGURE 16

6. Iron hubs do not need to be heated for bearing cup installation. Press the bearing cup into the hub using the appropriate assembly aids.

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.

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 the wheels and brake drum for damage.

STUD REMOVAL

⚠ WARNING

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.

⚠ WARNING

Failure to adequately support the hub can result in physical injury and/or damage to the hub.

2. Press the stud out of the hub.

⚠ CAUTION

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.

STUD REPLACEMENT

⚠ CAUTION

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.

⚠ WARNING

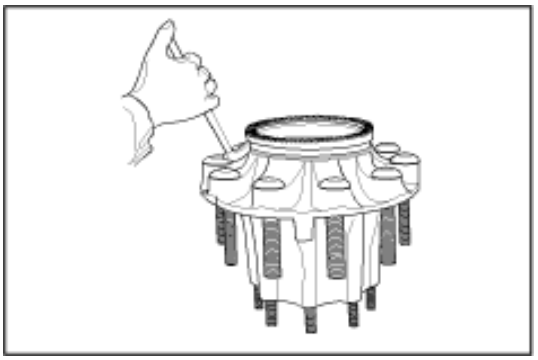
If the stud head is embedded into the hub, the hub should be replaced.

ABS TONE RING (As Applicable)

1. Inspect the ABS Tone Ring for any damage caused during hub removal or hub servicing.

2. If replacement is necessary, use a small pry bar (see figure 17) or hammer to gently remove the ring, using a circular pattern around the ring to prevent cocking.

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



Using Pry Bar to Remove ABS Ring
FIGURE 17

⚠ 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.

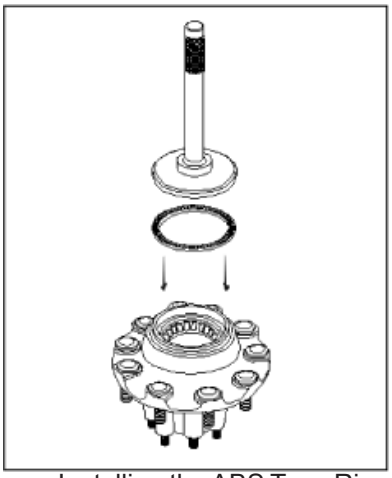
NOTE

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

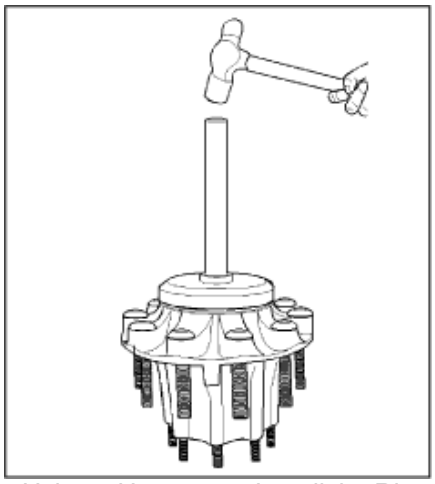
4. Place the hub in a press and place the ABS ring on the hub ring seat.

5. 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 18).

6. 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 figures 18-19).



Installing the ABS Tone Ring
FIGURE 18



Using a Hammer to Install the Ring
FIGURE 19

7. 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 the ring is completely seated.

A dial indicator can be used once the hub is reinstalled on the spindle to check axial runout.

REINSTALLATION

INSTALLING THE WHEEL HUB

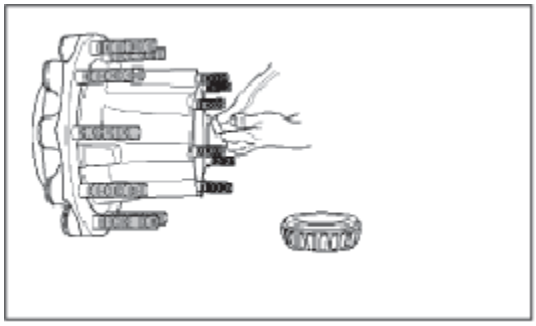
⚠ CAUTION

Never support the hub on the spindle with just the inner bearing and seal. This can damage the seal and cause premature failure, i.e., by cocking the seal in the bore.

NOTE

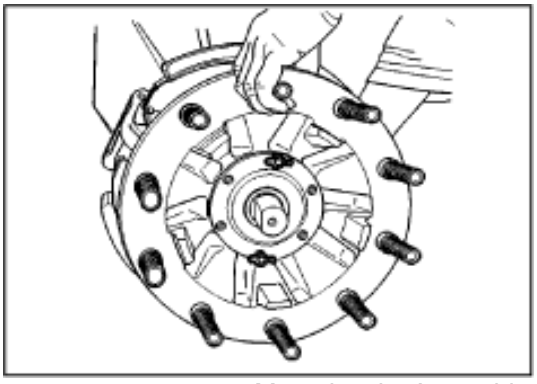
If you are working on a steer or trailer hub, go to step 2. If you are working on a drive hub, proceed as follows.

1. For drive hub installation, place the hub horizontal, and remove the outer cone. Fill the cavity, through the end of the hub with the axle flange studs, with as much oil as possible. Reinstall the outer cone in the hub (see figure 20).



Prelubricating the Drive Hub
FIGURE 20

2. For steer and trailer hubs, 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, and spindle and to avoid seal damage (see figure 21).

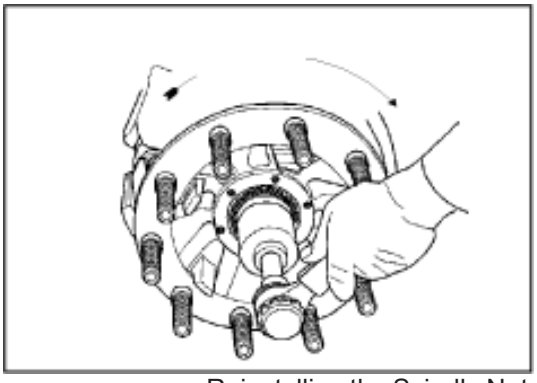


Mounting the Assembly
FIGURE 21

⚠ CAUTION

Once the hub is on the spindle, do not remove the outer bearing. Removing the outer bearing may cause the seal to become misaligned, resulting in premature seal failure.

3. Install the axle nut system and adjust the bearings as required by the axle, bearing or seal manufacturer or reference TMC RP 618 for adjustment recommendations (figure 22 and table 8).



Reinstalling the Spindle Nut
FIGURE 22

INSTALLING THE HUBCAP

NOTE

The hubcap bolt holes must be free of debris, such as silicon gasket sealer to ensure the bolts will tighten properly to avoid leaks. The vent should also be clean and free of debris. Remove any burrs or sharp edges. Always use new gaskets.

1. Install the hubcap.

NOTE

Use SAE Grade 5 bolts or stronger. Do not use star washers or split lock washers as they will allow contaminants to corrode the threads. Use only flat washers with no locking features.

2. Torque the hubcap bolts to 12-18 Ft.•Lbs., using a star pattern.

⚠ CAUTION

If you are using semi-fluid grease, special procedures must be followed as outlined in the “Semi-Fluid Grease Lubricant” section.

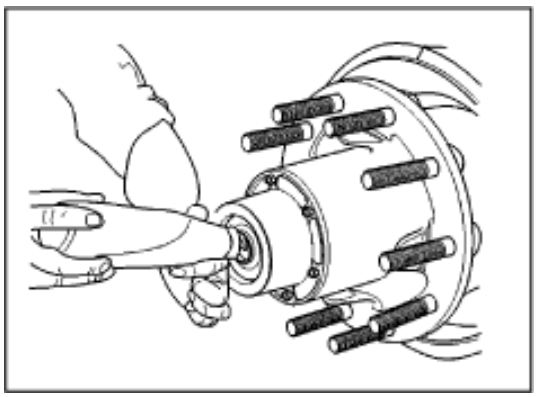
REINSTALLATION

OIL LUBRICANT

NOTE

Use any oil approved for use with manually adjusted bearings (refer to trailer or tractor OEM for oil recommendations).

1. Fill the hub through the hubcap or the fill hole with oil. It may be necessary to add lubricant more than once to adequately fill the hub (see figure 23).



Filling the Hub with Oil
FIGURE 23

2. Be certain the hub cap is properly filled to the “oil level” mark on the face of the cap.

SEMI-FLUID GREASE LUBRICANT

⚠ WARNING

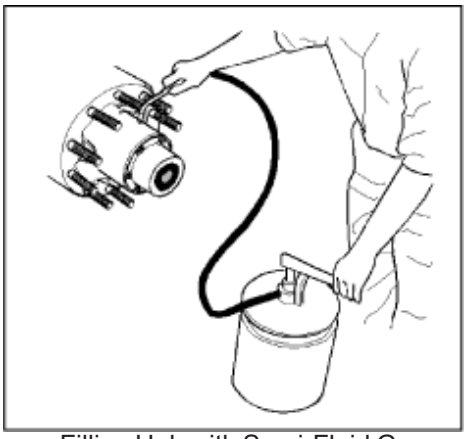
Failure to fill and maintain the hub with the correct amount of semi-fluid grease may cause premature failure of the wheel hub system, bearing failure and possible loss of the wheel and will void your warranty.

NOTE

Please refer to TMC RP 631A for the recommended fill and maintenance procedures.

1. If the hub is equipped with a fill hole, remove the fill hole plug.

2. Fill the hub with the OEM recommended amount of room temperature (60˚F minimum) semi-fluid grease through the fill hole in the hub. (Figure 25)



Filling Hub with Semi-Fluid Grease
FIGURE 25

3 . Reinstall and tighten the fill plug to 20-25 Ft.•Lbs.

REINSTALLATION

BRAKE DRUMS AND WHEELS

Hub Pilot Wheel Mounting System

⚠ CAUTION

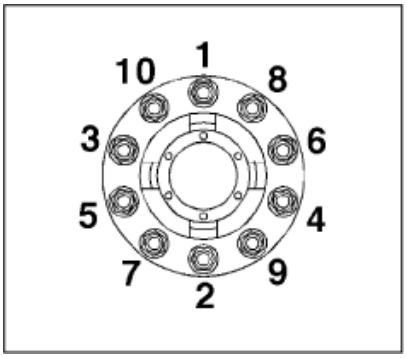
The brake drum must be fully seated on the drum pilot and against the hub face during and after installation of the wheel(s).

NOTE

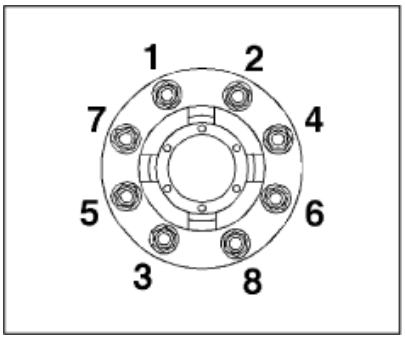
If your shop practice requires the use of lubricant or anti-corrosion material to the threads and/or the drum pilot area, avoid getting lubricant on the flat mating surfaces of the hub, drum, and wheels.

⚠ WARNING

Always tighten the top nut first to fully seat the brake drum on the drum pilot and against the hub face. See the adjacent diagram for bolt tightening sequence, and tighten in order from 1 through 8 or 10, depending on the bolt pattern (see figures 26-27).



10 Stud Tightening Sequence
FIGURE 26



8 Stud Tightening Sequence
FIGURE 27

1. Remove all foreign material to ensure the drum fits the drum pilot properly and can fully seat against the hub mounting face.

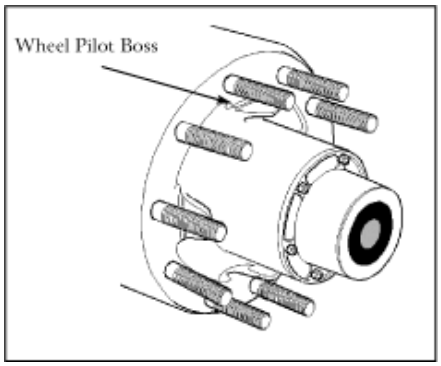
2. In environments where a corrosion inhibitor is beneficial, ConMet recommends the use of Corrosion Block, a product of Lear Chemical Research, (905) 564-0018. In severely corrosive environments, a light coat of Corrosion Block on the drum and wheel pilots has proven beneficial.

3. In addition to the above preparation, apply two drops of oil to a point betweeen the nuts and nut flange washer and two drops to the last two or three threads at the end of each stud. Also, lightly lubricate the pilots on the hub to ease wheel installation and removal.

⚠ CAUTION

Do not get lubricant on the mounting face of the drum or wheel. Failure to clean lubricant from these surfaces may result in decreased clamping load.

4. Before installation of brake drums and wheels that utilize the hub piloted system, rotate the hub so one of the wheel pilot bosses is at the top (12 o'clock position) (see figure 28).

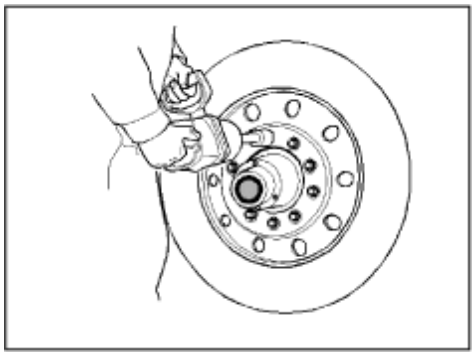


Rotating the Hub
FIGURE 28

5. Position the brake drum over the hub, so it seats on the drum pilot and against the hub face.

6. Place the wheel(s) into position. One or more nuts can be started in order to hold wheel(s) and drum into position.

7. Tighten the top nut first. Apply 50 Ft•Lbs. torque to draw the brake drum up fully against the hub (see figure 29).



Reinstalling the Wheel
FIGURE 29

REINSTALLATION

⚠ DANGER

Excessive or inadequate wheel nut torque can result in a failure of the wheel mounting system. After the first 50-100 miles, retorque all the nuts to 450-500 Ft.• Lbs.

8. Install the remaining wheel nuts and using the sequence as shown, torque all the nuts to 50 Ft.•Lbs, then retorque to 450-500 Ft.•Lbs. (see figures 28-29). The last nut rotation must be with a calibrated torquing device.

9. Inspect the brake and wheel installation by checking the seating of the wheel(s) and drum at the pilots, and by turning the wheel(s) and checking for any irregularity.

Ball Seat Wheel Mounting System

Clean all mating surfaces on the hub, drum,wheels and nuts. Remove loose paint, scale, and any material building around the pilots of the drum, hub, and wheels. Be sure paint is fully cured on recently refurbished wheels.

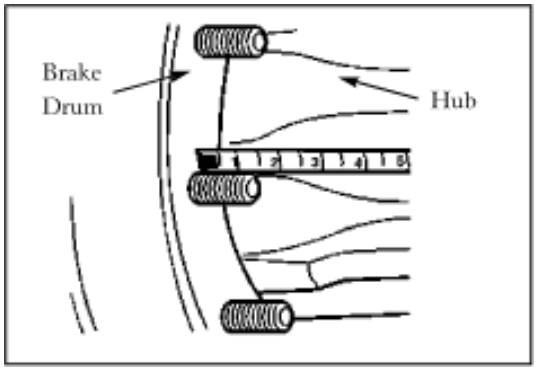
NOTE

When dual wheels are mounted, the stud length beyond the brake drum (standout) should be from 1.31-1.44" as measured from the brake drum to the end of the stud (see figure 30).

When mounting dual aluminum wheels, use ALCOA inner cap nuts 5978R and 5978L or the equivalent. These nuts can also be used with longer studs up to 1.88" standout.

For special single aluminum wheel applications on drive and trailer hubs, use ALCOA single cap nuts 5995R and 5995L or 5554R and 5554R and 5554L or the equivalent, depending on the stud thread length (see table 3).

For single steel wheel applications, use BATCO 13-3013R and 13-3013L or the equivalent (see table 4).



Stud Standout
FIGURE 30

Aluminum Wheels	ALCOA Cap Nut Number
3/4-16" Threaded Studs	5995 R and 5995 L or 5554 R and 5554L, depending on stud length

Single Aluminum Wheel Applications
TABLE 3

Steel Wheels	BATCO Cap Nut Number
3/4-16" Threaded Studs	13-3013 R and 13-3013 L

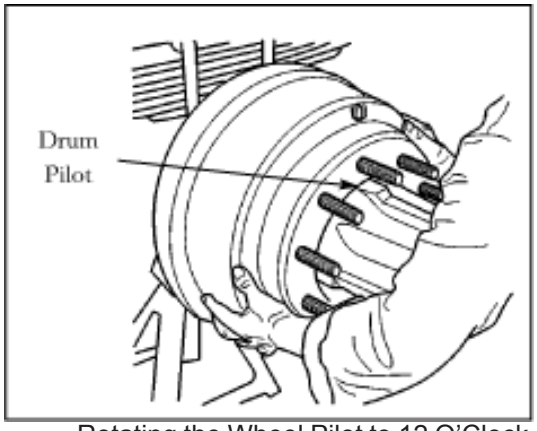
Single Steel Wheel Applications
TABLE 4

1 . When installing the inner dual, verify the inner nuts being used are suitable for the application: aluminum wheels, steel wheels, brake drum thickness.

⚠ CAUTION

Inner cap nuts must be deep enough to ensure the stud will not bottom inside the nut and must be of a configuration approved by wheel manufacturer.

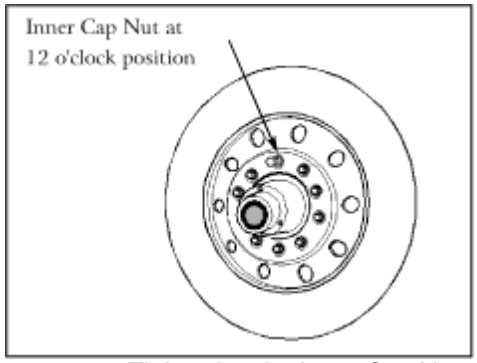
2 . Rotate the hub to bring a drum pilot to the top (12 o'clock) position (see figure 31). Position the inner wheel and tire assembly over the studs against the drum



Rotating the Wheel Pilot to 12 O'Clock
FIGURE 31

3 . Beginning in the 12 o'clock position, install the inner cap nuts by hand to ensure they are not cross-threaded. Do not tighten any nuts at this time.

4 . Apply sufficient torque (about 50 Ft.•Lbs.) to the inner top cap nut to draw the brake drum up on the drum pilot and against the hub and seat the ball seat of the nut into the ball socket of the wheel (see figure 32).

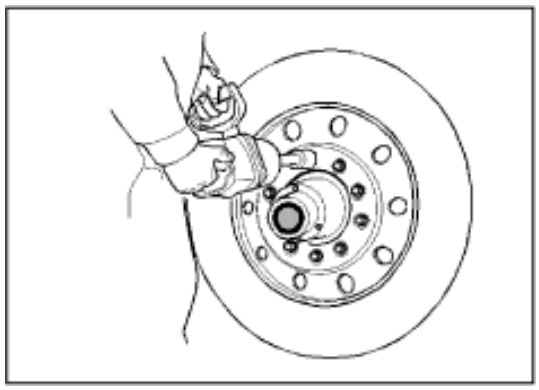


Tightening the Inner Cap Nuts
FIGURE 32

5 . To properly center the wheel, lightly tighten the remaining wheel nuts. Verify the drum is in place over the drum pilots

.

6 . Starting with the top nut first and using a staggered pattern, torque the inner wheel nuts in stages to 450-500 Ft•Lbs. (see figure 33). The last nut rotation must be with a calibrated torque device.

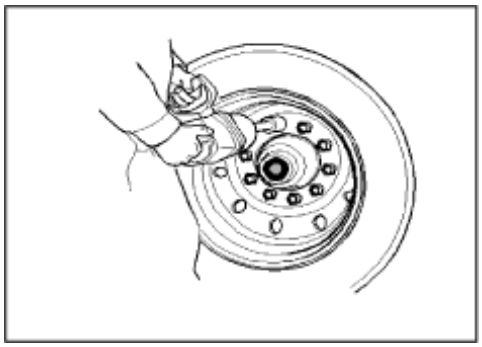


Torquing the Inner Wheel Nuts
FIGURE 33

NOTE

Use the appropriate nuts with the above technique to install the front and outer dual wheels. Follow your shop practice to locate the valve stems.

7. Install the outer wheel and nuts and tighten to 450-500 Ft.•Lbs. (see figure 34). The last nut rotation must be with a calibrated torque device.



Torquing the Outer Wheel Nuts
FIGURE 34

8. Inspect the brake and wheel installation by checking the seating of the wheel(s) and drum at the pilots and by turning the wheel(s) and check for any irregularity.

⚠ DANGER

Excessive or inadequate wheel nut torque can result in a failure of the wheel mounting system. After the first 50-100 miles, retorque all the nuts to 450-500 Ft.• Lbs. Always remove the load from the wheels by jacking the truck or trailer up when retorquing. Loosen the outer nuts to retorque the inner nuts.

SPECIFICATIONS

Service Parts List
TABLE 4

Hub	Description	Bearing Number
Steer Axle 12,000 / 14,600 lb GAWR	Inner Cup	HM212011
	Inner Cone	HM212049
	Outer Cup	3720
	Outer Cone	3782
"R" Series Drive Axle	Inner Cup	592A
	Inner Cone	594A
	Outer Cup	572
	Outer Cone	580

Hub	Description	Bearing Number
"TN" Trailer Axle	Inner Cup	HM218210
	Inner Cone	HM218248
	Outer Cup	HM212011
	Outer Cone	HM212049
"TP" Trailer Axle	Cups	HM518410
	Cones	HM518445

Assembly Aids Kit (Part No. 107525)
TABLE 5

ConMet Part No.	Part Description	Qty
107526	Cup Pusher Trailer TN Inner NP503727	1
107527	Cup Pusher Trailer TN Outer Steer Inner, NP026773	1
107528	Cup Pusher Steer Outer, NP 435398	1

ConMet Part No.	Part Description	Qty
107529	Cup Pusher Trailer TP Inner or Outer NP593561	1
107530	Cup Pusher Drive Inner, NP363298	1
107531	Cup Pusher Drive Outer, NP053874	1

Dissembly Aids Kit (Part No. 107532)
TABLE 6

ConMet Part No.	Part Description	Qty
107533	Cup Knockout Trailer TN Inner NP503727	1
107534	Cup Knockout Trailer TN Outer NP026773	1
107535	Cup Knockout Steer Outer NP435398	1
107536	Cup Knockout Steer Inner NP026773	1

ConMet Part No.	Part Description	Qty
107537	Cup Knockout Drive Inner NP363298	1
107538	Cup Knockout Driver Outer NP053874	1
107539	Cup Knockout Trailer TP (Inner or Outer) NP593561	1

Wheel End Torque Specifications
TABLE 7

Item	Measurement	Torque (Ft lbs)	Notes
Ball Seat	3/4-16	450-500	Alwys tighten the top nut first. If lubricant is used, apply sparingly on threads only. Consult the wheel manufacturer for torque requirements. Do not lubricate the faces of the hub, drum, wheel or on the ball seats of the wheel nuts.
Wheel Nut	1 1/8-16		
Hub Pilot	22 mm x 1.5 mm	450-500	Alwys tighten the top nut first. Apply two drops of oil between the nut and nut flange, and two or three drops to the outermost 2 or 3 threads of the wheel studs. Lightly lubricate the wheel pilots on the hub.
Wheel Nut			
Drive Studs	3/4-16	40-60	Consult manufacturer's instructions for drive axle shaft installation for all drive studs.
	5/8-18		
	1/2-20		
Hub Cap	5/16-18	12-18	-
Oil Fill Plug	1/4 npt	20-25	-
	3/8 npt		-
	9/16-18		O-ring Style
Disc Brake Rotor			See breake manufacturer
Inboard Brake Drum		175-200	-

SPECIFICATIONS

Manual Wheel Bearing Adjustment Procedures*
TABLE 8

For best results, check bearing adjustment with a magnetic base dial indicator that reads to the nearest .0001".

<table>
<tr><td colspan="8">Step 1: Lubricate the bearings with the manufacturer's recommended lubricant before proceeding with Step 2.</td></tr>
<tr><td colspan="8">Steps 2-6: Preliminary Bearing adjustment (listed below)</td></tr>
<tr><td rowspan="2">Initial Torque on Adjusting Nut</td><td rowspan="2">Initial Back Off on Adjusting Nut</td><td rowspan="2">Final Torque on Adjusting Nut</td><td colspan="3">Back Off of Adjustment Nut</td><td colspan="2">Jam Nut Torque</td></tr>
<tr><td>Axle Type</td><td>Threads Per Inch</td><td>Final Back Off</td><td>Nut Size or Type</td><td>Torque</td></tr>
<tr><td>Step 2</td><td>Step 3</td><td>Step 4</td><td colspan="3">Step 5</td><td colspan="2">Step 6</td></tr>
<tr><td rowspan="6">200 lb-ft while rotating hub</td><td rowspan="6">One full turn</td><td rowspan="6">50-lb-ft while rotating hub</td><td rowspan="4">Steer (font non-drive)</td><td>12</td><td>1/6 turn**</td><td colspan="2" rowspan="2">No jam nut
Install cotter pin</td></tr>
<tr><td>18</td><td>1/4 turn**</td></tr>
<tr><td>14</td><td rowspan="2">1/2 turn</td><td rowspan="2">Under 2-5/8"</td><td rowspan="2">200-300 lb-ft</td></tr>
<tr><td>18</td></tr>
<tr><td rowspan="2">Drive</td><td>12</td><td rowspan="2">1/4 turn</td><td>Dowell washer</td><td>300-400 lb-ft</td></tr>
<tr><td>16</td><td>Tang*** washer</td><td>200-275 lb-ft</td></tr>
<tr><td>Trailer****</td><td>12
16</td><td>1/4 turn</td><td>2-5/8" and over</td><td>300-400 lb-ft</td></tr>
<tr><td colspan="8">Step 7: Final Bearing Adjustment</td></tr>
<tr><td colspan="3" rowspan="5">Measure the preliminary bearing adjustment end play with a .0001" reading magnetic base dial indicator.
If zero end play is measured, back the adjustment off about one half flat and remeasure.
Use the chart to the right as a guide to identify how far to turn the nut to make the final adjustment.</td><td rowspan="2">Spindle threads Per Inch</td><td colspan="3">Bearing Adjustment - Change Per Nut Flat</td></tr>
<tr><td>6 Flat Nut</td><td>8 Flat Nut</td></tr>
<tr><td>12</td><td>.0139"</td><td>.0104"</td></tr>
<tr><td>14</td><td>.0119"</td><td>.0089"</td></tr>
<tr><td>16</td><td>.0104"</td><td>.0078"</td></tr>
<tr><td>18</td><td>.0093"</td><td>.0069"</td></tr>
</table>

* **The goal is to achieve wheel bearing end play of .001" to .0005" when measured with a dial indicator. If end play is not within .001" to .005", readjustment is recommended.**

** Single nut

*** For single axle (13,000 - 19,000 lb capacity) with tang washers, consult manufacturer's specifications.

**** Positive adjustment wheel bearings (a product of Rockwell International), use 250-300 lb•ft on adjusting nut and jam nut. See Rockwell Field Maintenance Manual No. 14.

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