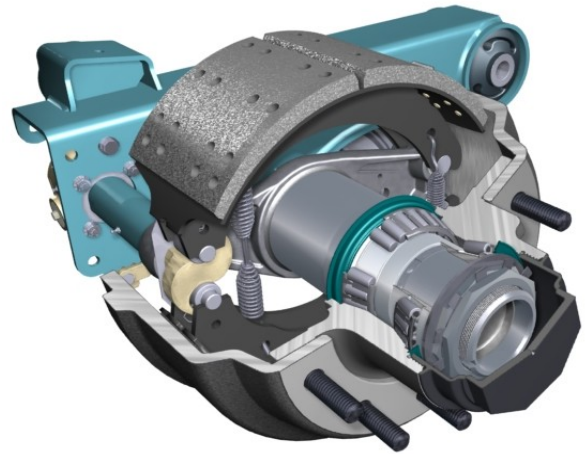
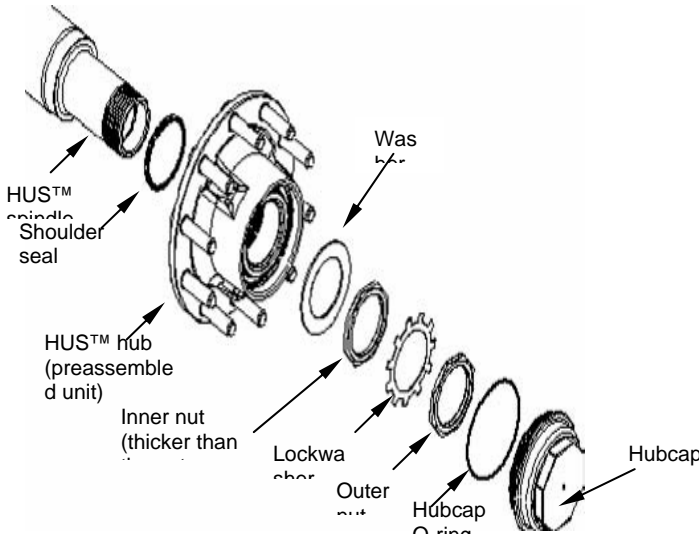


H TECHNICAL BULLETIN

No: 97117-126
Subject: HUS Wheel End Procedures
Product: Wheel Ends – Asia Pacific Region
Date: November 2004 **Revision:** A



HUS™ HUB PROCEDURES INTRODUCTION

The HUS™ hub is a permanently sealed and lubricated assembly designed to help reduce wheel-end maintenance.

The following features are unique to the HUS hub and help to distinguish it from the other hub assemblies found on INTRAAX® suspensions:

- It is constructed of steel and manufactured by SKF.
- The hubcap screws onto the hub and has no provision for adding lubricant.
- Warranty and service information is stamped on the hubcap.
- The four piece axle spindle locking

hardware consists of a washer, a thicker inner nut, a bendable tab lockwasher and a thinner outer nut.

The inner nut is also stamped with installation information.

Because the spindle locking hardware is unique to the HUS hub, it is not interchangeable with other INTRAAX hub assemblies or other unitised hubs.

Except for the shoulder seal, hubcap, hubcap O-ring, wheel studs and lug nuts, **THERE ARE NO SERVICEABLE COMPONENTS IN THE HUS HUB ASSEMBLY.**

Should it become necessary, the entire HUS hub must be replaced as a complete assembly.

INSPECTIONS AND INSPECTION INTERVALS

At regular intervals, the HUS hub should be checked for seal leaks, smooth rotation and end play.

In addition to the intervals listed below, all three inspections should be done at each brake reline, since the wheel end will be dismantled enough to make these inspections easy. In addition to the inspection at brake service, always maintain current shop preventive maintenance and pre-trip inspection practices.

Every Three Months

Visually inspect the back of the hub and the hubcap for leakage. Refer to the section titled **“CHECKING FOR SEAL LEAKS”** for complete inspection details.

Every 12 months or 160,000 km),

Or whichever occurs first

Visually inspect the back of the hub and the hubcap for leakage and check the HUS hub for smooth rotation. Refer to the section titled **“CHECKING FOR SMOOTH ROTATION”** for complete inspection details.

If the bearings feel rough or sound noisy, contact the Hendrickson technical service department for advice.

CHECKING FOR SEAL LEAKS

1. Check the back side of the hub.

The HUS™ hub gets filled with grease at the factory during the manufacturing process. The grease is contained in the hub by an integral inboard grease seal.

A small amount of grease may be visible at this seal. **This is a normal occurrence and does not indicate a seal leak.**

If this seal is leaking, a large quantity of grease will be present on the back side of the hub.

If you see this condition, replace the hub.

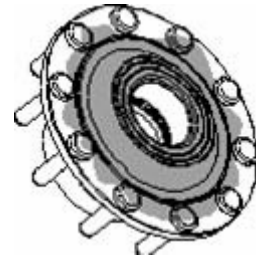


Figure 2: Check back side of hub for grease seal leak

During hub installation, a small amount of grease will appear at the spindle bearing shoulder to hub joint. **This is also normal and does not indicate a seal leak.**

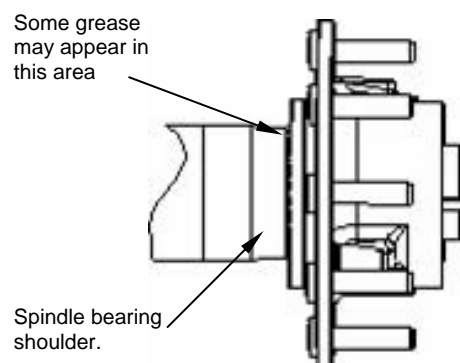


Figure 3: Normally present grease at spindle bearing shoulder



Figure 4: Normally present grease at hub outer bearing seal.

Small amounts of grease may also be visible on the other side of the hub outer seal (Figure 4).

This is also normal and does not indicate a seal leak.

However, if a large amount of grease is visible, the seal is leaking and the hub should be replaced.

CHECKING FOR SMOOTH ROTATION

1. Rotate the hub in both directions. Check for free, smooth and quiet rotation.
2. If the bearings feel rough or sound noisy, contact the Hendrickson technical service department.

CHECKING END PLAY

This procedure should only be attempted when the rotation check reveals a rough feeling, noisy sounding hub and the Hendrickson technical service department has advised you to perform this check.

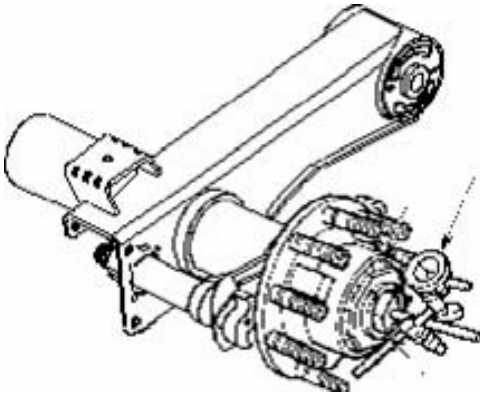


Figure 5: Attaching a dial indicator to check end play.

1. Attach the magnetic base of a dial indicator to the end of the spindle.
2. Adjust the dial indicator so that its pointer touches the hub.

Slightly rotate the hub in both directions while pushing the hub inward until the dial indicator reading remains constant.

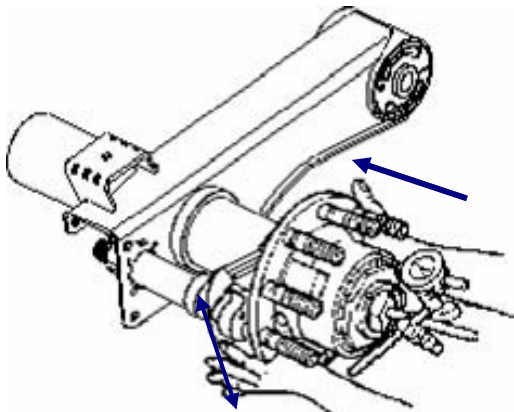


Figure 6: Push the hub inward while rotating in both directions.

Zero the dial indicator.

Pull the hub outward until the dial indicator reading remains constant DO NOT rotate the hub.

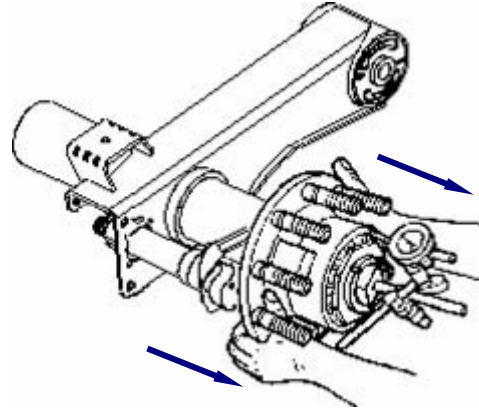


Figure 7: Pull the hub outwards.

Read the value on the dial indicator.

This value indicates end play.

Correct end play is between 0.000 and 0.006 in.

If excess end play is identified (more than 0.008 in.), contact the Hendrickson technical service department. They will provide further assistance.

DO NOT attempt to remove the hub without first contacting Hendrickson.

REMOVAL

The HUS™ hub is a permanently sealed and lubricated assembly designed to help reduce wheelend maintenance.

Except for the shoulder seal, hubcap and hubcap O-ring, no individual component of the HUS hub assembly can be serviced.

When necessary, the entire HUS hub must be replaced as an assembly.

IMPORTANT:

Do not attempt to remove the hub bearings, seals or lubricant from the unitized assembly.

Removal of these components will void the warranty.

Under normal operating conditions, it is not necessary to remove the HUS hub assembly from the axle.

The only exception is when stripped or damaged wheel studs need to be replaced. If that is the case, use the following procedure to remove the HUS hub assembly.

1. Obtain an HUS hub service kit. CR Part Number SK831.

The service kit consists of a tube of Molykote D lubricant, a shoulder seal and a hubcap O-ring.

Whenever the HUS hub is removed from the spindle, the shoulder seal must be replaced, the entire spindle (except for the spindle threads) and hub bore must be wiped clean and relubricated with Molykote D and the hubcap O'Ring must be inspected and replaced (if necessary. Refer to the **"HUBCAP O-RING INSPECTION PROCEDURE "** for more inspection details).

2. Remove the tyre & wheel assembly.

CAUTION:

Remove the wheel nuts to remove the tyre & wheel assembly.

Do not remove the inner and outer spindle nuts and then attempt to remove the tyre & wheel assembly, brake drum and hub as an entire assembly.

The clip inside the hub bore can dislodge, causing the hub to disassemble. Damage to components can result.

3. Disengage the brake shoes and remove the brake drum.
4. Remove the hubcap by rotating it counterclockwise.

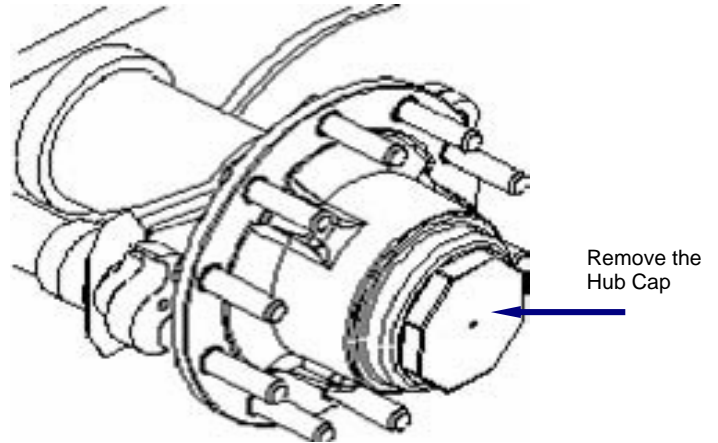


Figure 8: Remove the Hub Cap.

5. Using a screwdriver or other suitable tool, straighten the two opposing flattened lockwasher tabs until they clear the outer nut.

CAUTION:

Keep the tool securely on the lockwasher tabs. If the tool slips off the tabs, damage to the hub outer seal can occur.

NOTE:

Because of the high installation torque (700 ft. lbs., 949 Nm), a torque multiplier may be useful when removing the inner and outer spindle nuts in the following step.

6. Remove the outer spindle nut, lock washer, inner spindle nut and washer. Use care when removing the inner spindle nut to prevent damage to the hub outer seal.

NOTE:

With the outer nut, lockwasher, inner nut and washer removed, it is possible to see most of the hub outer seal. Small amounts of grease may be visible at the hub outer seal .

This is a normal occurrence and does not indicate a seal leak.

However if a large amount of grease is visible, the seal is leaking and the hub must be replaced.

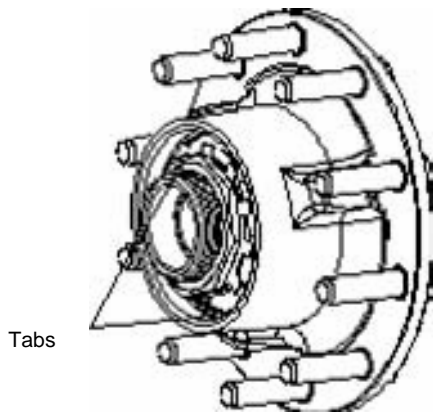


Figure 9: Straighten the lockwasher tabs.

WARNING:

WHEN REMOVING THE HUB ASSEMBLY FROM THE AXLE SPINDLE IN THE FOLLOWING STEP, CAREFULLY PULL THE HUB OFF THE SPINDLE AS STRAIGHT AS POSSIBLE TO AVOID DISLODGING THE CLIP INSIDE THE HUB BORE. IF THE CLIP BECOMES DISLODGED, THE HUB WILL DISASSEMBLE, WHICH CAN CONTAMINATE THE LUBRICANT AND VOID THE WARRANTY. DAMAGE TO COMPONENTS CAN RESULT.

DO NOT ATTEMPT TO REBUILD A DISASSEMBLED HUB. A NEW HUS HUB MUST BE INSTALLED.

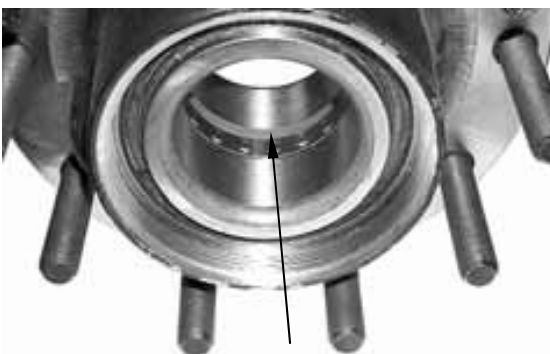


Figure 10: Avoid dislodging the clip inside the hub bore.

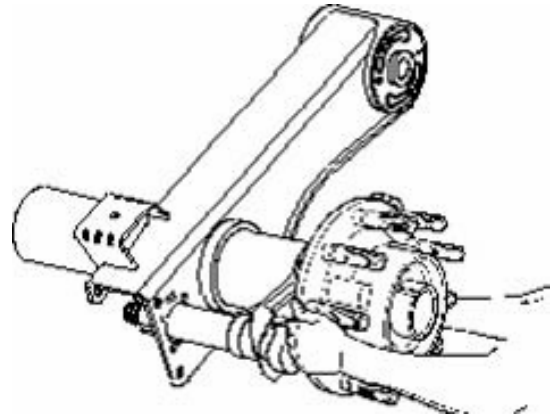


Figure 11: Removing the HUS Hub.

CAUTION:

To prevent damage to the hub outer seal, keep all contaminants away from the seal when removing the hub.

3. Grasp the hub assembly with both hands. If the hub assembly is free on the axle spindle, pull the hub as straight as possible to avoid dislodging the clip inside the hub bore. If the hub assembly is stuck on the axle spindle, use either one of the following procedures to remove the hub from the spindle:

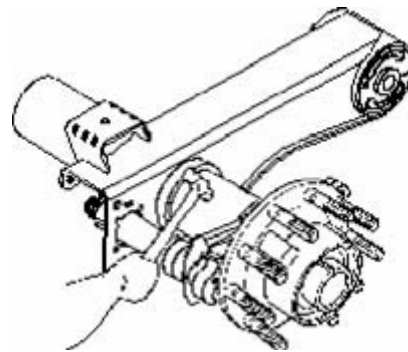


Figure 12: Tap lightly on the axle to loosen the Hub

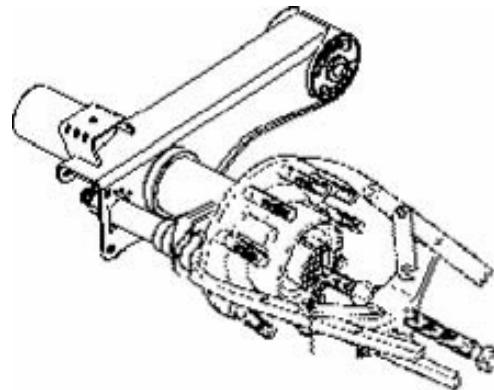


Figure 13: Removing the Hub with a Puller.

1. Tap lightly on the unmachined part of the axle with a hammer. (Figure 12) Tapping may loosen the hub assembly for easier removal.

OR

Attach a three-pronged puller to the hub. (Figure 13)

Install a metal plate between the puller screw and the end of the spindle

CAUTION:

To prevent damage to the end of the spindle, always use a metal plate between the puller screw and the end of the spindle.

3. While holding the puller screw stationary, spin the hub to remove it from the axle.
4. When the hub reaches the end of the spindle, pull the hub off the spindle as straight as possible to prevent dislodging the clip inside the hub bore.

IMPORTANT:

If a puller is required to remove a stuck HUS hub, do not reinstall the same hub. Replace the hub.

INSTALLATION

NOTE:

A torque bar or torque multiplier capable of measuring at least 700 ft. lbs. (949 Nm) of torque is required to install the HUS™ hub.

Whenever the HUS™ hub is removed from the spindle, the shoulder seal must be replaced before the hub is installed. Use the following procedure to replace the shoulder seal.

1. Carefully remove the existing shoulder seal. Take care not to scratch, nick or otherwise mark the hub bore when removing the seal.
2. Install the new shoulder seal into the inner ring groove in the hub. When properly oriented for installation, the shoulder seal inner diameter will taper inward. Do not force the shoulder seal into the inner ring groove.

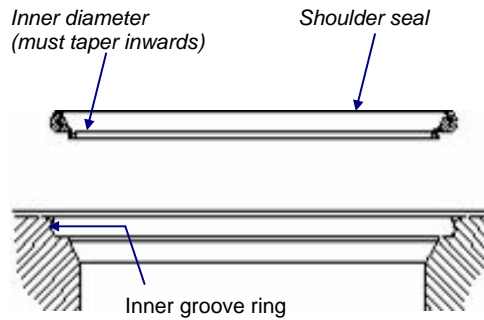


Figure 15: Shoulder seal installation details.

CAUTION:

To prevent damage to the hub outer seal, keep all contaminants away from the seal when installing the hub.

To prevent HUS hub component damage, do not use solvents to clean the hub bore. Solvents can enter the hub and contaminate the lubricant.

Do not attempt to install the hub, brake drum and tyre & wheel assembly as an entire assembly.

The clip inside the hub bore can dislodge, causing the hub to disassemble and damage to components can result.

3. Remove the old grease from the axle spindle, axle threads and hub bore by wiping with a clean rag.
4. Check the axle spindle and hub bore for scratches, nicks or marks. If necessary, repair them with fine emery cloth.
5. Use your finger to verify that the hub side of the axle bearing shoulder and the side of the hub that contacts this shoulder are completely free of debris.

CAUTION:

Prevent debris from entering the joint between the hub and the axle bearing shoulder. If debris is trapped in this joint, it can create a gap that allows water to enter the axle spindle area and cause corrosion.

6. Use Molykote D spindle grease to lubricate the entire axle spindle (except the threads), including the bearing journals and the hub side of the bearing shoulder. DO NOT allow any lubricant to get on the spindle threads.

CAUTION:

When installing the hub assembly onto the spindle in the following step, align the hub bore straight onto the spindle to avoid dislodging the clip inside the hub bore.

If the clip becomes dislodged, the hub will disassemble, which can contaminate the lubricant and void the warranty.

Do not attempt to rebuild a disassembled hub. A new HUS™ hub must be installed.

CAUTION:

When installing the hub assembly onto the spindle in the following step, do not force the hub assembly onto the spindle. The hub can jam on the spindle resulting in component damage.

Also make sure the shoulder seal does not fall out of the inner ring groove. If the shoulder seal falls out of the groove, remove the hub and inspect the shoulder seal for tears before re-installing the shoulder seal and retrying the hub installation.

7. Carefully align the hub bore to the spindle and slide the hub straight onto the spindle. Tapping lightly on the unmachined part of the axle with a hammer may help ease hub installation. The hub is correctly installed when it contacts the spindle bearing shoulder. Do not force the hub assembly onto the spindle. If the hub does not slide easily onto the spindle, carefully remove the hub so that you do not dislodge the clip inside the hub bore or damage the shoulder seal and

repeat step seven until the hub is correctly aligned.

NOTE:

It is normal to see a small bead of grease at the spindle bearing shoulder when the hub is installed onto the spindle.

8. Install the inner washer.

NOTE:

When installing the spindle nuts in the following steps, rotate the hub while tightening the nuts to the specified torque.

9. Install the inner nut. While rotating the hub, use a torque wrench to tighten the inner nut to 700 ft. lbs. (949 Nm) of torque. Be careful not to damage the hub outer seal when tightening the inner nut.
10. Install the lockwasher (figure 64) and verify that the tab is correctly inserted into the spindle keyway.
11. Install the outer nut. Use a torque wrench to tighten the outer nut to 250 ft. lbs. (340 Nm) of torque.
12. Bend two lockwasher tabs over opposing flats of the outer nut.

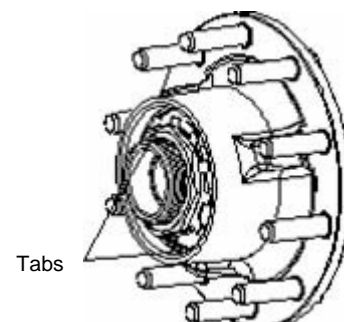


Figure 17: Bend the opposing tabs over the outer nut.

CAUTION:

When bending the lockwasher tabs, keep the tool securely on the tabs. If the tool slips off the tabs, damage to the hub outer seal can occur.

13. Inspect the hubcap O-ring and replace it if necessary. Refer to the “**HUBCAP O-RING INSPECTION PROCEDURE**” for more inspection details.

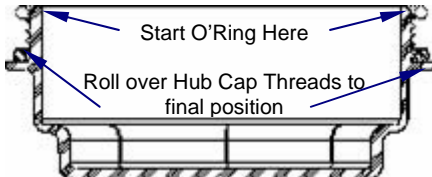


Figure 18: Hub Cap O' Ring installation details.

14. If a new O-ring is required, install it by rolling it over the hubcap threads.
15. Install the hubcap and tighten it to 50-75 ft. lbs. (68-102 Nm) of torque.

HUBCAP O-RING INSPECTION PROCEDURE

The hubcap O-ring helps prevent moisture from entering the hub. A cracked or torn O-ring will allow moisture to pass through to the internal part of the hub, which can shorten the life of the hub. Therefore, the hubcap O-ring should be replaced if flat spots, cuts, tears or surface breakdown are observed.

WHEEL STUD REMOVAL AND REPLACEMENT

Replacing a stripped or damaged wheel stud is the only service procedure that requires removing the HUS™ hub from the axle (except for hub replacement). When replacing a wheel stud, use only wheel studs manufactured for use with the HUS hub (CR part numbers ST91 for short studs or ST113 for long studs). www.chicago-rawhide.com for complete sizing and ordering details.

Use the following procedure to replace a damaged wheel stud on the HUS hub.

WARNING:

THE FOLLOWING PROCEDURE REQUIRES THE USE OF A HYDRAULIC PRESS. TO AVOID SERIOUS PERSONAL INJURY AND COMPONENT DAMAGE, OBSERVE ALL WARNINGS AND CAUTIONS PROVIDED BY THE HYDRAULIC PRESS MANUFACTURER.

1. Remove the hub following the “REMOVAL” instructions.
2. Support the inboard side of the hub flange perpendicular to the press cylinder.
3. Use the press cylinder to push on the threaded end of the stud and force it out of the hub.
4. Turn the hub over. Support the outboard side of the hub flange perpendicular to the press cylinder.
5. Use the press cylinder to push on the stud head, applying no more than 10,000 pounds (44,500N) of force to seat the new stud.
6. Install the hub following the “INSTALLATION INSTRUCTIONS”

PREPARING THE HUS HUB FOR HUBODOMETER INSTALLATION

Use the following procedure to prepare the HUS hub for hubodometer installation.

1. Remove the hubcap.
2. Using the pilot in the centre of the hubcap, drill a 9/16-in. hole through the hubcap. Remove all drilling residue from the hubcap.
3. Install the hubodometer stud into the hole just drilled. Tighten the stud to the manufacturer's torque specification.
4. Remove and discard the existing hubcap O-ring.

NOTE:

A new hubcap O-ring must be installed whenever the Hub Cap is removed and replaced.

5. Install a new O-ring by rolling it over the hubcap threads.
6. Install the hubcap and tighten it to 50-75 ft. lbs. (68-102 Nm) of torque.

WARNING

**Do not attempt to rebuild a disassembled hub.
A new HUS™ hub must be installed.**

Further information is available from
Hendrickson Asia Pacific Product
Support Department 61 3 9767 3400
or E-mail:
technicalservice@hendrickson.com.au

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