# STEERTEK NXT High Capacity  
Steer Axle System for Autocar®  
ACX-XPEDITOR™ Vehicles

**SUBJECT:** Service Instructions  
**LIT NO:** 17730-297  
**DATE:** August 2018  
**REVISION:** A

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SECTION 1

Introduction

This publication is intended to acquaint and assist maintenance personnel in the preventive maintenance, service, repair and rebuild of the Hendrickson STEERTEK NXT High Capacity Steer Axle System for applicable Autocar® ACX-XPEDITOR™ Vehicles.

NOTE

Use only Hendrickson Genuine Parts for servicing this suspension system.

It is important to read and understand the entire Technical Procedure publication prior to performing any maintenance, service, repair, or rebuild of the product. The information in this publication contains parts lists, safety information, product specifications, features, proper maintenance, service, repair and rebuild instructions for STEERTEK NXT High Capacity Steer Axle System.

Hendrickson reserves the right to make changes and improvements to its products and publications at any time. Contact Hendrickson Tech Services for information on the latest version of this manual at 1-866-755-5968 (toll-free U.S. and Canada), 1-630-910-2800 (outside U.S. and Canada) or e-mail: techservices@hendrickson-intl.com.

The latest revision of this publication is available online at www.hendrickson-intl.com.
SECTION 2
Product Description

Hendrickson’s STEERTEK NXT High Capacity Steer Axle System — STEERTEK NXT High Capacity is a durable and lightweight alternative to forged I-beam axles. Optimized performance and integrated with Hendrickson spring and elastomer technology, STEERTEK NXT achieves complete suspension and axle system efficiency. The unique design provides up to 60 pounds of weight savings compared to traditional forged I-beam axles. Continuous beam architecture minimizes stress points for added durability. STEERTEK NXT High Capacity is rated for 100% off-highway use.

Knuckle Assembly — Removable kingpin design helps reduced maintenance. Premium kingpin bushings and seals provide enhanced protection from the elements to improve bushing life.

Multiple Axle Configurations — Single or twin steer applications, deep or standard drop, wide or narrow track, flexible spring seat centers and multiple steering arm and tie rod arm configurations.

FIGURE 2-1

TECHNICAL NOTES
1. The 20,000 pound capacity STEERTEK NXT High Capacity system is approved for 100% OFF-highway usage. Other applications must be pre-approved by both Hendrickson and vehicle manufacturer. The system has a 20,000 pound capacity with load ratings up to 24,000 pound in certain applications. System capacity represents maximum loads on tires at ground level.

2. The STEERTEK NXT system is available with 69.02” and 70.89” Intersections (KPI).

3. The STEERTEK NXT system offers 3.74” and 5.00” axle beam drop height. Axle beam drop is measured from the kingpin intersection to the top of the axle.

4. Integrated system is anti-lock braking system (ABS) ready. This system is compatible with industry standard wheel ends and brakes.

5. The STEERTEK NXT system product identification is etched on the front of the axle beam providing the following information, see Figure 2-2:
   ■ Axle part number: Identifies the features of the axle beam.
   ■ Axle assembly number: Identifies the complete assembly, which includes the steering knuckles and bracket assemblies.

FIGURE 2-2
SECTION 3
Important Safety Notice

Proper maintenance, service and repair is important to the reliable operation of the suspension. The procedures recommended by Hendrickson and described in this technical publication are methods of performing such maintenance, service and repair.

The warnings and cautions should be read carefully to help prevent personal injury and to assure that proper methods are used. Improper maintenance, service or repair may damage the vehicle, cause personal injury, render the vehicle unsafe in operation, or void manufacturer's warranty.

Failure to follow the safety precautions in this manual can result in personal injury and/or property damage. Carefully read and understand all safety related information within this publication, on all decals and all such materials provided by the vehicle manufacturer before conducting any maintenance, service or repair.

- EXPLANATION OF SIGNAL WORDS

Hazard "Signal Words" (Danger-Warning-Caution) appear in various locations throughout this publication. Information accented by one of these signal words must be observed to help minimize the risk of personal injury to service personnel, or possibility of improper service methods which may damage the vehicle or render it unsafe.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

Additional 'Notes' or 'Service Hints' are utilized to emphasize areas of procedural importance and provide suggestions for ease of repair. The following definitions indicate the use of these signal words as they appear throughout the publication.

<table>
<thead>
<tr>
<th>Signal Word</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DANGER</strong></td>
<td>Indic平es an imminently hazardous situation which, if not avoided, will result in serious injury or death.</td>
</tr>
<tr>
<td><strong>WARNING</strong></td>
<td>Indicates a potential hazardous situation which, if not avoided, can result in serious injury or death.</td>
</tr>
<tr>
<td><strong>CAUTION</strong></td>
<td>Indicates a potential hazardous situation which, if not avoided, may result in minor or moderate injury, or property damage.</td>
</tr>
</tbody>
</table>

**NOTE**

An operating procedure, practice condition etc., which is essential to emphasize.

**SERVICE HINT**

A helpful suggestion, which will make the servicing being performed a little easier and/or faster.

Also note that particular service operations may require the use of special tools designed for specific purposes. These special tools can be found in the Special Tools Section of this publication.

The torque symbol alerts you to tighten fasteners to a specified torque value. Refer to Torque Specifications Section of this publication.
SAFETY PRECAUTIONS

FASTENERS

- **WARNING**
  - DISCARD USED FASTENERS. ALWAYS USE NEW FASTENERS TO COMPLETE A REPAIR. FAILURE TO DO SO COULD RESULT IN FAILURE OF THE PART, OR MATING COMPONENTS, LOSS OF VEHICLE CONTROL, PERSONAL INJURY, OR PROPERTY DAMAGE.

  LOOSE OR OVER TORQUED FASTENERS CAN CAUSE COMPONENT DAMAGE, LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE, OR SEVERE PERSONAL INJURY. MAINTAIN CORRECT TORQUE VALUE AT ALL TIMES. CHECK TORQUE VALUES ON A REGULAR BASIS AS SPECIFIED, USING A TORQUE WRENCH THAT IS REGULARLY CALIBRATED. TORQUE VALUES SPECIFIED IN THIS TECHNICAL PUBLICATION ARE FOR HENDRICKSON SUPPLIED FASTENERS ONLY. IF NON-HENDRICKSON FASTENERS ARE USED, FOLLOW TORQUE SPECIFICATION LISTED IN THE VEHICLE MANUFACTURER’S SERVICE MANUAL.

LOAD CAPACITY

- **WARNING**
  - ADHERE TO THE PUBLISHED CAPACITY RATINGS FOR THE SUSPENSIONS. ADD-ON AXLE ATTACHMENTS (I.E. SLIDING FIFTH WHEELS) AND OTHER LOAD TRANSFERRING DEVICES CAN INCREASE THE SUSPENSION LOAD ABOVE THE RATED AND APPROVED CAPACITIES WHICH COULD RESULT IN FAILURE AND LOSS OF VEHICLE CONTROL, POSSIBLY CAUSING PERSONAL INJURY OR PROPERTY DAMAGE.

REPAIR OR RECONDITIONING

- **WARNING**
  - THE REPAIR OR RECONDITIONING OF SUSPENSION OR AXLE COMPONENTS IS NOT ALLOWED AS SHOWN ON LABEL IN FIGURE 3-1. ANY AXLE COMPONENTS FOUND TO BE DAMAGED OR OUT OF SPECIFICATIONS MUST BE REPLACED. ALL MAJOR HENDRICKSON COMPONENTS ARE HEAT TREATED AND TEMPERED. THE COMPONENTS CANNOT BE BENT, WELDED, HEATED, OR REPAIRED WITHOUT REDUCING THE STRENGTH OR LIFE OF THE COMPONENT. FAILURE TO FOLLOW THESE GUIDELINES CAN CAUSE LOSS OF VEHICLE CONTROL, POSSIBLE PERSONAL INJURY, DEATH, OR PROPERTY DAMAGE AND WILL VOID APPLICABLE WARRANTIES.

SUPPORT THE VEHICLE PRIOR TO SERVICING

- **WARNING**
  - PLACE THE VEHICLE ON A LEVEL FLOOR AND CHOCK THE WHEELS TO HELP PREVENT THE VEHICLE FROM MOVING. NEVER WORK UNDER A RAISED VEHICLE SUPPORTED ONLY BY A FLOOR JACK. ALWAYS SUPPORT A RAISED VEHICLE WITH SAFETY STANDS. BLOCK THE WHEELS AND MAKE SURE THE UNIT WILL NOT ROLL BEFORE RELEASING BRAKES. A JACK CAN SLIP OR FALL OVER. SERIOUS PERSONAL INJURY CAN RESULT.

MODIFYING COMPONENTS

- **WARNING**
  - DO NOT MODIFY OR REWORK PARTS WITHOUT AUTHORIZATION FROM HENDRICKSON. DO NOT SUBSTITUTE REPLACEMENT COMPONENTS NOT AUTHORIZED BY HENDRICKSON. USE OF MODIFIED, REWORKED, SUBSTITUTE OR REPLACEMENT PARTS NOT AUTHORIZED BY HENDRICKSON MAY NOT MEET HENDRICKSON’S SPECIFICATIONS, AND CAN RESULT IN FAILURE OF THE PART, LOSS OF VEHICLE CONTROL, POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE, AND WILL VOID ANY APPLICABLE WARRANTIES. USE ONLY HENDRICKSON AUTHORIZED REPLACEMENT PARTS.

SHOCK ABSORBERS

- **WARNING**
  - THE SHOCK ABSORBERS ARE NOT SUPPLIED BY HENDRICKSON, ALTHOUGH IT IS A REQUIRED COMPONENT. HENDRICKSON IS NOT RESPONSIBLE FOR COMPONENTS SUPPLIED BY THE VEHICLE MANUFACTURER. FOR ASSISTANCE WITH INSPECTION, MAINTENANCE AND REBUILD INSTRUCTIONS, SEE VEHICLE MANUFACTURER.

PERSONNEL PROTECTIVE EQUIPMENT

- **WARNING**
  - ALWAYS WEAR PROPER EYE PROTECTION AND OTHER REQUIRED PERSONAL PROTECTIVE EQUIPMENT TO HELP PREVENT PERSONAL INJURY WHEN PERFORMING VEHICLE MAINTENANCE, REPAIR OR SERVICE.
**WARNING**

UNAUTHORIZED WELDING OR MODIFICATIONS CAN CAUSE CRACKS OR OTHER AXLE STRUCTURAL DAMAGE AND RESULT IN LOSS OF VEHICLE CONTROL, SEVERE PERSONAL INJURY OR DEATH. DO NOT BEND, WELD OR MODIFY AXLE WITHOUT AUTHORIZATION FROM HENDRICKSON TRUCK COMMERCIAL VEHICLE SYSTEMS.

**AXLE CAMBER**

AXLE CAMBER IS NOT ADJUSTABLE. DO NOT CHANGE THE AXLE CAMBER ANGLE OR BEND THE AXLE BEAM, SEE FIGURE 3-1. BENDING THE AXLE BEAM TO CHANGE THE CAMBER ANGLE CAN DAMAGE THE AXLE AND REDUCE AXLE STRENGTH, WILL VOID HENDRICKSON'S WARRANTY AND CAN CAUSE LOSS OF VEHICLE CONTROL, POSSIBLY CAUSING PERSONAL INJURY OR PROPERTY DAMAGE.

**WARNING**

IMPROPER JACKING METHOD

IMPROPER JACKING METHOD CAN CAUSE STRUCTURAL DAMAGE AND RESULT IN LOSS OF VEHICLE CONTROL, SEVERE PERSONAL INJURY OR DEATH. DO NOT USE AXLE BEAM OUTBOARD OF AXLE SEATS. REFER TO VEHICLE MANUFACTURER FOR PROPER JACKING INSTRUCTIONS, SEE FIGURE 3-1.

**FIGURE 3-1**

**WARNING**

DAMAGED AXLE COMPONENTS

IF A VEHICLE EQUIPPED WITH A STEERTEK NXT SYSTEM IS INVOLVED IN A CRASH, THE AXLE STEER KNUCKLES MUST BE DISASSEMBLED AND A THOROUGH INSPECTION OF THE AXLE MUST BE PERFORMED NOTING THE CONDITION OF THE AXLE BEAM, KINGPINS, AND KNUCKLE ASSEMBLIES, INCLUDING THE AREAS OF AXLE TO KINGPIN INTERFACE, FOR ANY DAMAGE, GAPS, KINGPIN MOVEMENT OR PLAY. IF ANY COMPONENT APPEARS DAMAGED, OR THE KINGPINS APPEAR TO CONTAIN ANY DAMAGE, GAPS, MOVEMENT OR PLAY, THE COMPLETE AXLE ASSEMBLY MUST BE REPLACED.

In addition, in the event a crash results in excessive side load damage to adjacent parts, such as a bent wheel, hub, or spindle, it is strongly recommended to replace such adjacent parts and the complete axle assembly.

CONTACT HENDRICKSON TECH SERVICES WITH ANY QUESTIONS. FAILURE TO REPLACE ANY DAMAGED COMPONENTS CAN CAUSE LOSS OF VEHICLE CONTROL, POSSIBLE PERSONAL INJURY, DEATH, OR PROPERTY DAMAGE AND WILL VOID ANY APPLICABLE WARRANTIES.

**CAUTION**

PROCEDURES AND TOOLS

A MECHANIC USING A SERVICE PROCEDURE OR TOOL WHICH HAS NOT BEEN RECOMMENDED BY HENDRICKSON MUST FIRST SATISFY HIMSELF THAT NEITHER HIS 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.
**WARNING**

**OFF-ROADWAY TOWING**

When a vehicle is disabled and equipped with a SteerTech NXT system, care must be taken to ensure there is no damage to the suspension or axle when towing the vehicle. The use of tow straps is necessary to tow a disabled vehicle from a repair facility parking lot into the shop bay. The tow straps should be connected to the tow hooks provided by the vehicle manufacturer at the front of the bumper. If the use of tow hooks is not an option, then tow straps may be wrapped around the front SteerTech NXT system, (see Figure 3-2) in a manner that is acceptable for towing the vehicle from a repair facility parking lot into the shop bay. Do not use a tow chain around the front SteerTech NXT system to tow the vehicle, doing so will damage the axle and void any applicable warranty, (see Figure 3-2). For detailed instructions for on-highway towing, see towing procedure section of this publication.

**FIGURE 3-2**

---

**WARNING**

**TORCH/WELDING**

Do not use a cutting torch to remove any fasteners. The use of heat on suspension components will adversely affect the strength of these parts. A component damaged in this manner can result in the loss of vehicle control and possible personal injury or property damage.

Exercise extreme care when handling or performing maintenance in the area of the leaf spring assembly and axle. Do not connect arc welding ground line to the leaf spring assembly or axle. Do not strike an arc with the electrode on the leaf spring assembly or axle. Do not use heat near the leaf spring assembly or axle. Do not nick or gouge the leaf spring assembly or axle. Such improper actions can damage the leaf spring assembly or the axle, and can cause loss of vehicle control and possible personal injury or property damage.

**WARNING**

**PARTS CLEANING**

Solvent cleaners can be flammable, poisonous and cause burns. To help avoid serious personal injury, carefully follow the manufacturer’s product instructions and guidelines and the following procedure:

1. Wear proper eye protection
2. Wear clothing that protects your skin
3. Work in a well ventilated area
4. Do not use gasoline, or solvents that contain gasoline. Gasoline can explode
5. Hot solution tanks or alkaline solutions must be used correctly. Follow the manufacturer’s recommended instructions and guidelines carefully to help prevent personal accident or injury

Do not use hot solution tanks or water and alkaline solutions to clean ground or polished parts. Doing so will cause damage to the parts and void any applicable warranty.
SECTION 4
Parts List
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<thead>
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<th>KEY NO.</th>
<th>PART NO.</th>
<th>DESCRIPTION</th>
<th>VEHICLE QTY.</th>
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<tbody>
<tr>
<td>79272-001</td>
<td>Left Hand</td>
<td>Clamp Group Assembly, Includes Key Nos. 1-11</td>
<td>1</td>
</tr>
<tr>
<td>79272-002</td>
<td>Right Hand</td>
<td>Clamp Group Assembly, Includes Key Nos. 1-11</td>
<td>1</td>
</tr>
<tr>
<td>34013-228</td>
<td>clamp group fasteners service kit, one side</td>
<td>includes key nos. 1-2, 4</td>
<td>1</td>
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<tr>
<td>64107-002</td>
<td>1&quot;-8 UNC x 7&quot; Hex Bolt</td>
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<tr>
<td>78356-002</td>
<td>1&quot; Spherical Washer</td>
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<td></td>
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<tr>
<td>78888-000</td>
<td>Top Pad with Jounce Stop</td>
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<tr>
<td>79273-001</td>
<td>Spring Liner</td>
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<tr>
<td>53816-100</td>
<td>Left Hand</td>
<td>Leaf Spring Assembly with Bushings</td>
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<tr>
<td>53816-200</td>
<td>Right Hand</td>
<td>Leaf Spring Assembly with Bushings</td>
<td>1</td>
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<td>77458-001</td>
<td>Spring Spacer</td>
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<td>77232-000</td>
<td>Axle Seat</td>
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<td>*Threaded</td>
<td>Axle Collar</td>
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<td>10</td>
<td>1&quot;-8 UNC x 6½&quot; Hex Cap Bolt</td>
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<td>77360-XXX</td>
<td>STEERTEK NXT High Capacity Axle, Includes Key Nos. 12-48, see Chart below</td>
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<td>77284-006</td>
<td>Axle Assembly</td>
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<tr>
<td>77243-001</td>
<td>Left Hand</td>
<td>Knuckle Assembly, Includes Key Nos. 21, 24, 30-33</td>
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</tr>
<tr>
<td>77243-002</td>
<td>Right Hand</td>
<td>Knuckle Assembly, Includes Key Nos. 21, 24, 30-33</td>
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<tr>
<td>77337-001</td>
<td>Steering Arm</td>
<td>2</td>
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<tr>
<td>30550-027</td>
<td>1&quot;-14 UNF x 3½&quot; Hex Bolt</td>
<td>4</td>
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<tr>
<td>22962-001</td>
<td>1&quot; Flat Washer</td>
<td>8</td>
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<td>34013-230</td>
<td>Kingpin Service Kit, One Side</td>
<td>includes key nos. 18-29, 41-42</td>
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<td>75923-001</td>
<td>Kingpin</td>
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<td>77241-002</td>
<td>0.01&quot; Thickness</td>
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<td>77241-003</td>
<td>0.02&quot; Thickness</td>
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<tr>
<td>75918-001</td>
<td>Thrust Bearing</td>
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<tr>
<td>75960-001</td>
<td>Kingpin Seal</td>
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**NOTE:** * Item included in kit/assembly only, part not sold separately.
SECTION 5
Special Tools

SHOP MADE TOOLS

These shop made tools are designed to 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.

KINGPIN BUSHING DRIVER

KINGPIN BUSHING REMOVER/INSTALLER

COLLAR DRIVER

ADJUSTABLE STRAIGHT FLUTE REAMER

The dimension of cutting diameter must facilitate a range of 2.00" – 2.01"
SECTION 6
Towing Procedures

ON-HIGHWAY AND ON-ROADWAY
Hendrickson recommends that a vehicle equipped with a STEERTEK NXT steer axle and suspension system be towed by the following methods (listed in order of preference) for ON-HIGHWAY or ON-ROADWAY applications.

- **METHOD 1** — Wheel lift, the ideal towing procedure
- **METHOD 2** — Towing the vehicle from the rear
- **METHOD 3** — Conventional axle fork

Please read, understand and comply with any additional towing instructions and safety precautions that may be provided by the vehicle manufacturer.

Hendrickson will not be responsible for any damage to the axle, suspension or other vehicle components resulting from any towing method or fixture not authorized by Hendrickson.

Please contact Hendrickson Tech Services at 1-866-755-5968 or send e-mail to: techservices@hendrickson-intl.com with any questions regarding proper towing procedures for vehicles equipped with a STEERTEK NXT system.

**METHOD 1 — WHEEL LIFT**
This method provides the greatest ease for towing the vehicle. Lifting at the tires helps reduce the risk of possible damage to the axle, suspension, and engine components during towing operations, see Figure 6-1.

**FIGURE 6-1 Wheel Lift Method**

**METHOD 2 — TOWING VEHICLE FROM THE REAR**
This method is preferred when the proper equipment is not available to perform the wheel lift method and is necessary for wreckers not equipped with an under lift system.

**METHOD 3 — AXLE FORK LIFT**
This is an alternative method for towing the vehicle, but requires standard tow forks and designated lift points.
NOTE

When lifting a vehicle with an under lift boom, care must be taken not to damage the engine’s oil pan. Vehicles equipped with a front fairing may require removal of the front fairing prior to towing to prevent component damage.

- Ensure there is sufficient clearance between the oil pan and the boom.
- Release the tractor brakes.
- Install safety straps prior to towing the vehicle, it is preferred to use nylon safety straps. Chains have a tendency to bind and may cause damage to the axle.

1. Use a tow fork with a minimum of 4.5" opening, 2" shank, see Figure 6-2.
2. Install the fork in the boom properly.
3. The proper tow fork location is centered between the axle seats on the axle, see Figure 6-3.

OFF-ROADWAY TOWING

WHEN A VEHICLE IS DISABLED AND EQUIPPED WITH A STEERTEK NXT SYSTEM, CARE MUST BE TAKEN TO ENSURE THERE IS NO DAMAGE TO THE SUSPENSION OR AXLE WHEN TOWING THE VEHICLE. THE USE OF TOW STRAPS ARE NECESSARY TO TOW A DISABLED VEHICLE FROM A REPAIR FACILITY PARKING LOT INTO THE SHOP BAY. THE TOW STRAPS SHOULD BE CONNECTED TO THE TOW HOOKS PROVIDED BY THE VEHICLE MANUFACTURER AT THE FRONT OF THE BUMPER. IF THE USE OF TOW HOOKS IS NOT AN OPTION, THEN TOW STRAPS MAY BE WRAPPED AROUND THE FRONT STEERTEK NXT SYSTEM, (SEE FIGURE 6-4) IN A MANNER THAT IS ACCEPTABLE FOR TOWING THE VEHICLE FROM A REPAIR FACILITY PARKING LOT INTO THE SHOP BAY. DO NOT USE A TOW CHAIN AROUND THE FRONT STEERTEK NXT SYSTEM TO TOW THE VEHICLE, DOING SO WILL DAMAGE THE AXLE AND VOID ANY APPLICABLE WARRANTY, (SEE FIGURE 6-4).

- NYLON STRAPS OR CHAINS ARE NOT RECOMMENDED FOR ON-HIGHWAY OR ON-ROADWAY TOWING.
SECTION 7
Preventive Maintenance

The STEERTEK NXT High Capacity Steer Axle System is low maintenance system. Following appropriate inspection procedure is important to help ensure the proper maintenance and operation of the STEERTEK NXT high capacity steer axle system and component parts function to their highest efficiency.

HENDRICKSON RECOMMENDED PREVENTIVE MAINTENANCE INTERVALS

- The first 1,000 miles
- Vocational – every 25,000 miles (40,000 kilometers) or 6 months, whichever comes first

COMPONENT INSPECTION

- Axle seat — Check torque. Inspect axle seats for cracks or damage. Inspect axle seat liners, check for any missing liner material. If liner material is missing disassemble clamp group and replace liners, see Component Replacement Section of this publication.
- Clamp group — Check tightening torque on clamp group mounting hardware, refer to the Clamp Group Re-torque Interval in this section.
- Fasteners — Look for any loose or damaged fasteners on the entire suspension. Make sure all fasteners are tightened to the specified torque. Refer to Torque Specifications Section of this publication if fasteners are supplied by Hendrickson, non-Hendrickson fasteners, refer to the vehicle manufacturer. Use a calibrated torque wrench to check torque in a tightening direction. As soon as the fastener starts to move, record the torque. Correct the torque if necessary. Replace any worn or damaged fasteners.
- Operation — All steering components must move freely through the full range of motion from axle stop to axle stop.
- Steel leaf spring — Look for cracks. Replace if cracked or broken. Check the front bushing for any wear or deterioration. Replace if necessary, see the Component Replacement Section of this publication for replacement procedure.
- Steering pivot points — Check for looseness at all pivot points. Inspect and lubricate all pivot points. Refer to the Troubleshooting Guide Section of this publication.
- STEERTEK NXT High Capacity axle — The axle should be free of any nicks or gouges. Inspect for any cracks or dents on axle, replace if damaged.
- Tire wear — Inspect tires for wear patterns that may indicate suspension damage or misalignment, see Tire Inspection in this section.
- Wear and damage — Inspect all parts of suspension for wear and damage. Look for bent or cracked parts. Replace all worn or damaged parts.

Also see vehicle manufacturer’s applicable publications for other preventive maintenance requirements.
LUBRICATION INTERVALS

For vehicles equipped with the STEERTEK NXT High Capacity steer axle system, regular lubrication intervals should be followed to help prevent premature wear to the kingpin bushings and tie rod ends, see lubrication chart below.

STEERTEK NXT HIGH CAPACITY Greasing and Lubrication Specifications

<table>
<thead>
<tr>
<th>Component</th>
<th>Greasing Interval</th>
<th>Grease</th>
<th>NLGI Grade</th>
<th>Outside Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kingpin Bushings</td>
<td>Maximum of 10,000 miles (16,100 kilometers) or 90 days, whichever comes first.</td>
<td>Multipurpose Grease</td>
<td>2</td>
<td>Refer to the lubricant manufacturer’s specifications for the temperature service limits applicable to your area.</td>
</tr>
<tr>
<td>Tie Rod Ends</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drag Link</td>
<td>Refer to the Vehicle Manufacturer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Threaded Pin</td>
<td>Every 3 months</td>
<td>Lithium Base Grease</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: Lubrication greases acceptable for use on the STEERTEK NXT will carry a designation of NLGI #2 EP and rated GC-LB or equivalent.

KINGPIN LUBRICATION

1. Place vehicle on the ground.
2. Prior to greasing the kingpins on the vehicle, the suspension must be in a loaded condition.
3. Clean off all the grease zerks and grease gun tip with a clean shop towel prior to lubrication.
4. Lubricate the kingpins through the grease zerks on the top and bottom of the steering knuckle, see Lubrication Specification chart above.
5. Force the required lubricant into the upper and lower kingpin grease zerks, until new lubricant flows out from the upper kingpin connection and steering knuckle and the thrust bearing purge location, see Figures 7-1 and 7-2.

NOTE: Greasing at the lower zerk should purge grease from the thrust bearing shell. The left and right side of the STEERTEK NXT high capacity steer axle system have steel roller thrust bearings.

**FIGURE 7-1**

**FIGURE 7-2**
TIE ROD END LUBRICATION

LUBRICATION PROCEDURE
1. Turn the vehicle wheels straight ahead.
2. Wipe the grease zerk and grease gun tip with clean shop towels.
3. Wipe the seal/boot clean with shop towels.
4. Attach a grease gun to the grease zerk. Either a hand or pneumatic grease gun is acceptable. If air operated grease gun is used, system air pressure should not exceed 150 psi (1035 kPa).

**CAUTION**

EXCEEDING THE MAXIMUM AIR PRESSURE TO THE GREASE ZERK CAN CAUSE DAMAGE TO THE DUST BOOT AND COMPONENT FAILURE.

5. Dirt, water, and discolored old grease should flow from the relief vents or purge holes near the boot crimp or bellows area, see Figure 7-3. Continue to purge grease until fresh grease flows from the purge area.
6. If the tie rod end is designed for lube service and it will not accept grease proceed as follows:
   a. Remove the grease zerk
   b. Inspect the threaded grease zerk hole in the tie rod end and remove any obstructions
   c. Install a new grease zerk
   d. Continue the lubrication procedure
   e. If the tie rod end will not accept grease following this procedure it will be necessary to replace the tie rod end, (see Tie Rod Ends and Cross Tube replacement in the Component Replacement Section of this publication)
7. Apply grease until all the old grease is purged from the boot and fresh grease is coming out.

TIE ROD END

INSPECTION PROCEDURE
Before beginning this inspection procedure, the entire system must be unloaded (i.e., the front end of the vehicle must be raised and supported with safety stands).

**CAUTION**

DO NOT GREASE THE TIE ROD ASSEMBLY BEFORE PERFORMING THE INSPECTION. DOING SO CAN INHIBIT EFFORTS TO DETERMINE ACTUAL WEAR.

**CAUTION**

REPLACE THE ENTIRE TIE ROD END IF THE BOOT IS TORN OR MISSING, FAILURE TO DO SO CAN CAUSE PREMATURE WEAR OF THE TIE ROD END.

1. Block rear wheels of vehicle. Using the bottom of the axle beam or the frame rails, raise the front end off the ground and support with stands.
2. With the engine off, turn the wheels from full left to full right and then return to the straight-ahead position.
3. Check that the boots are in place and completely installed over the tie rod ends.
4. Check for cracking or tears in the boots. Also check the boot seals for damage. Replace the entire tie rod end if the boot is damaged.
**WARNING**

The cotter pin must be installed correctly through the tie rod end with the castle nut tightened to the proper torque specification in order to securely attach the tie rod. Loss of the cotter pin can cause the tie rod end nut to become loose and adversely affect vehicle steering and possibly result in total loss of steering control.

5. Check that the tie rod end nut is installed and secured with a cotter pin. If the cotter pin is missing, check the nut torque specification and then install a new cotter pin. Always tighten the castle nut to specified torque when setting the cotter pin. **DO NOT** back off the nut to insert cotter pin.

**WARNING**

It is critical to check the 5/8" tie rod clamp bolt head location to verify the clamp fasteners have sufficient clearance away from the lower shock mount at full wheel cut. The fasteners must not contact the lower shock mount. Failure to do so can cause one or more components to fail causing loss of vehicle control and possible personal injury or property damage.

6. Verify the 5/8" tie rod clamp bolt head does not contact the lower shock mount at full wheel cut, see Figure 7-4.

**WARNING**

The threaded portion of the tie rod end must extend past the slots into the tie rod cross tube, see Figure 7-4. Failure to do so can cause component damage, loss of vehicle control and possible personal injury or property damage.

7. Check that the tie rod end is threaded correctly into the cross tube and is engaged deeper than the end of the cross tube slot. The tie rod end must be visible the entire length of the cross tube slot, see Figure 7-4.

**CAUTION**

Do not use the following items or methods to check for movement of the tie rod assembly, which can cause damage to components:

- A CROW BAR, PICKLE FORK OR 2 X 4.
- ANYTHING OTHER THAN HANDS USED TO GRASP AND ROTATE THE CROSS TUBE ASSEMBLY (CAN RESULT IN DAMAGE TO THE CROSS TUBE).
- EXCESSIVE PRESSURE OR FORCE APPLIED TO THE TIE ROD ENDS OR THE JOINTS OF THE ASSEMBLY.

8. Check that grease zerks are installed. Replace a damaged grease zerk with a new one.

9. By hand or using a pipe wrench, with jaw protectors to avoid gouging the cross tube, rotate the cross tube toward the front of the vehicle and then toward the rear. After rotating, center the cross tube. If the cross tube will not rotate in either direction, replace both tie rod ends, see Figure 7-5.
10. Position yourself directly below the tie rod end. Using both hands, grab the assembly end as close to the tie rod end as possible (no more than 6" or 152.4 mm). Apply hand pressure with reasonable human effort vertically up and down in a push-pull motion several times (using approximately 50-100 pounds of force). Check for any movement or looseness at both tie rod end locations, see Figure 7-6.

11. If there is any movement in the tie rod assembly, install a magnetic based dial indicator on the tie rod arm, see Figure 7-7.

12. Set the dial indicator to zero.

13. Apply hand pressure with reasonable human effort vertically up and down in a push-pull motion several times (using approximately 50-100 pounds of force). Observe the reading on the dial indicator.

14. If the reading is more than 0.060", replace both tie rod ends at the next service interval.

15. If a tie rod end exhibits ≥ 0.125" of movement by hand, the vehicle should be removed immediately from use and the tie rod end be replaced.

**NOTE**

According to the Commercial Vehicle Safety Alliance (CVSA), the "out of service" criteria for front steer axle tie rod assemblies on any commercial vehicle is: Any motion other than rotational between any linkage member and its attachment point of more than \( \frac{1}{8} \)" (3 mm) measured with hand pressure only. (393.209(d)), (published in the North American Standard Out-of-Service Criteria Handbook, April 1, 2006.)

**CLAMP GROUP RE-TORQUE INTERVAL**

1. Clamp group hex bolts and axle collar hex cap bolts must be torqued to specification at preparation for delivery.

2. Clamp group hex bolts and axle collar hex cap bolts must be re-torqued at 1,000 miles.

3. Thereafter follow the 6 month/25,000 mile visual inspection and annual re-torque interval.

**WARNING**

ENSURE CLAMP GROUP IS ALIGNED PROPERLY PRIOR TO TIGHTENING HARDWARE. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE OR PERSONAL INJURY.
4. Ensure that the clamp group is properly aligned and the hex bolts are seated in the axle seat, and the top pad is centered on the leaf spring, see Figure 7-8.

5. Check for the signs of component or bolt movement.

6. If signs of movement are present, disassemble the clamp group fasteners, check for component wear or damage and replace as necessary, then install new clamp group fasteners and repeat Steps 4 through 5.

7. Tighten the clamp group hex bolts evenly in 100 foot pounds increments to 600 ± 20 foot pounds torque in the proper pattern to achieve uniform bolt tension, see Figure 7-9.

**STEERING KNUCKLE**

**CHECKING VERTICAL END PLAY (UP AND DOWN MOVEMENT)**

The operating specification for vertical end play on the steering knuckle is 0.008" to 0.030".

1. Chock the rear tires to help prevent the vehicle from moving.

2. Set the parking brakes.

3. Use a jack to raise the vehicle until both tires are 1" off the ground.

4. Place a dial indicator on each side of the axle as follows:
   a. Index the wheels slightly (left or right).
   b. Place the magnetic dial indicator base on the axle, see Figure 7-10.
   c. Place the tip of the dial indicator on the top of the upper steering knuckle (not on the grease cap).

5. Set the dial indicator to "0" (zero).

6. Lower the jack.

7. If vertical end play is greater than 0.030", or below 0.008" an adjustment of the upper knuckle is necessary.

8. ■ If the vertical end play is greater than 0.030", add shims until the proper vertical end play is achieved.
   ■ If the vertical end play is less than 0.008", remove shims until the proper vertical end play is achieved.

9. Retighten the kingpin draw keys to 188 ± 12 foot pounds torque.
KINGPIN BUSHING

INSPECTION PROCEDURE (STEERING KNUCKLE LATERAL MOVEMENT)

1. Chock the wheels to help prevent the vehicle from moving. Set the parking brake.
2. Use a jack to raise the vehicle until the wheels are off the ground. Support the vehicle with safety stands.
3. **CHECKING THE UPPER KINGPIN BUSHING.** Install the base of a dial indicator onto the axle beam and place the tip against the steering knuckle, see Figure 7-11.
4. Set the dial indicator to “0” zero.
5. Move the top of the tire in and out by applying reasonable constant pressure and then release, see Figure 7-13.
6. Check the reading on the dial indicator. If the dial indicator moves more than 0.015", the upper bushing is worn or damaged. Replace both bushings. Refer to the Kingpin Bushing replacement procedure in the Component Replacement Section of this publication.
7. **CHECKING THE LOWER KINGPIN BUSHING.** Install a dial indicator so that the base is on the axle and the indicator tip is against the inside of the bottom of the knuckle, see Figure 7-12.
8. Set the dial indicator to “0” zero.
9. Move the bottom of the tire in and out. If the dial indicator moves more than 0.015", the lower bushing is worn or damaged. Replace both kingpin bushings. Refer to the Component Replacement Section of this publication.

**NOTE**
If one bushing is worn or damaged, it is mandatory to replace both the top and bottom bushings on that knuckle assembly.
SHOCK ABSORBERS

The shock absorbers are not supplied by Hendrickson, although it is a required component. Hendrickson is not responsible for components supplied by the vehicle manufacturer. For assistance with inspection, maintenance and rebuild instructions see vehicle manufacturer.

TIRE INSPECTION

The leading causes of tire wear are the following, in order of importance:

1. Tire Pressure
2. Toe Setting
3. Thrust Angle
4. Camber

The following tire inspection guidelines are based upon Technology & Maintenance Council (TMC) recommended practices. Any issues regarding irregular tire wear where Hendrickson is asked for assistance will require tire and alignment maintenance records, reference TMC’s literature numbers RP 219A, RP 230, or RP 642.

Tire wear is normally the best indicator of vehicle alignment condition. If tires are wearing too rapidly or irregularly, alignment corrections may be needed. The tire wear patterns described below can help isolate specific alignment problems.

The most common conditions of concern are:

- Overall Fast Wear (Miles per 32nd)
- Feather Wear
- Rapid Shoulder Wear (One Shoulder Only)
- One-Sided Wear
- Diagonal Wear
- Cupping

**FIGURE 7-14**

**OVERALL FAST WEAR**
(Miles per 32nd)

**FIGURE 7-15**

**FEATHER WEAR**

**Overall Fast Wear** — Fast wear can be described as exhibiting a good, but accelerated wear pattern. It is typically caused by operating conditions, such as mountainous terrain, frequency and severity of turning, abrasive road surfaces in combination with vehicle configurations and their attributes such as power steering, heavy axle loads, high wheel cuts, setback axles, short wheel base tractors, long wheel base straight trucks. To correct this problem, consult with vehicle and tire manufacturers when specifying equipment or replacing tires. For more information, see TMC RP 219A publication, page 11. For information on how to accurately measure and record tire rates, see TMC RP 230 publication.

**Feather wear** — Tread ribs or blocks worn so that one side is higher than the other resulting in step-offs across the tread face. Generally, ribs or blocks exhibit this wear. To spot this problem, do the following:

With one hand flat on the tread of the tire and a firm down pressure, slide your hand across the tread of the tire. In one direction, the tire will feel smooth and in the opposite direction there will be a sharp edge to the tread. Typical causes of feather wear include: excessive side force scrubbing, resulting from conditions of misalignment such as excessive toe, drive axle misalignment, worn, missing or damaged suspension components, bent tie rods or other chassis misalignment.

To correct this problem, tires can be rotated to another axle for maximum utilization of remaining tread. Additionally, diagnose the vehicle itself and correct misalignment condition as required. If steer tire feathers are in opposite directions, an improper toe condition is most likely the cause. For more information, see TMC RP 219A publication, page 5.

If feather wear on both steer tires is in the same direction, drive axle or other chassis misalignment is indicated. If one steer tire shows feather wear and the other steer tire has normal wear, a combination of toe and drive axle or chassis misalignment is indicated.
Rapid Shoulder Wear (One Shoulder Only) — Is defined as a tire worn on the edge of one shoulder, sometimes extending to inner ribs. It can progress to diagonal wipeout. For more information, see TMC RP 219A publication, page 22.

This wear condition is usually caused by excessive toe or excessive camber. These conditions can be created by a misaligned or bent axle and can also be caused by loose or worn wheel bearings. To correct this type of rapid shoulder wear:

- **Tires** – Change direction of rotation of tire. If shoulder wear is severe, remove and retread.
- **Vehicle** – Diagnose misalignment and/or mechanical condition and correct.

One-sided wear — Is excessive wear on one side of tire extending from the shoulder towards the center of the tread. For more information, see TMC RP 219A, page 26.

One-sided wear is usually caused by improper alignment, worn kingpins, loose wheel bearings, excessive camber, excessive axle loads, non-parallel axles, or non-uniform tire and wheel assembly caused by improper bead seating or bent wheel.

To correct one-sided wear:

- **Tires** – Depending on severity, rotate tires to another axle position or, if worn to minimum tread depths, submit for possible retreading.
- **Vehicle** – Diagnose mechanical problem and correct.

Cupping — Localized, dished out areas of fast wear creating a scalloped appearance around the tire. Cupping, which appears around the tire on the shoulder ribs, may also progress to adjoining ribs, see TMC RP 219A publication, page 7.

Cupping is usually a result of moderate-to-severe imbalance, improper rim/wheel mounting, excessive wheel end play or other assembly non-uniformity. It can also be due to lack of shock absorber control on some suspension types.

To solve cupping problems:

- **Tires** – Correct mismount or balance problem. If ride complaints arise, steer tires may be rotated to drive or trailer axle.
- **Vehicle** – Diagnose component imbalance condition, i.e., wheel, rim, hub, brake, drum. Correct as necessary.

Diagonal Wear — Can be described as localized flat spots worn diagonally across the tread at approximately 25-35° angles, often repeating around the tread circumference. For more information, see TMC RP 219A publication, page 20.

Diagonal wear is usually caused by bad wheel bearings, toe out, mis-mounting of tire and wheel assembly to axle, and mismatched duals for size and/or inflation pressures. It may start as brake skid. Diagonal wear is aggravated by high speed empty or light load hauls.

To correct diagonal wear, reverse direction of rotation of the tire. If wear is excessive, true tire. If the source of trouble is the vehicle, diagnose cause and correct as needed.
SECTION 8
Alignment & Adjustments

ALIGNMENT DEFINITIONS

FIGURE 8-1

ACKERMANN GEOMETRY

Ackermann steering geometry — The geometry of the four bar linkage consisting of the front axle, two knuckle assemblies, and tie rod assembly is designed to provide free rolling of front tire in a turn. Ackermann geometry is dependent upon the steering axle track-width and wheelbase of the vehicle. Improper geometry results in wheel scrub in turns which generally appears as toe wear on the tire, usually more wear on one side of the vehicle than the other due to the operational route of the vehicle.

Bump steer (feedback) — The feedback felt through the steering linkage to the steering wheel when a steer axle tire hits a bump in the road. This occurs because the axle-end of the drag link and the axle attachment point of the spring do not travel in parallel circular arcs as the suspension moves up and down. This condition can also be caused by trapped air in the power steering system.

FIGURE 8-2

CAMBER

Camber — The angle formed by the inward or outward tilt of the wheel reference to a vertical line. Camber is positive when the wheel is tilted outward at the top and is negative when the wheel is tilted inward at the top.

Excessive positive camber may cause smooth wear on the outer half of the tire tread. Excessive negative camber may cause wear on the inner half of the tread. Static-unloaded camber angles are built into the axle to put the loaded tire perpendicular to the road.

FIGURE 8-3

CASTER

Caster — The forward or rearward tilt of the steering axle kingpin in reference to a vertical line. The angle is measured in degrees. Caster is positive when the top of the steering axis is tilted rearward and is negative when the tilt is forward. Proper caster is important for directional stability and returnability. Too much positive caster can cause shimmy, excessive steering effort and is normally a vehicle performance and handling consideration. Uneven positive caster may create a steering pull toward the side with the lower caster. This attribute may be used to compensate for crowned roads.
Kingpin inclination (KPI) — The inward tilt of the kingpin from the vertical. This front suspension parameter has a pronounced effect on steering effort and returnability. As the front wheels are turned around an inclined kingpin, the front of the truck is lifted. This lifting of the vehicle is experienced as steering effort when the turn is executed and exhibits itself as recovery force when the steering wheel is released.

Kingpin offset — The distance between the center of the tire patch and intersection of the kingpin axis with the ground. This parameter of front-end geometry is important in vehicles without power steering and has a major effect on static steering. If there is no kingpin offset, the tires must scrub around the center of the pin patch when turned in a static condition, resulting in higher static steering efforts.

Steering arm — The component that connects the drag link to the axle knuckle assembly.

Scrub, skew, tram angle or parallelism — The angle formed by two thrust or tracking lines of a tandem (or multiple) axle vehicle. As indicated by the term “parallelism”, the ideal condition is when the two thrust lines form a 0° angle, or are parallel to each other. Positive skew or tram is when the distance between the right axle ends is less than the distance between the left. Any scrub angle other than 0° will cause the tandem axles to work against each other. The steer axle must be turned to offset the “push” of the tandem axles to keep the vehicle moving straight ahead. This causes every tire on the vehicle to “scrub”. Tire wear from tandem scrubbing occurs at the leading edge of the steer tires in a pattern called “inside/outside” wear, that is, the inside edge of the left steer tire and the outside edge of the right steer tire will exhibit irregular wear for example. Additional tire wear may occur on all tandem axle tires.

Thrust angle, tracking, or square — The angle formed by the centerline of the vehicle frame (geometric centerline) and the direction that an axle points. As indicated by the term “square”, the ideal value for the angle is 0° or when the axle centerline is at 90° or perpendicular to the geometric centerline. Thrust or tracking to the right is positive, and to the left is negative. A steering correction is required to offset the effect of the thrust angles and keeps the vehicle traveling in a straight line. It results in a lateral offset between the steer and drive axle tires commonly referred to as “dog tracking.”

Tie rod arm (ackermann-arm, cross tube arm) — The component that transmits steering forces between left and right axle knuckle assemblies through the cross tube assembly.
SteerTek NXT High Capacity Steer Axle System for Autocar® ACX-XPEDITOR™ Vehicles

FIGURE 8-8

Toe-in — Is when the horizontal line intersects in front of the wheels, or the wheels are closer together in front than in the back. Toe-in is commonly designated as positive, toe-out as negative. Excessive toe-in wears the outside edge of the tires. Steer axle toe is adjustable to reduce wear to the leading edge of the tire and also to avoid road wander. Toe is adjusted in a static, unloaded condition so that the tires will run in a straight line under a dynamic, loaded condition.

FIGURE 8-9

Toe-out — Is when the horizontal lines intersect behind the wheels, or the wheels are closer together in back than in front. Toe-in is commonly designated as positive, toe-out as negative. Excessive toe-out wears the inside edge of the tires. Steer axle toe is adjustable to reduce wear to the leading edge of the tire and also to avoid road wander. Toe is adjusted in a static, unloaded condition so that the tires will run in a straight line under a dynamic, loaded condition.

FIGURE 8-10

Total toe — The angle formed by two horizontal lines through the planes of two wheels. Steer axle toe is adjustable to reduce wear to the leading edge of the tire and also to avoid road wander. Toe is adjusted in a static, unloaded condition so that the tires will run in a straight line under a dynamic, loaded condition.

Inspection Prior to Alignment

Wheels and Tires
Examine the following items:

- The tires are inflated to the manufacturer’s specified tire pressure.
- The steer axle tires are the same size and type.
- The lug nuts are tightened to manufacturer’s specified torque.
- The wheels are balanced.
- The wheels and tires are free of excessive wear and damage.
- Wheel bearing end play is within OEM specification.

Front Suspension
Inspect the following:

- All fasteners are installed and tightened to the specified torque. See Torque Specification Section of this publication.
- Leaf springs are free of wear or damage.
- Shock absorbers are free of wear and damage.
- Vehicle ride height for both the front and rear are within specification. Follow manufacturer’s guidelines (if equipped).
- Front and rear spring mounts are free of wear or damage.

**INSPECT TIE ROD ENDS**
Perform Tie Rod Inspection procedure; refer to the Preventive Maintenance Section of this publication.

**REAR AXLE AND REAR SUSPENSION**
The rear axle can cause front tire wear. If the outer edge of one front tire is worn and the inner edge of the other front tire is worn, check the following:
- Make sure the rear axle (especially a tandem axle) is correctly aligned. Refer to the procedure dictated by the vehicle or suspension manufacturer.
- All fasteners including U-bolts (if applicable) are installed and tightened to the specified torque.
- The leaf springs are not worn or damaged.
- The bushings in the leaf springs are not worn or damaged.
- The torque rods (if used) are correctly adjusted (if adjustable).
- The frame is not bent or twisted.
- Refer to any additional recommendations and specifications from the manufacturer of vehicle on rear axles and suspensions. Reference The Technology & Maintenance Council (TMC) Guidelines for Total Vehicle Alignment.

**FRONT WHEEL ALIGNMENT**
Hendrickson recommends technicians review The Technology & Maintenance Council’s publication (TMC) “Guidelines for Total Vehicle Alignment” (TMC RP 642).

Check total (front and rear) vehicle wheel alignment when any of the following occurs:
- Every 80,000 to 100,000 miles, or 12-18 months (normal maintenance).
- When the vehicle does not steer correctly.
- To correct a tire wear condition.

For rear wheel alignment specifications and adjustments refer to the vehicle manufacturer.

The front wheel alignment specifications can be found in the Alignment Specifications Section of this publication. There are two types of front wheel alignment:
1. **Minor alignment** – a minor front wheel alignment is done for all normal maintenance conditions, see below.
2. **Major alignment** – a major alignment is done when uneven or excessive tire wear is evident, or response at the steering wheel is sluggish, or the need for major wheel alignment check and adjustment is required, see below.

**MINOR FRONT WHEEL ALIGNMENT**
Perform the minor front wheel alignment in the following sequence:
1. Inspect all systems that affect wheel alignment. Refer to the Inspection Prior to Alignment in this section.
2. Check the wheel bearing end play.
3. Check and adjust toe.
4. Check and adjust the vehicle ride height as specified in the Preventive Maintenance Section of this publication.

**MAJOR FRONT WHEEL ALIGNMENT**

Be certain to follow wheel alignment inspection intervals as specified by the original equipment manufacturer. Before performing a major front wheel alignment it is recommended that alignment equipment calibration be checked to ensure proper vehicle alignment.

Major wheel alignment is accomplished in the following sequence of operation:

1. Inspect all the systems that influence the wheel alignment. Refer to the Inspection Prior to Alignment in this section.
2. Check and adjust the maximum turn angle, refer to the Steering Stop Adjustment Procedure in this section, see Figures 8-11 and 8-12.
3. If the vehicle is equipped with power steering, check the pressure relief in the power steering system and reset if necessary. Refer to the vehicle manufacturer regarding the subject: Adjusting the Pressure Relief in the Power Steering System.
4. Check the turning angle. Refer to the original equipment manufacturer specifications.
5. Check the kingpin (or steering axis) inclination. Refer to Kingpin Inclination under Alignment Definitions in this section.

**WARNING**

AXLE CAMBER IS NOT ADJUSTABLE. DO NOT CHANGE THE AXLE CAMBER ANGLE OR BEND THE AXLE BEAM. BENDING THE AXLE BEAM TO CHANGE THE CAMBER ANGLE CAN DAMAGE THE AXLE AND REDUCE AXLE STRENGTH, AND WILL VOID HENDRICKSON’S WARRANTY. A BENT AXLE BEAM CAN CAUSE LOSS OF VEHICLE CONTROL, POSSIBLY CAUSING PERSONAL INJURY OR PROPERTY DAMAGE, SEE FIGURE 8-13.

6. Check camber angle. **DO NOT** attempt to adjust camber. Refer to “Camber” under the Alignment Definitions in this section.

**FIGURE 8-11**

**FIGURE 8-12**

**FIGURE 8-13**
7. It is necessary to verify that all ride heights (front and rear) are within specifications prior to checking caster to get an accurate caster reading.

8. Check and adjust caster angle. Refer to Caster Angle under Alignment Definitions in this section.

NOTE
The use of two different angle caster shims will not change cross caster. Cross caster is the difference between the caster readings for left and right side of the vehicle.

9. Check and adjust toe-in, refer to “Toe Setting” in this section.

STEERING STOP

ADJUSTMENT PROCEDURE

When the axle or steering knuckle is replaced, the steering stop adjustment must be checked.

The steering stop adjustment procedure is as follows:

1. Drive truck onto turntables and chock the rear wheels.

2. Measure the wheel cut. The wheel cut is determined by steering the tires. Wheel cut is measured at the inside wheel only, therefore the tires must be turned to the full lock position for each right hand and left hand direction. Refer to the vehicle manufacturer for exact specifications.

3. Increase the wheel cut by loosening the jam nuts and screw the axle stops in clockwise.

4. Tighten the jam nuts.

NOTE
It is very important that the sides of the square head axle stops are set parallel to the axle beam to ensure a good contact point on the axle, see Figure 8-14.

5. Decrease the wheel cut by loosening the jam nuts and screw the axle stops out counter-clockwise.

6. Tighten the jam nuts to 50 ± 10 foot pounds torque.

7. Measure the wheel cut and check for any interference with related steering components.

WARNING
ALWAYS CHECK/RESET THE STEERING GEAR BOX POPPETS WHEN THE WHEEL CUT IS DECREASED. FOLLOW MANUFACTURER’S GUIDELINES FOR THE GEAR BOX POPPET RESETTING PROCEDURE. FAILURE TO DO SO CAN RESULT IN PREMATURE FAILURE OF THE AXLE OR STEERING KNUCKLE. THIS CONDITION CAN CAUSE LOSS OF VEHICLE CONTROL, PERSONAL INJURY OR PROPERTY DAMAGE AND VOID ANY APPLICABLE WARRANTY.

TOE SETTING

1. Place the vehicle on a level floor with the wheels in a straight ahead position.

2. Raise the vehicle and support the front axle with jack stands.

3. Use paint and mark the center area of tread on both steer axle tires around the complete outer diameter of the tires.

4. Scribe a line through both steer axle tires in the painted area around the complete outer diameter of the tires.

5. Raise the vehicle and remove the jack stands.

6. Set the vehicle on the ground.
NOTE

**DO NOT** measure toe-in with the front axle off the ground. The weight of the vehicle must be on the front axle when toe-in is measured.

7. Use a trammel bar and measure the distance between the scribe marks at the rear of the steer axle tires. Record the measurement.

8. Install the trammel bar and measure the distance between the scribe marks at the front of the steer axle tires. Record the measurement, see Figure 8-15.

**FIGURE 8-15**

9. When setting up the trammel bar the pointers should be level with the spindles at the front and rear of the steer axle tires.

10. To calculate the toe setting subtract the front measurement from the rear measurement, the difference between the two will equal the toe-in/toe-out measurement.

11. If the toe measurement is not within the specifications of \( \frac{1}{4}'' \pm \frac{1}{32}'' (0.060'' \pm 0.030'') \), it will be necessary to adjust the toe setting. Refer to the following procedure.
   a. Loosen the tie rod cross tube clamp bolts and locknuts.
   b. Turn the tie rod cross tube until the specified toe-in distance is achieved.
   c. Tighten the bolt and locknut on the tie rod cross tube to \( 68 \pm 7 \) foot pounds torque.

**WARNING**

THE THREADED PORTION OF THE TIE ROD END MUST EXTEND PAST THE SLOTS INTO THE TIE ROD CROSS TUBE, SEE FIGURE 8-16. FAILURE TO DO SO CAN CAUSE COMPONENT TO FAIL CAUSING LOSS OF VEHICLE CONTROL AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

12. Repeat Steps 1-10 until the correct toe setting is achieved.
It is critical to have the threaded portion of the tie rod end extend past the slots in the tie rod cross tube.

Tie Rod Cross Tube Slots

5/8" Tie Rod Clamp Bolt
It is critical to check the 5/8" tie rod clamp bolt head location to verify the clamp fasteners have sufficient clearance away from the lower shock mount at full wheel cut. The fasteners must not contact the lower shock mount.

Threaded Portion of the Tie Rod End

5/8" Tie Rod Clamp Locknut
Tightening Torque 68 ± 7 ft. lbs.
SECTION 9
Component Replacement

FASTENERS
Hendrickson recommends that when servicing the vehicle to replace the removed fasteners with new equivalent fasteners. Maintain correct torque values at all times. Check torque values as specified, see Hendrickson’s Torque Specifications Section of this publication. If non-Hendrickson fasteners are used follow torque specifications listed in the vehicle manufacturer’s service manual.

SHOCK ABSORBERS
The shock absorbers are not supplied by Hendrickson, although it is a required component. Hendrickson is not responsible for components supplied by the vehicle manufacturer. For assistance with inspection, maintenance and rebuild instructions see vehicle manufacturer.

LEAF SPRING AND CLAMP GROUP ASSEMBLY

YOU WILL NEED:
- Axle Collar Driver, refer to Special Tools Section of this Publication.
- Soft Jaw Vice

DISASSEMBLY
1. Place the vehicle on a level floor.
2. Chock the wheels.
3. Raise the vehicle and support the vehicle with frame stands.
4. Suspend the front axle to remove the load from leaf spring assembly.
5. Remove the tires for greater access.
6. Support the axle with a floor jack.
7. Remove the lower shock absorber mounting fasteners, refer to vehicle manufacturer’s instructions.

FIGURE 9-1

Leaf Spring with Lower Shock Absorber Mounting Bracket and Clamp Group Assembly

Axle Hole
Axle Seat Holes
Axle Hole
Axle Seat Liner Holes
Axle Seat Liner
Rear Axle Collar Threaded
Front Axle Collar Unthreaded
1” x 6.5” Axle Collar Hex Cap Screw
Axle Collar Driver
Axle Holes
8. Disconnect the rear shackles.
9. Partially remove the axle collar bolts with a couple of threads engaged, see Figure 9-2.
10. Strike the bolt heads with a hammer to dislodge and drive out the rear collars.
11. Install the collar bushing driver from the rear of the axle, see Figure 9-3.
12. Strike the bushing driver to dislodge and drive out the front axle collars, Figure 9-4, until the front bushing collars are clear from the axle, see Figure 9-5.
13. Lower the axle until there is enough clearance to remove the leaf spring assembly from the axle.
14. Remove the front spring eye bolt on the side being replaced.
15. Remove the leaf spring and clamp group assembly from the axle.

**WARNING**

WHEN PLACING THE LEAF SPRING AND CLAMP GROUP ASSEMBLY IN A VISE IT IS NECESSARY TO PROTECT THE MACHINED SURFACES FROM GOUGES OR MARRING BY USING BRASS JAWS (SOFT JAWS) SEE FIGURE 9-6. FAILURE TO DO SO CAN CAUSE PREMATURE PART DAMAGE, DAMAGE TO THE LEAF SPRING AND CLAMP GROUP ASSEMBLY, LOSS OF WARRANTY, LOSS OF VEHICLE CONTROL, CAUSING PERSONAL INJURY OR PROPERTY DAMAGE.

**SERVICE HINT**

It is acceptable to mount the leaf spring and clamp group components in a soft jaw vise to facilitate the tightening procedure.
1. Secure the leaf spring and clamp group assembly in a suitable holding device, such as a soft jaw vice, see Figure 9-6.

2. Ensure the clamp group hex bolts are tightened to 600 ± 20 foot pounds torque in the proper pattern to achieve uniform bolt tension, see Figures 9-7 and 9-8.

3. Install the new axle seat liner under the axle seat (liner ear snap to side of axle seat), see Figure 9-9.

**WARNING**

THE WEIGHT OF THE LEAF SPRING AND CLAMP GROUP ASSEMBLY IS APPROXIMATELY 230 POUNDS. CARE SHOULD BE TAKEN AT REMOVAL AND INSTALLATION TO PREVENT PERSONAL INJURY OR DAMAGE TO COMPONENTS.

4. Install the new leaf spring and clamp group assembly (approximate weight 230 pounds) on the axle. Ensure the axle seat liner holes are lined up with the axle seat and axle holes, see Figures 9-1.

5. Install the non-threaded collar at the front of the axle and the threaded collars at the rear of the axle going into the axle seat, axle seat liner and axle. Tap into place with a mallet.

6. Install the new axle collar fasteners with the bolt head located on the front side of the axle.

7. Tighten both sides, left and right of the axle collar bolts in four stages, stage one 100 foot pounds, stage two 350 foot pounds, stage three 700 foot pounds and the fourth and final 800 ± 20 foot pounds torque, see Figure 9-10.

8. Raise the axle and the leaf spring clamp group assembly.

9. Install the axle assembly into the front hanger and rear shackle assembly as per vehicle manufacturer's guidelines.

10. Install the lower shock fasteners and tighten to the vehicle manufacturer's specifications.

11. Raise the vehicle.

12. Remove the frame supports and load the front axle with the vehicle weight.

13. Install tires per the vehicle manufacturer's specifications.

14. Remove the wheel chocks.
CLAMP GROUP COMPONENTS

The clamp group instructions can be used to replace the different components in the clamp group, such as the leaf spring, axle seat or top pad with jounce stop.

YOU WILL NEED:

- Soft Jaw Vice

DISASSEMBLY

1. Remove the Leaf Spring and Clamp Group Assembly per instructions in this Section.
2. Remove and discard the four 1" hex bolts.
3. Remove the top pad with jounce stop.
4. Remove and discard all plastic leaf spring liners.
5. Remove the leaf spring assembly.
6. Prior to removal of the leaf spring spacer, note the location and orientation, see Figure 9-11. Remove the leaf spring spacer.
7. Inspect all clamp group components for any damage, replace as necessary.

ASSEMBLY

1. Install the leaf spring spacer in same location and orientation as removed, see Figure 9-11.
2. Install the leaf spring onto the spring spacer.
3. Install the new spring liner onto the leaf spring assembly.
4. Install the top pad with jounce stop on top of leaf spring liner.
5. Install the hex bolts into the holes on the top pad and jounce stop, see Figure 9-11, and hand tighten. **DO NOT** tighten to torque at this time.

**WARNING**

WHEN PLACING THE LEAF SPRING AND CLAMP GROUP ASSEMBLY IN A VISE IT IS NECESSARY TO PROTECT THE MACHINED SURFACES FROM GOUGES OR MARRING BY USING BRASS JAWS (SOFT JAWS) SEE FIGURE 9-12. FAILURE TO DO SO CAN CAUSE PREMATURE PART DAMAGE, DAMAGE TO THE LEAF SPRING AND CLAMP GROUP ASSEMBLY, LOSS OF WARRANTY, LOSS OF VEHICLE CONTROL, CAUSING PERSONAL INJURY OR PROPERTY DAMAGE.

**SERVICE HINT**

It is acceptable to mount the leaf spring and clamp group components in a soft jaw vise when performing the tightening procedure.

6. Secure the leaf spring and clamp group assembly in a suitable holding device, such as a soft jaw vise, see Figure 9-12.
7. Ensure that the clamp group is properly aligned and the top pad is centered on the leaf spring.
8. Tighten the clamp assembly hex bolts evenly in 100 foot pounds increments to $\pm 20$ foot pounds torque in the proper pattern to achieve uniform bolt tension, see Figure 9-13.
9. Install the new axle seat liner under the axle seat (liner tabs snap to the sides of axle seat), see Figure 9-9.

**WARNING**

THE WEIGHT OF THE LEAF SPRING AND CLAMP GROUP ASSEMBLY IS APPROXIMATELY 230 POUNDS. CARE SHOULD BE TAKEN AT REMOVAL AND INSTALLATION TO PREVENT PERSONAL INJURY OR DAMAGE TO COMPONENTS.

10. Install the new leaf spring and clamp group assembly (approximate weight 230 pounds) on the axle per the Leaf Spring and Clamp Group Assembly instructions in this section.

**STEERTEK NXT HIGH CAPACITY AXLE**

**AXLE REMOVAL**

1. Place the vehicle on level floor.
2. Chock the wheels.

**WARNING**

DO NOT USE A TORCH ON AXLE COLLAR BOLTS OR ANY OTHER PART OF THE STEERTEK NXT HIGHER CAPACITY STEER AXLE SYSTEM. THE USE OF A TORCH CAN CAUSE DAMAGE TO CERTAIN STEERTEK NXT COMPONENTS THAT CAN RESULT IN THE LOSS OF VEHICLE CONTROL AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

3. Raise the frame.

**FIGURE 9-14**

- Axle Collar Bolts
- Axle Collar Front, Non Threaded
- Axle Holes
- Axle Wrap Liner Holes
- Axle Hole
- Place a floor jack in center of axle
- Leaf Spring and Clamp Group Assembly
- Axle Collar Rear, Threaded
- Axle Collar Threaded
- Axle Collar Bolts Tightening Torque 800 ± 20 ft. lbs.
4. Support the vehicle with frame stands and suspend the front axle with the shocks attached.
5. Remove the front wheels, hubs, brake shoes, ABS sensors, and backing plate assembly.
6. Disconnect the drag link from the steering arm.
7. Support the axle with a suitable jack.

**WARNING**

**DO NOT REPAIR OR RECONDITION SUSPENSION OR AXLE COMPONENTS FOUND TO BE DAMAGED OR OUT OF SPECIFICATIONS.** ALL SUCH DAMAGED OR OUT OF SPECIFICATION COMPONENTS MUST BE REPLACED. ALL MAJOR HENDRICKSON COMPONENTS ARE HEAT TREATED AND TEMPERED. STEERTEK NXT COMPONENTS CANNOT BE BENT, WELDED, HEATED, OR REPAIRED WITHOUT REDUCING THE STRENGTH OR LIFE OF THE COMPONENT. FAILURE TO FOLLOW THESE GUIDELINES CAN CAUSE LOSS OF VEHICLE CONTROL, AND POSSIBLE PERSONAL INJURY OR DEATH OR PROPERTY DAMAGE AND WILL VOID APPLICABLE WARRANTIES.

8. Remove the 1" axle collar bolts and clamps, refer Leaf Spring and Clamp Group Disassembly.
9. Lower the axle and remove from the vehicle.

**AXLE INSTALLATION**

1. Place the new axle on the floor jack and position the axle under the vehicle, see Figure 9-14.
2. Install the new axle seat liner under the axle seat (liner ear snap to the side of the axle seat).
3. Raise the axle into position.
4. Ensure the axle seat liner holes are lined up with the axle seat and axle holes, see Figure 9-14.
5. Install the new axle collar fasteners with the bolt head located on the front side of the axle.
6. Tighten both sides, left and right of the axle collar bolts in four stages, stage one 100 foot pounds, stage two 350 foot pounds, stage three 700 foot pounds and the fourth and final 800 ± 20 foot pounds torque, see Figure 9-15.
7. Install the steering knuckles, refer to the Steering Knuckle Assembly instructions in this section.

8. Install the tie rod assembly into the tie rod arms.
9. Install the 7/8" washers on the tie rod arms and the castle nuts. Tighten the castle nuts to 185 foot pounds, then rotate until the first castle slot lines up with the cotter pin bore in the tie rod end. **DO NOT back off nut for cotter pin installation.**
10. Install the tie rod end cotter pin.
11. Connect the drag link in the steering arm.
12. Install the castle nut on the drag link taper stud. Tighten the castle nut to 185 foot pounds, then rotate until the first castle slot lines up with the cotter pin bore in the drag link. **DO NOT back off nut for cotter pin installation.**
13. Install the drag link cotter pin.
14. Install the brake backing plate assemblies and ABS sensor and torque all fasteners per manufacturer’s specifications.
15. Install the brakes, hubs, and wheels per the vehicle manufacturer’s guidelines.
16. Raise the vehicle and remove the frame supports.
17. Lower the vehicle and load the front axle with the truck's weight. Remove the floor jack.
18. Remove the wheel chocks.
19. Fill the hubs with the proper lubricant, (see manufacturer’s guidelines for recommended lubrication), if required.
20. Grease the front steering components as per lubrication guidelines in the Preventive Maintenance Section of this publication.

**STEERING KNuckle**

**STEERING KNuckle DISASSEMBLY**

1. Place the vehicle on level floor.
2. Chock the wheels.
3. Support the vehicle with jack stands on the axle.
4. Remove the wheel and hub assembly.
5. Remove the brake components from steering knuckle per the brake manufacturer’s procedure.

**SERVICE HINT**

Lightly tap the side of the tie rod arm with a mallet to separate the tie rod end from the tie rod arm, see Figure 9-16.

6. Disconnect the tie rod assembly from the tie rod arms, see Figure 9-16.
7. Remove the tie rod assembly.

**STEERING ARM DISASSEMBLY**

1. Remove the two steering-arm-to-knuckle hex bolts from the knuckle assembly. Figure 9-17.
2. Remove the steering arm from the knuckle. If necessary, use a leather or plastic mallet to tap the outside of the arm and separate the arm from the knuckle.
3. Remove the steering arm.
4. Inspect the steering arm for cracks or damage, replace as necessary.

**TIE ROD ARM DISASSEMBLY**

**WARNING**

SUPPORT THE TIE ROD ASSEMBLY DURING MAINTENANCE AND SERVICE TO PREVENT SERIOUS PERSONAL INJURY AND DAMAGE TO COMPONENTS.

**CAUTION**

DO NOT HEAT THE ARM TO REMOVE THE TIE ROD ASSEMBLY. HEATING THE TIE ROD ARM WILL SOFTEN PARTS. DAMAGE TO COMPONENTS WILL RESULT.

1. Remove tie rod arm 7/8" fasteners and discard.
2. Remove the tie rod arms, see Figure 9-18.
GREASE CAP, DRAW KEY AND KINGPIN DISASSEMBLY

YOU WILL NEED:
- Brass drift and hammer
- Heavy-duty King Pin Press that can generate 46,000 Lbs of force and will accommodate kingpins size of $2''$ to $2\frac{5}{32}''$

1. Remove the top grease cap.
2. Remove the draw keys.
   a. Loosen the threaded draw key locknut until the top of the locknut is even with the end of the draw key, see Figure 9-19.
   b. Use a brass drift and a hammer to hit the end of the draw key.
   c. Remove the nut from the draw key. Remove the draw key from the knuckle.
3. If you are not replacing the bushings, use the following procedure to prevent damaging the bushings during kingpin removal.
   a. Use a brass drift and a hammer to remove the kingpins from the knuckle. Figure 9-20.
   b. Remove any flaring on the drift that touches the bushings.
   c. Wrap tape to a thickness of $\frac{1}{16}''$ (1.5 mm) onto the end of the drift.
4. If the kingpin is hard to remove, use a hydraulic kingpin remover, refer to the Special Tools Section of this publication.
5. Remove the knuckle from the axle beam.

**WARNING**

WEAR GLOVES WHEN YOU REMOVE OR INSTALL SHIMS. SHIMS HAVE SHARP EDGES THAT CAN CAUSE SERIOUS PERSONAL INJURY.

6. While wearing gloves, remove the shims, the thrust bearing and the seal from the beam and/or steering knuckle. Figure 9-21.
7. Inspect the parts, refer to the Preventive Maintenance Section of this publication.
KINGPIN BUSHING

YOU WILL NEED:
- Impact wrench
- Adjustable Straight Flute Reamer with a cutting diameter a range of 2.0" to 2.01"

Refer to the Special Tools Section of this publication for the following shop made tools:
- Kingpin Bushing Driver
- Kingpin Bushing Installer/Remover Tool

REMOVAL
1. Place the steering knuckle on a workbench squarely supported.
2. Place the STEERTEK NXT kingpin bushing Installer/Remover tool in the steering knuckle/kingpin bore, see Figure 9-22.
3. Use a hammer and drive out the kingpin bushing, see Figure 9-23.
4. Rotate the knuckle over and repeat Steps 1-3 to remove the other kingpin bushing.
5. Clean the knuckle kingpin bores with a rotary wire wheel and inspect for reassembly, see Figure 9-24.
STEERING KNUCKLE BORE MEASUREMENT

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

1. Measure the upper knuckle bore inside diameter at two locations. Always use an inside micrometer or a telescoping gauge when taking a knuckle bore measurement. Some out-of-roundness at the top and bottom of the bore edges is acceptable. Steering knuckle bore diameter is 1.938" ± 0.003".

2. Measure the upper and lower bore in two positions and at two locations. The two positions must be 90° opposed from each other, see Figures 9-25 through 9-27. If the average measurement is more than the knuckle bore maximum diameter specification, replace the knuckle.

INSTALLATION

1. Install kingpin bushings from the axle side of the steering knuckle.

2. Place the new kingpin bushing into the steering knuckle bore so the seam DOES NOT align with the grease channel, see Figures 9-28 and 9-29.

3. Use the kingpin bushing driver to install the kingpin bushing into the steering knuckle bore, see Figure 9-30. Continue installation until the kingpin bushing is flush with the machined surface of the steering knuckle.

NOTE the location of the grease channel

DO NOT place the Kingpin Bushing Seam in line with the grease channel
4. Remove the kingpin bushing driver.
5. Install the kingpin bushing installer/remover tool.
6. Continue driving the kingpin bushing into the steering knuckle until it is flush with the bottom of kingpin seal bore, see Figures 9-31 and 9-32.
7. Repeat steps for the remaining kingpin bushing.
8. Ream the bushings, see Reaming procedure in this section.

KINGPIN PREPARATION AND MEASUREMENT

Cleaning Ground and Polished Parts
- Use a cleaning solvent to clean ground or polished parts and surfaces. **DO NOT USE GASOLINE.**
- **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.

Drying the Cleaned Parts
- Parts must be dried immediately after cleaning. Dry the parts with clean paper towels, clean rags, or compressed air. **DO NOT** dry bearings by spinning with compressed air. Damage to the bearings will result.

Preventing Corrosion on Cleaned Parts
- Apply a light coating of oil to all cleaned and dried parts that are going to be reused. **DO NOT** apply oil to the brake lining or the brake drums. If parts are to be stored, apply an effective rust inhibitor to all surfaces.

**WARNING**

TO HELP PREVENT SERIOUS EYE INJURY, ALWAYS WEAR PROPER EYE PROTECTION WHEN YOU PERFORM VEHICLE MAINTENANCE OR SERVICE.

**WARNING**

SOLVENT CLEANERS CAN BE FLAMMABLE, POISONOUS AND CAUSE BURNS. TO HELP AVOID SERIOUS PERSONAL INJURY, CAREFULLY FOLLOW THE MANUFACTURER’S PRODUCT INSTRUCTIONS AND GUIDELINES AND THE FOLLOWING PROCEDURES:
- **WEAR PROPER EYE PROTECTION.**
- **WEAR CLOTHING THAT PROTECTS YOUR SKIN.**
- **WORK IN A WELL VENTILATED AREA.**
DO NOT USE GASOLINE, SOLVENTS OR OTHER MATERIALS THAT CONTAIN GASOLINE THAT CAN EXPLODE.

HOT SOLUTION TANKS OR ALKALINE SOLUTIONS MUST BE USED CORRECTLY. FOLLOW THE MANUFACTURER’S RECOMMENDED INSTRUCTIONS AND GUIDELINES CAREFULLY TO HELP PREVENT PERSONAL ACCIDENT OR INJURY.

DO NOT USE HOT SOLUTION TANKS OR WATER AND ALKALINE SOLUTIONS TO CLEAN GROUND OR POLISHED PARTS. DAMAGE TO THE PARTS WILL RESULT.

1. Inspect the kingpin for wear or damage. Use a micrometer and measure the kingpin. If the kingpin has less than 2.0" diameter, replacement is necessary, see Figure 9-33.

2. Set up the reamer to match kingpin dimension, see Figure 9-34. The dimension of cutting diameter must facilitate a range of 2.0" to 2.001".

Kingpin minimum dimension is 2.0"

KINGPIN BUSHING REAMING

YOU WILL NEED:

- Fixed Reaming Tool, refer to Special Tools Section of this publication.

CAUTION

REAM THE KINGPIN BUSHINGS WITH AN ADJUSTABLE STRAIGHT FLUTE REAMER. (SEE SPECIAL TOOLS SECTION OF THIS PUBLICATION) DO NOT HONE OR BURNISH THE KINGPIN BUSHINGS. HONING OR BURNISHING WILL DAMAGE THE BUSHINGS AND VOID ANY APPLICABLE WARRANTY.

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.

WARNING

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

NOTE

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


**CAUTION**

USE A FIXED REAMER TO REAM THE KINGPIN BUSHINGS. DO NOT HONE OR BURNISH THE BUSHINGS. DAMAGE TO THE BUSHINGS WILL RESULT.

1. Place the knuckle in a vise with brass jaws, see Figure 9-35.
2. Install the pilot into the lower kingpin bore.
3. Install the reamer into the pilot.
4. Slide the reamer into the upper bushing and into the pilot until the reamer blades touch the bushing.
5. Rotate the reamer with a light **DOWNWARD** pressure. **DO NOT** apply too much force. Rotate the reamer smoothly, see Figure 9-36.
6. Turn the knuckle over in the vise and repeat Steps 2-5 for the other kingpin bushing. Figures 9-36 and 9-37.

**SERVICE HINT**

If the reamer must be removed through the bushing, rotate the tool in the opposite cutting direction.

7. Clean all material from the bushings.
8. Lightly lubricate the new kingpin with penetrating oil and slide into the steering knuckle bore to ensure the kingpin fits properly into the kingpin bushings.
KINGPIN SEAL INSTALLATION

YOU WILL NEED:

- Kingpin Seal Driver/Remover Tool, refer to the Special Tools Section in this publication.

1. Place the steering knuckle assembly on a suitable workbench.
2. Lay the kingpin seal into the bore of the steering knuckle. Ensure the lip of the kingpin seal faces toward the axle, see Figure 9-38.
3. Use a kingpin seal Driver/Remover tool and drive the seal firmly into the steering knuckle assembly with a hammer.
4. Install the kingpin seal until it bottoms out in the kingpin bore, see Figure 9-39.

STEERING KNUCKLE INSTALLATION

1. Clean the kingpin bores of the axle beam.
2. Install the thrust bearing assembly on the inner steering knuckle. The seal must face UPWARD toward the beam. The top inner diameter will contact the bottom of the axle beam, see Figures 9-40 and 9-41.

WARNING

WEAR GLOVES WHEN YOU INSTALL THE SHIMS. SHIMS HAVE SHARP EDGES THAT CAN CAUSE SERIOUS PERSONAL INJURY.

1. Place the knuckle onto the axle beam, see Figure 9-41.
2. Place a pry bar between the steering arm boss and the axle beam. Lift the knuckle and slide the shim pack between the top of the beam and the steering knuckle, see Figure 9-42.
5. Align all the steering knuckle components within the kingpin bore. If the bores are not aligned, the components will be damaged during kingpin installation.

6. Remove the pry bar.

7. Apply the multi-purpose grease onto the bottom half of the kingpin prior to kingpin installation onto the steering knuckle.

**CAUTION**

VERIFY THAT THE DRAW KEY IS INSTALLED COMPLETELY OR THE LOCKNUT IS TIGHTENED TO \(35 \pm 5\) FOOT POUNDS TORQUE. IF NOT INSTALLED CORRECTLY, THE KINGPIN AND THE AXLE BEAM WILL BE DAMAGED.

8. Install the kingpin into the top of the knuckle and through the area where the shims are located, see Figure 9-43 and 9-44. DO NOT force the kingpin through the upper kingpin bushing. Ensure the word TOP is facing up, see Figure 9-45.
9. Rotate the kingpin and slide in until the two draw key slots align with the axle draw key bores, see Figure 9-46 and 9-47.

10. If required, use a hammer and a brass drift to apply direct force to the kingpin for seating into the lower steering knuckle bore, see Figure 9-46.

11. Seat the upper draw key into the front of the axle beam, see Figure 9-47.

12. Seat the lower draw key into the back of the axle beam by striking it with a hammer and drift, see Figure 9-46. The draw keys must align with the slots of the kingpin.

13. Install draw key locknuts. Snug, **DO NOT** tighten torque until after the steering knuckle vertical end play procedure is completed.

---

**FIGURE 9-46**

![4¾" Draw Key](image1.png)

Part No.
75925-002
Front of the Axle Beam

**FIGURE 9-47**

![3 ⅜" Draw Key](image2.png)

Part No.
75925-001
Front of the Axle Beam

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**MEASURE STEERING KNUCKLE VERTICAL END PLAY**

1. Turn the knuckle to the straight-ahead position.

2. Attach a dial indicator to the axle. Place the tip onto the top of the steering knuckle.

3. Set the dial indicator to **zero**, see Figure 9-48.

4. Use one of the following methods to measure the vertical clearance.
   - Place a pry bar between the knuckle and the top of the axle center. Pry the knuckle up and measure the vertical end play.
   - Place a block of wood and a hydraulic jack under the bottom of the knuckle. Raise the knuckle until the pointer on the dial indicator stops, see Figure 9-48.

5. Record dial indicator reading.
   - If the knuckle binds or **zero** end play is measured, remove shims from the shim pack.
   - If the reading is more than the correct specification shown in Table 9-2, add shims to the shim pack.

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**TABLE 9-2**

<table>
<thead>
<tr>
<th>END PLAY SPECIFICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>New or Rebuilt Axles:</strong></td>
</tr>
<tr>
<td><strong>In-service Axles:</strong></td>
</tr>
</tbody>
</table>

6. Tighten upper and lower draw key locknuts to **35 ± 5** foot pounds torque.
GREASE CAP INSTALLATION

**WARNING**
TAKE CARE WHEN YOU USE LOCTITE ADHESIVE TO AVOID SERIOUS PERSONAL INJURY. READ THE MANUFACTURER’S INSTRUCTIONS BEFORE USING THIS PRODUCT. FOLLOW THE INSTRUCTIONS CAREFULLY TO PREVENT IRRITATION TO THE EYES AND SKIN. IF LOCTITE ADHESIVE MATERIAL GETS INTO YOU EYES, FOLLOW THE MANUFACTURER’S EMERGENCY PROCEDURES. HAVE YOUR EYES CHECKED BY A PHYSICIAN AS SOON AS POSSIBLE.

**NOTE**
If reusing a grease cap, ensure to apply the Loctite Straight Thread Sealant™ (STS) all around the threads (apply to a minimum of 3 threads), see Figure 9-49.

1. Ensure Loctite STS is applied to a minimum of three grease cap threads *(Note: New grease caps have Loctite STS pre-applied).*
2. Install the threaded grease caps onto the top of the knuckle.
3. Tighten the grease caps to \( 60 \pm 10 \) foot pounds, see Figure 9-50.
4. Remove the bottle jack and continue assembling the wheel ends.

STEERING ARM INSTALLATION

**WARNING**
TAKE CARE WHEN YOU USE LOCTITE ADHESIVE TO AVOID SERIOUS PERSONAL INJURY. READ THE MANUFACTURER’S INSTRUCTIONS BEFORE USING THIS PRODUCT. FOLLOW THE INSTRUCTIONS CAREFULLY TO PREVENT IRRITATION TO THE EYES AND SKIN. IF LOCTITE ADHESIVE MATERIAL GETS INTO YOU EYES, FOLLOW THE MANUFACTURER’S EMERGENCY PROCEDURES. HAVE YOUR EYES CHECKED BY A PHYSICIAN AS SOON AS POSSIBLE.

1. Use a tap to remove old Loctite adhesive from the internal threads of the knuckle.
2. Use new steering arm hex bolts and apply Loctite 680 adhesive. Ensure to cover at least half of the thread area.
3. Insert the hex bolts through the steering arm. Hand-start the bolts into the knuckle assembly, see Figure 9-51.
4. Tighten the steering arm hex bolts to \( 637 \pm 13 \) foot pounds torque.
TIE ROD ARM INSTALLATION

1. Install a new O-ring on the bottom of the steering knuckle.
2. Use a tap to remove old Loctite adhesive from the internal threads of the knuckle.
3. Use new tie rod arm hex bolts and apply Loctite 680 adhesive. Ensure to cover at least half of the thread area, see Figure 9-52.
4. Lubricate O-ring with grease and install tie rod arm on the bottom of the steering knuckle.
5. Insert the tie rod arm hex bolts through the tie rod arm and into the steering knuckle. Hand-start the bolts into the knuckle assembly, see Figure 9-52.
6. Tighten the tie rod arm bolts to $487 \pm 13$ foot pounds torque.
7. Install the brake torque plate.

**IMPORTANT NOTE**
It is critical to apply Loctite to the three brake torque plate bolts to ensure that these bolts sustain the proper torque requirement of steering knuckle assembly.

8. Apply Loctite Red 262 to the torque plate bolts prior to installation into the torque plate.

9. Tighten the torque plate bolts to $400 \pm 50$ foot pounds torque.
10. Install the tie rod end into the tie rod arm, see Figure 9-52.
11. Tighten the castle nuts to $185$ foot pounds torque then rotate the castle nut to the next castle slot and install cotter pin, see Figure 9-52.
12. Install the drag link into the steering arm and tighten to the vehicle manufacturer’s specifications.
13. Install wheel ends and tires.
14. Remove jack and safety stands.
15. Grease steering knuckles with the vehicle on the floor.
16. Remove the wheel chocks.

TIE ROD ENDS AND CROSS TUBE

**NOTE:**
Hendrickson supplies different tie rod configurations. Prior to ordering, locate the part number on the tie rod tube, for additional information see Technical Bulletin SEU-0223 or contact Hendrickson Tech Services.

DISASSEMBLY

1. Chock the wheels.
2. Position the steer axle tires straight ahead.
3. Remove the cotter pin and castle nut.
4. Lightly tap the side of the tie rod arm to loosen the tie rod end from the tie rod arm, see Figure 9-53.
5. Repeat to Steps 3 and 4 to remove the other tie rod end.
6. Remove the cross tube and tie rod ends from the vehicle.
7. Mount the cross tube in a soft jaw vice.
8. Remove the hardware from the clamp on the cross tube.
9. Count the exposed threads on the tie rod end being replaced.
10. Remove the tie rod end from the cross tube.

**WARNING**

**WARNING**

DO NOT HEAT THE CROSS TUBE WITH A TORCH TO FACILITATE THE REMOVAL OF THE TIE ROD END. THE USE OF SUCH HEAT CAN ADVERSELY AFFECT THE STRENGTH OF THE CROSS TUBE. A COMPONENT DAMAGED IN THIS MANNER WILL RESULT IN LOSS OF WARRANTY, AND CAN RESULT IN THE LOSS OF VEHICLE CONTROL, AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

11. If the opposing tie rod end is being replaced repeat Steps 8 through 10.
12. Inspect the cross tube for dents, cracks, or thread damage. Replace the cross tube if needed.

**ASSEMBLY**

1. Lubricate the new tie rod end threads with Anti-Seize.

**NOTE**

When installing the cross tube the thread direction of the tie rod ends are as follows:
- A right hand threaded tie rod end will be installed into the right side tie rod arm.
- A left hand threaded tie rod end will be installed into the left side tie rod arm.

2. Install the new tie rod end into the cross tube, leaving the same amount of threads exposed that were counted on the failed tie rod end prior to removal.

**WARNING**

THE THREADED PORTION OF THE TIE ROD END MUST EXTEND PAST THE SLOTS INTO THE TIE ROD CROSS TUBE. SEE FIGURE 9-54. FAILURE TO DO SO CAN CAUSE COMPONENT DAMAGE, LOSS OF VEHICLE CONTROL AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

**WARNING**

IT IS CRITICAL TO CHECK THE 5/8" TIE ROD CLAMP BOLT HEAD LOCATION TO VERIFY THE CLAMP FASTENERS HAVE SUFFICIENT CLEARANCE AWAY FROM THE LOWER SHOCK MOUNT AT FULL WHEEL CUT. THE FASTENERS MUST NOT CONTACT THE LOWER SHOCK MOUNT. FAILURE TO DO SO CAN CAUSE ONE OR MORE COMPONENTS TO FAIL CAUSING LOSS OF VEHICLE CONTROL AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

3. Replace the opposing tie rod end if necessary by repeating Steps 1 and 2.

**WARNING**

DO NOT HEAT THE CROSS TUBE WITH A TORCH TO ROTATE THE CROSS TUBE IN THE TIE ROD END. THE USE OF SUCH HEAT CAN ADVERSELY AFFECT THE STRENGTH OF THE CROSS TUBE. A COMPONENT DAMAGED IN THIS MANNER WILL RESULT IN LOSS OF WARRANTY, AND CAN RESULT IN THE LOSS OF VEHICLE CONTROL, AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.
4. It is critical that the cross tube rotate in the opposing tie rod end, even if it is not replaced.
5. Install the tie rod end into the tie rod arm.
6. Tighten the castle nuts to 185 foot pounds, torque then rotate the castle nut to the next castle slot and install cotter pin.
7. Grease the tie rod ends. Refer to the Lubrication Chart for required lubricant in the Preventive Maintenance Section of this publication.
8. Set the toe, refer to the Toe Adjustment Procedure in the Alignment & Adjustments Section of this publication.
### SECTION 10
Alignment Specifications

**STEERTEK NXT High Capacity Steer Axle System for Autocar® ACX-XPEDITOR™ Vehicles**

#### FRONT SUSPENSION ALIGNMENT SPECIFICATIONS

<table>
<thead>
<tr>
<th>Camber¹</th>
<th>Design Specification</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum</td>
<td>Maximum</td>
</tr>
<tr>
<td>Left</td>
<td>0.0° ± 1.0°</td>
<td>-1.0°</td>
</tr>
<tr>
<td>Right</td>
<td>-0.25° ± 1.0°</td>
<td>-1.25°</td>
</tr>
<tr>
<td>Cross</td>
<td>0.0°</td>
<td>—</td>
</tr>
</tbody>
</table>

**Camber Notes:**

1. The camber angle is not adjustable. **DO NOT** bend axle or otherwise try to adjust camber. If found out of specification, notify Hendrickson Tech Services for further information.

#### Caster¹,²

<table>
<thead>
<tr>
<th>Caster¹,²</th>
<th>Design Specification</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum</td>
<td>Maximum</td>
</tr>
<tr>
<td>Left</td>
<td>3° ± 1.0°</td>
<td>+2°</td>
</tr>
<tr>
<td>Right</td>
<td>3° ± 1.0°</td>
<td>+2°</td>
</tr>
<tr>
<td>Cross³</td>
<td>0.0°</td>
<td>—</td>
</tr>
</tbody>
</table>

**Caster Notes:**

1. Caster is determined with the vehicle at specified ride height for air suspension or at rated load for mechanical suspension systems. It is critical that the vehicle front and rear ride height is within specifications prior to performing a caster measurement or adjustment. See Hendrickson ride height specifications and procedure.

2. In most cases actual vehicle caster is defined with the frame rails at zero slope. Refer to the vehicle manufacturer’s specifications for correct frame rail slope. (Both the alignment surface and the vehicle’s frame rails should be level during execution of alignment procedures). For vehicles with a positive frame rake (higher in rear) add the frame slope (in degrees) to the caster reading to determine true vehicle caster.

3. The Cross caster angle is not adjustable – **DO NOT** bend axle or otherwise try to adjust cross caster. If found out of specifications notify Hendrickson Tech Services for further information. Changes to caster can be attained by using caster shims as provided by the vehicle manufacturer or chassis and body manufacturer. Caster shims must match, side to side, to reduce uneven loading to the suspension components. **The use of two different angle caster shims will not correct cross caster.**

4. **Example of caster adjustment:** 4.5° RH / 5° Left Hand would require one, 1.0 shim on each side to increase caster and achieve 5.50° Right Hand / 6.00° Left Hand, which is in specification. **DO NOT** attempt to use uneven shims.

**Hendrickson recommends the following TMC² practices:**

<table>
<thead>
<tr>
<th>Total Toe²</th>
<th>Design Specification¹</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum</td>
<td>Maximum</td>
</tr>
<tr>
<td></td>
<td>½e° ± ½s° (0.06° ± 0.03°)</td>
<td>½s° (0.03°)</td>
</tr>
</tbody>
</table>

**Toe-in Notes:**

1. Toe-in is to be set and adjusted in the normal vehicle unloaded configuration. Actual vehicle curb weight on the ground. Toe should be checked at the tires front and rear tread center, at a distance above ground equal to the tire’s rolling radius.

2. In most instances total toe is set by the vehicle manufacturer or body builder. Consult the vehicle manufacturer for specifications.
# SECTION 11
## Troubleshooting Guide

### STEERTEK NXT High Capacity

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>POSSIBLE CAUSE</th>
<th>CORRECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worn or damaged kingpins and kingpin bushings</td>
<td>Dirt in system—contaminated lubricant</td>
<td>Polish and inspect kingpin, replace bushing and seals, then follow specified lubrication procedures</td>
</tr>
<tr>
<td></td>
<td>Incorrect lubricant</td>
<td>Lubricate axle with specified lubricant</td>
</tr>
<tr>
<td></td>
<td>Axle not lubricated at scheduled frequency</td>
<td>Lubricate axle at scheduled frequency</td>
</tr>
<tr>
<td></td>
<td>Incorrect lubrication procedures</td>
<td>Use correct lubrication procedures</td>
</tr>
<tr>
<td></td>
<td>Lubrication interval not compatible with operating conditions</td>
<td>Change lubrication interval to match operating conditions</td>
</tr>
<tr>
<td></td>
<td>Worn or missing seals</td>
<td>Replace worn or missing seals</td>
</tr>
<tr>
<td>Vibration or shimmy of front axle during operation</td>
<td>Caster out of specification</td>
<td>Adjust caster to specification</td>
</tr>
<tr>
<td></td>
<td>Wheels and/or tires out of balance</td>
<td>Balance or replace wheels and/or tires</td>
</tr>
<tr>
<td></td>
<td>Worn shock absorbers</td>
<td>Replace shock absorbers per the vehicle manufacturer’s instructions</td>
</tr>
<tr>
<td></td>
<td>Wheel bearing adjustment</td>
<td>Adjust wheel bearing to the vehicle manufacturer’s specifications</td>
</tr>
<tr>
<td>Excessive wear on tires or uneven tire tread wear</td>
<td>Tires have incorrect air pressure</td>
<td>Adjust tire pressure to manufacturer’s specification</td>
</tr>
<tr>
<td></td>
<td>Tires out of balance</td>
<td>Balance or replace tires</td>
</tr>
<tr>
<td></td>
<td>Incorrect axle alignment</td>
<td>Align axles</td>
</tr>
<tr>
<td></td>
<td>Incorrect toe setting</td>
<td>Adjust toe-in to manufacturer’s specification</td>
</tr>
<tr>
<td></td>
<td>Incorrect steering arm geometry</td>
<td>Repair steering system as necessary</td>
</tr>
<tr>
<td></td>
<td>Excessive wheel bearing end play</td>
<td>Check specified wheel nut torque, replace worn or damaged wheel bearings</td>
</tr>
<tr>
<td></td>
<td>Wheel bearing adjustment</td>
<td>Adjust wheel bearing to the vehicle manufacturer’s specifications</td>
</tr>
<tr>
<td>Vehicle is hard to steer</td>
<td>Low pressure in the power steering system</td>
<td>Repair power steering system</td>
</tr>
<tr>
<td></td>
<td>Steering linkage needs lubrication</td>
<td>Lubricate steering linkage</td>
</tr>
<tr>
<td></td>
<td>Steering knuckles are binding</td>
<td>Check vertical end play</td>
</tr>
<tr>
<td></td>
<td>Incorrect steering arm geometry</td>
<td>Repair steering system as necessary</td>
</tr>
<tr>
<td></td>
<td>Caster out of specification</td>
<td>Adjust caster to specification</td>
</tr>
<tr>
<td></td>
<td>Tie rod ends hard to move</td>
<td>Replace tie rod ends</td>
</tr>
<tr>
<td></td>
<td>Worn thrust bearing</td>
<td>Replace thrust bearing</td>
</tr>
</tbody>
</table>
SECTION 12
Torque Specifications

HENDRICKSON RECOMMENDED TORQUE VALUES
PROVIDED IN FOOT POUNDS AND IN NM

1. 600 ± 20 ft. lbs (814 ± 27 Nm)
2. Snap Fit
3. 800 ± 20 ft. lbs (1084 ± 27 Nm)
4. 35 ± 5 ft. lbs (47 ± 7 Nm)
5. 637 ± 13 ft. lbs (864 ± 17 Nm)
6. 50 ± 10 ft. lbs (68 ± 14 Nm)
7. Min. 15 ft. lbs (Min. 20 Nm)
8. 487 ± 13 ft. lbs (660 ± 77 Nm)
9. 60 ± 10 ft. lbs (81 ± 14 Nm)
10. 185 ft. lbs (251 Nm)
11. 68 ± 7 ft. lbs (92 ± 9 Nm)
12. 68 ± 7 ft. lbs (92 ± 9 Nm)
## STEERTEK NXT High Capacity

### HENDRICKSON RECOMMENDED TORQUE SPECIFICATIONS

<table>
<thead>
<tr>
<th>NO.</th>
<th>COMPONENT</th>
<th>FASTENER</th>
<th>*TORQUE VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>QTY.</td>
<td>QTY. SIZE</td>
</tr>
<tr>
<td>1.</td>
<td>Clamp Group Hex Bolt</td>
<td>8</td>
<td>1&quot;-8 UNC</td>
</tr>
<tr>
<td>2.</td>
<td>Axle Seat Liner</td>
<td>2</td>
<td>Snap Fit</td>
</tr>
<tr>
<td>3.</td>
<td>Axle Collar at the Bolt Head</td>
<td>4</td>
<td>1&quot;-8 UNC</td>
</tr>
<tr>
<td>4.</td>
<td>Kingpin Draw Key Nut</td>
<td>4</td>
<td>7/8&quot;-14 UNC</td>
</tr>
<tr>
<td>5.</td>
<td>Knuckle Assembly to Steering Arm</td>
<td>4</td>
<td>1&quot;-14 UNF</td>
</tr>
<tr>
<td>6.</td>
<td>Knuckle / Axle Wheel Stop Bolt</td>
<td>2</td>
<td>5/8&quot; Jam Nut</td>
</tr>
<tr>
<td>8.</td>
<td>Knuckle Assembly to Tie Rod Arm</td>
<td>4</td>
<td>7/8&quot;-14 UNF</td>
</tr>
<tr>
<td>9.</td>
<td>Grease Cap</td>
<td>2</td>
<td>½&quot;</td>
</tr>
<tr>
<td>10.</td>
<td>Tie Rod Ends to Tie Rod Arm</td>
<td>2</td>
<td>7/8&quot; Castle Nut</td>
</tr>
<tr>
<td>11.</td>
<td>Tie Rod Tube to Tie Rod Ends</td>
<td>2</td>
<td>5/8&quot;</td>
</tr>
<tr>
<td>12.</td>
<td>Spindle Nut</td>
<td>2</td>
<td>***</td>
</tr>
</tbody>
</table>

- All hardware ¼" and greater is Grade 8 with no additional lubrication.

**NOTE:**
- * Torque values shown in this publication apply only if Hendrickson supplied fasteners are used. If non Hendrickson fasteners are used, follow the torque specification listed in the vehicle manufacturer’s service manual.
- ** Tighten to 185 foot pounds torque, advance nut to next hex face to install cotter pin. **DO NOT** back off nut for cotter pin installation.
- *** Refer to the vehicle manufacturer for spindle tightening procedure.
SECTION 13
Reference Material

This technical publication covers Hendrickson Truck Suspension’s recommended procedures for our parts/products. Other components play a major role in overall performance and Hendrickson recommends you follow the specific vehicle manufacturer’s recommendation for care and maintenance. Some recommended procedures have been developed by The Technology & Maintenance Council (TMC) and Hendrickson supports these recommendations. We have compiled a list of these below.

TMC
To obtain copies of the following RP’s, video’s, or charts, contact TMC at:
TMC/ATA Phone: 703-838-1763
2200 Mill Road website: tmc.truckline.com
Alexandria, VA 22314 online ordering: www.truckline.com/store

IMPORTANT REFERENCES
TMC RP 214B Tire/Wheel End Balance and Runout
TMC RP 216 Radial Tire Conditions Analysis Guide
TMC RP 219A Radial Tire Wear Conditions and Causes
TMC RP 222A User’s Guide To Wheels and Rims
TMC RP 230 Tire Test Procedures for Tread wear, Serviceability, and Fuel Economy
TMC RP 514 Pre-Alignment Inspection
TMC RP 618 Wheel Bearing Adjustment Procedure
TMC RP 620B Front End Alignment Steering Geometry
TMC RP 708A Trailer Axle Alignment
TMC RP 642 Guidelines For Total Vehicle Alignment
TMC RP 644 Wheel End Conditions Analysis Guide
TMC RP 645 Tie Rod End Inspection and Maintenance Procedure
Video’s
TMC T0326 Wheel End Maintenance
TMC T0372 Tire Pre-Trip Inspection Guidelines
Other
TMC T0400 Wheel bearing Adjustment Procedure Wall Chart