ASSEMBLY INSTRUCTIONS

STEERTEK™ NXT • STEERTEK™ Axle

SUBJECT: Kingpin Bushing and Thrust Bearing Service Kits
LIT NO: 59310-011
DATE: August 2025 **REVISION:** F

INTRODUCTION

This publication is intended as an overview to assist maintenance personnel with the installation, on an as-needed basis, of Kingpin Bushing and Thrust Bearing Service Kits on **STEERTEK™ NXT • STEERTEK** front steer axles equipped on AIRTEK® • SOFTEK® suspension systems or approved proprietary vehicle manufacturer suspensions.

STEERTEK NXT AXLE Service Kits		STEERTEK AXLE Service Kits	
KINGPIN BUSHING	**THRUST BEARING**	**KINGPIN BUSHING**	**THRUST BEARING**
60961-628 Axle Set 60961-629 Composite* 60961-630 Roller*	60961-631 Axle Set 60961-632 Composite* 60961-633 Roller*	60961-040 Axle Set 60961-009 Composite* 60961-039 Roller*	60961-043 Axle Set 60961-041 Composite* 60961-042 Roller*
 *Kit No. 60961-628 Shown*	 *Kit No. 60961-631 Shown*	 *Kit No. 60961-040 Shown*	 *Kit No. 60961-043 Shown*
Contents: (2) Upper Grease Cap Assembly (2) Lower Grease Cap Assembly (4) Kingpin Bushing (1) Composite Thrust Bearing (1) Roller Thrust Bearing (4) Kingpin Seal (4) ⅝"-11 UNC Socket Head Cap Screw (2) Loctite Tube (2) Grease Zerk	**Contents:** (1) Composite Thrust Bearing (1) Roller Thrust Bearing (4) Kingpin Seal (4) ⅝"-11 UNC Socket Head Cap Screw (2) Loctite Tube	**Contents:** (4) Grease Cap Assembly (4) Retaining Ring (4) Kingpin Bushing (1) Composite Thrust Bearing (1) Roller Thrust Bearing (4) Kingpin Seal (4) ⅝"-11 UNC Socket Head Cap Screw (2) Kingpin Shim (1) Loctite Tube	**Contents:** (1) Composite Thrust Bearing (1) Roller Thrust Bearing (4) Kingpin Seal (4) ⅝"-11 UNC Socket Head Cap Screw (4) Kingpin Shim (1) Loctite Tube
*Each kit is designed to service one steering knuckle assembly.			

Proper maintenance, service and repair are important to the reliable operation of the suspension and axle. For additional detailed instructions on preventive maintenance, component replacement and torque specifications on these components, refer to the (1) applicable Hendrickson Technical Publications (available online at www.hendrickson-intl.com) specific to the respective vehicle manufacturer at hand and (2) applicable vehicle manufacturer technical publications.

⚠ CAUTION

A TECHNICIAN USING A SERVICE PROCEDURE OR TOOL WHICH HAS NOT BEEN RECOMMENDED BY HENDRICKSON MUST FIRST SATISFY THEMSELVES THAT NEITHER THEIR SAFETY NOR THE VEHICLE'S SAFETY WILL BE JEOPARDIZED BY THE METHOD OR TOOL SELECTED. INDIVIDUALS DEVIATING IN ANY MANNER FROM THE INSTRUCTIONS PROVIDED ASSUME ALL RISKS OF POTENTIAL PERSONAL INJURY OR DAMAGE TO EQUIPMENT INVOLVED.

STEERING KNUCKLE DISASSEMBLY

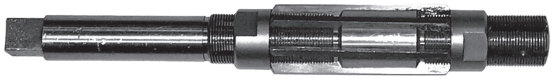
Prior to servicing kingpin bushings and thrust bearings, perform the (1) steering knuckle disassembly, (2) kingpin preparation and measurement, (3) kingpin bushing removal, (4) steering knuckle bore measurement, and (5) kingpin bushing installation procedures as found in the applicable STEERTEK NXT • STEERTEK • AIRTEK • SOFTEK Technical Publications (available online at www.hendrickson-intl.com).

KINGPIN BUSHING TOOLS

ADJUSTABLE STRAIGHT FLUTE REAMER

1.802" to 1.812" Cutting Diameter

McMaster-Carr #3141A28



EXTENSION PILOT TOOL

McMaster-Carr #3004A32

OR

PRECISION-FINISH CYLINDER HONE

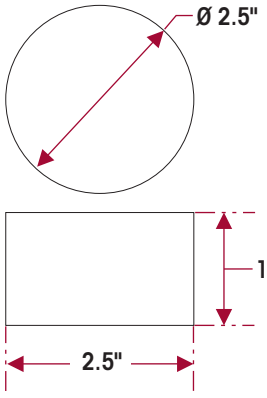
1.75" to 2.75" Cylinder ID

McMaster-Carr #7362A45

KINGPIN BUSHING AND SEAL TOOLS – SHOP MADE TOOLS

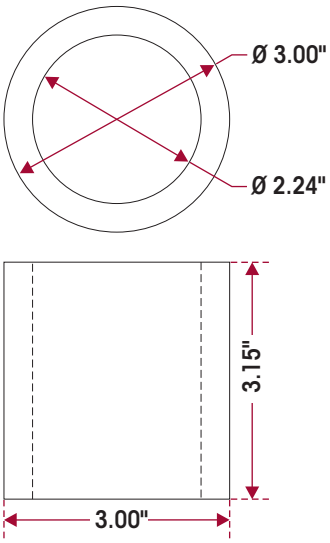
These shop made tools are designed to help install and remove kingpin bushings. Bushing tools are made from cold rolled steel or equivalent. Drawings are for reference only. Hendrickson does not supply these tools.

*Bushing Driver

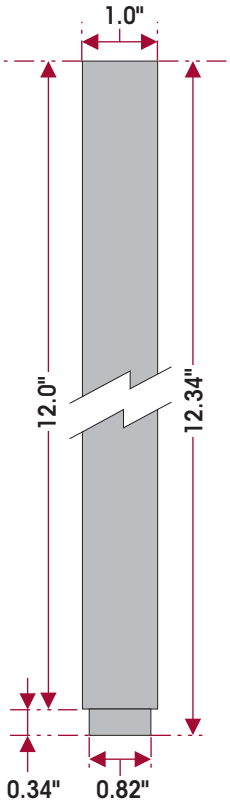


Bushing Receiving Tool

(press bushing replacement)

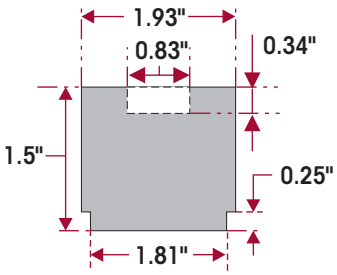


**Kingpin Handle



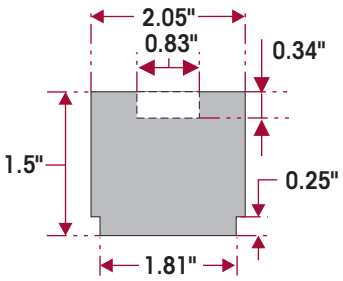
Bushing Installer / Remover Tool

(to seat bushing)



Seal Installer Tool

(to seat seal)



NOTE: * The **bushing driver** is necessary to sink the kingpin bushing flush into the steering knuckle bore.

** **Kingpin Handle** is used for both bushing installer /remover and seal installer tools

KINGPIN BUSHING

You will need:

To conduct kingpin bushing removal, reaming or honing, and installation; and kingpin seal installation, you will need the following tools.

- **A hydraulic shop press** with a minimum forcing capacity of 2.5 tons (or an arbor press) or use hand tools. If a shop press is not available to remove/install the kingpin bushings, an acceptable **optional method** is to use a hammer along with the appropriate shop made tools on a work bench.
- An adjustable straight flute reamer with extension pilot tool **or** precision-finish cylinder hone
- Kingpin Bushing and Seal Tools (including Kingpin Handle, Kingpin Bushing Installer/Remover Tool, Bushing Driver and Bushing Receiving Tool), refer to Page 2.
- Vise with brass jaws (soft jaws)

NOTE If one (1) bushing is worn or damaged, it is mandatory to replace both the upper and lower bushings on that knuckle assembly.

⚠ WARNING BEFORE APPLYING HYDRAULIC PRESSURE TO ANY TOOLING SET-UP, ALWAYS CHECK TO ENSURE THE PRESS PLATE, TOOLS, AND COMPONENTS BEING WORKED ON ARE POSITIONED PROPERLY, I.E. "IN LINE" WITH THE RAM OF THE PRESS. IMPROPER POSITIONING CAN CAUSE PERSONAL INJURY OR COMPONENT DAMAGE.

⚠ CAUTION PRIOR TO APPLYING HYDRAULIC PRESSURE TO REMOVE OR INSTALL THE KINGPIN BUSHING, SUPPORT THE LOWER STEERING KNUCKLE AS SHOWN IN FIGURE 1. IMPROPER SUPPORT TO THE STEERING KNUCKLE CAN CAUSE COMPONENT DAMAGE.

KINGPIN BUSHING REMOVAL

NOTE To remove the kingpin bushing, always **drive the bushing from the non-machined surface** of the upper or lower steering knuckle.

1. **STEERTEK NXT** axle – Remove the threaded grease cap and grease zerk.
   STEERTEK axle – Remove the threaded grease cap retaining ring.
2. Place the **machined surface** of the upper or lower steering knuckle face down (axle side down), ensure that each part of the steering knuckle assembly is squarely supported on the bushing receiving tool before applying hydraulic pressure to press out the kingpin bushings, see Figures 1 and 2.
3. From the **non-machined surface** of the upper or lower steering knuckle, use the kingpin bushing installer/remover tool (see Special Tools section of this publication) to drive the kingpin bushing and kingpin seal out of the steering knuckle, see Figure 3.
4. Clean the parts and inspect for reassembly, see Figure 4.

FIGURE 1

FIGURE 2

FIGURE 3

FIGURE 4

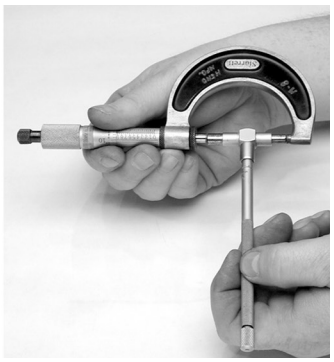
STEERING KNUCKLE BORE MEASUREMENT

Complete the following steering knuckle bore inspection and measurement instructions prior to installing the kingpin bushing.

FIGURE 5

FIGURE 6

FIGURE 7



1. Measure the upper and lower steering knuckle bore inside diameter at two locations. Always use an inside micrometer or a telescoping gauge when taking a knuckle bore measurement. The two positions must be 90° opposed from each other, see Figures 5 through 7. Some out-of-roundness at the top and bottom of the bore edges is acceptable. Steering knuckle bore diameter specification is 1.938" ± 0.003".
   a. If the average measurement is more than the knuckle bore maximum diameter specification, steering knuckle replacement is necessary.

KINGPIN BUSHING INSTALLATION

⚠ WARNING

BEFORE APPLYING HYDRAULIC PRESSURE TO ANY TOOLING SET-UP, ALWAYS CHECK TO ENSURE THE PRESS PLATE, TOOLS, AND COMPONENTS BEING WORKED ON ARE POSITIONED PROPERLY, I.E. "IN LINE" WITH THE RAM OF THE PRESS. IMPROPER POSITIONING CAN CAUSE PERSONAL INJURY OR COMPONENT DAMAGE.

NOTE

If a shop press is not available to remove / install the kingpin bushings, an acceptable optional method is to use a hammer along with the shop made tools (kingpin bushing driver, receiving tool, kingpin handle, bushing installer / remover and seal installer tools) on a work bench.

NOTE

To install the kingpin bushing, always drive the bushing from the machined side of the steering knuckle.

1. Place the **machined surface** of the upper/lower steering knuckle **face up** (axle side up). Ensure that each part of the steering knuckle assembly is squarely supported before applying hydraulic pressure to press in the kingpin bushing, see Figure 8.
2. From the **machined surface** of the steering knuckle, use the kingpin bushing driver tool to drive the kingpin bushing flush into steering knuckle, see Figure 9.
3. Use the kingpin bushing installer / remover tool to sink the kingpin bushing into the steering knuckle bore to just below the seal bore, see Figures 10 and 11.
4. Properly size the kingpin bushings to fit the kingpins, see instructions in the Kingpin Bushing Reaming / Honing section of this publication.

FIGURE 8

FIGURE 9

FIGURE 10

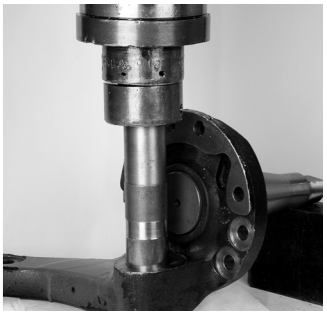
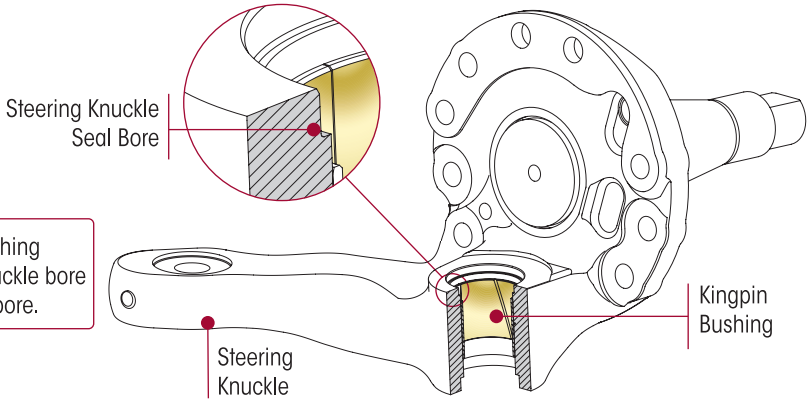


FIGURE 11



NOTE
Sink the kingpin bushing into the steering knuckle bore just below the seal bore.

KINGPIN BUSHING REAMING / HONING

Once new replacement kingpin bushings are installed, they will need to be properly sized to fit the respective kingpins using one of the following two methods: **Method A – Reaming** or **Method B – Honing**.

NOTE Bushing size is to be 0.001" larger than the kingpin size.

CAUTION DO NOT BURNISH THE KINGPIN BUSHINGS. BURNISHING WILL DAMAGE THE BUSHINGS AND VOID ANY APPLICABLE WARRANTY.

WARNING WHEN INSTALLING THE STEERING KNUCKLE COMPONENTS IN A VISE, IT IS NECESSARY TO PROTECT THE MACHINED SURFACES FROM GOUGES OR MARRING BY USING BRASS JAWS (SOFT JAWS). FAILURE TO DO SO CAN CAUSE PREMATURE PART DAMAGE, DAMAGE TO THE STEERING KNUCKLE COMPONENTS, LOSS OF WARRANTY, LOSS OF VEHICLE CONTROL, CAUSING PERSONAL INJURY OR PROPERTY DAMAGE.

WARNING PRIOR TO STEERING KNUCKLE INSTALLATION ENSURE THAT ALL RESIDUAL LOCTITE MATERIAL IS REMOVED FROM MOUNTING BOLTS AND THREAD BORES IN THE UPPER STEERING KNUCKLES, AND NEW LOCTITE 277 OR EQUIVALENT IS APPLIED TO HELP ENSURE THE BOLTS SUSTAIN THE PROPER TORQUE REQUIREMENT. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL RESULTING IN PERSONAL INJURY OR PROPERTY DAMAGE.

■ Method A – Reaming

NOTE Prior to reaming, re-assemble the steering knuckle, see Figures 12 and 13.

1. Place the steering knuckle (equipped with a replacement kingpin bushing) in a vise with brass jaws (soft jaws), see Figures 12 and 13.

FIGURE 12
Lower Steering Knuckle in Vise Shown

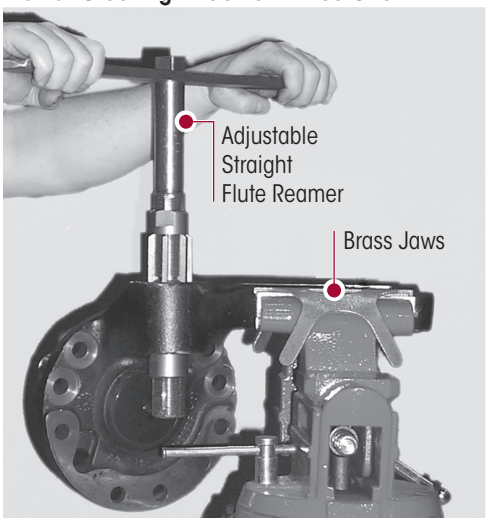
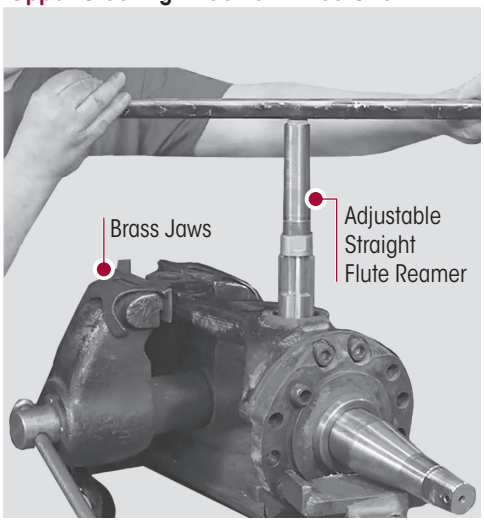


FIGURE 13
Upper Steering Knuckle in Vise Shown



2. Install the reamer onto the end of the extension pilot tool and position the extension pilot tool through the kingpin bushing.

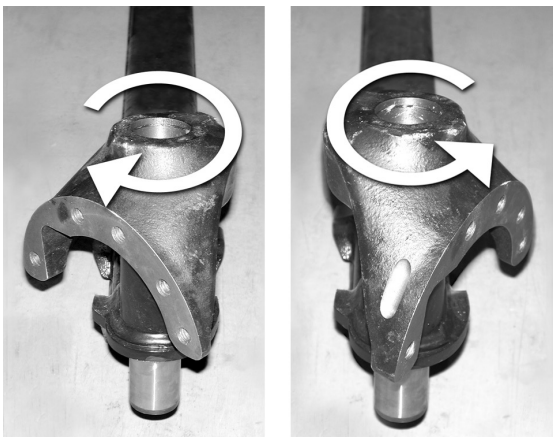
SERVICE HINT The pilot tool helps keep the reamer straight during the reaming process.

3. Slide the reamer into the steering knuckle until the blades touch the kingpin bushing inner diameter surface.
4. Rotate the reamer with a light **DOWNWARD** pressure. **DO NOT** apply too much force. Rotate the reamer smoothly, see Figures 12 and 13.
5. To remove the reamer, rotate the tool in the opposite cutting direction.
6. Remove the steering knuckle from the vise and repeat Steps 1 through 5 for the other mating steering knuckle equipped with a replacement kingpin bushing.
7. Disassemble the steering knuckle, then clean and remove all loose kingpin bushing material created by the reaming operation from the steering knuckle(s). Take special attention to remove material from the grease channels and dimples.
8. Clean the ⅝" brake backing plate bolts with a wire wheel and run a tap through the threads of the steering knuckle and then flush out with brake cleaner and dry with compressed air.
9. Lightly lubricate the mating kingpins with penetrating oil.
10. Re-assemble the steering knuckle and temporarily install it on the mating kingpin to ensure a close slip fit.

NOTE If the steering knuckle does not fit onto the kingpin, **DO NOT** force it.

11. Rotate the steering knuckle back and forth to verify there is no binding on the kingpin, see Figure 14.
12. If either of the bushings are too tight, repeat Steps 1 through 11 until proper clearance is achieved.
13. Proceed to Kingpin Seal Installation procedure.

FIGURE 14



■ Method B – Honing

1. Assemble the cylinder hone with clean, dry honing stones.

SERVICE HINT If the honing stones are damaged or oily, they should be replaced.

2. Ensure the wiper blocks are clean and dry, see Figure 15.
3. Place the steering knuckle (equipped with a replacement kingpin bushing) on a work surface.
4. Size the precision cylinder hone slightly smaller than the kingpin bushing inner diameter and insert it into the kingpin bushing, see Figures 15 and 16.
5. Increase the precision cylinder hone's diameter until there is just enough pressure on the kingpin bushing inner diameter to hold the hone in place.
6. Connect a power drive to the precision cylinder hone, see Figure 17.
7. Using the power drive, rotate the precision cylinder hone about ten revolutions in the kingpin bushing. The power drive should rotate at a speed of **less than 30 revolutions per minute (RPM)**.
8. Stop the power drive rotation.
9. Reduce the precision cylinder hone's diameter and remove it from the kingpin bushing.
10. Remove the steering knuckle from the work surface and repeat Steps 1 through 9 for the other steering knuckle.

FIGURE 15

STEERTEK NXT Axle
Upper Steering Knuckle Shown

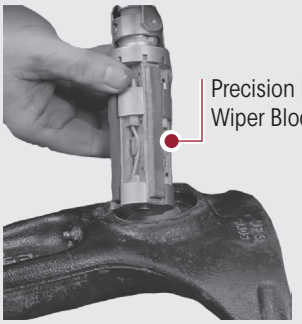
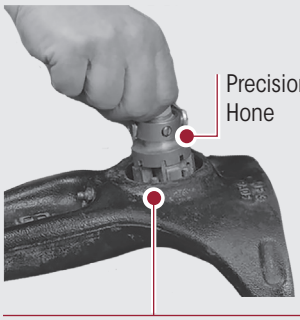


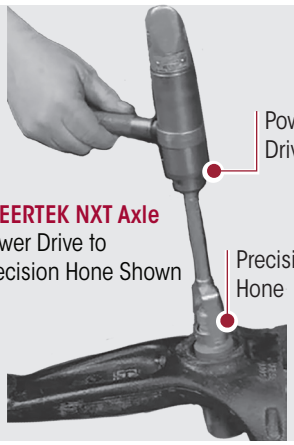
FIGURE 16

STEERTEK NXT Axle
Precision Hone in Kingpin Bushing Shown



Kingpin Bushing in Upper Steering Knuckle

FIGURE 17



STEERTEK NXT Axle
Power Drive to
Precision Hone Shown

11. Clean and remove all loose kingpin bushing material created by the honing operation from the steering knuckle(s). Take special attention to remove material from the grease channels and dimples.

NOTE If the steering knuckle does not fit onto the kingpin, **DO NOT** force it.

12. Perform Steps 8 through 11 in the Method A – Reaming section of this publication.
13. If either of the bushings are too tight, repeat steps 1 through 12 until proper clearance is achieved.
14. Proceed to the Kingpin Seal Installation procedure.

KINGPIN SEAL INSTALLATION

⚠ WARNING

WHEN INSTALLING STEERING KNUCKLE COMPONENTS IN A VISE IT IS NECESSARY TO PROTECT THE MACHINED SURFACES FROM GOUGES OR MARRING BY USING BRASS JAWS. FAILURE TO DO SO CAN CAUSE PREMATURE PART DAMAGE, DAMAGE TO THE STEERING KNUCKLE COMPONENTS, LOSS OF WARRANTY, LOSS OF VEHICLE CONTROL, CAUSING PERSONAL INJURY OR PROPERTY DAMAGE.

1. Place the steering knuckle assembly in a vise with brass jaws (soft jaws), see Figures 12 and 13, or place on a suitable workbench. The steering knuckle will have the **machined surface** facing up (axle side up).
2. Lay the kingpin seal into the bore of the steering knuckle. The seal lip should face outward or toward the axle, see Figure 18.
3. Use the seal installer tool (see tools specifications of this publication) and press seal firmly into the steering knuckle assembly.
4. **STEERTEK NXT** axle, **double lip** design, see Figure 19 – Install the kingpin seal until it bottoms out in the kingpin bore.

   STEERTEK axle, **single lip** design, see Figure 20 – Install the kingpin seal until it makes contact with the kingpin bushing.

FIGURE 18

Magnification of lip seal
Lip seal faces toward axle

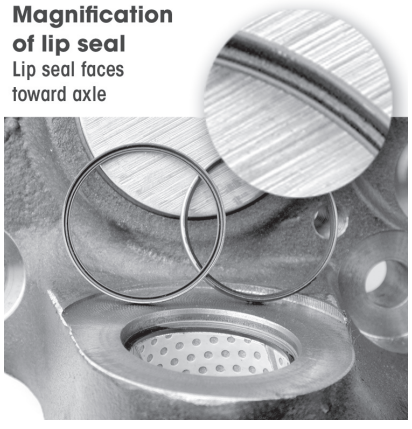


FIGURE 19

STEERTEK NXT
Magnification of the kingpin bushing and a **DOUBLE** lip seal installed in the steering knuckle.

FIGURE 20

STEERTEK
Magnification of the kingpin bushing and a **SINGLE** lip seal installed in the steering knuckle.

STEERING KNUCKLE ASSEMBLY

After replacement of the kingpin bushings, install the remaining items in the applicable Service Kits. **DO NOT** substitute aftermarket components when servicing.

1. Install the composite thrust bearing on the lower kingpin on the left side and the roller thrust bearing on the right side with the seal facing up toward axle (the black seal will designate the top side, see Figure 21).

FIGURE 21

Top View of Thrust Bearings

Composite – Left Side Roller – Right Side

Follow the Steering Knuckle Assembly procedure in the appropriate Hendrickson AIRTEK • SOFTEK • STEERTEK NXT • STEERTEK Technical Publication available online at www.hendrickson-intl.com.

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Additional Hendrickson Product Information
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Actual product performance may vary depending upon vehicle configuration, operation, service and other factors.
All applications must comply with applicable Hendrickson specifications and must be approved by the respective vehicle manufacturer with the vehicle in its original, as-built configuration.
Contact Hendrickson for additional details regarding specifications, applications, capacities, and operation, service and maintenance instructions.

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