



# **H** TECHNICAL PROCEDURE

## STEERTEK™ NXT / STEERTEK™ Axle and SOFTEK® • AIRTEK® Systems for International Truck Vehicles

**SUBJECT:** Service Instructions

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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 following Hendrickson equipment as installed on applicable International Truck vehicles:

- **SOFTEK®** — An integrated monoleaf spring suspension with the STEERTEK NXT axle
- **STEERTEK™ NXT** — A durable, lightweight, fabricated steer axle assembly
- **AIRTEK®** — An integrated front air suspension with the STEERTEK axle

See AIRTEK, SOFTEK and STEERTEK NXT parts lists to determine the components that are manufactured by Hendrickson. For components not manufactured or supplied by Hendrickson contact the vehicle manufacturer for proper preventive maintenance and rebuild instructions.

### 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 the SOFTEK / AIRTEK Suspension Systems and the STEERTEK NXT axle.

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), 630-910-2800 (outside U.S. and Canada) or email: techservices@hendrickson-intl.com.

**The latest revision of this publication is available online at [www.hendrickson-intl.com](http://www.hendrickson-intl.com).**

## SECTION 2 Product Description

**STEERTEK NXT** — Integrated into the SOFTEK systems as well as being an option on International's 2-leaf mechanical suspension system, see Figure 2-1. The box-shaped design provides a stiffer axle and resists torsional, longitudinal and vertical loads more effectively than traditional I-beam axles. Together with the front limbs of the leaf springs, the robotically welded axle beam forms a torsion system, enhancing roll stability characteristics and improving handling.

**Axle Clamp Group** — The Clamp Group consists of the top pad, ¾" U-bolts, washers, and nylon locknuts

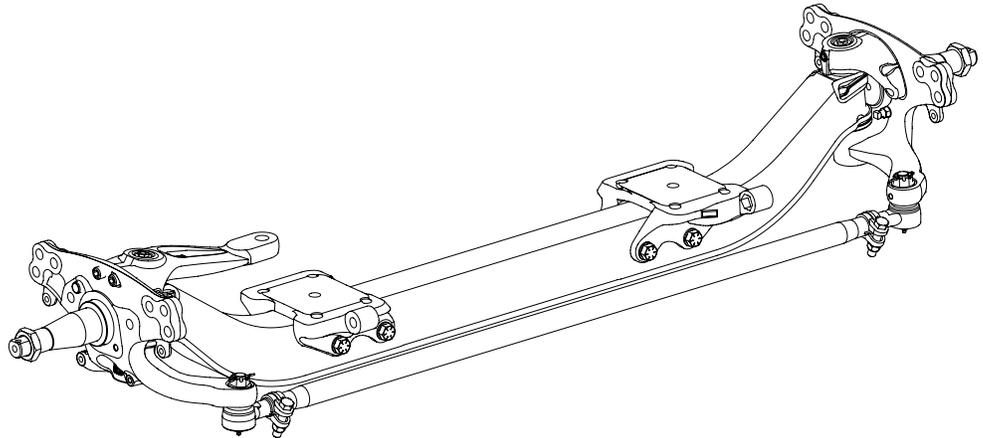
**Adjustable Tie Rod** — To help maximize tire life, the tie rod easily adjusts toe-in/out.

**Steering Knuckles** — The steering and tie rod arms are integrated for increased strength and reduced weight. The unique steering knuckle packaging delivers up to 55° wheel cut. The two piece knuckle design makes replacing the kingpin bushings easier by eliminating the need to remove the kingpins.

**FIGURE 2-1**

## STEERTEK NXT Axle

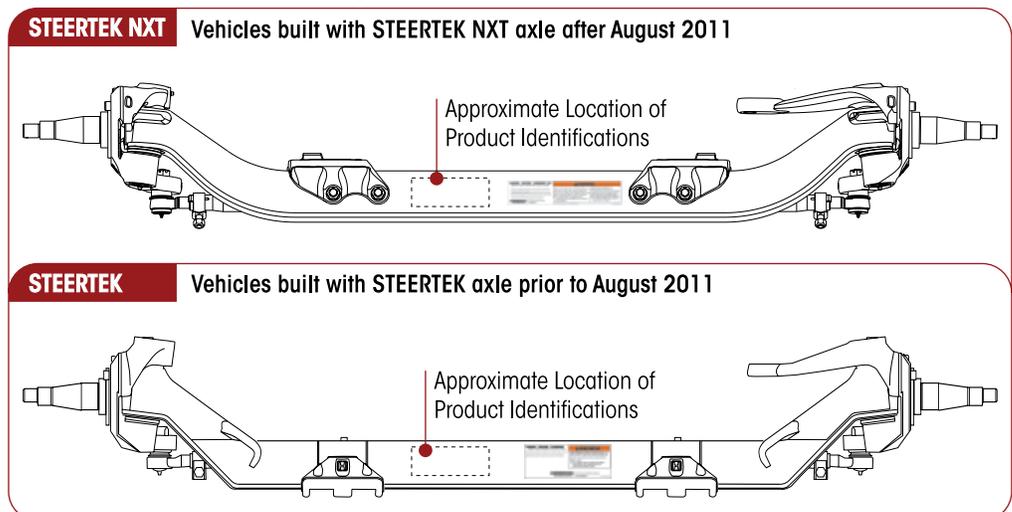
**Capacity:** 12K, 12.35K, 13K, 13.2K, 14K, 14.6K pounds



### TECHNICAL NOTES

1. The STEERTEK NXT axle is available with 69.02" and 70.89" Kingpin Intersections (KPI).
2. The STEERTEK NXT axle offers 4.25" and 5.36" axle beam drop height. Axle beam drop is measured from the kingpin intersection to the top of the axle.
3. STEERTEK NXT axle system weight is based on a 4.25" drop height and a 70.87" KPI axle. Weight includes, axle beam with axle spring seats, knuckle/steering arm assemblies and tie rod assemblies.
4. STEERTEK NXT can be used in applications that are up to 100 percent off-highway. Contact Hendrickson for approval and guidelines on any application that exceeds 15 percent off-highway usage. This system is anti-lock braking system (ABS) ready. STEERTEK NXT is compatible with industry standard wheel ends and brakes. STEERTEK NXT is also available with mechanical suspension options. Contact Hendrickson or vehicle manufacturer for availability.
5. The STEERTEK NXT axle 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** Front view of axle showing approximate location of etched Product Identification.



## 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.



INDICATES AN IMMINENTLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, WILL RESULT IN SERIOUS INJURY OR DEATH.



INDICATES A POTENTIAL HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, CAN RESULT IN SERIOUS INJURY OR DEATH.



INDICATES A POTENTIAL HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, MAY RESULT IN MINOR OR MODERATE INJURY, OR PROPERTY DAMAGE.

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#### NOTE

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

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#### 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

### WARNING

#### FASTENERS

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.

### WARNING

#### AIR SPRINGS

AIR SPRING ASSEMBLIES MUST BE COMPLETELY DEFLATED PRIOR TO LOOSENING ANY CLAMP GROUP HARDWARE, OR OTHERWISE PERFORMING ANY MAINTENANCE, SERVICE OR REPAIR OF THE SUSPENSION SYSTEM. UNRESTRICTED AIR SPRING ASSEMBLIES CAN VIOLENTLY SHIFT. DO NOT INFLATE AIR SPRING ASSEMBLIES WHEN THEY ARE UNRESTRICTED. AIR SPRING ASSEMBLIES MUST BE RESTRICTED BY SUSPENSION OR OTHER ADEQUATE STRUCTURE. DO NOT INFLATE BEYOND PRESSURES RECOMMENDED BY AIR SPRING MANUFACTURER, CONTACT HENDRICKSON TECHNICAL SERVICES FOR DETAILS. IMPROPER USE OR OVER INFLATION MAY CAUSE AIR SPRING ASSEMBLIES TO BURST, CAUSING PROPERTY DAMAGE AND/OR SEVERE PERSONAL INJURY.

### WARNING

WHEN SERVICING THE VEHICLE OR ATTACHING AN AIR SPRING AND THE VEHICLE IS ON THE GROUND, PRIOR TO AIRING THE SUSPENSION SYSTEM MAKE CERTAIN THE AIR SPRING LOCATOR IS INDEXED INTO THE UPPER AIR SPRING BRACKET PROPERLY, AND THE AIR SPRING IS FULLY SEATED ON THE TOP PAD. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN PREMATURE AIR SPRING FAILURE, CAUSE PERSONAL INJURY, OR PROPERTY DAMAGE.

### WARNING

PRIOR TO AND DURING DEFLATION AND INFLATION OF THE FRONT AIR SUSPENSION SYSTEM, ENSURE THAT ALL PERSONNEL AND EQUIPMENT ARE CLEAR FROM UNDER THE VEHICLE AND AROUND THE SERVICE AREA, FAILURE TO DO SO CAN CAUSE SERIOUS PERSONAL INJURY, DEATH, OR PROPERTY DAMAGE.

### WARNING

#### LOAD CAPACITY

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.

### WARNING

#### REPAIR OR RECONDITIONING

THE REPAIR OR RECONDITIONING OF SUSPENSION OR AXLE COMPONENTS IS NOT ALLOWED AS SHOWN ON LABEL IN FIGURE 3-3. ANY AXLE COMPONENTS FOUND TO BE DAMAGED OR OUT OF SPECIFICATIONS MUST BE REPLACED. ALL MAJOR HENDRICKSON COMPONENTS ARE HEAT TREATED AND TEMPERED. AIRTEK 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.

### WARNING

#### SHOCK ABSORBERS

THE SHOCK ABSORBERS ARE THE REBOUND TRAVEL STOPS FOR THE AIR SPRINGS. ANYTIME THE FRONT AXLE ON AN AIRTEK SUSPENSION IS SUSPENDED IT IS MANDATORY THAT THE SHOCK ABSORBERS REMAIN CONNECTED. FAILURE TO DO SO COULD CAUSE THE AIR SPRINGS TO EXCEED THEIR MAXIMUM LENGTH, POSSIBLY CAUSING THE AIR SPRINGS TO SEPARATE FROM THE PISTON, OR CAUSE A REVERSE ARCH IN THE STEEL LEAF SPRINGS, POSSIBLY RESULTING IN PREMATURE STEEL LEAF SPRING FAILURE.



**AXLE CAMBER**

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 IS NOT ADJUSTABLE.** DO NOT CHANGE THE AXLE CAMBER ANGLE OR BEND THE AXLE BEAM, SEE FIGURES 3-1 AND 3-2. 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.



**AXLE KINGPINS**

STEERTEK NXT / STEERTEK IS A UNIQUE AXLE, IN THAT THE KINGPIN IS CRYOGENICALLY INSTALLED IN THE AXLE. THE KINGPIN IS A NON-REPLACEABLE COMPONENT OF THE AXLE ASSEMBLY. DO NOT TRY TO REMOVE THE KINGPIN. IF THE KINGPIN OR ADJACENT MATING SURFACE SHOW SIGNS OF DAMAGE OR MOVEMENT, DO NOT OPERATE THE VEHICLE AND IMMEDIATELY CONTACT THE HENDRICKSON TECH SERVICES DEPARTMENT.



**STEERTEK NXT AXLE SPRING SEATS**

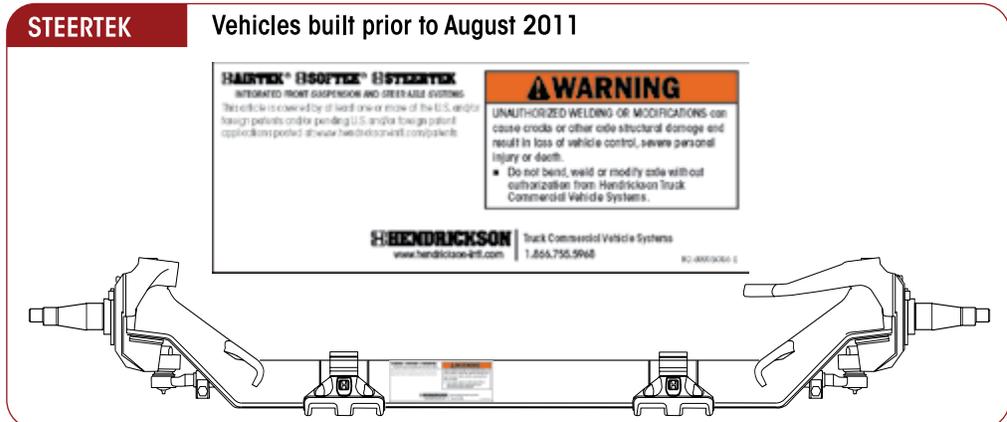
THE INTEGRATED AXLE SPRING SEATS ON THE STEERTEK NXT AXLE ARE NON-SERVICEABLE. UNAUTHORIZED TAMPERING OF INTEGRATED AXLE SPRING SEATS CAN CAUSE COMPONENT AND STRUCTURAL DAMAGE AND RESULT IN LOSS OF VEHICLE CONTROL, SEVERE PERSONAL INJURY OR DEATH, PROPERTY DAMAGE, AND WILL VOID ANY APPLICABLE WARRANTY. DO NOT REMOVE, MODIFY OR REPLACE INTEGRATED AXLE SPRING SEAT OR FASTENERS, SEE FIGURE 3-1.

**NOTE:** REPLACE ANY SAFETY DECALS THAT ARE FADED, TORN, MISSING, ILLEGIBLE, OR OTHERWISE DAMAGED. CONTACT HENDRICKSON TO ORDER REPLACEMENT LABELS.

**FIGURE 3-1**



**FIGURE 3-2**



**WARNING**

**DAMAGED AXLE COMPONENTS**

IF A VEHICLE EQUIPPED WITH A STEERTEK NXT / STEERTEK AXLE 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 THE COMPLETE AXLE ASSEMBLY.

CONTACT HENDRICKSON TECHNICAL 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.

**WARNING**

**MODIFYING COMPONENTS**

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.

**WARNING**

**OFF-ROADWAY TOWING**

WHEN A VEHICLE IS DISABLED AND EQUIPPED WITH A STEERTEK NXT / STEERTEK AXLE, CARE MUST BE TAKEN TO ENSURE THERE IS NO DAMAGE TO THE SUSPENSION OR AXLE WHEN TOWING THE VEHICLE. THE USE OF A TOW STRAP IS NECESSARY TO TOW A DISABLED VEHICLE TO 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 A TOW STRAP MAY BE WRAPPED AROUND THE FRONT AXLE, (SEE FIGURE 3-3) 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 AXLE OR WITH A SINGLE POINT LOCATION TO TOW THE VEHICLE. DOING SO WILL DAMAGE THE AXLE AND VOID ANY APPLICABLE WARRANTY, SEE FIGURE 3-3. FOR DETAILED TOWING INSTRUCTIONS FOR ON-HIGHWAY TOWING, SEE TOWING PROCEDURES SECTION IN THIS PUBLICATION.

**FIGURE 3-3**



 **CAUTION**

**PROCEDURES AND TOOLS**

A TECHNICIAN 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**

**PERSONNEL PROTECTIVE EQUIPMENT**

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

 **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 SPRING ASSEMBLY AND AXLE. DO NOT CONNECT ARC WELDING GROUND LINE TO THE SPRING ASSEMBLY OR AXLE. DO NOT STRIKE AN ARC WITH THE ELECTRODE ON THE SPRING ASSEMBLY OR AXLE. DO NOT USE HEAT NEAR THE SPRING ASSEMBLY OR AXLE. DO NOT NICK OR GOUGE THE SPRING ASSEMBLY OR AXLE. SUCH IMPROPER ACTIONS CAN CAUSE DAMAGE TO THE SPRING ASSEMBLY OR THE AXLE COULD FAIL, AND CAN CAUSE LOSS OF VEHICLE CONTROL AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

 **WARNING**

**SUPPORT THE VEHICLE PRIOR TO SERVICING**

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. CHOCK THE WHEELS AND MAKE SURE THE VEHICLE WILL NOT ROLL PRIOR TO RELEASING THE BRAKES. A FLOOR JACK CAN SLIP OR FALL OVER. SERIOUS PERSONAL INJURY CAN RESULT.

 **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:

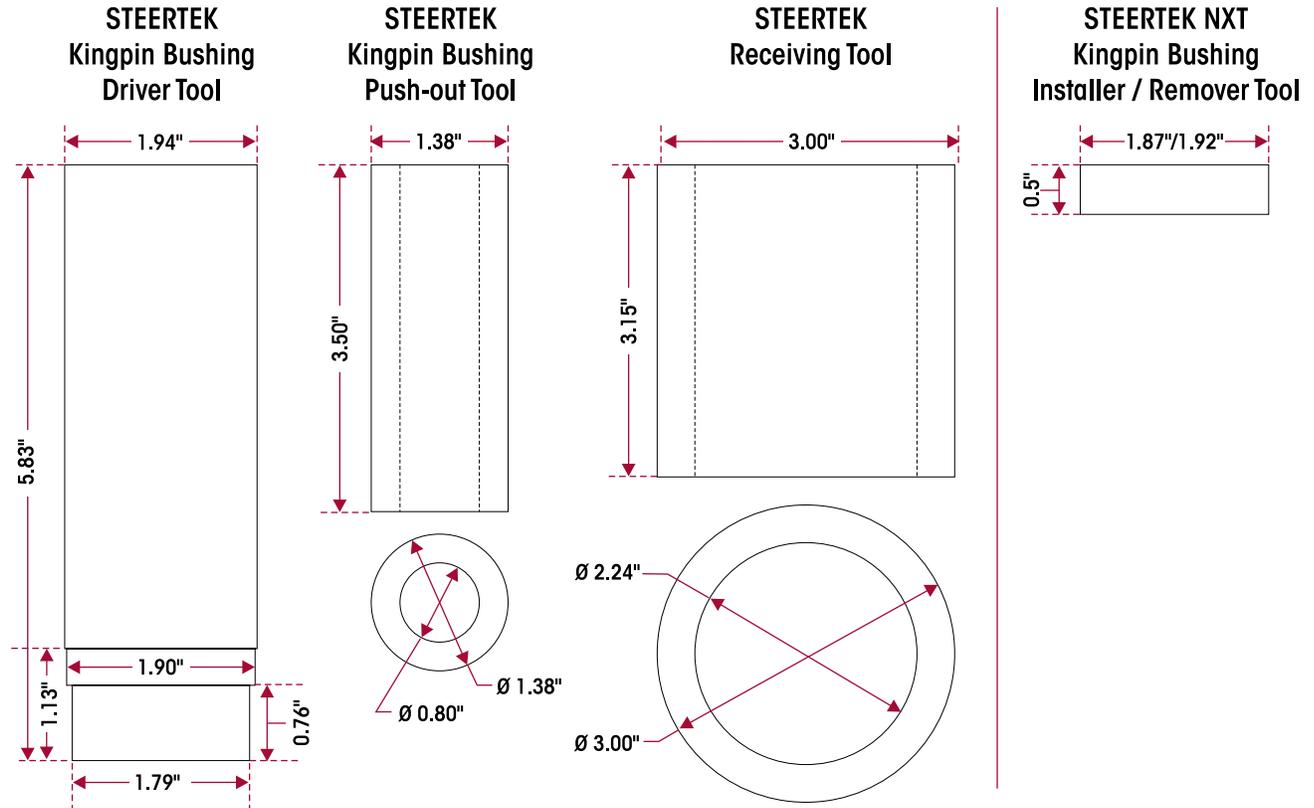
6. WEAR PROPER EYE PROTECTION
7. WEAR CLOTHING THAT PROTECTS YOUR SKIN
8. WORK IN A WELL VENTILATED AREA
9. DO NOT USE GASOLINE, OR SOLVENTS THAT CONTAIN GASOLINE. GASOLINE CAN EXPLODE
10. HOT SOLUTION TANKS OR ALKALINE SOLUTIONS MUST BE USED CORRECTLY. FOLLOW THE MANUFACTURER'S RECOMMENDED INSTRUCTIONS 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 Special 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 tools.

### KINGPIN BUSHING TOOLS



### ADJUSTABLE STRAIGHT FLUTE REAMER

The dimension of cutting diameter must facilitate a range of 1.802" – 1.812"



## SECTION 5 Parts List

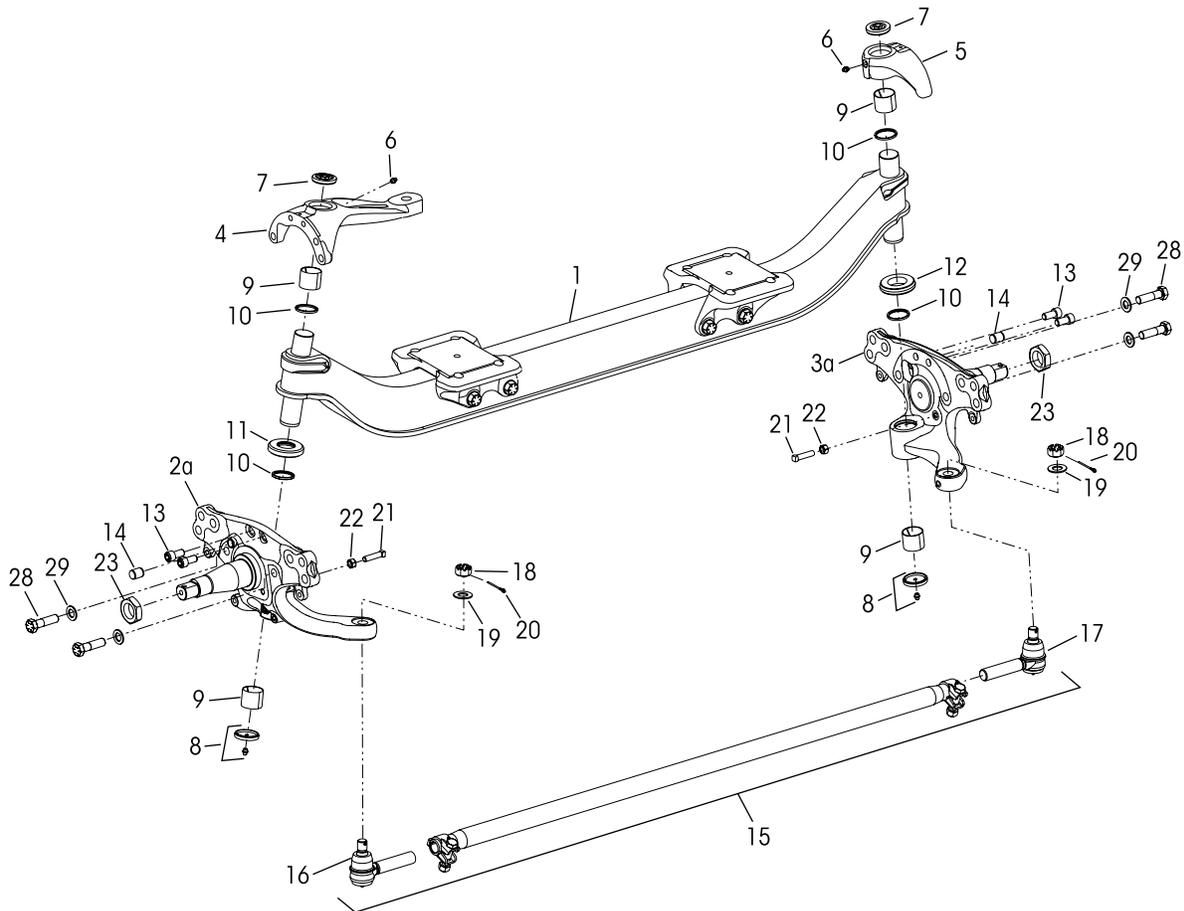
### STEERTEK NXT Axle Cross Caster

■ Medium-duty with Standard Brake Knuckle

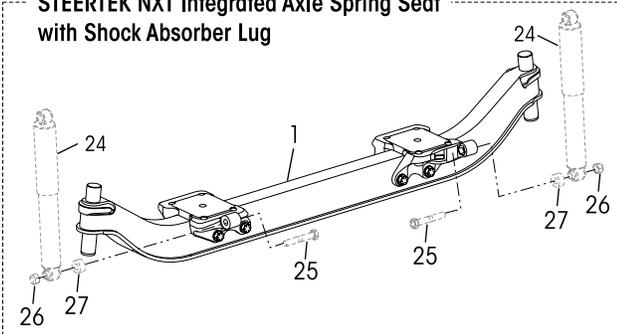
■ Standard-duty with Standard Brake Knuckle | Integrated Brake Knuckle (IBK)

ProStar (LT Series) 12K, 12.35K, 13.2K, 14K, 14.6K • TranStar (RH Series) 12K, 12.35K, 14K

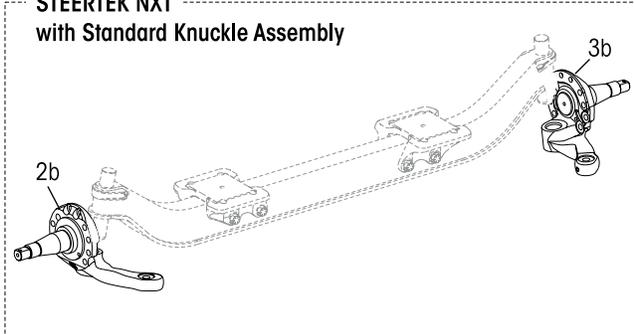
LoneStar (LS Series) 12.35K, 13.2K, 14K, 14.6K



STEERTEK NXT Integrated Axle Spring Seat  
with Shock Absorber Lug



STEERTEK NXT  
with Standard Knuckle Assembly





# STEERTEK™ NXT for International Truck Vehicles

KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.	KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.
		<b>STEERTEK NXT</b> Cross Caster Axle Assembly, <i>See Selection Guide on Page 12</i>	1			<b>Thrust Bearing Service Kits,</b>	
	79487-XXX	Medium-duty			60961-631	<b>Axle Set</b> , Includes Kit Nos. 60961-632 & -633	
	92997-XXX	• 10K, 12K w/Standard Brake Knuckle, Includes Key Nos. 1-10, 12-23			60961-632	<b>****Left Hand Composite Thrust Bearing</b> , Includes Key Nos. 10-11, 13 & Loctite, for 92997-XXX Axle	
		• 12K, 12.35K, 13.2K 14K, 14.6K w/Standard Brake Knuckle, Includes Key Nos. 1-23			60961-633	<b>Roller Thrust Bearing</b> , Includes Key Nos. 10, 12-13 & Loctite	
		• 12K, 12.35K, 13.2K w/Integrated Brake Knuckle (IBK), Includes Key Nos. 1-23, 28-29		10	68731-000	Kingpin Seal	4
1		<b>***Axle &amp; Kingpin Assembly</b> , Cross Caster <i>See Selection Guide on Page 12</i>	1	11	59828-000	<b>****Left Hand Composite Thrust Bearing</b>	1
	79486-XXXM	10K, 12K Medium-duty		12	64256-000L	<b>****Roller Thrust Bearing</b>	1
	92996-XXXM	<b>****12K, 12.35K, 13.2K, 14K, 14.6K Standard-duty, Replaces 68997-XXX</b>		13	60236-001	5/8"-11 UNC Socket Head Cap Screw	4
		Lower Steering Knuckle Assembly, Includes Key Nos. 8-10, 14, 21-22, <i>See Selection Guide on Page 12</i>		Not Shown	60937-000	Loctite® (Red) Compound Tube	1
a	80029-XXX	• with Integrated Brake Knuckle Assembly		14	64246-000	ABS Sensor Sleeve	2
b	58900-XXX	• with Standard Brake Knuckle Assembly		15		Tie Rod Assembly, Includes Key Nos. 16-18 <i>See Selection Guide on Page 25</i>	1
2		Left Hand	1			<b>Tie Rod End Service Kits, See Selection Guide on Page 25</b>	
3		Right Hand	1			<b>Axle Set</b> , Includes Left Hand & Right Hand Kits	
		Upper Steering Knuckle Assembly, Includes Key Nos. 6-7, 9-10, <i>See Selection Guide on Page 12</i>				<b>Left Hand</b> , Includes Key Nos. 16, 18-20	
4	60903-XXX	Left Hand	1			<b>Right Hand</b> , Includes Key Nos. 17-20	
5	60904-XXX	Right Hand	1			Tie Rod End, Includes Key No. 18, <i>See Selection Guide on Page 25</i>	
		<b>Kingpin Bushing and Bearing Service Kits,</b>		16		Left Hand	1
	60961-628	<b>Axle Set</b> , Includes Kit Nos. 60961-629 & -630		17		Right Hand	1
	60961-629	<b>Left Hand Composite Thrust Bearing</b> , Includes Key Nos. 6-11, 13, Loctite		18		<b>**7/8" Castle Nut</b>	2
	60961-630	<b>Roller Thrust Bearing</b> , Includes Key Nos. 6-10, 12-13, Loctite		19	22962-007	7/8" Flat Washer	2
6	33117-000	Grease Zerk	2	20	17800-004	Tie Rod Nut Cotter Pin	2
7	68687-003	Upper Grease Cap Assembly	2		60961-069	<b>Stop Bolt Service Kit, One Side</b> , Includes Key Nos. 21-22	
8	68687-002	Lower Grease Cap Assembly	2	21	60238-001	1/2"-13 UNC Square Head Bolt	2
9	58909-001	Kingpin Bushing	4	22	60240-000	1/2"-13 UNC Hex Jam Nut	2
				23	64578-000	1 1/2"-12 UNF Spindle Nut	2
				24		*Shock Absorber	2
				25		*3/4"-10 UNC x 5" Lower Shock Flange Bolt	2
				26		*3/4"-10 UNC Lower Shock Hex Flange Locknut	2
				27		*Shock Spacer (if equipped)	2
				28		<b>**3/4"-16 UNF x 2 3/4" Bolt (IBK)</b>	4
				29		<b>**3/4" Flat Washer (IBK)</b>	4

**NOTES:** \* Not supplied by Hendrickson, used for reference only. Hendrickson is not responsible for components supplied by the vehicle manufacturer. For assistance with maintenance and rebuild instructions on these components see vehicle manufacturer.

\*\* Item included in kit/assembly only, part not sold separately.

\*\*\* Axle spring seats come assembled with the axle beam and are not serviceable.

\*\*\*\* Effective January 2019, vehicles equipped with Hendrickson STEERTEK NXT/STEERTEK with the exception of 79487-XXX axle, will be installed with a left hand **composite** bearing and a right hand **roller** bearing configuration to replace the previous roller/roller bearing configuration for production and aftermarket.

\*\*\*\*\* Effective May 2019, the STEERTEK NXT cross caster axle assemblies replaced the non-cross caster axle assemblies (92997-XXX series replaced the 68997-XXX series and the 92996-XXX series replaced the 68996-XXX series).

■ Medium-duty Cross Caster with Standard Brake Knuckle Selection Guide

	Capacity	Mounting Fasteners	Wheel Base	KPI	STEERTEK NXT Assembly	Axle & Kingpin Assembly Key No. 1	Part Number			
							Lower Steering Knuckle Assembly		Upper Steering Knuckle Assembly	
							Left Hand Key No. 2	Right Hand Key No. 3	Left Hand Key No. 4	Right Hand Key No. 5
MV SERIES	10K	5/8"	< 200"	69.0"	79487-001	79486-002M	58900-293	58900-294	60903-279	60904-234
			> 200"		79487-002		58900-273	58900-274	60903-279	60904-234
		3/4"	< 200"	69.0"	79487-003		58900-493	58900-494	60903-479	60904-432
			> 200"		79487-004		58900-473	58900-474	60903-479	60904-432
	12K	5/8"	< 200"	69.0"	79487-005	79486-004M	58900-293	58900-294	60903-279	60904-234
			> 200"		79487-006		58900-273	58900-274	60903-279	60904-234
		3/4"	< 200"	69.0"	79487-007		58900-493	58900-494	60903-479	60904-432
			> 200"		79487-008		58900-473	58900-474	60903-479	60904-432

■ Standard-duty Cross Caster with Integrated Brake Knuckle (IBK) Selection Guide

LT SERIES • PROSTAR	12K	3/4"	< 200"	70.9"	*92997-503	*92996-001M	80029-093	80029-094	60903-463	60904-432
			> 200"		*92997-504		80029-073	80029-074		
		3/4"	< 200"	70.9"	*92997-547		80029-093	80029-094		
			> 200"		*92997-548		80029-073	80029-074		
	12.35K	3/4"	< 200"	70.9"	*92997-543	*92996-001M	80029-093	80029-094		
			> 200"		*92997-544		80029-073	80029-074		
		3/4"	< 200"	70.9"	*92997-559		80029-093	80029-094		
			> 200"		*92997-560		80029-073	80029-074		
	13.2K	3/4"	< 200"	70.9"	*92997-617	*92996-009M	80029-093	80029-094		
			> 200"		*92997-618		80029-073	80029-074		
		3/4"	< 200"	70.9"	*92997-627		80029-093	80029-094		
			> 200"		*92997-628		80029-073	80029-074		

■ Standard-duty Cross Caster with Standard Brake Knuckle built after August 1, 2011 Selection Guide

LT SERIES • PROSTAR	12K	3/4"	< 200"	69.0"	*92997-001	*92996-002M	58900-493	58900-494	60903-462	60904-432
			> 200"		*92997-002		58900-473	58900-474		
			3/4"	< 200"	70.9"		*92997-003	58900-493	58900-494	
				> 200"			*92997-004	58900-473	58900-474	
		3/4"	< 200"	69.0"	*92997-045	*92996-006M	58900-493	58900-494	60903-462	60904-432
			> 200"		*92997-046		58900-473	58900-474		
			3/4"	< 200"	70.9"		*92997-047	58900-493	58900-494	
				> 200"			*92997-048	58900-473	58900-474	
		5/8"	< 200"	69.0"	*92997-061	*92996-002M	58900-293	58900-294	60903-262	60904-232
			> 200"		*92997-062		58900-273	58900-274		
			5/8"	< 200"	70.9"		*92997-063	58900-293	58900-294	
				> 200"			*92997-064	58900-273	58900-274	
		5/8"	< 200"	69.0"	*92997-097	*92996-006M	58900-293	58900-294	60903-262	60904-232
			> 200"		*92997-098		58900-273	58900-274		
			5/8"	< 200"	70.9"		*92997-099	58900-293	58900-294	
				> 200"			*92997-100	58900-273	58900-274	

See notes on Page 15

Continued on Next Page

**Standard-duty Cross Caster with Standard Brake Knuckle built after August 1, 2011 Selection Guide**

Capacity	Mounting Fasteners	Wheel Base	KPI	Part Number					
				STEERTEK NXT Assembly	Axle & Kingpin Assembly Key No. 1	Lower Steering Knuckle Assembly		Upper Steering Knuckle Assembly	
						Left Hand Key No. 2	Right Hand Key No. 3	Left Hand Key No. 4	Right Hand Key No. 5
12.35K	3/4"	< 200"	69.0"	*92997-005	*92996-002M	58900-493	58900-494	60903-462	60904-432
		> 200"		*92997-006		58900-473	58900-474		
		< 200"	70.9"	*92997-043	*92996-001M	58900-493	58900-494	60903-463	
		> 200"		*92997-044		58900-473	58900-474		
	3/4"	< 200"	69.0"	*92997-049	*92996-006M	58900-493	58900-494	60903-462	60904-432
		> 200"		*92997-050		58900-473	58900-474		
		< 200"	70.9"	*92997-059	*92996-005M	58900-493	58900-494	60903-463	
		> 200"		*92997-060		58900-473	58900-474		
	5/8"	< 200"	69.0"	*92997-065	*92996-002M	58900-293	58900-294	60903-262	60904-232
		> 200"		*92997-066		58900-273	58900-274		
		< 200"	70.9"	*92997-095	*92996-001M	58900-293	58900-294	60903-263	
		> 200"		*92997-096		58900-273	58900-274		
	5/8"	< 200"	69.0"	*92997-101	*92996-006M	58900-293	58900-294	60903-262	60904-232
		> 200"		*92997-102		58900-273	58900-274		
		< 200"	70.9"	*92997-111	*92996-005M	58900-293	58900-294	60903-263	
		> 200"		*92997-112		58900-273	58900-274		
13.2K	3/4"	< 200"	70.9"	*92997-007	*92996-009M	58900-493	58900-494	60903-463	60904-432
		> 200"		*92997-008		58900-473	58900-474		
		< 200"	69.0"	*92997-009	*92996-010M	58900-493	58900-494	60903-462	
		> 200"		*92997-010		58900-473	58900-474		
	3/4"	< 200"	70.9"	*92997-051	*92996-011M	58900-493	58900-494	60903-463	60904-432
		> 200"		*92997-052		58900-473	58900-474		
		< 200"	69.0"	*92997-053	*92996-012M	58900-493	58900-494	60903-462	
		> 200"		*92997-054		58900-473	58900-474		
	5/8"	< 200"	70.9"	*92997-067	*92996-009M	58900-293	58900-294	60903-263	60904-232
		> 200"		*92997-068		58900-273	58900-274		
		< 200"	69.0"	*92997-069	*92996-010M	58900-293	58900-294	60903-262	
		> 200"		*92997-070		58900-273	58900-274		
	5/8"	< 200"	70.9"	*92997-103	*92996-011M	58900-293	58900-294	60903-263	60904-232
		> 200"		*92997-104		58900-273	58900-274		
		< 200"	69.0"	*92997-105	*92996-012M	58900-293	58900-294	60903-262	
		> 200"		*92997-106		58900-273	58900-274		
14K	3/4"	< 200"	69.0"	92997-011	92996-004M	58900-493	58900-494	60903-462	60904-432
		> 200"		92997-012		58900-473	58900-474		
	3/4"	< 200"	69.0"	92997-055	92996-008M	58900-493	58900-494	60903-462	60904-432
		> 200"		92997-056		58900-473	58900-474		
	3/4"	< 200"	70.9"	92997-113	92996-007M	58900-493	58900-494	60903-463	60904-432
		> 200"		92997-114		58900-473	58900-474		

See notes on Page 15

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■ Standard-duty Cross Caster with Standard Brake Knuckle built after August 1, 2011 Selection Guide

				Part Number						
Capacity	Mounting Fasteners	Wheel Base	KPI	STEERTEK NXT Assembly	Axle & Kingpin Assembly Key No. 1	Lower Steering Knuckle Assembly		Upper Steering Knuckle Assembly		
						Left Hand Key No. 2	Right Hand Key No. 3	Left Hand Key No. 4	Right Hand Key No. 5	
LT SERIES • PROSTAR	14K	5/8"	< 200"	69.0"	92997-071	92996-004M	58900-293	58900-294	60903-262	60904-232
			> 200"	92997-072	58900-273		58900-274			
		5/8"	< 200"	69.0"	92997-107	92996-008M	58900-293	58900-294	60903-262	60904-232
			> 200"	92997-108	58900-273		58900-274			
		5/8"	< 200"	70.9"	92997-115	92996-007M	58900-293	58900-294	60903-263	60904-232
			> 200"	92997-116	58900-273		58900-274			
	14.6K	3/4"	< 200"	69.0"	92997-013	92996-004M	58900-493	58900-494	60903-462	60904-432
			> 200"	92997-014	58900-473		58900-474			
			< 200"	69.0"	92997-057	92996-008M	58900-493	58900-494		
			> 200"	92997-058	58900-473		58900-474			
		5/8"	< 200"	69.0"	92997-073	92996-004M	58900-293	58900-294	60903-262	60904-232
			> 200"	92997-074	58900-273		58900-274			
5/8"		< 200"	69.0"	92997-109	92996-008M	58900-293	58900-294	60903-262	60904-232	
		> 200"	92997-110	58900-273		58900-274				
LS SERIES • LONESTAR	12.35K	3/4"	< 200"	70.9"	*92997-015	*92996-001M	58900-493	58900-494	60903-468	60904-432
			> 200"	*92997-016	58900-473		58900-474			
		5/8"	< 200"	70.9"	*92997-075	*92996-001M	58900-293	58900-294	60903-268	60904-232
			> 200"	*92997-076	58900-273		58900-274			
	13.2K	3/4"	< 200"	70.9"	*92997-017	*92996-009M	58900-493	58900-494	60903-468	60904-432
			> 200"	*92997-018	58900-473		58900-474			
			< 200"	69.0"	*92997-019	*92996-010M	58900-493	58900-494		
			> 200"	*92997-020	58900-473		58900-474			
		5/8"	< 200"	70.9"	*92997-077	*92996-009M	58900-293	58900-294	60903-268	60904-232
			> 200"	*92997-078	58900-273		58900-274			
			< 200"	69.0"	*92997-079	*92996-010M	58900-293	58900-294		
			> 200"	*92997-080	58900-273		58900-274			
	14K	3/4"	< 200"	70.9"	92997-021	92996-003M	58900-493	58900-494	60903-469	60904-432
			> 200"	92997-022	58900-473		58900-474			
			< 200"	69.0"	92997-023	92996-004M	58900-493	58900-494		
			> 200"	92997-024	58900-473		58900-474			
		5/8"	< 200"	70.9"	92997-081	92996-003M	58900-293	58900-294	60903-269	60904-232
			> 200"	92997-082	58900-273		58900-274			
< 200"			69.0"	92997-083	92996-004M	58900-293	58900-294			
> 200"			92997-084	58900-273		58900-274				
14.6K	3/4"	< 200"	69.0"	92997-025	92996-004M	58900-493	58900-494	60903-466	60904-432	
		> 200"	92997-026	58900-473		58900-474				
	5/8"	< 200"	69.0"	92997-085	92996-004M	58900-293	58900-294			
		> 200"	92997-086	58900-273		58900-274				

See notes on Page 15

Continued on Next Page

■ **Standard-duty Cross Caster with Standard Brake Knuckle built after August 1, 2011 Selection Guide**

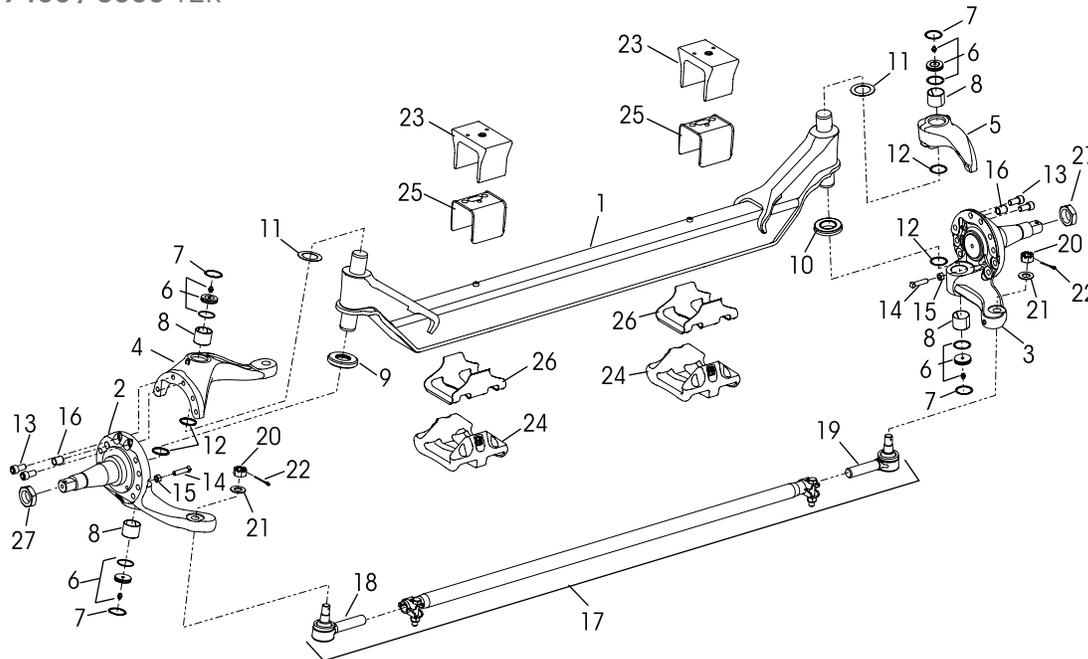
	Capacity	Mounting Fasteners	Wheel Base	KPI	Part Number					
					STEERTEK NXT Assembly	Axle & Kingpin Assembly Key No. 1	Lower Steering Knuckle Assembly		Upper Steering Knuckle Assembly	
							Left Hand Key No. 2	Right Hand Key No. 3	Left Hand Key No. 4	Right Hand Key No. 5
<b>RH SERIES • TRANSTAR</b>	12K	3/4"	< 200"	70.9"	*92997-029	*92996-001M	58900-493	58900-494	60903-467	60904-432
			> 200"		*92997-030		58900-473	58900-474		
		3/4"	< 200"	69.0"	*92997-033	*92996-002M	58900-493	58900-494	60903-464	60904-432
			> 200"		*92997-034		58900-473	58900-474		
		5/8"	< 200"	70.9"	*92997-087	*92996-001M	58900-293	58900-294	60903-267	60904-232
			> 200"		*92997-088		58900-273	58900-274		
	5/8"	< 200"	69.0"	*92997-089	*92996-002M	58900-293	58900-294	60903-264	60904-232	
		> 200"		*92997-090		58900-273	58900-274			
	13K	3/4"	< 200"	70.9"	*92997-037	*92996-003M	58900-493	58900-494	60903-467	60904-432
			> 200"	70.9"	*92997-038		58900-473	58900-474		
		5/8"	< 200"	70.9"	*92997-091	*92996-003M	58900-293	58900-294	60903-267	60904-232
			> 200"	70.9"	*92997-092		58900-273	58900-274		
14K	3/4"	< 200"	70.9"	92997-041	92996-003M	58900-493	58900-494	60903-467	60904-432	
		> 200"	70.9"	92997-042		58900-473	58900-474			
	5/8"	< 200"	70.9"	92997-093	92996-003M	58900-293	58900-294	60903-267	60904-232	
		> 200"	70.9"	92997-094		58900-273	58900-274			

**NOTE:** Items shown in light gray denotes STEERTEK NXT integrated axle spring seat **without** shock absorber lug.

\* Effective May 2019, the STEERTEK NXT cross caster axle assemblies replaced the non-cross caster axle assemblies (92997-XXX series replaced the 68997-XXX series and the 92996-XXX series replaced the 68996-XXX series).

Vehicles built with STEERTEK Axle prior to August 1, 2011

ProStar 12K, 12.35K, 13.2K, 14K, 14.6K • TranStar 12K, 13K, 14K • LoneStar 12.35K, 13.2K, 14K, 14.6K • 9200 / 9400 / 8600 12K



KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.
	70952-XXX	<b>STEERTEK</b> Axle Assembly, Includes Key Nos. 1-13, 16-27, <i>See Selection Guide on Page 17</i>	1
1		Axle & Kingpin Assembly	1
	64905-001	LoneStar • TranStar • 9200 / 9400 Models 12K	
	64905-002	ProStar Model 12K, 12.35K	
	64905-005	TranStar Model 13K, 14K	
	64905-006	ProStar • LoneStar Models 13.2K, 14K, 14.6K	
		Lower Steering Knuckle Assembly, Includes Key Nos. 8, 12, 16, <i>See Selection Guide on Page 17</i>	
2		Left Hand	1
3		Right Hand	1
		Upper Steering Knuckle Assembly, Includes Key Nos. 8, 12	
4		Left Hand, <i>See Selection Guide on Page 17</i>	1
5	60904-034	Right Hand	1
		<b>Kingpin Bushing and Bearing Service Kits</b>	
	60961-040	<b>Axle Set</b> , Includes Kit Nos. 60961-009 & -039	
	60961-009	<b>Left Hand with Composite Thrust Bearing</b> , Includes Key Nos. 6-9, 11-13, Loctite	
	60961-039	<b>Right Hand with Roller Thrust Bearing</b> , Includes Key Nos. 6-8, 10-13, Loctite	
6	59156-000	Grease Cap Assembly	4
7	58937-000	Retaining Ring	4
8	58909-000	Kingpin Bushing	4
		<b>Thrust Bearing Service Kits</b>	
	60961-043	<b>Axle Set</b> , Includes Kit Nos. 60961-041 & -042	
	60961-041	<b>Left Hand Composite Thrust Bearing</b> , Includes Key Nos. 9, 11-13, Loctite	
	60961-042	<b>Right Hand Roller Thrust Bearing</b> , Includes Key Nos. 10-13, Loctite	
9	59828-000	*Left Hand Composite Thrust Bearing	1

KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.
10	64256-000L	*Right Hand Roller Thrust Bearing	1
11		Kingpin Shim	As Req.
	60259-001X	0.005" Thickness (Pack of 4)	
	60259-002	0.047" Thickness	
12	58910-001	Kingpin Seal, <i>Replaces 58910-000</i>	4
13	60236-001	5/8"-11 UNC Socket Head Cap Screw	4
Not Shown	60937-000	Loctite® (Red) Compound Tube	1
	60961-069	<b>Stop Bolt Service Kit, One Side</b> , Includes Key Nos. 14-15	
14	60238-001	1/2"-13 UNC Square Head Bolt	2
15	60240-000	1/2"-13 UNC Hex Jam Nut	2
16	64246-000	ABS Sensor Sleeve	2
17		Tie Rod Assembly, Includes Key Nos. 18-20	1
		<i>See Selection Guide on Page 25</i>	
		<b>Tie Rod End Service Kits, See Selection Guide on Page 25</b>	
		<b>Axle Set</b> , Includes Left Hand & Right Hand Kits	
		<b>Left Hand</b> , Includes Key Nos. 18, 20-22	
		<b>Right Hand</b> , Includes Key Nos. 19-22	
		Tie Rod End, Includes Key No. 20, <i>See Selection Guide on Page 25</i>	
18		Left Hand	1
19		Right Hand	1
20		**7/8" Castle Nut	2
21	22962-007	7/8" Flat Washer	2
22	17800-004	Tie Rod Nut Cotter Pin	2
23		Top Axle Wrap, <i>See Selection Guide on Page 17</i>	2
24	64722-003	Bottom Axle Wrap	2
25	65757-000	Top Axle Wrap Liner	2
26	59845-000	Bottom Axle Wrap Liner	2
27	64578-000	1 1/2"-12 UNF Spindle Nut	2

**NOTES:** \* Effective January 2019, vehicles equipped with Hendrickson STEERTEK axle will be installed with a left hand **composite** bearing and a right hand **roller** bearing configuration to replace the previous roller/roller bearing configuration for production and aftermarket.

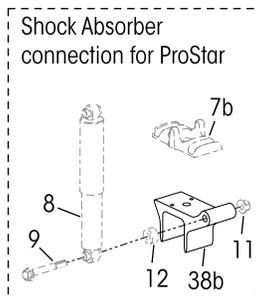
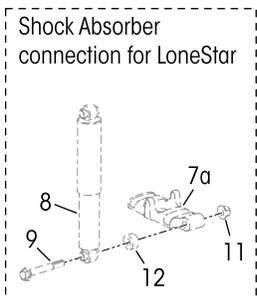
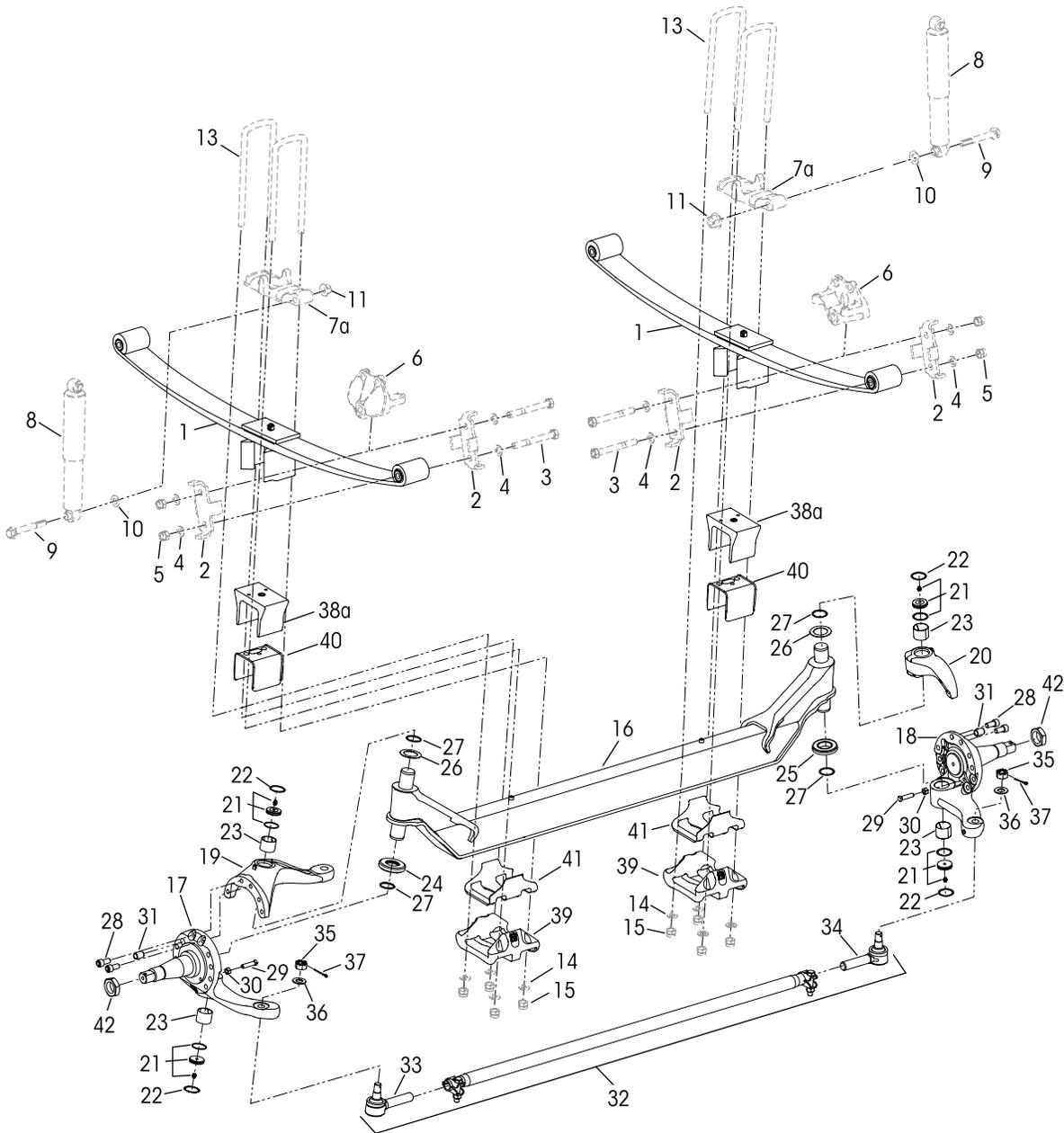
\*\* Item included in kit/assembly only, part not sold separately.

■ Vehicles built with STEERTEK axle prior to 1, 2011 Selection Guide

	Capacity	Wheel Base	KPI	Part Number						
				STEERTEK Axle Assembly	Lower Steering Knuckle Assembly		Upper Steering Knuckle Assembly Left Hand Key No. 4	Top Axle Wrap Key No. 23		
					Left Hand Key No. 2	Right Hand Key No. 3				
<b>LT SERIES • PROSTAR</b>	12K	< 200"	69.0"	70952-351	58900-075	58900-076	60903-042	59952-032		
		> 200"		70952-352	58900-073	58900-074				
	12.35K	< 200"		70952-353	58900-075	58900-076				
		> 200"		70952-354	58900-073	58900-074				
	13.2K	< 200"	70.9"	70952-355	58900-075	58900-076				
		> 200"		70952-356	58900-073	58900-074				
		< 200"	69.0"	70952-357	58900-075	58900-076				
	> 200"	70952-358		58900-073	58900-074					
	14K	< 200"		70952-359	58900-075	58900-076				
		> 200"		70952-390	58900-073	58900-074				
	14.6K	< 200"	69.0"	70952-391	58900-075	58900-076				
		> 200"		70952-392	58900-073	58900-074				
<b>RH SERIES/8600 • TRANSTAR</b>	12K	< 200"	70.9"	70952-281	58900-075	58900-076	60903-044	59952-023		
		> 200"		70952-280	58900-073	58900-074		59952-032		
		< 200"		70952-335	58900-093	58900-094				
		> 200"		70952-336	58900-091	58900-092				
	13K	< 200"	69.0"	70952-339	58900-093	58900-094	60903-061	59952-032		
		> 200"		70952-341	58900-093	58900-094				
		< 200"	70.9"	70952-342	58900-091	58900-092	60903-056	59952-023		
		> 200"		70952-343	58900-093	58900-094				
		< 200"		70952-344	58900-091	58900-092		59952-032		
		> 200"		70952-346	58900-091	58900-092				
		14K		> 200"	70.9"	70952-347	58900-093	58900-094	60903-061	59952-023
				< 200"		70952-348	58900-091	58900-092		59952-032
> 200"	69.0"		70952-310	58900-075		58900-076	60903-056	59952-023		
< 200"			70952-311	58900-073		58900-074				
12.35K	> 200"	70.9"	70952-393	58900-075	58900-076	59952-034				
	< 200"		70952-394	58900-073	58900-074					
13.2K	> 200"		69.0"	70952-395	58900-075	58900-076		59952-023		
	< 200"			70952-396	58900-073	58900-074				
14K	< 200"	70.9"	70952-397	58900-075	58900-076	59952-034				
	> 200"		70952-398	58900-073	58900-074					
	< 200"	69.0"	70952-399	58900-075	58900-076	59952-023				
	> 200"		70952-400	58900-073	58900-074					
14.6K	< 200"		70952-401	58900-075	58900-076					
	> 200"		70952-402	58900-073	58900-074					
<b>9200/9400</b>	12K	< 200"	70.9"	70952-279	58900-075	58900-076	60903-042	59952-023		
		> 200"		70952-278	58900-073	58900-074				

**SOFTEK® Monoleaf for vehicles built with STEERTEK Axle prior to June 2014**

LoneStar 12.35K • ProStar 12K, 12.35K • TranStar 12K • 9200 / 9400 / 8600 12K





# SOFTEK® Monoleaf for International Truck Vehicles

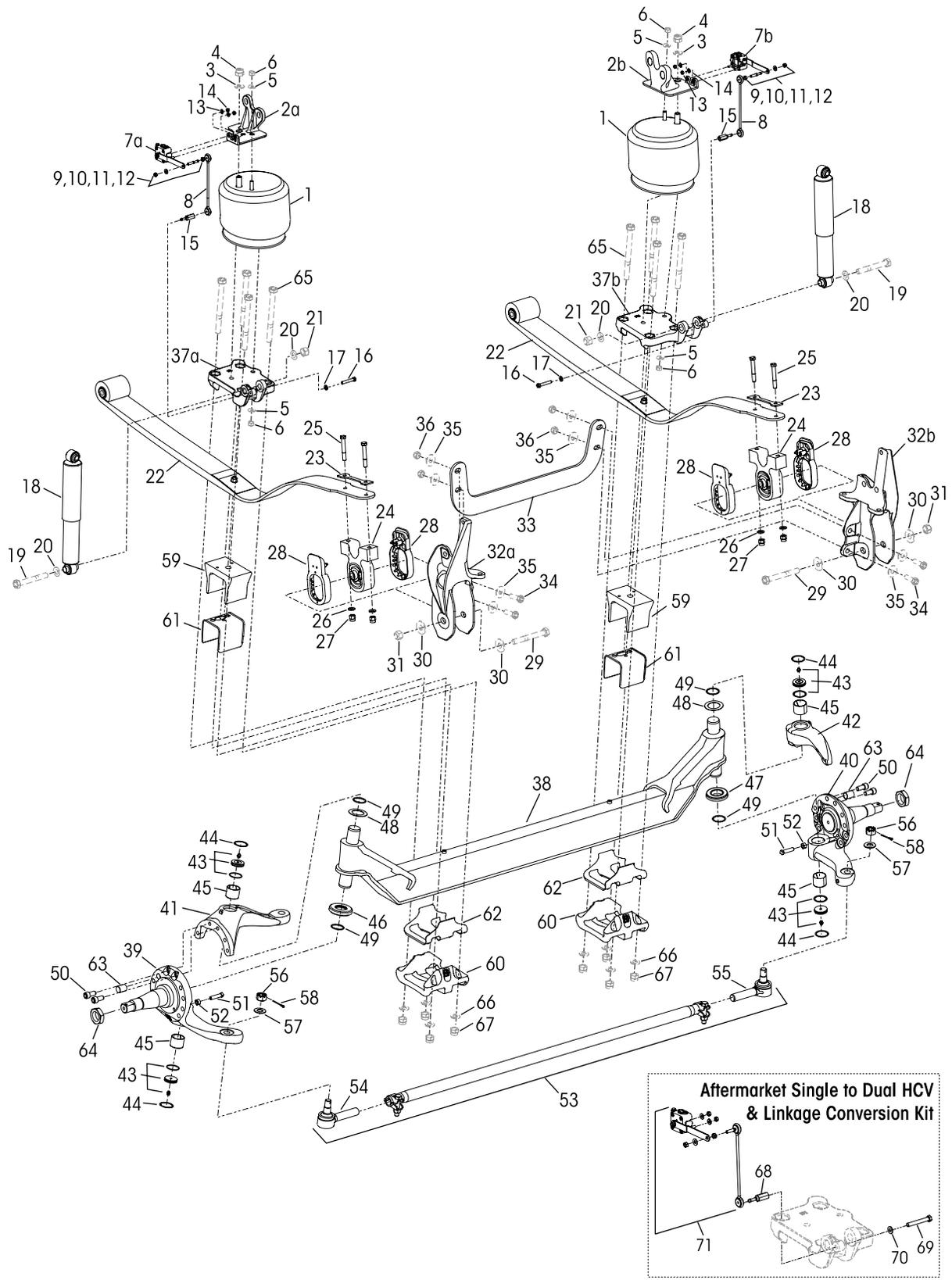
KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.	KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.
1	53597-000	Monoleaf Spring Assembly, Includes Bushings LoneStar • ProStar • 9200/9400 Models <i>Replaces 53297-000, 67399-001, 66347-001, 53497-000</i>	2	20	60904-034	Right Hand Upper Steering Knuckle Assembly, Includes Key Nos. 23, 27	1
	53598-000	TranStar • 8600 Models <i>Replaces 53298-000, 67399-002, 66347-002, 53498-000</i>				<b>Kingpin Bushing and Bearing Service Kits</b>	
2		*Shackle Plate	4		60961-040	<b>Axle Set</b> , Includes Kit Nos. 60961-009 & -039	
3		*3/4"-16 UNF x 6 1/2" Bolt	4		60961-009	<b>Left Hand with Composite Thrust Bearing</b> , Includes Key Nos. 21-24, 26-28 & Loctite	
4		*3/4" Flat Washer	8		60961-039	<b>Right Hand with Roller Thrust Bearing</b> , Includes Key Nos. 21-23, 25-28 & Loctite	
5		*3/4"-16 UNF Locknut	4	21	59156-000	Grease Cap Assembly	4
6		*Rear Spring Mount	2	22	58937-000	Retaining Ring	4
7		*Top Pad	2	23	58909-000	Kingpin Bushing	4
a		LoneStar • TranStar • 9200/9400/8600 Models				<b>Thrust Bearing Service Kits</b>	
b		ProStar Model			60961-043	<b>Axle Set</b> , Includes Kit Nos. 60961-041 & -042	
8		*Shock Absorber	2		60961-041	<b>Left Hand Composite Thrust Bearing</b> , Includes Key Nos. 24, 26-28 & Loctite	
9		*3/4"-10 UNC x 5" Lower Shock Flange Bolt	2		60961-042	<b>Right Hand Roller Thrust Bearing</b> , Includes Key Nos. 25-28 & Loctite	
10		*3/4" Lower Shock Hardened Washer	2	24	59828-000	***Left Hand Composite Thrust Bearing	1
11		*3/4"-10 UNC Lower Shock Flange Locknut	2	25	64256-000L	***Right Hand Roller Thrust Bearing	1
12		*Shock Spacer - 19 mm	2	26		Kingpin Shim	As Req.
13		*3/4"-16 UNF U-bolt 7.75" Ride Height - 13" Long 7.00" Ride Height - 12 1/4" Long	4		60259-001X	0.005" Thickness (Pack of 4)	
14		*3/4" Flat Washer	8		60259-002	0.047" Thickness	
15		*3/4"-16 UNF Locknut	8	27	58910-001	Kingpin Seal, <i>Replaces 58910-000</i>	4
		<b>STEERTEK Axle Assembly</b> , Includes Key Nos. 16-42	1	28	60236-001	3/8"-11 UNC Socket Head Cap Screw	4
	70952-311	12.35K, LoneStar Model		Not Shown	60937-000	Loctite® (Red) Compound Tube	1
	70952-310	Above 200" Wheel Base Below 200" Wheel Base			60961-069	<b>Stop Bolt Service Kit, One Side</b> , Includes Key Nos. 29-30	
	70952-313	12K, 12.35K, ProStar Model		29	60238-001	1/2"-13 UNC Square Head Bolt	2
	70952-312	Above 200" Wheel Base Below 200" Wheel Base		30	60240-000	1/2"-13 UNC Hex Jam Nut	2
	70952-278	12K, 9200/9400 Models		31	64246-000	ABS Sensor Sleeve	2
	70952-279	Above 200" Wheel Base Below 200" Wheel Base		32		Tie Rod Assembly, Includes Key Nos. 33-35 <i>See Selection Guide on Page 25</i>	1
	70952-280	12K, TranStar • 8600 Models				<b>Tie Rod End Service Kits</b> , <i>See Selection Guide on Page 25</i>	
	70952-281	Above 200" Wheel Base Below 200" Wheel Base				<b>Axle Set</b> , Includes Left Hand & Right Hand Kits	
16	64905-001	Axle & Kingpin Assembly	1			<b>Left Hand</b> , Includes Key Nos. 33, 35-37	
17		Left Hand Lower Steering Knuckle Assembly, Includes Key Nos. 23, 27, 31	1			<b>Right Hand</b> , Includes Key Nos. 34-37	
	58900-073	Above 200" Wheel Base				Tie Rod End, Includes Key No. 32, <i>See Selection Guide on Page 25</i>	
	58900-075	Below 200" Wheel Base		33		Left Hand	1
18		Right Hand Lower Steering Knuckle Assembly, Includes Key Nos. 23, 27, 31	1	34		Right Hand	1
	58900-074	Above 200" Wheel Base		35		**7/8" Castle Nut	2
	58900-076	Below 200" Wheel Base		36	22962-007	7/8" Flat Washer	2
19		Left Hand Upper Steering Knuckle Assembly, Includes Key Nos. 23, 27	1	37	17800-004	Tie Rod Nut Cotter Pin	2
	60903-056	LoneStar Model		38		Top Axle Wrap	2
	60903-042	ProStar • 9200/9400 Models		a	59952-023	LoneStar • TranStar • 9200/9400/8600 Models	
	60903-044	TranStar • 8600 Models		b	59952-032	ProStar Model	
				39	64722-003	Bottom Axle Wrap	2
				40	65757-000	Top Axle Wrap Liner	2
				41	59845-000	Bottom Axle Wrap Liner	2
				42	64578-000	1 1/2"-12 UNF Spindle Nut	2

**NOTES:** \* Not supplied by Hendrickson, used for reference only. Hendrickson is not responsible for components supplied by the vehicle manufacturer. For assistance with maintenance and rebuild instructions on these components see vehicle manufacturer.

\*\* Item included in kit/assembly only, part not sold separately.

\*\*\* Effective January 2019, vehicles equipped with Hendrickson STEERTEK NXT /STEERTEK axle will be installed with a left hand **composite** bearing and a right hand **roller** bearing configuration to replace the previous roller/roller bearing configuration for production and aftermarket.

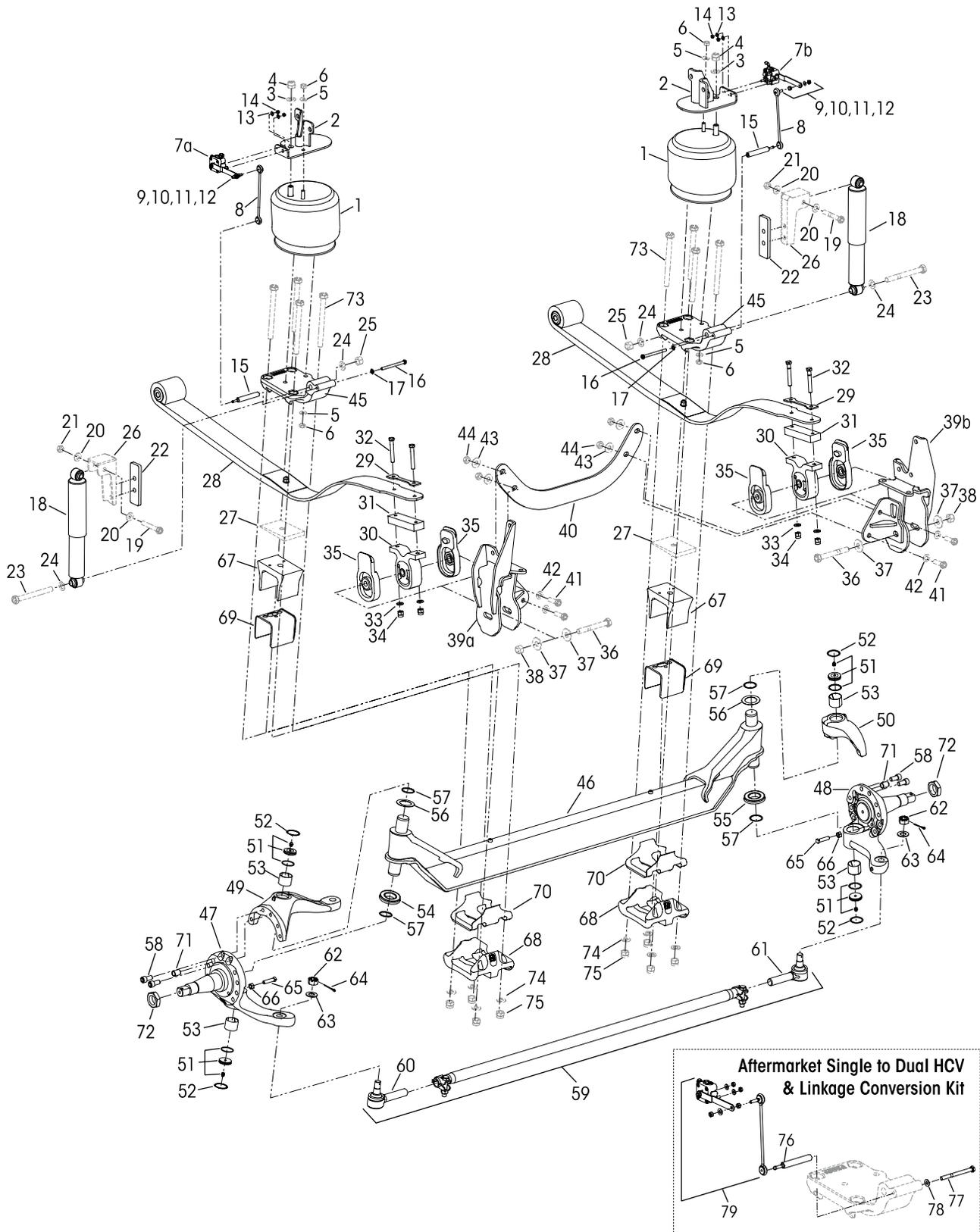
**AIRTEK® for International Truck New Engine Configuration (NEC) with STEERTEK Axle**  
 Vehicles built after September 2006 and November 2010 – 9200 / 9400 Models





			VEHICLE				VEHICLE
KEY NO.	PART NO.	DESCRIPTION	QTY.	KEY NO.	PART NO.	DESCRIPTION	QTY.
1	65790-002L	Air Spring	2	40		Right Hand Lower Steering Knuckle Assembly Includes Key Nos. 45, 49, 63	
2		Air Spring Bracket			58900-074	Above 200" Wheel Base	1
a	66775-000	Left Hand	1		58900-076	Below 200" Wheel Base	
b	66776-000	Right Hand	1			Upper Steering Knuckle Assembly Includes Key Nos. 45, 49	
3		*3/4" Flat Washer	2	41	60903-041	Left Hand	1
4		*3/4"-16 UNF Nylocknut	2	42	60904-034	Right Hand	1
5		*1/2" Hardened Washer	4			<b>Kingpin Bushing and Bearing Service Kits</b> <b>Axle Set</b> , Includes Kit Nos. 60961-009 & -039 <b>Left Hand with Composite Thrust Bearing</b> , Includes Key Nos. 43-46, 48-50, Loctite <b>Right Hand with Roller Thrust Bearing</b> , Includes Key Nos. 43-45, 47-50, Loctite	
6		*1/2"-13 UNC Nylocknut	4		60961-040		
	59427-013L	HCV & Linkage Assembly Left Hand, Includes Key Nos. 7a-14			60961-009		
	59427-014L	Right Hand, Includes Key Nos. 7b-14			60961-039		
7		*****Height Control Valve		43	59156-000	Grease Cap Assembly	4
a	59935-011L	Left Hand	1	44	58937-000	Retaining Ring	4
b	59935-018L	Right Hand	1	45	58909-000	Kingpin Bushing	4
8	59428-004	HCV Linkage	2			<b>Thrust Bearing Service Kits</b> <b>Axle Set</b> , Includes Kit Nos. 60961-041 & -042 <b>Left Hand Composite Thrust Bearing</b> , Includes Key Nos. 46, 48-50 and Loctite <b>Right Hand Roller Thrust Bearing</b> , Includes Key Nos. 47-50 and Loctite	
9	59169-000	5/16"-18 UNC Stud	2	46	59828-000	****Left Hand Composite Thrust Bearing	1
10	17491-011	5/16"-18 UNC Nut	2	47	64256-000L	****Right Hand Roller Thrust Bearing	1
11	22962-029	5/16" Hardened Washer	2	48		Kingpin Shim 0.005" Thickness (Pack of 4) 0.047" Thickness	As Req.
12	59016-000	5/16"-18 UNC Locknut	2	49	58910-001	Kingpin Seal, <i>Replaces 58910-000</i>	4
13	22962-028	1/4" Hardened Washer	4	50	60236-001	5/8"-11 UNC Socket Head Cap Screw	4
14	49983-000	1/4"-20 UNC Locknut	4	Not Shown	60937-000	Loctite® (Red) Compound Tube	1
	60961-154	<b>Lower Link Mount Service Kit, One Side</b> , Includes Key Nos. 15-17			60961-069	<b>Stop Bolt Service Kit, One Side</b> , Includes Key Nos. 51-52	
15	59429-003	Lower Link Mount	2	51	60238-001	1/2"-13 UNC Square Head Bolt	2
16	58035-002	3/8"-16 UNC x 1.38" Hex Bolt	2	52	60240-000	1/2"-13 UNC Hex Jam Nut	2
17	22962-015	3/8" Flat Washer	2	53		Tie Rod Assembly, Includes Key Nos. 54-56 <i>See Selection Guide on Page 25</i>	1
18		Shock Absorber	2			<b>Tie Rod End Service Kits</b> , <i>See Selection Guide on Page 25</i> <b>Axle Set</b> , Includes Left Hand & Right Hand Kits <b>Left Hand</b> , Includes Key Nos. 54, 56-58 <b>Right Hand</b> , Includes Key Nos. 55-58 Tie Rod End, Includes Key No. 56, <i>See Selection Guide on Page 25</i>	
	65992-001L	Sleeper		54		Left Hand	1
	65992-002L	Day Cab		55		Right Hand	1
19		*3/4"-10 UNC x 5" Lower Shock Bolt	2	56		**7/8" Castle Nut	2
20		*3/4" Lower Shock Hardened Washer	4	57	22962-007	7/8" Flat Washer	2
21		*3/4"-10 UNC Lower Shock Hex Locknut	2	58	17800-004	Tie Rod Nut Cotter Pin	2
22	66420-000	Leaf Spring Assembly Includes Spring Eye Bushing	2	59	59952-023	Top Axle Wrap	2
	60961-158	<b>Rear Spring Mount Service Kit, One Side</b> , Includes Key Nos. 23-27		60	64722-003	Bottom Axle Wrap	2
23	58920-000	Spring End Plate	2	61	65757-000	Top Axle Wrap Liner	2
24		**Rear Spring Mount	2	62	59845-000	Bottom Axle Wrap Liner	2
25	30970-001	1/2"-20 UNF x 3 1/2" Bolt	4	63	64246-000	ABS Sensor Sleeve	2
26	22962-014	1/2" Hardened Washer	4	64	64578-000	1 1/2"-12 UNF Spindle Nut	2
27	17700-034	1/2"-20 UNF Nylocknut	4	65		*3/4"-10 UNC x 8 1/2" Hex Bolt	8
28	66779-000	Thrust Washer	4	66		*3/4" Flat Washer	8
29		*3/4"-10 UNC x 6 1/2" Hex Bolt	2	67		*3/4"-10 UNC-2B Nylocknut	8
30		*3/4" Flat Washer	4		60961-155	<b>Aftermarket Dual HCV &amp; Linkage Conversion Kit</b> Includes key Nos. 68-71	
31		*3/4"-10 UNC Locknut	2	68	59429-003	Lower Link Mount	1
32		Rear Hanger		69	58035-002	3/8"-16 UNC x 1 3/8" Hex Bolt	1
a	66382-001	Left Hand	1	70	22962-015	3/8" Flat Washer	1
b	66382-002	Right Hand	1	71	59427-013L	Left Hand HCV & Linkage Assembly	1
33	66419-000	Belly Band	1				
34		*5/8"-11 UNC x 2" Hex Bolt	4				
35		*9/16" Hardened Washer - O.D. 1 3/4"	8				
36		*5/8"-11 UNC Hex Locknut	4				
37		Top Pad					
a	68318-001	Left Hand	1				
b	68318-002	Right Hand	1				
	70952-0XX	<b>STEERTEK Axle Assembly</b> , Includes Key Nos. 38-64, <i>Contact Hendrickson Truck Parts for part number</i>	1				
38	64905-001	Axle & Kingpin Assembly	1				
39		Left Hand Lower Steering Knuckle Assembly Includes Key Nos. 45, 49, 63					
	58900-073	Above 200" Wheel Base	1				
	58900-075	Below 200" Wheel Base					

**AIRTEK® Prior to International Truck New Engine Configuration (PEC) with STEERTEK Axle**  
 Vehicles built prior to September 2006 – 9200 / 9400 Models





VEHICLE				VEHICLE			
KEY NO.	PART NO.	DESCRIPTION	QTY.	KEY NO.	PART NO.	DESCRIPTION	QTY.
1	65790-002L	Air Spring	2	47		Left Hand Lower Steering Knuckle Assembly Includes Key Nos. 53, 57, 71	
2		*****Air Spring Bracket, <i>See Replacement Guide on Page 24</i>	2	58900-071		250 Ackermann - Long Wheel Base	1
3		*3/4" Flat Washer	2	58900-073		200 Ackermann - Short Wheel Base	
4		*3/4"-16 UNC Nylocknut	2	48		Right Hand Lower Steering Knuckle Assembly Includes Key Nos. 53, 57, 71	
5		*1/2" Hardened Washer	2	58900-072		250 Ackermann - Long Wheel Base	1
6		*1/2"-13 UNC Nylocknut	2	58900-074		200 Ackermann - Short Wheel Base	
		HCV & Linkage Assembly				Upper Steering Knuckle Assembly Includes Key Nos. 53, 57	
	59427-013L	Left Hand, If equipped, Includes Key Nos. 7a-14	1	49	60903-041	Left Hand	1
	59427-014L	Right Hand, Includes Key Nos. 7b-14	1	50	60904-034	Right Hand	1
7		*****Height Control Valve				<b>Kingpin Bushing and Bearing Service Kits</b>	
a	59935-011L	Left Hand, If equipped	1	60961-040		<b>Axle Set</b> , Includes Kit Nos. 60961-009 & -039	
b	59935-018L	Right Hand, <i>Replaces 59935-010</i>	1	60961-009		<b>Left Hand with Composite Thrust Bearing</b> , Includes Key Nos. 51-54, 56-58, Loctite	
8	59428-004	HCV Linkage	2	60961-039		<b>Right Hand with Roller Thrust Bearing</b> , Includes Key Nos. 51-53, 55-58, Loctite	
9	59169-000	5/16"-18 UNC Stud	2	51	59156-000	Grease Cap Assembly	4
10	17491-011	5/16"-18 UNC Nut	2	52	58937-000	Retaining Ring	4
11	22962-029	5/16" Hardened Washer	2	53	58909-000	Kingpin Bushing	4
12	59016-000	5/16"-18 UNC Locknut	2			<b>Thrust Bearing Service Kits</b>	
13	22962-028	1/4" Hardened Washer	4	60961-043		<b>Axle Set</b> , Includes Kit Nos. 60961-041 & -042	
14	49983-000	1/4"-20 UNC Locknut	4	60961-041		<b>Left Hand Composite Thrust Bearing</b> , Includes Key Nos. 54, 56-58 and Loctite	
	60961-071	<b>Lower Link Mount Service Kit, One Side</b> , Includes Key Nos. 15-17		60961-042		<b>Right Hand Roller Thrust Bearing</b> , Includes Key Nos. 55-58 and Loctite	
15	59429-002	Lower Link Mount	2	54	59828-000	****Left Hand Composite Thrust Bearing,	1
16	58035-006	3/8"-16 UNC x 3 1/2" Hex Bolt	2	55	64256-000L	****Right Hand Roller Thrust Bearing	1
17	22962-015	3/8" Flat Washer	2	56		Kingpin Shim	As Req.
18		Shock Absorber	2		60259-001X	0.005" Thickness (Pack of 4)	
	65992-001L	Sleeper			60259-002	0.047" Thickness	
	65992-002L	Day Cab		57	58910-001	Kingpin Seal, <i>Replaces 58910-000</i>	4
19		*5/8"-11 UNC x 4" Upper Shock Bolt	2	58	60236-001	5/8"-11 UNC Socket Head Cap Screw	4
20		*5/8" Upper Shock Washer	4	Not Shown	60937-000	Loctite (Red) Compound Tube	1
21		*5/8"-11 UNC Upper Shock Locknut	2	59		Tie Rod Assembly, Includes Key Nos. 60-62 <i>See Selection Guide on Page 25</i>	1
22	59946-001	Shock Spacer	2			<b>Tie Rod End Service Kits, See Selection Guide on Page 25</b>	
23		*3/4"-10 UNC x 8" Lower Shock Bolt	2			<b>Axle Set</b> , Includes Left Hand & Right Hand Kits	
24		*3/4" Lower Shock Hardened Washer	4			<b>Left Hand</b> , Includes Key Nos. 60, 62-64	
25		*3/4"-10 UNC Lower Shock Hex Locknut	2			<b>Right Hand</b> , Includes Key Nos. 61-64	
26		*Shock Bracket	2			Tie Rod End, Includes Key No. 62, <i>See Selection Guide on Page 25</i>	
27		*Caster Wedge	2	60		Left Hand	1
28		*****Leaf Spring Assembly with Bushing Replace 65771-000 with Kit No. 60961-134, <i>See Replacement Guide on Page 24</i>	2	61		Right Hand	1
	60961-109	<b>Rear Spring Mount Service Kit (One Side)</b> Includes Key Nos. 29-34		62		**7/8" Castle Nut	2
29	58920-000	Spring End Plate	2	63	22962-007	7/8" Flat Washer	2
30	58918-000	Rear Spring Mount	2	64	17800-004	Tie Rod Nut Cotter Pin	2
31	65772-000	Rear Mount Spacer	2		60961-069	<b>Stop Bolt Service Kit, One Side</b> , Includes Key Nos. 65-66	
32	30970-001	1/2"-20 UNF x 3 1/2" Bolt	4	65	60238-001	1/2"-13 UNC Square Head Bolt	2
33	22962-014	1/2" Hardened Washer	4	66	60240-000	1/2"-13 UNC Hex Jam Nut	2
34	17700-034	1/2"-20 UNF Nylocknut	4	67	59952-023	Top Axle Wrap	2
35	65856-000	Thrust Washer	4	68	64722-003	Bottom Axle Wrap	2
36		*3/4"-10 UNC x 6" Hex Bolt	2	69	65757-000	Top Axle Wrap Liner	2
37		*3/4" Flat Washer	4	70	59845-000	Bottom Axle Wrap Liner	2
38		*3/4"-10 UNC Locknut	2	71	64246-000	ABS Sensor Sleeve	2
39		Rear Hanger		72	64578-000	1 1/2"-12 UNF Spindle Nut	2
a	68317-001	Left Hand	1	73		*3/4"-10 UNC x 8 1/2" Hex Bolt	8
b	68317-002	Right Hand	1	74		*3/4" Flat Washer	8
40	66019-000	Belly Band (For Service Only)	1	75		*3/4"-10 UNC-2B Nylocknut	8
41		*5/8"-11 UNC x 2" Hex Bolt	4		60961-116	<b>Aftermarket Dual HCV &amp; Linkage Conversion Kit</b> Includes key Nos. 76-79	
42		*5/8" Hardened Washer - O.D. 1.3"	4	76	59429-002	Lower Link Mount	1
43		*5/8" Hardened Washer - O.D. 1.75"	4	77	58035-006	3/8"-16 UNC x 3 1/2" Hex Bolt	1
44		*5/8"-11 UNC Hex Locknut	4	78	22962-015	3/8" Flat Washer	1
45		*****Top Pad, <i>See Replacement Guide on Page 24</i>	2	79	59427-013L	Left Hand HCV & Linkage Assembly	1
	70952-0XX	<b>STEERTEK Axle Assembly</b> , Includes Key Nos. 46-72, <i>Contact Hendrickson Truck Parts for Part Number</i>	1				
46	64905-001	Axle & Kingpin Assembly	1				

**AIRTEK • Prior to New Engine Configuration (\*PEC) Component Replacement Guide**

Description	Current Part No. (*PEC)	Replacement Part Number	Comments
Air Spring Bracket	64583-000 (LH) 64586-000 (RH)	**66775-000 (LH) **66776-000 (RH)	Requires the replacement of both air spring brackets, both top pads, lower link mount(s) with the **NEC design and the elimination of both upper shock bracket spacers. Contact Hendrickson Engineering for more information.
Lower Link Mount	59429-002	59429-002	Will continue to be serviced with the *PEC design in the aftermarket.
Spacer for Upper Shock Bracket	59946-001	See Comments	No longer required when the top pad is replaced with the **NEC design.
Leaf Spring Assembly	65771-000	66420-000	Requires the replacement of both leaf springs along with the removal of the caster wedge (if equipped), replace with Service Kit 60961-134, see below for contents.
Top Pad	64580-000	**68318-001 (LH) **68318-002 (RH)	Requires the replacement of both top pads, both air spring brackets, lower link mount(s) with the **NEC design and removal of both upper shock bracket spacers. Contact Hendrickson Engineering for more information.
<p>♦ <b>PEC:</b> Prior to New Engine Configuration, vehicles built prior to 9/2006                      ♦♦ <b>NEC:</b> New Engine Configuration, vehicles built after 9/2006</p>			

**AIRTEK \*PEC Replacement Service Kit Contents**

PART NO.	DESCRIPTION	QTY.
<b>60961-134</b>	<b>Leaf Spring Assembly Replacement Kit, Axle Set</b>	
66420-000	Leaf Spring Assembly, Pre-assembled with Spring End Plate, Thrust washers, Rear Spring Mount, Rear Spring Mount Spacer, and Fasteners	
58917-016	3/4"-10 UNC x 8 1/2" Hex Bolt (Clamp Group)	10
22962-001	3/4" Flat Washer	8
17700-033	3/4"-10 UNC-2B Nylocknut	8
58917-008	3/4"-10 UNC x 6" Hex Bolt (Rear Hanger)	2
22962-033	3/4" Flat Washer	8
49842-000	3/4"-10 UNC-2B Nylocknut	4

**NOTES:**

- \* Not supplied by Hendrickson, used for reference only. Hendrickson is not responsible for components supplied by the vehicle manufacturer. For assistance with maintenance and rebuild instructions on these components see vehicle manufacturer.
- \*\* Item included in kit/assembly only, part not sold separately.
- \*\*\* Axle spring seats come assembled with the axle beam and are not serviceable.
- \*\*\*\* Effective January 2019, vehicles equipped with Hendrickson STEERTEK NXT/STEERTEK axle will be installed with a left hand **composite** bearing and a right hand **roller** bearing configuration to replace the previous roller/roller bearing configuration for production and aftermarket.
- \*\*\*\*\* The recommendation of the vehicle manufacturer is that dual height control valves are only to be installed on the front suspension when the rear suspension is equipped with a single height control valve system. This arrangement is best suited to keep the vehicle level versus having dual height control systems on both the front and rear suspensions.
- \*\*\*\*\* No longer available for service, see Replacement Guide on Page 24.

Hendrickson **AIRTEK Ride Height Gauge for International Truck Vehicles** Literature number 45745-251 can be obtained online at [www.hendrickson-intl.com/Litform](http://www.hendrickson-intl.com/Litform)

**■ Tie Rod Selection Guide**

		Axle Model	Wheel Base	KPI	Tie Rod Assembly Part Number	Tie Rod End Part Number	Tie Rod End Service Kit No.	
<b>12K - 12.35K</b>	<b>1 1/4" Threads</b>	<b>Vehicles built after January 2014</b>						
		STEERTEK NXT	<200"	69.0"	76877-004	70995-001 (LH) 70995-002 (RH)	60961-734 (Axle Set) 60961-736 (LH) 60961-741 (RH)	
			>200"		76877-005			
			<200"	70.8"	76877-005			
			>200"		76877-002			
		<b>Vehicles built between January 2014 and August 2011</b>						<b>Tie Rod Assembly Replacement Part No.</b>
		STEERTEK NXT STEERTEK	<200"	69.0"	60239-004	♦ Tie rod end kits are no longer available for these assembly numbers, requires complete tie rod assembly replacement.	76877-004	
			>200"		60239-005		76877-005	
			<200"	70.8"	60239-005		76877-005	
			>200"		60239-002		76877-002	
		<b>Vehicles built prior to August 2011</b>						<b>Tie Rod Assembly Replacement Part No.</b>
		STEERTEK	<200"	69.0"	60239-004	♦ Tie rod end kits are no longer available for these assembly numbers, requires complete tie rod assembly replacement.	76877-004	
>200"	60239-005		76877-005					
<200"	70.8"		60239-001	76877-001				
>200"			60239-002	76877-002				

<b>13.2K - 14.6K</b>	<b>1 1/8" Threads</b>	<b>Vehicles built after January 2014</b>					
		STEERTEK NXT	<200"	69.0"	76879-001	76876-001 (LH) 76876-002 (RH)	60961-735 (Axle Set) 60961-742 (LH) 60961-743 (RH)
			>200"		76879-001		
			<200"	70.8"	76879-001		
			>200"		76879-002		
		<b>Vehicles built prior to January 2014</b>					
		STEERTEK NXT STEERTEK	<200"	69.0"	64006-001	64002-001 (LH) 64002-002 (RH)	60961-011 (Axle Set) 60961-027 (LH) 60961-028 (RH)
			>200"		64006-001		
			<200"	70.8"	64006-001		
			>200"		64006-002		

**NOTE:** ♦ Hendrickson supplies various tie rod assemblies. Locate the tie rod assembly part number on the tie rod tube to help determine the tie rod end kit or complete tie rod assembly replacement needed for service as shown in this Tie Rod Selection Guide.

## SECTION 6 Towing Procedures

### ON-HIGHWAY AND ON-ROADWAY

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 / STEERTEK axle.

Hendrickson recommends that a vehicle equipped with a STEERTEK NXT / STEERTEK axle 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

#### ■ **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**



#### ■ **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 — Conventional Axle FORK**

This is an alternative method for towing the vehicle, but requires standard tow forks and designated lift points depending on which front axle is equipped on the vehicle, STEERTEK NXT or STEERTEK.

**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.

- Place a spacer on the boom, to provide adequate clearance between the oil pan and the boom if necessary. Lift the vehicle in order to place spacer under tires. This will provide sufficient room under the axle to locate forks in the proper position.
- It is recommended to maintain the air in the air springs (if equipped) to help prevent damage to the air spring bump stop while towing the vehicle. An alternative air source may be necessary if the engine or compressor will not function. If the air spring is punctured, tow the steer axle suspension with the air springs deflated.
- 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.

**STEERTEK NXT EQUIPPED (vehicles built after August 2011)**

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 locknuts on the axle spring seats, see Figure 6-3.

**FIGURES 6-2**



**FIGURE 6-3**



**STEERTEK EQUIPPED (vehicles built prior to August 2011)**

1. Install the fork in the boom properly.
2. Position the proper tow forks directly under the axle, inside the axle clamp groups as shown in Figures 6-4 and 6-5.

**FIGURE 6-4**



**FIGURE 6-5**



- Prior to lifting the vehicle, ensure that the bottom axle plate is flat in the tow fork to minimize any gap between the bottom axle plate and the tow fork, see Figure 6-6. Lift vehicle and secure the vehicle to the boom.

FIGURE 6-6



### OFF-ROADWAY TOWING



WHEN A VEHICLE IS DISABLED AND EQUIPPED WITH A STEERTEK NXT / STEERTEK AXLE, CARE MUST BE TAKEN TO ENSURE THERE IS NO DAMAGE TO THE SUSPENSION OR AXLE WHEN TOWING THE VEHICLE. THE USE OF A TOW STRAP IS NECESSARY TO TOW A DISABLED VEHICLE TO 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 A TOW STRAP MAY BE WRAPPED AROUND THE FRONT AXLE, (SEE FIGURE 6-7) 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 AXLE OR WITH A SINGLE POINT LOCATION TO TOW THE VEHICLE. DOING SO WILL DAMAGE THE AXLE AND VOID ANY APPLICABLE WARRANTY, SEE FIGURE 6-7.

- NYLON STRAPS OR CHAINS ARE NOT RECOMMENDED FOR ON-HIGHWAY OR ON-ROADWAY TOWING

FIGURE 6-7



## SECTION 7

# Preventive Maintenance

The SOFTEK, AIRTEK and other suspension systems installed on STEERTEK NXT / STEERTEK axle are low maintenance systems. Following appropriate inspection procedure is important to help ensure the proper maintenance and operation of the SOFTEK / AIRTEK suspension system and component parts function to their highest efficiency.

### HENDRICKSON RECOMMENDED PREVENTIVE MAINTENANCE INTERVALS

- **The first 1,000 miles**
- **On-highway** – Visual inspection every 50,000 miles (80,000 km) or 6 months, whichever comes first

### COMPONENT INSPECTION

- **Air spring** — Look for chaffing or any signs of spring or component damage.
- **Belly band** (if equipped) — Inspect for damage, cracks, dents, or loose fasteners. Any cracks require replacement. Replace as necessary.
- **Clamp group** — Check torque on clamp group mounting hardware, refer to vehicle manufacturer's torque specifications.
- **Fasteners** — Look for any loose or damaged fasteners on the entire suspension. Make sure all fasteners are tightened to the specified torque. Refer to  Tightening Torque Specifications Section in 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.
- **Rear spring hangers** — Check for cracks or loose mounting hardware. Replace if necessary, see the Component Replacement Section of this publication for replacement procedure.
- **Rear spring mount** — Check for proper alignment with spring taper and check for proper torque on rear spring mount fasteners. Refer to the  Tightening Torque Specifications Section in this publication.
- **Shock absorbers** — Look for any signs of dents or leakage, misting is not considered a leak. See Shock Absorber Inspection in this section.
- **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 in this publication.
- **STEERTEK NXT / STEERTEK Axle** — The axle should be free of any nicks or gouges. Inspect for any cracks or dents on axle.
- **Thrust washers and rear hanger** — Look for any signs of excessive wear to the thrust washers and rear hanger clamp. See Thrust Washer Inspection detailed in this section.
- **Tire wear** — Inspect tires for wear patterns that may indicate suspension damage or misalignment. See Tire Inspection in this section.
- **Top and bottom axle wrap liners (If equipped)** — Look for any cracking or broken pieces on liner in load bearing areas. See Axle Wrap Liner 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 • STEERTEK axle, regular lubrication intervals should be followed to help prevent premature wear to the kingpin bushings and tie rod ends, see Lubrication Specifications in Table 7-1.

**NOTE** The recommended service lubrication interval is a guideline, the vehicle may require increased lubrication interval depending on severity of operation.

TABLE 7-1

STEERTEK NXT • STEERTEK Greasing and Lubrication Specifications				
Application	Component	Greasing Interval	Grease	Outside Temperature
<b>GENERAL</b> Does not include linehaul or medium-duty applications	Kingpin Bushings	Maximum of 25,000 miles (40,225 km) or 90 days, whichever comes first	Multipurpose Grease NLGI Grade 2	Refer to the lubricant manufacturer's specifications for the temperature service limits applicable to your area
	Tie Rod Ends			
	Drag Link	See Vehicle Manufacturer		
Application Specific Recommendations				
<b>ON-HIGHWAY</b> Linehaul Only High Mileage Accumulation 95% Highway Surface No off-roadway operation Greater than 50,000 miles (80,500 kilometers) per year	Kingpin Bushings	Maximum of 100,000 miles (161,000 km) or 1 year, whichever comes first	Multipurpose Grease NLGI Grade 2	Refer to the lubricant manufacturer's specifications for the temperature service limits applicable to your area
	Tie Rod Ends			
	Drag Link	See Vehicle Manufacturer		
<b>MEDIUM-DUTY</b> Low Mileage Accumulation No off-road operation 95% Highway Surface No off-roadway operation City Delivery, Inner City Coach, Heavy-haul, school bus, motor home, transit coach Less than 50,000 miles (80,500 kilometers) per year	Kingpin Bushings	Maximum of 40,000 miles (64,000 km) or 6 months, whichever comes first	Multipurpose Grease NLGI Grade 2	Refer to the lubricant manufacturer's specifications for the temperature service limits applicable to your area
	Tie Rod Ends			
	Drag Link	See Vehicle Manufacturer		

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

## KINGPIN LUBRICATION

STEERTEK NXT upper kingpin grease zerks are located on the inboard side of the steering knuckle and upper kingpin connection, see Figure 7-1. On some models of the STEERTEK NXT a grease zerk is located on the bottom of lower steering knuckle on the inboard side.

STEERTEK kingpin grease zerks are located on the top and bottom of the kingpin grease caps.

1. Place vehicle on the ground.

FIGURE 7-1



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.

**NOTE**

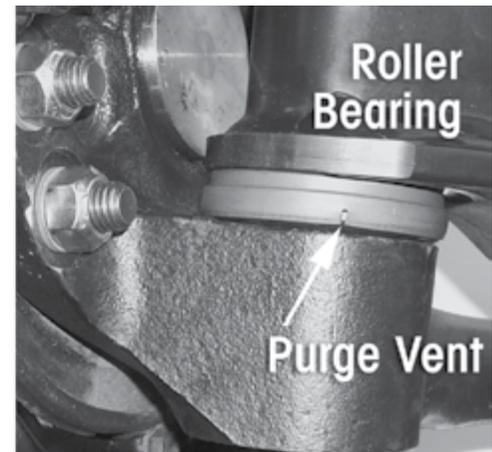
Effective January 2019, vehicles equipped with Hendrickson STEERTEK NXT/STEERTEK axle will be installed with a left hand composite bearing and a right hand roller bearing configuration to replace the previous roller/roller bearing configuration for production and aftermarket.

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 7-2 and 7-3.

**FIGURE 7-2**



**FIGURE 7-3**



**NOTE**

Greasing at the lower fitting should purge grease from the thrust bearing shell. The left side of the axle has a composite style thrust bearing and the right side of the axle has a steel roller thrust bearing, see Figures 7-4 and 7-5. Both purge in the same area.

**FIGURE 7-4**



**FIGURE 7-5**



**Top View of Thrust Bearings**

**COMPOSITE THRUST BEARING**  
Left Side

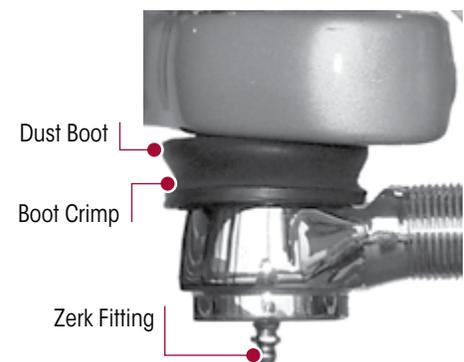
**ROLLER THRUST BEARING**  
Right Side

**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).

**FIGURE 7-6**



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 7-6. 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 End 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 ENDS

### INSPECTION

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).



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



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.



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 POSSIBLY RESULT IN TOTAL LOSS OF VEHICLE 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.



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.

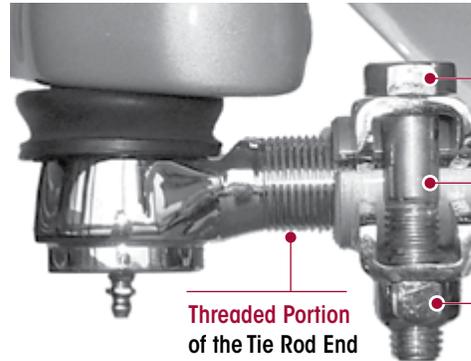
6. Verify the 5/8" tie rod clamp bolt head does not contact the lower shock mount at full wheel cut, see Figure 7-7.



THE THREADED PORTION OF THE TIE ROD END MUST EXTEND PAST THE SLOTS INTO THE TIE ROD CROSS TUBE, SEE FIGURE 7-7. 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 7-7.

**FIGURE 7-7**



**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.

**Tie Rod Cross Tube Slots**

It is critical to have the threaded portion of the tie rod end extend past the slots in the tie rod cross tube.

**5/8" Tie Rod Clamp Locknut**

**Tightening Torque**  
 $68 \pm 7$  ft. lbs. ( $92 \pm 9$  Nm)

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



DO NOT USE THE FOLLOWING ITEMS OR METHODS TO CHECK FOR MOVEMENT OF THE TIE ROD ASSEMBLY, WHICH CAN CAUSE DAMAGE TO COMPONENTS:

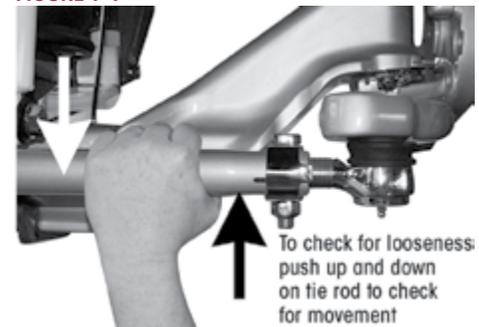
- A CROW BAR, PICKLE FORK OR 2 X 4
- ANYTHING OTHER THAN HANDS USED TO GRASP AND ROTATE THE CROSS TUBE ASSEMBLY (CAN RESULT IN DAMAGE TO THE CROSS TUBE)
- EXCESSIVE PRESSURE OR FORCE APPLIED TO THE TIE ROD ENDS OR THE JOINTS OF THE ASSEMBLY

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 7-8.

**FIGURE 7-8**



**FIGURE 7-9**



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  $75 \pm 25$  foot pounds of force. Check for any movement or looseness at both tie rod end locations, see Figure 7-9.

**FIGURE 7-10**



11. If there is any movement in the tie rod assembly, install a magnetic based dial indicator on the Ackermann arm, see Figure 7-10.

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 approx. 75 ± 25 lb. 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 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**

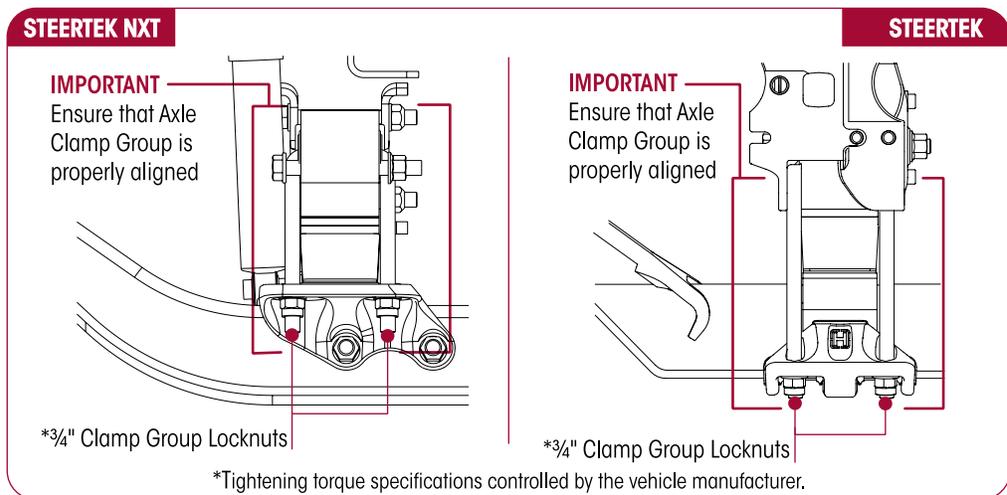


**WARNING**

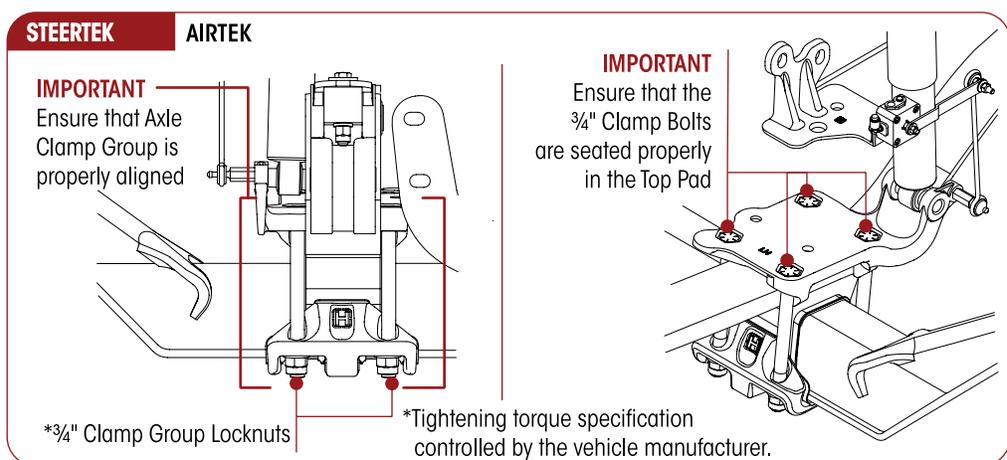
LOOSE OR OVER TORQUED FASTENERS CAN CAUSE COMPONENT DAMAGE, LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE, OR SEVERE PERSONAL INJURY. MAINTAIN CORRECT TORQUE VALUES AT ALL TIMES. CHECK TORQUE VALUES ON A REGULAR BASIS AS SPECIFIED.

1. Clamp group locknuts must be torqued to specification at preparation for delivery.
2. Clamp group locknuts must be re-torqued at 1,000 miles thereafter, follow the 6 month / 50,000 mile inspection and annual re-torque interval.

**FIGURE 7-11**



**FIGURE 7-12**

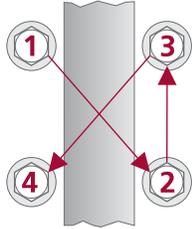




ENSURE CLAMP GROUP IS ALIGNED PROPERLY PRIOR TO TIGHTENING HARDWARE. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE OR PERSONAL INJURY.

3. Ensure that the clamp group is properly aligned and the U-bolts/hex bolts are seated in the top pad, and the top pad/bottom axle wrap is centered on the axle spring seat/top axle wrap, see Figures 7-11 and 7-12.

**FIGURE 7-13**



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

5. 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 1 through 5.

6. Tighten the clamp group locknuts evenly in 50 foot pounds increments to vehicle manufacturer's torque specification in the proper pattern to achieve uniform bolt tension, see Figure 7-13.

## STEERING KNUCKLE

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

**FIGURE 7-14**

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

1. Check 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 7-14.

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"**, loosen the socket head cap screws and **push down** on the knuckle assembly until the proper vertical end play is achieved.

■ If the vertical end play is **less than 0.008"**, loosen the socket head cap screws and **pull up** on the knuckle assembly until the proper vertical end play is achieved.

9. Retighten the socket head cap screws to  $\boxed{187} \pm 12$  foot pounds torque.



#### NOTE

**ONLY** if the vehicle is built **prior to August 2011** equipped with the **STEERTEK** axle can the vertical end play be further adjusted with a shim.

#### STEERTEK axle (prior to August 2011)

10. ■ If vertical end play is **greater than 0.030"**, install shims (Hendrickson part no. 60259-002) between the top of the axle and the bottom of the upper steering knuckle to obtain the proper vertical end play specification.

■ If the vertical end play is **less than 0.008"**, remove shims (Hendrickson part no. 60259-002) between the top of the axle and the bottom of the upper steering knuckle to obtain the proper vertical end play specification.

## KINGPIN BUSHING

### INSPECTING 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 7-15.

FIGURE 7-15

#### CHECKING UPPER KINGPIN BUSHING



FIGURE 7-16

#### CHECKING LOWER KINGPIN BUSHING



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 7-17.
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.

FIGURE 7-17

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 7-16.
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 (1) bushing is worn or damaged, it is mandatory to replace both the top and bottom bushings on that knuckle assembly.

## SHOCK ABSORBER

### NOTE

It is not necessary to replace shock absorbers in pairs if only one (1) shock absorber requires replacement.

Hendrickson uses a long service life, premium shock absorber on all SOFTEK / AIRTEK suspensions. If shock absorber replacement is necessary, Hendrickson recommends that the shock absorbers be replaced with identical Hendrickson Genuine parts for servicing. Failure to do so will affect the suspension performance, durability, and will void any applicable warranty. See vehicle manufacturer's applicable publications for other shock absorber inspection requirements.

Inspection of the shock absorber can be performed by doing a heat test, and a visual inspection. Replace as necessary, refer to the Component Replacement Section of this publication.

FIGURE 7-18



### HEAT TEST

1. Drive the vehicle at moderate speeds on rough road for minimum of fifteen minutes.



**WARNING**

DO NOT GRAB THE SHOCK ABSORBER AS IT COULD POSSIBLY BE HOT AND CAUSE PERSONAL INJURY.

2. Use an infrared thermometer to check the temperature of the shock absorber. This can also be performed by carefully touching the shock absorber body below the dust cover. Touch the frame to get an ambient reference, see Figure 7-18. A warm shock absorber is acceptable, a cold shock absorber should be replaced.
3. To inspect for an internal failure, remove and shake the suspected shock absorber. Listen for the sound of metal parts rattling inside. Rattling of metal parts can indicate that the shock absorber has an internal failure and the shock absorber should be replaced.

### VISUAL INSPECTION

Look for these potential problems when doing a visual inspection. Inspect the shock absorbers fully extended. Replace as necessary.

FIGURE 7-19

#### SHOCK ABSORBER VISUAL INSPECTION - UNACCEPTABLE CONDITIONS



Damaged upper or lower mount



Damaged upper or lower bushing



Damaged dust cover and / or shock body



Bent or dented shock absorber

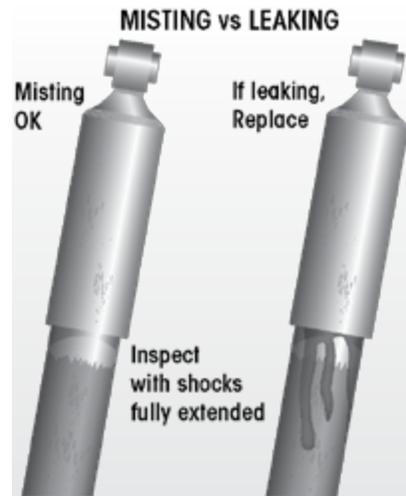


Improper intallation  
Example: washer (if equipped installed backwards

**LEAKING VS. MISTING SHOCK ABSORBER VISUAL INSPECTION**

The inspection must not be conducted after driving in wet weather or a vehicle wash. The shock absorber needs to be free from water. Many shock absorbers are often misdiagnosed as failures. Misting is the process whereby very small amounts of shock absorber fluid evaporate at a high operating temperature through the upper seal of the shock absorber. When the "mist" reaches the cooler outside air, it condenses and forms a film on the outside of the shock absorber body. Misting is perfectly normal and necessary function of the shock absorber. The fluid which evaporates through the seal area helps to lubricate and prolong the life of the seal.

**FIGURE 7-20**



**NOTE** AIRTEK and SOFTEK Suspension systems are equipped with a premium seal on the shock absorber, however this seal will allow for misting to appear on the shock absorber body (misting is not a leak and is considered acceptable).

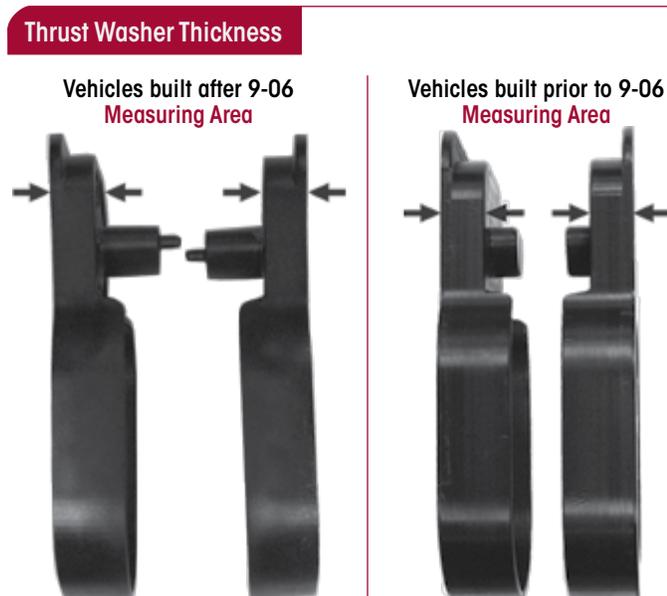
Inspect the shock absorber fully extended. **A shock absorber that is truly leaking** will show signs of fluid **leaking in streams from the upper seal**. These streams can easily be seen, underneath the main body (dust cover) of the shock absorber. Replace as necessary.

**AIRTEK THRUST WASHER**

In normal use these components will function satisfactorily, even though the components may show some wear.

**NOTE** If one (1) thrust washer is worn out, Hendrickson recommends both thrust washers on that side of the suspension be replaced. Inspect the thrust washers on the other side of the vehicle and replace if necessary, see Thrust Washer in the Component Replacement Section of this publication.

**FIGURE 7-21**



An indication that the rear mount/thrust washers are worn, or need replacement is when the suspension exhibits one or more of the following conditions:

1. Excessive lateral movement of the spring.
2. The spring taper is making contact with the rear hanger clamp or the rear hanger.
3. The thrust washers in Figure 7-21, show normal acceptable thickness. Thickness can be measured with a micrometer or a ruler.

If one or more of these conditions is experienced, disassembly of the rear leaf spring hanger is required to replace the thrust washers.

- The normal thickness of a new thrust washer is 1 1/16" (0.685") or 17.4 mm
- The minimum thickness allowable for a thrust washer is 9/16" (0.560") or 14.2 mm

## AXLE WRAP LINER (If equipped)

### NOTE

Axle wrap liners are not equipped on vehicles built with STEERTEK NXT axle.

### INSPECTION

- Axle wrap liners are installed on the STEERTEK axle to help prevent any type of abrasion on the axle at the clamp group area. Any time an axle wrap is removed it is mandatory that the axle wrap liner be replaced.
- Liner Crack Criteria:  
It is possible for the axle wrap liner to crack during service. If the liner is cracked and all the pieces are intact it is not necessary to replace the liner. If the liner is broken out and there are pieces missing the liner must be replaced immediately, see Figure 7-22. See Axle Wrap replacement in the Component Replacement Section of this publication.

FIGURE 7-22

Axle Wrap Liners  
Unacceptable Cracks



## TIRE INSPECTION

The leading potential causes of tire wear according to TMC (The Technology & Maintenance Council) 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 TMC recommended practices. Any issues regarding irregular tire wear where Hendrickson is asked for assistance, will require tire and alignment maintenance records as described in the TMC literature number RP 642 or TMC "Guidelines for Total Vehicle Alignment" publication.

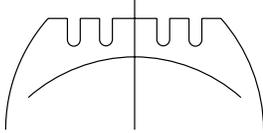
Tire wear is normally the best indicator of vehicle alignment condition. If tires are wearing too rapidly or irregularly, alignment corrections may be needed. The tire wear patterns described below can help isolate specific alignment problems.

The most common conditions of concern are:

- Overall Fast Wear (miles per 32nd)
- Feather Wear
- Cupping
- Diagonal Wear
- Rapid Shoulder Wear (one shoulder only)
- One-Sided Wear

FIGURE 7-23

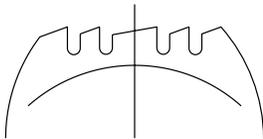
**OVERALL FAST WEAR**  
(Miles per 32nd)



**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.

FIGURE 7-24

**FEATHER WEAR**



**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:

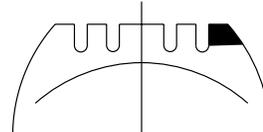
With one hand flat on the tread of the tire and a firm down pressure, slide your hand across the tread of the tire. In one direction, the tire will feel smooth and in the opposite direction there will be a sharp edge to the tread. Typical causes of feather wear include: excessive side force scrubbing, 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.

FIGURE 7-25

**RAPID SHOULDER WEAR**  
(One Shoulder Only)



**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.

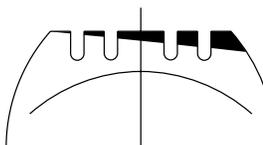
This wear condition is usually caused by excessive toe or excessive camber. These conditions can be created by a misaligned or bent axle and can also be caused by loose or worn wheel bearings.

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.

FIGURE 7-26

**ONE-SIDED WEAR**



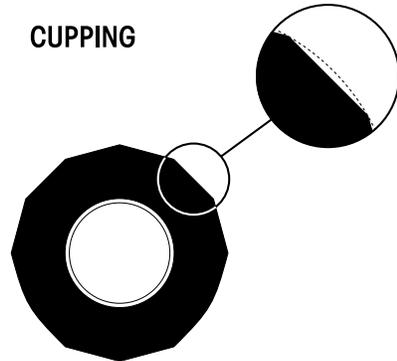
**One-sided wear**—Is excessive wear on one side of tire extending from the shoulder towards the center of the tread. For more information, see TMC RP 219A, page 26.

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.

**FIGURE 7-27**



**CUPPING**

**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:

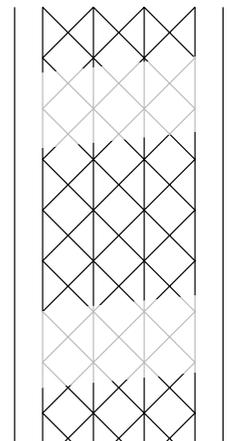
- *Tires* – Correct mismatch or balance problem. If ride complaints arise, steer tires may be rotated to drive or trailer axle.
- *Vehicle* – Diagnose component imbalance condition, i.e., wheel, rim, hub, brake, drum. Correct as necessary.

**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 or retread. If the source of trouble is the vehicle, diagnose cause and correct as needed.

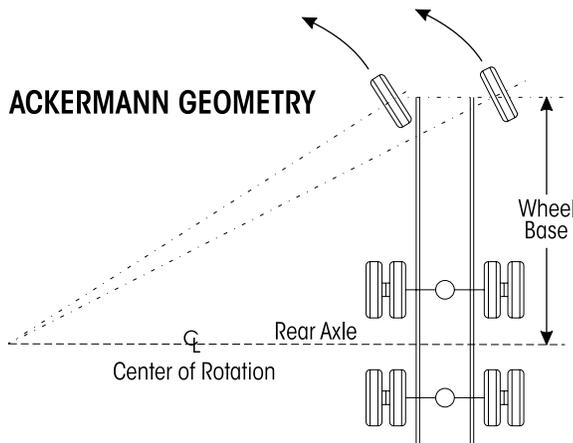
**FIGURE 7-28**  
**DIAGONAL WEAR**



## SECTION 8 Alignment & Adjustments

### ALIGNMENT DEFINITIONS

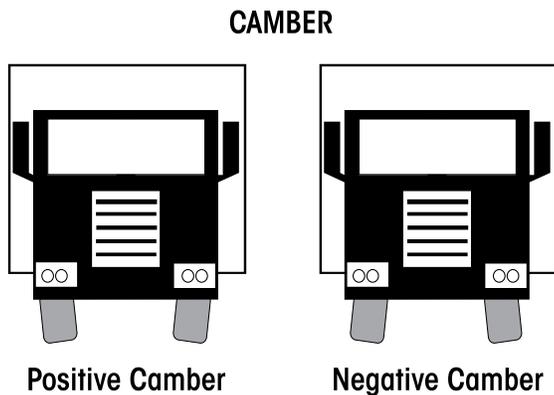
FIGURE 8-1



**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.

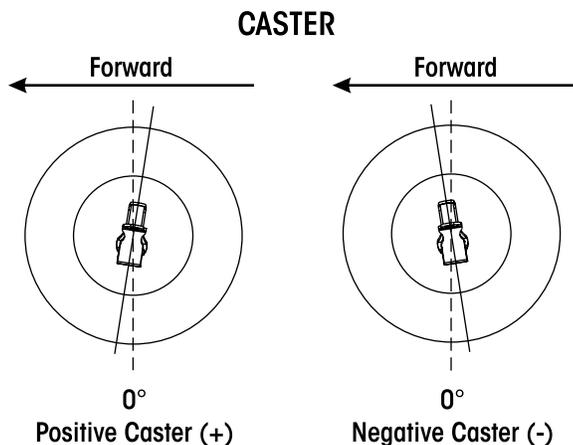
FIGURE 8-2



**Camber** — 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.

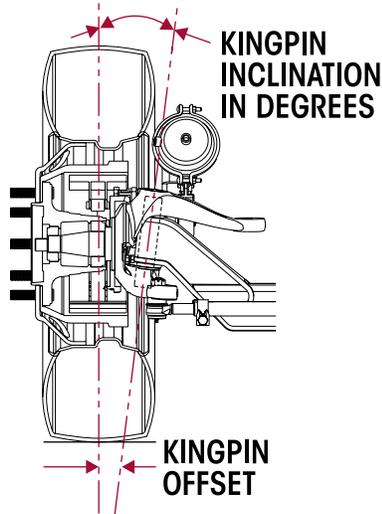
Excessive positive camber may cause smooth wear on the outer half of the tire tread. Excessive negative camber may cause wear on the inner half of the tread. Static-unloaded camber angles are built into the axle to put the loaded tire perpendicular to the road.

FIGURE 8-3



**Caster** — 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.

**FIGURE 8-4**

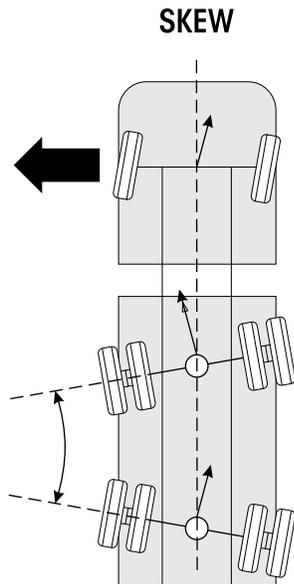


**Kingpin inclination (KPI)** — The inward tilt of the kingpin from the vertical. This front suspension parameter has a pronounced effect on steering effort and returnability. As the front wheels are turned around an inclined kingpin, the front of the truck is lifted. This lifting of the vehicle is experienced as steering effort when the turn is executed and exhibits itself as recovery force when the steering wheel is released.

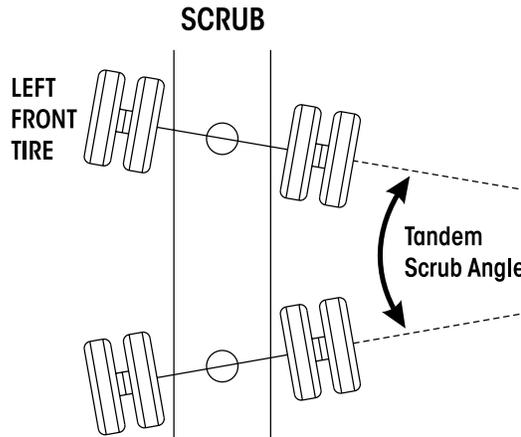
**Kingpin offset** — The distance between the center of the tire patch and intersection of the kingpin axis with the ground. This parameter of front-end geometry is important in vehicles without power steering and has a major effect on static steering. If there is no kingpin offset, the tires must scrub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

**FIGURE 8-5**



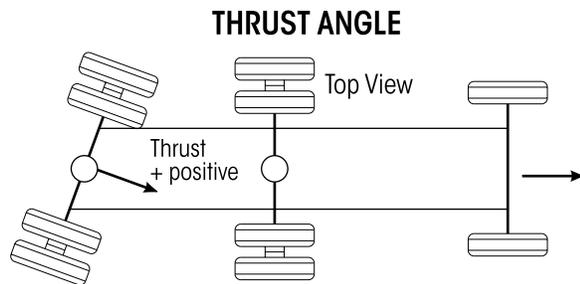
**FIGURE 8-6**



**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.

**FIGURE 8-7**

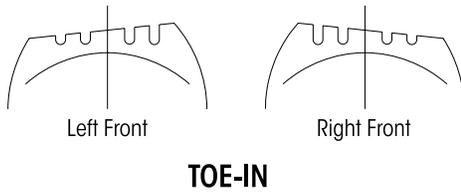


**Thrust angle, tracking, or square** — The angle formed by the centerline of the vehicle frame (geometric centerline) and the direction that an axle points. As indicated by the term "square", the ideal value for the angle is 0° or when the axle centerline is at 90° or perpendicular to the geometric 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."

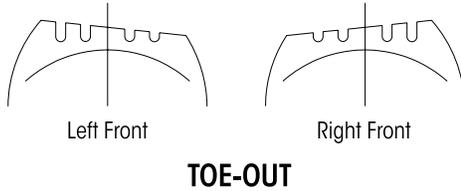
**Tie rod arm (ackermann-arm, cross tube arm)** — The component that transmits steering forces between left and right axle knuckle assemblies through the cross tube assembly.

FIGURE 8-8



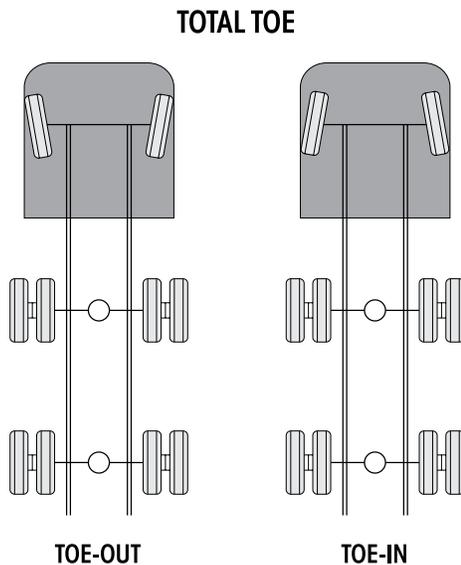
**Toe-in** — Is when the horizontal line intersects in front of the wheels, or the wheels are closer together in front than in the back. Toe-in is commonly designated as positive, toe-out as negative. Excessive toe-in wears the outside edge of the tires. Steer axle toe is adjustable to reduce wear to 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



**Toe-out on turns** — (See Ackermann Geometry). Excessive turning angles such as those encountered in pickup and delivery operations may contribute to premature tire wear. Be advised that the greater turning angles, the more that toe and camber change. If you have any doubt regarding the optimum turning angles for your operation, contact the vehicle's manufacturer, axle OEM, tire OEM and alignment equipment manufacturer for advice.

**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 Tightening Torque Specification Section of this publication.
- Leaf springs are free of wear or damage

- Air 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 in this publication.

### REAR AXLE AND REAR SUSPENSION

The rear axle misalignment 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 AIRTEK front wheel alignment specifications can be found in the Alignment Specifications Section of this publication. There are two types of front wheel alignment:

- a. **Minor alignment** – a minor front wheel alignment is done **for all** normal maintenance conditions, see below.
- b. **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.

**FIGURE 8-11**



**FIGURE 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 FIGURES 8-13 AND 8-14.

 **WARNING**

UNAUTHORIZED TAMPERING OF STEERTEK NXT INTEGRATED AXLE SPRING SEATS CAN CAUSE COMPONENT AND STRUCTURAL DAMAGE AND RESULT IN LOSS OF VEHICLE CONTROL, SEVERE PERSONAL INJURY OR DEATH, PROPERTY DAMAGE, AND WILL VOID ANY APPLICABLE WARRANTY, SEE FIGURE 8-13.

■ DO NOT REMOVE, MODIFY OR REPLACE INTEGRATED AXLE SPRING SEAT OR FASTENERS

**NOTE**

Contact Hendrickson Tech Services for any questions regarding STEERTEK NXT integrated axle spring seats and / or fasteners.

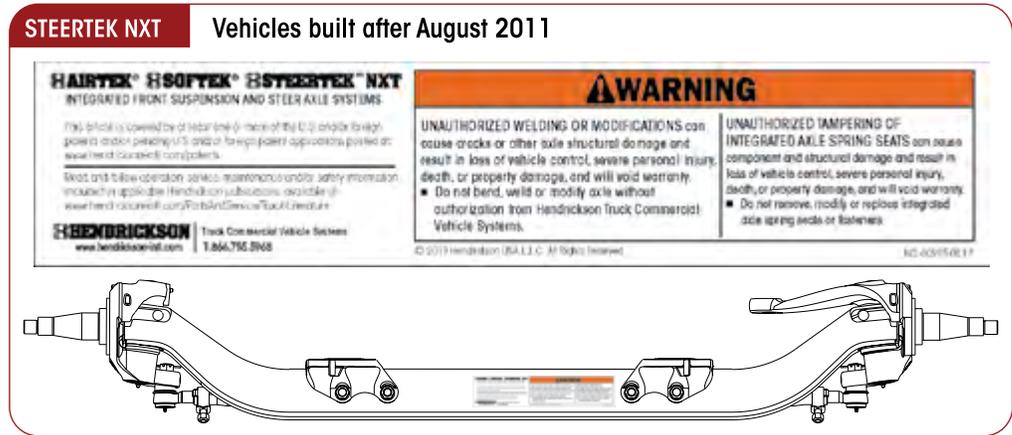
6. Check camber angle. **DO NOT** attempt to adjust camber. Refer to "Camber" under the Alignment Definitions in this section.
7. It is necessary to verify that all ride heights (front and rear) are within specifications prior to checking caster to get an accurate caster reading.
8. Check and adjust caster angle. Refer to Caster Angle under Alignment Definitions in this section.

**NOTE**

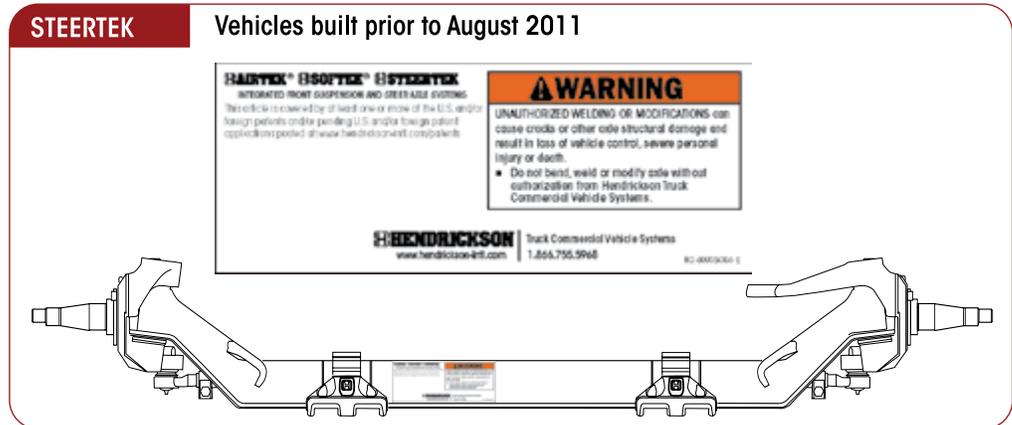
The use of two different angle caster shims will not change cross caster. Cross caster is the difference between the caster readings for left and right side of the vehicle.

9. Check and adjust toe-in, refer to adjusting the Toe-In under Alignment Definitions in this section.

**FIGURE 8-13**



**FIGURE 8-14**

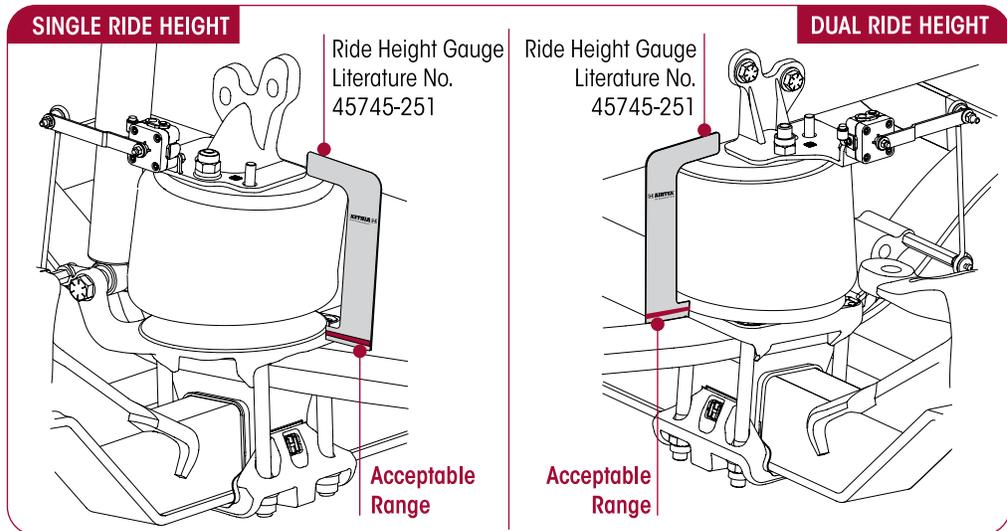


### AIRTEK RIDE HEIGHT VERIFICATION

The recommendation of the vehicle manufacturer is that dual height control valves are only to be installed on the front suspension when the rear suspension is equipped with a single height control valve system. This arrangement is best suited to keep the vehicle level versus having dual height control systems on both the front and rear suspensions.

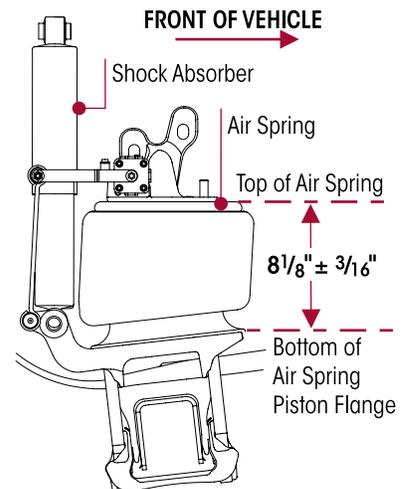
1. Drive the vehicle onto a level surface.
2. Free and center all suspension joints by slowly moving vehicle back and forth several times without using the brakes. It is **IMPORTANT** when coming to a complete stop to verify the brakes are released.
3. Chock drive wheels.
4. Verify that the air system is at full operating pressure.
5. Detach the lower rubber grommet of the height control valve linkage from the lower stud and exhaust the suspension system air by lowering the height control valve arm.
6. Re-attach the lower grommet of the height control valve linkage onto the lower stud to fill the suspension system with air. Wait until the airflow to front air springs has stopped.
7. The ride height is measured at the front of the air spring. Place the height gauge (Literature No. 45745-251) so the flat surface of the height gauge is against the side of the frame rail, the horizontal flat is sitting on top of the air spring bead plate. Align the bottom of the height gauge to the air spring piston flange as shown in Figure 8-15. Verify that the air spring height is within the "**ACCEPTABLE**" tolerance indicated on the gauge.

FIGURE 8-15



8. If the air spring is piston flange edge contacts the "BELOW SPEC" region, the ride is set too low. If the air spring piston flange contacts to the "ABOVE SPEC" region, the ride height is set too high. If the ride height is out of specification it will be necessary to adjust the ride height.
9. If a gauge is not available, measure the suspension reference ride height on the front axle (top front of the air spring to the bottom of the air spring piston flange). The reference ride height specification is  $8\frac{1}{8}" \pm \frac{3}{16}"$ , see Figure 8-16. If the reference ride height is out of specification it will be necessary to adjust the ride height.

FIGURE 8-16



### ADJUSTMENT PROCEDURE

1. Verify that the air system is at full operating pressure.

### SERVICE HINT

It is very important that the leveling valve be cycled completely before and after any ride height adjustments. Cycling of the leveling valve will help make the adjustment more accurate.

2. See Air Spring Safety Notice in the Important Safety Notice Section of this publication prior to deflating or inflating the suspension system. Cycle the air system. Detach the lower rubber grommet of the height control valve linkage from the lower stud and exhaust the suspension system air by lowering the height control valve arm.
3. Refill the suspension by raising the height control valve arm by hand, so that the air springs are above the proper ride height.
4. Lower the leveling valve arm to exhaust the air system until the suspension is at the proper ride height.
5. Use a  $\frac{1}{8}"$  wooden dowel rod (golf tee) to set the neutral position for the height control valve by aligning the hole in the leveling arm with the hole in the height control valve cover, as shown in Figure 8-17. **DO NOT** use a metal rod or nail as this may cause damage to the height control valve.

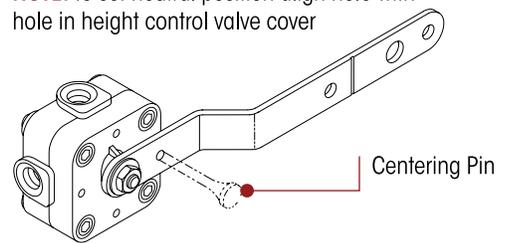
**NOTE**

Hendrickson recommends the following be performed during any type of ride height adjustment to help prevent socket head cap screws from loosening from the height control valve housing, potentially causing subsequent air leaks from the height control valve.

6. Prior to adjusting the height control valve, clean the threads of the mounting fasteners of any debris and corrosion.
7. To adjust the height control valve, loosen the mounting locknuts.
8. Adjust the height control valves by loosening the mounting locknuts and pivoting the valve body about the mounting bolt so the link mount stud inserts directly into the center hole of the rubber grommet at the proper height. Check the rubber grommet for any tearing or damage, replace as necessary.
9. If equipped with –
  - **Single height control valve** – Facing the air spring from the outboard side of the vehicle, pivot the valve body counter clockwise to increase the ride height and clockwise to decrease the ride height.
  - **Dual height control valve** – Facing the air spring from the outboard side for the left side of the vehicle, pivot the valve body clockwise to increase the ride height and counter clockwise to decrease the ride height. For the right side of the vehicle, pivot the valve body counter clockwise to increase the ride height and clockwise to decrease the ride height.

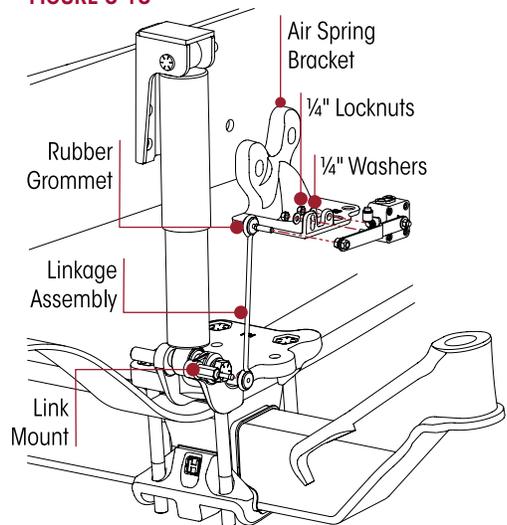
**FIGURE 8-17**

**NOTE:** To set neutral position align hole with hole in height control valve cover



10. Tighten the mounting locknuts to  $8 \pm 1$  foot pounds torque after the adjustment is made, see Figure 8-18. Install a (5 mm) allen wrench in the bottom socket head cap screws to prevent the screws from turning while re-tightening the locknuts.
11. Remove the dowel from the height control valve.
12. Cycle the air from the system by lowering the height control valve arm.
13. Reconnect the height control valve linkage rubber grommet to the link mount. Allow the air suspension system to completely fill with air.
14. Recheck the ride height after adjustment, (if equipped with dual height control valves check both sides of the vehicle).
15. Repeat Steps 2 through 11 until the ride height is within specification.

**FIGURE 8-18**



## STEERING STOP

### ADJUSTMENT PROCEDURE

When the axle or lower 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.

FIGURE 8-19



### 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 8-19.

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

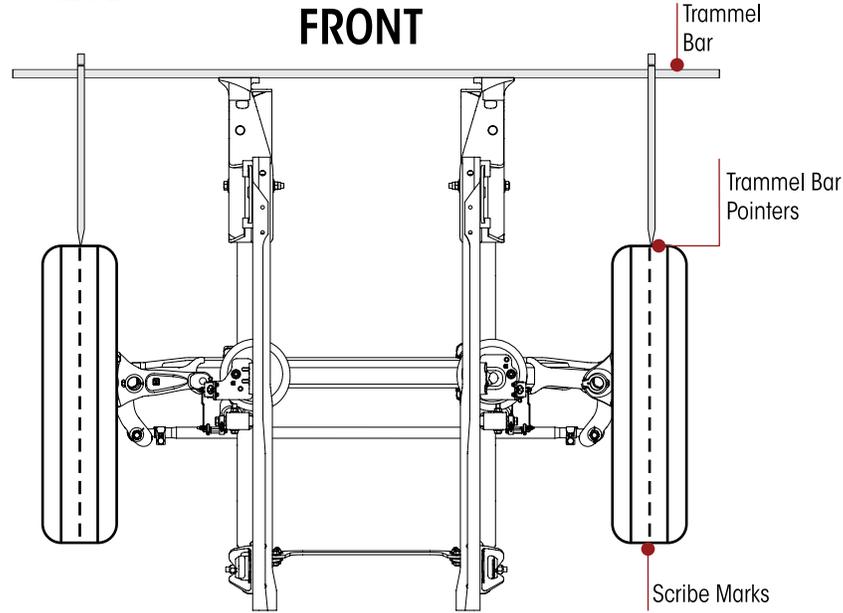
**DO NOT** measure toe-in with the front axle off the ground. The weight of the vehicle must be on the front axle when toe-in is measured.

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 8-20.

### NOTE

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

**FIGURE 8-20**



9. 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.
10. If the toe measurement is not within the specifications of  $\frac{1}{16}'' \pm \frac{1}{32}''$  (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.

**WARNING**

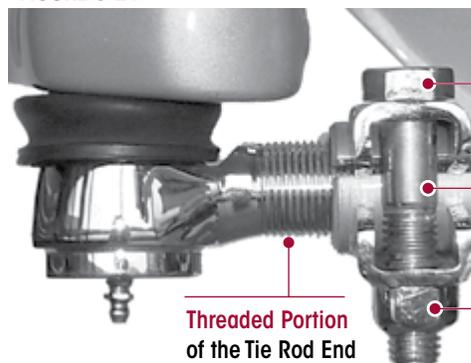
THE THREADED PORTION OF THE TIE ROD END MUST EXTEND PAST THE SLOTS INTO THE TIE ROD CROSS TUBE, SEE FIGURE 8-21. FAILURE TO DO SO CAN CAUSE COMPONENT TO FAIL CAUSING LOSS OF VEHICLE CONTROL AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

**WARNING**

IT IS CRITICAL TO CHECK THE  $\frac{5}{8}''$  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.

- c. Tighten the bolt and locknut on the tie rod cross tube to  $\boxed{67} \pm 7$  foot pounds torque.
11. Verify the  $\frac{5}{8}''$  tie rod clamp bolt head does not contact the lower shock mount at full wheel cut, see Figure 8-21.
12. Repeat Steps 1-10 until the correct toe setting is achieved.

**FIGURE 8-21**



**$\frac{5}{8}''$  Tie Rod Clamp Bolt**

It is critical to check the  $\frac{5}{8}''$  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.

**Tie Rod Cross Tube Slots**

It is critical to have the threaded portion of the tie rod end extend past the slots in the tie rod cross tube.

**$\frac{5}{8}''$  Tie Rod Clamp Locknut**

**Tightening Torque**  
**68  $\pm$  7 ft. lbs. (92  $\pm$  9 Nm)**

## 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 in this publication. If non-Hendrickson fasteners are used follow torque specifications listed in the vehicle manufacturer's service manual.

### AIRTEK HEIGHT CONTROL VALVE

The recommendation of the vehicle manufacturer is that dual height control valves are only to be installed on the front suspension when the rear suspension is equipped with a single height control valve system. This arrangement is best suited to keep the vehicle level versus having dual height control systems on both the front and rear suspensions.

### DISASSEMBLY

1. Drain the air from the secondary air tank.

#### WARNING

PRIOR TO AND DURING DEFLATION AND INFLATION OF THE FRONT AIR SUSPENSION SYSTEM, ENSURE THAT ALL PERSONNEL AND EQUIPMENT ARE CLEAR FROM UNDER THE VEHICLE AND AROUND THE SERVICE AREA, FAILURE TO DO SO CAN CAUSE SERIOUS PERSONAL INJURY, DEATH, OR PROPERTY DAMAGE.

2. See Air Spring Warnings and instructions in the Important Safety Notice Section of this publication prior to deflating or inflating the suspension system.
3. Deflate the air spring(s) by removing the height control valve linkage(s) at the rubber grommet(s) and lowering the height control linkage arm. This will exhaust the air pressure in the air springs.

#### CAUTION

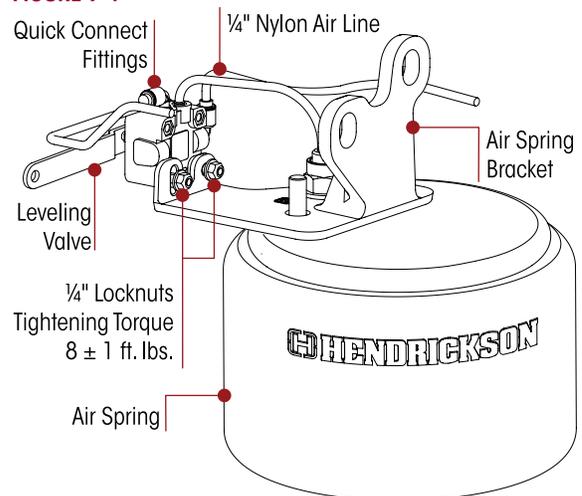
THE HEIGHT CONTROL VALVE FITTINGS ARE NON-SERVICEABLE. IF THE HEIGHT CONTROL VALVE IS TO BE RE-INSTALLED; CARE MUST BE TAKEN TO REMOVE DIRT AND DEBRIS FORM THE PUSH-TO-CONNECT FITTINGS. FAILURE TO DO SO CAN RESULT IN THE PUSH-TO-CONNECT FITTINGS FAILING TO SEAL PROPERLY WITH THE AIR LINE.

4. Disconnect the air line(s) from the height control valve(s), see Figure 9-1.
5. Remove the mounting fasteners.
6. Remove the height control valve .

### ASSEMBLY

1. Attach the height control valve(s) on the mounting bracket as shown in Figure 9-1.
2. Attach the 1/4" fasteners. **DO NOT** tighten the locknuts to specified torque until after the proper ride height is attained. Mount the height control valve parallel to the flange of the upper air spring bracket, see Figure 9-2.

FIGURE 9-1

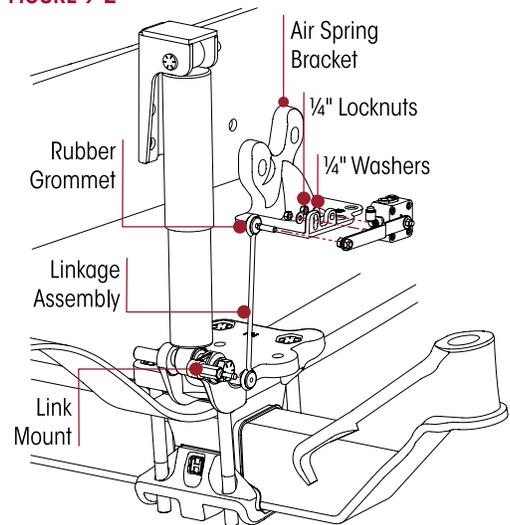


**SERVICE HINT**

When replacing or installing nylon air line tubing into quick-connect fittings it is critical that the end of the air line is cut square. Improper cut of the end of the air line tubing can cause the air line to seat improperly in the quick connect fitting causing air leakage.

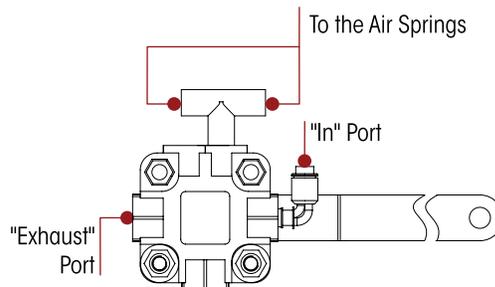
3. Attach the air lines to the height control valve(s), see Figure 9-3.
4. Install the height control valve linkage assembly(s).
5. Adjust the height control valve(s) to proper specifications. See the Alignment & Adjustments Section of this publication for proper ride height adjustment.
6. After the adjustment is made, install a 3/16" allen wrench in the bottom socket head cap screws to prevent the screws from turning while tightening the 1/4" locknuts to torque.
7. Tighten the 1/4" locknuts to  $8 \pm 1$  foot pounds torque.

**FIGURE 9-2**

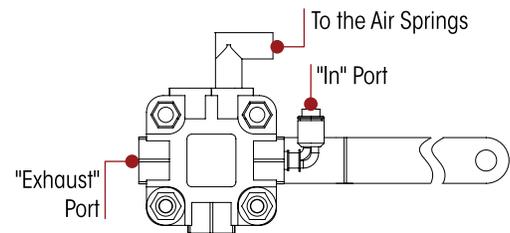


**FIGURE 9-3**

**Single Height Control Valve**



**Dual Height Control Valve (if equipped)**



**AIRTEK AIR SPRING**

**DISASSEMBLY**

1. Place the vehicle on level floor.
2. Chock the wheels.
3. Support the vehicle with frame stands.



WHEN SERVICING THE VEHICLE OR ATTACHING AN AIR SPRING AND THE VEHICLE IS ON THE GROUND, PRIOR TO AIRING THE SUSPENSION SYSTEM MAKE CERTAIN THE AIR SPRING LOCATOR IS INDEXED INTO THE UPPER AIR SPRING BRACKET PROPERLY, AND THE AIR SPRING IS FULLY SEATED ON THE TOP PAD. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN PREMATURE AIR SPRING FAILURE, CAUSE PERSONAL INJURY, OR PROPERTY DAMAGE.

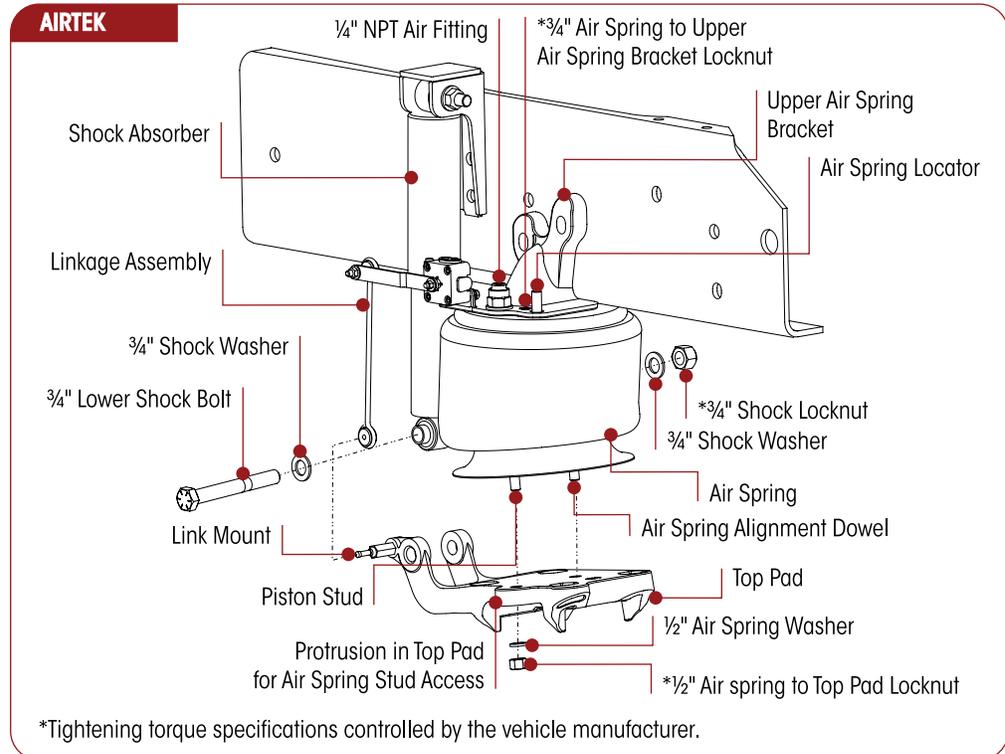


PRIOR TO AND DURING DEFLATION AND INFLATION OF THE FRONT AIR SUSPENSION SYSTEM, ENSURE THAT ALL PERSONNEL AND EQUIPMENT ARE CLEAR FROM UNDER THE VEHICLE AND AROUND THE SERVICE AREA, FAILURE TO DO SO CAN CAUSE SERIOUS PERSONAL INJURY, DEATH, OR PROPERTY DAMAGE.

4. See Air Spring Warnings and instructions in the Important Safety Notice Section of this publication prior to deflating or inflating the suspension system.
5. Remove the air from the air system by disconnecting the height control valve linkage(s) at the rubber grommet(s) and allowing the lever(s) to drop. This will exhaust air from the system.

6. If the air spring is damaged and the suspension is deflated, it will be necessary to raise the frame and support the vehicle with frame stands to obtain adequate clearance for air spring removal.
7. Disconnect the 1/4" NPT air fitting from the air spring.
8. Remove the lower 1/2" air spring locknut from the piston stud to remove the air spring from the top pad and discard fasteners, see Figure 9-4.
9. Remove the 3/4" upper air spring locknut from the air spring bracket, discard fasteners.
10. Remove the air spring.

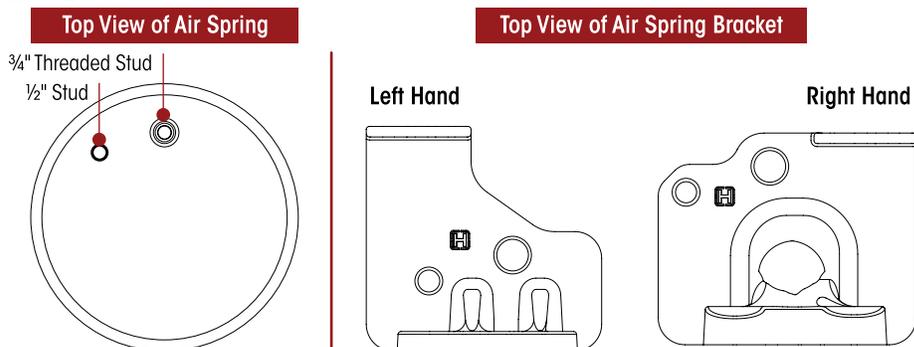
**FIGURE 9-4**



**ASSEMBLY**

1. Compress the air spring and slide into vertical position.
2. There is a locating 1/2" stud and 3/4" threaded stud on top of the air spring, see Figure 9-5.

**FIGURE 9-5**



3. There are two (2) studs on the bottom of the air spring. Guide studs through the air spring bracket and properly seat the lower air spring piston into the top axle pad. Secure the 1/2" locknut to the piston.

4. Tighten the 3/4" upper air spring locknuts and the 1/2" lower air spring locknuts to vehicle manufacturer's torque specifications.

**WARNING**

WHEN SERVICING THE VEHICLE OR ATTACHING AN AIR SPRING AND THE VEHICLE IS ON THE GROUND, PRIOR TO AIRING THE SUSPENSION SYSTEM MAKE CERTAIN THE AIR SPRING LOCATOR IS INDEXED INTO THE UPPER AIR SPRING BRACKET PROPERLY, AND THE AIR SPRING IS FULLY SEATED ON THE TOP PAD. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN PREMATURE AIR SPRING FAILURE, CAUSE PERSONAL INJURY, OR PROPERTY DAMAGE.

5. See Air Spring Warnings and instructions in the Important Safety Notice Section of this publication prior to deflating or inflating the suspension system.
6. Install the air line into the air spring.
7. Air up the suspension.
8. Check the air spring for leaks.
9. Check the ride height and adjust if necessary, see the Alignment & Adjustments Section of this publication for the proper ride height adjustment.
10. Remove the wheel chocks.

### SHOCK ABSORBER

**NOTE**

For some International Truck Models, shock absorber is 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 on these components see vehicle manufacturer.

**NOTE**

It is not necessary to replace the shock absorber in pairs if only one (1) shock absorber requires replacement.

- There are different lower shock mount configurations, refer to the Parts Lists Section of this publication

**WARNING**

THE SHOCK ABSORBERS ARE THE REBOUND TRAVEL STOPS FOR THE SPRINGS. ANYTIME THE FRONT AXLE ON AN AIRTEK SUSPENSION IS SUSPENDED IT IS MANDATORY THAT THE SHOCK ABSORBERS REMAIN CONNECTED. FAILURE TO DO SO COULD CAUSE THE AIR SPRINGS TO EXCEED THEIR MAXIMUM LENGTH, POSSIBLY CAUSING THE AIR SPRINGS TO SEPARATE FROM THE PISTON, OR CAUSE A REVERSE ARCH IN THE STEEL LEAF SPRINGS, POSSIBLY RESULTING IN PREMATURE STEEL LEAF SPRING FAILURE.

### DISASSEMBLY

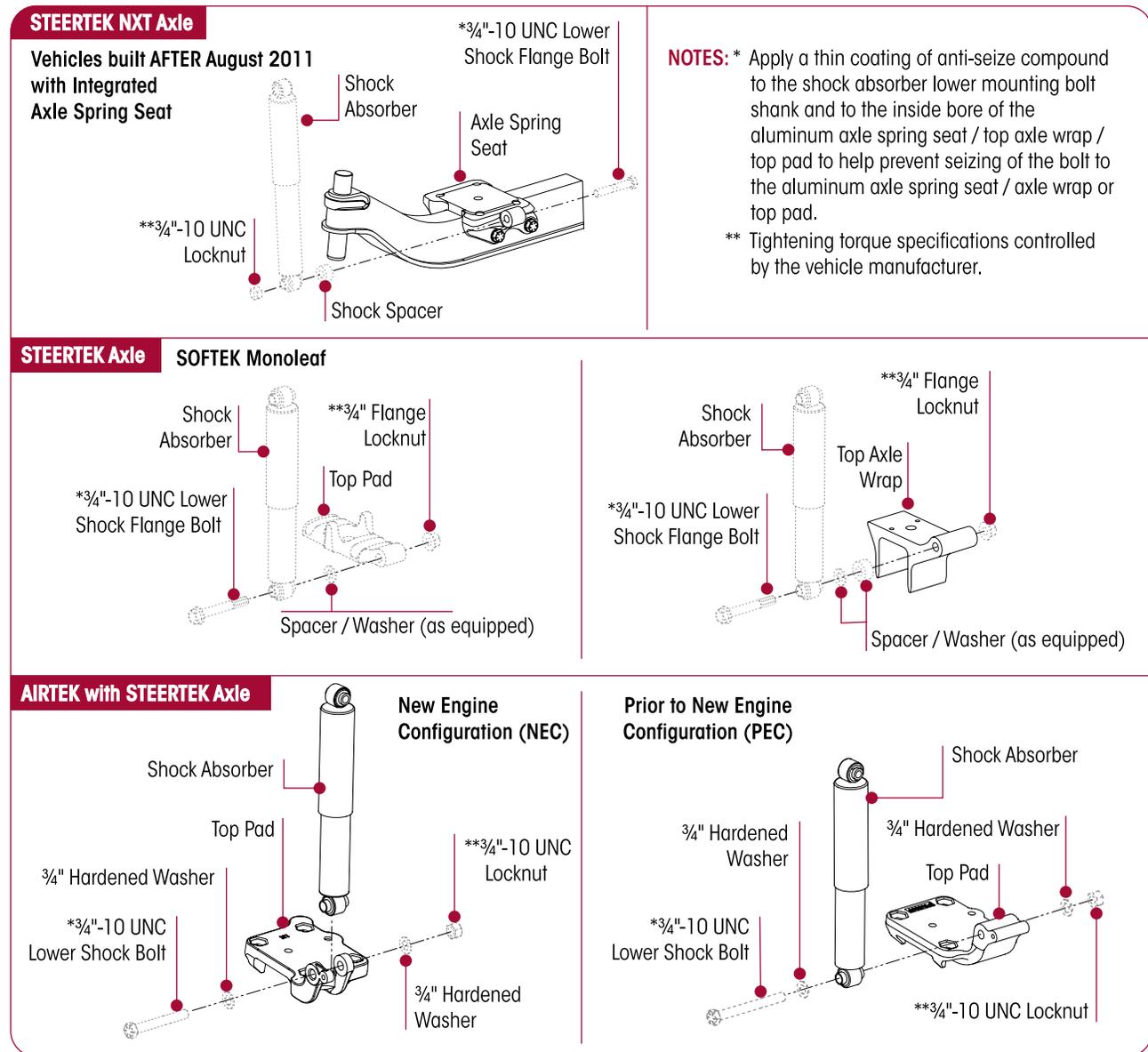
1. Remove the lower mounting bolts, shock spacer (if equipped) and fasteners.
2. Remove the upper mounting bolts and fasteners.
3. Slide out the shock absorber.
4. Inspect the shock absorber mounting brackets and hardware for damage or wear, replace as necessary.

### ASSEMBLY

1. Install the shock absorber into the upper mounting bracket.
2. Install the upper shock mounting bolt and fasteners.
3. Apply a thin coating of anti-seize compound to the shock absorber lower mounting bolt shank and to the inside bore of the (aluminum top axle wrap•top pad•axle spring seat) to help prevent seizing of the bolt to the aluminum axle wrap•top pad•axle spring seat.
4. Install the lower bolt from the inboard side to the outboard side of the axle spring seat/top pad/top axle wrap and attach the shock spacer (if equipped) and fasteners, see Figure 9-6.

5. Tighten the upper and lower shock eye locknuts to vehicle manufacturer's torque specifications.

FIGURE 9-6



### AIRTEK BELLY BAND (If equipped)

#### DISASSEMBLY

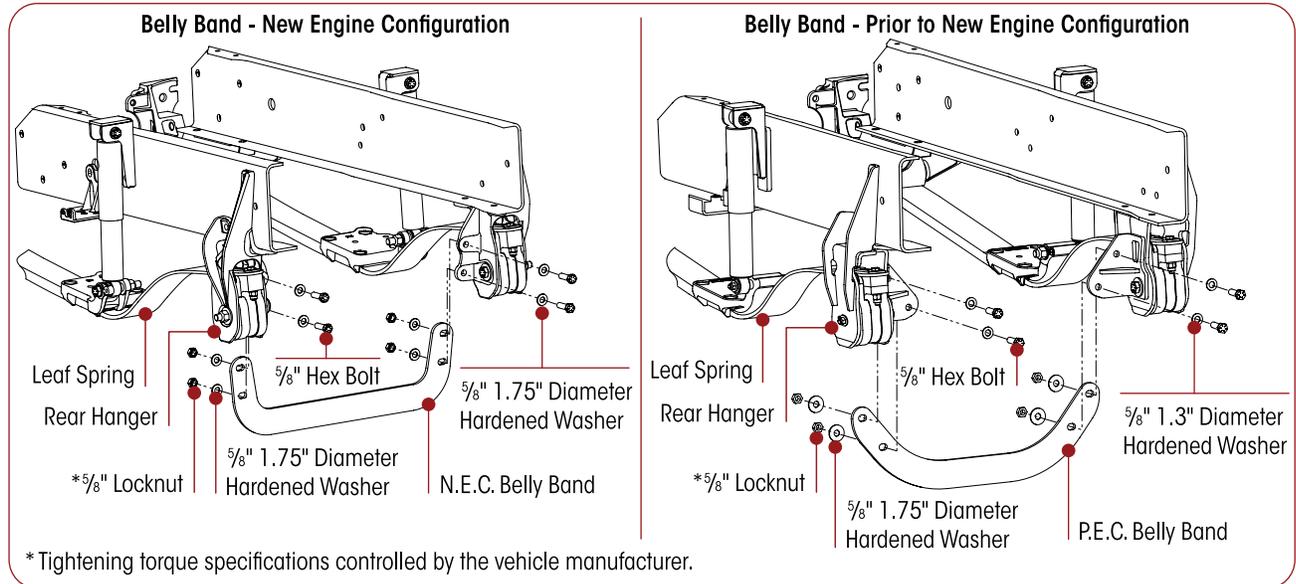
1. Place the vehicle on level floor.
2. Chock the wheels.
3. Remove the four (4) belly band mounting fasteners and discard.
4. Remove belly band.

#### ASSEMBLY

1. Install belly band in front of mounting bracket.
2. Install the new belly band mounting fasteners, see Figure 9-7.

- **PEC** – Install the new belly band mounting fasteners with the larger diameter washer located on the belly band side of the connection and with the smaller diameter washer located on the back of the rear hanger, see Figure 9-7.
- 3. Tighten to vehicle manufacturer’s torque specifications.
- 4. Remove the wheel chocks.

**FIGURE 9-7**



**AIRTEK – REAR SPRING HANGER AND THRUST WASHERS (NEC)**

**NOTE**

The AIRTEK with the PEC design rear spring hangers require modified hangers and other components contained in Kit Number 60961-131. See AIRTEK with PEC to NEC Rear Spring Hanger and Thrust Washer component replacement in this section.

**DISASSEMBLY**

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



PRIOR TO AND DURING DEFLATION AND INFLATION OF THE FRONT AIR SUSPENSION SYSTEM, ENSURE THAT ALL PERSONNEL AND EQUIPMENT ARE CLEAR FROM UNDER THE VEHICLE AND AROUND THE SERVICE AREA, FAILURE TO DO SO CAN CAUSE SERIOUS PERSONAL INJURY, DEATH, OR PROPERTY DAMAGE.

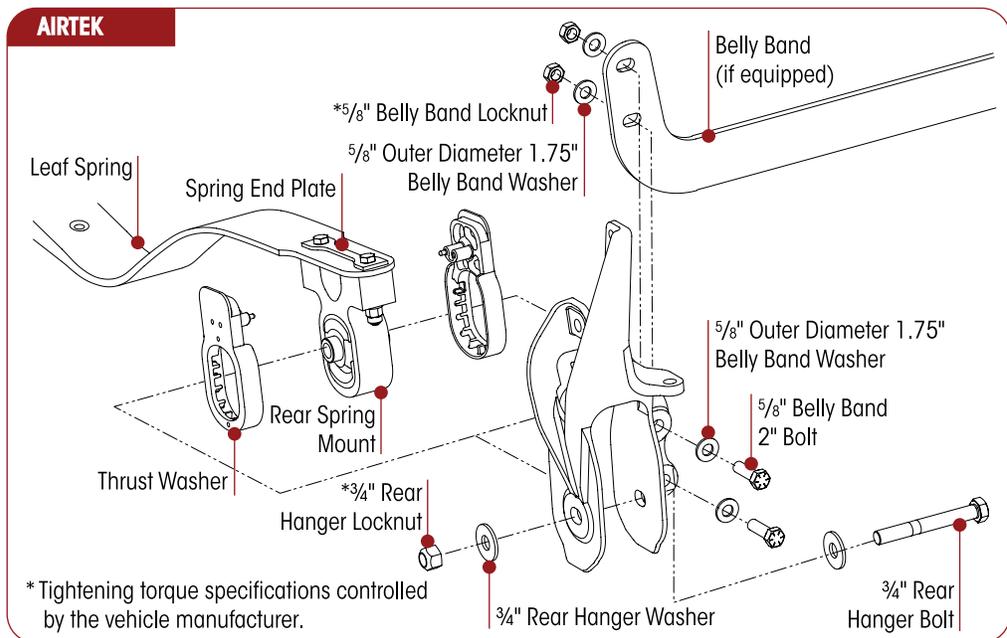
3. See Air Spring Warnings and instructions in the Important Safety Notice Section of this publication prior to deflating or inflating the suspension system.
4. Deflate the air springs by detaching the upper rubber grommet of the height control valve linkage from the upper stud and exhaust the suspension system air by lowering the height control valve arm.
5. Remove the air lines from air springs.
6. Raise the frame.
7. Support the vehicle with frame stands.
8. Remove the (2) mounting fasteners that connect the belly band (if equipped) to the rear hanger.
9. Suspend the front axle from the shock absorbers.
10. Remove the rear spring eye bolt and fastener.

**SERVICE HINT**

A bottle jack may be required to raise the axle slightly to facilitate removal of the rear spring eye bolt.

11. Remove the hardware from the rear spring hanger. See manufacturer's guidelines.
12. Remove the rear hanger from the vehicle, see Figure 9-8.
13. Remove the two (2) thrust washers from the rear spring mount.
14. Inspect the rear spring mount and both thrust washers for excessive wear or damage. See Thrust Washer Inspection in the Preventive Maintenance Section of this publication.
15. If damaged or worn excessively, replace with Genuine Hendrickson Parts as detailed in the Component Replacement Section of this publication.

**FIGURE 9-8**

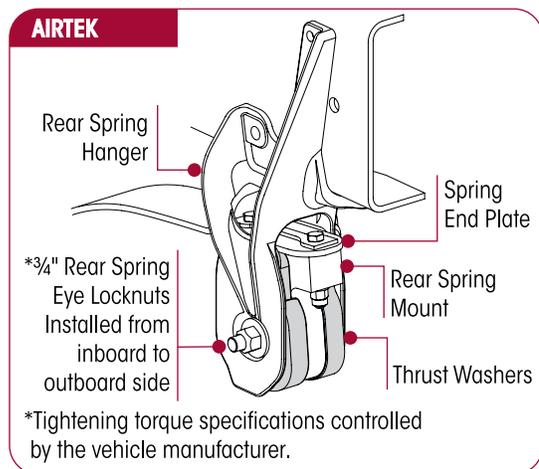


\*Tightening torque specifications controlled by the vehicle manufacturer.

**FIGURE 9-9**

**ASSEMBLY**

1. Install the thrust washers on the rear spring mount, see Figure 9-8.
2. Slide the rear hanger clamp over the rear spring mount.
3. Install the rear spring hanger on the frame.
4. Install new frame mounting hardware. Follow manufacturer's guidelines.
5. Install belly band fasteners. (if equipped). Tighten  $\frac{5}{8}$ " locknuts to vehicle manufacturer's torque specifications.
6. Install  $\frac{3}{4}$ " x 6" rear hanger bolt from the inboard to outboard side.
7. Install the rear hanger fasteners. Tighten  $\frac{3}{4}$ " locknuts to vehicle manufacturer's torque specifications, see Figure 9-9.
8. Remove the wheel chocks.



\*Tightening torque specifications controlled by the vehicle manufacturer.

## AIRTEK LEAF SPRING ASSEMBLY

### DISASSEMBLY

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

### WARNING

DEFLATE AND DISCONNECT THE AIR SYSTEM PRIOR TO RAISING THE FRONT OF THE VEHICLE. PRIOR TO AND DURING DEFLATION AND INFLATION OF THE FRONT AIR SUSPENSION SYSTEM, ENSURE THAT ALL PERSONNEL AND EQUIPMENT ARE CLEAR FROM UNDER THE VEHICLE AND AROUND THE SERVICE AREA, FAILURE TO DO SO CAN CAUSE SERIOUS PERSONAL INJURY, DEATH, OR PROPERTY DAMAGE.

3. See Air Spring Warnings and instructions in the Important Safety Notice Section of this publication prior to deflating or inflating the suspension system.
4. Deflate the air springs by detaching the upper rubber grommets of the height control valve linkages from the upper studs and exhaust the suspension system air by lowering the height control valve arms.
5. Disconnect the air lines from the air springs.
6. Install a floor jack with a 4" lifting plate below the axle and raise the truck.
7. Remove the tires.
8. Install frame stands behind the rear spring mounts to support the vehicle. It may be necessary to remove peripheral components for installation.
9. Lower the jack allowing the axle to hang, but **DO NOT** remove the jack from the axle.
10. Loosen both front spring eye bolts, but **DO NOT** remove the bolts.
11. Remove both rear spring eye bolts.
12. Remove both lower shock absorber mounting bolts.

### SERVICE HINT

To ease in the removal of the spring eye bolts it may be necessary to raise or lower the axle slightly.

13. Disconnect the lower air spring mounting fasteners from the top pad and discard.
14. Loosen (**DO NOT** remove at this time) the clamp group locknuts for the leaf spring that is **NOT** being serviced.

### WARNING

DO NOT USE A CUTTING TORCH TO REMOVE CLAMP GROUP BOLTS OR ATTACHING FASTENERS. THE USE OF SUCH HEAT ON SUSPENSION COMPONENTS CAN 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.

15. Remove and discard the 3/4" clamp group fasteners. Remove the top pad, bottom axle wrap and liner from the leaf spring that is being serviced, see Figure 9-10.
16. Lower the jack, allowing the suspension to pivot down out of the rear hanger.

### NOTE

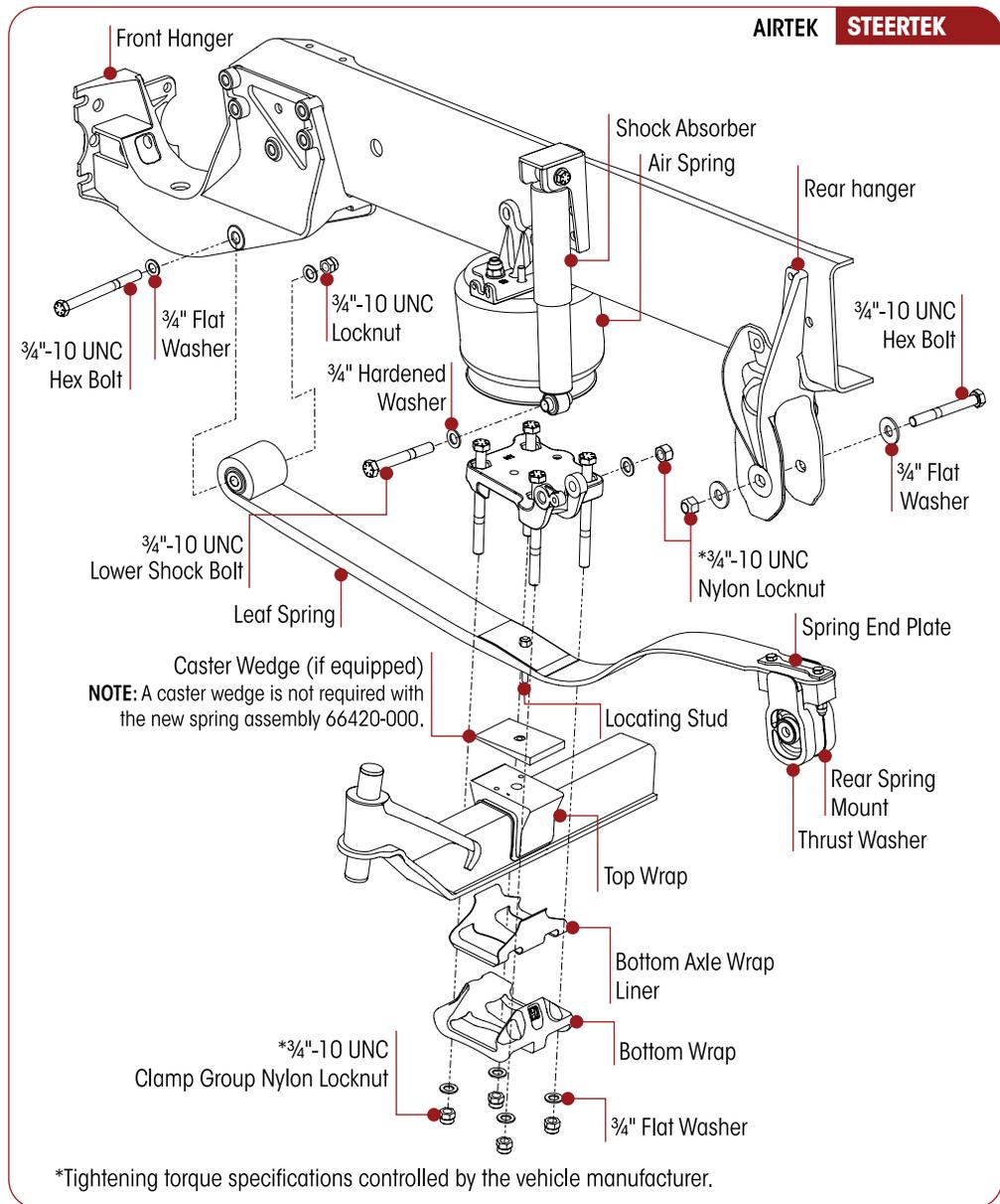
Be aware of the amount and the orientation of caster wedges (if equipped) on the top axle wrap, they may slide during leaf spring removal. Caster wedges are supplied by the vehicle manufacturer. A caster wedge should not be used if the new spring part number is 66420-000. The proper caster is built into this spring part number.

17. Remove and discard the front spring eye bolt from the leaf spring being serviced.
18. Remove the leaf spring assembly. Approximate weight of the leaf spring is 60 pounds.

### ASSEMBLY

1. Install the leaf spring assembly over the axle and into the front spring hanger.
2. Install the 3/4" front spring eye bolt and fastener, but **DO NOT** tighten.

FIGURE 9-10



3. Ensure to replace any caster wedges (if equipped) that may have been displaced during leaf spring disassembly, in the same orientation as removed prior to disassembly. Caster wedges are supplied by the vehicle manufacturer. A caster wedge should not be used if the new spring part number is 66420-000. The proper caster is built into this spring part number.
4. Engage the leaf spring to the axle with the leaf spring locating stud into the aligning hole of the top axle wrap.
5. Install the top pad on top of the leaf spring.



**WARNING**

DO NOT ASSEMBLE CLAMP GROUP WITHOUT AXLE WRAP LINERS. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE OR PERSONAL INJURY.

6. Install a new bottom axle wrap liner in the bottom axle wrap.
7. Install the bottom axle wrap.
8. Install the new clamp group fasteners. The clamp group locknuts must be replaced when the clamp group is removed.

9. Snug the clamp group fasteners to  100 foot pounds pre-torque.
10. Raise the axle and the rear spring assembly into the rear spring hanger.
11. Install the 3/4" rear spring eye bolt in the rear hanger. The bolt must be installed from the inboard side to the outboard side, see Figure 9-10.
12. Install the lower shock mounting bolts from the outboard side to the inboard side.
13. Lower the floor jack

**IMPORTANT NOTE**

Only the weight of the axle should be on the spring at the time of the front and rear spring eye fasteners are tighten to torque.

14. Tighten the lower shock mounting bolts to vehicle manufacturer's torque specifications.
15. Tighten the front and rear spring eye 3/4" locknuts to vehicle manufacturer's torque specifications.
16. Install the air spring into the top pad using new hardware (nut and washer). Make sure the air spring piston seats into the top pad correctly, see Figure 9-11.
17. Install the tires.
18. See Air Spring Warnings and instructions in the Important Safety Notice Section of this publication prior to deflating or inflating the suspension system.
19. Install air lines to the air spring.
20. Install the height control valve linkage and inflate the suspension to normal operating pressure.
21. Raise the vehicle and remove the frame supports.
22. Lower the vehicle.
23. Remove the floor jack.

**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.

**FIGURE 9-11**

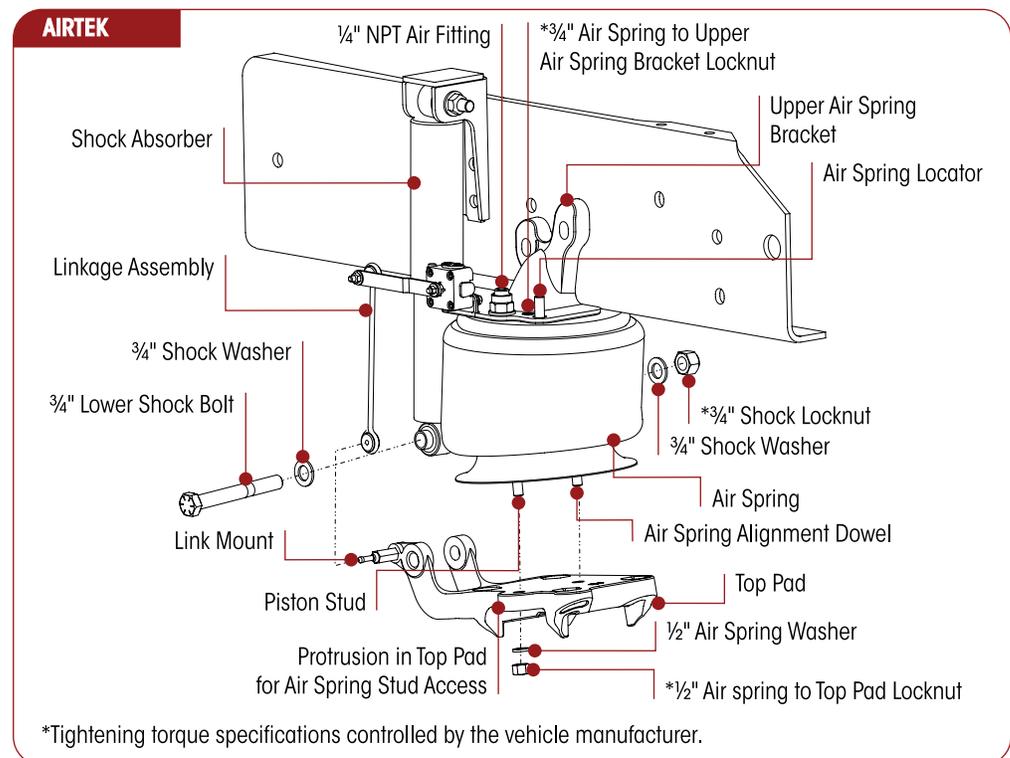


FIGURE 9-12

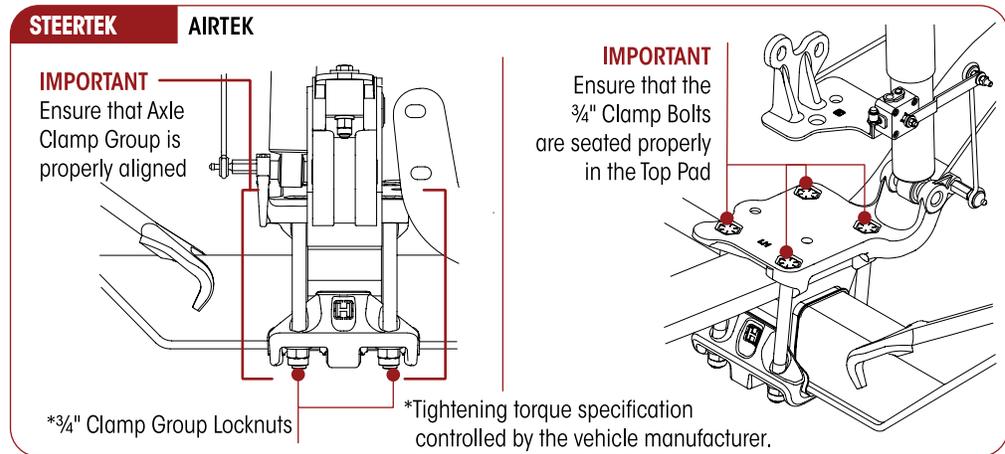
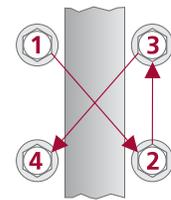


FIGURE 9-13



24. Ensure that the clamp group is properly aligned and the hex bolts are seated in the top pad, and the bottom axle wrap is centered on the top axle wrap, see Figure 9-12.
25. Tighten the clamp group locknuts evenly in 50 foot pounds increments to vehicle manufacturer's torque specifications in the proper pattern to achieve uniform bolt tension, see Figure 9-13.
26. Verify proper ride height. See Alignment & Adjustments Section of this publication.
27. Remove the wheel chocks.

## SOFTEK MONOLEAF SPRING ASSEMBLY

### ■ Vehicles built with STEERTEK axle prior to June 2014

#### DISASSEMBLY

1. Place the vehicle on a level floor.
2. Chock the wheels.
3. Raise the vehicle.
4. Support the vehicle with frame stands.
5. Suspend the front axle to remove the load from leaf spring assembly.
6. Remove the front and rear 3/4" spring eye bolts fasteners. Loosen the 3/4" shackle pivot bolt.

#### SERVICE HINT

To ease in the removal of the spring eye bolts, it may be necessary to raise the axle slightly.

7. Remove the clamp group U-bolts and fasteners. Discard the fasteners.



#### WARNING

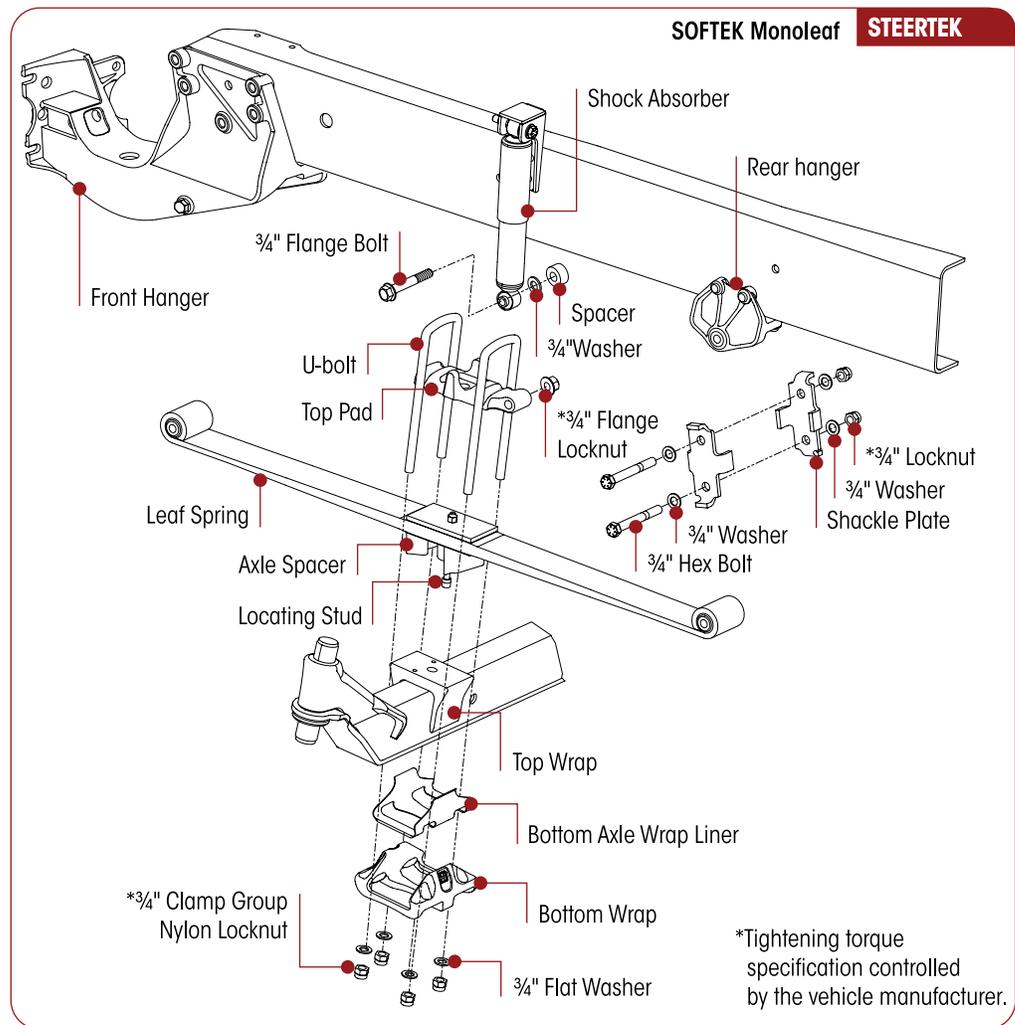
DO NOT USE A CUTTING TORCH TO REMOVE CLAMP GROUP BOLTS OR ATTACHING FASTENERS. THE USE OF SUCH HEAT ON SUSPENSION COMPONENTS CAN ADVERSELY AFFECT THE STRENGTH OF THESE PARTS. A COMPONENT DAMAGED IN THIS MANNER CAN RESULT IN THE LOSS OF VEHICLE CONTROL AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

#### SERVICE HINT

If a clamp group locknut fails to come off the bolt, cut half way through the U-bolt with an abrasive cut off wheel, taking care not to contact the axle beam or other components. Using an impact wrench, spin the locknut to fracture the bolt and remove.

8. Remove the top pad from the leaf spring assembly and the bottom axle wrap, see Figure 9-14.
9. Remove the leaf spring and axle spacer assembly.

**FIGURE 9-14**



**ASSEMBLY**

1. Install the new spring and axle spacer assembly on the axle. Verify that the locating stud is engaged properly in the top axle wrap, see Figure 9-14.
2. Install the top pad with the shock mount (if equipped) facing the rear of the vehicle.



**DO NOT ASSEMBLE CLAMP GROUP WITHOUT AXLE WRAP LINERS. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE OR PERSONAL INJURY.**

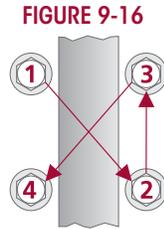
3. Remove and replace the bottom axle wrap liner located in the bottom axle wrap.
4. Install the bottom axle wrap.
5. Install the new 3/4" clamp group U-bolts and fasteners. The U-bolts and fasteners must be replaced when the clamp group is disassembled.
6. Snug the clamp group, **DO NOT** tighten to torque at this time.
7. Raise the axle and the leaf spring assembly into the front hanger and rear shackle assembly.
8. Install the 3/4" spring eye bolts and fasteners. Snug bolts. **DO NOT** tighten at this time. Front spring eye bolts are inserted from the outboard side to the inboard side to avoid component interference.



**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.**

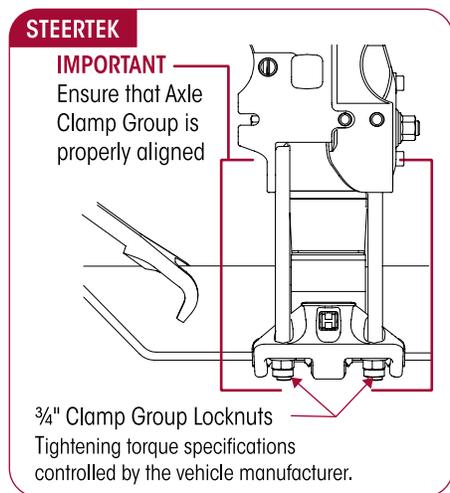
9. Ensure that the clamp group is properly aligned and the U-bolts are seated in the top pad, and the bottom axle wrap is centered with the top axle wrap, see Figure 9-15.

10. Tighten the clamp group locknuts evenly in 50 foot pounds increments to vehicle manufacturer's torque specifications in the proper pattern to achieve uniform bolt tension, see Figure 9-16.



11. Remove the frame supports and load the front axle with the vehicle weight.
12. Tighten the 3/4" spring eye bolt locknuts to the vehicle manufacturer's torque specifications, see Figure 9-14.
13. Remove the wheel chocks.

FIGURE 9-15



## AIRTEK REAR SPRING MOUNT

### DISASSEMBLY

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



PRIOR TO AND DURING DEFLATION AND INFLATION OF THE FRONT AIR SUSPENSION SYSTEM, ENSURE THAT ALL PERSONNEL AND EQUIPMENT ARE CLEAR FROM UNDER THE VEHICLE AND AROUND THE SERVICE AREA, FAILURE TO DO SO CAN CAUSE SERIOUS PERSONAL INJURY, DEATH, OR PROPERTY DAMAGE.

3. See Air Spring Warnings and instructions in the Important Safety Notice Section of this publication prior to deflating or inflating the suspension system.
4. Deflate the air springs by detaching the upper rubber grommet of the height control valve linkage from the upper stud and exhaust the suspension system air by lowering the height control valve arm.
5. Support the vehicle with frame stands.
6. Install a floor jack with a 4" lifting plate below the axle and raise the truck.
7. Remove the tires.
8. Lower the jack allowing the axle to hang, but **DO NOT** remove the jack from the axle.
9. Loosen, **DO NOT REMOVE** both front spring eye bolts.
10. Remove both lower shock absorber mounting bolts.

### SERVICE HINT

To ease in the removal of the spring eye bolts it may be necessary to raise or lower the axle slightly.

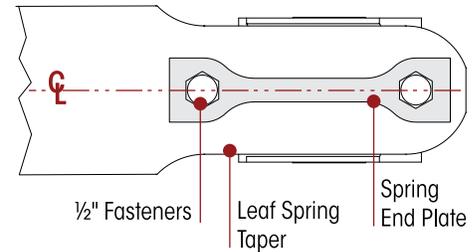
11. Remove both rear spring eye bolts.
12. Disconnect both air springs from the top pads of the clamp groups.
13. Loosen the clamp group locknuts.
14. Lower the jack allowing the suspension to pivot down out of the rear hanger clamps.
15. Remove the 1/2" rear spring mounting fasteners.

16. Remove the rear spring mount.
17. Inspect the leaf spring taper for cracks or damage. Replace leaf spring if damaged.

**ASSEMBLY**

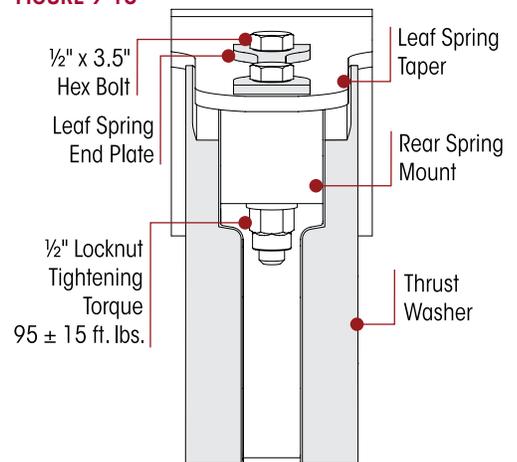
1. Install the spring end plate so that it is centered on the spring taper, see Figure 9-17.
2. Install new ½" bolts through the spring end plate and spring taper.
3. Install the rear spring mount centered on the underside of the leaf spring taper.
4. Install new fasteners to snug. **DO NOT TIGHTEN** at this time.

**FIGURE 9-17**

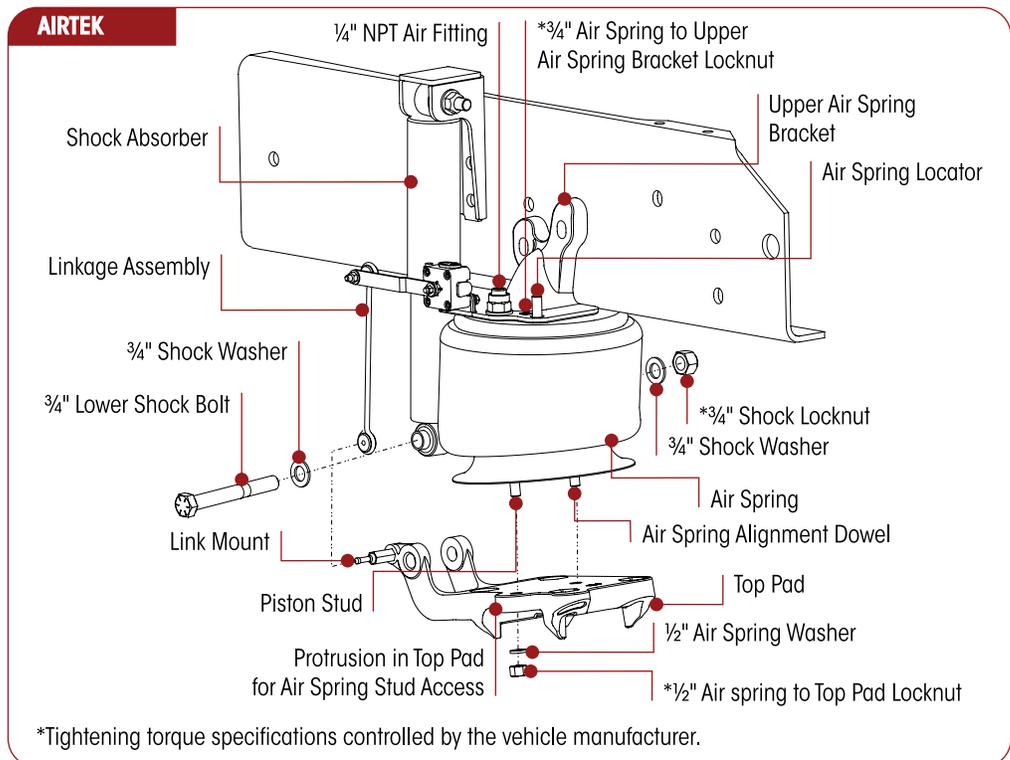


5. Align the rear spring mount and the leaf spring taper so that the mating surfaces are flush with each other, see Figure 9-18.
6. Tighten rear spring mount locknuts to  $95 \pm 15$  foot pounds torque.
7. Raise the leaf springs into the rear hangers.
8. Install the rear spring eye bolts.
9. Install the lower shock absorber mounting bolts.
10. Install the air spring into the top pad. Make sure the air spring piston seats into the top pad correctly, see Figure 9-19.

**FIGURE 9-18**



**FIGURE 9-19**



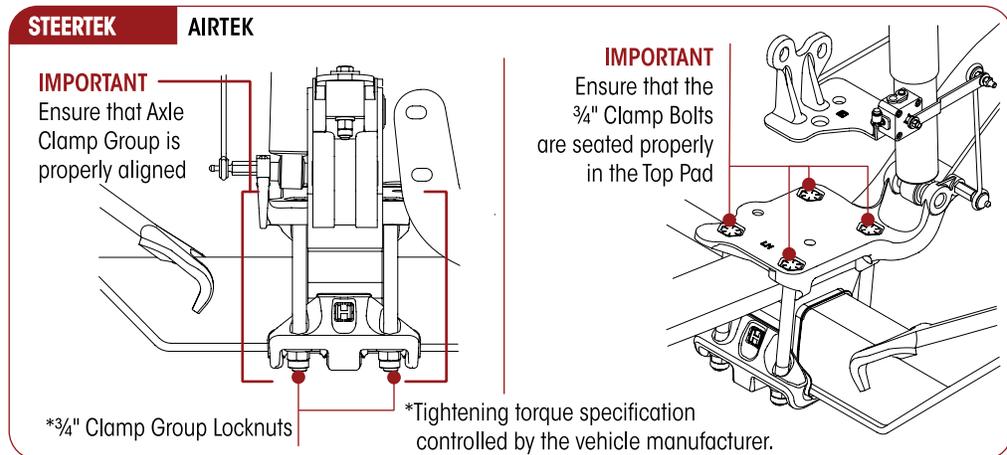
11. Lower the floor jack and allow the suspension to hang.
12. Install the tires.
13. Raise the vehicle and remove the frame supports.
14. See Air Spring Warnings and instructions in the Important Safety Notice Section of this publication prior to deflating or inflating the suspension system.
15. Install air lines to the air spring.
16. Install the height control valve linkage and inflate the suspension to normal operating pressure.
17. Remove the floor jacks.



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.

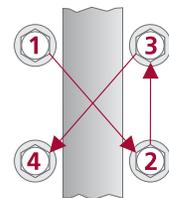
18. Ensure that the clamp group is properly aligned and the hex bolts are seated in the top pad, and the bottom axle wrap is centered on the top axle wrap, see Figures 9-20.

**FIGURE 9-20**



**FIGURE 9-21**

19. Tighten the clamp group locknuts evenly in 50 foot pounds increments to vehicle manufacturer's torque specifications in the proper pattern to achieve uniform bolt tension, see Figure 9-21.
20. Tighten the lower shock mounting bolts to vehicle manufacturer's torque specifications.
21. Tighten the front and rear spring eye  $\frac{3}{4}$ " locknuts to vehicle manufacturer's torque specifications.
22. Verify proper ride height, see Alignment & Adjustments Section of this publication.
23. Remove the wheel chocks.



## FRONT LEAF SPRING EYE BUSHING

The spring eye bushings for the SOFTEK / AIRTEK spring are designed for extended service life. In the event of premature/excessive wear or damage, careful consideration must be given to the contributing factors. This must be corrected in order to help prevent the new bushings from sustaining wear or damage in the same manner. The front bushings are not replaceable components, therefore Hendrickson requires in the event of premature/excessive wear or damage, that the front leaf spring assembly be replaced.

## BOTTOM AXLE WRAP

### ■ Vehicles built with STEERTEK axle

#### DISASSEMBLY

1. Place the vehicle on level floor.
2. Chock the wheels.
3. Support the vehicle with frame stands.
4. **SOFTEK / STEERTEK equipped vehicles** – proceed to Step 8.

#### WARNING

PRIOR TO AND DURING DEFLATION AND INFLATION OF THE FRONT AIR SUSPENSION SYSTEM, ENSURE THAT ALL PERSONNEL AND EQUIPMENT ARE CLEAR FROM UNDER THE VEHICLE AND AROUND THE SERVICE AREA, FAILURE TO DO SO CAN CAUSE SERIOUS PERSONAL INJURY, DEATH, OR PROPERTY DAMAGE.

5. See Air Spring Warnings and instructions in the Important Safety Notice Section of this publication prior to deflating or inflating the suspension system.
6. Deflate the air springs by disconnecting the height control valve linkage and lowering the height control valve arm. This will exhaust the air pressure in the air springs.
7. Remove air spring on side being replaced, see Air Spring Replacement in this section.

#### WARNING

DO NOT USE A CUTTING TORCH TO REMOVE CLAMP GROUP BOLTS OR ATTACHING FASTENERS. THE USE OF SUCH HEAT ON SUSPENSION COMPONENTS CAN 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.

#### SERVICE HINT

If a clamp group nut fails to come off bolt, cut half way through the bolt with an abrasive cut off wheel, taking care not to contact axle beam or other components. Using an impact wrench, spin the locknut to fracture the bolt and remove.

8. Remove and discard the 3/4" clamp group hex bolts / U-bolts and fasteners on the side being replaced, see Figures 9-22 and 9-23.
9. Remove the bottom axle wrap. It may be necessary to use a dead blow mallet to dislodge axle wrap.
10. Once removed, inspect the axle wrap for damage and replace if necessary.
11. Discard the used bottom axle wrap liner.

#### ASSEMBLY

#### WARNING

DO NOT ASSEMBLE CLAMP GROUP WITHOUT AXLE WRAP LINERS. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE OR PERSONAL INJURY.

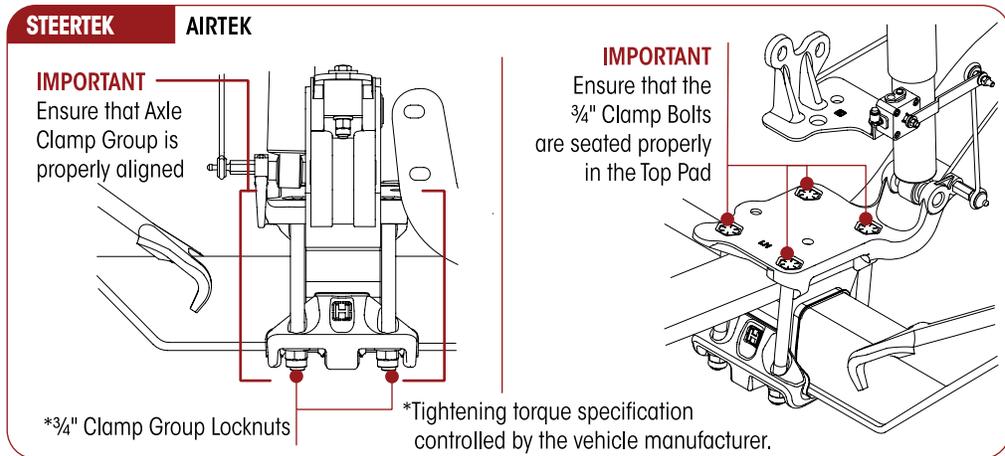
1. Install the new bottom axle wrap liner into bottom axle wrap.
2. Install the bottom axle wrap on axle.
3. Install the new 3/4" hex bolts / U-bolts and fasteners.

#### 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 bolts are seated in the top pad, and the bottom axle wrap is centered on the top axle wrap, see Figures 9-22 and 9-23.

FIGURE 9-22



5. Tighten the clamp group locknuts evenly in 50 foot pounds increments to vehicle manufacturer's torque specifications in the proper pattern to achieve uniform bolt tension, see Figure 9-24.
6. **SOFTEK / STEERTEK equipped vehicles** – proceed to Step 9.
7. Install the air spring, see Air Spring Assembly in this section.
8. Install the height control valve linkage and inflate the suspension to normal operating pressure.
9. Remove the frame stands and wheel chocks.

FIGURE 9-24

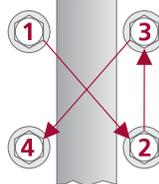
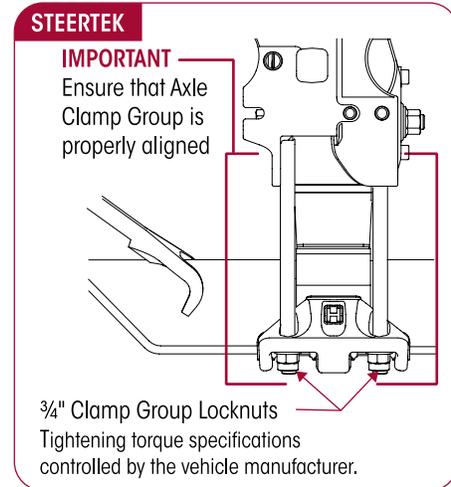


FIGURE 9-23



## TOP AXLE WRAP (In Chassis)

### ■ Vehicles built with STEERTEK axle

#### DISASSEMBLY

1. Place the vehicle on level floor.
2. Chock the wheels.
3. Support the vehicle with frame stands.
4. **SOFTEK / STEERTEK equipped vehicles** – proceed to Step 8.



#### WARNING

PRIOR TO AND DURING DEFLATION AND INFLATION OF THE FRONT AIR SUSPENSION SYSTEM, ENSURE THAT ALL PERSONNEL AND EQUIPMENT ARE CLEAR FROM UNDER THE VEHICLE AND AROUND THE SERVICE AREA, FAILURE TO DO SO CAN CAUSE SERIOUS PERSONAL INJURY, DEATH, OR PROPERTY DAMAGE.

5. See Air Spring Warnings and instructions in the Important Safety Notice Section of this publication prior to deflating or inflating the suspension system.
6. Deflate the air springs by disconnecting the height control valve linkage and lowering the height control valve arm. This will exhaust the air pressure in the air springs.

7. Disconnect the air lines at the air springs.
8. Lower the floor jack and suspend the front axle to remove the load from the leaf springs.
9. Remove the air spring, see Air Spring Disassembly in the Component Replacement Section of this publication.

**WARNING**

DO NOT USE A CUTTING TORCH TO REMOVE CLAMP GROUP BOLTS OR ATTACHING FASTENERS. THE USE OF SUCH HEAT ON SUSPENSION COMPONENTS CAN 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.

**SERVICE HINT**

If a clamp group nut fails to come off bolt, cut half way through the bolt with an abrasive cut off wheel, taking care not to contact axle beam or other components. Using an impact wrench, spin the locknut to fracture the bolt and remove.

10. Remove the 3/4" clamp group hex bolts / U-bolts and fasteners from the side being serviced.

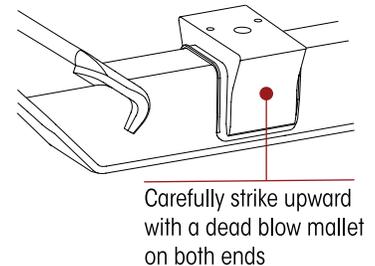
**NOTE**

There are different lower shock mount configuration for SOFTEK Monoleaf, see Parts Lists Section of this publication.

11. Remove the lower shock mounting bolt from the side being serviced.
12. Remove the top pad, bottom axle wrap and liner (discard liner).

13. Remove the leaf spring assembly and caster wedge (if equipped).
14. Strike the axle wrap with a dead blow mallet at the front and rear on the underside of the axle wrap to dislodge it from the axle, see Figure 9-25.
15. Clean and inspect the axle wrap and axle for cracks or damage, replace if cracks or damage are present.

**FIGURE 9-25**



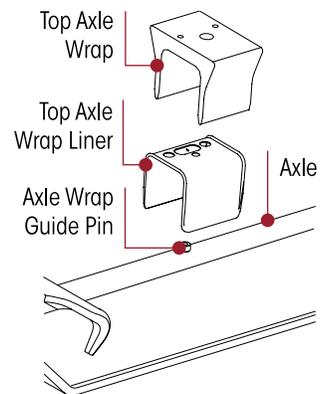
**ASSEMBLY**

**WARNING**

DO NOT ASSEMBLE CLAMP GROUP WITHOUT AXLE WRAP LINERS. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE OR PERSONAL INJURY.

1. Install the new axle wrap liner on the axle.
2. Spray the top of the axle wrap liner and the inside of the axle wrap with a silicon lubricant.
3. Position the axle wrap on the axle over the axle wrap liner, see Figure 9-26.
4. Protect the top surface of the axle wrap with a block of wood, cardboard, or shop towels.

**FIGURE 9-26**



**CAUTION**

DO NOT STRIKE THE TOP AXLE WRAP WITH A HAMMER. HENDRICKSON RECOMMENDS USING A PLASTIC DEAD BLOW Mallet WITH CARE WHEN INSTALLING THE AXLE WRAP.

5. Using a dead blow mallet drive the axle wrap onto the axle indexing the axle guide pin until the axle wrap is firmly seated on the axle.
6. Install the caster wedge (if equipped).
7. Install a bottle jack between the axle wrap and frame rail flange.
8. Jack the axle wrap down into position on the axle, using care to make sure the axle wrap bore indexes the locating bushing on the axle.
9. Install the leaf spring assembly on the axle wrap indexing the center bolt in the locating hole.

10. SOFTEK / STEERTEK equipped vehicles – proceed to Step 13.
11. Install the 3/4" spring eye bolts in the rear hangers. The rear spring eye bolt must be installed from the inboard side to the outboard side, see Figure 9-27.
12. Install the top pad on the leaf spring with the directional identification facing the front of the vehicle, see Figure 9-28.

**WARNING**

DO NOT ASSEMBLE CLAMP GROUP WITHOUT AXLE WRAP LINERS. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE OR PERSONAL INJURY.

FIGURE 9-27

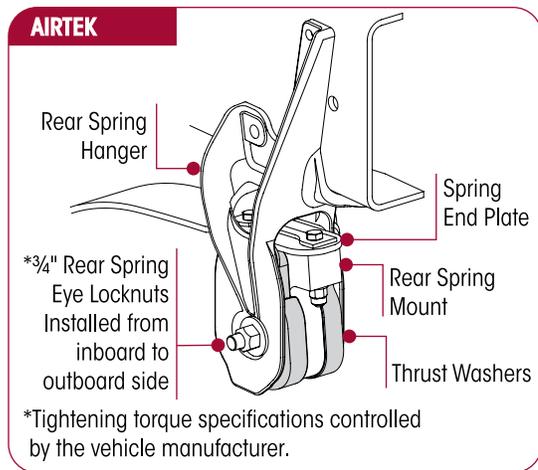
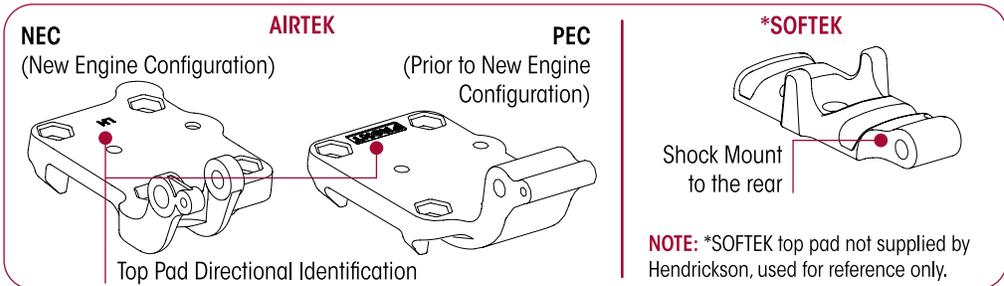


FIGURE 9-28



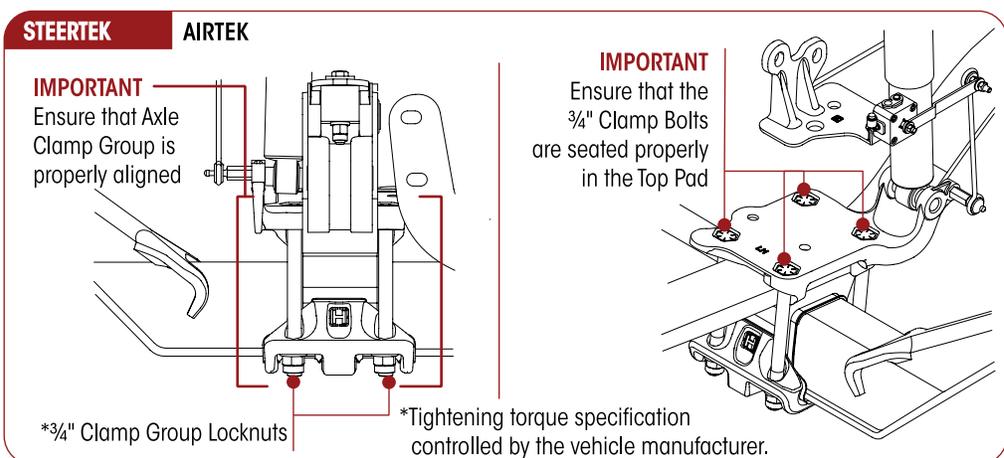
13. Remove and replace the bottom axle wrap liner.
14. Install the bottom axle wrap.
15. Install new clamp group hex bolts / U-bolts into the top pad.
16. Install the new 3/4" clamp group hex bolt / U-bolt fasteners.

**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.

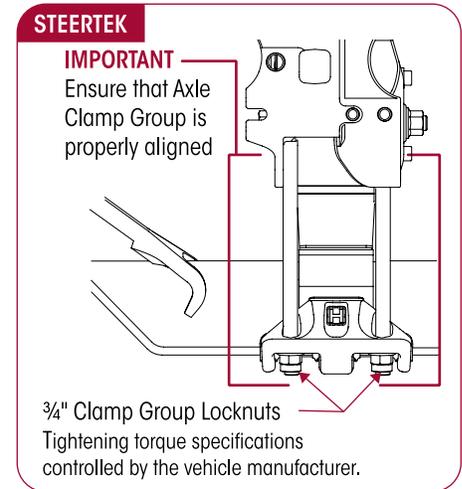
17. Ensure that the clamp group is properly aligned and the hex bolts are seated in the top pad, and the bottom axle wrap is centered on the top axle wrap, see Figures 9-29 and 9-30.

FIGURE 9-29

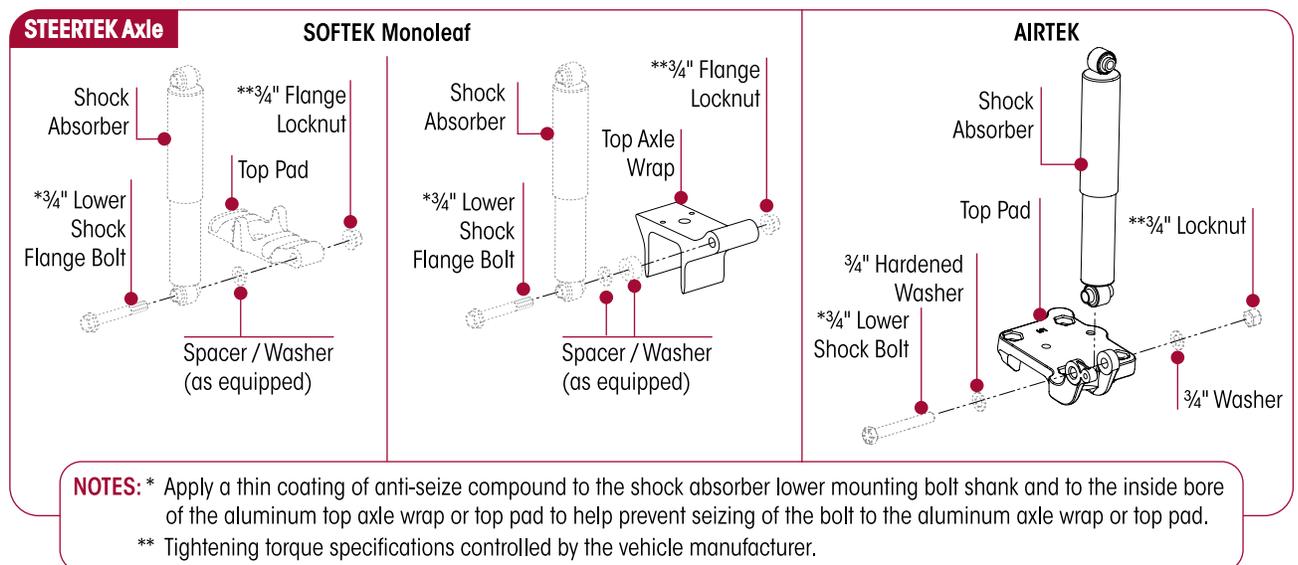


18. Snug the clamp group fasteners to  $\approx$  100 foot pounds pre-torque.
19. Apply a thin coating of anti-seize to the lower shock mounting bolt, see Figure 9-31.
20. Install the lower shock mounting bolts from the outboard side to the inboard side.
21. **SOFTEK / STEERTEK equipped vehicles** – proceed to Step 30.
22. Install the air spring into upper air spring mounting bracket and the top pad. Make sure the air spring piston seats into the top pad correctly, see Figure 9-32.
23. Attach new air spring mounting fasteners. Tighten upper air spring mounting fastener and the lower air spring mounting fastener to vehicle manufacturer's torque specifications. Raise the vehicle and remove the frame supports.

**FIGURE 9-30**



**FIGURE 9-31**



24. Lower the floor jack and load the front axle with the truck's weight. Remove the floor jack.
25. See Air Spring Warnings and instructions in the Important Safety Notice Section of this publication prior to deflating or inflating the suspension system.
26. Install air lines to the air spring.
27. Install the height control valve linkage and inflate the suspension to normal operating pressure.

FIGURE 9-32

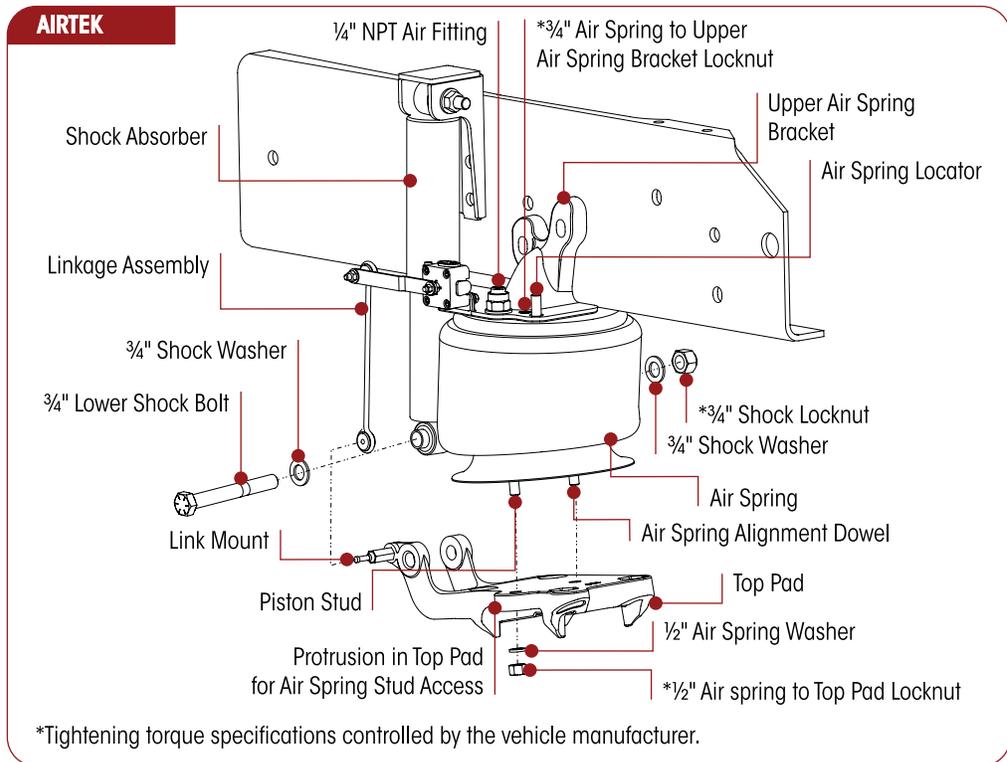
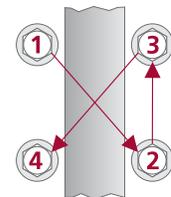


FIGURE 9-33



28. Tighten the clamp group locknuts evenly in 50 foot pounds increments to vehicle manufacturer's torque specifications in the proper pattern to achieve uniform bolt tension, see Figure 9-33.
29. Tighten the lower shock mounting bolts to vehicle manufacturer's torque specifications, see Figure 9-31.
30. Verify proper ride height. See Alignment & Adjustments Section of this publication.
31. Remove the frame stands.
32. Tighten the 3/4" spring eye locknuts to vehicle manufacturer's torque specifications.
33. Remove the wheel chocks.

## STEERTEK NXT AXLE ASSEMBLY

### ■ Vehicles built with STEERTEK NXT axle after August 2011

**CLAMP GROUP** consist of top pad, U-bolts, washers and locknuts.

**AXLE REMOVAL** refer to Figure 9-34 when replacing the components of the STEERTEK NXT axle.



**WARNING**

DO NOT USE A TORCH ON CLAMP GROUP BOLTS OR ANY OTHER PART OF THE SOFTEK SUSPENSION. IF THE CLAMP GROUP BOLTS WILL NOT COME LOOSE WITH AN IMPACT WRENCH, USE A CUT OFF WHEEL AND CUT THE SHANK OF THE BOLT. THE USE OF A TORCH CAN CAUSE DAMAGE TO CERTAIN SOFTEK COMPONENTS THAT CAN RESULT IN THE LOSS OF VEHICLE CONTROL AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

1. Place the vehicle on level floor.
2. Chock the wheels.
3. Raise the frame.

4. Support the vehicle with frame stands and suspend the front axle with the shocks attached.



**WARNING**

THE INTEGRATED AXLE SPRING SEATS ON THE STEERTEK NXT AXLE ARE NON-SERVICEABLE. DO NOT REMOVE, MODIFY OR REPLACE INTEGRATED FASTENERS, DOING SO CAN CAUSE STRUCTURAL DAMAGE AND RESULT IN LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE, SEVERE PERSONAL INJURY, OR DEATH AND VOID ANY APPLICABLE WARRANTY.

5. Remove the front wheels, hubs, brake shoes, ABS sensors, and backing plate assembly.

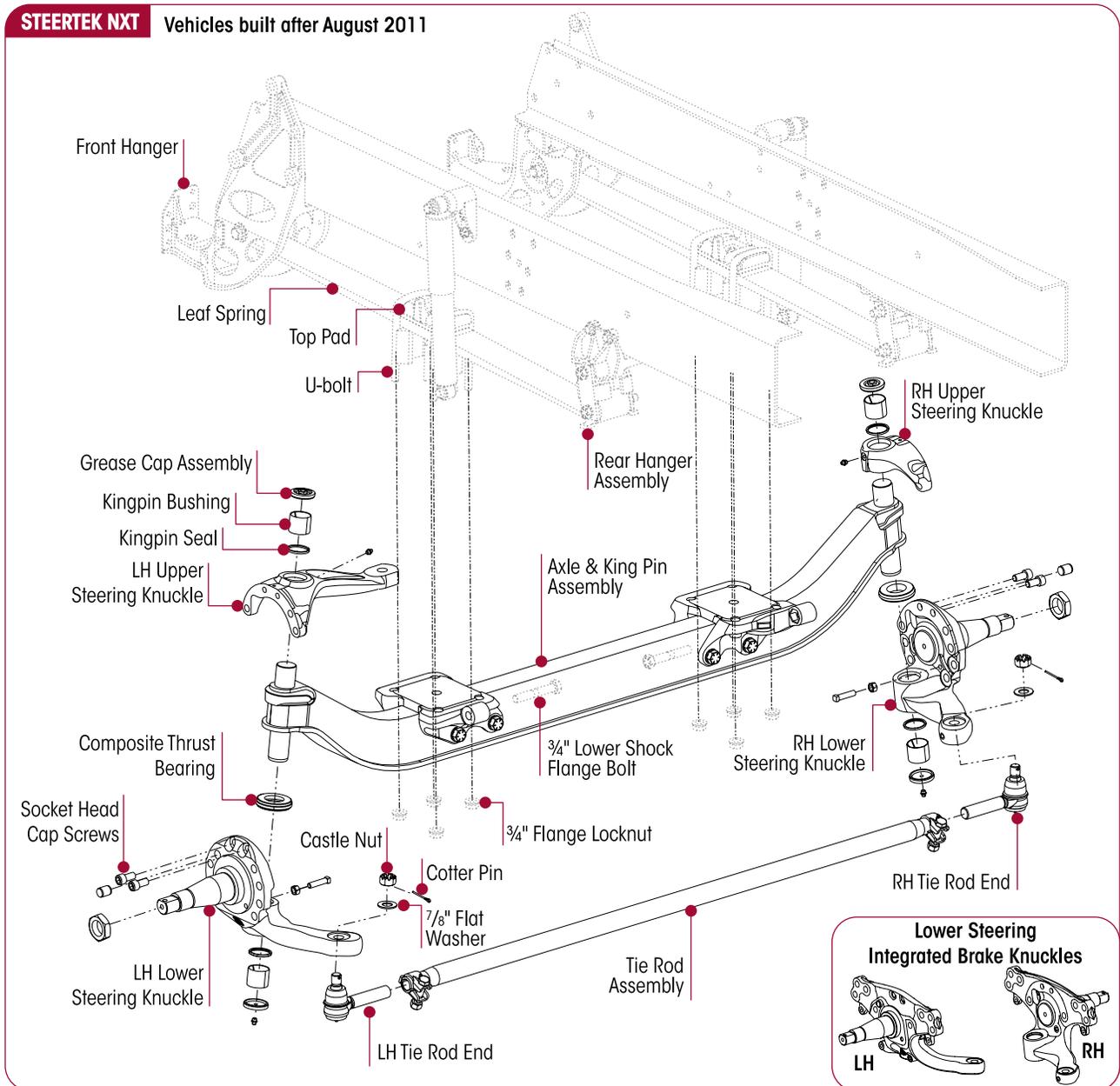
6. Disconnect the drag link from the steering arm.

7. Support the axle with a floor jack.

**FIGURE 9-34**

**STEERTEK NXT**

Vehicles built after August 2011



**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. SOFTEK 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.

**SERVICE HINT**

If a clamp group nut fails to come off bolt, cut half way through the bolt with an abrasive cut off wheel, taking care not to contact axle beam or other components. Using an impact wrench, spin the locknut to fracture the bolt and remove.

8. Disconnect and remove the lower shock mounting bolts and shock spacer (if equipped).
9. Remove the 3/4" clamp group bolts and fasteners.
10. Lower the axle and remove from the vehicle.

**■ STEERTEK NXT Axle (Removed From Chassis)**

**AXLE DISASSEMBLY**

1. Remove the tie rod assembly, see Tie Rod disassembly in this section.

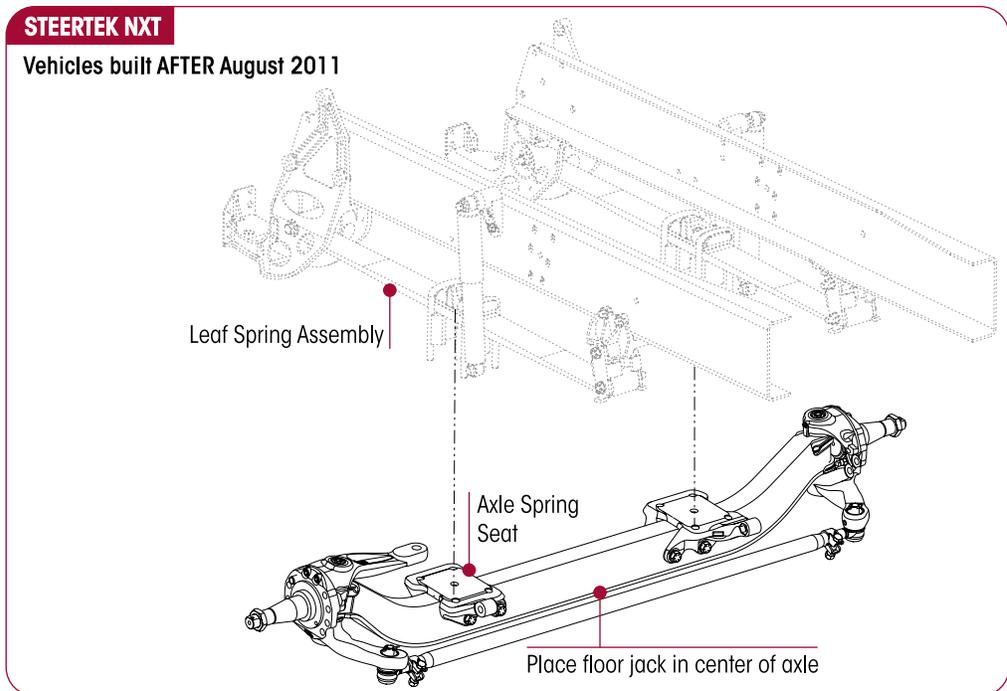
**WARNING**

REMOVAL OF THE CAP SCREWS WILL ALLOW THE STEERING KNUCKLE TO SEPARATE FROM THE AXLE. THE STEERING KNUCKLE MUST BE SUPPORTED BEFORE REMOVAL OF THESE TWO (2) CAP SCREWS. FAILURE TO DO SO CAN CAUSE COMPONENT DAMAGE OR PERSONAL INJURY.

2. Remove the two (2) 5/8" socket head cap screws from the steering knuckle assembly.
3. Remove the steering knuckle and thrust bearing.
4. After complete removal of the one side, repeat steps 1-3 for the opposite side of the axle.
5. Inspect the steering kingpin bushings for excessive wear. If worn, replace the kingpin bushings and seals. See the Kingpin Bushing replacement instructions in this section.

**STEERTEK NXT AXLE INSTALLATION**

**FIGURE 9-35**



1. Place the new axle on the floor jack and position the axle under the vehicle.
2. Raise the axle into position. Care must be taken at this point to ensure that the front leaf spring assembly's center bolt is aligned correctly in the axle spring seat, see Figures 9-35.
3. Install the top pad.
4. Install the new clamp group fasteners. **DO NOT** tighten to torque at this time.



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.

5. Ensure the clamp group is properly aligned and the U-bolts are seated in the top pad, and the top pad is centered on the axle spring seat, see Figure 9-36.
6. Snug the clamp group fasteners to  $\approx$  100 foot pounds pre-torque.
7. Install the steering knuckles as per the Steering Knuckle Assembly instructions in this section.
8. Install the tie rod assembly in the Ackermann arms.

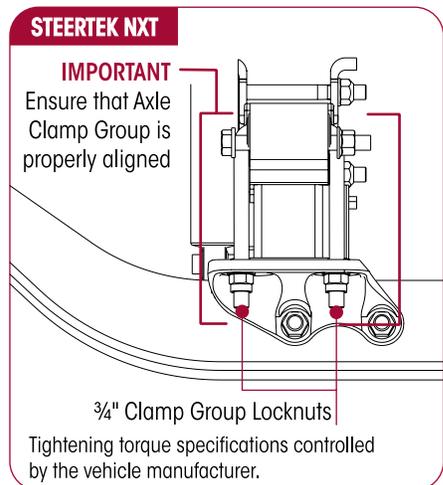
9. Install the  $\frac{7}{8}$ " hardened washers on the Ackermann arm and the castle nuts. Tighten the castle nuts to  $\approx$  185 foot pounds, then rotate until the first castle slot lines up with the cotter pin bore in the tie rod end. **DO NOT** back off nut for cotter pin installation.

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  $\approx$  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.

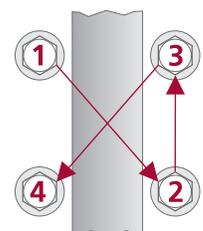
13. Install the drag link cotter pin.
14. Install and tighten the lower shock mounting bolts and spacer (if equipped) to vehicle manufacturer's torque specifications.
15. Install the brake backing plate assemblies and ABS sensor and torque all fasteners per manufacturer's specifications.
16. Install the brakes, hubs, and wheels per the manufacturer's guidelines.
17. Raise the vehicle and remove the frame supports.
18. Lower the floor jack and load the front axle with the truck's weight. Remove the floor jack.

19. Tighten the clamp group locknuts evenly in 50 foot pounds increments to vehicle manufacturer's torque specifications in the proper pattern to achieve uniform bolt tension, see Figure 9-37.
20. Remove the wheel chocks.
21. Fill the hubs with the proper lubricant, (see manufacturer's guidelines for recommended lubrication), if required.
22. Grease the front steering components as per lubrication guidelines in the Preventive Maintenance Section of this publication.

**FIGURE 9-36**



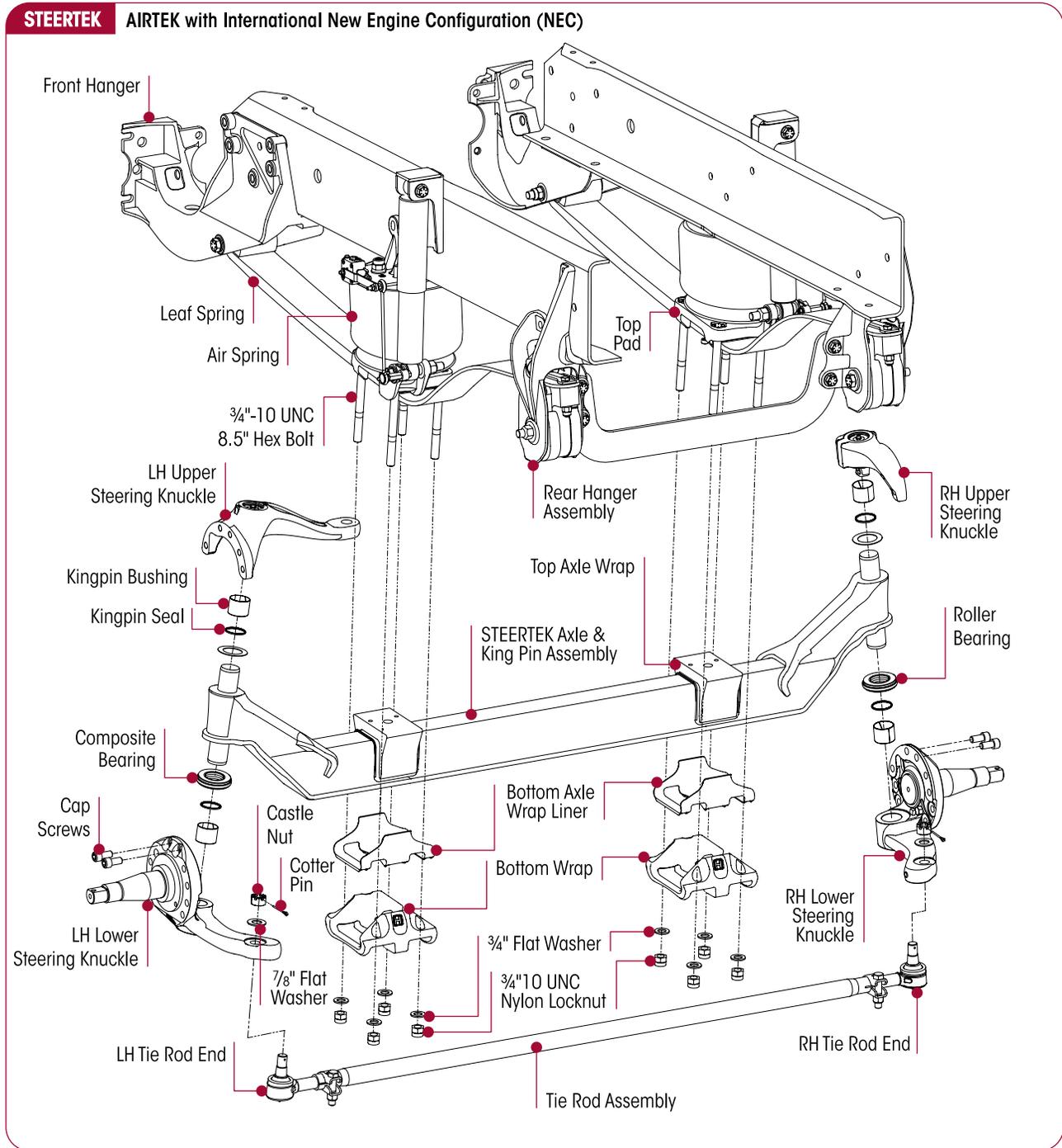
**FIGURE 9-37**



**AIRTEK FRONT AXLE ASSEMBLY**

■ Vehicles built with STEERTEK axle after September 2006

FIGURE 9-38





## STEERTEK AXLE

### ■ Vehicles built prior to August 2011

#### REMOVAL

Refer to Figures 9-38 and 9-39 when replacing the components of the STEERTEK axle. **STEERTEK AXLE CLAMP GROUP** consist of the following components:

- Top axle wrap
- Top axle wrap liner
- Top pad
- Bottom axle wrap
- Bottom axle wrap liner
- ¾" Bolts, washers and nylon locknuts

#### WARNING

DO NOT USE A TORCH ON CLAMP GROUP BOLTS OR ANY OTHER PART OF THE AIRTEK SUSPENSION. IF THE CLAMP GROUP BOLTS WILL NOT COME LOOSE WITH AN IMPACT WRENCH, USE A CUT OFF WHEEL AND CUT THE SHANK OF THE BOLT. THE USE OF A TORCH CAN CAUSE DAMAGE TO CERTAIN SOFTEK / AIRTEK COMPONENTS THAT CAN RESULT IN THE LOSS OF VEHICLE CONTROL AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

1. Place the vehicle on level floor.
2. Chock the wheels.
3. **SOFTEK equipped vehicles** — proceed to Step 6.

#### WARNING

PRIOR TO AND DURING DEFLATION AND INFLATION OF THE FRONT AIR SUSPENSION SYSTEM, ENSURE THAT ALL PERSONNEL AND EQUIPMENT ARE CLEAR FROM UNDER THE VEHICLE AND AROUND THE SERVICE AREA, FAILURE TO DO SO CAN CAUSE SERIOUS PERSONAL INJURY, DEATH, OR PROPERTY DAMAGE.

4. See Air Spring Warnings and instructions in the Important Safety Notice Section of this publication prior to deflating or inflating the suspension system.
5. **AIRTEK equipped vehicles** — Deflate the air springs by disconnecting the height control valve linkage and lowering the height control valve arm. This will exhaust the air pressure in the air springs.
6. Raise the frame.
7. Support the vehicle with frame stands.
8. Suspend the front axle with the shock absorbers attached.
9. Remove the front wheels, hubs, brake shoes, ABS sensors, and backing plate assembly.
10. Disconnect the drag link from the steering arm.
11. **SOFTEK equipped vehicles** — proceed to Step 13.
12. **AIRTEK equipped vehicles** — Remove lower air spring mounting fasteners for both air springs at the axle top pad and unseat from the top pad.
13. Support the axle with a floor 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. AIRTEK 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.

#### SERVICE HINT

If a clamp group nut fails to come off bolt, cut half way through the bolt with an abrasive cut off wheel, taking care not to contact axle beam or other components. Using an impact wrench, spin the locknut to fracture the bolt and remove.

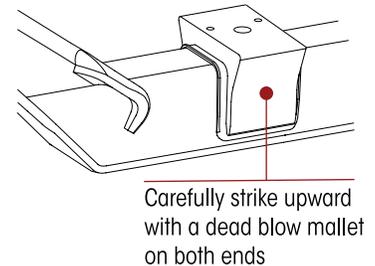
14. Remove the ¾" clamp group bolts and fasteners.
15. Lower the axle and remove from the vehicle.

■ **STEERTEK Axle (Removed from Chassis)**

**CLAMP GROUP DISASSEMBLY**

1. Remove the bottom axle wrap and liner from the axle.
2. Strike the top axle wrap with a dead blow mallet at the front and rear on the underside of the axle wrap to dislodge it from the axle, see Figure 9-40.
3. After removal of the top axle wrap from the axle, inspect for cracks or fretting.
4. Remove the tie rod assembly, see Tie Rod disassembly in this section.

**FIGURE 9-40**



**WARNING**

REMOVAL OF THE CAP SCREWS WILL ALLOW THE STEERING KNUCKLE TO SEPARATE FROM THE AXLE. THE STEERING KNUCKLE MUST BE SUPPORTED BEFORE REMOVAL OF THESE TWO (2) CAP SCREWS. FAILURE TO DO SO CAN CAUSE COMPONENT DAMAGE OR PERSONAL INJURY.

5. Remove the two (2) 5/8" socket head cap screws from the steering knuckle assembly.
6. Remove the steering knuckle, thrust bearing, and shims (if equipped).
7. After complete removal of the one side, repeat steps 1-6 for the opposite side of the axle.
8. Inspect the steering kingpin bushings for excessive wear. If worn, replace the kingpin bushings and seals. See Kingpin Bushing component replacement instructions in this section.

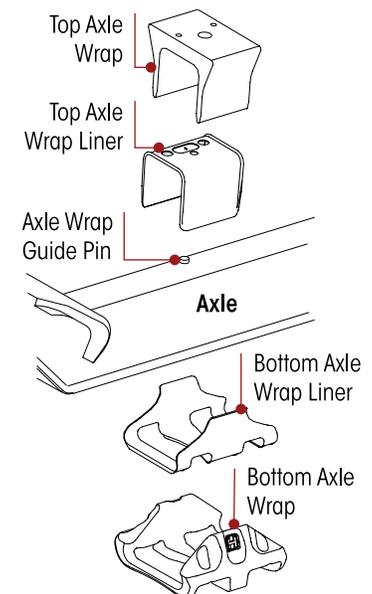
**CLAMP GROUP ASSEMBLY**

**WARNING**

DO NOT ASSEMBLE CLAMP GROUP WITHOUT AXLE WRAP LINERS. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE OR PERSONAL INJURY.

1. Install the new upper axle wrap liner on the axle. Index the liner with the axle's guide pin, see Figure 9-41.

**FIGURE 9-41**



**CAUTION**

DO NOT STRIKE THE TOP AXLE WRAP WITH A HAMMER. DAMAGE TO THE ALUMINUM AXLE WRAP WILL OCCUR. USE A PLASTIC DEAD BLOW MALLET WITH CARE WHEN INSTALLING THE AXLE WRAP.

**WARNING**

SECURELY INSTALL THE TOP WRAP TO THE AXLE. FAILURE TO DO SO CAN CAUSE LOSS OF CONTROL OF THE VEHICLE, PERSONAL INJURY OR PROPERTY DAMAGE.

**SERVICE HINT**

Apply a lubricant (such as an aerosol silicone) to the outer surface of the plastic liner to aid in assembly of the top axle wrap.

2. Install the top axle wrap, see Axle Wrap Assembly instructions located in this section. The axle wrap must be aligned with the guide pin on the axle.
3. At this point in the assembly **DO NOT** install anything further on the axle.

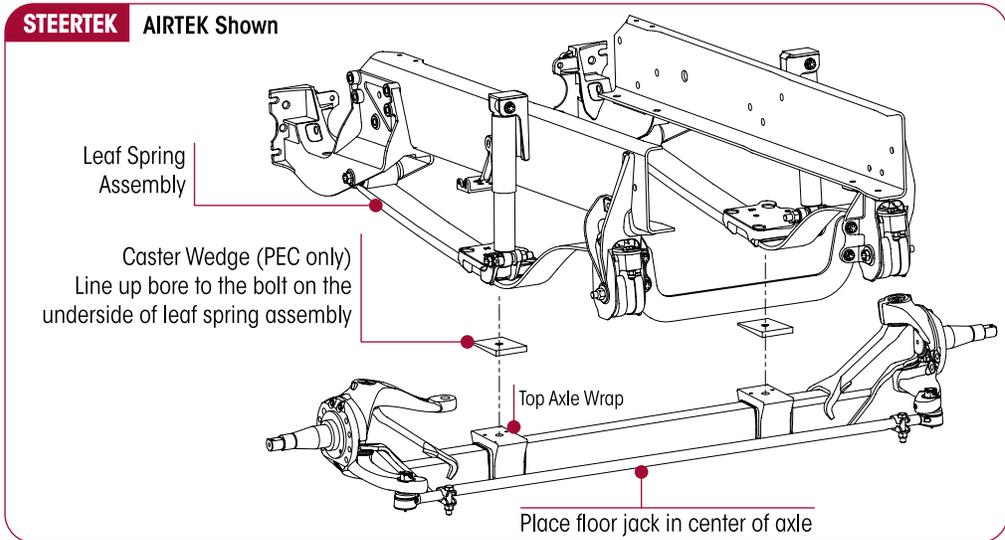
**STEERTEK AXLE INSTALLATION**

1. Place the new axle on the floor jack and position the axle under the vehicle.
2. Install PEC caster wedges (if equipped).
3. Raise the axle into position. Care must be taken at this point to ensure that the front leaf spring assembly's center bolt is aligned correctly in the top axle wrap, see Figure 9-42.

**WARNING**

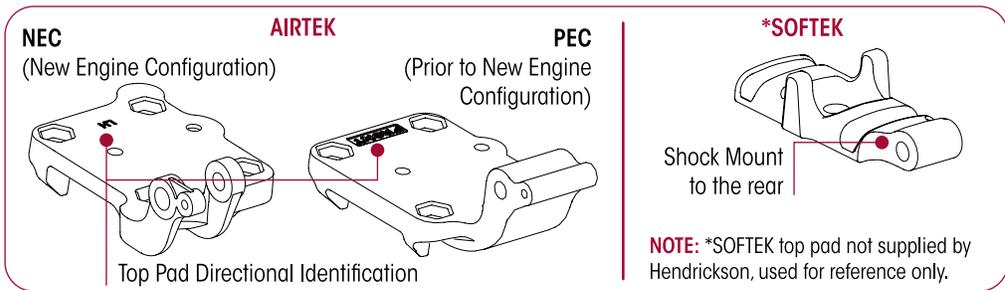
DO NOT ASSEMBLE CLAMP GROUP WITHOUT AXLE WRAP LINERS. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE OR PERSONAL INJURY.

FIGURE 9-42



4. Install the new bottom axle wrap liners and front axle spacers on the bottom axle wraps.
5. Install the bottom axle wrap on the axle.
6. Install the top pad with the directional identification facing the front of the vehicle, see Figure 9-43.

FIGURE 9-43



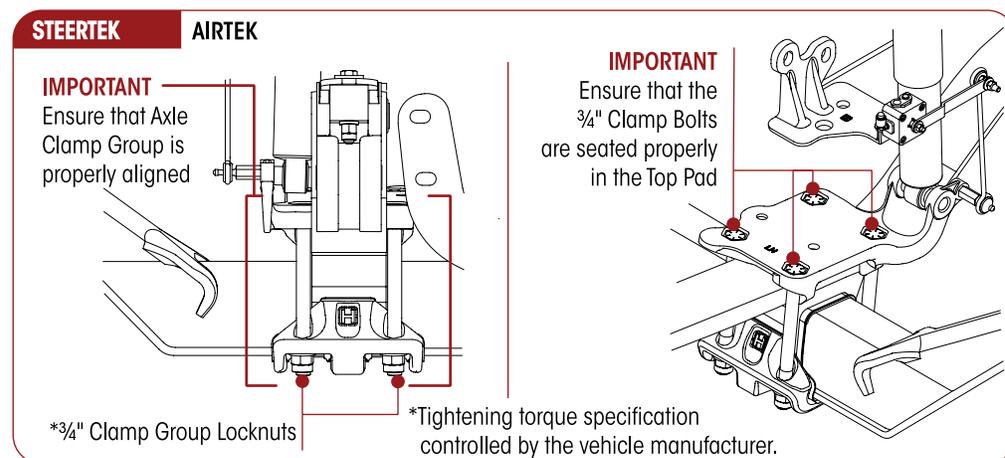
7. Install the new clamp group fasteners.



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.

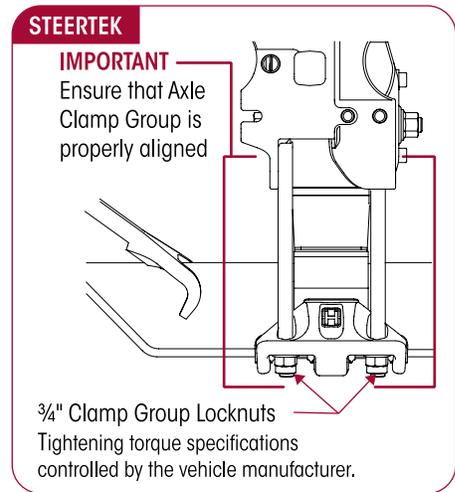
8. Ensure the clamp group is properly aligned and the hex bolts are seated in the top pad, and the bottom axle wrap is centered on the top axle wrap, see Figures 9-44 and 9-45.

FIGURE 9-44

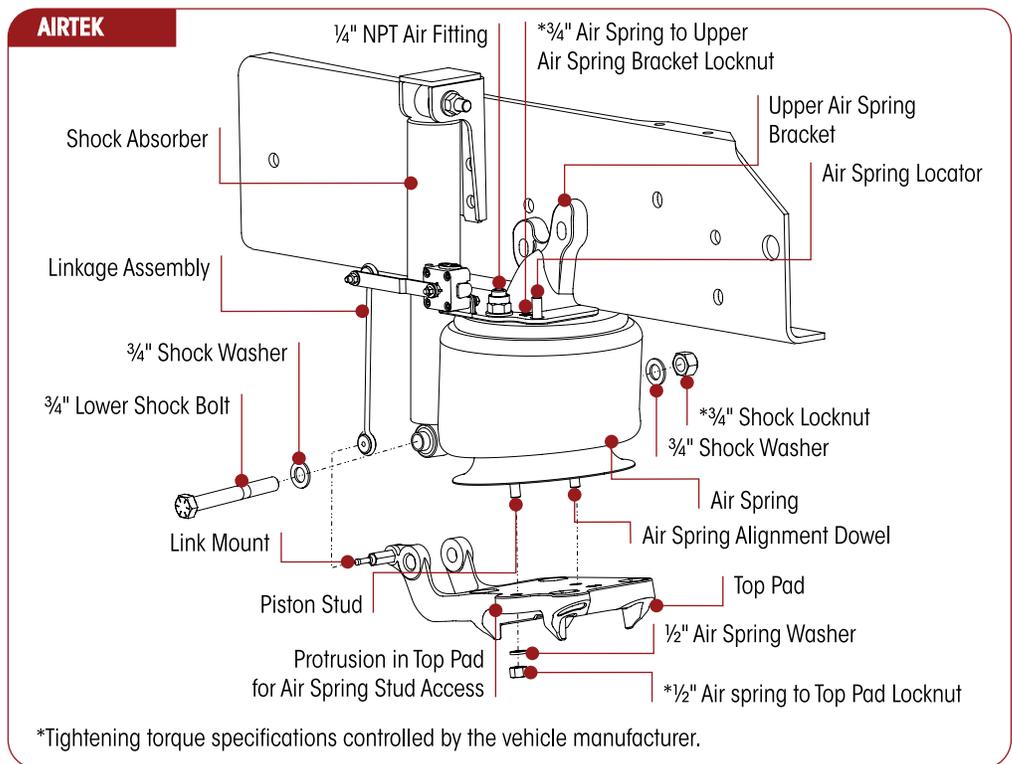


9. Snug the clamp group fasteners to  $\boxed{3}$  100 foot pounds pre-torque.
10. **SOFTEK equipped vehicles** — proceed to Step 13.
11. See Air Spring Warnings and instructions in the Important Safety Notice Section of this publication prior to deflating or inflating the suspension system.
12. **AIRTEK equipped vehicles** — Engage the air springs into the top pad and install new lower air spring mounting fasteners. Tighten the lower air spring mounting fastener to vehicle manufacturer's torque specifications, see Figure 9-46.

**FIGURE 9-45**



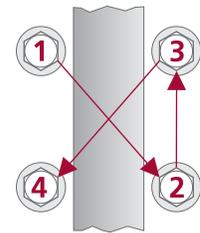
**FIGURE 9-46**



13. Install the lower shock mounting bolts.
14. Install the steering knuckles as per the Steering Knuckle replacement instructions in this section.
15. Install the tie rod assembly.
16. Install the  $\frac{7}{8}$ " hardened washers on the Ackermann arm and the castle nuts. Tighten the castle nuts to  $\boxed{3}$  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.
17. Install the tie rod end cotter pin.
18. Connect the drag link. Install the castle nut to install the steering arm. Tighten the castle nut to  $\boxed{3}$  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.

19. Install the drag link cotter pin.
20. Install the brake backing plate assemblies and ABS sensor and torque all fasteners per manufacturer's specifications.
21. Install the brakes, hubs, and wheels per the manufacturer's guidelines.
22. Raise the vehicle and remove the frame supports.
23. Lower the floor jack and load the front axle with the truck's weight. Remove the floor jack.
24. **SOFTEK equipped vehicles** — proceed to Step 26.
25. **AIRTEK equipped vehicles** — Install the height control valve linkage and inflate the suspension to normal operating pressure.

FIGURE 9-47



26. Tighten the clamp group locknuts evenly in 50 foot pounds increments to vehicle manufacturer's torque specifications in the proper pattern to achieve uniform bolt tension, see Figure 9-47.
27. Tighten the lower shock mounting bolts to vehicle manufacturer's torque specifications.
28. **SOFTEK equipped vehicles** — proceed to Step 31.
29. **AIRTEK equipped vehicles** — Reconnect the height control valve and air up the suspension.
30. Verify proper ride height. See Alignment & Adjustments Section of this publication.
31. Remove the wheel chocks.
32. Fill the hubs with the proper lubricant, (see manufacturer's guidelines for recommended lubrication), if required.
33. Grease the front steering components as per lubrication guidelines in the Preventive Maintenance Section of this publication.

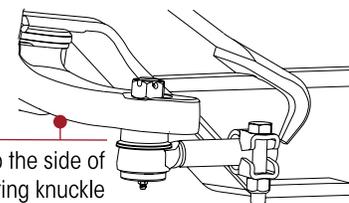
### STEERING KNUCKLE DISASSEMBLY

See tools needed to remove and install kingpin bushing under the Special Tools Section of this publication.

The steering knuckle disassembly and assembly includes the Kingpin Preparation and Measurement and Kingpin Bushing Removal process.

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.
6. Remove the tie rod assembly.

FIGURE 9-48



Lightly tap the side of lower steering knuckle (Ackermann arm) to loosen the tie rod end

#### SERVICE HINT

Lightly tap the side of the Ackermann arm with a mallet to separate the tie rod end from the Ackermann arm, see Figure 9-48.

7. Remove the drag link from the knuckle if necessary.



REMOVAL OF THE CAP SCREWS WILL ALLOW THE STEERING KNUCKLE TO SEPARATE FROM THE AXLE. THE STEERING KNUCKLE MUST BE SUPPORTED BEFORE REMOVAL OF THESE TWO (2) CAP SCREWS. FAILURE TO DO SO CAN CAUSE COMPONENT DAMAGE OR PERSONAL INJURY.

8. Remove the 2 socket head cap screws that connect upper kingpin connection to the steering knuckle, see Figure 9-49.
9. Remove the lower steering knuckle from the kingpin by sliding it down the kingpin.
10. Remove the upper steering knuckle by sliding it up off the kingpin.

FIGURE 9-49



### 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.



**CAUTION**

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

**WARNING**

THE STEERTEK HAS A UNIQUE AXLE. THE KINGPIN IS CRYOGENICALLY INSTALLED IN THE AXLE. THE KINGPIN IS A NON-REPLACEABLE COMPONENT OF THE AXLE ASSEMBLY. DO NOT TRY TO REMOVE THE KINGPIN. DOING SO WILL DAMAGE THE AXLE AND MAY CAUSE LOSS OF VEHICLE CONTROL, PERSONAL INJURY OR PROPERTY DAMAGE. IF THE KINGPIN SHOWS SIGNS OF MOVEMENT, CONTACT HENDRICKSON PRODUCT ENGINEERING - TECH SERVICES.

1. Prepare and polish the kingpin by removing all grease and excess debris using a fine grit (220 grit or higher) emery cloth and parts solvent, see Figures 9-50 through 9-53.

FIGURE 9-50



FIGURE 9-51



FIGURE 9-52



FIGURE 9-53



2. Inspect the kingpin for wear or damage. Use a micrometer and measure the upper and lower kingpin in two locations. Positions must be 90° opposed from each other. If the kingpin has less than 1.802" diameter, replacement of the axle is necessary, see Figures 9-54 through 9-57. **Kingpin minimum dimension is 1.802".**

FIGURE 9-54



FIGURE 9-55



FIGURE 9-56



FIGURE 9-57



### KINGPIN BUSHING REMOVAL

**You will need:**

- A hydraulic shop press with a minimum forcing capacity of 2.5 tons (or use an arbor press)
- Kingpin Bushing Tools, see Special Tool Section in this publication
  - Push-out Tool
  - Driver Tool
  - Receiving Tool
  - STEERTEK NXT (Vehicles built after August 2011) Remover / Installer Tool



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



PRIOR TO APPLYING HYDRAULIC PRESSURE TO REMOVE OR INSTALL THE KINGPIN BUSHING, SUPPORT THE LOWER STEERING KNUCKLE AS SHOWN IN FIGURES 9-58 THROUGH 9-60. IMPROPER SUPPORT TO THE STEERING KNUCKLES CAN CAUSE COMPONENT DAMAGE.

**FIGURE 9-58**



**FIGURE 9-60**



**FIGURE 9-59**



**FIGURE 9-61**



1. **STEERTEK axle** (Vehicles built prior to August 2011)
  - a. Remove the grease cap retaining ring.
  - b. Ensure that each part of the steering knuckle assembly is squarely supported on the receiving tool before applying hydraulic pressure to press out the kingpin bushings, see Figures 9-58 through 9-60.
  - c. Remove the grease zerk in the grease cap.
  - d. Place a driver on top of the grease cap and press out the kingpin bushing and seal using the grease cap.
  - e. Proceed to Step 3.
2. **STEERTEK NXT axle** (Vehicles built after August 2011)
  - a. Remove the threaded grease cap and grease zerk.
  - b. Ensure that each part of the steering knuckle assembly is squarely supported on the receiving tool before applying hydraulic pressure to press out the kingpin bushings, see Figures 9-58 through 9-60.
  - c. Place the STEERTEK NXT installer/remover tool in the steering knuckle/kingpin bore. Then place the kingpin bushing push-out tool on top of the installer/remover.
  - d. Press out the kingpin bushing.
3. Clean the parts and inspect for reassembly, see Figure 9-61.

### 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  $1.938" \pm 0.003"$ .
2. Measure the upper and lower bore in two positions and at two locations. The two positions must be  $90^\circ$  opposed from each other, see Figures 9-62 through 9-64. If the average measurement is more than the knuckle bore maximum diameter specification, replace the knuckle.

FIGURE 9-62



FIGURE 9-63



FIGURE 9-64



## KINGPIN BUSHING INSTALLATION

### You will need:

- A hydraulic shop press with a minimum forcing capacity of 2.5 tons

### **WARNING**

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

1. Install the lower or upper steering knuckle in the press. Ensure that each part of the steering knuckle assembly is squarely supported on the receiving tool before applying hydraulic pressure to press in the kingpin bushings.
2. Always install the kingpin bushing from the machined side (axle side) of the lower steering knuckle using a bushing driver, (see driver specifications in the Special Tools Section of this publication). Press in bushing to a depth of no less than  $\frac{15}{64}$ " (0.236") or 6 millimeters and no more than  $\frac{5}{16}$ " (0.32") or 8 millimeters, see Figures 9-65 and 9-67.
3. Following this procedure it is necessary to ream the kingpin bushings to fit the kingpins, see Kingpin Bushing Reaming Instructions in this section.

**FIGURE 9-65**



**FIGURE 9-66**



**FIGURE 9-67**



## KINGPIN BUSHING REAMING

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

1. Install the lower steering knuckle assembly in a vise with brass jaws.

### SERVICE HINT

It is acceptable to mount the knuckle components in a vise either vertically or horizontally when performing the reaming procedure.

2. Install the reamer into the lower steering knuckle until the blades touch the kingpin bushing.
3. Rotate the reamer with light downward pressure. Rotate the reamer smoothly. **DO NOT** apply too much pressure, see Figures 9-68 and 9-69.
4. Slide the reamer out of the bottom of the steering knuckle assembly. If it is necessary to remove the reamer from the top, rotate the reamer opposite of cutting rotation.
5. Clean and remove all kingpin bushing material from the steering knuckle assembly. Take special attention to remove material from the grease channels and dimples.

FIGURE 9-68

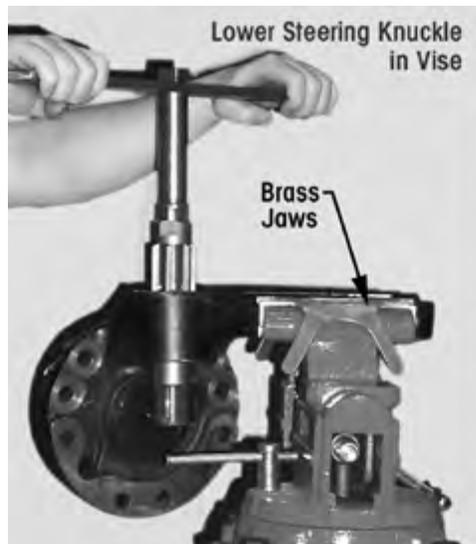
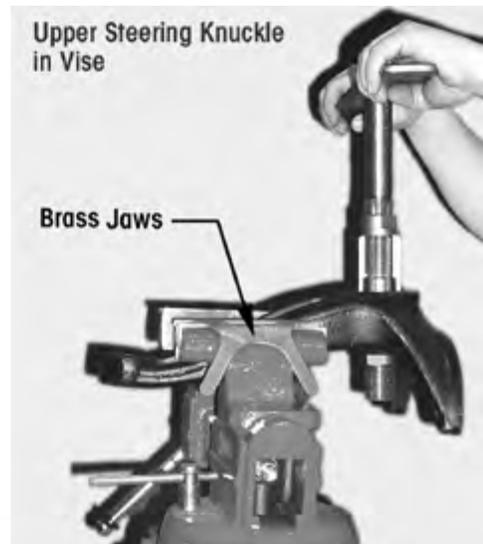


FIGURE 9-69



6. Clean the  $\frac{5}{8}$ " brake backing plate bolts with a wire wheel and run a tap through the threads of the lower steering knuckle assembly and then flush out with brake cleaner and dry with compressed air.

 **WARNING**

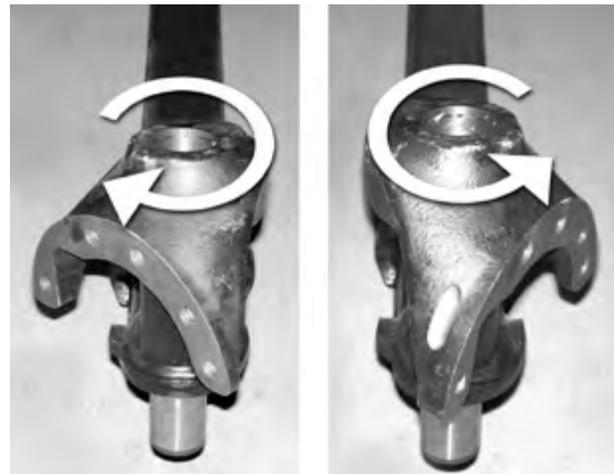
PRIOR TO INSTALLATION ENSURE THAT ALL RESIDUAL LOCTITE® MATERIAL IS REMOVED FROM THE MOUNTING BOLTS AND THE THREAD BORES IN THE UPPER STEERING KNUCKLES, AND NEW LOCTITE 277 OR EQUIVALENT IS APPLIED TO HELP ENSURE THAT THE BOLTS SUSTAIN THE PROPER TORQUE REQUIREMENT. FAILURE TO DO SO CAN CAUSE LOSS OF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

**NOTE**

The Hendrickson Genuine part, socket head cap screw comes with a pre-applied loctite compound.

7. Temporarily install the upper/lower knuckle on the kingpin to check for fit.
8. Rotate the upper/lower knuckle back and forth to verify there is no binding on the kingpin, see Figure 9-70.
9. If the bushing is too tight repeat Steps 1 through 8 until the proper clearance is achieved.

FIGURE 9-70



**NOTE**

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

10. Proceed to Kingpin Seal installation.

**KINGPIN SEAL INSTALLATION**

 **WARNING**

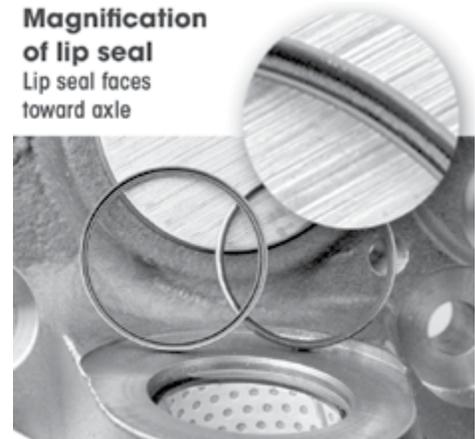
WHEN INSTALLING UPPER/LOWER STEERING KNUCKLE COMPONENTS IN A VISE IT IS NECESSARY TO PROTECT THE MACHINED SURFACES FROM GOUGES OR MARRING BY USING BRASS JAWS. FAILURE TO DO SO CAN CAUSE PREMATURE PART DAMAGE, DAMAGE TO THE STEERING KNUCKLE COMPONENTS, LOSS OF WARRANTY, LOSS OF VEHICLE CONTROL, CAUSING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

1. Place the upper/lower steering knuckle assembly in a vise with brass jaws or place on a suitable workbench. The steering knuckle will have the machined surface facing up (axle side up).

2. Lay the kingpin seal into the bore of the steering knuckle. The seal lip should face outward or toward the axle, see Figure 9-71.
3. Use a kingpin bushing driver tool (see Special Tool Section) and press seal firmly into the steering knuckle assembly.
4. **STEERTEK NXT** — Double Lip design, see Figure 9-72. Install the kingpin seal until it bottoms out in the kingpin bore.
5. **STEERTEK** — Single Lip design, see Figure 9-73. Install the kingpin seal until it makes contact with the kingpin bushing.

**FIGURE 9-71**

**Magnification of lip seal**  
Lip seal faces toward axle



**FIGURE 9-72**

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



**FIGURE 9-73**

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



### STEERING KNUCKLE ASSEMBLY

After replacement of the kingpin bushings it is necessary to re-assemble the steering knuckle assemblies. **DO NOT** substitute aftermarket components when servicing.

#### NOTE

Effective January 2019, vehicles equipped with Hendrickson STEERTEK NXT/STEERTEK axle will be installed with a left hand composite bearing and a right hand roller bearing configuration to replace the previous roller/roller bearing configuration for production and aftermarket.

1. Install the composite thrust bearing on the lower kingpin on the left side and the roller thrust bearing on the right side with the seal facing up toward axle (the black seal will designate the top side), see Figures 9-74 and 9-75.
2. Install the shim, if equipped, on the upper kingpin.
3. Pack the bushing dimples on the upper and lower steering knuckles with multi purpose Lithium based grease (NLGI Grade 2) before installation.
4. Install the upper steering knuckle on the upper arm kingpin.

**FIGURE 9-74**



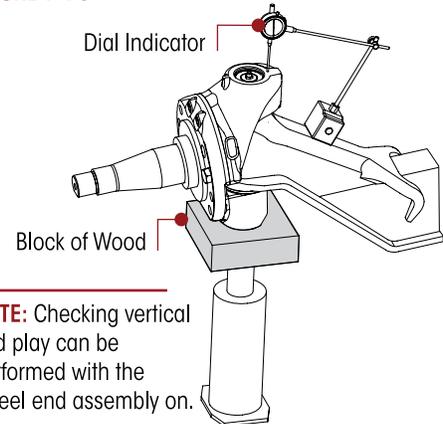
**FIGURE 9-75**



**Top View of Thrust Bearings**  
**COMPOSITE THRUST BEARING**    **ROLLER THRUST BEARING**  
Left Side                                      Right Side

5. Install the lower steering knuckle on the lower kingpin and install the old socket head cap screws loose into the top two (2) threaded holes.
6. Install a bottle jack under the lower knuckle and slightly raise the knuckle until it is possible to thread in the three (3) brake backing plate bolts by hand. These are for guide purposes only.
7. Snug the two socket head cap screws.
8. Lower the bottle jack so that all the vertical end play is on the underside of the axle.
9. Affix a magnetic base dial indicator on the axle and place the tip of the dial indicator on top of the knuckle assembly, see Figure 9-76.

FIGURE 9-76



**NOTE:** Checking vertical end play can be performed with the wheel end assembly on.

10. Zero the dial indicator.
11. Raise the bottle jack until there is **NO CLEARANCE** between the knuckle assembly and the bottom of the axle, slightly lifting the axle.
12. Check the reading on the dial indicator. The specification for vertical travel on the steering knuckle during assembly is 0.008" to 0.011".
13. If the clearance is **above 0.011"**, loosen the socket head cap screws and **push down** on the knuckle assembly until the proper vertical end play is achieved.

If the clearance is **below 0.008"**, loosen the socket head cap screws and **pull up** on the knuckle assembly until the proper vertical end play is achieved.

**NOTE**

**ONLY** if the vehicle is built **prior to August 2011** equipped with the **STEERTEK** axle can the vertical end play be further adjusted with a shim.

**STEERTEK (prior to August 1, 2011)**

- If the vertical clearance is above 0.011", add a 0.005" shim
- If the vertical clearance is below 0.008", it may be necessary to remove a 0.005" shim

**NOTE**

The Hendrickson Genuine part, socket head cap screw comes with a pre-applied Loctite compound.



PRIOR TO INSTALLATION ENSURE THAT ALL RESIDUAL LOCTITE MATERIAL IS REMOVED FROM THE MOUNTING BOLTS AND THE THREAD BORES IN THE UPPER STEERING KNUCKLE, 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.

14. Remove one (1) old socket head cap screw and replace with new socket head cap screw.
15. Remove second socket head cap screw and replace with new socket head cap screw. Tighten both socket head cap screws to  187 ± 12 foot pounds torque.
16. Recheck the vertical end play with the dial indicator, see Figure 9-77 or a 0.010" feeler gauge.
17. Remove the brake spider bolts, they should thread out freely.
18. Remove the bottle jack and continue assembling the wheel ends.

**IMPORTANT NOTE**

It is critical to apply Loctite to the three (3) brake spider bolts to ensure that these bolts sustain the proper torque requirement of steering knuckle assembly.

19. Apply loctite to the three (3) brake spider bolts prior to installation into the brake spider. Tighten bolts to  187 ± 12 foot pounds torque.

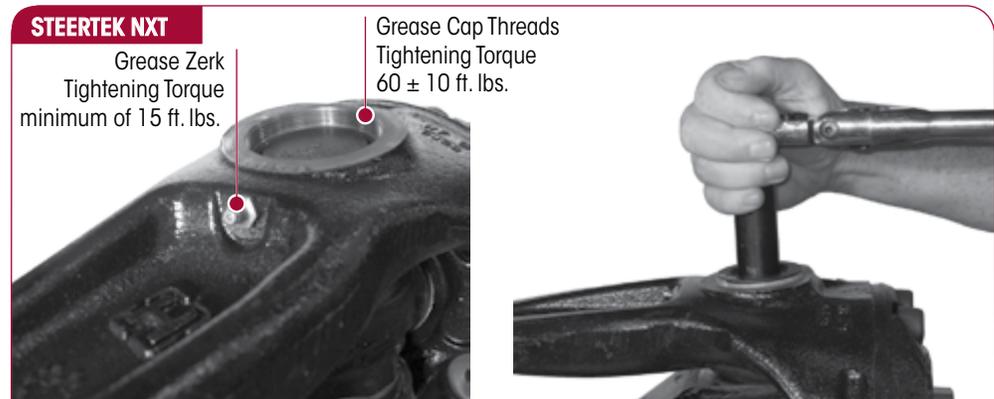
**WARNING**

DO NOT GREASE KNUCKLES WITHOUT THE BRAKE SPIDER INSTALLED AND TIGHTENED TO PROPER TORQUE. FAILURE TO DO SO CAN CAUSE COMPONENT DAMAGE RESULTING IN FAILURE AND LOSS OF VEHICLE CONTROL, POSSIBLY CAUSING PERSONAL INJURY OR PROPERTY DAMAGE.

20. Install the tie rod end into the lower steering knuckle arm.
21. Tighten the castle nuts to  $\mathbb{N}$  185 foot pounds torque then rotate the castle nut to the next castle slot and install cotter pin.
22. Install the drag link into the steering arm and tighten to the vehicle manufacturer's specifications.
23. Install new O-rings on the grease caps and lubricate O-rings with grease.
24. **STEERTEK Axle** – Install new grease caps and retaining rings.

**STEERTEK NXT Axle** – Install new grease caps. Note the grease caps on the STEERTEK NXT axle are threaded, tighten to  $\mathbb{N}$  60 ± 10 foot pounds torque. Allow 30 minutes for thread sealant to cure before greasing. Install new grease zerk and tighten to a minimum of  $\mathbb{N}$  15 foot pounds, see Figure 9-77.

**FIGURE 9-77**



25. Install brakes, drums, wheels and tires.
26. Remove jack and safety stands.
27. Grease steering knuckles with the vehicle on the floor.
28. Remove the wheel chocks.

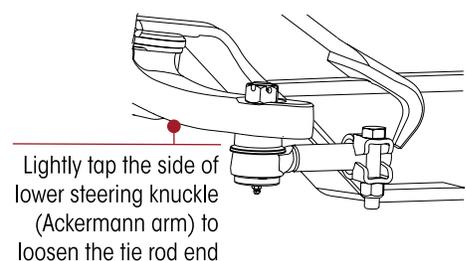
**TIE ROD END AND CROSS TUBE**

**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.

**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 Ackermann arm to loosen the tie rod end from the Ackermann arm, see Figure 9-78.
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.

**FIGURE 9-78**



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**

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 AND 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 Ackermann arm.
- A left hand threaded tie rod end will be installed into the left side Ackermann 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**

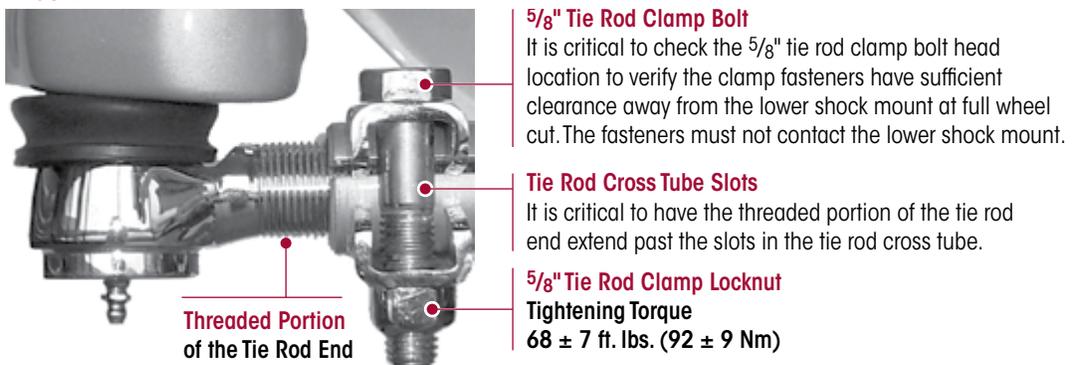
THE THREADED PORTION OF THE TIE ROD END MUST EXTEND PAST THE SLOTS INTO THE TIE ROD CROSS TUBE, SEE FIGURE 9-79. FAILURE TO DO SO CAN CAUSE COMPONENT DAMAGE, LOSS OF VEHICLE CONTROL AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

**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 2 and 3.

**FIGURE 9-79**



**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 lower steering knuckle.
6. Tighten the castle nuts to  185 foot pounds (251 Nm) 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 in this publication.

## **SINGLE TO DUAL HEIGHT CONTROL VALVE CONVERSION**

Hendrickson has Dual Height Control Valve Conversion Kits available to convert from a single height control valve to dual height control valves, (Kit number 60961-116), see Parts List Section in this publication for more information.

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### **NOTE**

The recommendation of the vehicle manufacturer is that dual height control valves are only to be installed on the front suspension when the rear suspension is equipped with a single height control valve system. This arrangement is best suited to keep the vehicle level versus having dual height control systems on both the front and rear suspensions.

---

### **DISASSEMBLY**

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



PRIOR TO AND DURING DEFLATION AND INFLATION OF THE FRONT AIR SUSPENSION SYSTEM, ENSURE THAT ALL PERSONNEL AND EQUIPMENT ARE CLEAR FROM UNDER THE VEHICLE AND AROUND THE SERVICE AREA, FAILURE TO DO SO CAN CAUSE SERIOUS PERSONAL INJURY, DEATH, OR PROPERTY DAMAGE.

3. See Air Spring Warnings and instructions in the Important Safety Notice Section of this publication prior to deflating or inflating the suspension system.
4. Remove the air from the air system by disconnecting the height control valve linkage at the rubber grommet and allowing the lever to drop. This will exhaust air from the system.



THE HEIGHT CONTROL VALVE FITTINGS ARE NON-SERVICEABLE. IF THE HEIGHT CONTROL VALVE IS TO BE RE-INSTALLED; CARE MUST BE TAKEN TO REMOVE DIRT AND DEBRIS FORM THE PUSH-TO-CONNECT FITTINGS. FAILURE TO DO SO CAN RESULT IN THE PUSH-TO-CONNECT FITTINGS FAILING TO SEAL PROPERLY WITH THE AIR LINE.

5. Disconnect the delivery air line to the right air spring at the T-fitting.
6. Remove the T-fitting from the right air spring.

### **ASSEMBLY**

1. Install the new left side height control valve assembly on the left side upper air spring bracket and connect the new height control valve linkage to the bracket on the top pad.
2. Inspect the air line removed from the T-fitting to the right air spring. Trim the end square if necessary. Insert the air line into the right air spring.
3. Install a new air line from the left height control valve delivery port into the left air spring. Cut the new line to length and ensure that the ends of the line are cut square. Make sure that air lines are fully seated in the fittings.
4. Acquire access to the air lines inside the left frame rail. Cut plastic ties as necessary to gain access to the air lines routed inside the frame rail.
5. The supply line from the foot valve will continue to be the supply line for both height control valves. It will be necessary to cut the supply line install a T-fitting at or near a frame rail hole location closest to the left height control valve.
6. Cut to length and install an air line from the T-fitting to the right height control valve supply port.

7. Trace the former left air spring delivery line (which will now be the left height control valve supply line).
8. Cut this line to length and insert into the T-fitting.
9. Install new plastic ties and secure all air lines inside the right frame rail. This should complete the installation and plumbing of the height control valves, see Dual Height Control Valve in the Plumbing Diagram Section of this publication.
10. Air up vehicle system to proper air pressure.
11. Install the height control valve linkage(s) and inflate the suspension to normal operating pressure.
12. Remove chocks from wheels.
13. Verify proper ride height, see Alignment & Adjustments Section of this publication.

## SECTION 10 Alignment Specifications

### STEERTEK NXT • STEERTEK Axle for International Truck Vehicles

FRONT SUSPENSION ALIGNMENT SPECIFICATIONS						
CAMBER <sup>1</sup>	DESIGN SPECIFICATION		RANGE			
	AIRTEK	SOFTEK	AIRTEK		SOFTEK	
			MINIMUM	MAXIMUM	MINIMUM	MAXIMUM
LEFT	0.00°±1.0°	0.0°±1.0°	-1.0°	+1.0°	-1.0°	+1.0°
RIGHT	-0.25°±1.0°	-0.25°±1.0°	-1.25°	+0.75°	-1.25°	+0.75°
CROSS	0.25°±1.0°	0.0°	-0.75°	+1.25°	—	+2.0°
<b>CAMBER NOTES:</b>						
<sup>1</sup> The camber angle is not adjustable. <b>DO NOT</b> bend axle or otherwise try to adjust camber. If found out of specification, notify Hendrickson Tech Services for further information.						
CASTER <sup>1,2</sup>	DESIGN SPECIFICATION		RANGE			
	AIRTEK	SOFTEK	AIRTEK		SOFTEK	
			MINIMUM	MAXIMUM	MINIMUM	MAXIMUM
LEFT	6.0°±1.0°	5.0°±1.0°	+5.0°	+7.0°	+4.0°	+6.0°
RIGHT	6.0°±1.0°	5.0°±1.0°	+5.0°	+7.0°	+4.0°	+6.0°
CROSS <sup>3</sup>	0.0°	0.0°	—	+1.5°	—	+1.5°
<b>CASTER NOTES:</b>						
<sup>1</sup> 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.						
<sup>2</sup> 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.						
<sup>3</sup> <b>The Cross caster angle is not adjustable – DO NOT</b> 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. <b>The use of two different angle caster shims will not correct cross caster.</b>						
<sup>4</sup> <b>Example of caster adjustment:</b> 4.5° RH/5° LH, would require one (1), 1.0 shim on each side to increase caster and achieve 5.50° RH/6.00° LH, which is in specification. <b>DO NOT</b> attempt to use uneven shims.						
<b>Hendrickson recommends the following TMC<sup>2</sup> practices:</b>						
TOTAL TOE <sup>2</sup>	DESIGN SPECIFICATION <sup>1</sup>		RANGE			
			MINIMUM		MAXIMUM	
	1/16" ± 1/32" (0.06" ± 0.03")		1/32" (0.03")		3/32" (0.09")	
<b>TOE-IN NOTES:</b>						
<sup>1</sup> Toe-in is to be set and adjusted in the normal vehicle unladed 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.						
<sup>2</sup> In most instances total toe is set by the vehicle manufacturer or body builder. Consult the vehicle manufacturer for specifications.						

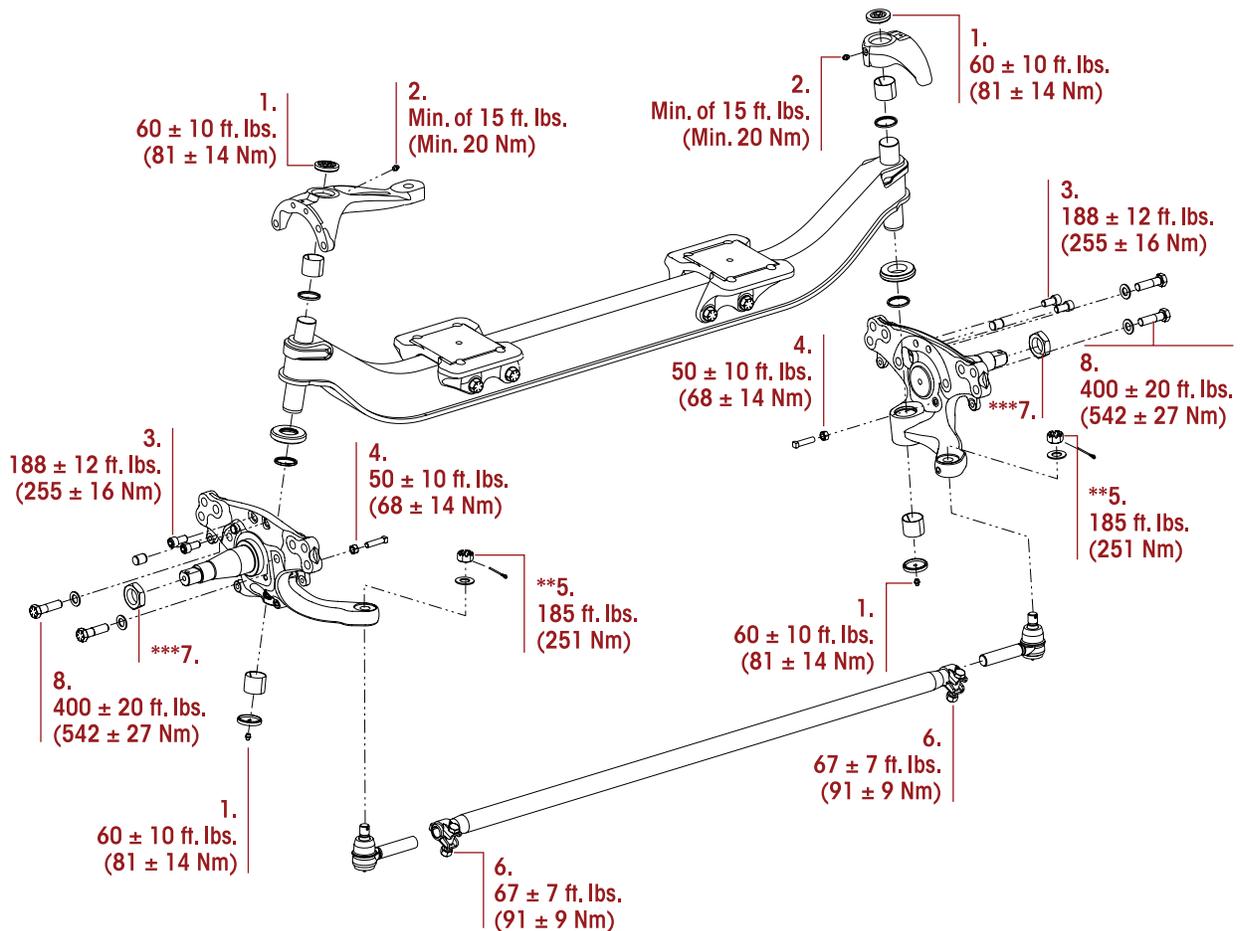
# SECTION 11 Torque Specifications

HENDRICKSON RECOMMENDED TORQUE VALUES  
PROVIDED IN FOOT POUNDS AND IN NEWTON  
METERS

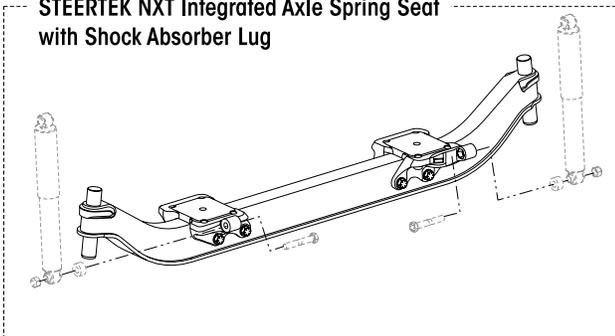
## STEERTEK NXT Axle Cross Caster

- Medium-duty with Standard Brake Knuckle
- Standard-duty with Standard Brake Knuckle | Integrated Brake Knuckle (IBK)

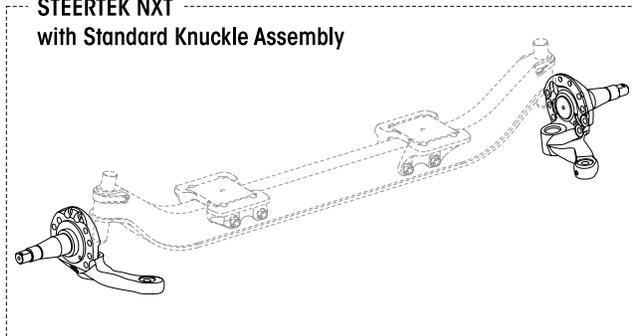
ProStar (LT Series) 12K, 12.35K, 13.2K, 14K, 14.6K • TranStar (RH Series) 12K, 12.35K, 14K  
LoneStar (LS Series) 12.35K, 13.2K, 14K, 14.6K



STEERTEK NXT Integrated Axle Spring Seat  
with Shock Absorber Lug



STEERTEK NXT  
with Standard Knuckle Assembly



**STEERTEK NXT Axle Cross Caster**

<b>HENDRICKSON RECOMMENDED TORQUE SPECIFICATIONS</b>					
<b>NO.</b>	<b>COMPONENT</b>	<b>FASTENERS</b>		<b>TORQUE VALUE</b>	
		<b>QTY.</b>	<b>SIZE</b>	<b>FOOT POUNDS</b>	<b>Nm</b>
	Frame fasteners are furnished and installed by the vehicle manufacturer. Vehicle manufacturer may use an equivalent HUCK fastener at frame mount.				
1	Grease Cap Assembly	4	½"	60 ± 10	81 ± 14
2	Grease Zerk	2		Minimum of 15	Minimum of 20
3	Knuckle Attachment Bolt (Socket Head Cap Screw)	4	5/8"	188 ± 12	255 ± 16
4	Knuckle / Axle Wheel Stop Bolt	2	½" Jam Nut	50 ± 10	68 ± 14
5	Tie Rod Ends / Drag Link to Steering Knuckle	2	7/8" Castle Nut	**185	**251
6	Tie Rod Tube to Tie Rod Ends	2	5/8"	67 ± 7	91 ± 9
7	Spindle Nut	2	1½"	***	***
8	Integrated Knuckle Attachment Fasteners	4	¾"	400 ± 20	542 ± 27
<b>• All hardware ¼" and greater is Grade 8 with no additional lubrication.</b>					
<b>NOTE:</b>	<p>* Not supplied by Hendrickson. Follow vehicle manufacturer's torque specifications. Hendrickson is not responsible for maintaining vehicle manufacturer's torque values.</p> <p>** Torque to 185 foot pound, advance nut to next hex face to install cotter pin. DO NOT back off nut for cotter pin installation.</p> <p>*** Torque value based on wheel end hardware. Contact vehicle manufacturer for torque specification.</p>				

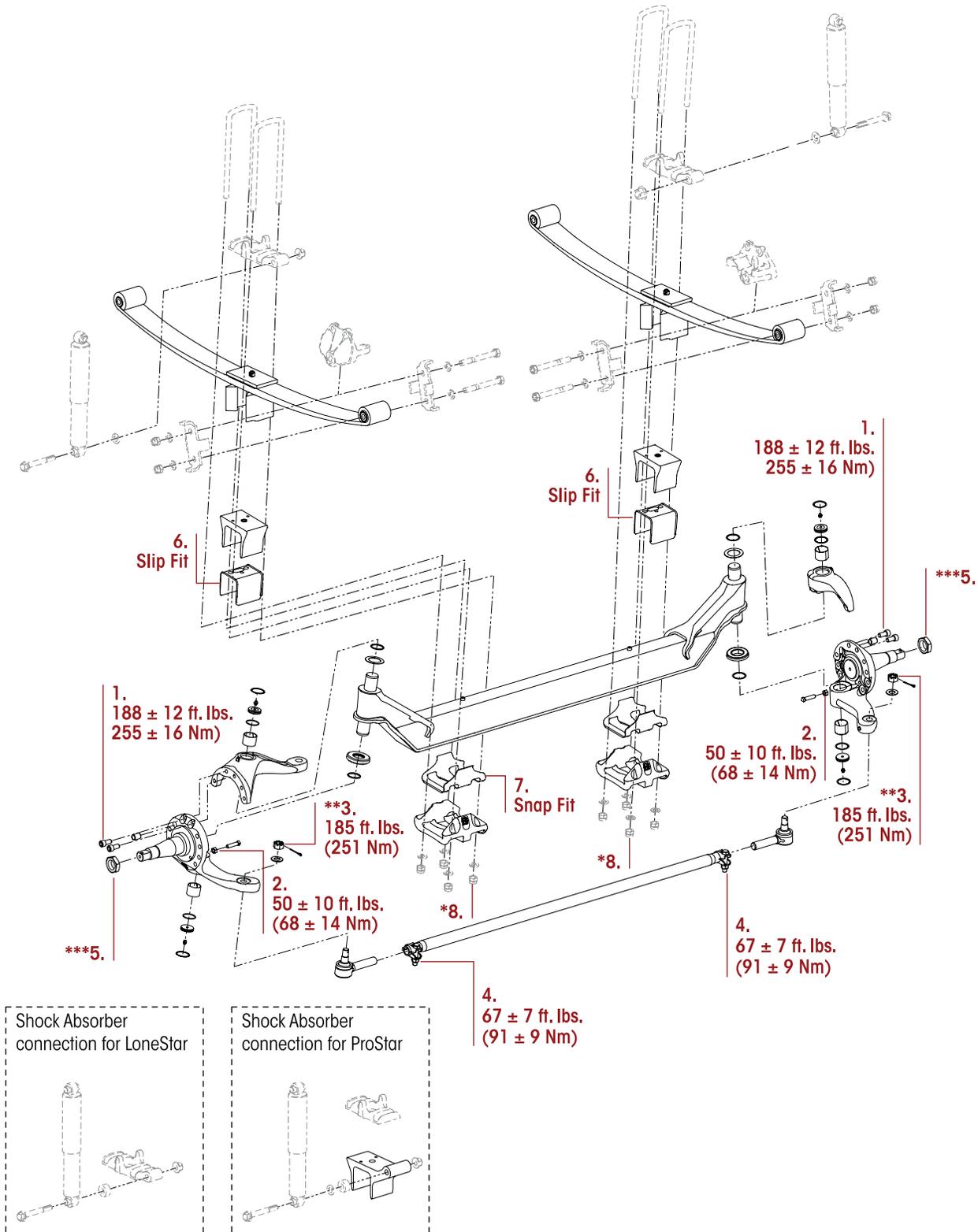
SOFTEK Monoleaf with STEERTEK Axle

Vehicles built PRIOR TO June 2014

LoneStar 12.35K • ProStar 12K, 12.35K

TranStar 12K • 9200 / 9400 / 8600 12K

HENDRICKSON RECOMMENDED TORQUE VALUES  
PROVIDED IN FOOT POUNDS AND IN NEWTON METERS

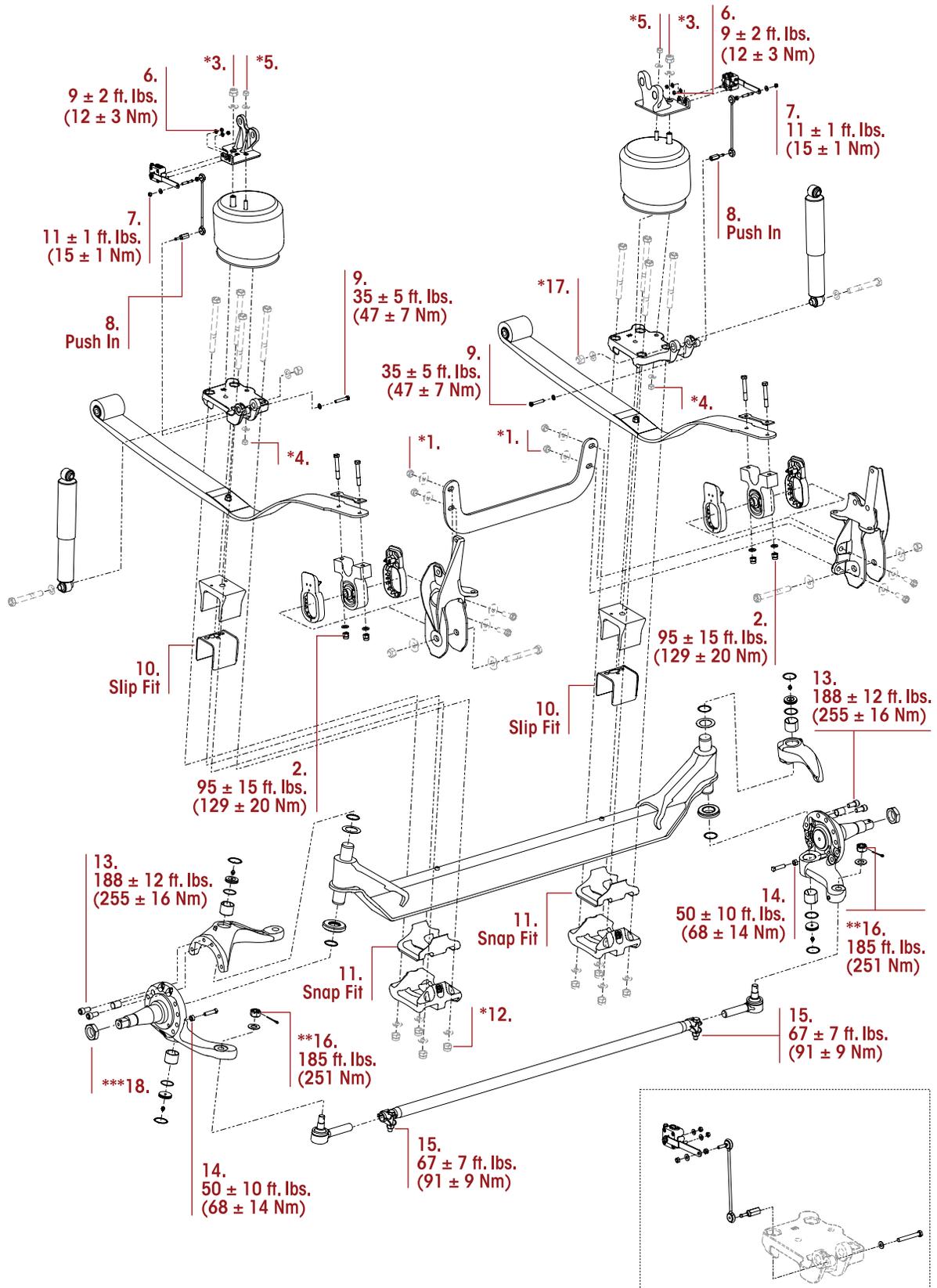


**SOFTEK MONOLEAF with STEERTEK Axle  
Vehicles built PRIOR to June 2014**

<b>HENDRICKSON RECOMMENDED TORQUE SPECIFICATIONS</b>					
<b>NO.</b>	<b>COMPONENT</b>	<b>FASTENERS</b>		<b>TORQUE VALUE</b>	
		<b>QTY.</b>	<b>SIZE</b>	<b>FOOT POUNDS</b>	<b>Nm</b>
	Frame fasteners are furnished and installed by the vehicle manufacturer. Vehicle manufacturer may use an equivalent HUCK fastener at frame mount.				
1	Knuckle Attachment Bolt (Socket Head Cap Screw)	4	5/8"	188 ± 12	255 ± 16
2	Knuckle / Axle Wheel Stop Bolt	2	1/2" Jam Nut	50 ± 10	68 ± 14
3	Tie Rod Ends / Drag Link to Steering Knuckle	2	7/8" Castle Nut	**185	**251
4	Tie Rod Tube to Tie Rod Ends	2	5/8"	67 ± 7	91 ± 9
5	Spindle Nut	2	1 1/2"	***	***
6	Top Axle Wrap Liner	2		Slip Fit	Slip Fit
7	Bottom Axle Wrap Liner	2		Snap Fit	Snap Fit
8	Clamp Group Fasteners	8	3/4"	*	*
<b>• All hardware 1/4" and greater is Grade 8 with no additional lubrication.</b>					
<b>NOTE:</b>	<p>* Not supplied by Hendrickson. Follow vehicle manufacturer's torque specifications. Hendrickson is not responsible for maintaining vehicle manufacturer's torque values.</p> <p>** Torque to 185 foot pound, advance nut to next hex face to install cotter pin. DO NOT back off nut for cotter pin installation.</p> <p>*** Torque value based on wheel end hardware. Contact vehicle manufacturer for torque specification.</p>				

New Engine Configuration (NEC) with STEERTEK Axle  
 Vehicles built AFTER September 2006  
 9200 / 9400 Models

HENDRICKSON RECOMMENDED TORQUE VALUES  
 PROVIDED IN FOOT POUNDS AND IN NEWTON  
 METERS



**AIRTEK**

<b>HENDRICKSON RECOMMENDED TORQUE SPECIFICATIONS</b>					
<b>NO.</b>	<b>COMPONENT</b>	<b>FASTENERS</b>		<b>TORQUE VALUE</b>	
		<b>QTY.</b>	<b>SIZE</b>	<b>FOOT POUNDS</b>	<b>Nm</b>
	Frame fasteners are furnished and installed by the vehicle manufacturer. Vehicle manufacturer may use an equivalent HUCK fastener at frame mount.				
1	Rear Spring Hanger to Belly Band	4	5/8"	*	*
2	Rear Spring Mount to Leaf Spring	2	1/2"	95 ± 15	129 ± 20
3	Air Spring to Air Spring Bracket	2	3/4"	*	*
4	Air Spring to Top Pad	2	1/2"	*	*
5	Air Spring Bracket to Frame	2	5/8"	*	*
6	Height Control Valve to Air Spring Bracket	2	1/4"	9 ± 2	12 ± 3
7	Linkage Rod to Height Control Valve Arm	1	5/16"	11 ± 1	15 ± 1
8	Linkage Rod to Link Mount	None	Grommet	Push In	Push In
9	Link Mount to Top Pad	1	3/8"	35 ± 5	47 ± 7
10	Top Axle Wrap Liner	4	Formed	Slip Fit	Slip Fit
11	Bottom Axle Wrap Liner	4	Formed	Snap Fit	Snap Fit
	<b>WARNING: DO NOT ASSEMBLE CLAMP GROUP WITHOUT AXLE WRAP LINERS. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE OR PERSONAL INJURY.</b>				
12	Clamp Group Hardware	8	3/4"	*	*
	<b>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.</b>				
13	Knuckle Attachment Bolt (Socket Head Cap Screw)	4	5/8"	188 ± 12	255 ± 16
14	Knuckle / Axle Wheel Stop Bolt	2	5/8" Jam Nut	50 ± 10	68 ± 14
15	Tie Rod Tube to Tie Rod Ends	2	5/8"	67 ± 7	91 ± 9
16	Tie Rod Ends / Drag Link to Steering Knuckle	2	7/8" Castle Nut	**185	**215
17	Lower Shocks Eye Bolts	2	3/4"	*	*
18	Spindle Nut	2	1 1/2"	***	***
<b>• All hardware 1/4" and greater is Grade 8 with no additional lubrication.</b>					
<b>NOTE:</b>	<p>* Not supplied by Hendrickson. Follow vehicle manufacturer's torque specifications. Hendrickson is not responsible for maintaining vehicle manufacturer's torque values.</p> <p>** Torque to 185 foot pound, advance nut to next hex face to install cotter pin. DO NOT back off nut for cotter pin installation.</p> <p>*** Torque value based on wheel end hardware. Contact vehicle manufacturer for torque specification.</p>				

**STEERTEK Axle**

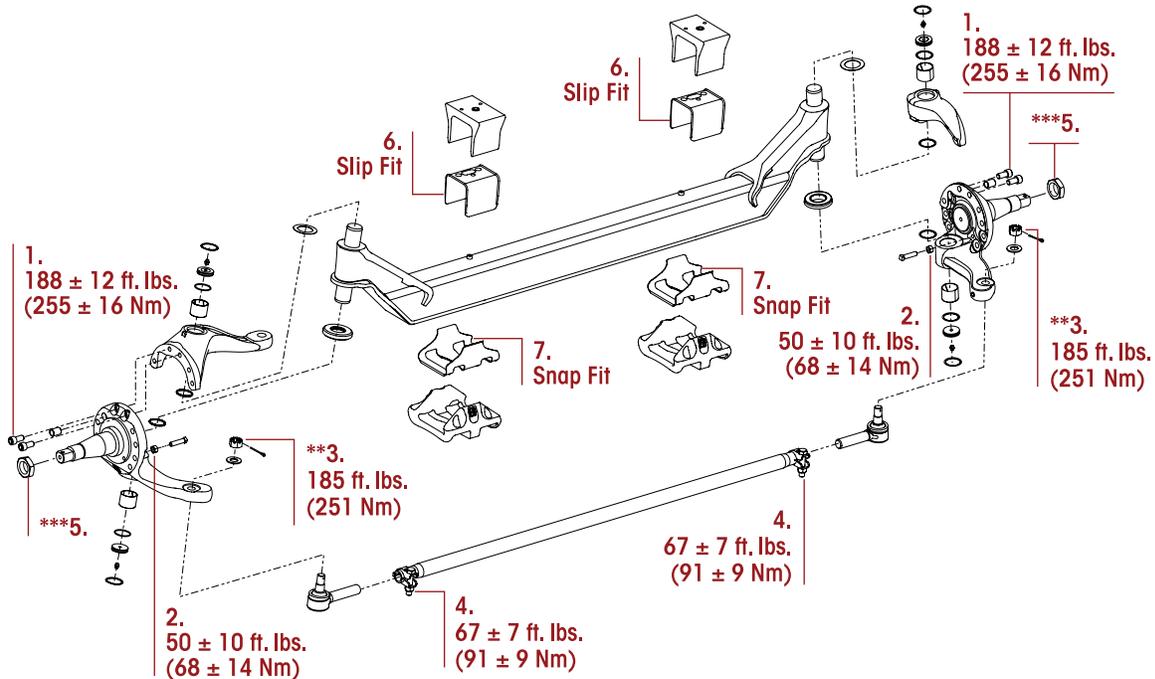
Vehicles built PRIOR TO August 1, 2011

ProStar 12K, 12.35K, 13.2K, 14K, 14.6K

TranStar 12K, 13K, 14K • LoneStar 12.35K, 13.2K, 14K, 14.6K

9200 / 9400 / 8600 12K

HENDRICKSON RECOMMENDED TORQUE VALUES  
PROVIDED IN FOOT POUNDS AND IN NEWTON  
METERS



**STEERTEK Axle**  
Vehicles built PRIOR to August 2011

**HENDRICKSON RECOMMENDED TORQUE SPECIFICATIONS**

NO.	COMPONENT	FASTENERS		TORQUE VALUE	
		QTY.	SIZE	FOOT POUNDS	Nm
Frame fasteners are furnished and installed by the vehicle manufacturer. Vehicle manufacturer may use an equivalent HUCK fastener at frame mount.					
1	Knuckle Attachment Bolt (Socket Head Cap Screw)	4	5/8"	188 ± 12	255 ± 16
2	Knuckle / Axle Wheel Stop Bolt	2	1/2" Jam Nut	50 ± 10	68 ± 14
3	Tie Rod Ends / Drag Link to Steering Knuckle	2	7/8" Castle Nut	**185	**251
4	Tie Rod Tube to Tie Rod Ends	2	5/8"	67 ± 7	91 ± 9
5	Spindle Nut	2	1 1/2"	***	***
6	Top Axle Wrap Liner	2		Slip Fit	Slip Fit

• All hardware 1/4" and greater is Grade 8 with no additional lubrication.

**NOTE:** \* Not supplied by Hendrickson. Follow vehicle manufacturer's torque specifications. Hendrickson is not responsible for maintaining vehicle manufacturer's torque values.  
 \*\* Torque to 185 foot pound, advance nut to next hex face to install cotter pin. DO NOT back off nut for cotter pin installation.  
 \*\*\* Torque value based on wheel end hardware. Contact vehicle manufacturer for torque specification.

## SECTION 12

# Troubleshooting Guide

AIRTEK TROUBLESHOOTING GUIDE		
CONDITION	POSSIBLE CAUSE	CORRECTION
Worn or damaged kingpins and kingpin bushings	Dirt in system– contaminated lubricant	Polish and inspect kingpin, replace bushing and seals, then follow specified lubrication procedures
	Incorrect lubricant	Lubricate axle with specified lubricant
	Axle not lubricated at scheduled frequency	Lubricant axle at scheduled frequency
	Incorrect lubrication procedures	Use correct lubrication procedures
	Lubrication interval not compatible with operating conditions	Change lubrication interval to match operating conditions
	Worn or missing seals	Replace worn or missing seals
Vibration or shimmy of front axle during operation	Caster out of specification	Check ride height and adjust caster to specification
	Wheels and/or tires out of balance	Balance or replace wheels and/or tires
	Worn shock absorbers	Replace shock absorbers
	Worn thrust washers and rear hanger clamps	Replace thrust washers and rear hanger clamps
	Broken engine mount	Replace engine mount
	Wheel bearing adjustment	Adjust wheel bearing to the vehicle manufacturer's specifications.
Excessive wear on tires or uneven tire tread wear	Tires have incorrect air pressure	Adjust tire pressure to manufacturer's specification.
	Tires out of balance	Balance or replace tires
	Incorrect tandem axle alignment	Align tandem axles
	Incorrect toe setting	Adjust toe-in to manufacturer's specification
	Incorrect steering arm geometry	Repair steering system as necessary
	Worn kingpin bushings	Replace kingpin bushings
	Excessive wheel bearing end play	Check specified wheel nut torque, replace worn or damaged wheel bearings
	Wheel bearing adjustment	Adjust wheel bearing to the vehicle manufacturer's specifications.
Vehicle is hard to steer	Low pressure in the power steering system	Repair power steering system
	Steering linkage needs lubrication	Lubricate steering linkage
	Steering knuckles are binding	Check vertical end play
	Incorrect steering arm geometry	Repair steering system as necessary
	Caster out of specification	Check ride height and adjust caster to specification
	Tie rod ends hard to move	Replace tie rod ends
	Worn thrust bearing	Replace thrust bearing
	Steering gear box internal problem	Perform steering gear troubleshooting procedures per steering gear manufacturing guidelines.

*Continued on next page*

AIRTEK TROUBLESHOOTING GUIDE (CONTINUED)		
CONDITION	POSSIBLE CAUSE	CORRECTION
Tie rod ends are worn and require replacement	Tie rod ends need lubrication	Lubricate tie rod end. Make sure lubrication schedule is followed
	Severe operating conditions	Increase frequency of inspection and lubrication intervals
	Damaged boot on tie rod end	Replace tie rod end
Bent or broken cross tube, tie rod end ball stud, or tie rod end  <b>NOTE:</b> Damaged components require replacement	Pump/gear relief valve pressure setting exceeds system specifications	Adjust power steering system to manufacturer's specified pressure
	Steering gear poppets improperly set or malfunctioning	Check for proper operation or adjust poppets to vehicle manufacturer's specifications
	Axle stops improperly set	Set axle stops to vehicle manufacturer's specifications
	Severe duty cycle service	Increase frequency of inspection and lubrication intervals
Worn or broken steering ball stud	Drag link fasteners lightened past specified torque	Tighten drag link fasteners to the specified torque
	Lack of lubrication or incorrect lubricant	Lubricate linkage with specified lubricant
	Power steering stops out of adjustment	Adjust steering stops to vehicle manufacturer's specifications
Suspension has harsh or bumpy ride	Air spring not inflated	Check air supply to air spring, repair as necessary
	Air spring ride height out of specification	Adjust ride height to proper specification
	Broken or worn leaf spring	Replace leaf spring
	Front suspension overloaded	Redistribute steer axle load
Restricted steering radius	Steering stops not adjusted correctly	Adjust steering stops to achieve correct wheel cut
Vehicle leans	Ride height incorrect	Adjust ride height to specification
	Air spring(s) are not inflated	Repair source of air pressure loss
	Leaf spring broken	Replace leaf spring
	Excessive weight bias	Contact the vehicle manufacturer or Hendrickson Tech Services
Vehicle wanders	Caster out of specifications	Check ride height prior and adjust caster to specification
	Incorrect toe setting	Adjust toe to specification
	Fifth wheel not greased	Grease fifth wheel
	Air in the power steering system	Remove air from the power steering systems
	Rear ride height out of adjustment	Adjust ride height to specification
	Front ride height out of adjustment	Adjust ride height to specification

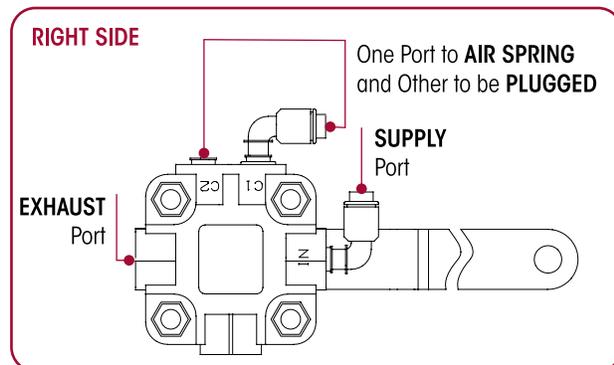
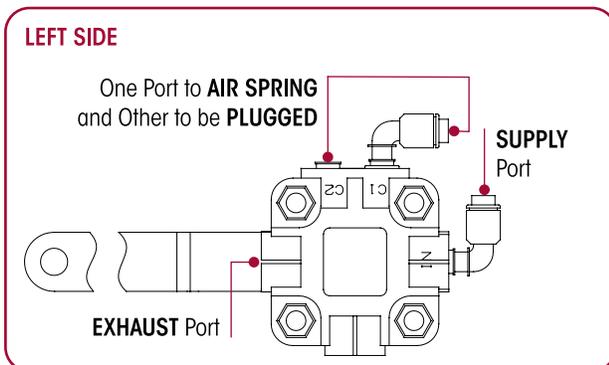
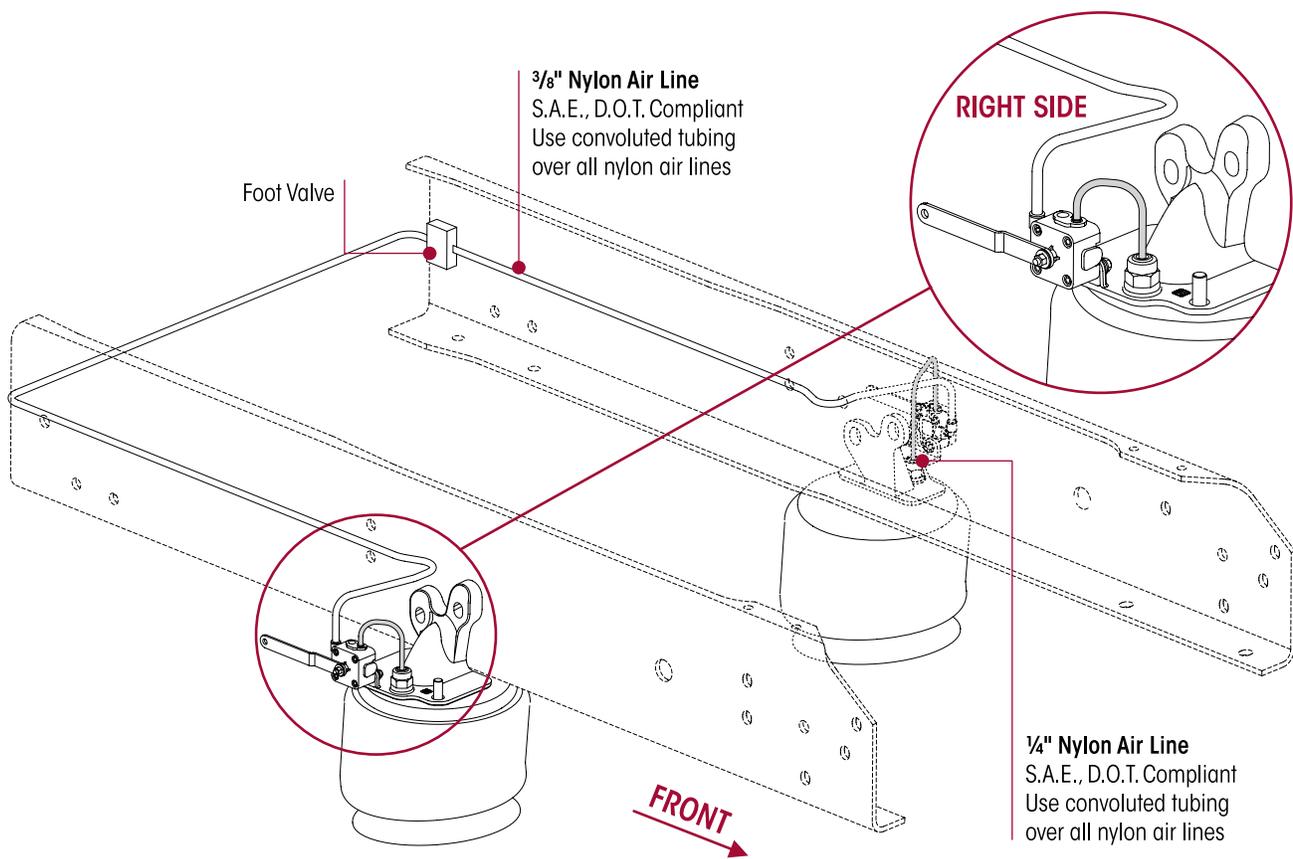
<b>SOFTEK MONOLEAF TROUBLESHOOTING GUIDE</b>		
<b>CONDITION</b>	<b>POSSIBLE CAUSE</b>	<b>CORRECTION</b>
Worn or damaged kingpins and kingpin bushings	Dirt in system– contaminated lubricant	Polish and inspect kingpin, replace bushing and seals, then follow specified lubrication procedures
	Incorrect lubricant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

## SECTION 13 AIRTEK Plumbing Diagrams

### DUAL HEIGHT CONTROL VALVES

When replacing or installing nylon air line tubing into quick-connect fittings it is critical that the end of the air line is cut square. Improper cut of the end of the air line tubing can cause the air line to seat improperly in the quick connect fitting causing air leakage.

The recommendation of the vehicle manufacturer is that dual height control valves are only to be installed on the front suspension when the rear suspension is equipped with a single height control valve system. This arrangement is best suited to keep the vehicle level versus having dual height control systems on both the front and rear suspensions.



## SECTION 14

# 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: <a href="http://tmc.truckline.com">tmc.truckline.com</a>
Alexandria, VA 22314	online ordering: <a href="http://www.truckline.com/store">www.truckline.com/store</a>

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

*Call Hendrickson at **1.866.755.5968** (toll-free) or **1.630.910.2800** for additional information.*



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