

# **H** TECHNICAL PROCEDURE

## **AIRTEK® • SOFTEK® Front Suspension Systems for Blue Bird Buses**

**SUBJECT:** Service Instructions

**LIT NO:** 17730-248

**DATE:** April 2014

**REVISION:** G

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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 Blue Bird Buses:

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

### 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 AIRTEK / SOFTEK Suspensions and the STEERTEK NXT / STEERTEK 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), 1-630-910-2800 (outside U.S. and Canada) or e-mail: techservices@hendrickson-intl.com.

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

## SECTION 2

# Product Description

**STEERTEK NXT** — Integrated into the AIRTEK/SOFTEK system, 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 fabricated axle beam forms a torsion system, enhancing roll stability characteristics and improving handling.

**Axle Clamp Group** — The Clamp Group consists of the top pad, 3/4" hex bolts / U-bolts, washers, and nylon locknuts

**Integrated Axle Seats** — Integrated axle seats to improve ground clearance, reduce part count, and simplify assembly.

**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 a maximum of 50° wheel cut. The two piece knuckle design makes replacing the kingpin bushings easier by eliminating the need to remove the kingpins.

**AIRTEK** — Winner of the 2001 Automotive News and Cap Gemini Ernst & Young PACE Award for Product Innovation. AIRTEK is an integrated front air suspension and fabricated steer axle that work together to form an integrated torsion system. This lightweight system provides driver comfort and is ideal for a variety of applications. Utilizing a system approach, Hendrickson has engineered and optimized the following components to form a system delivering superior ride, stability and handling characteristics with reduced weight and maintenance.



**Air Springs** — Exclusive to Hendrickson, the lightweight air springs deliver a soft ride. The air springs are engineered to support 78% of the vertical load while providing a low spring rate. The quick “snap” design for the 10,000 pound capacity, the bolt on design for the 13,200/14,600 pound capacity, and the “push-to-connect” air supply design also provide fast and easy installation and removal.

**Leaf Spring Assembly** — With its innovative design, the leaf spring provides superior stability, performance and a soft ride. The patented leaf spring shares loads equally with the air spring. Durable rubber front and patented rear bushings are greaseless and only require periodic inspections.

**SOFTEK** — is an integrated front mechanical suspension and robotically welded steer axle that work together to form an integrated torsion system. Utilizing a system approach, Hendrickson has engineered and optimized the following components to form a system delivering ride, stability and handling characteristics with reduced weight and maintenance.

**Leaf spring assembly** — With its innovative design, the leaf spring provides superior stability, performance and a soft ride. Durable rubber front and patented rear bushings are greaseless and only require periodic inspections.

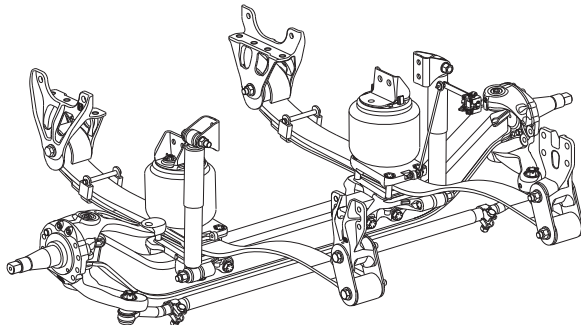
**Shock absorbers** — AIRTEK/SOFTEK utilizes premium shocks that have been tested and tuned specifically for the suspension system.

**Frame brackets** — Optimized design delivers weight reduction and proven durability. The front and rear frame brackets are common between the AIRTEK/SOFTEK suspensions.

**BLUE BIRD – VISION BUSES**

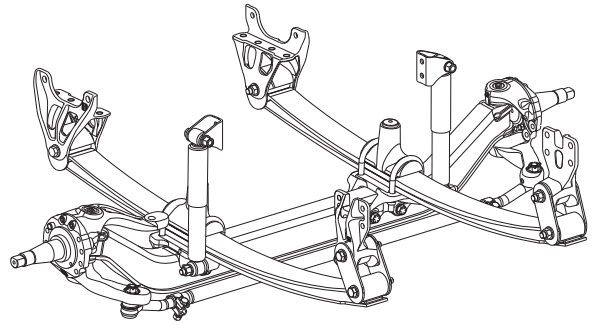
**FIGURE 2-1**

**AIRTEK®** Air Suspension System  
Capacity: 10,000 pounds



**FIGURE 2-2**

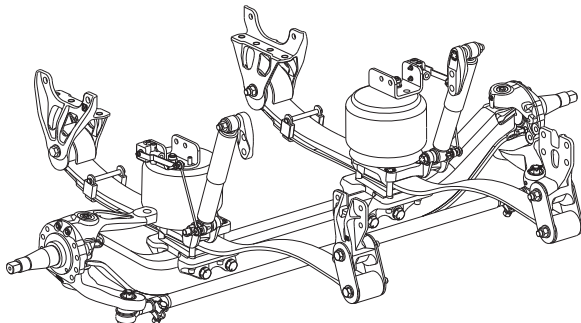
**SOFTEK®** Mechanical Suspension System  
Capacity: 8,500 / 10,000 pounds



**BLUE BIRD – ALL AMERICAN BUSES**

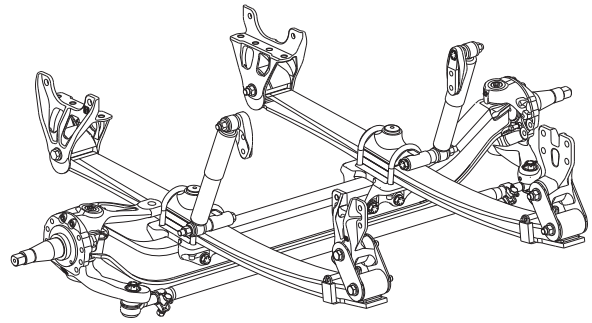
**FIGURE 2-3**

**AIRTEK®** Air Suspension System  
Capacity: 13,200 / 14,600 pounds



**FIGURE 2-4**

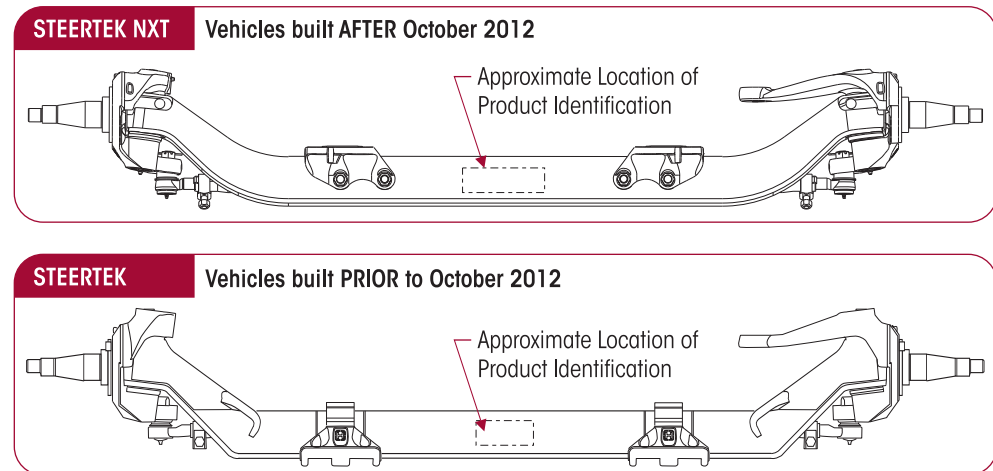
**SOFTEK®** Mechanical Suspension System  
Capacity: 13,200 / 14,600 pounds



## TECHNICAL NOTES

1. AIRTEK and SOFTEK are approved for on-highway use; other applications must be pre-approved by Hendrickson Sales Engineering. System capacity rating for the suspension represents maximum loads on tires at ground level.
2. The STEERTEK NXT axle is available with 69" kingpin intersection (KPI) for the Vision Bus and with 71" kingpin intersection (KPI) for the All American Bus.
3. AIRTEK suspension weight includes frame and shackle bracket assemblies, main springs, bushings, air springs and air spring bracket, height control system, shocks, upper shock brackets and axle clamp group.
4. SOFTEK suspension weight includes frame and shackle bracket assemblies, steel leaf springs, bushings, shocks, upper shock brackets and axle clamp group.
5. STEERTEK NXT axle weight includes the axle beam, knuckle/steering arm assemblies and tie rod assemblies.
6. AIRTEK and SOFTEK are integral to and available exclusively with the STEERTEK NXT axle. This system is anti-lock braking system (ABS) ready. STEERTEK NXT is compatible with most industry standard wheel ends and brakes. Contact OEM for more information.
7. The STEERTEK NXT axle product identification is etched on the center front of the axle beam providing the following information:
  - Axle part number: Identifies the features of the axle beam.
  - Axle assembly number: Identifies the complete assembly, which includes the steering knuckles, bracket assemblies and tie rod assemblies

**FIGURE 2-5** Front view of the axle showing approximate location of product identification.



## SECTION 3

# Important Safety Notice

Proper maintenance, service and repair are 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 the 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 in 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.

 **DANGER**

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

 **WARNING**

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

 **CAUTION**

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

#### NOTE

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

#### SERVICE HINT

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

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



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

## ■ SAFETY PRECAUTIONS

### 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 REGULARLY CALIBRATED TORQUE WRENCH. 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. ALWAYS CHECK TORQUE IN TIGHTENING DIRECTION.

### DANGER

#### AIR SPRINGS

AIR SPRING ASSEMBLIES MUST BE DEFLATED PRIOR TO LOOSENING ANY CLAMP GROUP HARDWARE. 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

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 CAN RESULT IN FAILURE AND LOSS OF VEHICLE CONTROL, POSSIBLY CAUSING PERSONAL INJURY OR PROPERTY DAMAGE.

### WARNING

#### SHOCK ABSORBERS

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 CAN 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.

### WARNING

#### REPAIR AND RECONDITIONING

THE REPAIR OR RECONDITIONING OF SUSPENSION OR AXLE COMPONENTS IS NOT ALLOWED. SEE LABEL IN FIGURE 3-1. ANY AXLE COMPONENTS FOUND TO BE DAMAGED OR OUT OF SPECIFICATIONS MUST BE REPLACED. ALL MAJOR HENDRICKSON COMPONENTS ARE HEAT TREATED AND TEMPERED. 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

#### 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**

**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.

**WARNING**

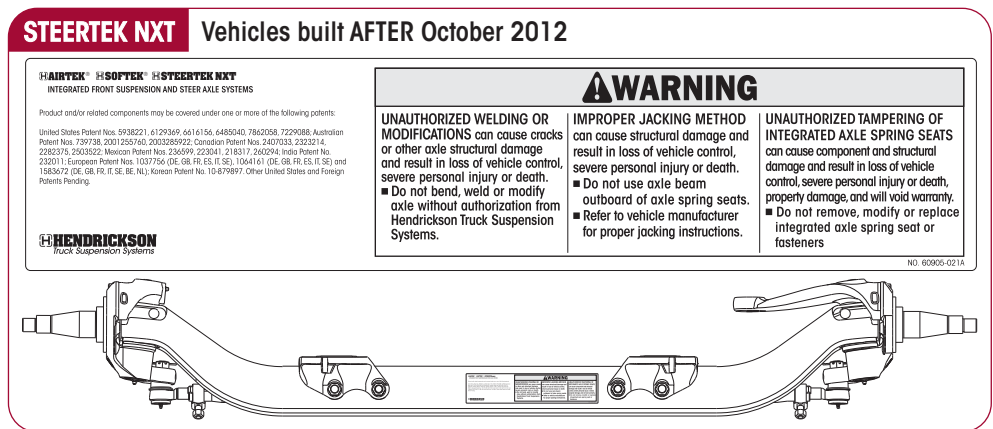
**IMPROPER JACKING METHOD**

IMPROPER JACKING METHOD CAN CAUSE STRUCTURAL DAMAGE AND RESULT IN LOSS OF VEHICLE CONTROL, SEVERE PERSONAL INJURY OR DEATH. DO NOT USE AXLE BEAM OUTBOARD OF AXLE SPRING SEATS. REFER TO VEHICLE MANUFACTURER FOR PROPER JACKING INSTRUCTIONS, SEE FIGURES 3-1 AND 3-2.

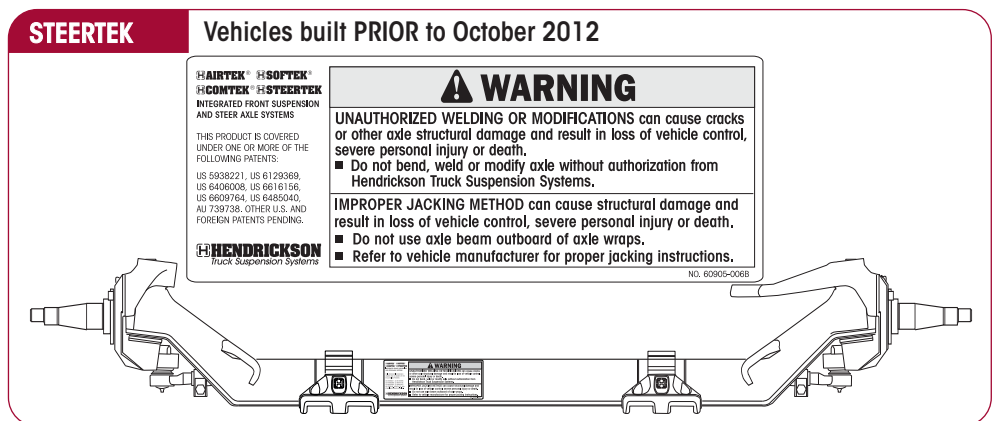
**NOTE:**

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**

**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 SHOWS SIGNS OF MOVEMENT, CONTACT THE HENDRICKSON TECH SERVICES DEPARTMENT.

**⚠ DANGER****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.

**⚠ WARNING****DAMAGED AXLE COMPONENTS**

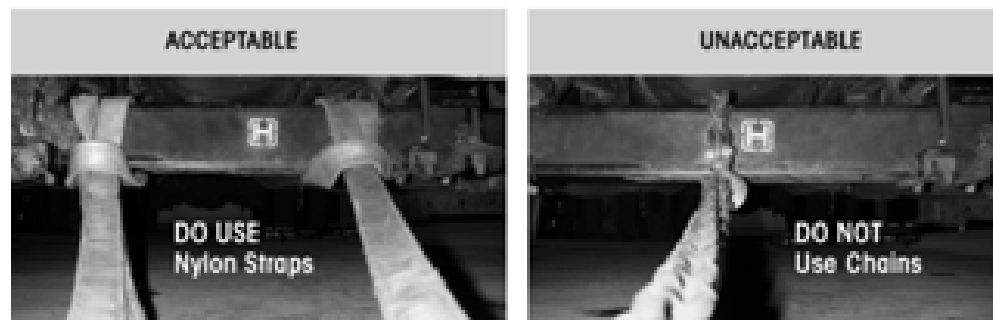
IF A VEHICLE EQUIPPED WITH A STEERTEK NXT / STEERTEK AXLE IS INVOLVED IN A CRASH, THE AXLE STEER KNUCKLES MUST BE DISASSEMBLED AND A THOROUGH INSPECTION OF THE AXLE MUST BE PERFORMED NOTING THE CONDITION OF THE AXLE BEAM, KINGPINS, AND KNUCKLE ASSEMBLIES, INCLUDING THE AREAS OF AXLE TO KINGPIN INTERFACE, 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 SUCH ADJACENT PARTS AND 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****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 TOW STRAPS ARE NECESSARY TO TOW A DISABLED VEHICLE FROM A REPAIR FACILITY PARKING LOT INTO THE SHOP BAY. THE TOW STRAPS SHOULD BE CONNECTED TO THE TOW HOOKS PROVIDED BY THE VEHICLE MANUFACTURER AT THE FRONT OF THE BUMPER. IF THE USE OF TOW HOOKS IS NOT AN OPTION, THEN TOW STRAPS MAY BE WRAPPED AROUND THE FRONT STEERTEK NXT / STEERTEK 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 STEERTEK NXT / STEERTEK AXLE TO TOW THE VEHICLE, DOING SO WILL DAMAGE THE AXLE AND VOID ANY APPLICABLE WARRANTY, (SEE FIGURE 3-3). FOR DETAILED INSTRUCTIONS FOR ON-HIGHWAY TOWING, SEE TOWING PROCEDURE SECTION IN THIS PUBLICATION.

**FIGURE 3-3****OFF-ROADWAY TOWING**





**WARNING**

**PERSONNEL PROTECTIVE EQUIPMENT**

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



**CAUTION**

**PROCEDURES AND TOOLS**

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



**WARNING**

**TORCH/WELDING**

DO NOT USE A CUTTING TORCH TO REMOVE ANY ATTACHING 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 BY ONLY A FLOOR JACK. ALWAYS SUPPORT A RAISED VEHICLE WITH SAFETY STANDS. BLOCK THE WHEELS AND MAKE SURE THE UNIT WILL NOT ROLL BEFORE RELEASING BRAKES. A JACK CAN SLIP OR FALL OVER. SERIOUS PERSONAL INJURY CAN RESULT.



**WARNING**

**PARTS CLEANING**

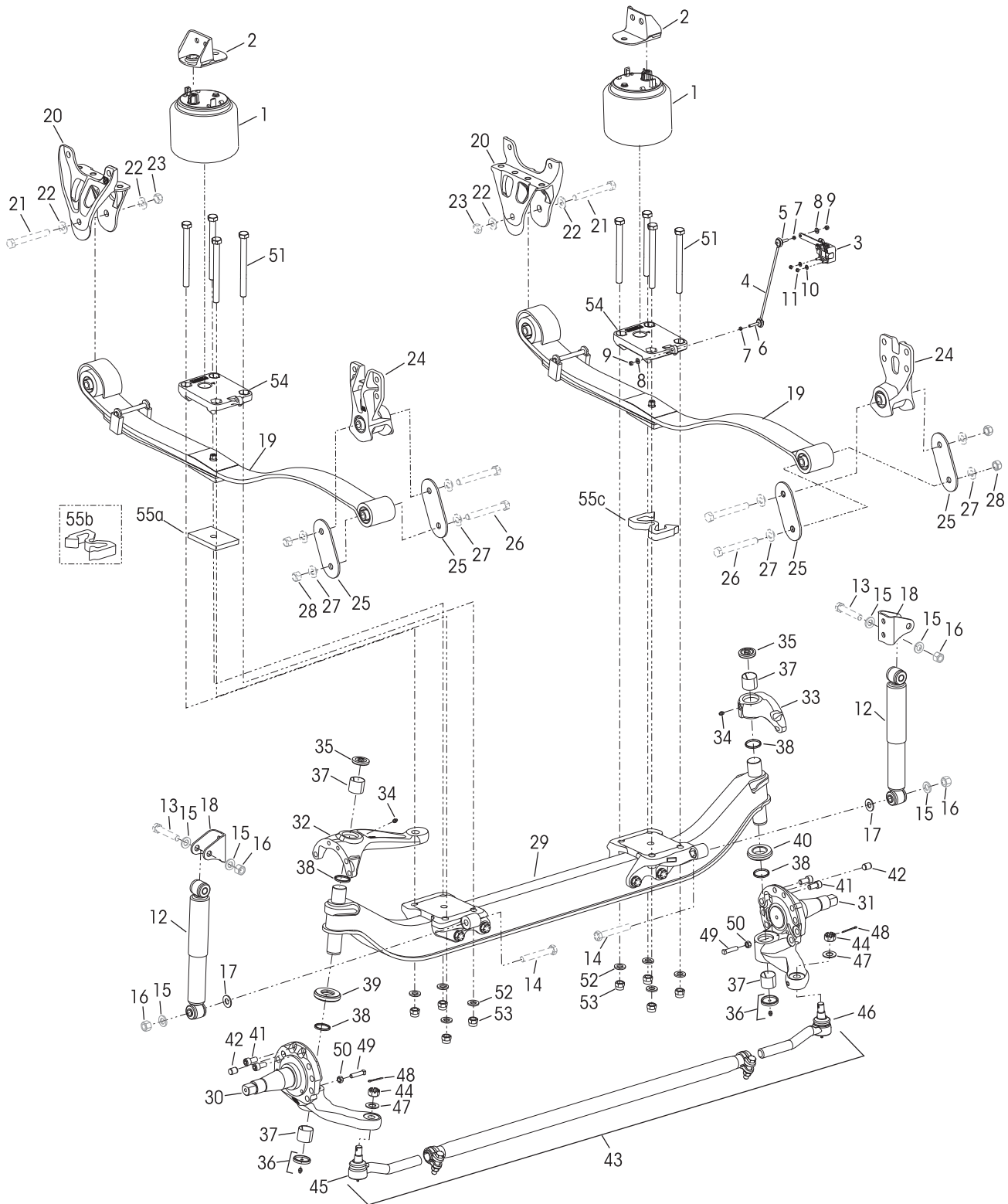
SOLVENT CLEANERS CAN BE FLAMMABLE, POISONOUS AND CAUSE BURNS. TO HELP AVOID SERIOUS PERSONAL INJURY, CAREFULLY FOLLOW THE MANUFACTURER'S PRODUCT INSTRUCTIONS AND GUIDELINES AND THE FOLLOWING PROCEDURES:

1. WEAR PROPER EYE PROTECTION.
2. WEAR CLOTHING THAT PROTECTS YOUR SKIN.
3. WORK IN A WELL VENTILATED AREA.
4. DO NOT USE GASOLINE, OR SOLVENTS THAT CONTAIN GASOLINE. GASOLINE CAN EXPLODE.
5. HOT SOLUTION TANKS OR ALKALINE SOLUTIONS MUST BE USED CORRECTLY. FOLLOW THE MANUFACTURER'S RECOMMENDED INSTRUCTIONS AND GUIDELINES CAREFULLY TO HELP PREVENT PERSONAL ACCIDENT OR INJURY.

DO NOT USE HOT SOLUTION TANKS OR WATER AND ALKALINE SOLUTIONS TO CLEAN GROUND OR POLISHED PARTS. DOING SO WILL CAUSE DAMAGE TO THE PARTS AND VOID ANY APPLICABLE WARRANTY.

# SECTION 4 Parts Lists

■ AIRTEK with STEERTEK NXT axle for Blue Bird Vision Vehicles built  
AFTER October 2012 –10K Capacity

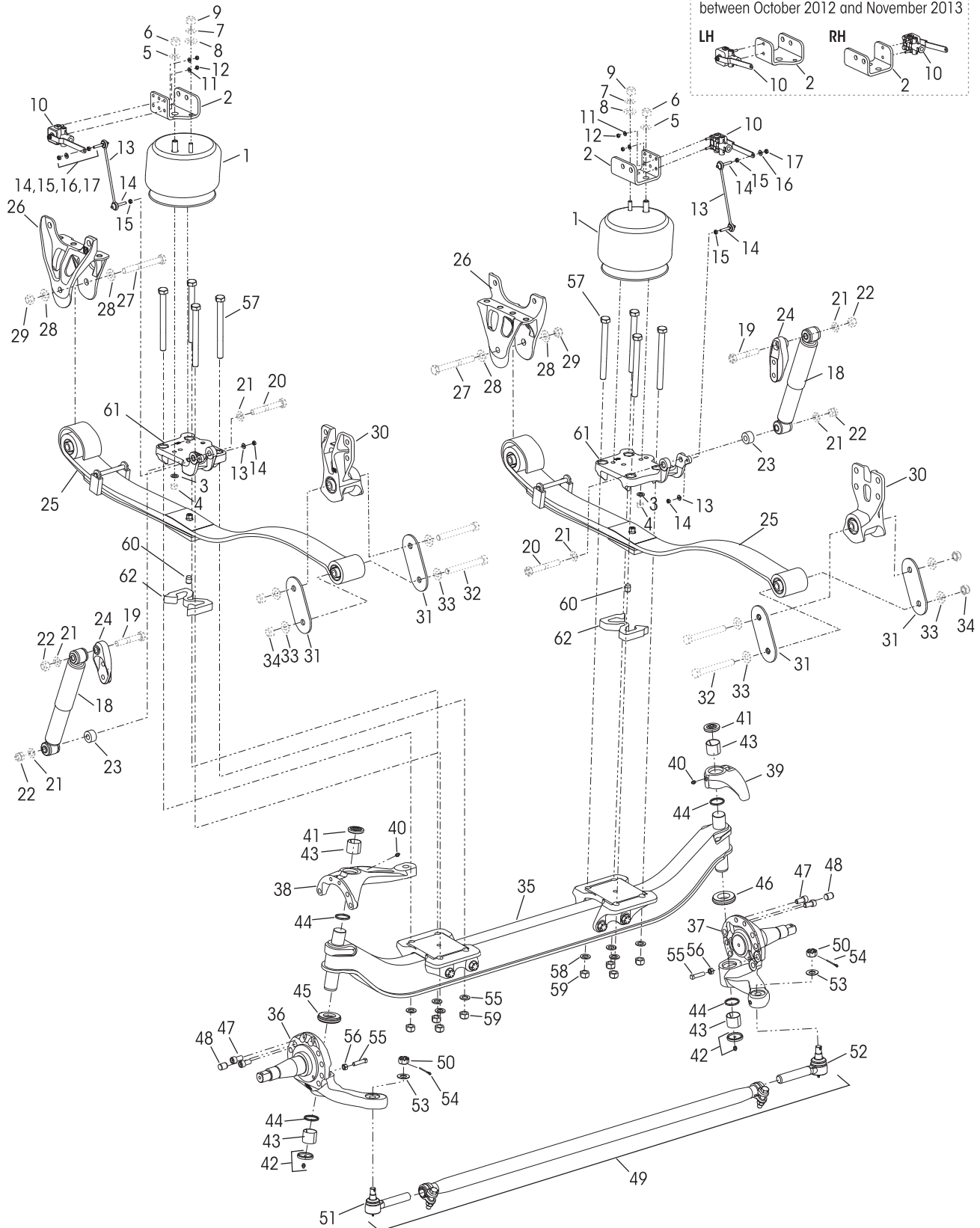
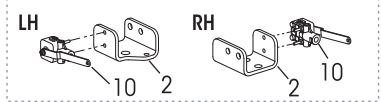




KEY NO.	PART NO.	DESCRIPTION	NO.REQ.	KEY NO.	PART NO.	DESCRIPTION	NO.REQ.
1	64075-002L	Air Spring	2		60961-628	<b>Kingpin Bushing and Bearing Service Kit, Axle Set</b> , Includes Kit Nos. 60961-629 & -630	
2	60850-001	Air Spring Bracket	2		60961-629	<b>LH Kingpin Bushing w/Composite Thrust Bearing Service Kit</b> , Includes Key Nos. 34-39, 41, Loctite	
	59427-008	HCV, Link Mount & Linkage Assembly, Includes Key Nos. 3-11	1		60961-630	<b>RH Kingpin Bushing w/Roller Thrust Bearing Service Kit</b> , Includes Key Nos. 34-38, 40-41 & Loctite	
3	59935-004	Height Control Valve	1	34	33117-000	Grease Zerk	2
4	59428-001	HCV Linkage	1	35	68687-003	Grease Cap Assembly, Upper	2
	64742-001	<b>Link Mount Service Kit</b> , Includes Key Nos. 5-6		36	68687-002	Grease Cap Assembly, Lower	2
5		* $\frac{5}{16}$ "-18 UNC Stud - 2.07"	1	37	58909-001	Kingpin Bushing	4
6		* $\frac{5}{16}$ "-18 UNC Stud - 2.44"	1		60961-631	<b>Thrust Bearing Service Kit, Axle Set</b> , Includes Kit Nos. 60961-632 & -633	
7		* $\frac{5}{16}$ "-18 UNC Hex Nut	2		60961-632	<b>LH Composite Thrust Bearing Service Kit</b> , Includes Key Nos. 38-39, 41 & Loctite	
8		* $\frac{5}{16}$ " Hardened Washer	2		60961-633	<b>RH Roller Thrust Bearing Service Kit</b> , Includes Key Nos. 38, 40-41 & Loctite	
9		* $\frac{5}{16}$ "-18 UNC Locknut	2	38	68731-000	Kingpin Seal	4
10		* $\frac{1}{4}$ " Hardened Washer	2	39	59828-000	LH Composite Thrust Bearing	1
11		* $\frac{1}{4}$ "-20 UNC Locknut	2	40	64256-000	RH Roller Thrust Bearing	1
12	58913-009L	Shock Absorber	2	41	60236-001	$\frac{5}{8}$ " Socket Head Cap Screw	4
13		** $\frac{3}{4}$ "-10 UNC Upper Shock Bolt	2	Not Shown	60937-000	Loctite® (Red) Compound Tube	1
14		** $\frac{3}{4}$ "-10 UNC Lower Shock Bolt	2	42	64246-000	ABS Sensor Sleeve	2
15		** $\frac{3}{4}$ " Hardened Washer	6	43		***Tie Rod Assembly, 10K, 5.36" Drop, Includes Key Nos. 44-46, See Selection Guide on page 27	1
16		** $\frac{3}{4}$ "-10 UNC Hex Locknut	4		44	* $\frac{7}{8}$ " Castle Nut	2
17	22962-046	Shock Spacer (Flat Washer) - 0.118" Thick	2			*** <b>Tie Rod End Service Kit, Axle Set</b> , Includes LH and RH Kits, See Selection Guide on page 27	
18	59423-002	Shock Bracket	2			*** <b>LH Tie Rod End Service Kit</b> , Includes Key Nos. 45, 47-48, See Selection Guide on page 27	
19	53487-000	Leaf Spring Assembly	2			*** <b>RH Tie Rod End Service Kit</b> , Includes Key Nos. 46-48, See Selection Guide on page 27	
20	64488-002	Front Hanger	2	45		***LH Tie Rod End, See Selection Guide on page 27	1
21		**M20 Hex Bolt - 170 mm	2	46		***RH Tie Rod End, See Selection Guide on page 27	1
22		**M20 Hardened Washer	4	47	22962-007	$\frac{7}{8}$ " Flat Washer	2
23		**M20 Locknut	2	48	17800-004	Tie Rod Nut Cotter Pin	2
24	66510-001	Rear Shackle Bracket	2		60961-069	<b>Stop Bolt Service Kit, One Side</b> , Includes Key Nos. 49-50	
25	64314-000	Rear Shackle Plate	4	49	60238-001	$\frac{1}{2}$ "-13 UNC Square Head Bolt	2
26		**M20 Hex Bolt - 150 mm	4	50	60240-000	$\frac{1}{2}$ "-13 UNC Hex Jam Nut	2
27		**M20 Hardened Washer	8			<b>Clamp Group Service Kit, One Side</b> , Includes Key Nos. 51-53	
28		**M20 Locknut	4		60961-673	6.5" Ride Height	
	68987-XXX	STEERTEK NXT Axle Assembly, Includes Key Nos. 29-33, 39-41, 43, 47-48. Contact Hendrickson Tech Services for Part Number	1		60961-674	8.5" Ride Height	
29	68986-001M	Axle & Kingpin Assembly, Narrow 6.5", 8.5" Ride Height	1	51		$\frac{3}{4}$ "-16 UNF Hex bolt	8
30		LH Lower Steering Knuckle Assembly, Includes Key Nos. 36-38, 49-50	1		21867-036	6.5" Ride Height - 5.0"	
	58900-235	150 Ackermann Air Brake, Includes Key No. 42			21867-006	8.5" Ride Height - 7.0"	
	58900-233	200 Ackermann Air Brake, Includes Key No. 42		52	22962-001	$\frac{3}{4}$ " Flat Washer	8
	58900-231	250 Ackermann Air Brake, Includes Key No. 42		53	17700-035	$\frac{3}{4}$ "-16 UNF 2B Nylon Locknut	8
	58900-255	150 Ackermann Hydraulic Brake		54		Top Pad	
	58900-253	200 Ackermann Hydraulic Brake			64516-001	LH	1
	58900-251	250 Ackermann Hydraulic Brake			64516-002	RH	1
31		RH Lower Steering Knuckle Assembly, Includes Key Nos. 36-38, 49-50	1	55		Front Axle Spacer	1
	58900-236	150 Ackermann Air Brake, Includes Key No. 42		a	70105-010	LH 6.5" Ride Height - 10 mm	
	58900-234	200 Ackermann Air Brake, Includes Key No. 42		b	64536-060	LH 8.5" Ride Height - 60 mm	
	58900-232	250 Ackermann Air Brake, Includes Key No. 42		c	64536-050	RH 8.5" Ride Height - 50 mm	
	58900-256	150 Ackermann Hydraulic Brake		Not Shown	18831-021	Dowel Pin 2.0" - 8.5" Ride Height	2
	58900-254	200 Ackermann Hydraulic Brake					
	58900-252	250 Ackermann Hydraulic Brake					
32		LH Upper Steering Knuckle Assembly, Includes Key Nos. 34-35, 37-38	1				
	60903-216	For Axle Assembly Nos. not included below					
	60903-252	For Axle Assembly Nos. 68987-045 through 68987-048					
33	60904-202	RH Upper Steering Knuckle Assembly, Includes Key Nos. 34-35, 37-38	1				

■ AIRTEK with STEERTEK NXT axle for Blue Bird All American Buses built  
AFTER October 2012 – 13.2K/14.6K Capacity

\*\*\*\*\*HCV Configuration for Vehicles built  
between October 2012 and November 2013

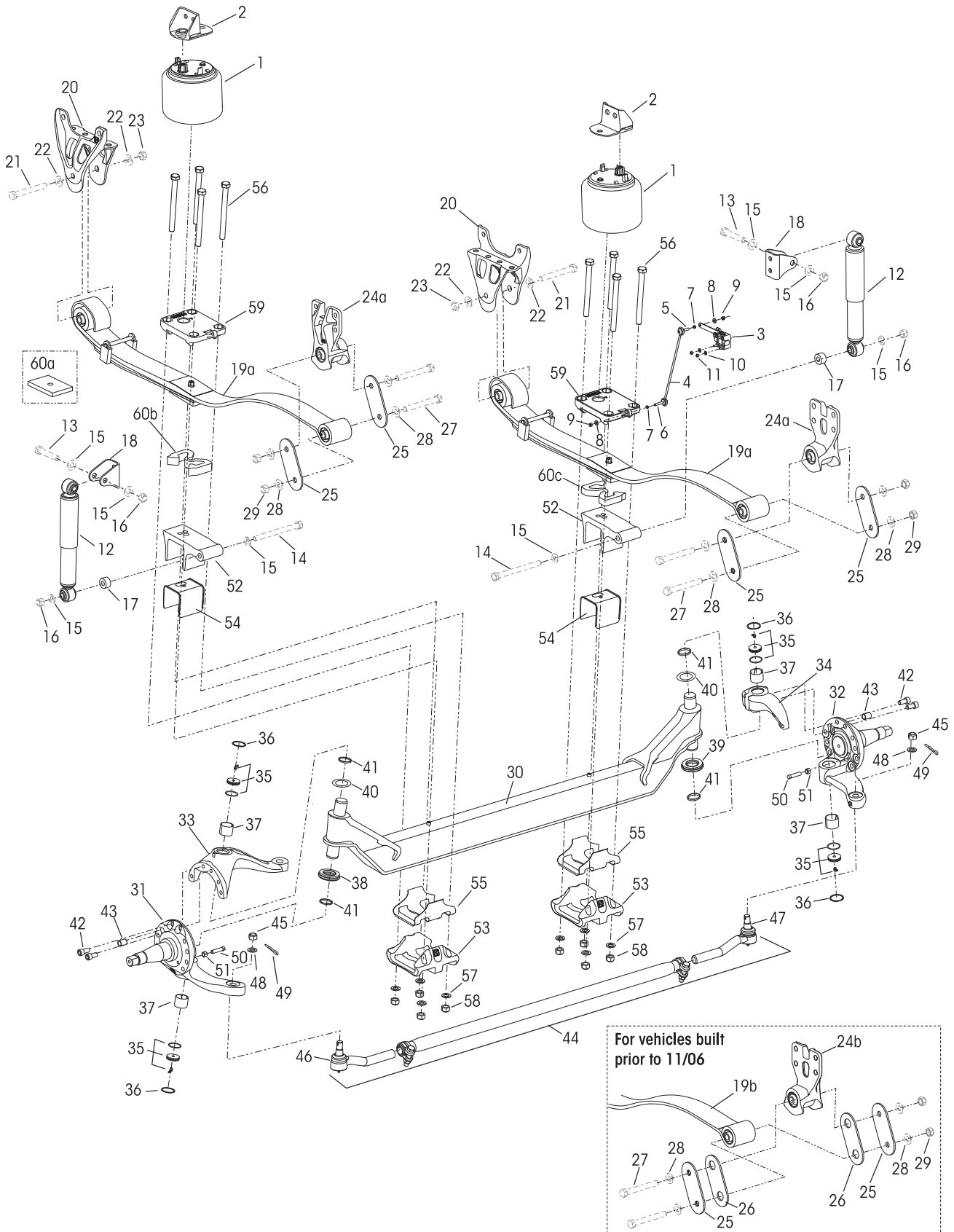




KEY NO.	PART NO.	DESCRIPTION	NO.REQ.	KEY NO.	PART NO.	DESCRIPTION	NO.REQ.
1	66865-002L	Air Spring	2		60961-628	<b>Kingpin Bushing and Bearing Service Kit, Axle Set</b> , Includes Kit Nos. 60961-629 & -630	
2	66807-002	Air Spring Bracket, <i>Replaces 66807-001</i>	2		60961-629	<b>LH Kingpin Bushing w/Composite Thrust Bearing Service Kit</b> , Includes Key Nos. 40-45, 47, Loctite	
3	22962-014	½" Hardened Washer	2		60961-630	<b>RH Kingpin Bushing w/Roller Thrust Bearing Service Kit</b> , Includes Key Nos. 40-44, 46-47 & Loctite	
4		**½"-13 UNC Nylon Locknut	2	40	33117-000	Grease Zerk	2
5		**¾" Hardened Washer	2	41	68687-003	Grease Cap Assembly, Upper	2
6		**¾"-10 UNC Nylon Locknut	2	42	68687-002	Grease Cap Assembly, Lower	2
7		**Hardened Washer	2	43	58909-001	Kingpin Bushing	4
8		**Wide Hardened Washer	2		60961-631	<b>Thrust Bearing Service Kit, Axle Set</b> , Includes Kit Nos. 60961-632 & -633	
9		**½"-13 UNC Nylon Locknut	2		60961-632	<b>LH Composite Thrust Bearing Service Kit</b> , Includes Key Nos. 44-45, 47 & Loctite	
	59013-001	*****Height Control Valve Assembly, Includes Key Nos. 10-12, <i>Replaces 59013-000</i>	2		60961-633	<b>RH Roller Thrust Bearing Service Kit</b> , Includes Key Nos. 44, 46-47 & Loctite	
10	60501-001	Height Control Valve, <i>Replaces 60501-000</i>	2	44	68731-000	Kingpin Seal	4
11	22962-028	¼" Hardened Washer	4	45	59828-000	LH Composite Thrust Bearing	1
12	49983-000	¼"-20 UNC Locknut	4	46	64256-000	RH Roller Thrust Bearing	1
	66825-001	HCV Linkage Assembly, Includes Key Nos. 13-17	2	47	60236-001	⅝" Socket Head Cap Screw	4
13	59428-005	HCV Linkage	2	Not Shown	60937-000	Loctite® (Red) Compound Tube	1
14		*⅝"-18 UNC Stud - 2.44"	4	48	64246-000	ABS Sensor Sleeve	2
15		*⅝"-18 UNC Hex Nut	4	49		***Tie Rod Assembly, 13.2K/14.6K, 4.25" Drop, Includes Key Nos. 50-52, <i>See Selection Guide on page 27</i>	1
16		*⅝" Hardened Washer	4	50		*⅞" Castle Nut	2
17		*⅝"-18 UNC Locknut	4			*** <b>Tie Rod End Service Kit, Axle Set</b> , Includes LH and RH Kits, <i>See Selection Guide on page 27</i>	
18	58913-011L	Shock Absorber	2			*** <b>LH Tie Rod End Service Kit</b> , Includes Key Nos. 51, 53-54, <i>See Selection Guide on page 27</i>	
19		**¾"-10 UNC Upper Shock Bolt	2			*** <b>RH Tie Rod End Service Kit</b> , Includes Key Nos. 52-54, <i>See Selection Guide on page 27</i>	
20		**¾"-10 UNC Lower Shock Bolt	2	51		***LH Tie Rod End, <i>See Selection Guide on page 27</i>	1
21		**¾" Hardened Washer	6	52		***RH Tie Rod End, <i>See Selection Guide on page 27</i>	1
22		**¾"-10 UNC Hex Locknut	4	53	22962-007	⅞" Flat Washer	2
23	59946-006	Shock Spacer	2	54	17800-004	Tie Rod Nut Cotter Pin	2
24	67463-002	Shock Bracket	2		60961-069	<b>Stop Bolt Service Kit, One Side</b> , Includes Key Nos. 55-56	
25	53487-000	Leaf Spring Assembly	2	55	60238-001	½"-13 UNC Square Head Bolt	2
26	64488-002	Front Hanger	2	56	60240-000	½"-13 UNC Hex Jam Nut	2
27		**M20 Hex Bolt - 170 mm	2			<b>Clamp Group Service Kit, One side</b> , Includes Key Nos. 57-59	
28		**M20 Hardened Washer	4		60961-673	6.8" Ride Height	
29		**M20 Locknut	2		60961-692	7.8" Ride Height	
30	66510-001	Rear Shackle Bracket	2		60961-674	8.8" Ride Height	
31	64314-000	Rear Shackle Plate	4		60961-693	9.8" Ride Height	
32		**M20 Hex Bolt - 150 mm	4	57		¾"-16 UNF Hex bolt	8
33		**M20 Hardened Washer	8		21867-036	6.8" Ride Height - 5.0"	
34		**M20 Locknut	4		21867-007	7.8" Ride Height - 6.0"	
	68987-XXX	STEERTEK NXT Axle Assembly, Includes Key Nos. 35-39, 45-47, 49, 53-54. Contact Hendrickson Tech Service for Part Number	1		21867-006	8.8" Ride Height - 7.0"	
35		Axle & Kingpin Assembly 6.8", 7.8", 8.8" and 9.8" Ride Height	1		21867-004	9.8" Ride Height - 8.0"	
	68986-005M	13.2K, Narrow		58	22962-001	¾" Flat Washer	8
	68986-002M	14.6K, Wide		59	17700-035	¾"-16 UNF 2B Nylon Locknut	8
36		LH Lower Steering Knuckle Assembly Includes Key Nos. 42-44, 55-56	1	60		Dowel Pin	2
	58900-235	150 Ackermann Air Brake, Includes Key No. 48				6.8" Ride Height	None Req.
	58900-233	200 Ackermann Air Brake, Includes Key No. 48			18831-022	7.8" Ride Height - 1.13"	
	58900-231	250 Ackermann Air Brake, Includes Key No. 48			18831-021	8.8" Ride Height - 2.0"	
	58900-255	150 Ackermann Hydraulic Brake			18831-023	9.8" Ride Height - 3.0"	
	58900-253	200 Ackermann Hydraulic Brake		61		Top Pad	
	58900-251	250 Ackermann Hydraulic Brake			66814-001	LH	1
37		RH Lower Steering Knuckle Assembly Includes Key Nos. 42-44, 55-56	1		66814-002	RH	1
	58900-236	150 Ackermann Air Brake, Includes Key No. 48		62		LH/RH Front Axle Spacer	2
	58900-234	200 Ackermann Air Brake, Includes Key No. 48				6.8" Ride Height	None Req.
	58900-232	250 Ackermann Air Brake, Includes Key No. 48			64536-025	7.8" Ride Height - 25 mm	
	58900-256	150 Ackermann Hydraulic Brake			64536-050	8.8" Ride Height - 50 mm	
	58900-254	200 Ackermann Hydraulic Brake			64536-075	9.8" Ride Height - 75 mm	
	58900-252	250 Ackermann Hydraulic Brake					
38		LH Upper Steering Knuckle Assembly Includes Key Nos. 40-41, 43-44	1				
	60903-255	14.6K					
	60903-258	13.2K	1				
39	60904-202	RH Upper Steering Knuckle Assembly Includes Key Nos. 40-41, 43-44	1				



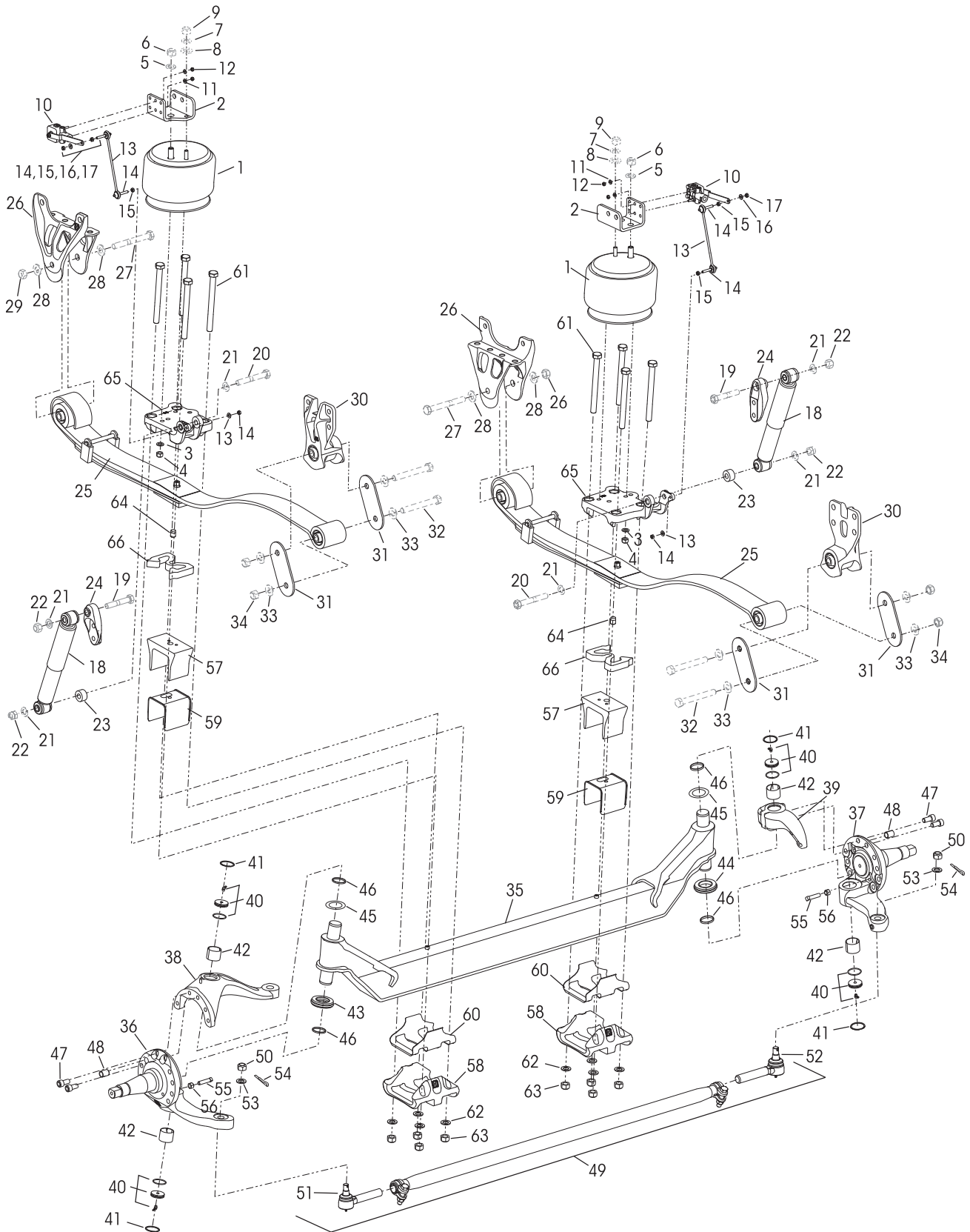
■ AIRTEK with STEERTEK axle for Blue Bird Vision Buses built PRIOR to October 2012 – 10K Capacity





KEY NO.	PART NO.	DESCRIPTION	NO.REQ.	KEY NO.	PART NO.	DESCRIPTION	NO.REQ.
1	64075-002L	Air Spring	2		60961-039	<b>RH Kingpin Bushing w/Roller Thrust Bearing Service Kit</b> , Includes Key Nos. 35-37, 39-42 and Loctite	
2	60850-001	Air Spring Bracket	2	35	59156-000	Grease Cap Assembly	4
	59427-008	HCV, Link Mount & Linkage Assembly, Includes Key Nos. 3-11	1	36	58937-000	Retaining Ring	4
3	59935-004	Height Control Valve	1	37	58909-000	Kingpin Bushing	4
4	59428-001	HCV Linkage	1		60961-043	<b>Thrust Bearing Service Kit, Axle Set</b> , Includes Kit Nos. 60961-041 & 60961-042	
	64742-001	Link Mount Service Kit, Includes Key Nos. 5-6			60961-041	<b>LH Composite Thrust Bearing Service Kit</b> , Includes Key Nos. 38, 40-42 and Loctite	
5		* $\frac{5}{16}$ "-18 UNC Stud - 2.07"	1		60961-042	<b>RH Roller Thrust Bearing Service Kit</b> , Includes Key Nos. 39-42 and Loctite	
6		* $\frac{5}{16}$ "-18 UNC Stud - 2.44"	1	38	59828-000	LH Composite Thrust Bearing	1
7		* $\frac{5}{16}$ "-18 UNC Hex Nut	2	39	64256-000	RH Roller Thrust Bearing	1
8		* $\frac{5}{16}$ " Hardened Washer	2	40		Kingpin Shim	
9		* $\frac{5}{16}$ "-18 UNC Locknut	2		60259-002	0.047"	2
10		* $\frac{1}{4}$ " Hardened Washer	2		60259-001	0.005" (As needed for service)	
11		* $\frac{1}{4}$ "-20 UNC Locknut	2	41	58910-001	Kingpin Seal, <i>Replaces 58910-000</i>	4
12	58913-009L	Shock Absorber, <i>Replaces 58913-008</i>	2	42	60236-001	$\frac{5}{8}$ "-11 UNC Socket Head Cap Screw	4
13		** $\frac{3}{4}$ "-10 UNC Upper Shock Bolt	2	Not Shown	60937-000	Loctite (Red) Compound Tube	1
14		** $\frac{3}{4}$ "-10 UNC Lower Shock Bolt	2	43	64246-000	ABS Sensor Sleeve	2
15		** $\frac{3}{4}$ " Hardened Washer	8	44		***Tie Rod Assembly, 10K, 5.36" Drop, Includes Key Nos. 45-47, <i>See Selection Guide on page 27</i>	1
16		** $\frac{3}{4}$ "-10 UNC Hex Locknut	4	45		* $\frac{7}{8}$ " Castle Nut	2
17	59946-001	Shock Spacer	2			*** <b>Tie Rod End Service Kit, Axle Set</b> , Includes LH and RH Kits, <i>See Selection Guide on page 27</i>	
18	59423-002	Shock Bracket	2			*** <b>LH Tie Rod End Service Kit</b> , Includes Key Nos. 46, 48-49, <i>See Selection Guide on page 27</i>	
19		Leaf Spring Assembly	2			*** <b>RH Tie Rod End Service Kit</b> , Includes Key Nos. 47-49, <i>See Selection Guide on page 27</i>	
a	53487-000	For vehicles built after 11/06, <i>Replaces 66805-001</i>		46		***LH Tie Rod End, <i>See Selection Guide on page 27</i>	1
b	60512-000	For vehicles built prior to 11/06		47		***RH Tie Rod End, <i>See Selection Guide on page 27</i>	1
20	64488-002	Front Hanger, <i>Replaces 64488-000</i>	2	48	22962-007	$\frac{7}{8}$ " Flat Washer	2
21		**M20 Hex Bolt - 170 mm	2	49	17800-004	Tie Rod Nut Cotter Pin	2
22		**M20 Hardened Washer	4		60961-069	<b>Stop Bolt Service Kit, One Side</b> , Includes Key Nos. 50-51	
23		**M20 Locknut	2	50	60238-001	$\frac{1}{2}$ "-13 UNC Square Head Bolt	2
24		Rear Shackle Bracket	2	51	60240-000	$\frac{1}{2}$ "-13 UNC Hex Jam Nut	2
a	66510-001	For vehicles built after 11/06		52	59952-003	Top Axle Wrap	2
b	64316-000	For vehicles built prior to 11/06		53	64722-003	Bottom Axle Wrap	2
25	64314-000	Rear Shackle Plate	4		60961-015	<b>Top/Bottom Axle Wrap Liner Service Kit, One Side</b> , Includes Key Nos. 54-55	
26	64159-000	Thrust Washer	4	54	60508-000	Top Axle Wrap Liner	2
		Only for vehicles built prior to 11/06		55	59845-000	Bottom Axle Wrap Liner	2
27		**M20 Hex Bolt - 150 mm	4			<b>Clamp Group Service Kit, One Side</b> , Includes Key Nos. 56-58	
28		**M20 Hardened Washer	8		60961-051	6.5" Ride Height	
29		**M20 Locknut	4		60961-052	8.5" Ride Height	
	60952-XXX	STEERTEK Axle Assembly, Includes Key Nos. 30-36, 38-40, 42, 44, 48-55. Contact Hendrickson Tech Services for Part Number	1	56		$\frac{3}{4}$ "-16 UNF Hex bolt	8
30	64905-004	Axle & Kingpin Assembly, Narrow 6.5", 8.5" Ride Height	1		21867-044	6.5" Ride Height - 10.0"	
31		LH Lower Steering Knuckle Assembly	1		21867-045	8.5" Ride Height - 12.0"	
		Includes Key Nos. 37, 41		57	22962-001	$\frac{3}{4}$ " Flat Washer	8
	58900-035	150 Ackermann Air Brake, Includes Key No. 43		58	17700-035	$\frac{3}{4}$ "-16 UNF 2B Nylon Locknut	8
	58900-033	200 Ackermann Air Brake, Includes Key No. 43		59		Top Pad	
	58900-031	250 Ackermann Air Brake, Includes Key No. 43			64516-001	LH	1
	58900-055	150 Ackermann Hydraulic Brake			64516-002	RH	1
	58900-053	200 Ackermann Hydraulic Brake		60		Front Axle Spacer	1
	58900-051	250 Ackermann Hydraulic Brake		a	70105-010	LH 6.5" Ride Height - 10 mm, <i>Replaces 64536-010</i>	
32		RH Lower Steering Knuckle Assembly	1		64536-060	LH 8.5" Ride Height - 60 mm	
		Includes Key Nos. 37, 41		c	64536-050	RH 8.5" Ride Height - 50 mm	
	58900-036	150 Ackermann Air Brake, Includes Key No. 43		Not Shown	18831-021	Dowel Pin 2.0", 8.5" Ride Height	2
	58900-034	200 Ackermann Air Brake, Includes Key No. 43					
	58900-032	250 Ackermann Air Brake, Includes Key No. 43					
	58900-056	150 Ackermann Hydraulic Brake					
	58900-054	200 Ackermann Hydraulic Brake					
	58900-052	250 Ackermann Hydraulic Brake					
33	60903-016	LH Upper Steering Knuckle Assembly	1				
		Includes Key Nos. 37, 41					
34	60904-002	RH Upper Steering Knuckle Assembly	1				
		Includes Key Nos. 37, 41					
	60961-040	<b>Kingpin Bushing and Bearing Service Kit, Axle Set</b> , Includes Kit Nos. 60961-009 & -039					
	60961-009	<b>LH Kingpin Bushing w/Composite Thrust Bearing Service Kit</b> , Includes Key Nos. 35-38, 40-42 and Loctite					

■ AIRTEK with STEERTEK axle for Blue Bird All American Buses built  
PRIOR to October 2012 – 13.2K/14.6K Capacity

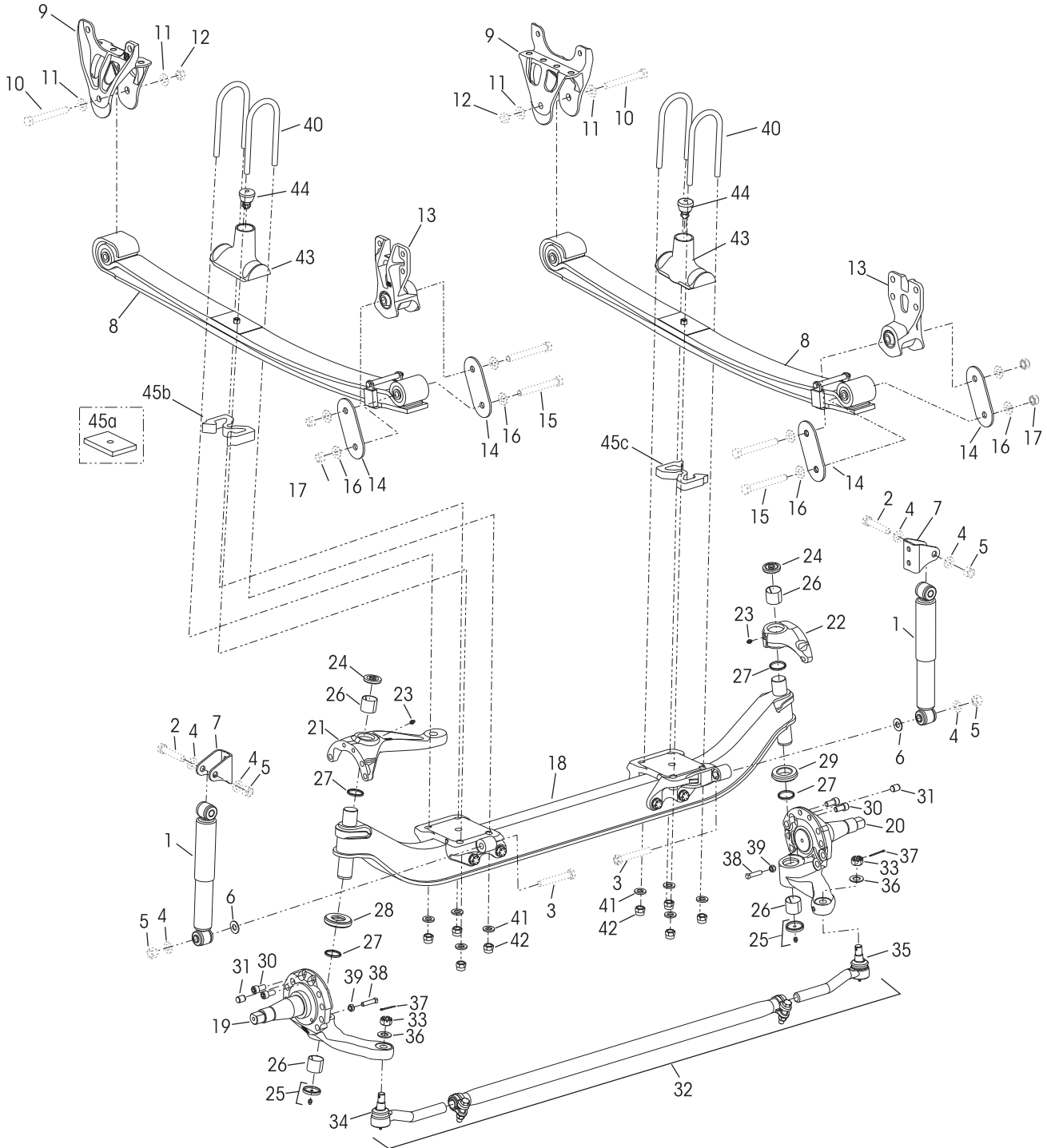






KEY NO.	PART NO.	DESCRIPTION	NO.REQ.	KEY NO.	PART NO.	DESCRIPTION	NO.REQ.
1	66865-002L	Air Spring	2		60961-039	<b>RH Kingpin Bushing w/Roller Thrust Bearing Service Kit</b> , Includes Key Nos. 40-42, 44-47 and Loctite	
2	66807-002	Air Spring Bracket, <i>Replaces 66807-001</i>	2	40	59156-000	Grease Cap Assembly	4
3	22962-014	½" Hardened Washer	2	41	58937-000	Retaining Ring	4
4	17730-032	½"-13 UNC Nylon Locknut	2	42	58909-000	Kingpin Bushing	4
5		**¾" Hardened Washer	2		60961-043	<b>Thrust Bearing Service Kit, Axle Set</b> , Includes Kit Nos. 60961-041 & 60961-042	
6		**¾"-10 UNC Nylon Locknut	2		60961-041	<b>LH Composite Thrust Bearing Service Kit</b> , Includes Key Nos. 43, 45-47 and Loctite	
7		**Hardened Washer	2		60961-042	<b>RH Roller Thrust Bearing Service Kit</b> , Includes Key Nos. 44-47 and Loctite	
8		**Wide Hardened Washer	2	43	59828-000	LH Composite Thrust Bearing	1
9		**½"-13 UNC Nylon Locknut	2	44	64256-000	RH Roller Thrust Bearing	1
	59013-000	*****Height Control Valve Assembly, Includes Key Nos. 10-12	2	45	60259-002	Kingpin Shim - 0.047"	2
10	60501-000	Height Control Valve	2		60259-001	Kingpin Shim - 0.005" (As needed for service)	
11	22962-028	¼" Hardened Washer	4	46	58910-001	Kingpin Seal, <i>Replaces 58910-000</i>	4
12	49983-000	¼"-20 UNC Locknut	4	47	60236-001	¾"-11 UNC Socket Head Cap Screw	4
	66825-001	HCV Linkage Assembly, Includes Key Nos. 13-17	2	Not Shown	60937-000	Loctite (Red) Compound Tube	1
13	59428-005	HCV Linkage	2	48	64246-000	ABS Sensor Sleeve	2
14		*⅝"-18 UNC Stud - 2.44"	4	49		***Tie Rod Assembly, 13.2K/14.6K, 4.25" Drop, Includes Key Nos. 50-52, <i>See Selection Guide on page 27</i>	1
15		*⅝"-18 UNC Hex Nut	4	50		*⅞" Castle Nut	2
16		*⅝" Hardened Washer	4			*** <b>Tie Rod End Service Kit, Axle Set</b> , Includes LH and RH Kits, <i>See Selection Guide on page 27</i>	
17		*⅝"-18 UNC Locknut	4			*** <b>LH Tie Rod End Service Kit</b> , Includes Key Nos. 51, 53-54, <i>See Selection Guide on page 27</i>	
18	58913-011L	Shock Absorber	2			*** <b>RH Tie Rod End Service Kit</b> , Includes Key Nos. 52-54, <i>See Selection Guide on page 27</i>	
19		**¾"-10 UNC Upper Shock Bolt	2	51		***LH Tie Rod End, <i>See Selection Guide on page 27</i>	1
20		**¾"-10 UNC Lower Shock Bolt	2	52		***RH Tie Rod End, <i>See Selection Guide on page 27</i>	1
21		**¾" Hardened Washer	6	53	22962-007	⅞" Flat Washer	2
22		**¾"-10 UNC Hex Locknut	4	54	17800-004	Tie Rod Nut Cotter Pin	2
23	59946-006	Shock Spacer	2		60961-069	<b>Stop Bolt Service Kit, One Side</b> , Includes Key Nos. 55-56	
24	67463-002	Shock Bracket, <i>Replaces 65000-002</i>	2	55	60238-001	½"-13 UNC Square Head Bolt	2
25	53487-000	Leaf Spring Assembly, <i>Replaces 66805-001</i>	2	56	60240-000	½"-13 UNC Hex Jam Nut	2
26	64488-002	Front Hanger	2	57	59952-026	Top Axle Wrap	2
27		**M20 Hex Bolt - 170 mm	2	58	64722-003	Bottom Axle Wrap	2
28		**M20 Hardened Washer	4		60961-015	<b>Top/Bottom Axle Wrap Liner Service Kit, One Side</b> , Includes Key Nos. 59-60	
29		**M20 Locknut	2	59	60508-000	Top Axle Wrap Liner	2
30	66510-001	Rear Shackle Bracket	2	60	59845-000	Bottom Axle Wrap Liner	2
31	64314-000	Rear Shackle Plate	4			<b>Clamp Group Service Kit, One side</b> , Includes Key Nos. 61-63	
32		**M20 Hex Bolt - 150 mm	4		60961-051	6.8" Ride Height	
33		**M20 Hardened Washer	8		60961-146	7.8" Ride Height	
34		**M20 Locknut	4		60961-052	8.8" Ride Height	
	60952-XXX	STEERTEK Axle Assembly, Includes Key Nos. 35-41, 43-45, 47, 49, 53-60. Contact Hendrickson Tech Service for Part Number	1		60961-147	9.8" Ride Height	
35		Axle & Kingpin Assembly 6.8", 7.8", 8.8" and 9.8" Ride Height	1	61	21867-044	¾"-16 UNF Hex bolt 6.8" Ride Height - 10.0"	8
	64905-004	13.2K, Narrow			21867-027	7.8" Ride Height - 11.0"	
	64905-007	14.6K, Wide			21867-045	8.8" Ride Height - 12.0"	
36		LH Lower Steering Knuckle Assembly, Includes Key Nos. 42, 46	1		21867-035	9.8" Ride Height - 13.0"	
	58900-035	150 Ackermann Air Brake, Includes Key No. 48		62	22962-001	¾" Flat Washer	8
	58900-033	200 Ackermann Air Brake, Includes Key No. 48		63	17700-035	¾"-16 UNF 2B Nylon Locknut	8
	58900-031	250 Ackermann Air Brake, Includes Key No. 48		64		Dowel Pin 6.8" Ride Height None Req.	2
	58900-055	150 Ackermann Hydraulic Brake			18831-022	7.8" Ride Height - 1.13"	
	58900-053	200 Ackermann Hydraulic Brake			18831-021	8.8" Ride Height - 2.0"	
	58900-051	250 Ackermann Hydraulic Brake			18831-023	9.8" Ride Height - 3.0"	
37		RH Lower Steering Knuckle Assembly, Includes Key Nos. 42, 46	1	65	66814-001	****LH Top Pad	1
	58900-036	150 Ackermann Air Brake, Includes Key No. 48			66814-002	****RH Top Pad	1
	58900-034	200 Ackermann Air Brake, Includes Key No. 48		66		LH/RH Front Axle Spacer 6.8" Ride Height None Req.	2
	58900-032	250 Ackermann Air Brake, Includes Key No. 48			64536-025	7.8" Ride Height - 25 mm	
	58900-056	150 Ackermann Hydraulic Brake			64536-050	8.8" Ride Height - 50 mm	
	58900-054	200 Ackermann Hydraulic Brake			64536-075	9.8" Ride Height - 75 mm	
	58900-052	250 Ackermann Hydraulic Brake					
38		LH Upper Steering Knuckle Assembly, Includes Key Nos. 42, 46	1				
	60903-058	13.2K					
	60903-055	14.6K					
39	60904-002	RH Upper Steering Knuckle Assembly, Includes Key Nos. 42, 46	1				
	60961-040	<b>Kingpin Bushing and Bearing Service Kit, Axle Set</b> , Includes Kit Nos. 60961-009 & -039					
	60961-009	<b>LH Kingpin Bushing w/Composite Thrust Bearing Service Kit</b> , Includes Key Nos. 40-43, 45-47 and Loctite					

■ SOFTEK with STEERTEK NXT axle for Blue Bird Vision Buses built AFTER October 2012 – 8.5K/10K Capacity

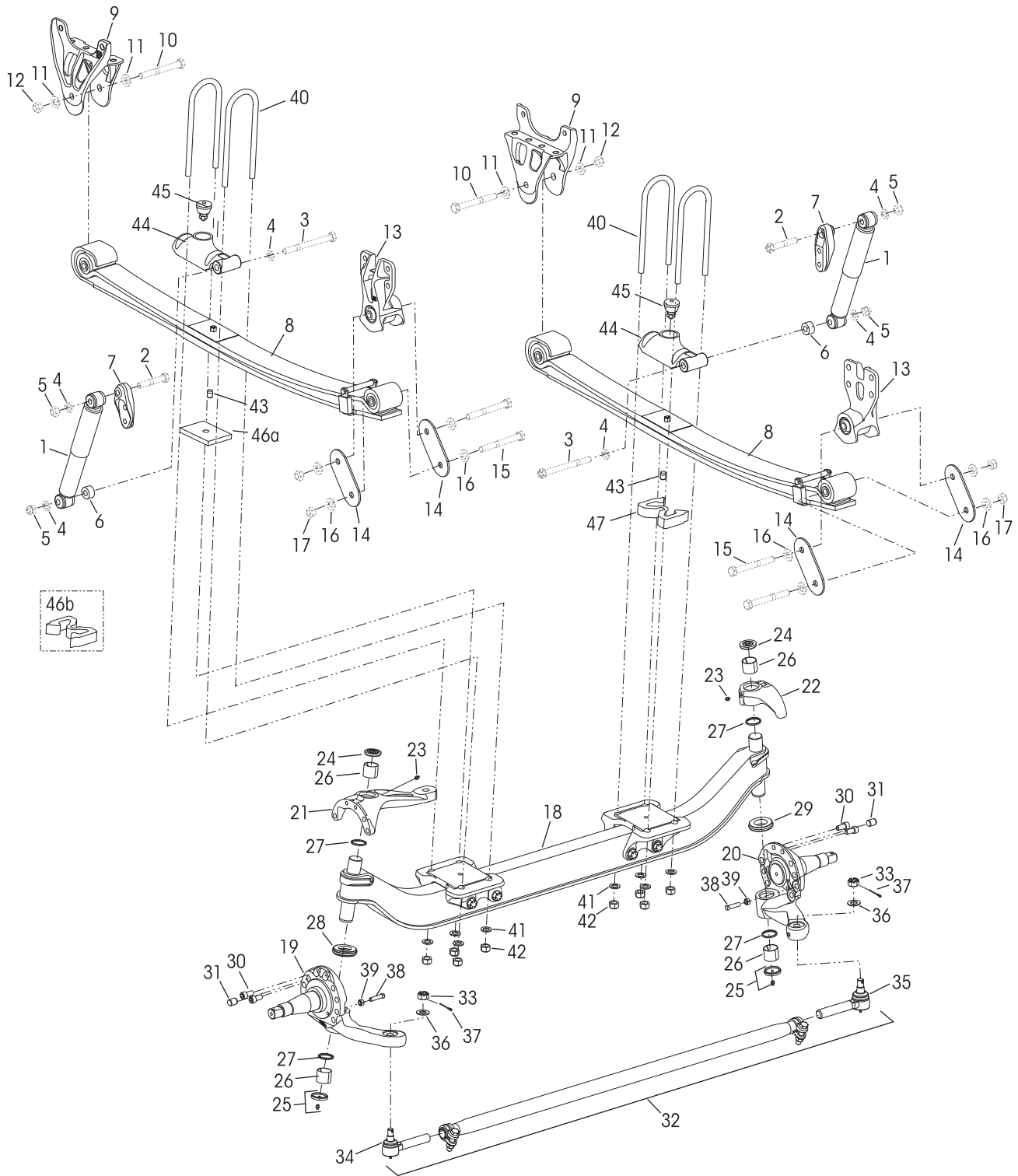




KEY NO.	PART NO.	DESCRIPTION	NO.REQ.	KEY NO.	PART NO.	DESCRIPTION	NO.REQ.
1	58913-009L	Shock Absorber	2	26	58909-001	Kingpin Bushing	4
2		**3/4"-10 UNC Upper Shock Bolt	2		60961-631	<b>Thrust Bearing Service Kit, Axle Set,</b> Includes Kit Nos. 60961-632 & -633	
3		**3/4"-10 UNC Lower Shock Bolt	2		60961-632	<b>LH Composite Thrust Bearing Service Kit,</b> Includes Key Nos. 27-28, 30 & Loctite	
4		**3/4" Hardened Washer	6		60961-633	<b>RH Roller Thrust Bearing Service Kit,</b> Includes Key Nos. 27, 29-30 & Loctite	
5		**3/4"-10 UNC Hex Locknut	4	27	68731-000	Kingpin Seal	4
6	22962-046	Shock Spacer (Flat Washer) - 0.118" Thick	2	28	59828-000	LH Composite Thrust Bearing	1
7	59423-002	Shock Bracket	2	29	64256-000	RH Roller Thrust Bearing	1
8		Leaf Spring Assembly	2	30	60236-001	3/8" Socket Head Cap Screw	4
	53627-000	8.5K, <i>Replaces 66623-001</i>		Not Shown	60937-000	Loctite® (Red) Compound Tube	1
	53624-000	10K, <i>Replaces 66624-001</i>		31	64246-000	ABS Sensor Sleeve	2
9	64488-002	Front Hanger	2	32		***Tie Rod Assembly, 10K, 5.36" Drop, Includes Key Nos. 33-35, <i>See Selection Guide on page 27</i>	1
10		**M20 Hex Bolt - 170 mm	2	33		*7/8" Castle Nut	2
11		**M20 Hardened Washer	4			*** <b>Tie Rod End Service Kit, Axle Set,</b> Includes LH and RH Kits, <i>See Selection Guide on page 27</i>	
12		**M20 Locknut	2			*** <b>LH Tie Rod End Service Kit,</b> Includes Key Nos. 34, 36-37, <i>See Selection Guide on page 27</i>	
13	66510-001	Rear Shackle Bracket	2			*** <b>RH Tie Rod End Service Kit,</b> Includes Key Nos. 35-37, <i>See Selection Guide on page 27</i>	
14	64314-000	Rear Shackle Plate	4	34		***LH Tie Rod End, <i>See Selection Guide on page 27</i>	1
15		**M20 Hex Bolt - 150 mm	4	35		***RH Tie Rod End, <i>See Selection Guide on page 27</i>	1
16		**M20 Hardened Washer	8	36	22962-007	7/8" Flat Washer	2
17		**M20 Locknut	4	37	17800-004	Tie Rod Nut Cotter Pin	2
	68987-XXX	STEERTEK NXT Axle Assembly, Includes Key Nos. 18-22, 28-30, 32, 36-37, Contact Hendrickson Tech Service for Part Number	1		60961-069	<b>Stop Bolt Service Kit, One Side,</b> Includes Key Nos. 38-39	
18	68986-001M	Axle & Kingpin Assembly, Narrow 6.5", 8.5" Ride Height	1	38	60238-001	1/2"-13 UNC Square Head Bolt	2
19		LH Lower Steering Knuckle Assembly Includes Key Nos. 25-27, 38-39	1	39	60240-000	1/2"-13 UNC Hex Jam Nut	2
	58900-235	150 Ackermann Air Brake, Includes Key No. 31				<b>Clamp Group Service Kit, One side,</b> Includes Key Nos. 40-42	
	58900-233	200 Ackermann Air Brake, Includes Key No. 31			60961-669	6.5" Ride Height	
	58900-231	250 Ackermann Air Brake, Includes Key No. 31			60961-671	8.5" Ride Height	
	58900-255	150 Ackermann Hydraulic Brake		40		3/4"-16 UNF U-bolt	4
	58900-253	200 Ackermann Hydraulic Brake			64804-065	6.5" Ride Height	
	58900-251	250 Ackermann Hydraulic Brake			64804-085	8.5" Ride Height	
20		RH Lower Steering Knuckle Assembly Includes Key Nos. 25-27, 38-39	1	41	22962-001	3/4" Flat Washer	8
	58900-236	150 Ackermann Air Brake, Includes Key No. 31		42	17700-035	3/4"-16 UNF 2B Nylon Locknut	8
	58900-234	200 Ackermann Air Brake, Includes Key No. 31			64506-000	Top Pad/Axle Stop Assembly, Includes Key Nos. 43-44	
	58900-232	250 Ackermann Air Brake, Includes Key No. 31		43	64519-000	Top Pad	2
	58900-256	150 Ackermann Hydraulic Brake		44	64080-000	Rubber Axle Stop	2
	58900-254	200 Ackermann Hydraulic Brake		45		Front Axle Spacer	1
	58900-252	250 Ackermann Hydraulic Brake		a	70105-010	LH 6.5" Ride Height - 10 mm	
21	60903-216	LH Upper Steering Knuckle Assembly Includes Key Nos. 23-24, 26-27	1	b	64536-060	LH 8.5" Ride Height - 60 mm	
22	60904-202	RH Upper Steering Knuckle Assembly Includes Key Nos. 23-24, 26-27	1	c	64536-050	RH 8.5" Ride Height - 50 mm	
	60961-628	<b>Kingpin Bushing and Bearing Service Kit, Axle Set,</b> Includes Kit Nos. 60961-629 & -630		Not Shown	18831-021	Dowel Pin 2.0", 8.5" Ride Height	2
	60961-629	<b>LH Kingpin Bushing w/Composite Thrust Bearing Service Kit,</b> Includes Key Nos. 23-28, 30, Loctite					
	60961-630	<b>RH Kingpin Bushing w/Roller Thrust Bearing Service Kit,</b> Includes Key Nos. 23-27, 29-30 & Loctite					
23	33117-000	Grease Zerk	2				
24	68687-003	Grease Cap Assembly, Upper	2				
25	68687-002	Grease Cap Assembly, Lower	2				



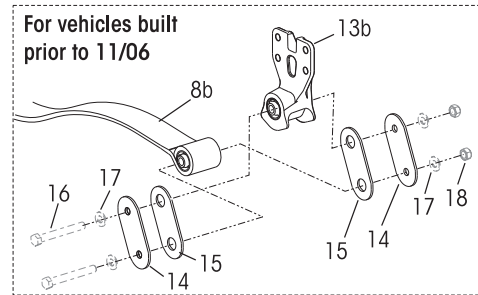
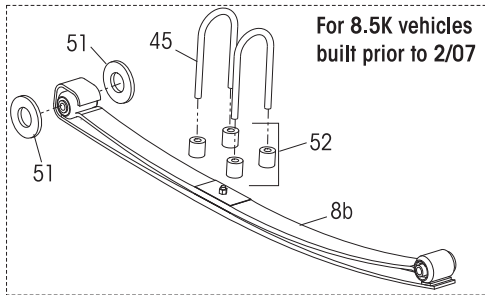
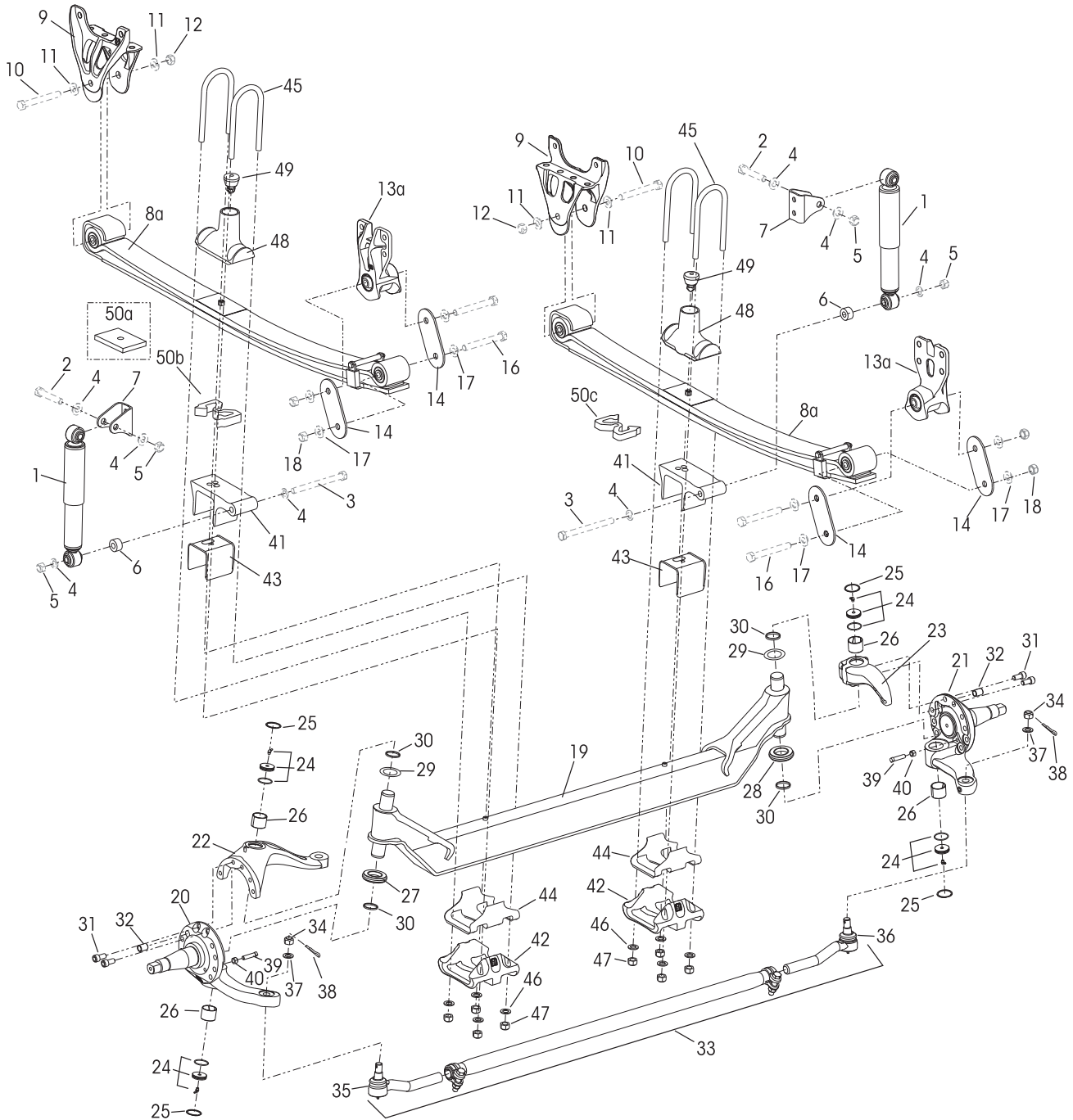
■ SOFTEK with STEERTEK NXT axle for Blue Bird All American buses built AFTER October 2012 – 13.2K/14.6K Capacity





KEY NO.	PART NO.	DESCRIPTION	NO.REQ.	KEY NO.	PART NO.	DESCRIPTION	NO.REQ.
1	58913-010L	Shock Absorber	2		60961-633	<b>RH Roller Thrust Bearing Service Kit,</b> Includes Key Nos. 27, 29-30 & Loctite	
2		**3/4"-10 UNC Upper Shock Bolt	2	27	68731-000	Kingpin Seal	4
3		**3/4"-10 UNC Lower Shock Bolt	2	28	59828-000	LH Composite Thrust Bearing	1
4		**3/4" Hardened Washer	6	29	64256-000	RH Roller Thrust Bearing	1
5		**3/4"-10 UNC Hex Locknut	4	30	60236-001	3/8" Socket Head Cap Screw	4
6	59946-001	Shock Spacer	2	Not Shown	60937-000	Loctite® (Red) Compound Tube	1
7	67463-002	Shock Bracket	2	31	64246-000	ABS Sensor Sleeve	2
8		Leaf Spring Assembly	2	32		***Tie Rod Assembly, 13.2K/14.6K, 4.25" Drop, Includes Key Nos. 33-35, See Selection Guide on page 27	1
	53625-000	13.2K, Replaces 66625-001		33		*7/8" Castle Nut	2
	53626-000	14.6K, Replaces 66626-001				*** <b>Tie Rod End Service Kit, Axle Set,</b> Includes LH and RH Kits, See Selection Guide on page 27	
9	64488-002	Front Hanger	2			*** <b>LH Tie Rod End Service Kit,</b> Includes Key Nos. 34, 36-37, See Selection Guide on page 27	
10		**M20 Hex Bolt - 170 mm	2			*** <b>RH Tie Rod End Service Kit,</b> Includes Key Nos. 35-37, See Selection Guide on page 27	
11		**M20 Hardened Washer	4	34		***LH Tie Rod End, See Selection Guide on page 27	1
12		**M20 Locknut	2	35		***RH Tie Rod End, See Selection Guide on page 27	1
13	66510-001	Rear Shackle Bracket	2	36	22962-007	7/8" Flat Washer	2
14	64314-000	Rear Shackle Plate	4	37	17800-004	Tie Rod Nut Cotter Pin	2
15		**M20 Hex Bolt - 150 mm	4		60961-069	<b>Stop Bolt Service Kit, One Side,</b> Includes Key Nos. 38-39	
16		**M20 Hardened Washer	8	38	60238-001	1/2"-13 UNC Square Head Bolt	2
17		**M20 Locknut	4	39	60240-000	1/2"-13 UNC Hex Jam Nut	2
	68987-XXX	STEERTEK NXT Axle Assembly, Includes Key Nos. 18-22, 28-30, 32, 36-37, Contact Hendrickson Tech Services for Part Number	1			<b>Clamp Group Service Kit, One side,</b> Includes Key Nos. 40-42	
18		Axle & Kingpin Assembly	1		60961-669	6.8" Ride Height	
		6.8", 7.8", 8.8" and 9.8" Ride Height			60961-670	7.8" Ride Height	
	68986-004M	13.2K, Narrow			60961-671	8.8" Ride Height	
	68986-003M	14.6K, Wide			60961-672	9.8" Ride Height	
19		LH Lower Steering Knuckle Assembly	1	40		3/4"-16 UNF U-bolt	4
		Includes Key Nos. 25-27, 38-39			64804-065	6.8" Ride Height - 6.5"	
	58900-235	150 Ackermann Air Brake, Includes Key No. 31			64804-075	7.8" Ride Height - 7.5"	
	58900-233	200 Ackermann Air Brake, Includes Key No. 31			64804-085	8.8" Ride Height - 8.5"	
	58900-231	250 Ackermann Air Brake, Includes Key No. 31			64804-095	9.8" Ride Height - 9.5"	
	58900-255	150 Ackermann Hydraulic Brake		41	22962-001	3/4" Flat Washer	8
	58900-253	200 Ackermann Hydraulic Brake		42	17700-035	3/4"-16 UNF 2B Nylon Locknut	8
	58900-251	250 Ackermann Hydraulic Brake		43		Dowel Pin	2
20		RH Lower Steering Knuckle Assembly	1			6.8" Ride Height	None Req.
		Includes Key Nos. 25-27, 38-39			18831-022	7.8" Ride Height - 1.13"	
	58900-236	150 Ackermann Air Brake, Includes Key No. 31			18831-021	8.8" Ride Height - 2.0"	
	58900-234	200 Ackermann Air Brake, Includes Key No. 31			18831-023	9.8" Ride Height - 3.0"	
	58900-232	250 Ackermann Air Brake, Includes Key No. 31			66806-001	Top Pad/Axle Stop Assembly, Includes Key Nos. 44-45	
	58900-256	150 Ackermann Hydraulic Brake		44	66666-000	Top Pad	2
	58900-254	200 Ackermann Hydraulic Brake		45	64080-000	Rubber Axle Stop	2
	58900-252	250 Ackermann Hydraulic Brake		46		LH Front Axle Spacer	1
21		LH Upper Steering Knuckle Assembly	1	a	70105-010	6.8" Ride Height - 10 mm	
		Includes Key Nos. 23-24, 26-27		b	64536-035	7.8" Ride Height - 35 mm	
	60903-258	13.2K		b	64536-060	8.8" Ride Height - 60 mm	
	60903-255	14.6K		b	64536-085	9.8" Ride Height - 85 mm	
22	60904-202	RH Upper Steering Knuckle Assembly	1	47		RH Front Axle Spacer	1
		Includes Key Nos. 23-24, 26-27				6.8" Ride Height	None Req.
	60961-628	<b>Kingpin Bushing and Bearing Service Kit,</b> <b>Axle Set,</b> Includes Kit Nos. 60961-629 & -630			64536-025	7.8" Ride Height - 25 mm	
	60961-629	<b>LH Kingpin Bushing w/Composite Thrust Bearing</b> <b>Service Kit,</b> Includes Key Nos. 23-28, 30, Loctite			64536-050	8.8" Ride Height - 50 mm	
	60961-630	<b>RH Kingpin Bushing w/Roller Thrust Bearing</b> <b>Service Kit,</b> Includes Key Nos. 23-27, 29-30 & Loctite			64536-075	9.8" Ride Height - 75 mm	
23	33117-000	Grease Zerk	2				
24	68687-003	Grease Cap Assembly, Upper	2				
25	68687-002	Grease Cap Assembly, Lower	2				
26	58909-001	Kingpin Bushing	4				
	60961-631	<b>Thrust Bearing Service Kit, Axle Set,</b> Includes Kit Nos. 60961-632 & -633					
	60961-632	<b>LH Composite Thrust Bearing Service Kit,</b> Includes Key Nos. 27-28, 30 & Loctite					

■ SOFTEK with STEERTEK axle for Blue Bird Vision Buses built PRIOR to October 2012 – 8.5K/10K Capacity

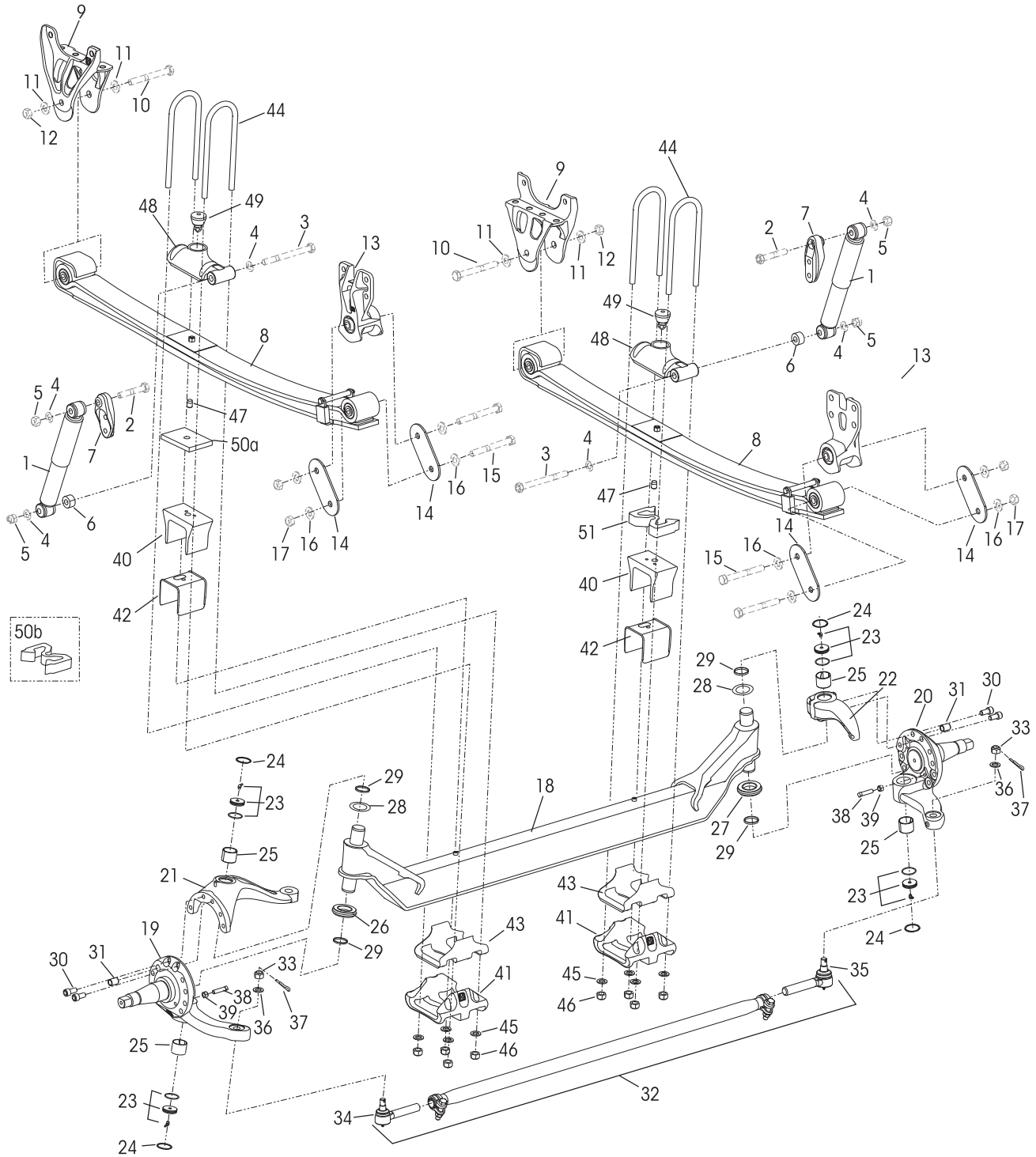




KEY NO.	PART NO.	DESCRIPTION	NO.REQ.	KEY NO.	PART NO.	DESCRIPTION	NO.REQ.
1	58913-009L	Shock Absorber, <i>Replaces 58913-007</i>	2		60961-041	<b>LH Composite Thrust Bearing Service Kit,</b> Includes Key Nos. 27, 29-31 and Loctite	
2		**3/4"-10 UNC Upper Shock Bolt	2		60961-042	<b>RH Roller Thrust Bearing Service Kit,</b> Includes Key Nos. 28-31 and Loctite	
3		**3/4"-10 UNC Lower Shock Bolt	2	27	59828-000	LH Composite Thrust Bearing	1
4		**3/4" Hardened Washer	8	28	64256-000	RH Roller Thrust Bearing	1
5		**3/4"-10 UNC Hex Locknut	4	29		Kingpin Shim	
6	59946-001	Shock Spacer	2		60259-002	0.047"	2
7	59423-002	Shock Bracket	2		60259-001	0.005" (As needed for service)	
8		Leaf Spring Assembly	2	30	58910-001	Kingpin Seal, <i>Replaces 58910-000</i>	4
a		• For vehicles built after 11/06		31	60236-001	5/8"-11 UNC Socket Head Cap Screw	4
	53627-000	8.5K, <i>Replaces 66623-001</i>		Not Shown	60937-000	Loctite (Red) Compound Tube	1
	53624-000	10K, <i>Replaces 66624-001</i>		32	64246-000	ABS Sensor Sleeve	2
b		• For vehicles built prior to 11/06		33		***Tie Rod Assembly, 8.5K/10K, 5.36" Drop, Includes Key Nos. 34-36, <i>See Selection Guide</i> <i>on page 27</i>	1
	66364-000	8.5K		34		*7/8" Castle Nut	2
	60511-000	10K				*** <b>Tie Rod End Service Kit, Axle Set,</b> Includes LH and RH Kits, <i>See Selection Guide</i> <i>on page 27</i>	
9	64488-002	Front Hanger, <i>Replaces 64488-000</i>	2			*** <b>LH Tie Rod End Service Kit,</b> Includes Key Nos. 35, 37-38, <i>See Selection Guide on page 27</i>	
10		**M20 Hex Bolt - 170 mm	2			*** <b>RH Tie Rod End Service Kit,</b> Includes Key Nos. 36-38, <i>See Selection Guide on page 27</i>	
11		**M20 Hardened Washer	4	35		***LH Tie Rod End, <i>See Selection Guide</i> <i>on page 27</i>	1
12		**M20 Locknut	2	36		***RH Tie Rod End, <i>See Selection Guide</i> <i>on page 27</i>	1
13		Rear Shackle Bracket	2	37	22962-007	7/8" Flat Washer	2
a	66510-001	For vehicles built after 11/06		38	17800-004	Tie Rod Nut Cotter Pin	2
b	64316-000	For vehicles built prior to 11/06			60961-069	<b>Stop Bolt Service Kit, One Side,</b> Includes Key Nos. 39-40	
14	64314-000	Rear Shackle Plate	4	39	60238-001	1/2"-13 UNC Square Head Bolt	2
15	64159-000	Thrust Washer Only for vehicles built prior to 11/06	4	40	60240-000	1/2"-13 UNC Hex Jam Nut	2
16		**M20 Hex Bolt - 150 mm	4	41	59952-003	Top Axle Wrap	2
17		**M20 Hardened Washer	8	42	64722-003	Bottom Axle Wrap	2
18		**M20 Locknut	4		60961-015	<b>Top/Bottom Axle Wrap Liner Service Kit,</b> <b>One Side,</b> Includes Key Nos. 43-44	
	60952-XXX	STEERTEK Axle Assembly, Includes Key Nos. 19-25, 27-29, 31-44. Contact Hendrickson Tech Service for Part Number	1	43	60508-000	Top Axle Wrap Liner	2
19	64905-004	Axle & Kingpin Assembly, Narrow 6.5", 8.5" Ride Height	1	44	59845-000	Bottom Axle Wrap Liner	2
20		LH Lower Steering Knuckle Assembly Includes Key Nos. 26, 30	1			<b>Clamp Group Service Kit, One side,</b> Includes Key Nos. 45-47	
	58900-035	150 Ackermann Air Brake, Includes Key No. 32			60961-140	6.5" Ride Height	
	58900-033	200 Ackermann Air Brake, Includes Key No. 32			60961-141	8.5" Ride Height	
	58900-031	250 Ackermann Air Brake, Includes Key No. 32		45		3/4"-16 UNF U-bolt	4
	58900-055	150 Ackermann Hydraulic Brake			64804-110	6.5" Ride Height - 11.0"	
	58900-053	200 Ackermann Hydraulic Brake			64804-130	8.5" Ride Height - 13.0"	
	58900-051	250 Ackermann Hydraulic Brake		46	22962-001	3/4" Flat Washer	8
21		RH Lower Steering Knuckle Assembly Includes Key Nos. 26, 30	1	47	17700-035	3/4"-16 UNF 2B Nylon Locknut	8
	58900-036	150 Ackermann Air Brake, Includes Key No. 32			64506-000	Top Pad/Axle Stop Assembly, Includes Key Nos. 48-49	
	58900-034	200 Ackermann Air Brake, Includes Key No. 32		48	64519-000	Top Pad	2
	58900-032	250 Ackermann Air Brake, Includes Key No. 32		49	64080-000	Rubber Axle Stop	2
	58900-056	150 Ackermann Hydraulic Brake		50		Front Axle Spacer	1
	58900-054	200 Ackermann Hydraulic Brake		a	70105-010	LH 6.5" Ride Height - 10 mm, <i>Replaces 64536-010</i>	
	58900-052	250 Ackermann Hydraulic Brake		b	64536-060	LH 8.5" Ride Height - 60 mm	
22	60903-016	LH Upper Steering Knuckle Assembly Includes Key Nos. 26, 30	1	c	64536-050	RH 8.5" Ride Height - 50 mm	
23	60904-002	RH Upper Steering Knuckle Assembly Includes Key Nos. 26, 30	1	51	66164-000	Thrust Pad Washer For 8.5K vehicles built prior to 2/07	2
	60961-040	<b>Kingpin Bushing and Bearing Service Kit,</b> <b>Axle Set,</b> Includes Kit Nos. 60961-009 & -039		52	66366-001	Clamp Group Spacer For 8.5K vehicles built prior to 2/07	4
	60961-009	<b>LH Kingpin Bushing w/Composite Thrust</b> <b>Bearing Service Kit,</b> Includes Key Nos. 24-27, 29-31 and Loctite		Not Shown	18831-021	Dowel Pin 2.0", 8.5" Ride Height	2
	60961-039	<b>RH Kingpin Bushing w/Roller Thrust</b> <b>Bearing Service Kit,</b> Includes Key Nos. 24-26, 28-31 and Loctite					
24	59156-000	Grease Cap Assembly	4				
25	58937-000	Retaining Ring	4				
26	58909-000	Kingpin Bushing	4				
	60961-043	<b>Thrust Bearing Service Kit, Axle Set,</b> Includes Kit Nos. 60961-041 & -042					



■ SOFTEK with STEERTEK axle for Blue Bird All American Buses built  
PRIOR to October 2012 – 13.2K/14.6K Capacity



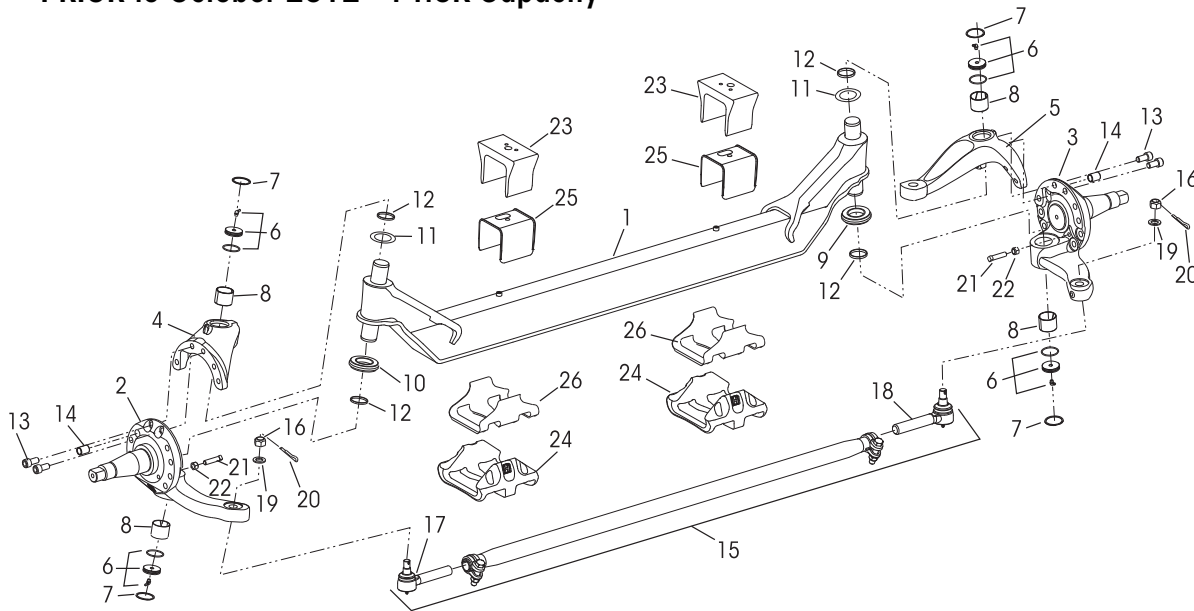




KEY NO.	PART NO.	DESCRIPTION	NO.REQ.	KEY NO.	PART NO.	DESCRIPTION	NO.REQ.
1	58913-010L	Shock Absorber	2	28		Kingpin Shim	
2		**3/4"-10 UNC Upper Shock Bolt	2		60259-002	0.047"	2
3		**3/4"-10 UNC Lower Shock Bolt	2		60259-001	0.005" (As needed for service)	
4		**3/4" Hardened Washer	6	29	58910-001	Kingpin Seal, <i>Replaces 58910-000</i>	4
5		**3/4"-10 UNC Hex Locknut	4	30	60236-001	5/8"-11 UNC Socket Head Cap Screw	4
6	59946-001	Shock Spacer	2	Not Shown	60937-000	Loctite (Red) Compound Tube	1
7	67463-002	Shock Bracket, <i>Replaces 65000-002</i>	2	31	64246-000	ABS Sensor Sleeve	2
8		Leaf Spring Assembly	2	32		***Tie Rod Assembly, 13.2K/14.6K, 4.25" Drop, Includes Key Nos. 33-35, <i>See Selection Guide on page 27</i>	1
	53625-000	13.2K, <i>Replaces 66625-001</i>					
	53626-000	14.6K, <i>Replaces 66626-001</i>					
9	64488-002	Front Hanger	2	33		*7/8" Castle Nut	2
10		**M20 Hex Bolt - 170 mm	2			***Tie Rod End Service Kit, Axle Set, Includes LH and RH Kits, <i>See Selection Guide on page 27</i>	
11		**M20 Hardened Washer	4			***LH Tie Rod End Service Kit, Includes Key Nos. 34, 36-37, <i>See Selection Guide on page 27</i>	
12		**M20 Locknut	2			***RH Tie Rod End Service Kit, Includes Key Nos. 35-37, <i>See Selection Guide on page 27</i>	
13	66510-001	Rear Shackle Bracket	2	34		***LH Tie Rod End, <i>See Selection Guide on page 27</i>	1
14	64314-000	Rear Shackle Plate	4	35		***RH Tie Rod End, <i>See Selection Guide on page 27</i>	1
15		**M20 Hex Bolt - 150 mm	4	36	22962-007	7/8" Flat Washer	2
16		**M20 Hardened Washer	8	37	17800-004	Tie Rod Nut Cotter Pin	2
17		**M20 Locknut	4		60961-069	Stop Bolt Service Kit, One Side, Includes Key Nos. 38-39	
	60952-XXX	STEERTEK Axle Assembly, Includes Key Nos. 18-24, 26-28, 30-43, Contact Hendrickson Tech Services for Part Number	1	38	60238-001	1/2"-13 UNC Square Head Bolt	2
18		Axle & Kingpin Assembly	1	39	60240-000	1/2"-13 UNC Hex Jam Nut	2
	64905-002	6.8", 7.8", 8.8" and 9.8" Ride Height		40	59952-026	Top Axle Wrap	2
	64905-005	13.2K, Narrow		41	64722-003	Bottom Axle Wrap	2
19		LH Lower Steering Knuckle Assembly	1		60961-015	Top/Bottom Axle Wrap Liner Service Kit, One Side, Includes Key Nos. 42-43	
		Includes Key Nos. 25, 29		42	60508-000	Top Axle Wrap Liner	2
	58900-035	150 Ackermann Air Brake, Includes Key No. 31		43	59845-000	Bottom Axle Wrap Liner	2
	58900-033	200 Ackermann Air Brake, Includes Key No. 31				Clamp Group Service Kit, One side, Includes Key Nos. 44-46	
	58900-031	250 Ackermann Air Brake, Includes Key No. 31			60961-142	6.8" Ride Height	
	58900-055	150 Ackermann Hydraulic Brake			60961-143	7.8" Ride Height	
	58900-053	200 Ackermann Hydraulic Brake			60961-144	8.8" Ride Height	
	58900-051	250 Ackermann Hydraulic Brake			60961-145	9.8" Ride Height	
20		RH Lower Steering Knuckle Assembly	1	44		3/4"-16 UNF U-bolt	4
		Includes Key Nos. 25, 29			64804-120	6.8" Ride Height - 12.0"	
	58900-036	150 Ackermann Air Brake, Includes Key No. 31			64804-130	7.8" Ride Height - 13.0"	
	58900-034	200 Ackermann Air Brake, Includes Key No. 31			64804-140	8.8" Ride Height - 14.0"	
	58900-032	250 Ackermann Air Brake, Includes Key No. 31			64804-150	9.8" Ride Height - 15.0"	
	58900-056	150 Ackermann Hydraulic Brake		45	22962-001	3/4" Flat Washer	8
	58900-054	200 Ackermann Hydraulic Brake		46	17700-035	3/4"-16 UNF 2B Nylon Locknut	8
	58900-052	250 Ackermann Hydraulic Brake		47		Dowel Pin	2
21		LH Upper Steering Knuckle Assembly	1			6.8" Ride Height	None Req.
		Includes Key Nos. 25, 29			18831-022	7.8" Ride Height - 1.13"	
	60903-058	13.2K			18831-021	8.8" Ride Height - 2.0"	
	60903-055	14.6K			18831-023	9.8" Ride Height - 3.0"	
22	60904-002	RH Upper Steering Knuckle Assembly	1		66806-001	Top Pad/Axle Stop Assembly Includes Key Nos. 48-49	
		Includes Key Nos. 25, 29		48	66666-000	Top Pad	2
	60961-040	Kingpin Bushing and Bearing Service Kit, Axle Set, Includes Kit Nos. 60961-009 & -039		49	64080-000	Rubber Axle Stop	2
	60961-009	LH Kingpin Bushing w/Composite Thrust Bearing Service Kit, Includes Key Nos. 23-26, 28-30, Loctite		50		LH Front Axle Spacer	1
	60961-039	RH Kingpin Bushing w/Roller Thrust Bearing Service Kit, Includes Key Nos. 23-25, 27-30, Loctite		a	70105-010	6.8" Ride Height - 10 mm <i>Replaces 64536-010</i>	
23	59156-000	Grease Cap Assembly	4	b	64536-035	7.8" Ride Height - 35 mm	
24	58937-000	Retaining Ring	4	b	64536-060	8.8" Ride Height - 60 mm	
25	58909-000	Kingpin Bushing	4	b	64536-085	9.8" Ride Height - 85 mm	
	60961-043	Thrust Bearing Service Kit, Axle Set, Includes Kit Nos. 60961-041 & -042		51		RH Front Axle Spacer	1
	60961-041	LH Composite Thrust Bearing Service Kit, Includes Key Nos. 26, 28-30 and Loctite			64536-025	6.8" Ride Height	None Req.
	60961-042	RH Roller Thrust Bearing Service Kit, Includes Key Nos. 27-30 and Loctite			64536-050	7.8" Ride Height - 25 mm	
26	59828-000	LH Composite Thrust Bearing	1		64536-075	8.8" Ride Height - 50 mm	
27	64256-000	RH Roller Thrust Bearing	1			9.8" Ride Height - 75 mm	



■ **STEERTEK Right Hand Drive for Blue Bird Vehicles built  
PRIOR to October 2012 –14.6K Capacity**



KEY NO.	PART NO.	DESCRIPTION	NO. REQ.
	67951-XXX	STEERTEK Axle Assembly, Includes Key Nos. 1-7, 9-11, 13, 15, 19-26 Contact Hendrickson Tech Services for Part Number	1
1		Axle & Kingpin Assembly	1
	67905-405	SOFTEK Standard Drop - 14.6K	
	67905-407	AIRTEK Deep Drop - 14.6K	
2		LH Lower Steering Knuckle Assembly Includes Key Nos. 8,12	1
	58900-035	150 Ackermann Air Brake, Includes Key No. 14	
	58900-033	200 Ackermann Air Brake, Includes Key No. 14	
	58900-031	250 Ackermann Air Brake, Includes Key No. 14	
	58900-055	150 Ackermann Hydraulic Brake	
	58900-053	200 Ackermann Hydraulic Brake	
	58900-051	250 Ackermann Hydraulic Brake	
3		RH Lower Steering Knuckle Assembly Includes Key Nos. 8,12	1
	58900-036	150 Ackermann Air Brake, Includes Key No. 14	
	58900-034	200 Ackermann Air Brake, Includes Key No. 14	
	58900-032	250 Ackermann Air Brake, Includes Key No. 14	
	58900-056	150 Ackermann Hydraulic Brake	
	58900-054	200 Ackermann Hydraulic Brake	
	58900-052	250 Ackermann Hydraulic Brake	
4	60904-001	LH Upper Steering Knuckle Assembly Includes Key Nos. 8,12	1
5	70903-001	RH Upper Steering Knuckle Assembly Includes Key Nos. 8,12	1
	60961-040	<b>Kingpin Bushing and Bearing Service Kit, Axle Set</b> , Includes Kit Nos. 60961-009 & -039	
	60961-009	<b>RH Kingpin Bushing w/Composite Thrust Bearing Service Kit</b> , Includes Key Nos. 6-9, 10-12, Loctite	
	60961-039	<b>LH Kingpin Bushing w/Roller Thrust Bearing Service Kit</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
	60961-043	<b>Thrust Bearing Service Kit, Axle Set</b> Includes Kit Nos. 60961-041 & -042	
	60961-041	<b>RH Composite Thrust Bearing Service Kit</b> , Includes Key Nos. 9, 11-13, Loctite	

KEY NO.	PART NO.	DESCRIPTION	NO. REQ.
	60961-042	<b>LH Roller Thrust Bearing Service Kit</b> , Includes Key Nos. 10-13, Loctite	
9	59828-000	RH Composite Thrust Bearing	1
10	64256-000	LH Roller Thrust Bearing	1
11	60259-002	Kingpin Shim - 0.047"	2
Not Shown	60259-001	Kingpin Shim - 0.005" (As needed for service)	
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
14	64246-000	ABS Sensor Sleeve	2
15		***Tie Rod Assembly, 13.2K/14.6K, 4.25" Drop, Includes Key Nos. 16-18, See Selection Guide on page 27	1
16		*7/8" Castle Nut	2
		*** <b>Tie Rod End Service Kit, Axle Set</b> , Includes LH and RH Kits, See Selection Guide on page 27	
		*** <b>LH Tie Rod End Service Kit</b> , Includes Key Nos. 17, 19-20, See Selection Guide on page 27	
		*** <b>RH Tie Rod End Service Kit</b> , Includes Key Nos. 18-20, See Selection Guide on page 27	
17		***LH Tie Rod End, See Selection Guide on page 27	1
18		***RH Tie Rod End, See Selection Guide on page 27	1
19	22962-007	7/8" Flat Washer	2
20	17800-004	Tie Rod Nut Cotter Pin	2
	60961-069	<b>Stop Bolt Service Kit, One Side</b> , Includes Nos. 21-22	
21	60238-001	1/2"-13 UNC Square Head Bolt	2
22	60240-000	1/2"-13 UNC Hex Jam Nut	2
23		Top Axle Wrap	2
	59952-026	13.2K	
	59952-031	14.6K	
24	64722-003	Bottom Axle Wrap	2
	60961-015	<b>Top/Bottom Axle Wrap Liner Service Kit, One Side</b> , Includes Nos. 25-26	
25	60508-000	Top Axle Wrap Liner	2
26	59845-000	Bottom Axle Wrap Liner	2



## ■ AIRTEK / SOFTEK – TIE ROD SELECTION GUIDE

Vehicles built AFTER March 2014			
TYPE	TIE ROD ASSEMBLY PART NO.	TIE ROD END PART NO.	TIE ROD END SERVICE KIT NO.
<b>■ 8.5K-10K • Drop Tie Rods – 1 ¼" Threads</b>			
150 / 200 Ackermann	76878-003	76875-001 (LH) 76875-002 (RH)	60961-737 (Axle Set) 60961-739 (LH) 60961-740 (RH)
250 Ackermann	76878-001		
<b>■ 13.2K • Straight Tie Rods – 1 ½" Threads</b>			
150 Ackermann	76877-004	70995-001 (LH) 70995-002 (RH)	60961-734 (Axle Set) 60961-736 (LH) 60961-741 (RH)
200 Ackermann	76877-005		
250 Ackermann	76877-001		
250 Ackermann	76877-006		
<b>■ 14.6K • Straight Tie Rods – 1 ¼" Threads</b>			
150 Ackermann	76879-001	76876-001 (LH) 76876-002 (RH)	60961-735 (Axle Set) 60961-742 (LH) 60961-743 (RH)
200 / 250* Ackermann	76879-002		
250 Ackermann	76879-003		

Vehicles built PRIOR TO March 2014				
TYPE	TIE ROD ASSEMBLY PART NO.	TIE ROD END PART NO.	TIE ROD END SERVICE KIT NO.	REPLACEMENT TIE ROD ASSEMBLY PART NUMBER
	These tie rod ends, tie rod assemblies and tie rod end service kits are <b>NO LONGER AVAILABLE</b> and will require complete tie rod assembly replacement.			
<b>■ 8.5K-10K • Drop Tie Rods – 1 ¼" Threads</b>				
150 / 200 Ackermann	66699-003	66645-001 (LH) 66645-002 (RH)	60961-139 (Axle Set) 60961-137 (LH) 60961-138 (RH)	76878-003
250 Ackermann	66699-001			76878-001
150 / 200 Ackermann	59948-005	64004-001 (LH) 64004-002 (RH)	60961-012 (Axle Set) 60961-029 (LH) 60961-030 (RH)	76878-003
250 Ackermann	59948-006			76878-001
<b>■ 13.2K • Straight Tie Rods – 1 ½" Threads</b>				
150 Ackermann	60239-004	64000-001 (LH) 64000-002 (RH)	60961-010 (Axle Set) 60961-025 (LH) 60961-026 (RH)	76877-004
200 Ackermann	60239-005			76877-005
250 Ackermann	60239-001			76877-001
250 Ackermann	60239-006			76877-006
<b>■ 14.6K • Straight Tie Rods – 1 ¼" Threads</b>				
150 Ackermann	64006-001	64002-001 (LH) 64002-002 (RH)	60961-011 (Axle Set) 60961-027 (LH) 60961-028 (RH)	76879-001
200 / 250* Ackermann	64006-002			76879-002
250 Ackermann	64006-003			76879-003
* For 68987-018 and 68987-024 Axle Assembly				

**NOTE:** Quantities of service kit components may vary from amount shown in this publication.

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

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

\*\*\* Hendrickson supplies different tie rod assemblies and each type may take a different replacement tie rod end kit to service. Prior to ordering, find the part number on the tie rod tube, refer to Hendrickson Publication No. SEU-0223 or contact Hendrickson Truck Parts for corresponding kit numbers.

\*\*\*\* When servicing the Top Pad Part No. 66814-001/-002 on 13.2K/14.6K AIRTEK built prior to October 2012 (Key No. 65 on page 16), it will require to replace both left hand and right hand Top Pads.

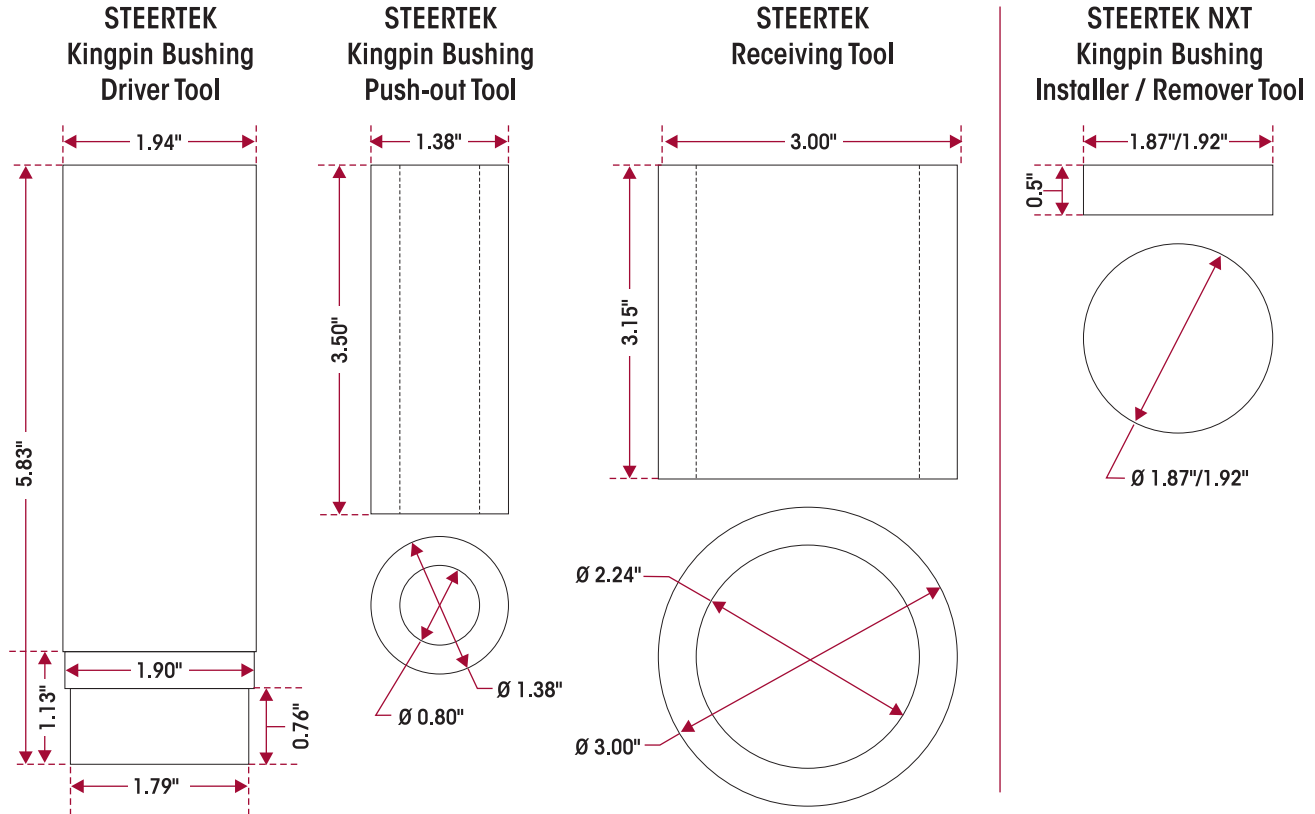
\*\*\*\*\* When servicing Height Control Valve Assembly on

- AIRTEK with 13.2K/14.6K capacity, built between October 2012 and November 2013 – replace the HCV assembly with 59013-000
- AIRTEK with 13.2K/14.6K capacity, built after November 2013 – replace the HCV assembly with 59013-001.

## SECTION 5 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.

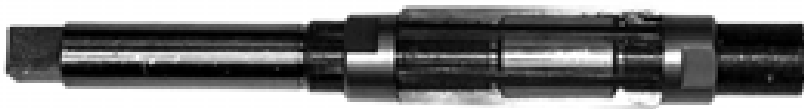
### KINGPIN BUSHING TOOLS



### ADJUSTABLE STRAIGHT FLUTE REAMER

#### Adjustable Straight Flute Reamer

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



## SECTION 6

# Towing Procedure

### ON-HIGHWAY AND ON-ROADWAY

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

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 toll-free at 1-866-755-5968 (U.S. and Canada) or send e-mail to: [techservices@hendrickson-intl.com](mailto:techservices@hendrickson-intl.com) with any questions regarding proper towing procedures for vehicles equipped with a STEERTEK NXT / STEERTEK axle.

#### METHOD 1 — WHEEL LIFT

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

**FIGURE 6-1** Wheel lift method



#### METHOD 2 — TOWING VEHICLE FROM THE REAR

This method is preferred when the proper equipment is not available to perform the wheel lift method and is necessary for wreckers not equipped with an under lift system.

### METHOD 3 — AXLE FORK LIFT

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

#### 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.

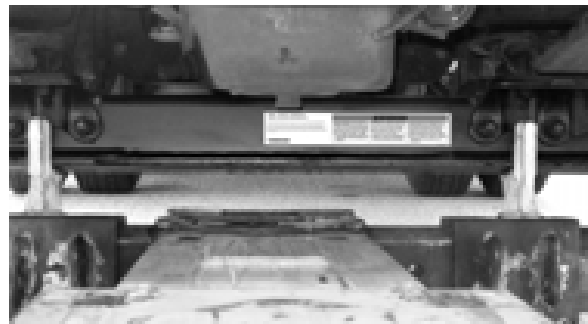
#### STEERTEK NXT equipped (vehicles built AFTER October 2012)

1. Use a Miller Short Frame Fork, Part No. 0200019, or comparable (3.25" Clearance), 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.

FIGURE 6-2



FIGURE 6-3



#### STEERTEK equipped (vehicles built PRIOR to October 2012)

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



3. 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.

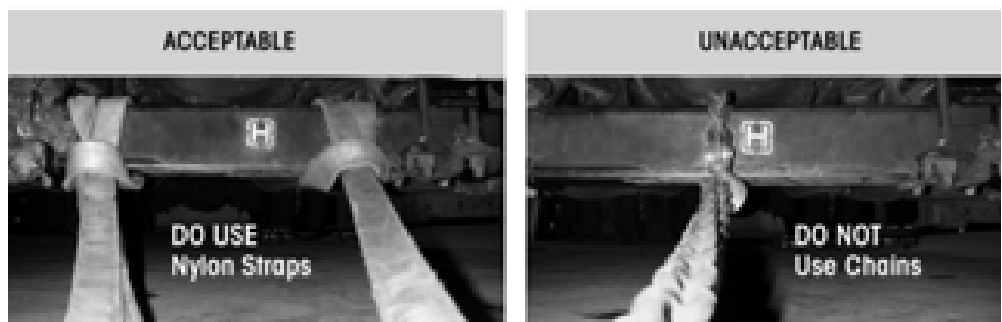
**FIGURE 6-6**

### OFF-ROADWAY TOWING METHOD

**WARNING**

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 TOW STRAPS ARE NECESSARY TO TOW A DISABLED VEHICLE FROM A REPAIR FACILITY PARKING LOT INTO THE SHOP BAY. THE TOW STRAPS SHOULD BE CONNECTED TO THE TOW HOOKS PROVIDED BY THE VEHICLE MANUFACTURER AT THE FRONT OF THE BUMPER. IF THE USE OF TOW HOOKS IS NOT AN OPTION, THEN TOW STRAPS MAY BE WRAPPED AROUND THE FRONT STEERTEK NXT / STEERTEK 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 STEERTEK NXT / STEERTEK AXLE 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****OFF-ROADWAY TOWING**

## SECTION 7

# Preventive Maintenance


Following appropriate inspection procedure is important to help ensure the proper maintenance and operation of the AIRTEK•SOFTEK•STEERTEK system and component parts function to their highest efficiency.

### HENDRICKSON RECOMMENDED PREVENTIVE MAINTENANCE INTERVALS

#### VISUAL INSPECTION

- **The first 1,000 miles (1,609 km)**
- **On-highway** – every 25,000 miles (40,000 km) or 6 months, whichever comes first

#### COMPONENT INSPECTION

- **Air spring** — Look for chaffing or any signs of spring or component damage.
- **Clamp group** — Check torque on clamp group mounting hardware. Refer to  Torque Specifications Section of this publication.
- **Fasteners** — Look for any loose or damaged fasteners on the entire suspension. Make sure all fasteners are tightened to the specified torque, see Torque Specification Section of this publication for recommended torque requirements. 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.
- **Front hangers and shackle brackets** — Check for proper fastener torque values using a calibrated torque wrench. Check for cracks or loose mounting hardware. Replace if necessary, see the Component Replacement Section of this publication for replacement procedure.
- **Operation** — All steering components must move freely through the full range of motion from axle stop to axle stop.
- **Shock absorber** — Look for any signs of dents or leakage, misting is not considered a leak. See Shock Absorber Inspection in this section.
- **Steel leaf spring and wrap leaf assembly** — Look for cracks. Check the front and rear bushings for any wear or deterioration. Replace spring assembly if any of the previous conditions are observed. 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 Trouble Shooting Guide Section in the Appendix of 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 (If equipped)** — Look for any signs of excessive wear to the thrust washers, shackles and shackle bracket. 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.
- **Top pad (AIRTEK)** — Check for cracks or damage. Replace if necessary, see the Component Replacement Section of this publication for replacement procedure.
- **Top pad and bump stop (SOFTEK)** — Check for cracks and/or missing rubber bump stops. Replace if necessary, see the Component Replacement Section of this publication for replacement procedure.



- **Wear and damage** — Inspect all parts of suspension for wear and damage. Look for bent or cracked parts. Replace all worn or damaged parts.

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 chart below.

### NOTE

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

### STEERTEK NXT / STEERTEK GREASING AND LUBRICATION SPECIFICATIONS

Component	Greasing Interval	Grease	NLGI Grade	Outside Temperature
Kingpin Bushings	Maximum of 25,000 miles (40,000 kilometers), or for 90 days, whichever comes first.	Multipurpose Grease	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>NOTE:</b> 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.
2. Prior to greasing the kingpins on the vehicle, the suspension must be in a loaded condition.
3. Clean off all the grease zerks and grease gun tip with a clean shop towel prior to lubrication.
4. Lubricate the kingpins through the grease zerks on the top and bottom of the steering knuckle, see Lubrication Specification chart above.
5. Force the required lubricant into the upper and lower kingpin grease zerks, until new lubricant flows out from the upper kingpin connection and steering knuckle and the thrust bearing purge location, see Figures 7-2 and 7-3.

**FIGURE 7-1**



FIGURE 7-2



FIGURE 7-3

**NOTE**

Greasing at the lower zerk 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 Figure 7-4. Both purge in the same area.

FIGURE 7-4

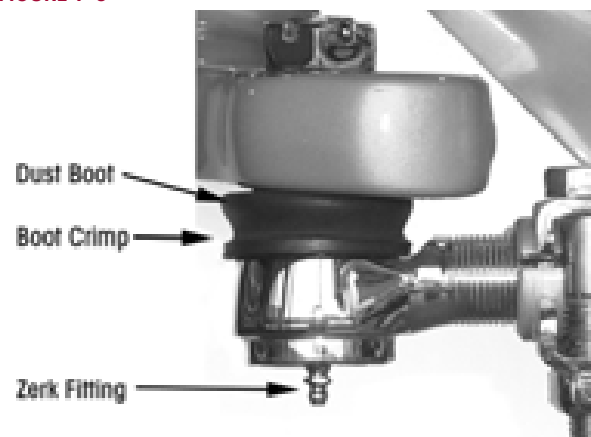
**TIE ROD END LUBRICATION****LUBRICATION INTERVALS**

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

**CAUTION**

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

FIGURE 7-5



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 7-5. 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. Refer to Tie Rod End replacement in Component Replacement Section of this publication.
7. Apply grease until all the old grease is purged from the boot and fresh grease is coming out.

## TIE ROD END INSPECTION

### INSPECTION PROCEDURE

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

 **CAUTION**

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

 **CAUTION**

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

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

 **WARNING**

THE COTTER PIN MUST BE INSTALLED CORRECTLY THROUGH THE TIE ROD END WITH THE CASTLE NUT TIGHTENED TO THE PROPER TORQUE SPECIFICATION IN ORDER TO SECURELY ATTACH THE TIE ROD. LOSS OF THE COTTER PIN CAN CAUSE THE TIE ROD END NUT TO BECOME LOOSE AND ADVERSELY AFFECT VEHICLE STEERING AND POSSIBLY RESULT IN TOTAL LOSS OF STEERING CONTROL.

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

 **WARNING**

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

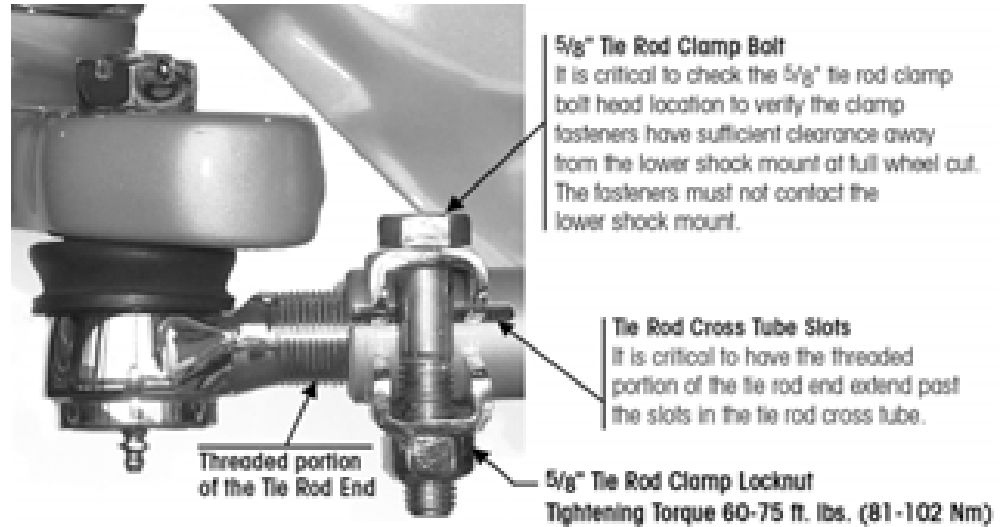
6. Verify the 5/8" tie rod clamp bolt head does not contact the lower shock mount at full wheel cut, see Figure 7-6.

 **WARNING**

THE THREADED PORTION OF THE TIE ROD END MUST EXTEND PAST THE SLOTS INTO THE TIE ROD CROSS TUBE, SEE FIGURE 7-6. 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 7-6.
8. Check that grease zerks are installed. Replace a damaged grease zerk with a new one.

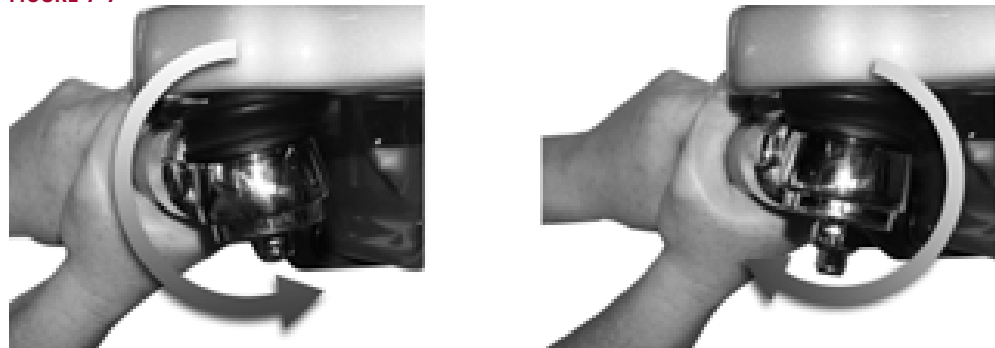
FIGURE 7-6


**CAUTION**

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

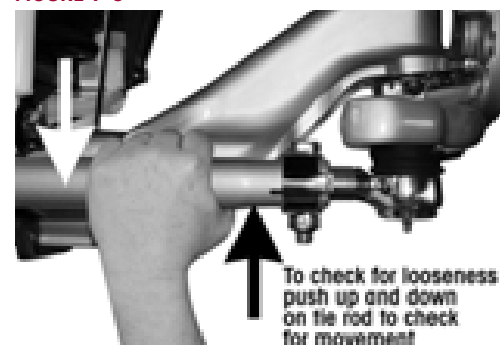
- A CROW BAR, PICKLE FORK OR 2 X 4.
  - ANYTHING OTHER THAN HANDS USED TO GRASP AND ROTATE THE CROSS TUBE ASSEMBLY (CAN RESULT IN DAMAGE TO THE CROSS TUBE).
  - EXCESSIVE PRESSURE OR FORCE APPLIED TO THE TIE ROD ENDS OR THE JOINTS OF THE ASSEMBLY.
9. By hand or using a pipe wrench, with jaw protectors 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 7-7.

FIGURE 7-7



10. Position yourself directly below the tie rod end. Using both hands, grab the assembly end as close to the tie rod end as possible (no more than 6" or 152.4 mm). Apply hand pressure with reasonable human effort vertically up and down in a push-pull motion several times (using approximately 50-100 foot pounds (67-135 Nm) of force). Check for any movement or looseness at both tie rod end locations, see Figure 7-8.

FIGURE 7-8



11. If there is any movement in the tie rod assembly, install a magnetic based dial indicator on the Ackermann arm, see Figure 7-9.
12. Set the dial indicator to zero.
13. Apply hand pressure with reasonable human effort vertically up and down in a push-pull motion several times (using approximately 50-100 foot pounds (67-135 Nm) 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  $\geq 0.125"$  of movement by hand, the vehicle should be removed immediately from use and replace the tie rod end.

**FIGURE 7-9**

**NOTE**

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

**CLAMP GROUP RE-TORQUE INTERVAL**

**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 torque to specification at preparation for delivery.
2. Clamp group locknuts must be re-torqued at 1,000 miles (1,609 km).
3. Thereafter follow the 6 month/ 25,000 miles (40,000 km) visual inspection and annual re-torque interval.
4. 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 7-10 through 7-12.
5. Check for the signs of component or bolt movement.
6. If signs of movement are present, disassemble the clamp group fasteners, check for component wear or damage and replace as necessary, then install new clamp group fasteners and repeat Steps 1 through 5.



FIGURE 7-10

**AIRTEK with STEERTEK NXT** Vehicles built AFTER October 2012

**IMPORTANT**  
Ensure that Axle Clamp Group is properly aligned

**IMPORTANT**  
Ensure that the 3/4" Clamp Bolts are seated properly in the Top Pad

3/4" Clamp Group Locknuts  
Tightening Torque 285-305 ft. lbs. (386-414 Nm)

FIGURE 7-11

**AIRTEK with STEERTEK** Vehicles built PRIOR to October 2012

**IMPORTANT**  
Ensure that Axle Clamp Group is properly aligned

**IMPORTANT**  
Ensure that the 3/4" Clamp Bolts are seated properly in the Top Pad

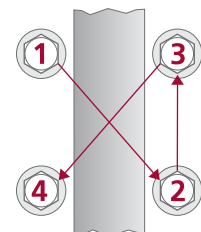
3/4" Clamp Group Locknuts  
Tightening Torque 285-305 ft. lbs. (386-414 Nm)

FIGURE 7-12

<b>SOFTEK with STEERTEK NXT</b> Vehicles built AFTER October 2012	<b>SOFTEK with STEERTEK</b> Vehicles built PRIOR to October 2012
<p><b>IMPORTANT</b> Ensure that Axle Clamp Group is properly aligned</p> <p>3/4" Clamp Group Locknuts Tightening Torque 285-305 ft. lbs. (386-414 Nm)</p>	<p><b>IMPORTANT</b> Ensure that Axle Clamp Group is properly aligned</p> <p>3/4" Clamp Group Locknuts Tightening Torque 285-305 ft. lbs. (386-414 Nm)</p>

- Tighten the clamp group locknuts evenly in 50 foot pounds increments in the proper pattern, see Figure 7-13, to achieve uniform bolt tension. **STEERTEK NXT/STEERTEK** — 285-305 foot pounds (386-414 Nm) torque.

FIGURE 7-13



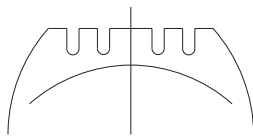
## TIRE INSPECTION

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

- a. Tire Pressure
  - b. Toe Setting
  - c. Thrust Angle
  - d. Camber
- The following tire inspection guidelines are based upon Technology & Maintenance Council (TMC) recommended practices. Any issues regarding irregular tire wear where Hendrickson is asked for assistance, will require tire and alignment maintenance records, reference TMC's literature numbers RP 219A, RP 230, or RP 642.
  - Tire wear is normally the best indicator of vehicle alignment condition. If tires are wearing too rapidly or irregularly, alignment corrections may be needed. The tire wear patterns described below can help isolate specific alignment problems.
  - The most common conditions of concern are:
    - Overall Fast Wear (Miles per 32nd)
    - Feather Wear
    - Cupping
    - Diagonal Wear
    - Rapid Shoulder Wear (One Shoulder Only)
    - One-Sided Wear

**FIGURE 7-14**

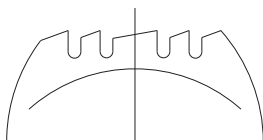
### OVERALL FAST WEAR (Miles per 32nd)



**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 7-15**

### FEATHER WEAR



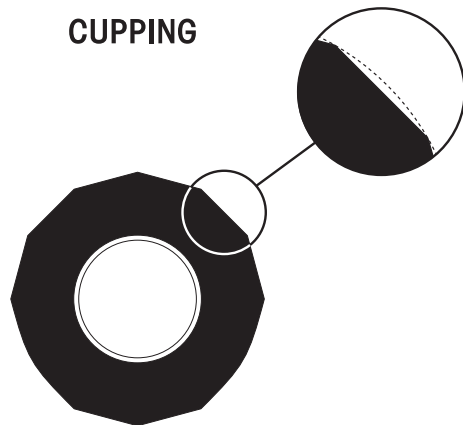
**Feather wear** — Tread ribs or blocks worn so that one side is higher than the other resulting in step-offs across the tread face. Generally, ribs or blocks exhibit this wear. To spot this problem, do the following:

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 7-16

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

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

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

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

FIGURE 7-17

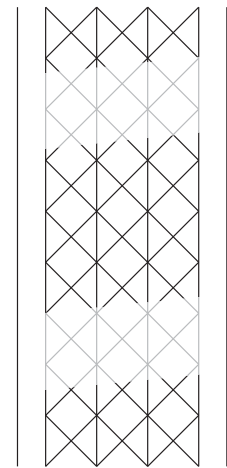
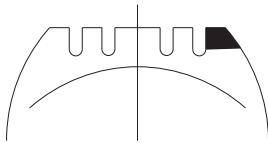
**DIAGONAL WEAR**

FIGURE 7-18

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

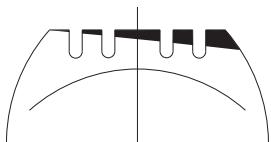
**Rapid Shoulder Wear (One Shoulder Only)** — Is defined as a tire worn on the edge of one shoulder, sometimes extending to inner ribs. It can progress to diagonal wipeout. For more information, see TMC RP 219A publication, page 22.

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 7-19

**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.



## SHOCK ABSORBER INSPECTION

Hendrickson uses a long service life, premium shock absorber on all AIRTEK and SOFTEK suspensions. When the 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 the warranty.

**FIGURE 7-20**

Inspection of the shock absorber can be performed by doing a heat test, and a visual inspection. For instructions on shock absorber replacement see the Component Replacement Section of this publication. It is not necessary to replace shock absorbers in pairs if one shock absorber requires replacement.



### HEAT TEST

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

 **WARNING**

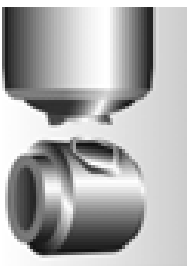
**DO NOT GRAB THE SHOCK AS IT CAN POSSIBLY CAUSE PERSONAL INJURY.**

2. Lightly touch the shock body carefully below the dust cover, see Figure 7-20.
3. Touch the frame to get an ambient reference. A warm shock absorber is acceptable, a cold shock absorber should be replaced.
4. To inspect for an internal failure, remove and shake the suspected shock. Listen for the sound of metal parts rattling inside. Rattling of metal parts can indicate that the shock has an internal failure.

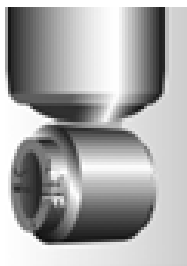
### VISUAL INSPECTION

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

**FIGURE 7-21**



Damaged upper or lower mount



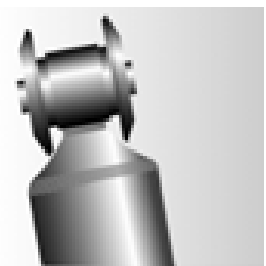
Damaged upper or lower bushing



Damaged dust cover and / or shock body



Bent or dented shock



Improper installation  
Example: washers (if equipped) installed backwards.

### LEAKING VS. MISTING SHOCK VISUAL INSPECTION

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

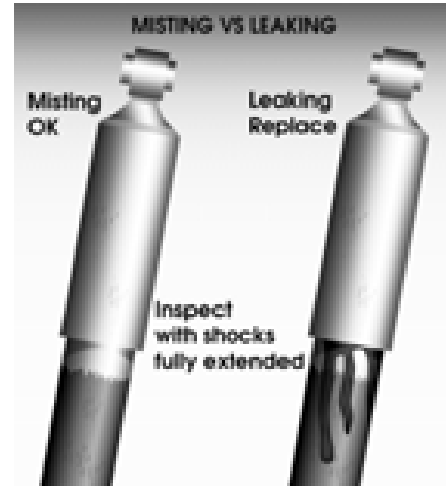
A shock that is truly leaking and needs to be replaced will show signs of fluid leaking in streams from the upper seal. These streams can easily be seen when the shock is fully extended, underneath the main body (dust cover) of the shock. Look for these potential problems when doing a visual inspection. Inspect the shock absorbers fully extended. Replace as necessary.

#### NOTE

The AIRTEK/SOFTEK suspension is equipped with a premium seal on the shock, however this seal will allow for misting to appear on the shock body (misting is not a leak and is considered acceptable).

If the shock is damaged, install a new shock absorber as detailed in the Component Replacement Section of this publication.

FIGURE 7-22



## KINGPIN BUSHING INSPECTION

### INSPECTION PROCEDURE (Steering Knuckle Lateral Movement)

1. Chock the wheels to help prevent the vehicle from moving. Set the parking brake.
2. Use a jack to raise the vehicle until the wheels are off the ground. Support the vehicle with safety stands.
3. **CHECKING THE UPPER KINGPIN BUSHING.** Install the base of a dial indicator onto the axle beam and face the tip against the steering knuckle, see Figure 7-23.
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 7-25.
6. Check the reading on the dial indicator. If the dial indicator moves more than 0.015", the upper bushing is worn or damaged. Replace both bushings. Refer to the Kingpin Bushing replacement procedure in the Component Replacement Section of this publication.
7. **CHECKING THE LOWER KINGPIN BUSHING.** Install a dial indicator so that the base is on the axle and the indicator tip is against the inside of the bottom of the knuckle, see Figure 7-24.

FIGURE 7-23



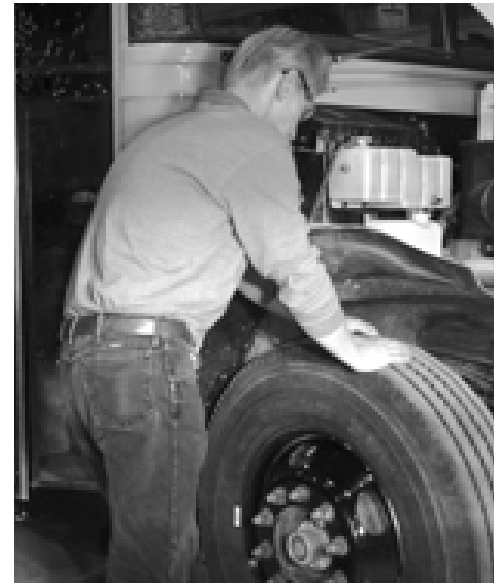
FIGURE 7-24



8. Set the dial indicator to "0" zero.
9. Move the bottom of the tire in and out. If the dial indicator moves more than 0.015", the lower bushing is worn or damaged. Replace both kingpin bushings. Refer to the Component Replacement Section of this publication.

**NOTE**

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

**FIGURE 7-25**


## STEERING KNUCKLE INSPECTION

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

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

1. Chock the rear tires to help prevent the vehicle from moving.
2. Set the parking brakes.
3. Use a jack to raise the vehicle until both tires are 1" off the ground.

**FIGURE 7-26**

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 7-26.
  - 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.



### ADJUSTMENT

#### STEERTEK NXT AXLE (AFTER October 2012)

1.
  - 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.
2. Retighten the socket head cap screws to 175-200 foot pounds (237-271 Nm) torque.

**NOTE**

**ONLY** if the vehicle is built **PRIOR to** October 2012 equipped with the **STEERTEK** axle can the vertical end play be further adjusted with a shim. The **STEERTEK NXT** axle does not use a shim.

### STEERTEK AXLE (PRIOR to October 2012)

3. ■ 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

### AXLE WRAP LINER INSPECTION (if equipped)

#### INSPECTION PROCEDURE

- 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 7-27. See Axle Wrap replacement in the Component Replacement Section of this publication.

FIGURE 7-27

#### Axle Wrap Liners Unacceptable Cracks



### SHACKLE THRUST WASHER INSPECTION (if equipped)

#### NOTE

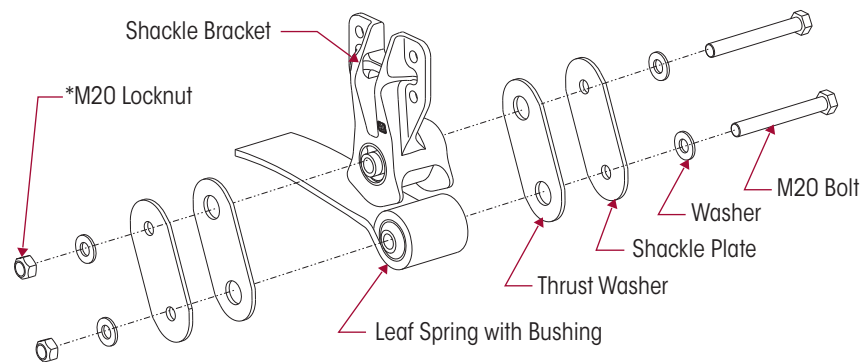
SOFTEK for Vision 8.5K capacity vehicles built **AFTER** 02/2007, and all other vehicles built **AFTER** 11/2006 are not equipped with shackle thrust washers.

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

An indication that the shackle 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 rear spring eye and or thrust washers are in contact with the shackle plates.

FIGURE 7-28  
FOR VEHICLES BUILT PRIOR TO 11/06



\*Tightening torque specifications controlled by vehicle manufacturer.

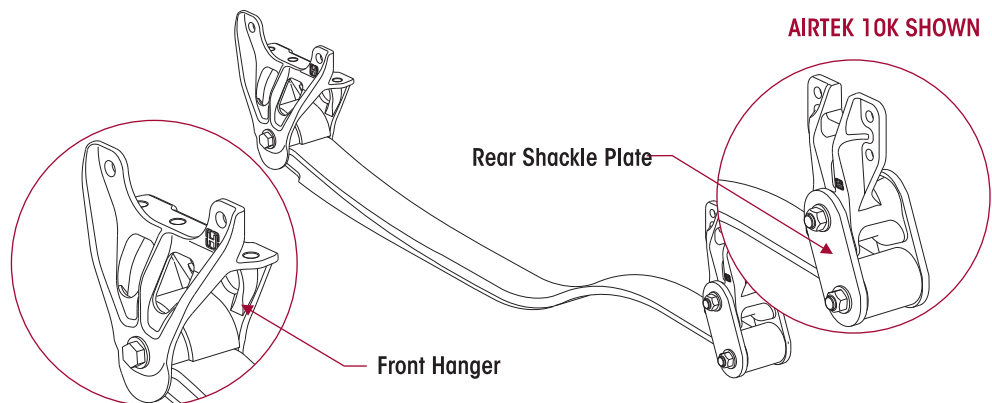
3. Normal and unacceptable thickness of the thrust washers, see Figure 7-28, can be measured with a micrometer or a ruler.
  - The normal thickness of a new thrust washer is  $\frac{3}{16}$ " (0.187").
  - The minimum thickness allowable for a thrust washer is  $\frac{3}{32}$ " (0.090").
  - If one or more of these conditions is experienced, disassembly of the rear shackle assembly is required to replace the thrust washers.
  - If one 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 Shackle Thrust Washer replacement procedure in the Component Replacement Section of this publication.

### SURFACE PAINT WEAR INSPECTION

**SOFTEK/AIRTEK Front Hanger / Rear Shackle Bracket** — Hendrickson AIRTEK and SOFTEK suspension systems equipped on Blue Bird buses, utilize rubber bushings in the leaf springs. These rubber bushings allow the leaf spring to deflect and may contact the front hanger and shackle plates when the bus encounters high lateral acceleration (e.g. a highway clover leaf). The rubber bushing will center the leaf spring between the legs of the hanger/shackle plates once the vehicle is driven straight.

This function of the rubber bushing may allow the leaf spring to contact the front hanger/rear shackle plate and possibly remove surface paint from the contact area. Surface paint wear does not cause damage that will affect the function or durability of the front hanger/rear shackle plate or their mating components provided a minimum wall thickness is maintained.

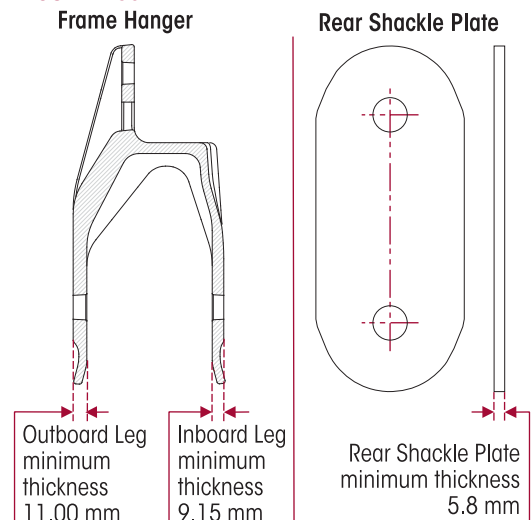
**FIGURE 7-29**



**FIGURE 7-30**

An indication that the front hanger/ rear shackle plates are worn and require replacement is when the components no longer meet the following minimum requirements:

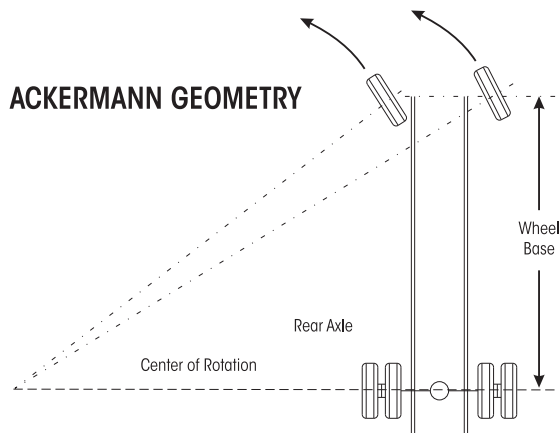
- Front hanger inboard leg minimum thickness of 9.15 mm and the outboard leg thickness minimum thickness 11.00 mm, see Figure 7-30.
- Rear shackle plate minimum thickness of 5.8 mm, see Figure 7-30.



## SECTION 8 Alignment & Adjustments

### ALIGNMENT DEFINITIONS

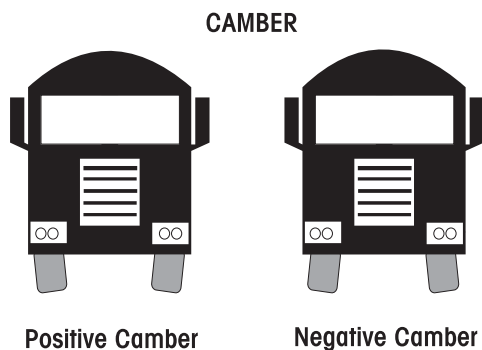
FIGURE 8-1



**Ackermann Steering Geometry** — The geometry of the four bar linkage consisting of the front axle beam pivot points, tie rod arms, and cross tube and attempts to provide free rolling of front tires 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 is present 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.

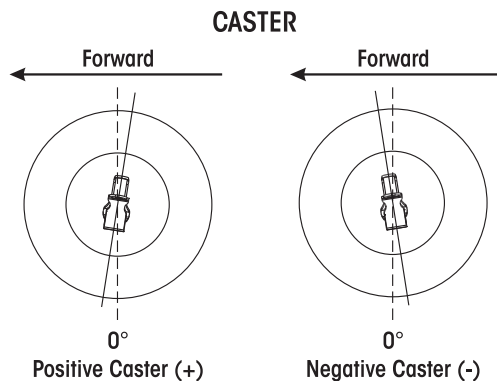
FIGURE 8-2



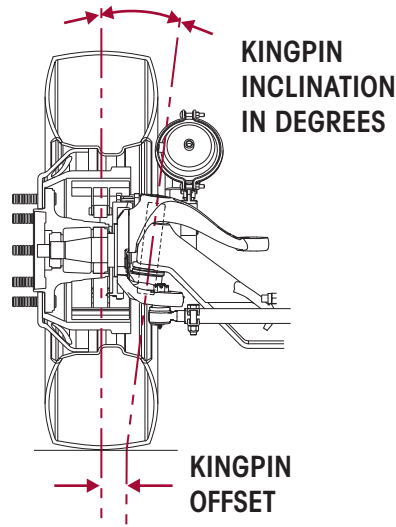
**Camber** — The angle formed by the inward or outward tilt of the wheel reference to a vertical line. Camber is positive when the wheel is tilted outward at the top and is negative when the wheel is tilted inward at the top.

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



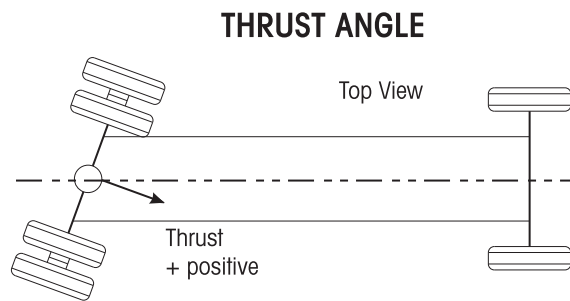
**Caster** — The forward or rearward tilt of the steering axle kingpin in reference to a vertical line. The angle is measured in degrees. Caster is positive when the top of the steering axis is tilted rearward and is negative when the tilt is forward. Proper caster is important for directional stability and return ability. 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 return ability. 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.

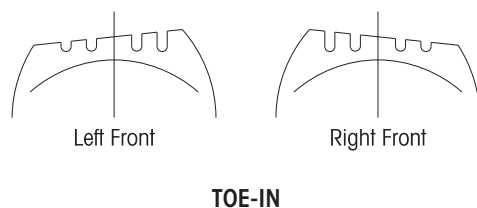
**Steering Arm** — The component that connects the drag link to the axle knuckle assembly.

**FIGURE 8-5**


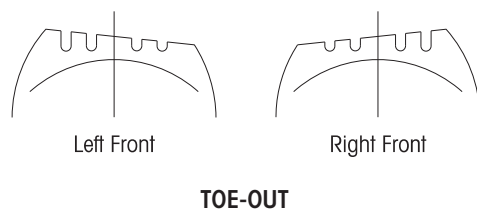
**Thrust Angle, Tracking, or Square** — The angle formed by the centerline of the vehicle frame (geometric centerline) and the direction that an axle points. As indicated by the term “square”, the ideal value for the angle is 0° or when the axle centerline is at 90° or perpendicular to the geometric 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 8-6**


**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.

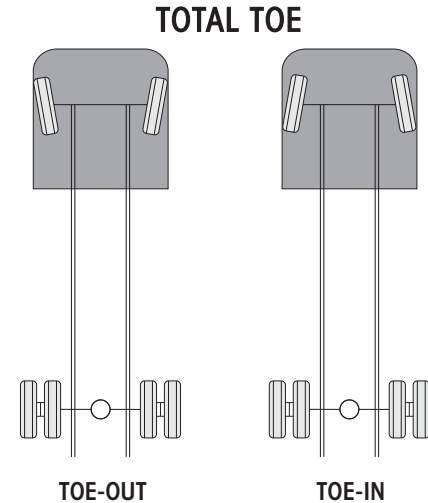
**FIGURE 8-7**


**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.

**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 the 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.

FIGURE 8-8



## 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 and check for tire to rim runout.
- The wheels and tires are free of excessive wear and damage.
- Wheel bearing end play is within OEM specification.

### FRONT SUSPENSION

Inspect the following:

- All fasteners are installed and tightened to the specified torque. See Torque Specification Section of this publication.
- Leaf springs are free of wear or damage.
- Air springs are free of wear or damage (if equipped).
- 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 for wear or damage.

### INSPECT TIE ROD ENDS

Perform the "Tie Rod Inspection" procedure, refer to the Preventive Maintenance Section of this publication.





## REAR AXLE AND REAR SUSPENSION

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 from the manufacturer of the vehicle or the suspension.
- 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 TMC (The Technology & Maintenance Council) Guidelines for Total Vehicle Alignment.

## FRONT WHEEL ALIGNMENT

Hendrickson recommends technicians review TMC's publication TMC (Technology & Maintenance Council) "Guidelines for Total Vehicle Alignment".

The AIRTEK/SOFTEK front wheel alignment specification can be found in the Front Wheel Alignment Specification Section of this publication.

Check the total vehicle wheel alignment when the following occur:

- Every 80,000 to 100,000 miles (128,700 to 160,900 kms), or 12-18 months (normal maintenance), whichever comes first.
- When the vehicle does not steer correctly.
- To correct a tire wear condition.

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

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

1. *Minor alignment* – a minor front wheel alignment is done **for all** normal maintenance conditions, see below.
2. *Major alignment* – a major alignment is done when uneven or excessive tire wear is evident, or response at the steering wheel is sluggish, or the need for major wheel alignment check and adjustment is required, see below.

## MINOR FRONT WHEEL ALIGNMENT

Perform the minor front wheel alignment in the following sequence:

1. Inspect all systems that affect wheel alignment. Refer to "Inspection Prior to Alignment" in this section.
2. Check the wheel bearing end play.
3. Check and adjust the vehicle ride height (for AIRTEK) as specified in this section.
4. Check toe-in and adjust if necessary.

## 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 8-9 and 8-10.

**FIGURE 8-9**



**FIGURE 8-10**



3. If the vehicle is equipped with power steering, check the pressure relief in the power steering system and reset if necessary. Refer to vehicle manufacturer regarding the subject: Adjusting the Pressure Relief in the Power Steering System.
4. Verify the turning angle per Step 2, (toe-out during vehicle turns or the Ackermann angle). Refer to vehicle manufacturer's specifications.
5. Check the kingpin (or steering axis) inclination (the kingpin inclination is not adjustable). Refer to "Kingpin Inclination", in the Alignment Definitions in this section.
6. Check the camber angle. **DO NOT** attempt to adjust. Refer to "Camber" in the 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 8-11 AND 8-12.

### 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 8-12.

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

### NOTE

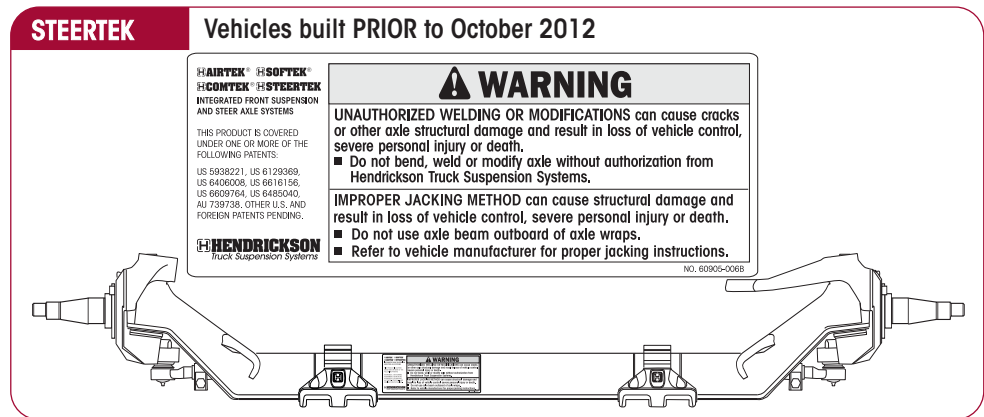
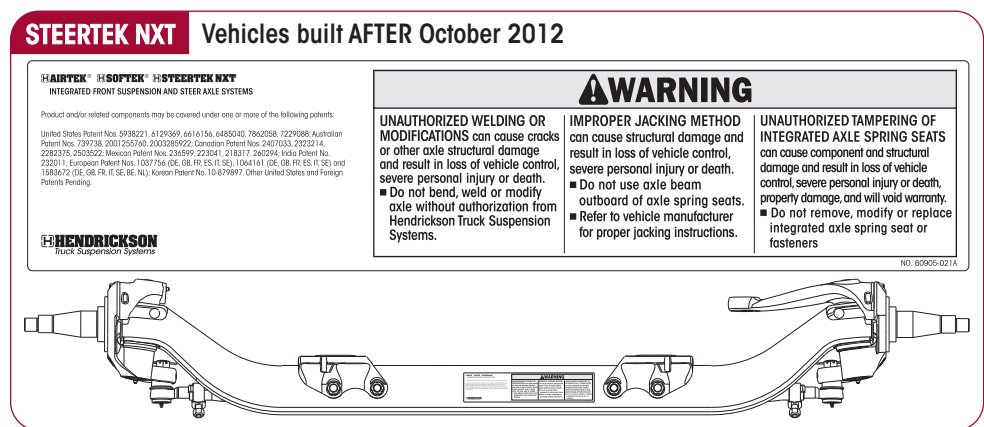
Contact Hendrickson Tech Services for any questions regarding STEERTEK NXT integrated axle spring seats and / or fasteners.

7. Check and adjust caster angle. Refer to "Caster" in the Alignment Definitions in this section. **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.

### SERVICE HINT

Prior to checking caster confirm that the vehicle is at its proper ride height front and rear. The front and rear ride height must be correct to achieve proper caster.

8. Check and adjust toe-in, refer to Toe Setting in this Section.

**FIGURE 8-11**

**FIGURE 8-12**


### AIRTEK 10K – SINGLE HCV VERIFICATION

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 that the brakes are released.**
3. Chock front wheels.
4. Verify that the air system is at full operating pressure.

#### 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, and any subsequent air leaks from the height control valve.

5. Prior to adjusting the height control valve, clean the threads of the 1/4" valve mounting fasteners to remove any debris and corrosion.

#### 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.

6. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to inflating or deflating the suspension system.

#### SERVICE HINT

It is very important that the leveling valve be cycled completely before and after any ride height adjustments. This cycling of the leveling valve will help to make the adjustment as accurate as possible.

7. Detach 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 linkage arm.
8. Re-attach the upper grommet of the height control valve linkage onto the upper stud to fill the suspension system with air. Wait until the airflow to front air springs has stopped.
9. Measure the suspension reference ride height on the shock absorber, see Figure 8-13 and, measuring from the center of the top mounting bolt to the center of the bottom mounting bolt.
10. The referenced ride height measurement is specified in Table 8-1. If the reference measurement is not within  $\pm 1/4$ " of specification, the ride height **MUST** be adjusted, see Single Ride Height Adjustment in this section. If the ride height measurement is within specification, than no adjustment is necessary, proceed to next step.
11. Remove wheel chocks.

FIGURE 8-13

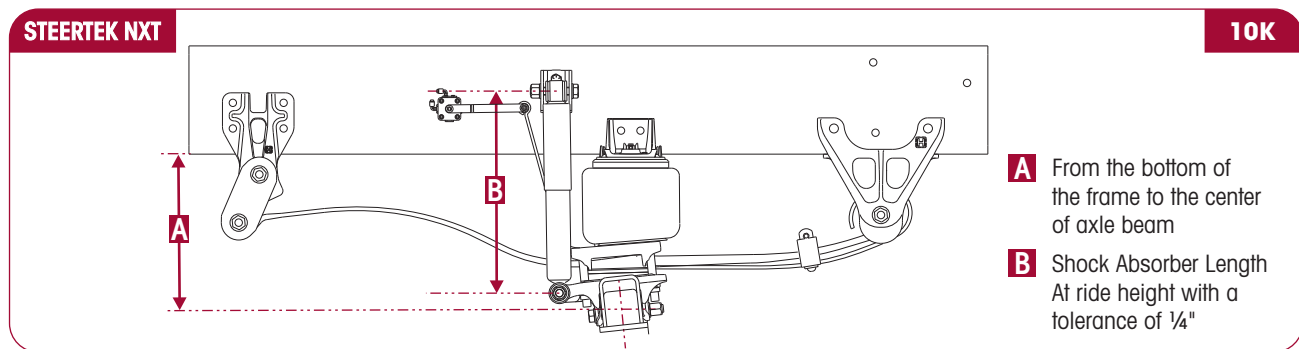


TABLE 8-1

Blue Bird Vision Model

AIRTEK	RIDE HEIGHT Dimension A	SHOCK ABSORBER LENGTH Dimension B
Equipped with STEERTEK NXT / STEERTEK	12 $1/2$ "	18 $5/16$ "
COMFORT AIR	*Referenced Ride Height 4 $7/8$ "	**Referenced Shock Absorber Length 22 $3/4$ "

\*The referenced ride height from the bottom of the frame to the bottom of main support member.  
 \*\*At ride height with a tolerance of  $1/4$ ".

10K – SINGLE HCV RIDE HEIGHT 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.

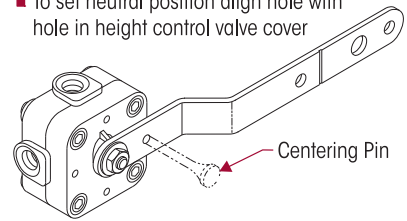
2. See Air Spring Safety Notice in the Important Safety Notice Section of this publication prior to deflating or inflating the suspension system. Cycle the air system.
3. Cycle the air system. Detach the lower rubber grommet(s) of the height control valve linkage(s) from the lower stud and exhaust the suspension system air by lowering the height control valve linkage arm.
4. Refill the suspension by raising the height control valve arm(s) by hand, so that the air springs are above the proper ride height.
5. Lower the height control valve arm(s) to exhaust the air system until the suspension is at the proper ride height.
6. Use a  $1/8$ " wooden dowel rod (golf tee) to set the neutral position for the height control valve(s) by aligning the hole in the height control valve arm(s) with the hole in the height control valve cover, as shown in Figure 8-14. **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.

**FIGURE 8-14**

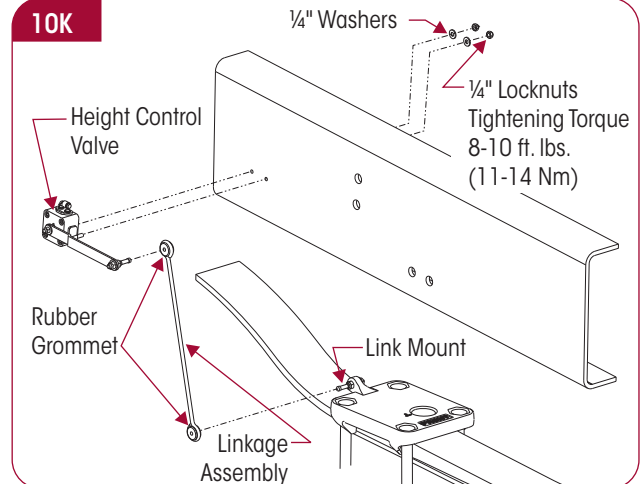
- To set neutral position align hole with hole in height control valve cover



- Prior to adjusting the height control valves, clean the threads of the mounting fasteners of any debris and corrosion.
- To adjust the height control valve, loosen the mounting locknuts.
- 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.
- Facing the air spring from the outboard side for the left side of the vehicle, pivot the valve body counter clockwise to increase the ride height and clockwise to decrease the ride height. For the right side of the vehicle, pivot the valve body clockwise to increase the ride height and counter clockwise to decrease the ride height.

**SERVICE HINT**

It is necessary to place a  $\frac{3}{16}$ " Allen wrench in the head of the mounting bolts while adjusting ride height to prevent movement of the bolts, which can cause air leakage in the body of the leveling valve.

**FIGURE 8-15**


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

### AIRTEK 13.2K/14.6K – DUAL HCV 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 linkage arms.
6. Re-attach the lower grommet of the height control valve linkages onto the lower studs to fill the suspension system with air. Wait until the airflow to the front air springs has stopped.
7. The referenced ride height measurements are specified in Table 8-2. If the reference measurement is not within  $\pm \frac{1}{4}$ " of specification, the ride height **MUST** be adjusted, see Dual Ride Height Adjustment in this section. If ride height measurement is within specification, than no adjustment is necessary, proceed to Step 8.
8. Remove wheel chocks.

FIGURE 8-16

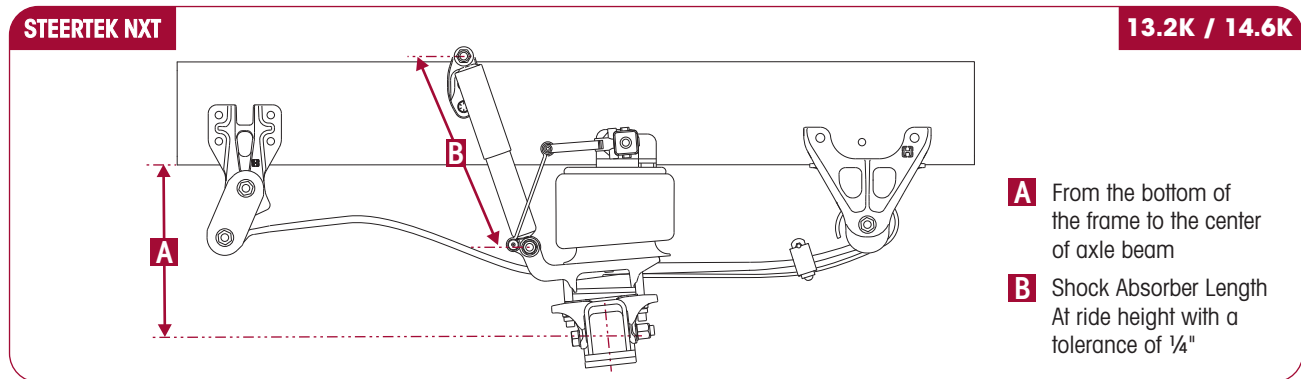


TABLE 8-2

Blue Bird All American Model

AIRTEK	FRONT ENGINE		REAR ENGINE	
	Ride Height Dimension A	Shock Absorber Length Dimension B	Ride Height Dimension A	Shock Absorber Length Dimension B
Equipped with STEERTEK NXT after October 2012	14 $\frac{7}{8}$ "	17 $\frac{15}{16}$ "	14 $\frac{7}{8}$ "	18 $\frac{5}{32}$ "
Equipped with STEERTEK prior to October 2012		17 $\frac{1}{4}$ "		17 $\frac{15}{32}$ "
<b>COMFORT AIR</b>	*Referenced Ride Height 4 $\frac{7}{8}$ "		**Referenced Shock Absorber Length 22 $\frac{3}{4}$ "	

\*The referenced ride height from the bottom of the frame to the bottom of main support member.  
 \*\*At ride height with a tolerance of  $\frac{1}{4}$ ".

### 14K – DUAL RIDE HEIGHT ADJUSTMENT PROCEDURE

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

#### SERVICE HINT

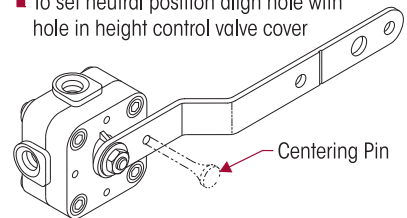
It is very important that the leveling valve be cycled completely before and after any ride height adjustments. Cycling of the leveling valve will help make the adjustment more accurate.

2. See Air Spring Safety Notice in the Important Safety Notice Section of this publication prior to deflating or inflating the suspension system.
3. Cycle the air system. Detach the lower rubber grommet(s) of the height control valve linkage(s) from the lower stud and exhaust the suspension system air by lowering the height control valve linkage arm.
4. Refill the suspension by raising the height control valve arm(s) by hand, so that the air springs are above the proper ride height.
5. Lower the height control valve arm(s) to exhaust the air system until the suspension is at the proper ride height.

6. Use a  $\frac{1}{8}$ " wooden dowel rod (golf tee) to set the neutral position for the height control valve(s) by aligning the hole in the height control valve arm(s) 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.

**FIGURE 8-17**

- To set neutral position align hole with hole in height control valve cover

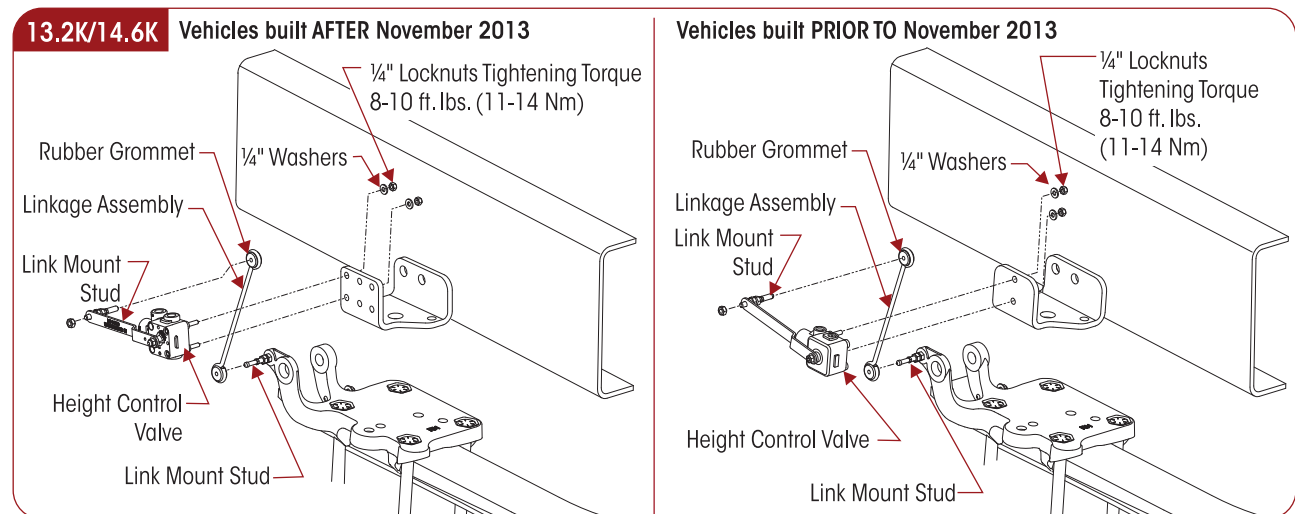


#### SERVICE HINT

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.

7. Prior to adjusting the height control valves, clean the threads of the mounting fasteners of any debris and corrosion.
8. To adjust the height control valve, loosen the mounting locknuts. Pivot the valve body about the mounting bolt so the upper link mount stud inserts directly into the center hole of the rubber grommet at the proper height.
9. Check the rubber grommet for any tearing or damage, replace as necessary.


**FIGURE 8-18**



10. Facing the air spring from the outboard side for the **left side** of the vehicle, pivot the valve body counter clockwise to increase the ride height and clockwise to decrease the ride height. For the **right side** of the vehicle, pivot the valve body clockwise to increase the ride height and counter clockwise to decrease the ride height.

**NOTE**

It is necessary to place a  $\frac{3}{16}$ " Allen wrench in the head of the mounting bolts while adjusting ride height to prevent movement of the bolts, which can cause air leakage in the body of the leveling valve.

11. Tighten the mounting locknuts to  8-10 foot pounds (11-14 Nm) 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. Remove the dowel from the height control valves.
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 mounts. 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 adjustment Steps 2 through 14 until the ride height is within specification.
16. Remove wheel chocks.

**STEERING STOP****ADJUSTMENT PROCEDURE**

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


**WARNING**

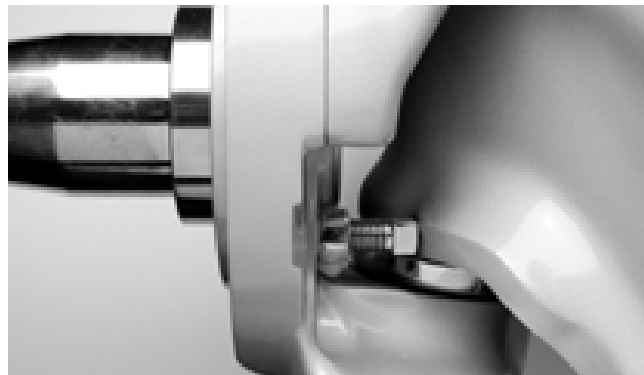
ALWAYS CHECK/RESET THE STEERING GEAR BOX POPPET WHEN THE WHEEL CUT IS DECREASED. FOLLOW MANUFACTURER'S GUIDELINES FOR THE GEAR BOX POPPET RESETTING PROCEDURE. FAILURE TO DO SO CAN RESULT IN PREMATURE FAILURE OF THE AXLE OR STEERING KNUCKLE. THIS CONDITION CAN CAUSE LOSS OF VEHICLE CONTROL, POSSIBLE PERSONAL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

1. Drive the vehicle on turntables and chock the rear wheels.
2. Measure the wheel cut. The wheel cut is determined by steering the tires. Wheel cut is measured at the inside wheel only, therefore the tires must be turned to the full lock position for each right hand and left hand direction. Refer to the vehicle manufacturer for exact specifications.
3. Increase the wheel cut by loosening the jam nuts and screw the axle stops in clockwise.
4. Tighten the jam nuts.

**NOTE**

It is very important that the sides of the square head axle stops are set parallel to the axle beam to ensure a good contact point on the axle, see Figure 8-19.

5. Decrease the wheel cut by loosening the jam nuts and screw the axle stops out counter-clock-wise.
6. Tighten the jam nuts to  40-60 foot pounds (54-81 Nm) torque.
7. Measure the wheel cut and check for any interference with related steering components.

**FIGURE 8-19**



## 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.

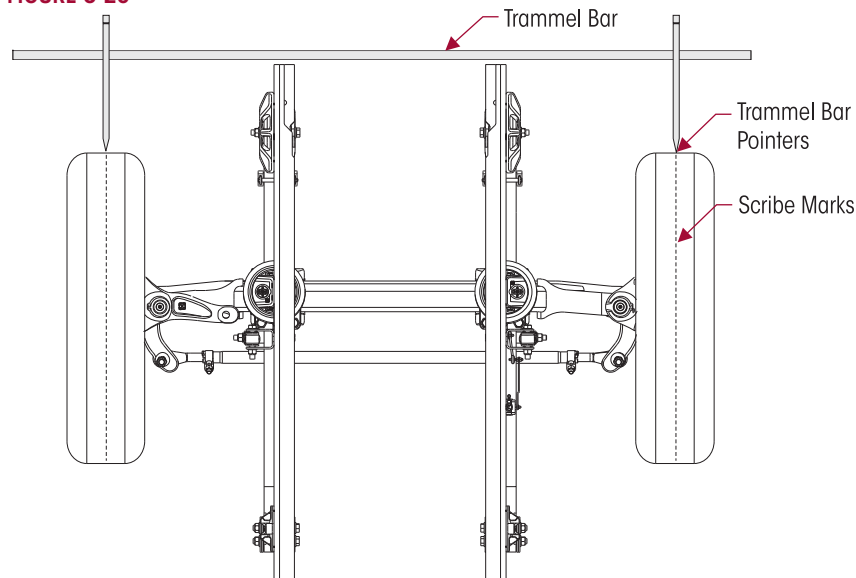
**NOTE**

**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.

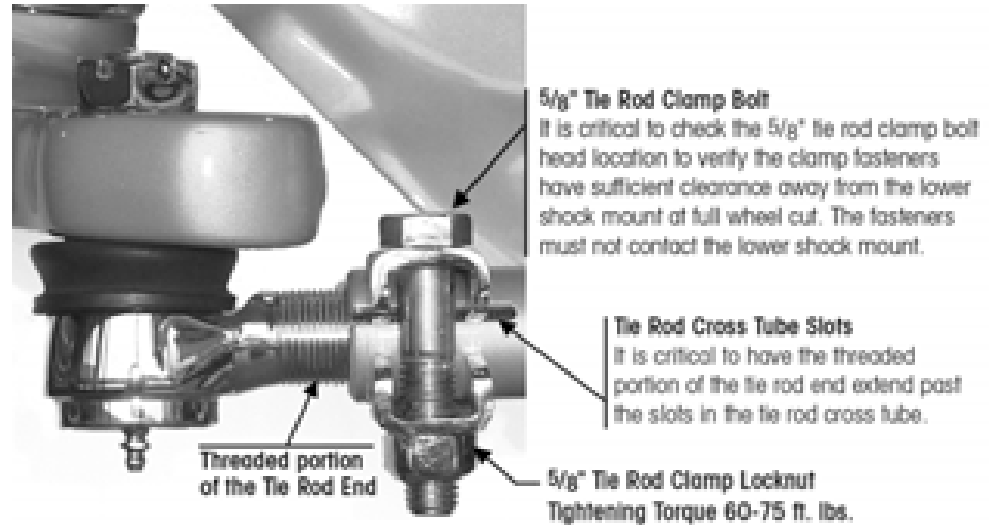
**FIGURE 8-20**


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.
  - c. Tighten the bolt and locknut on the tie rod cross tube to 60-75 foot pounds (81-102 Nm) torque.

**WARNING**

THE THREADED PORTION OF THE TIE ROD END MUST EXTEND PAST THE SLOTS INTO THE TIE ROD (SEE FIGURE 8-21) 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.

11. Verify the 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****SPRING EYE RE-TORQUE**

- This procedure to re-torque is necessary when replacing the: front hanger, shackle assembly and leaf spring assembly

**AIRTEK / SOFTEK RE-TORQUE PROCEDURE**

1. Chock the rear wheels of the vehicle to prevent movement.
2. Verify ride height. Adjust if necessary, see AIRTEK Ride Height adjustment procedure in this Section.

**NOTE**

**DO NOT** remove the spring eye bolts.

3. Loosen all six (6) front and rear spring eye bolts, see Figures 8-22.
4. Let the suspension settle.
5. Tighten the front M20 spring eye bolt locknuts to vehicle manufacturer's specifications.
6. Tighten the rear M20 spring eye bolt and shackle bolt locknuts to vehicle manufacturer's specifications.



FIGURE 8-22

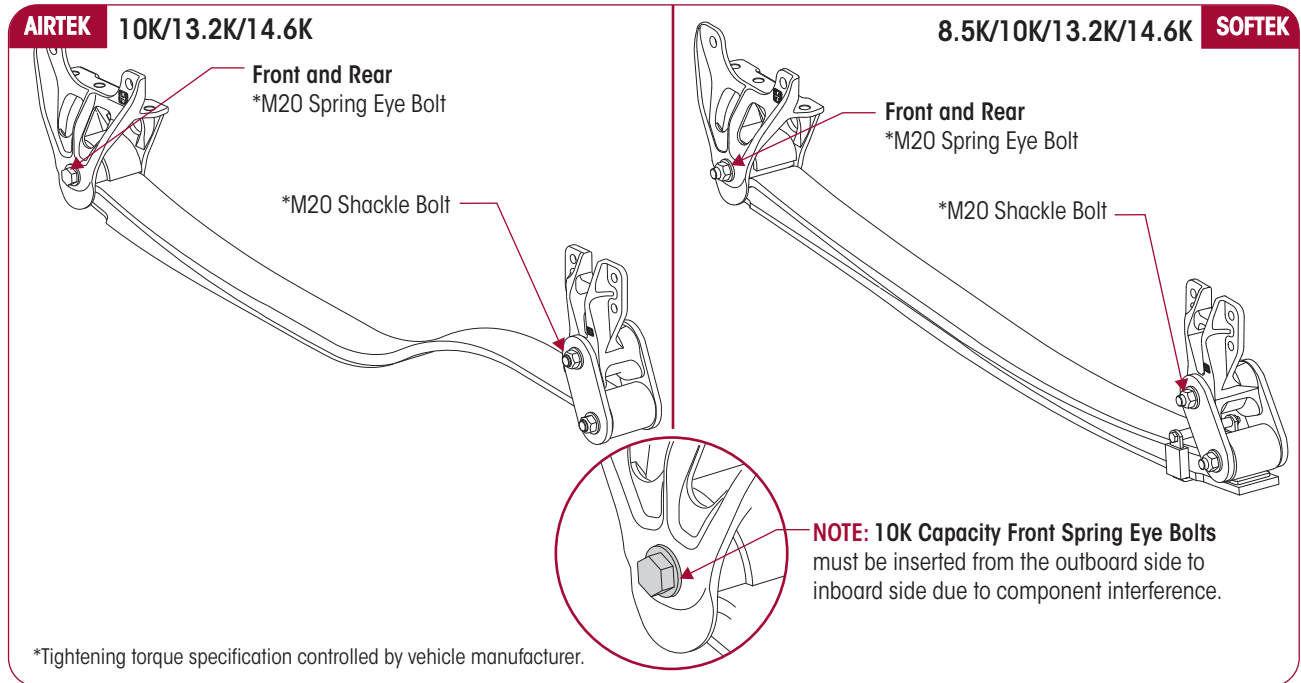


FIGURE 8-23

- Affix a straight edge to the bottom of the frame rail in front of the air spring, see Figure 8-23.
- With the vehicle on a level surface measure the distance from the top of the straight edge to the ground on both sides of the vehicle and record the measurements.
- Measure the difference from one side to the other.
- Do a road test and repeat measurement Steps 7 to 9.
- If the measurement is less than  $\frac{3}{8}$ " the vehicle is level. If measurement is more than  $\frac{3}{8}$ " contact Hendrickson Tech Services.



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

### SPACERS

There are different front axle spacer configurations for each front suspension system. Prior to disassembly of the front axle clamp group, note the orientation and quantity of the front axle spacer(s) (if equipped). It is required that the axle spacers be installed in the same orientation and location as removed to preserve the existing vertical alignment. Refer to the Parts List Section of this publication.

### HEIGHT CONTROL VALVE

#### ■ AIRTEK 10K

#### 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 additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to inflating or deflating the suspension system.
3. Exhaust the air from the air system by disconnecting the height control valve linkage(s) at the rubber grommet(s) and allowing the lever to drop. Lower the height control valve lever arm. This will exhaust air from the system.



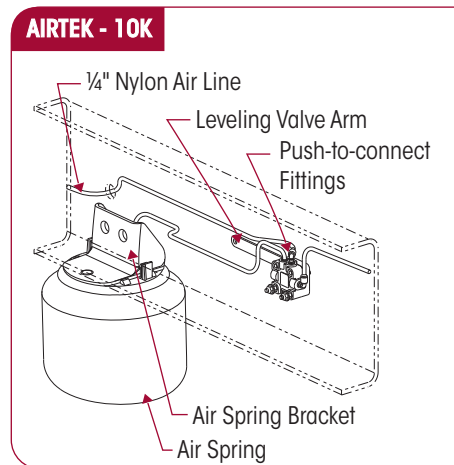
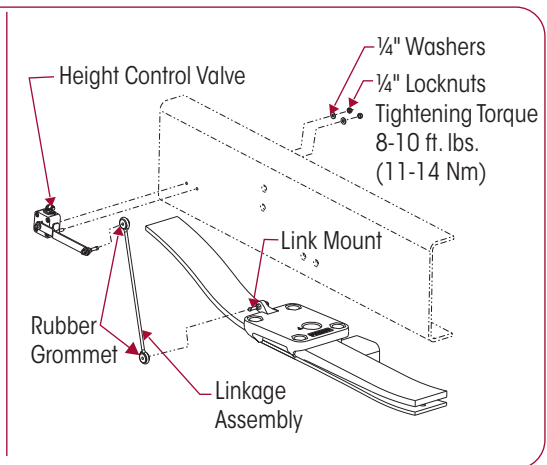
#### CAUTION

THE PUSH-TO-CONNECT FITTINGS ARE NON-SERVICEABLE. IT IS NECESSARY TO CLEAN THE DIRT AND DEBRIS AWAY FROM THE PUSH-TO-CONNECT FITTINGS AND THE AIR LINES TO HELP PREVENT ANY FOREIGN MATERIAL FROM ENTERING THE AIR SPRING, AIR SYSTEM OR DAMAGING THE PUSH-TO-CONNECT FITTINGS. CLEAN PUSH-TO-CONNECT FITTINGS USING SOAPY WATER AND A SOFT BRISTLED BRUSH AND DRY WITH COMPRESSED AIR.

4. Remove the air lines from the height control valve, see Figure 9-1. The air lines are push-to-connect. Push in on the air line to release tension, push down on the collar and pull out the air line.
5. Remove the two ¼" mounting nuts and washers.
6. Remove the height control valve.

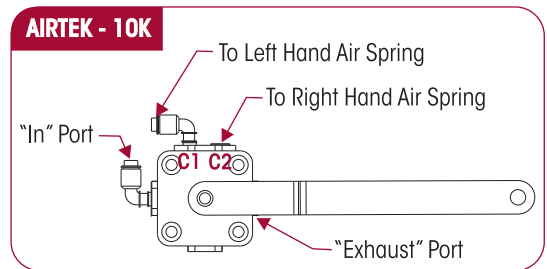
#### ASSEMBLY

1. Attach the height control valve on the vehicle frame as shown in Figure 9-1.
2. Attach the ¼" washers and the locknuts. **DO NOT** tighten the locknuts to specified torque until after the proper ride height is attained. Mount the height control valve parallel to flange of the frame, see Figure 9-2.

**FIGURE 9-1**

**FIGURE 9-2**

**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, see Figure 9-3.
4. Install the height control valve linkage assembly.
5. Adjust the height control valve to proper specifications. See the Alignment & Adjustments Section of this publication for proper ride height adjustment.
6. Tighten the 1/4" locknuts to 8-10 foot pounds (11-14 Nm) torque.

**FIGURE 9-3**


## HEIGHT CONTROL VALVE

### ■ AIRTEK 13.2K/14.6K

#### DISASSEMBLY

1. Drain the air from the secondary air tank.

**WARNING**

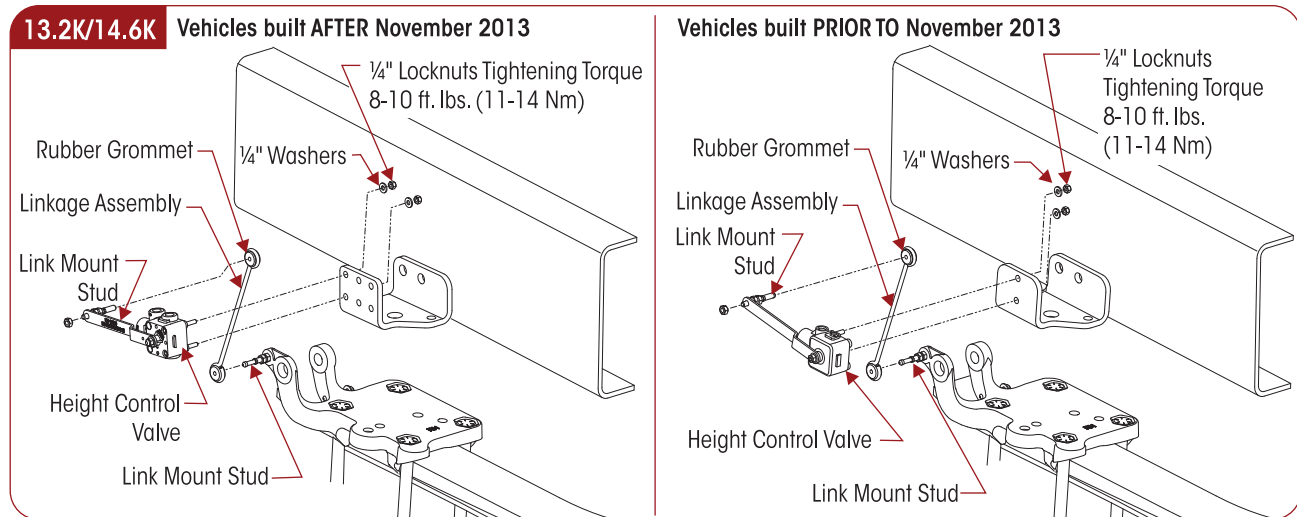
PRIOR TO AND DURING DEFLATION AND INFLATION OF THE FRONT AIR SUSPENSION SYSTEM, ENSURE THAT ALL PERSONNEL AND EQUIPMENT ARE CLEAR FROM UNDER THE VEHICLE AND AROUND THE SERVICE AREA, FAILURE TO DO SO CAN CAUSE SERIOUS PERSONAL INJURY, DEATH, OR PROPERTY DAMAGE.

2. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to inflating or deflating the suspension system.
3. Exhaust the air from the air system by disconnecting the height control valve linkage(s) at the rubber grommet(s) and allowing the lever to drop. Lower the height control valve lever arm. This will exhaust air from the system.
4. Remove the air lines from the height control valve, see Figure 9-4. The air lines are push-to-connect. Push in on the air line to release tension, push down on the collar and pull out the air line.
5. Remove the two 1/4" mounting nuts and washers.
6. Remove the height control valve.

### ASSEMBLY

1. Re-install the air fittings into the height control valve. Ensure the Teflon® thread sealing ring is seated around the base of the fitting's hex shoulder. Tighten to 8-10 foot pounds (11-14 Nm) torque.
2. Install the height control valve to the upper air spring bracket by attaching the 1/4" washers and locknuts. Tighten fasteners to 8-10 foot pounds (11-14 Nm) torque, see Figure 9-5.

FIGURE 9-5



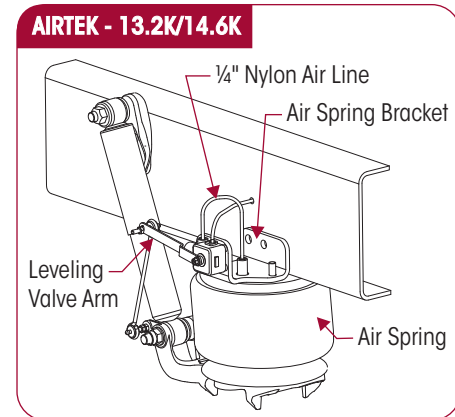
3. Install the air lines to the height control valve. Refer the Plumbing Diagram Section of this publication.
4. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to inflating or deflating the suspension system.
5. Inflate the suspension by connecting the height control valve linkage to the height control valve arm and lower mounting bracket. Verify the air springs inflate uniformly without binding.
6. Remove the frame supports.
7. Remove the wheel chocks.
8. Verify proper ride height adjustment, see ride height adjustment in the Alignment & Adjustments Section of this publication.

## AIR SPRING – AIRTEK 10K

### DISASSEMBLY

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

FIGURE 9-4



**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 additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to inflating or deflating the suspension system.
6. Remove the air from the air system by disconnecting the height control valve linkage at the rubber grommet of the height control valve arm and allow the arm to drop. This will exhaust air from the system.

**WARNING**

IF THE AIR SPRING IS TO BE RE-INSTALLED; INSPECT LOCK-TABS FOR DAMAGE OR CRACKS PRIOR TO RE-INSTALLATION. CARE MUST BE TAKEN TO REMOVE DIRT AND DEBRIS FROM THE PUSH-TO-CONNECT FITTING. FAILURE TO DO SO CAN RESULT IN THE PUSH-TO-CONNECT FITTING FAILING TO SEAL WITH THE AIR LINE.

7. Disconnect the air line to the air spring.
8. Raise the frame to allow for air spring removal.
9. Separate the air spring from the upper air spring bracket by applying downward pressure on air spring, see Figure 9-6, pushing outward on the lock-tabs outside the bracket, and inward on inlet lock-tabs. This will dislodge the air spring from the upper air spring bracket.
10. Apply upward pressure between the base of the air spring and the top pad. This will dislodge the air spring from the top pad, see Figure 9-7.
11. Remove the air spring.

**FIGURE 9-6**

**FIGURE 9-7**

**ASSEMBLY**

1. Insert the air spring into the top pad. Make sure the lock tabs click in place.
2. Compress the air spring and slide into vertical position. There is a locating nodule on the air spring to index the position in the upper air spring bracket.
3. Pull the air spring up into the upper air spring bracket until the air spring snaps into place in the upper air spring bracket. Verify all four lock-tabs are engaged, see Figure 9-8.

**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.

4. Install the air line into the air spring.

**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 SPRING TOP PAD. FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN PREMATURE AIR SPRING FAILURE, CAUSE PERSONAL INJURY, OR PROPERTY DAMAGE.

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

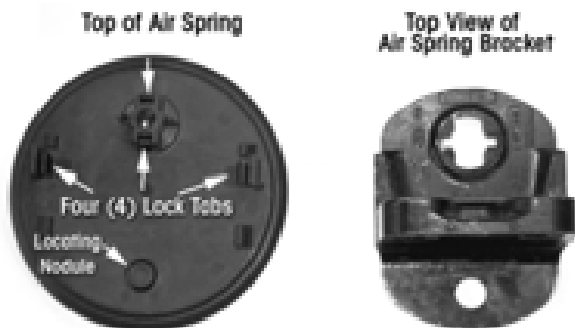
**AIR SPRING – AIRTEK 13.2K/14.6K****DISASSEMBLY**

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

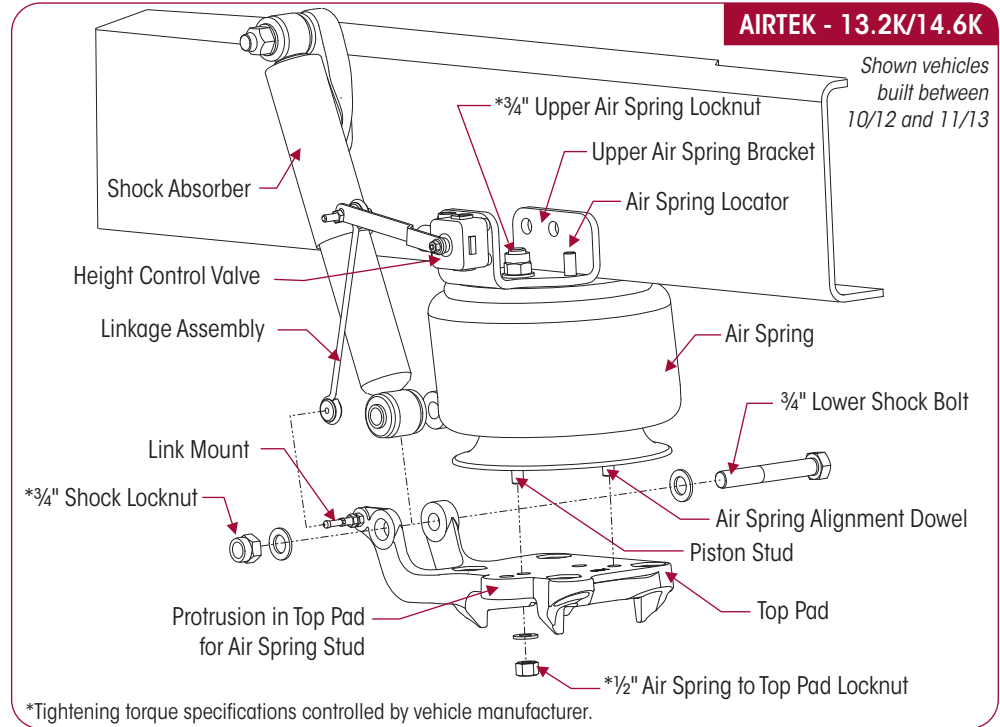
**WARNING**

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.

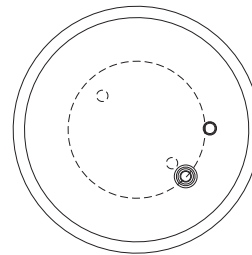
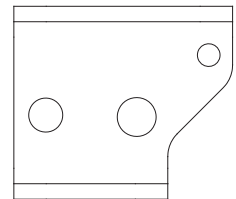
5. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to inflating or deflating the suspension system.
6. Exhaust the air from the air system by disconnecting the height control valve linkage(s) at the rubber grommet(s) and allowing the lever to drop. Lower the height control valve lever arm. This will exhaust air from the system.
7. 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.
8. Disconnect the ¼" NPT air fitting from the air spring.
9. Remove the lower ½" air spring locknut from the piston stud to remove the air spring from the top pad, see Figure 9-9.
10. Remove the ¾" upper air spring locknut from the air spring bracket.
11. Remove the air spring.

**FIGURE 9-8**



**FIGURE 9-9**

**ASSEMBLY**

1. Compress the air spring and slide into vertical position.
2. There is a locating 1/2" stud and 3/4" threading stud on top of the air spring.
3. There are two 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, see Figure 9-10.
4. Tighten the 3/4" upper air spring locknuts to vehicle manufacturer's specifications and the 1/2" lower air spring locknuts to 20-30 foot pounds (27-41 Nm).
5. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to inflating or deflating 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 Alignment & Adjustments Section of this publication for the proper ride height adjustment.
10. Remove the wheel chocks.

**FIGURE 9-10**
**Top View of Air Spring**

**Top View of Air Spring Bracket**


## FRONT LEAF SPRING FRAME HANGER

### DISASSEMBLY

1. Place the vehicle on level floor.
2. Chock the wheels.
3. Raise the frame.
4. Support the vehicle with frame stands.
5. Suspend the front axle from the shock absorbers.
6. **SOFTEK** equipped vehicles – proceed to Step 10.



### 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.

7. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to inflating or deflating the suspension system.
8. **AIRTEK** equipped vehicles – Exhaust the air from the air system by disconnecting the height control valve linkage(s) at the rubber grommet(s) and allowing the lever to drop. Lower the height control valve lever arm. This will exhaust air from the system.
9. Remove the air lines from air springs (if equipped).
10. Remove the M20 spring eye bolt, washers and locknut.

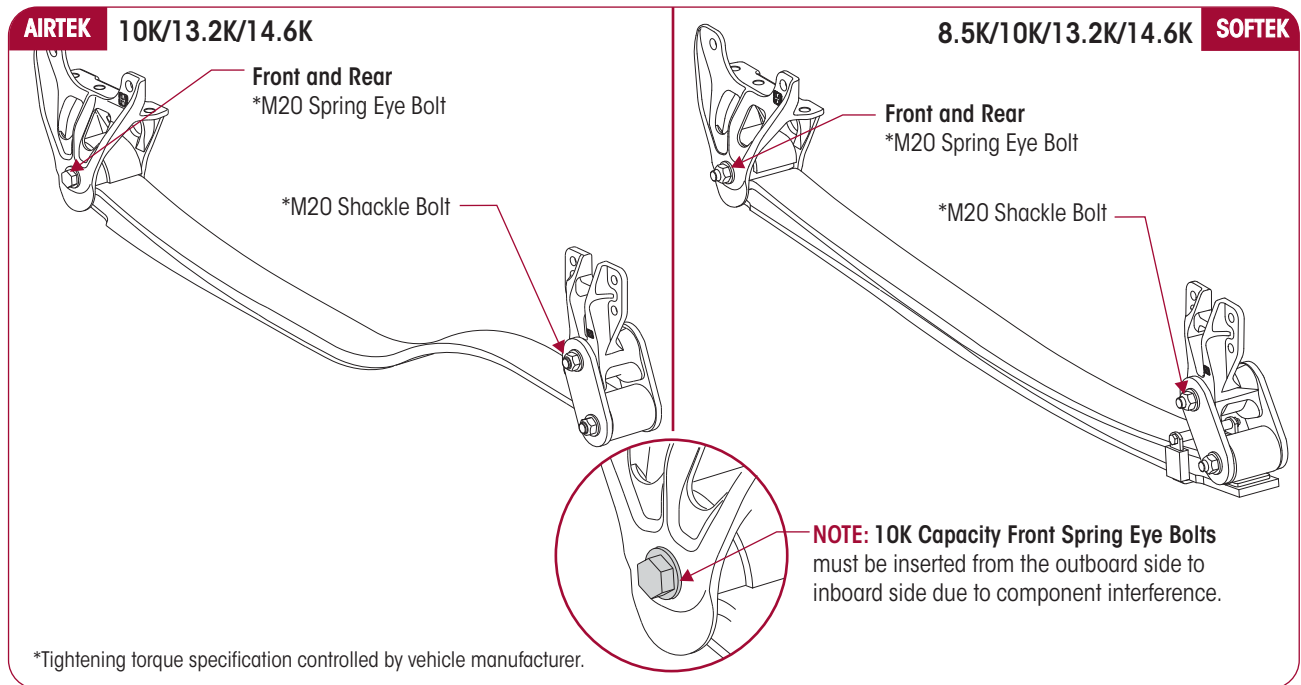
### SERVICE HINT

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

11. Remove the frame mounting fasteners from the hanger per manufacturer's guidelines.
12. Remove the hanger from the vehicle, see Figure 9-11.

### ASSEMBLY

1. Install the new hanger on the frame.
2. Install new frame fasteners per manufacturer's guidelines.
3. Install the new M20 spring eye bolt from the outboard side of the hanger, washers and locknut, see Figure 9-11.
4. Remove the frame stands and lower frame.
5. **SOFTEK** equipped vehicles – proceed to Step 9.
6. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to inflating or deflating the suspension system.
7. **AIRTEK** equipped vehicles – Install the air lines into the air springs.
8. Install the height control valve linkage and inflate the suspension to normal operating pressure.
9. Tighten M20 locknut to vehicle manufacturer's specifications.
10. Remove the wheel chocks.

**FIGURE 9-11**


## REAR SHACKLE FRAME BRACKET

### DISASSEMBLY

1. Place the vehicle on level floor.
2. Chock the wheels.
3. Raise the frame.
4. Support the vehicle with frame stands.
5. Suspend the front axle from the shocks.
6. **SOFTEK** equipped vehicles – proceed to Step 10.

### 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.

7. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to inflating or deflating the suspension system.
8. **AIRTEK** equipped vehicles – Exhaust the air from the air system by disconnecting the height control valve linkage(s) at the rubber grommet(s) and allowing the lever to drop. Lower the height control valve lever arm. This will exhaust air from the system.
9. Remove the air lines from air springs (if equipped).
10. Remove the rear M20 spring eye and shackle pivot bolts, washers and locknuts.

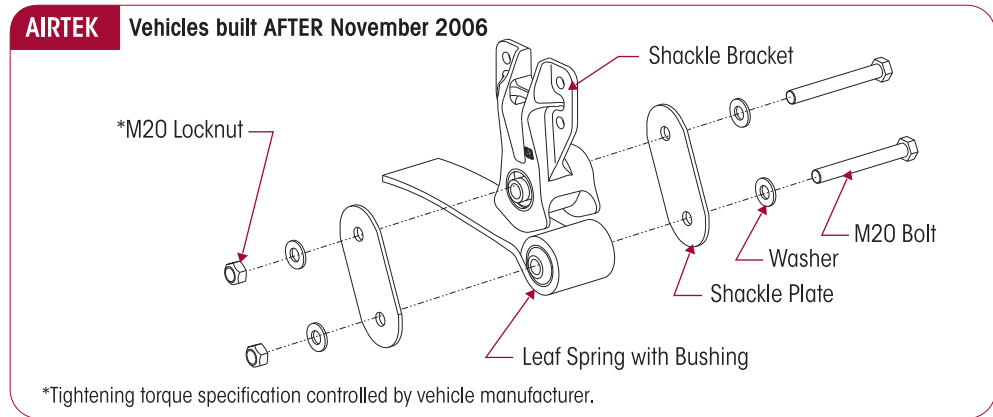
### SERVICE HINT

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

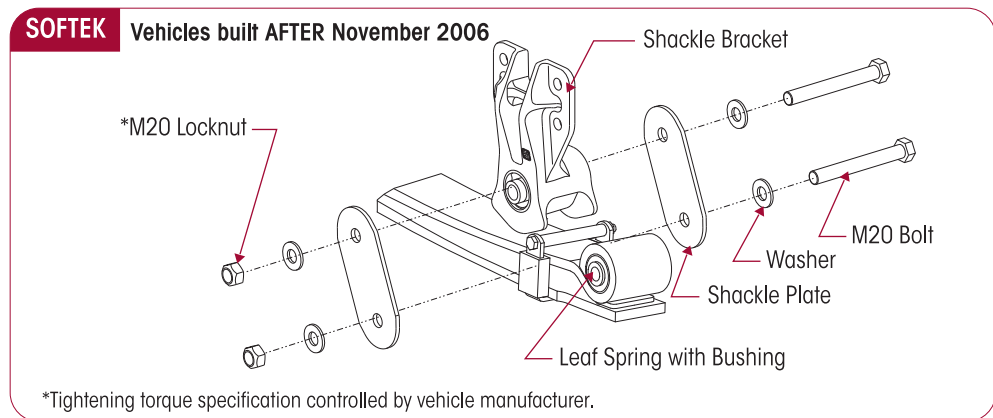
11. Remove the frame fasteners from the shackle bracket per manufacturer's guidelines.
12. Remove the shackle bracket from the vehicle, see appropriate configuration, Figures 9-12, 9-13 and 9-14.

13. Inspect the shackle assembly and both thrust washers (if equipped) for excessive wear or damage. See Thrust Washer Inspection in the Preventive Maintenance Section of this publication. Hendrickson recommends the thrust washers be replaced when this assembly is serviced.
14. If damaged or worn excessively, replace with genuine Hendrickson parts as detailed in the Component Replacement Section of this publication.

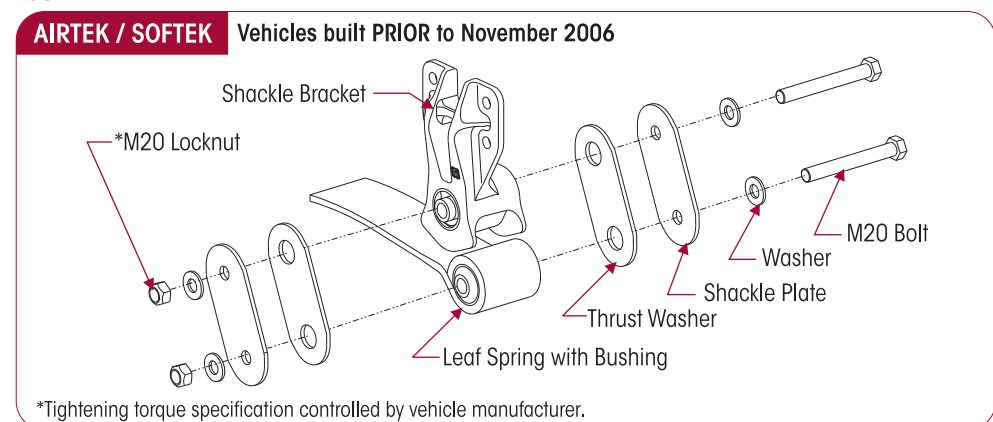
**FIGURE 9-12**



**FIGURE 9-13**



**FIGURE 9-14**



**ASSEMBLY**

1. Install the shackle bracket on the frame.
2. Install new frame fasteners per manufacturer's guidelines.
3. Install the thrust washers (if equipped) and shackle plates with the M20 bolts, washers and locknuts. Snug the shackle bolts. **DO NOT** tighten.
4. Remove the frame stands and lower frame.
5. **SOFTEK** equipped vehicles – proceed to Step 9.
6. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to inflating or deflating the suspension system.
7. **AIRTEK** equipped vehicles – Install the air lines into the air springs.
8. Install the height control valve linkage and inflate the suspension to normal ride height.
9. Tighten M20 shackle locknuts to vehicle manufacturer's specifications, see Figures 9-12, 9-13 and 9-14.
10. Remove the wheel chocks.

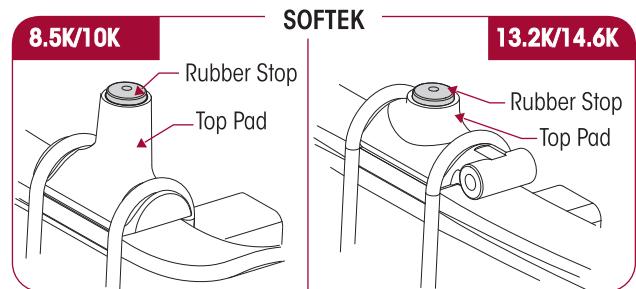
**SOFTEK RUBBER AXLE STOP**
**REMOVAL**

1. Insert a small pry bar between the rubber stop and the inside of the top pad.

2. Apply downward force on the pry bar and pull the rubber stop out of the top pad, see Figure 9-15.

3. Inspect the top pad and frame rail flange for any contact damage.

4. Clean any debris from inside the top pad.

**FIGURE 9-15**

**INSTALLATION**

1. Lubricate the new rubber axle stop with soapy water.
2. Install the rubber axle stop in the top pad.
3. Apply downward force on the rubber axle stop until it is seated firmly in the top pad.

**THRUST WASHERS (if equipped)**
**DISASSEMBLY**

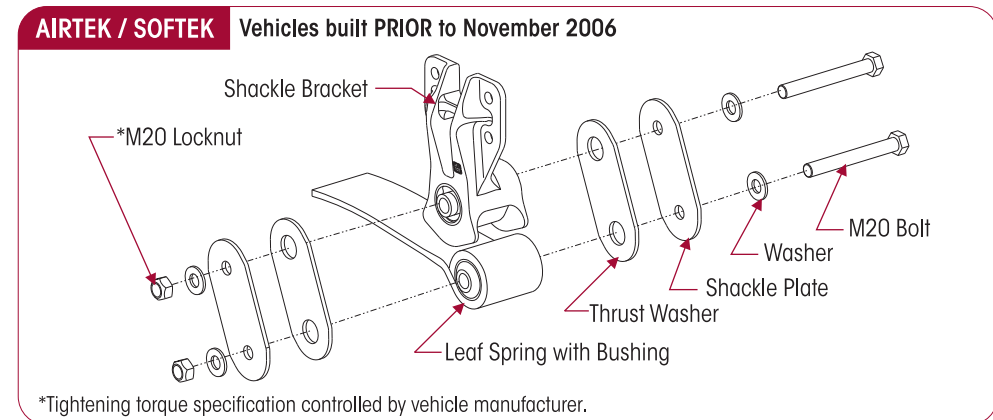
1. Place the vehicle on level floor.
2. Chock the wheels.
3. Raise the frame.
4. Support the vehicle with frame stands.
5. **SOFTEK** equipped vehicles – proceed to Step 8.

**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.

6. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to inflating or deflating the suspension system.
7. **AIRTEK** equipped vehicles – Exhaust the air from the air system by disconnecting the height control valve linkage(s) at the rubber grommet(s) and allowing the lever to drop. Lower the height control valve lever arm. This will exhaust air from the system.
8. Suspend the front axle from the shocks.
9. Remove the M20 spring eye and shackle pivot bolts, washers and locknuts.
10. Remove the shackle plates and thrust washers (if equipped).

FIGURE 9-16



### ASSEMBLY

1. Install the **NEW** thrust washers (if equipped) and shackle plates with the M20 bolts, washers and locknuts, see Figure 9-16.
2. Remove frame stands and lower frame.
3. **SOFTTEK** equipped vehicles – proceed to Step 7.
4. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to inflating or deflating the suspension system.
5. **AIRTEK** equipped vehicles – Install air lines into the air springs.
6. Install the height control valve linkage and inflate the suspension to normal ride height.
7. Tighten M20 locknuts to vehicle manufacturer's specifications.
8. Remove the wheel chocks.

### AIRTEK LEAF SPRING ASSEMBLY

#### DISASSEMBLY

1. Place the vehicle on a level floor.
2. Chock the wheels.
3. Exhaust the air from the air system by disconnecting the height control valve linkage(s) at the rubber grommet(s) and allowing the lever to drop. Lower the height control valve lever arm. This will exhaust air from the system.
4. Install a floor jack with a 4 inch lifting plate below the axle and raise the truck.
5. Remove the tires.
6. Install frame stands behind the rear spring mounts. It may be necessary to remove peripheral components for installation of the frame stands.

**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.

7. Lower the jack allowing the axle to hang, but **DO NOT** remove the jack from the axle.
8. Loosen both front spring eye bolts, but **DO NOT** remove the bolts.
9. Loosen the M20 shackle pivot bolt.
10. Remove both rear spring eye bolts.
11. Remove both lower shock absorber mounting fasteners.

**SERVICE HINT**

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

12. Disconnect the air lines at the air springs.
13. Disconnect the bottom of the air springs from the top pad per the Air Spring Component Disassembly 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.

14. Loosen the clamp group locknuts for the leaf spring that **IS NOT** being replaced.
15. Lower the jack allowing the suspension to pivot down out of the rear hanger clamps.
16. Remove the clamp group fasteners from the leaf spring being replaced and discard.
17. **STEERTEK NXT** axle — vehicles built **AFTER** October 2012

**WARNING**

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.

**NOTE**

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

- a. Remove the top pad, galvanized liner and front axle spacer (if equipped) from the leaf spring assembly that is going to be removed, see Figure 9-17.
  - b. Proceed to Step 19.
18. **STEERTEK** axle — vehicles built **PRIOR** to October 2012
    - a. Remove the top pad, front axle spacer (if equipped), galvanized liner, and the bottom axle wrap from the leaf spring that is going to be removed, see Figure 9-18.
  19. Remove the leaf spring assembly. Approximate weight of the leaf spring is 48 pounds.

**ASSEMBLY**

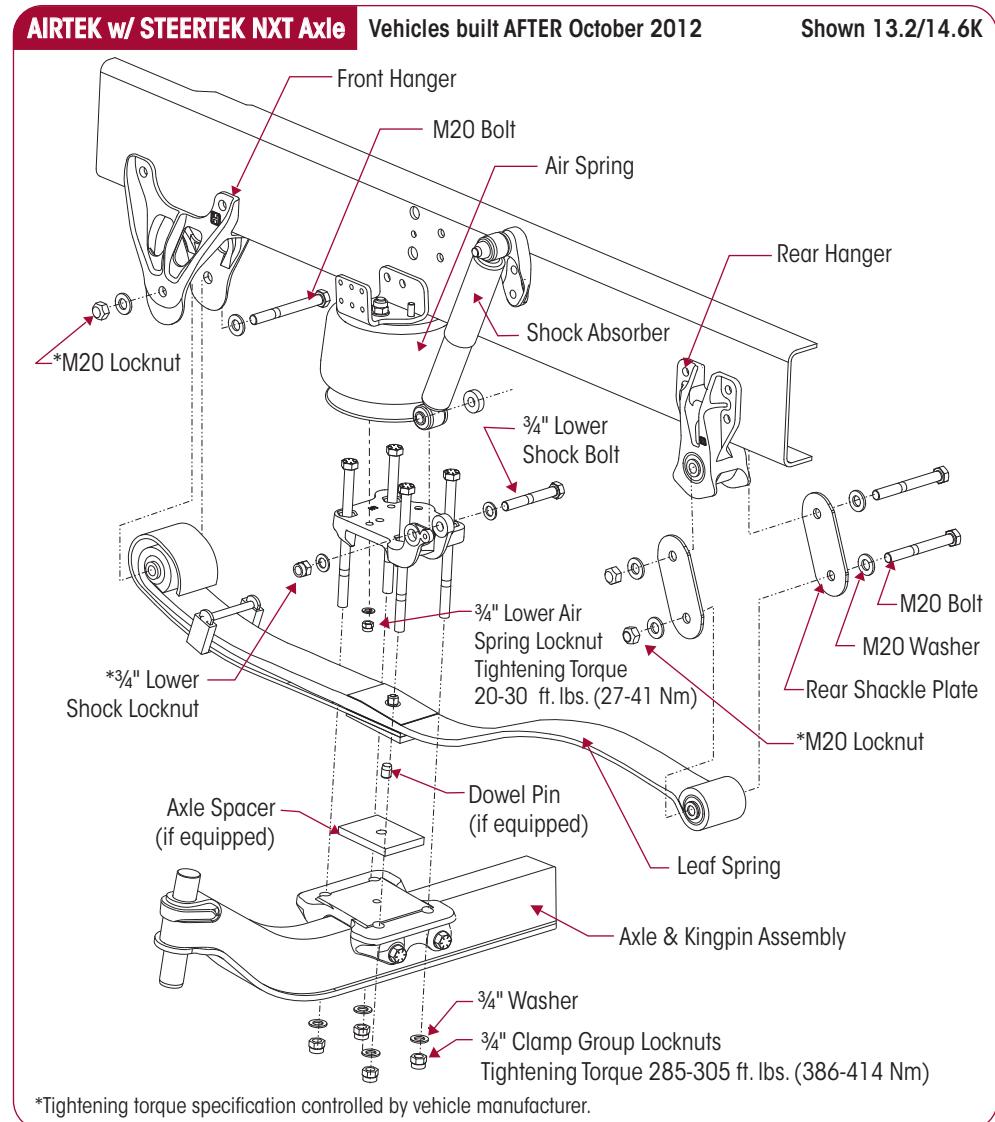
1. Install the new leaf spring assembly with the galvanized liner on the axle. Verify that the dowel pin is engaged properly in the axle spring seat/top wrap, see Figures 9-19 and 9-20.
2. Install the FRONT spring eye bolt and fastener, snug but **DO NOT** tighten at this time.
3. Remove and replace the bottom axle wrap liner located in bottom axle wrap (if equipped and install the bottom axle wrap.
4. Install the top pad on top of the leaf spring.

5. Install the new clamp group fasteners. New clamp group fasteners must be used when the clamp group is removed, to prevent premature bolt fatigue.
6. Snug the clamp group, **DO NOT** tighten to torque at this time.
7. Raise the axle and the REAR spring assemblies into the rear spring hangers.
8. Install the rear spring eye bolts in the rear hangers, snug but **DO NOT** tighten at this time, see Figures 9-17 and 9-18.

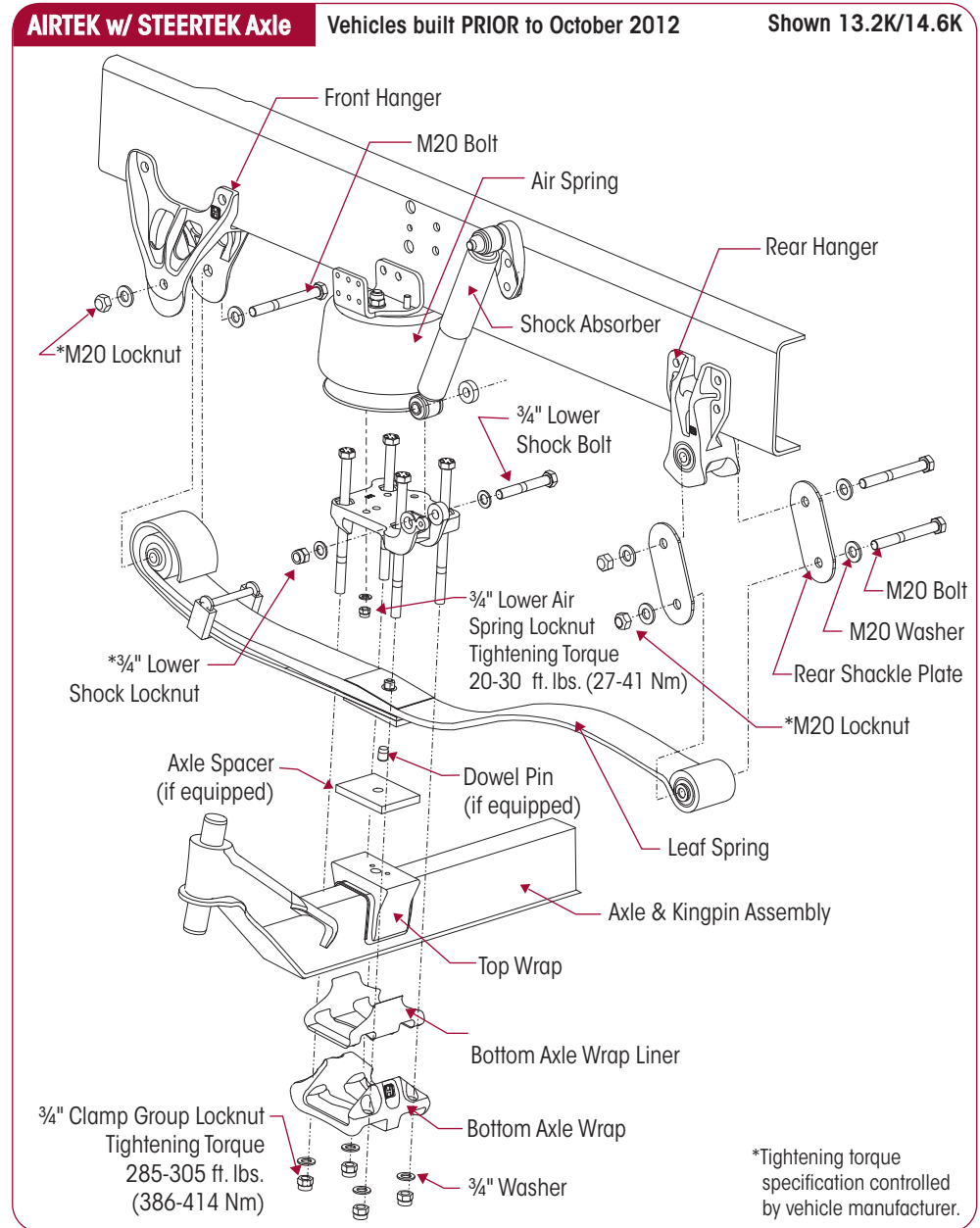
**IMPORTANT NOTE**

Only the weight of the axle should be on the spring at the time of the front and rear spring eye tightening torque. See the Spring Eye Re-torque procedure in the Alignment & Adjustments Section of this publication.

9. Install the tires.
10. Raise the vehicle and remove the frame supports and load the front axle and then lower the vehicle.
11. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to inflating or deflating the suspension system.
12. Install air lines, and air up system.

**FIGURE 9-17**



**FIGURE 9-18**


13. Install the lower shock mounting bolts from the inboard side to the outboard side.
14. Tighten the lower shock mounting bolts per the vehicle manufacturer's specifications.
15. Tighten the front and rear spring eye per the vehicle manufacturer's specifications.
16. Install the air springs into the top pads per the Air Spring Component Assembly instructions in this publication. Make sure the air spring piston seats into the top pad correctly.
17. Ensure that the clamp group is properly aligned and the hex bolts are seated top pad, see Figures 9-19 and 9-20.

FIGURE 9-19

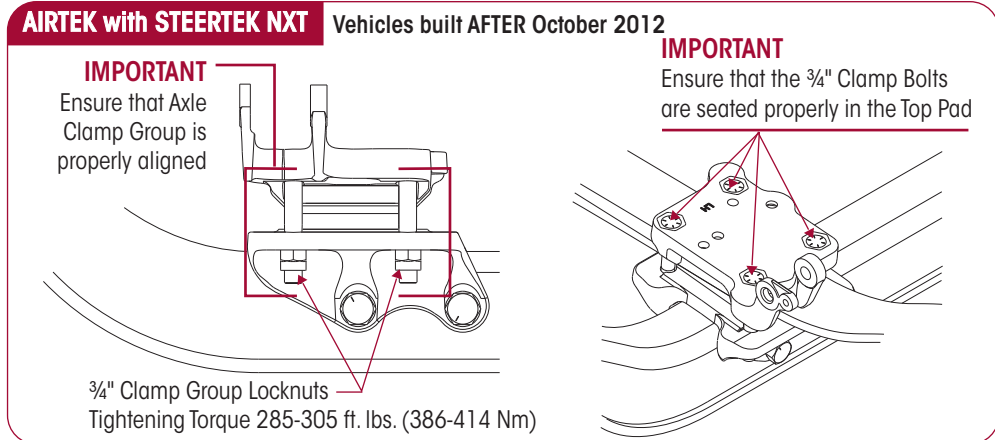
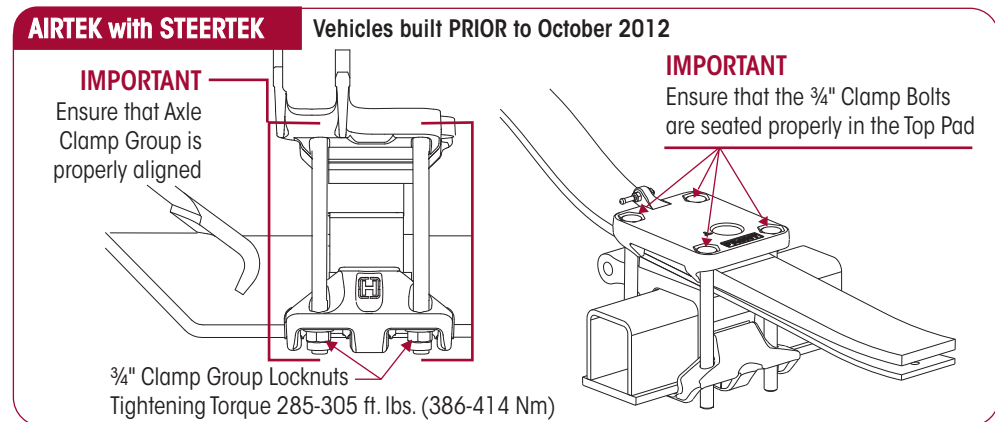
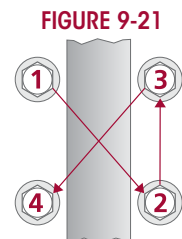


FIGURE 9-20



18. Tighten the clamp group locknuts evenly in 50 foot pounds increments to 285-305 foot pounds (386-414 Nm) torque in the proper pattern to achieve uniform bolt tension, see Figure 9-21.
19. Verify proper ride height, see Alignment & Adjustments Section of this publication.
20. Tighten the M20 spring eye bolt locknuts to vehicle manufacturer's specifications.
21. Remove the wheel chocks.



## SOFTEK LEAF SPRING ASSEMBLY

### DISASSEMBLY

1. Place the vehicle on a level floor.
2. Chock the wheels.
3. Raise the vehicle.
4. Install a floor jack with a 4 inch lifting plate below the axle and raise the truck.
5. Remove the tires.
6. Install frame stands behind the rear spring mounts. It may be necessary to remove peripheral components for installation of the frame stands.
7. Lower the jack allowing the axle to hang, but **DO NOT** remove the jack from the axle.



8. Loosen both front spring eye bolts, but **DO NOT** remove the bolts.
9. Loosen the M20 shackle pivot bolt.
10. Remove both rear spring eye bolts.
11. Remove both lower shock absorber mounting fasteners.

**SERVICE HINT**

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

12. Suspend the front axle to remove the load from leaf spring assembly.
13. Remove the front and rear M20 spring eye bolts washer and locknuts. Loosen the M20 shackle pivot bolt.

 **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.

14. Loosen the clamp group locknuts for the leaf spring that **IS NOT** being replaced.
15. Lower the jack allowing the suspension to pivot down out of the rear hanger clamps.
16. Remove the clamp group fasteners from the leaf spring being replaced and discard.
17. **STEERTEK NXT** axle — vehicles built **AFTER** October 2012

 **WARNING**

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.

**NOTE**

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

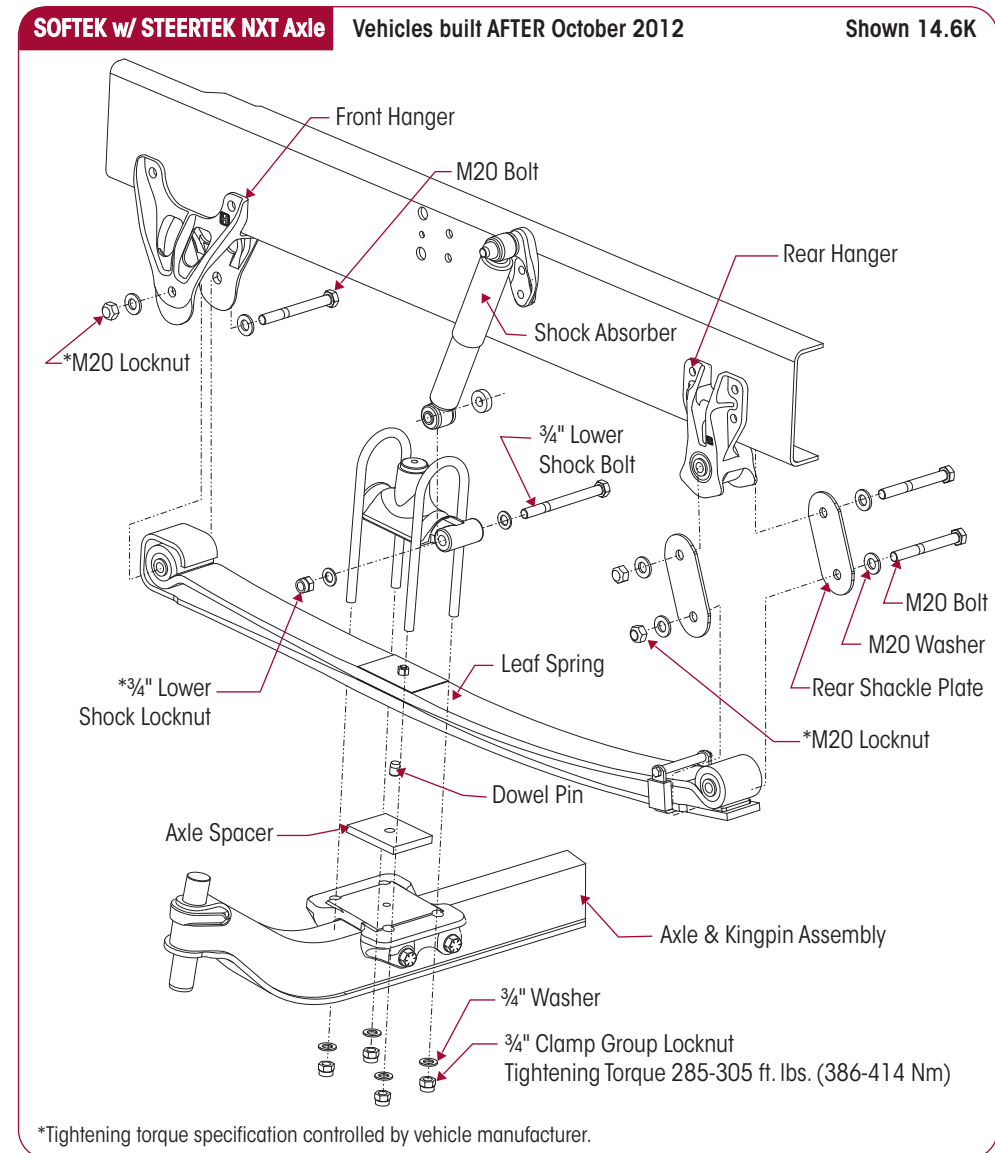
- a. Remove the top pad, galvanized liner and front axle spacer (if equipped) from the leaf spring assembly that is going to be removed, see Figure 9-22.
  - b. Proceed to Step 19.
18. **STEERTEK** axle — vehicles built **PRIOR** to October 2012
    - a. Remove the top pad, front axle spacer (if equipped), galvanized liner, and the bottom axle wrap from the leaf spring that is going to be removed, see Figure 9-23.
  19. Remove the leaf spring assembly. Approximate weight of the leaf spring is 48 pounds.
  20. Raise the vehicle and remove the frame supports and load the front axle and then lower the vehicle.

**ASSEMBLY**

1. Install the new leaf spring assembly with the galvanized liner on the axle. Verify that the dowel pin is engaged properly in the axle spring seat/top wrap, see Figures 9-22 and 9-23.
2. Install the FRONT spring eye bolt and fastener, snug but **DO NOT** tighten at this time.
3. Remove and replace the bottom axle wrap liner located in bottom axle wrap (if equipped and install the bottom axle wrap.
4. Install the top pad on top of the leaf spring.
5. Install the new clamp group fasteners. New clamp group fasteners must be used when the clamp group is removed, to prevent premature bolt fatigue.
6. Snug the clamp group, **DO NOT** tighten to torque at this time.

7. Raise the axle and the REAR spring assemblies into the rear spring hangers.
8. Install the rear spring eye bolts in the rear hangers, snug but **DO NOT** tighten at this time, see Figures 9-22 and 9-23.

FIGURE 9-22



9. Install the lower shock mounting bolts from the inboard side to the outboard side.
10. Lower the floor jack and allow the suspension to hang by the spring eye bolts and shock mounts.

**IMPORTANT NOTE**

Only the weight of the axle should be on the spring at the time of the front and rear spring eye tightening torque. See the Spring Eye Re-torque procedure in the Alignment & Adjustments Section of this publication.

11. Tighten the lower shock mounting bolts per the vehicle manufacturer's specifications.
12. Tighten the front and rear spring eye per the vehicle manufacturer's specifications.
13. Ensure that the clamp group is properly aligned and the hex bolts are seated top pad, see Figures 9-24 and 9-25.
14. Install the tires.



FIGURE 9-23

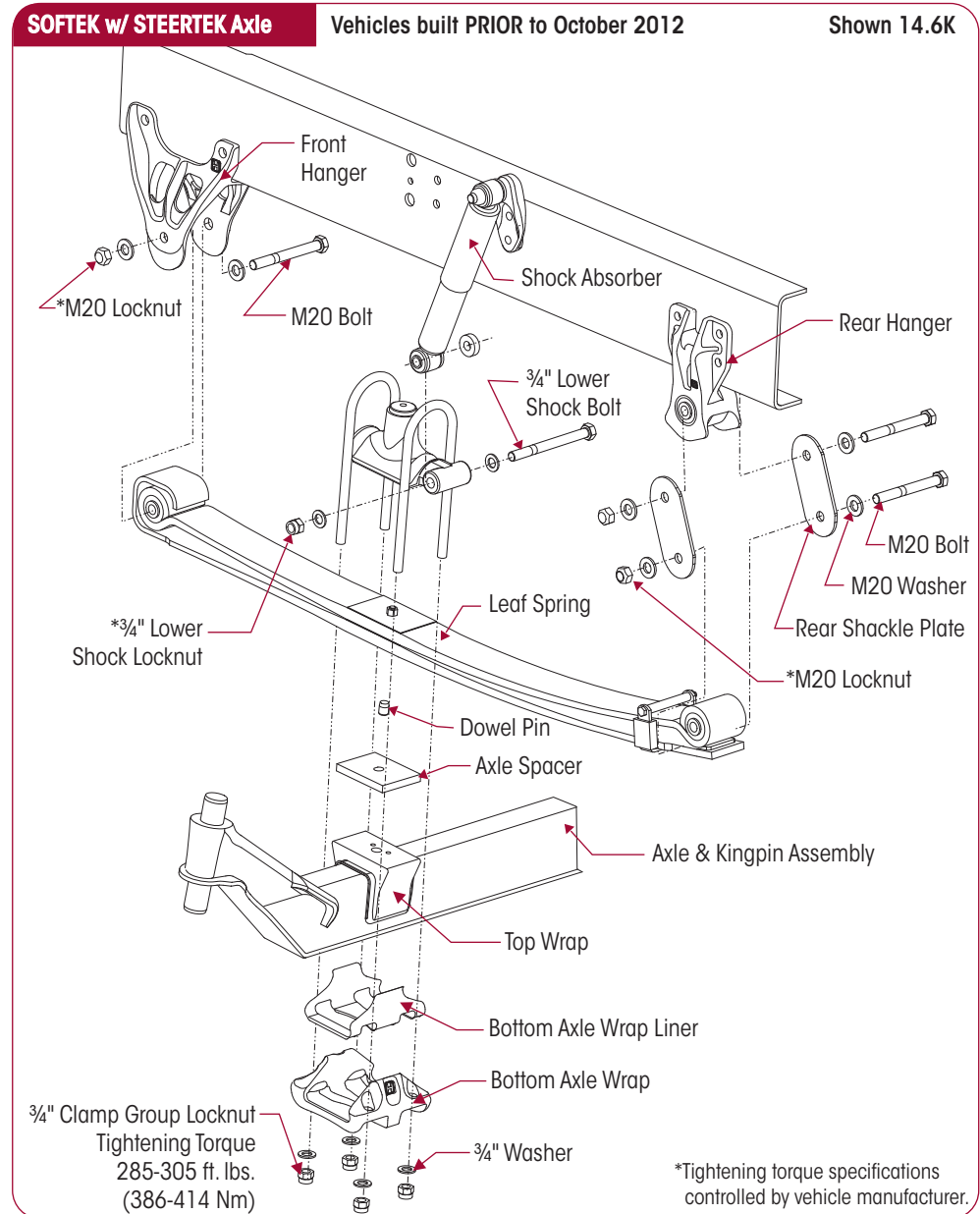


FIGURE 9-24

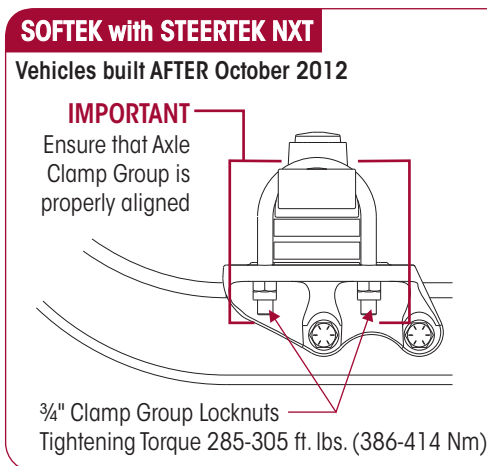


FIGURE 9-25

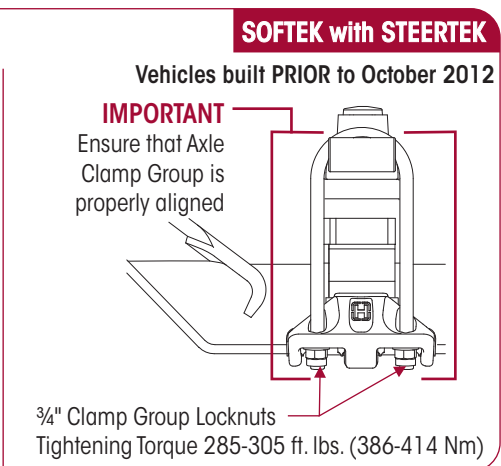
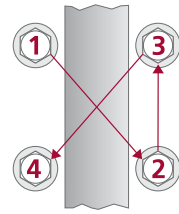


FIGURE 9-26



15. Tighten the clamp group locknuts evenly in 50 foot pounds increments to 285-305 foot pounds (386-414 Nm) torque in the proper pattern to achieve uniform bolt tension, see Figure 9-26.
16. Tighten the M20 spring eye bolt locknuts to vehicle manufacturer's specifications.
17. Remove the wheel chocks.

## FRONT LEAF SPRING EYE BUSHINGS

The spring eye bushings for the AIRTEK and SOFTEK spring and wrap leaf assemblies are designed to provide extended service life. If premature wear occurs careful consideration must be given to the contributing factor that caused the wear. This must be corrected in order to prevent the new bushing from wearing in the same manner. The front and rear bushings are permanently installed in the spring leaf and are not serviceable. If a bushing wears prematurely, the spring and wrap leaf assembly must be replaced. Follow the procedure for the Front Leaf Spring removal in the Component Replacement Section of this publication.

## SHOCK ABSORBER

### ■ Vision Buses (8.5K/10K) AIRTEK/SOFTEK

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



### 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.

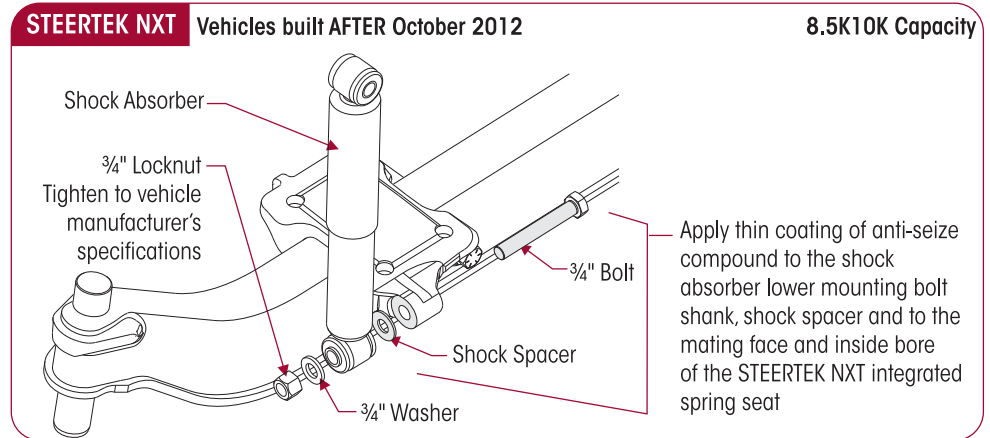
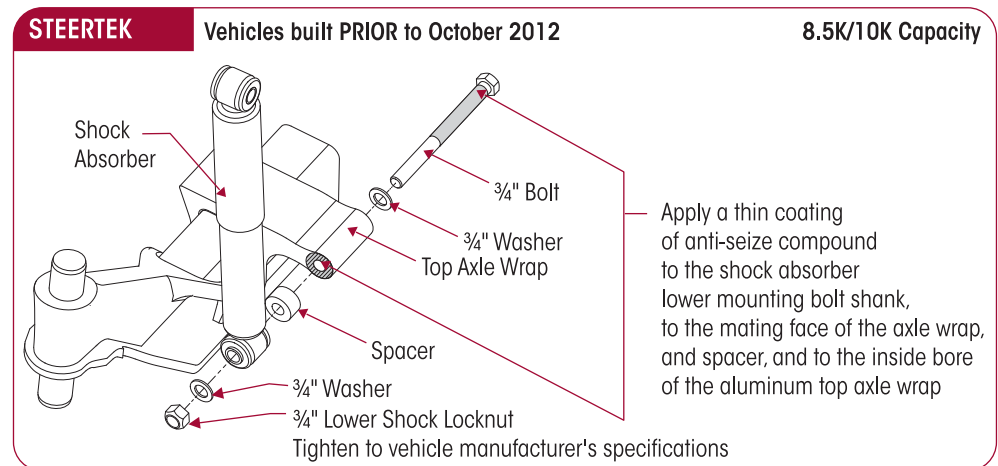
### DISASSEMBLY

1. Remove the  $\frac{3}{4}$ " lower mounting bolt, fasteners, and spacer.
2. Remove the  $\frac{3}{4}$ " upper mounting bolt and fasteners.
3. Slide the shock absorber out of the upper bracket and off of the lower mounting bolt.
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  $\frac{3}{4}$ " shock mounting bolt, washers and locknut.
3. Vehicles built with **STEERTEK NXT** axle **AFTER** October 2012
  - a. Apply a thin coating of anti-seize compound to the shock absorber lower mounting bolt shank, shock spacer, and to the mating face and inside bore of the STEERTEK NXT integrated spring seat. This is necessary to help prevent seizing of the bolt to the spring seat, see Figure 9-27.
  - b. Install the lower bolt from the inboard side to the outboard side of the integrated spring seat and attach the spacer, washer, and locknut, see Figure 9-27 and proceed to Step 5.
4. Vehicles built with **STEERTEK** axle **PRIOR** to October 2012
  - a. Apply a thin coating of anti-seize compound to the shock absorber lower mounting bolt shank, to the mating face of the axle wrap and spacer, and to the inside bore of the aluminum axle wrap. This is necessary to help prevent seizing of the bolt to the aluminum axle wrap, see Figure 9-28.

- b. Install the lower bolt from the inboard side to the outboard side of the top axle wrap and attach the spacer, washer, and locknut, see Figure 9-28.
5. Tighten both upper and lower  $\frac{3}{4}$ " locknuts to vehicle manufacturer's specifications, see Figures 9-27 and 9-28.

**FIGURE 9-27**

**FIGURE 9-28**


## SHOCK ABSORBER

### ■ All American Buses (13.2K/14.6K) AIRTEK/SOFTEK

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

#### DISASSEMBLY

1. Remove the  $\frac{3}{4}$ " lower mounting bolt, fasteners, and spacer.
2. Remove the  $\frac{3}{4}$ " upper mounting bolt and fasteners.
3. Slide the shock absorber out of the lower bracket and off of the lower mounting bolt.
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  $\frac{3}{4}$ " shock mounting fasteners.

3. Vehicles built with **STEERTEK NXT** axle – Install the lower bolt from the inboard side to the outboard side of the integrated spring seat and attach the spacer, washer, and locknut, see Figure 9-29.
4. Vehicles built with **STEERTEK** axle – Install the lower bolt from the inboard side to the outboard side of the top axle wrap and attach the spacer, washer, and locknut, see Figure 9-30.
5. Tighten both upper and lower  $\frac{3}{4}$ " locknuts to vehicle manufacturer's specifications, see Figures 9-29 and 9-30.

FIGURE 9-29

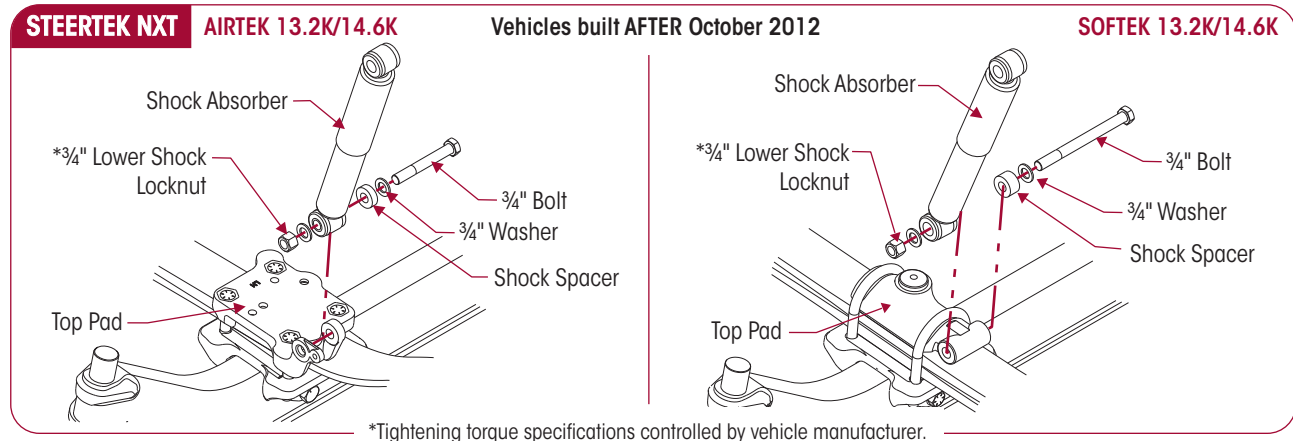
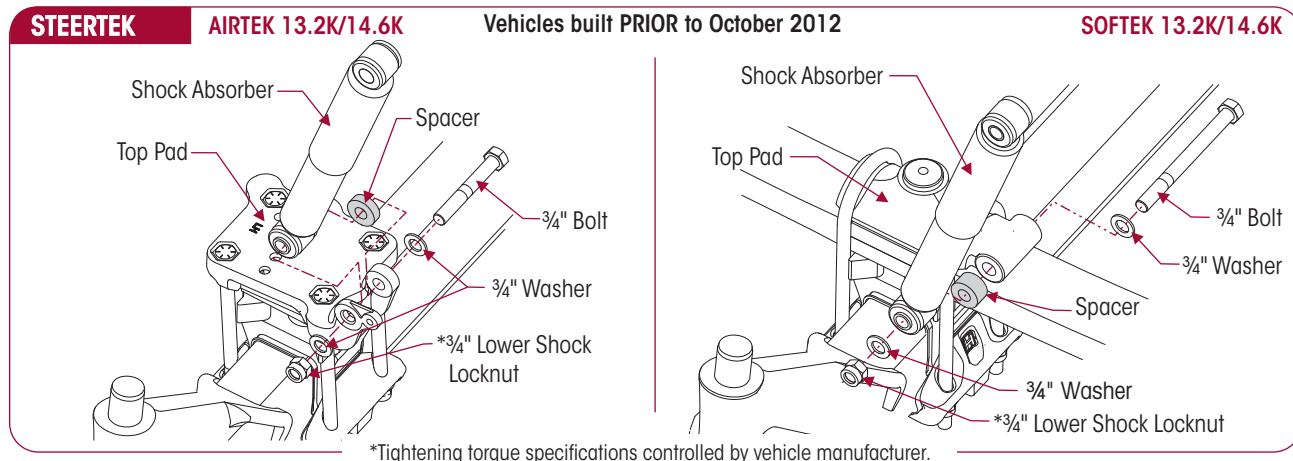


FIGURE 9-30



### BOTTOM AXLE WRAP (if equipped)

#### ■ Vehicles built with STEERTEK axle PRIOR to October 2012

##### DISASSEMBLY

1. Place the vehicle on level floor.
2. Chock the wheels.
3. Raise the frame.
4. Support the vehicle with frame stands.
5. **SOFTEK** 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.



6. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to inflating or deflating the suspension system.
7. **AIRTEK** equipped vehicles – exhaust the air from the air system by disconnecting the height control valve linkage(s) at the rubber grommet(s) and allowing the lever to drop. Lower the height control valve lever arm. This will exhaust air from the system.

**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.

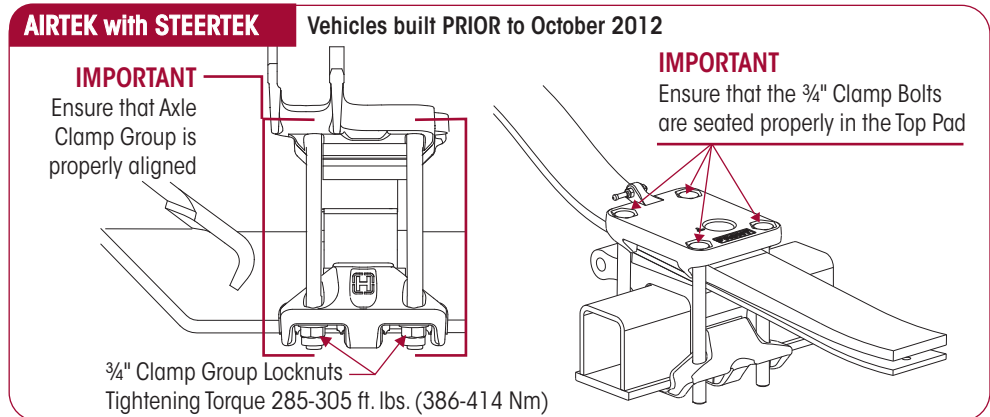
**SERVICE HINT**

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.

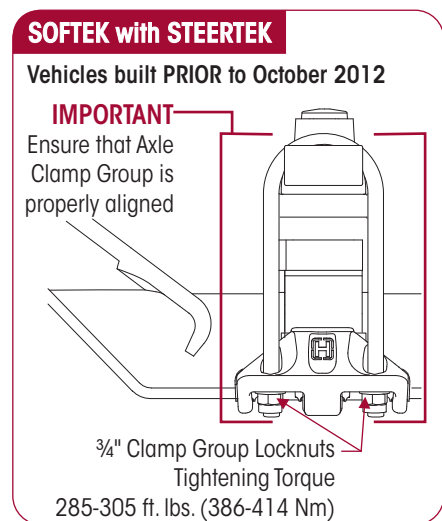
8. Remove 3/4" hex bolts, washers and locknuts.
9. Remove the air spring, see Air Spring Replacement instructions in this section. Discard fasteners.
10. Remove bottom axle wrap. It may be necessary to use a dead blow mallet to dislodge axle wrap.
11. Once removed inspect axle wrap for damage. Replace if necessary.
12. Discard used bottom axle wrap liner.

**ASSEMBLY**

**FIGURE 9-31**

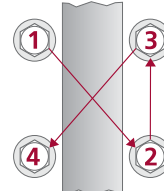


**FIGURE 9-32**



1. Install new bottom axle wrap liner into bottom axle wrap.
2. Install bottom axle wrap on axle.
3. Install new 3/4" clamp group fasteners. 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 9-31 and 9-32.

**FIGURE 9-33**



4. Tighten locknuts evenly to 285-305 foot pounds (386-414 Nm) torque, see Figure 9-33 for proper torque sequence.



5. **SOFTEK** equipped vehicles – proceed to Step 8.
6. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to inflating or deflating the suspension system.
7. **AIRTEK** equipped vehicles – Install Air spring. See Air Spring assembly in this section.
8. Remove the wheel chocks.

### TOP AXLE WRAP - In Chassis (if equipped)

#### ■ Vehicles built with STEERTEK axle PRIOR to October 2012

##### DISASSEMBLY

1. Place the vehicle on level floor.
2. Chock the wheels.
3. Raise the frame.
4. Support the vehicle with frame stands.
5. Suspend the front axle to remove the load from the spring and wrap leaf assembly.
6. **SOFTEK** equipped vehicles – proceed to Step 11.

#### 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.

7. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to inflating or deflating the suspension system.

#### DANGER

AIR SPRINGS MUST BE DEFLATED PRIOR TO LOOSENING ANY CLAMP GROUP HARDWARE. UNCONSTRAINED AIR SPRINGS CAN VIOLENTLY SHIFT, RESULTING IN POSSIBLE PERSONAL INJURY, DEATH OR PROPERTY DAMAGE.

8. **AIRTEK** equipped vehicles – Exhaust the air from the air system by disconnecting the height control valve linkage(s) at the rubber grommet(s) and allowing the lever to drop. Lower the height control valve lever arm. This will exhaust air from the system.
9. Disconnect the air lines at the air springs (if equipped).
10. Remove the air spring (See Air Spring disassembly in this section).
11. Support the axle with a jack.
12. Remove the front and rear M20 spring eye bolts, washers and locknuts.

#### SERVICE HINT

A bottle jack may be required to raise the axle slightly in order to remove spring eye bolts.

#### WARNING

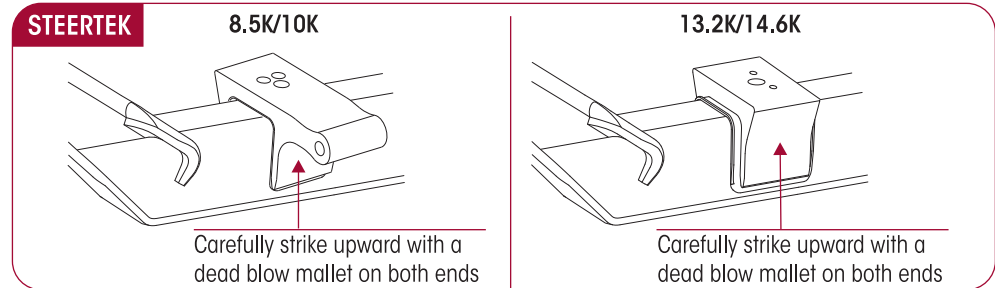
DO NOT USE A CUTTING TORCH TO REMOVE CLAMP GROUP BOLTS OR ATTACHING FASTENERS. THE USE OF SUCH HEAT ON SUSPENSION COMPONENTS CAN ADVERSELY AFFECT THE STRENGTH OF THESE PARTS. A COMPONENT DAMAGED IN THIS MANNER CAN RESULT IN THE LOSS OF VEHICLE CONTROL AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

#### 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.

13. Remove the 3/4" clamp group fasteners and discard.
14. Remove the top pad, the galvanized liner, and the bottom axle wrap.
15. Remove the lower shock mounting bolt.
16. Remove the spring and wrap leaf assembly

17. 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 9-34.
18. Clean and inspect the axle wrap and axle wrap liner for cracks or damage, replace each if cracks or damage are present.

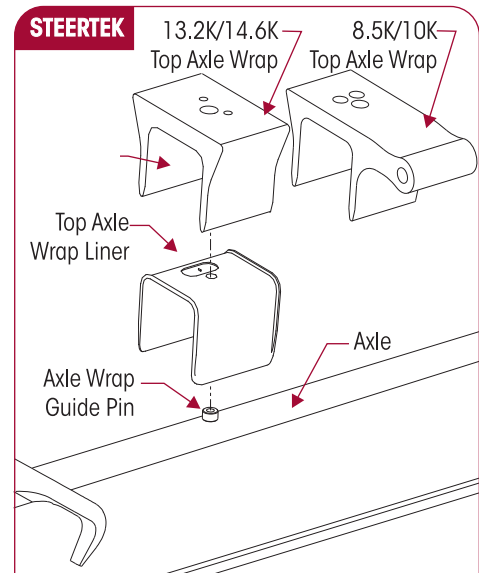
**FIGURE 9-34**

**ASSEMBLY**

1. Install the new axle wrap liner on the axle.
2. Spray the axle wrap liner and the axle wrap with a silicon lubricant.
3. Position the axle wrap on the axle, see Figure 9-35.

**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.

4. Protect the top surface of the axle wrap with a block of wood, cardboard, or shop towels.
5. Install a bottle jack between the axle wrap and frame rail flange.
6. 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.

**FIGURE 9-35**

**IMPORTANT NOTE**

For Flat Floor Models install the intermediate dowel pin into the axle wrap.

7. Install the spring and wrap leaf assembly on the axle wrap (indexing the dowel pin if equipped).
8. Install the galvanized liner and the top pad on the spring and wrap leaf assembly.
9. Remove and replace the bottom axle wrap liner.
10. Install the bottom axle wrap.
11. Install the new 3/4" clamp group fasteners.
12. Snug the clamp group, **DO NOT** torque at this time.
13. Use a jack and raise the axle and spring assembly into the front spring hanger and shackle assembly.

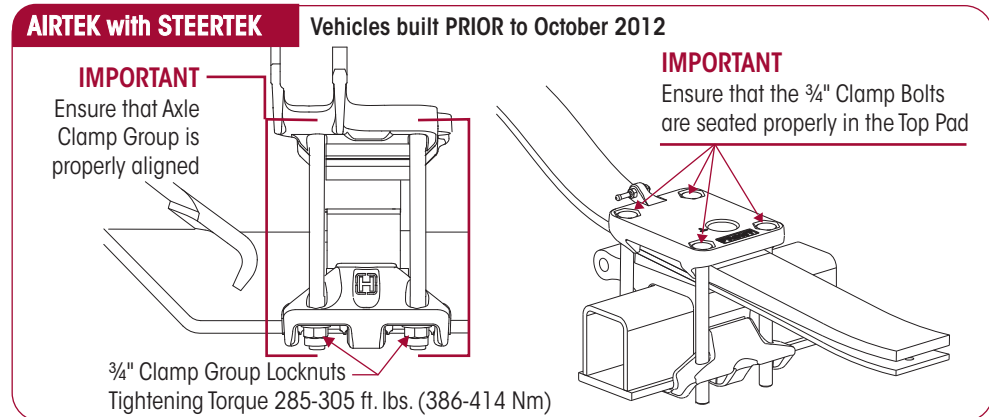
**SERVICE HINT**

A bottle jack may be required to raise the axle slightly in order to install the spring eye bolts.

14. Install the M20 spring eye bolts in the front spring hanger and rear shackle assembly.

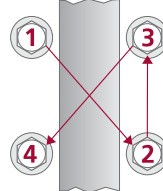
15. Ensure that the clamp group is properly aligned and the hex bolts are seated in the top pad, and the bottom axle wrap is centered with the top axle wrap, see Figures 9-36 and 9-37.

FIGURE 9-36



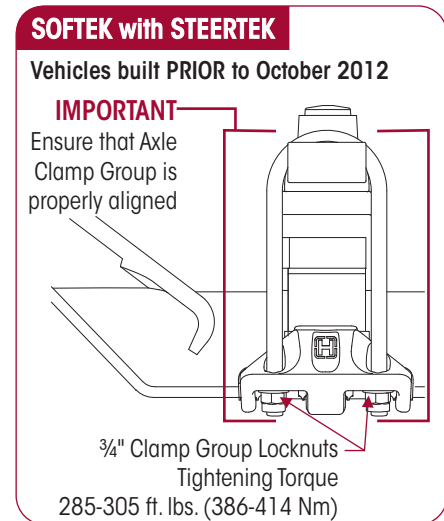
16. Tighten locknuts evenly to 285-305 foot pounds (386-414 Nm) torque, see Figure 9-38 for proper torque sequence.

FIGURE 9-38



17. Apply a thin coating of anti-seize to the lower shock mounting bolt.
18. Install shocks, see Shock Absorber assembly in this section.
19. Remove the jack from the axle.
20. Remove the frame stands.
21. **SOFTEK** equipped vehicles – proceed to Step 25.
22. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to inflating or deflating the suspension system.
23. **AIRTEK** equipped vehicles – attach air lines to the air springs.
24. Air up system to the proper ride height, see Ride Height Adjustment in the Alignment & Adjustments Section of this publication.
25. Tighten the M20 spring eye bolt locknuts to vehicle manufacturer's specifications.
26. Remove the wheel chocks.

FIGURE 9-37





### FRONT AXLE ASSEMBLY – STEERTEK NXT AXLE

#### ■ AIRTEK – Vehicles built AFTER October 2012

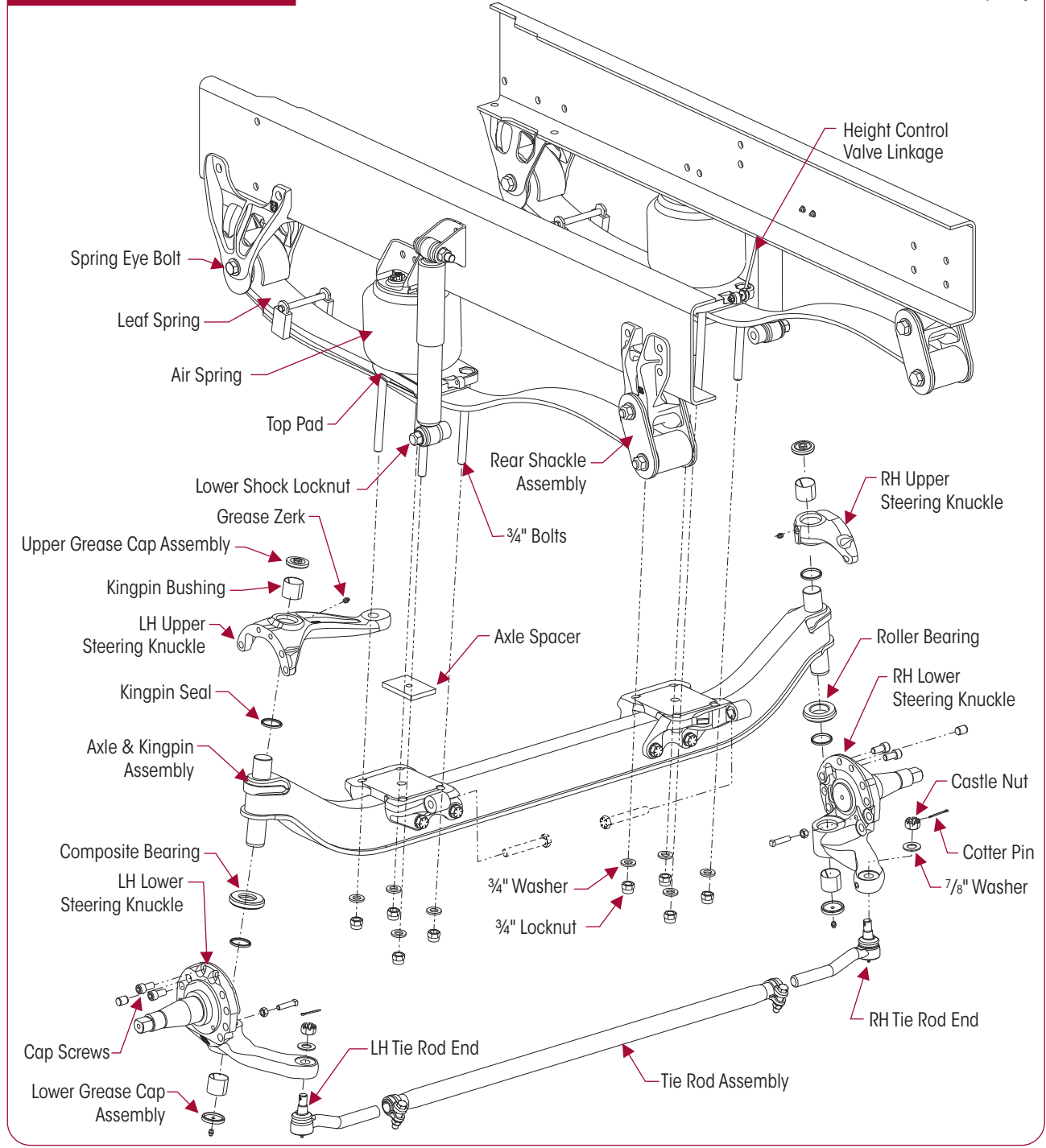
The STEERTEK NXT axle clamp group consist of the top pad, 3/4" bolts, washers and nylon locknuts

FIGURE 9-39

AIRTEK with STEERTEK NXT Axle

Vehicles built AFTER October 2012

Shown 10K Capacity

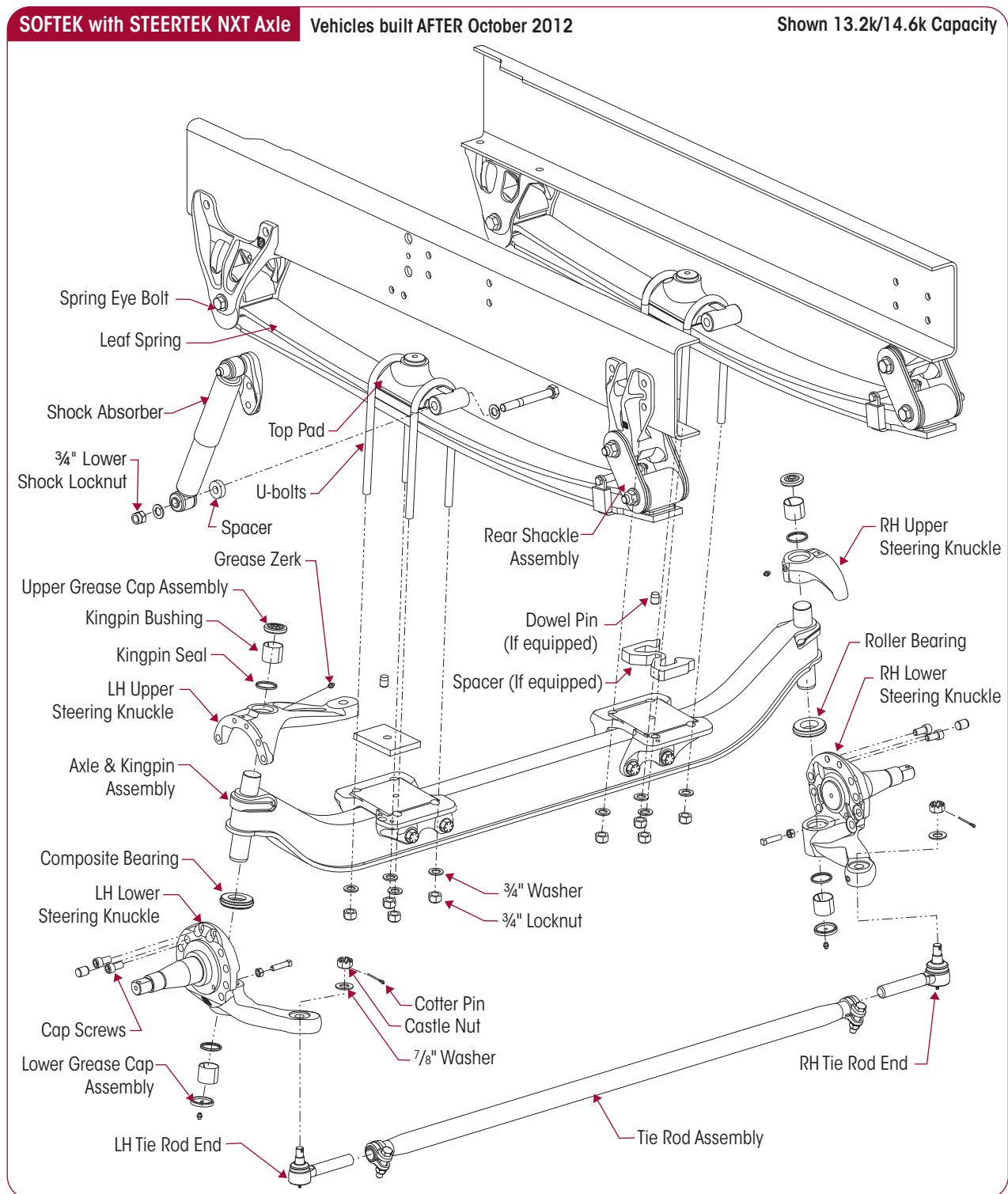




■ **SOFTEK – Vehicles built AFTER October 2012**

The STEERTEK NXT axle clamp group consist of the top pad, 3/4" bolts, washers and nylon locknuts

FIGURE 9-40





## STEERTEK NXT AXLE REMOVAL

### Vehicles built AFTER October 2012

#### DISASSEMBLY

Refer to Figures 9-39 and 9-40 when replacing the components of the STEERTEK NXT axle as shown.

#### WARNING

DO NOT USE A TORCH ON CLAMP GROUP BOLTS OR ANY OTHER PART OF THE AIRTEK/SOFTEK SUSPENSIONS. 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 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 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 additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to deflating or inflating the air system.

#### WARNING

AIR SPRING ASSEMBLIES MUST BE DEFLATED PRIOR TO LOOSENING ANY CLAMP GROUP HARDWARE. 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.

5. **AIRTEK** equipped vehicles – Exhaust the air from the air system by disconnecting the height control valve linkage(s) at the rubber grommet(s) and allowing the lever to drop. Lower the height control valve lever arm. This will exhaust air from the system.
6. Raise the vehicle.
7. Support the vehicle with frame stands.

#### DANGER

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.

8. Suspend the front axle with the shocks 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.

#### CAUTION

IF THE AIR SPRING IS TO BE RE-INSTALLED; CARE MUST BE TAKEN TO REMOVE DIRT AND DEBRIS FROM THE PUSH-TO-CONNECT FITTING. FAILURE TO DO SO COULD RESULT IN THE PUSH-TO-CONNECT FITTING FAILING TO SEAL WITH THE AIR LINE. INSPECT LOCK-TABS FOR DAMAGE OR CRACKS PRIOR TO RE-INSTALLATION.

12. **AIRTEK** equipped vehicles – Unseat both of the air springs at the axle top pad.
13. Support the axle with a floor jack.

**WARNING**

THE REPAIR OR RECONDITIONING OF SUSPENSION OR AXLE COMPONENTS IS NOT ALLOWED. ANY SUSPENSION OR 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.

14. If the vehicle is equipped with the shock absorbers attached to the integrated axle spring seat, it will be necessary to remove the lower shock mounting locknuts and washers. Remove the shock absorbers from the lower mounting bolts and push clear of spring assembly.

**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.

15. Remove the 3/4" clamp group fasteners and discard.
16. Lower the axle and remove from the vehicle.

**■ STEERTEK NXT AXLE (Removed from Chassis)****AXLE REMOVAL**

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 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 through 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.

**AXLE INSTALLATION**

1. Place the new axle on the floor jack and position the axle under the vehicle.
2. Install the axle spacer (if equipped).
3. Raise the axle into position. Care must be taken at this point to ensure that the center bolt of front leaf spring assembly is aligned properly with the axle spring seat, see Figure 9-41.
4. Install the galvanized liner between the leaf spring and the top pad, see Figure 9-41.
5. Install the top pad with the directional identification facing correctly on the vehicle, See Figure 9-42.
6. Install the new 3/4" clamp group fasteners. Snug the bolts, **DO NOT** tighten to the specified torque at this time.
7. Ensure that the clamp groups are properly aligned and the bolts are seated in the top pad, and the top pad is centered on the axle spring seat, see Figure 9-43.
8. **SOFTEK** equipped vehicles — proceed to Step 11.
9. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to inflating or deflating the suspension system.





FIGURE 9-41

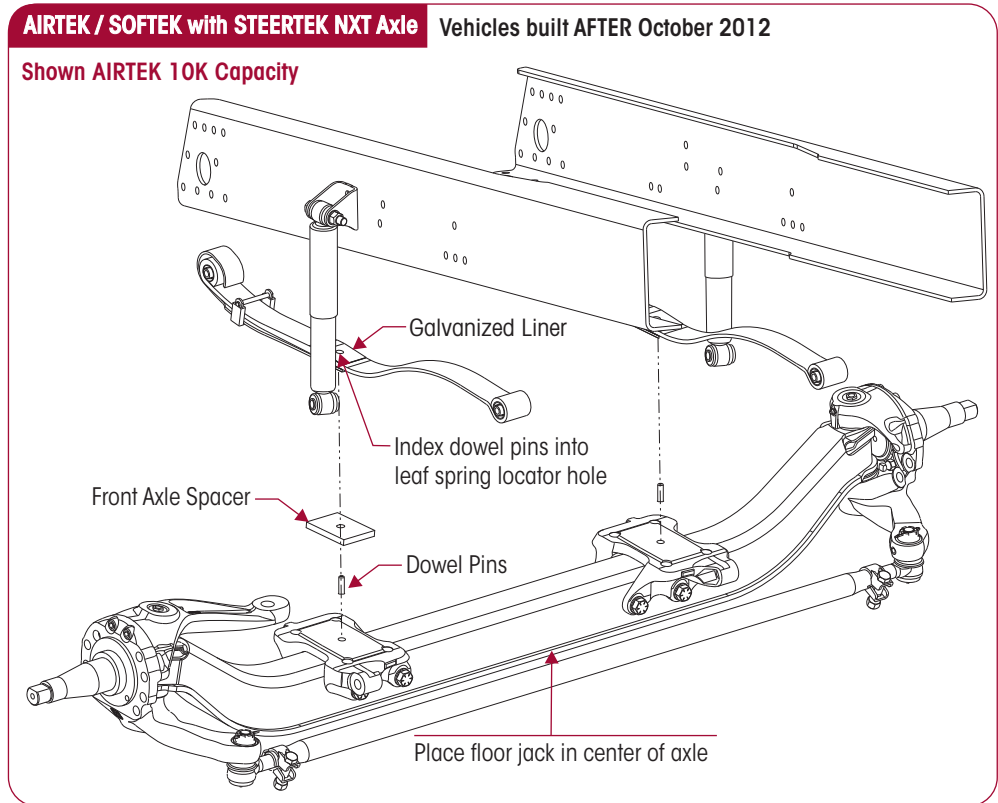


FIGURE 9-42

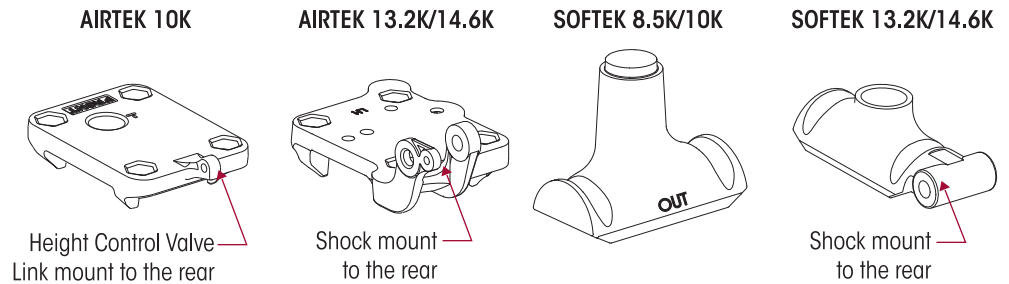
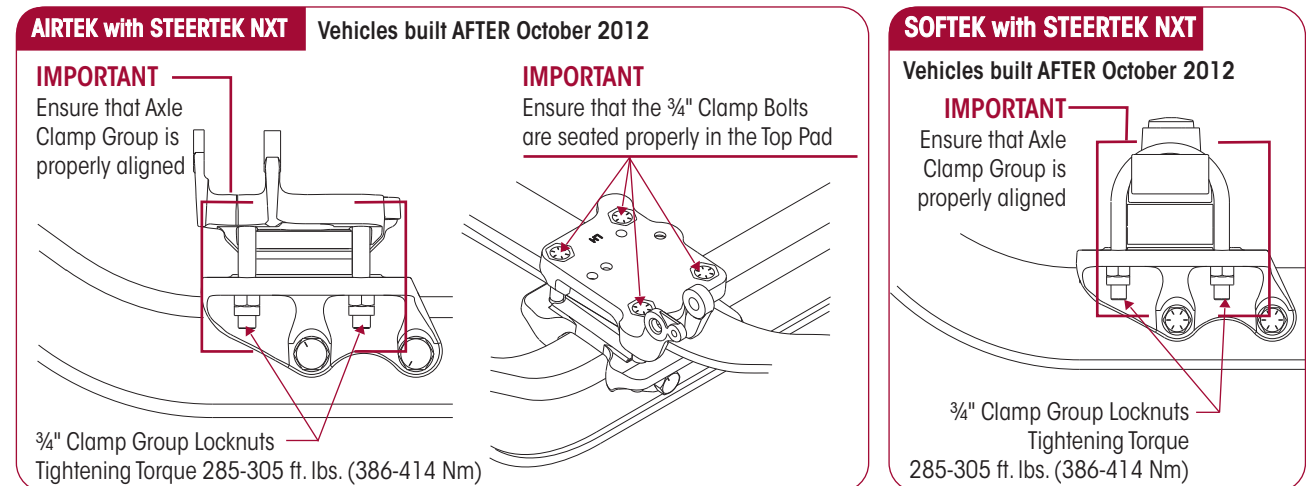
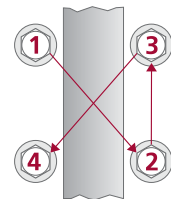


FIGURE 9-43



10. **AIRTEK** equipped vehicles:
  - Engage the 10K air springs into the top pad. The bottom of the air spring snaps into the top pad.
  - Engage the 13.2K/14.6K air springs into the top pad. Install new lower air spring mounting fasteners and tighten to 20-30 foot pounds (27-41 Nm) torque.
11. Install the lower shock absorber connection (if removed). Install the lower shock fasteners and tighten to vehicle manufacturer's specifications.
12. Install the steering knuckles as per the Steering Knuckle assembly instructions in this section.
13. Install the tie rod assembly as per the Tie Rod End and Cross Tube assembly instructions in this section.
14. Install the  $\frac{7}{8}$ " hardened washers on the Ackermann arm and the castle nuts. Tighten the castle nuts to 185 foot pounds (251 Nm), then rotate until the first castle slot lines up with the cotter pin bore in the tie rod end. **DO NOT** back off the nut for cotter pin installation.
15. Install the tie rod end cotter pins.
16. Connect the drag link in the steering arms.
17. Install the castle nut to install the steering arm. Tighten the castle nut to 185 foot pounds, (251 Nm) 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.
18. Install the drag link cotter pin.
19. If the vehicle is equipped with the shock absorbers attached to the integrated axle spring seat, install the lower shock mounting bolts and tighten to vehicle manufacturer's specifications.
20. Install the brake backing plate assemblies and ABS sensor.
21. Install the brakes, hubs, and wheels as per manufacturer's guidelines.
22. Fill the hubs with the proper lubricant (see manufacturer's guidelines for recommended lubrication specifications).
23. Grease the front steering components as per lubrication guidelines in the Preventive Maintenance Section of this publication.
24. Raise the vehicle and remove the frame stands.
25. Lower the vehicle.
26. **SOFTEK** equipped vehicles — proceed to Step number 28.
27. **AIRTEK** equipped vehicles — Reconnect the height control valve and air up the system.
28. Tighten the  $\frac{3}{4}$ " clamp group locknuts evenly in 50 foot pounds increments to 285-305 foot pounds (386-414 Nm) torque in the proper sequence to achieve uniform bolt tension, see Figure 9-44.
29. **SOFTEK** equipped vehicles — proceed to Step 31.
30. **AIRTEK** equipped vehicles — Adjust ride height per instructions in the Alignment & Adjustments Section of this publication.
31. Remove the wheel chocks.

FIGURE 9-44





### FRONT AXLE ASSEMBLY – STEERTEK AXLE

#### ■ AIRTEK – Vehicles built PRIOR to October 2012

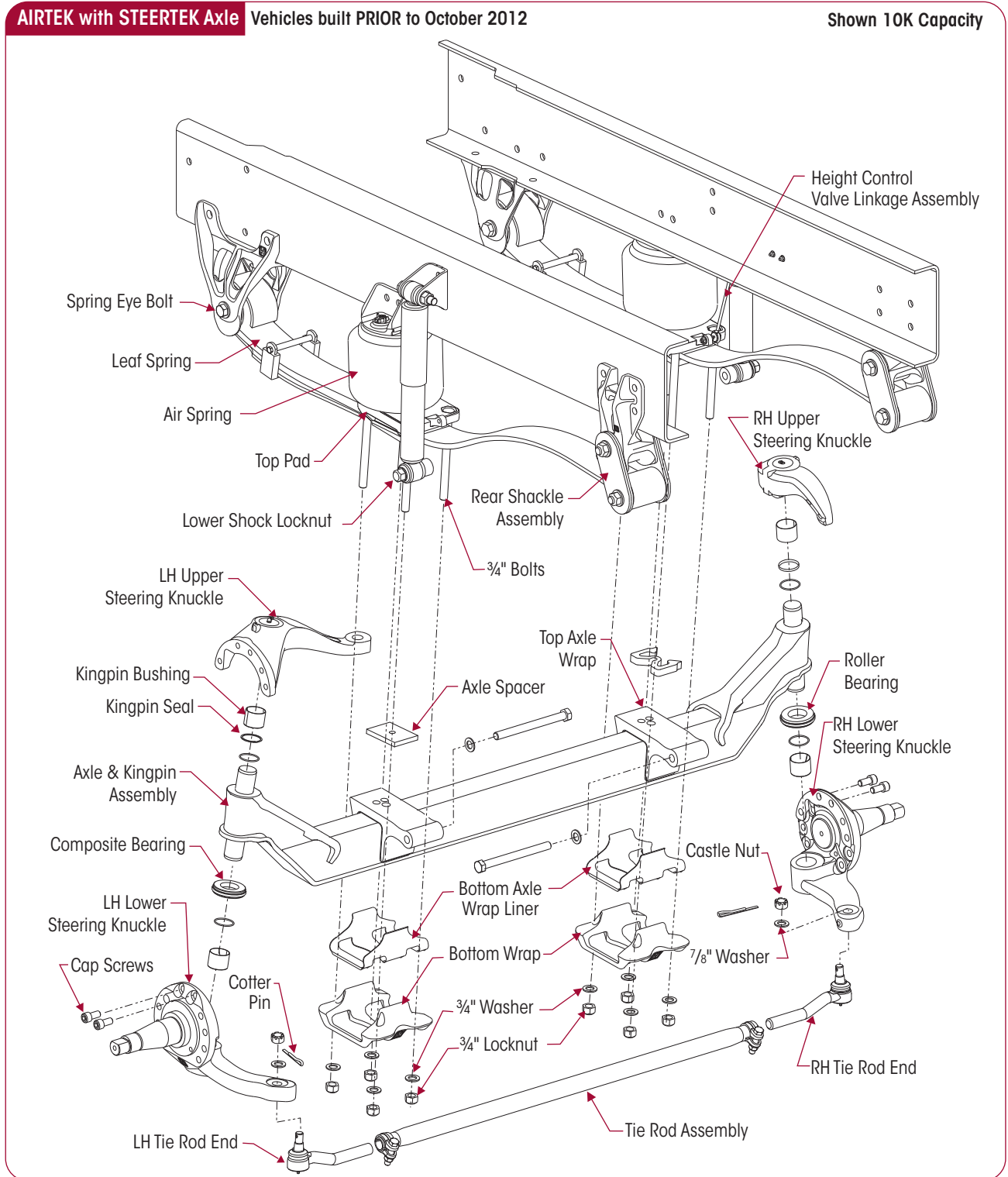
The STEERTEK axle clamp group consist of the Top axle wrap, bottom axle wrap, top axle wrap liner, bottom axle wrap liner, top pad, 3/4" bolts, washers and nylon locknuts

FIGURE 9-45

AIRTEK with STEERTEK Axle

Vehicles built PRIOR to October 2012

Shown 10K Capacity



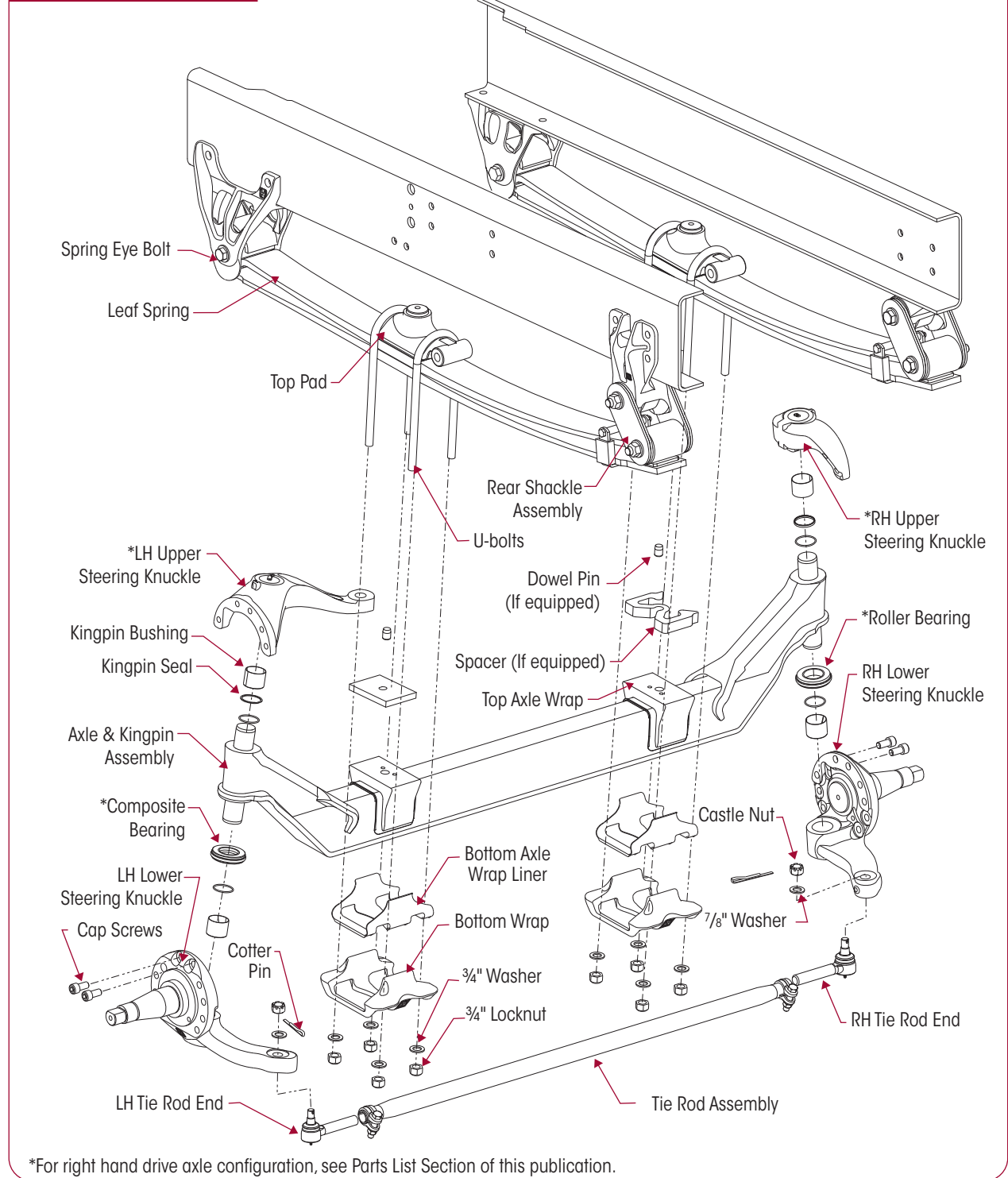
■ **SOFTEK – Vehicles built PRIOR to October 2012**

The STEERTEK axle clamp group consist of the Top axle wrap, bottom axle wrap, top axle wrap liner, bottom axle wrap liner, top pad, 3/4" bolts, washers and nylon locknuts

FIGURE 9-46

**SOFTEK with STEERTEK Axle** Vehicles built PRIOR to October 2012

Shown 13.2k/14.6k Capacity



\*For right hand drive axle configuration, see Parts List Section of this publication.



## STEERTEK AXLE REMOVAL

### Vehicles built PRIOR to October 2012

#### AXLE DISASSEMBLY

Refer to Figures 9-45 and 9-46 when replacing the components of the STEERTEK axle.

 **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 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 additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to inflating or deflating the suspension system.
5. **AIRTEK** equipped vehicles — Exhaust the air from the air system by disconnecting the height control valve linkage(s) at the rubber grommet(s) and allowing the lever to drop. Lower the height control valve lever arm. This will exhaust air from the system.
6. Raise the frame.
7. Support the vehicle with frame stands.
8. Suspend the front axle with the shocks attached.
9. Remove the front wheels, hubs, brake shoes 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**

THE REPAIR OR RECONDITIONING OF SUSPENSION OR AXLE COMPONENTS IS NOT ALLOWED. HENDRICKSON ADVISES REPLACING ALL COMPONENTS FOUND TO BE DAMAGED OR OUT OF SPECIFICATIONS. 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.

14. If the vehicle is equipped with the shock absorbers attached to the top axle wrap, it will be necessary to remove the lower shock mounting locknuts and washers. Remove the shock absorbers from the lower mounting bolts and push clear of spring assembly.

**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.

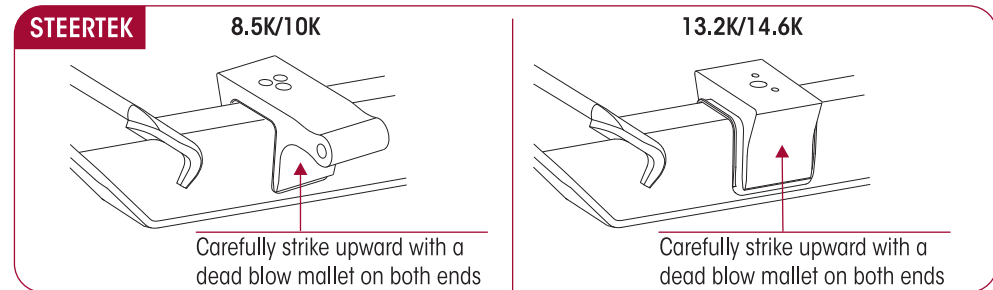
15. Remove the 3/4" clamp group bolts, washers, and locknuts. Discard fasteners.
16. Lower the axle and remove from the vehicle.

## ■ 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 9-47.

FIGURE 9-47



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.

### WARNING

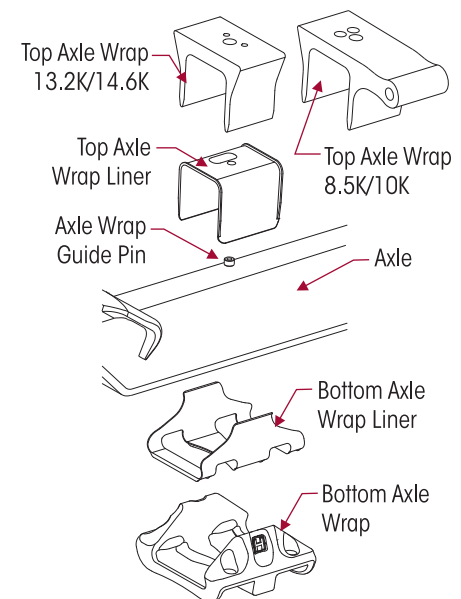
REMOVAL OF THE CAP SCREWS WILL ALLOW THE STEERING KNUCKLE TO SEPARATE FROM THE AXLE. THE BACKBONE MUST BE SUPPORTED BEFORE REMOVAL OF THESE TWO (2) CAP SCREWS. FAILURE TO DO SO CAN CAUSE COMPONENT DAMAGE OR PERSONAL INJURY.

5. Remove the two  $\frac{5}{8}$ " 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 the Kingpin Bushing replacement instructions in this section.

### CLAMP GROUP ASSEMBLY

1. Install the new upper axle wrap liner on the axle. Index the liner with the axle's guide pin, see Figure 9-48.

FIGURE 9-48



### 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.



### AXLE INSTALLATION

1. Place the new axle on the floor jack and position the axle under the vehicle.
2. Install the axle spacer (if equipped) on the top axle wrap prior to raising the axle into position.
3. Raise the axle into position, see Figures 9-49 and 9-50. Care must be taken at this point to ensure that the front leaf spring assemblies' center bolt is aligned correctly in the top axle wrap.

FIGURE 9-49

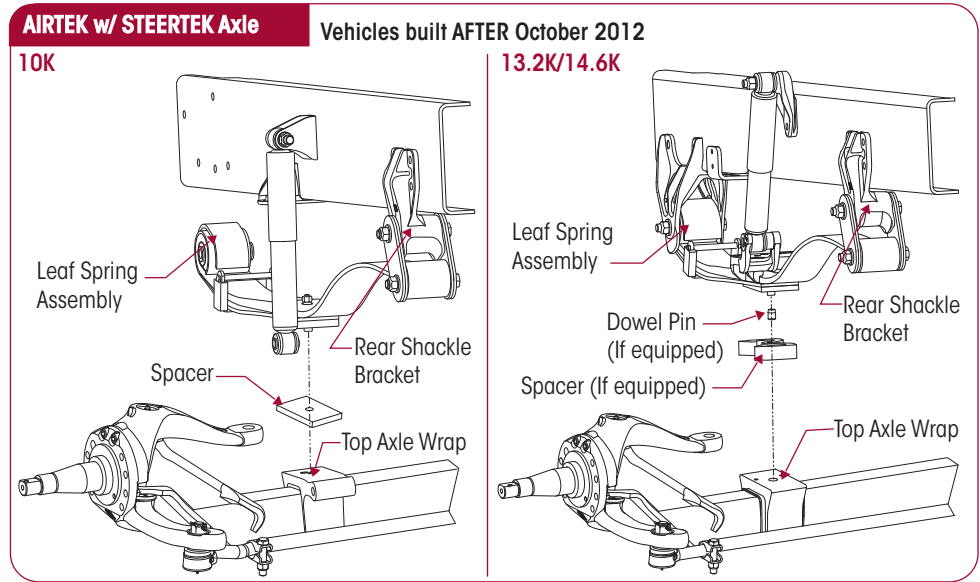
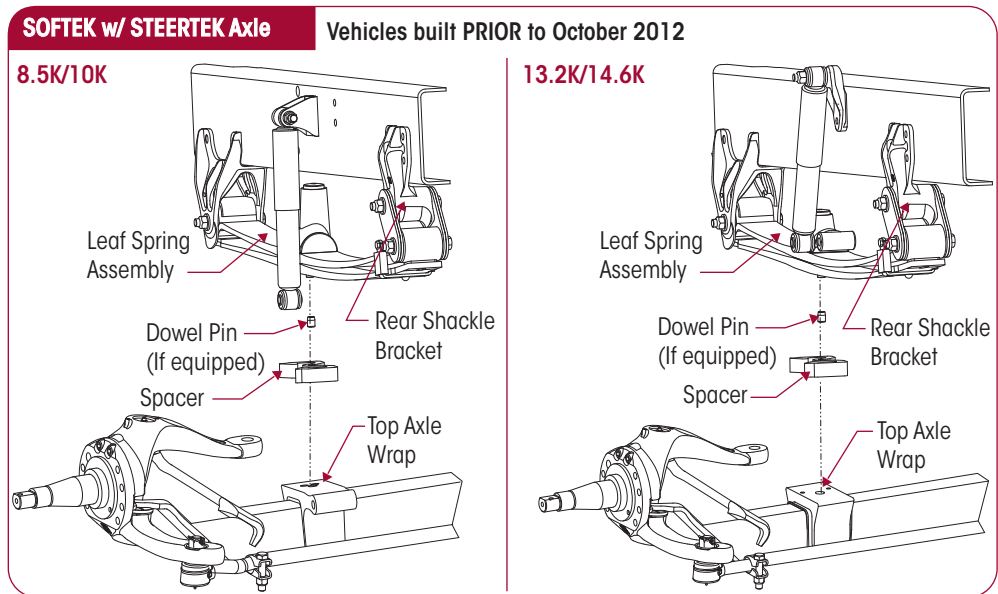


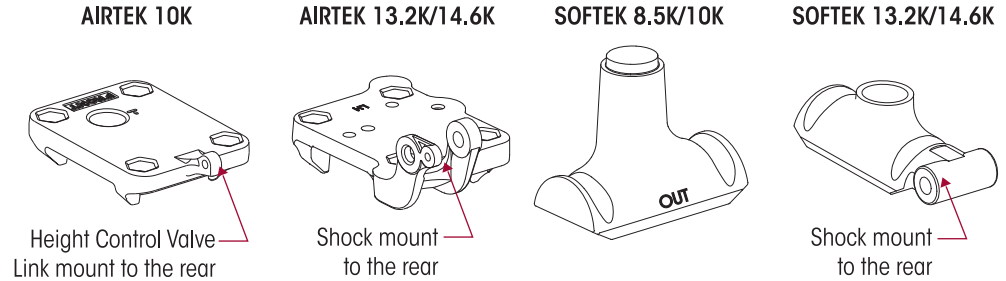
FIGURE 9-50



4. Verify that the galvanized liner is between the leaf springs and the top pad.
5. Install the new bottom axle wrap liners on the bottom axle wraps.
6. Install the bottom axle wraps on the axle.
7. Install the top pad with the directional identification facing correctly on the vehicle, see Figure 9-51.

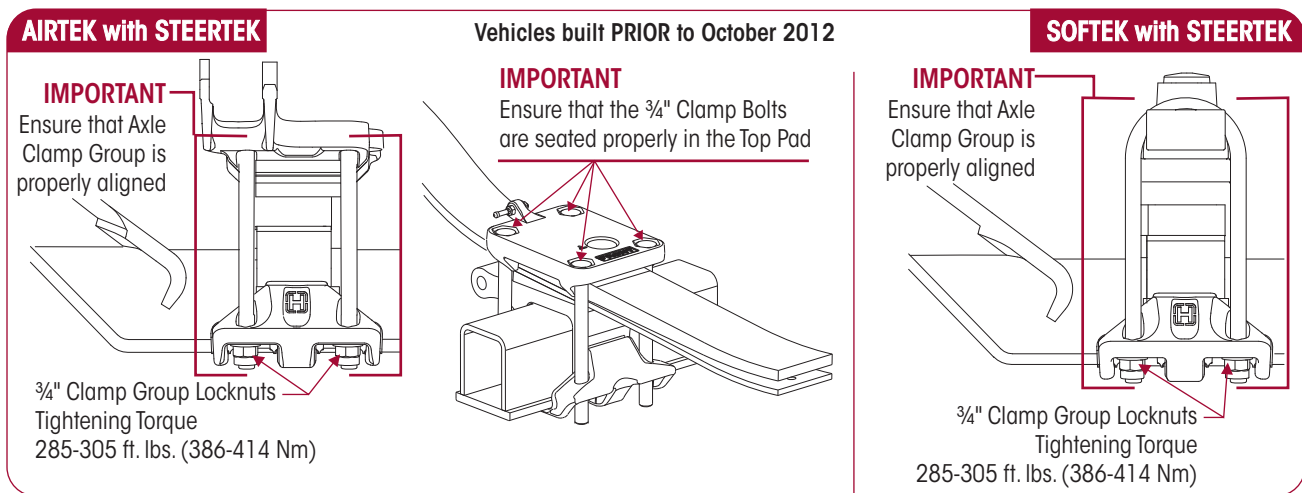


FIGURE 9-51



8. Install the new  $\frac{3}{4}$ " clamp group bolts, washers and locknuts. Snug the bolts, **DO NOT** tighten to the specified torque at this time.
9. Ensure that the clamp groups are properly aligned and the bolts are seated in the top pad, and the bottom axle wraps are centered on the top axle wraps, see Figure 9-52.

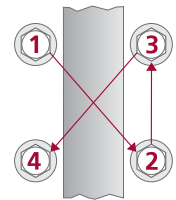
FIGURE 9-52



10. **SOFTEK** equipped vehicles — proceed to Step 13.
11. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to inflating or deflating the suspension system.
12. **AIRTEK** equipped vehicles:
  - Engage the 10K air springs into the top pad. The bottom of the air spring snaps into the top pad.
  - Engage the 13.2K/14.6K air springs into the top pad. Install new lower air spring mounting fasteners and tighten to  $\mathbb{N}$  20-30 foot pounds (27-41 Nm) torque.
13. Install the lower shock absorber connection (if removed). Install the lower shock fasteners and tighten to vehicle manufacturer's specifications.
14. Install the steering knuckles as per the Steering Knuckle replacement instructions in this section.
15. Install the tie rod assembly as per the Tie Rod replacement instructions in this section.
16. Install the  $\frac{7}{8}$ " hardened washers on the Ackermann arm and the castle nuts. Tighten the castle nuts to  $\mathbb{N}$  185 foot pounds (251 Nm), then rotate until the first castle slot lines up with the cotter pin bore in the tie rod end. **DO NOT** back off the nut for cotter pin installation.
17. Install the tie rod end cotter pins.
18. Connect the drag link. Install the castle nut.



19. Tighten the castle nut to 185 foot pounds (251 Nm), then rotate until the first castle slot lines up with the cotter pin bore in the drag link. **DO NOT** back off the nut for cotter pin installation.
20. Install the drag link cotter pin.
21. Install the brake backing plate assemblies.
22. Install the brakes, hubs, and wheels as per manufacturer's guidelines.
23. Fill the hubs with the proper lubricant (see manufacturer's guidelines for recommended lubrication specifications).
24. Raise the vehicle and remove the frame stands.
25. Lower the vehicle.
26. **SOFTEK** equipped vehicles — proceed to Step number 28.
27. **AIRTEK** equipped vehicles — Reconnect the height control valve and air up the system.

**FIGURE 9-53**


28. Tighten the 3/4" clamp group locknuts evenly in 50 foot pounds increments to 285-305 foot pounds (386-414 Nm) torque in the proper sequence to achieve uniform bolt tension, see Figure 9-53.
29. **SOFTEK** equipped vehicles — proceed to Step number 31.
30. **AIRTEK** equipped vehicles — Adjust ride height per instructions in the Alignment & Adjustments Section of this publication.
31. Grease the front steering components as per lubrication guidelines in the Preventive Maintenance Section of this publication.
32. Remove the wheel chocks.

## ■ STEERING KNUCKLE DISASSEMBLY

### DISASSEMBLY

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

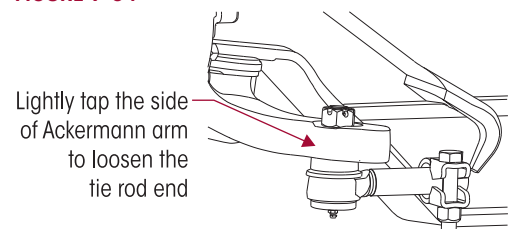
The steering knuckle disassembly and assembly includes the Kingpin Preparation and Measurement and Kingpin Bushing Removal process.

1. Place the vehicle on level floor.
2. Chock the wheels.
3. Raise the frame.
4. Support the vehicle with frame stands.
5. Remove the wheel and hub assembly.
6. Remove the brake components from steering knuckle.
7. Remove the tie rod assembly.

### 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 9-54.

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

**FIGURE 9-54**


### 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.

9. Remove the 2 socket head cap screws that connect upper kingpin connection to the steering knuckle, see Figure 9-55.
10. Remove the lower steering knuckle from the kingpin by sliding it down the kingpin.
11. Remove the upper steering knuckle by sliding it up off the kingpin.

FIGURE 9-55



## ■ 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 9-56 through 9-59.

FIGURE 9-56



FIGURE 9-57



FIGURE 9-58



FIGURE 9-59



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 9-60 through 9-63.

**Kingpin minimum dimension is 1.802"**

FIGURE 9-60



FIGURE 9-61



FIGURE 9-62



FIGURE 9-63



## ■ 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** October 2012) will also need Remover / Installer Tool

### WARNING

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.

### CAUTION

PRIOR TO APPLYING HYDRAULIC PRESSURE TO REMOVE OR INSTALL THE KINGPIN BUSHING, SUPPORT THE LOWER STEERING KNUCKLE AS SHOWN IN FIGURES 9-64 AND 9-65. IMPROPER SUPPORT TO THE STEERING KNUCKLES CAN CAUSE COMPONENT DAMAGE.

FIGURE 9-64



FIGURE 9-65



FIGURE 9-66



1. **STEERTEK** axle (Vehicles built **PRIOR** to October 2012)
  - 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 9-64 through 9-66.
  - 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** October 2012)
  - 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 Figure 9-64 through 9-66.
  - c. Place the STEERTEK NXT installer/remove tool in the steering knuckle/kingpin bore. Then place the kingpin bushing push-out tool on top of the installer/remove.
  - d. Press out the kingpin bushing.
3. Clean the parts and inspect for reassembly, see Figure 9-67.

**FIGURE 9-67**


### ■ 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 9-68 through 9-70. If the average measurement is more than the knuckle bore maximum diameter specification, replace the knuckle.

**FIGURE 9-68**

**FIGURE 9-69**

**FIGURE 9-70**


### ■ KINGPIN BUSHING INSTALLATION

**You will need:**

- A hydraulic shop press with a minimum forcing capacity of 2.5 tons.
- Kingpin bushing driver, refer to the Special Tools Section in this publication.
- Adjustable straight flute reamer, refer to the Special Tools Section in this publication.



#### **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  $\frac{1}{4}$ " (0.236") or 6 millimeters and no more than  $\frac{5}{16}$ " (0.32") or 8 millimeters, see Figures 9-71 and 9-73.
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 9-71



FIGURE 9-72



FIGURE 9-73



### ■ KINGPIN BUSHING REAMING

#### CAUTION

REAM THE KINGPIN BUSHINGS WITH AN ADJUSTABLE STRAIGHT FLUTE REAMER. DO NOT HONE OR BURNISH THE KINGPIN BUSHINGS. HONING OR BURNISHING WILL DAMAGE THE BUSHINGS AND VOID ANY APPLICABLE WARRANTY.

#### WARNING

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

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

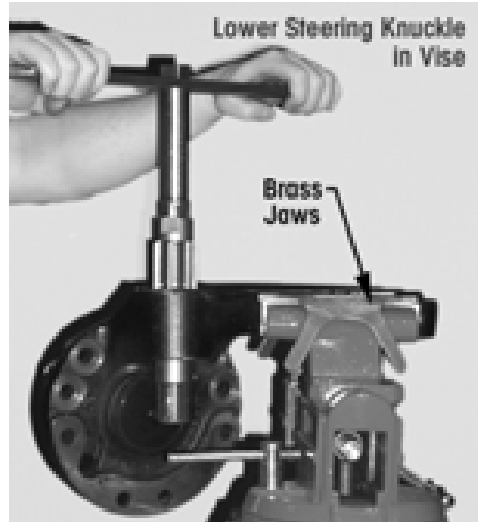
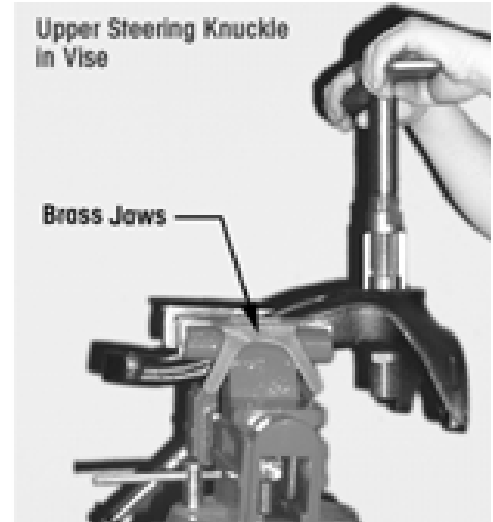
#### SERVICE HINT

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

5. Install the reamer into the lower steering knuckle until the blades touch the kingpin bushing.
6. Rotate the reamer with light downward pressure. Rotate the reamer smoothly. **DO NOT** apply too much pressure, see Figures 9-74 and 9-75.
7. Slide the reamer out of the lower steering knuckle assembly. If it is necessary to remove the reamer from the top, rotate the reamer opposite of cutting rotation.
8. Clean and remove all kingpin bushing material from the knuckle assembly. Take special attention to remove material from the grease channels and dimples.
9. Clean the  $\frac{5}{8}$ " brake backing plate bolts with a wire wheel and run a tap through the threads of the upper kingpin connection/steering arm 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 KINGPIN CONNECTION OR STEERING ARM, 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.

**FIGURE 9-74**

**FIGURE 9-75**

**NOTE**

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

10. Install the steering arm and upper kingpin connection on the kingpin.

11. Check for the proper fit by rotating the knuckle assembly back and forth to verify there is no binding on the kingpin, see Figures 9-76 and 9-77.

12. If the bushing is too tight repeat Steps 1 through 8 until the proper clearance is achieved.

**FIGURE 9-76**

**FIGURE 9-77**

**NOTE**

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

## ■ KINGPIN SEAL INSTALLATION

1. Place the 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 9-78.
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 9-79. Install the kingpin seal until it bottoms out in the kingpin bore.

**FIGURE 9-78**

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



5. **STEERTEK** — Single Lip design, see Figure 9-80. Install the kingpin seal until it makes contact with the kingpin bushing.

FIGURE 9-79

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



FIGURE 9-80

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



## ■ STEERING KNUCKLE ASSEMBLY

### ASSEMBLY

After replacement of the kingpin bushings it is necessary to re-assemble the steering knuckle assemblies. The STEERTEK NXT/STEERTEK axle is equipped with two different thrust bearings installed. The composite thrust bearing is installed on the left side of the axle. The roller bearing is installed on the right side of the axle, see Figure 9-83. **DO NOT** substitute aftermarket components when servicing.

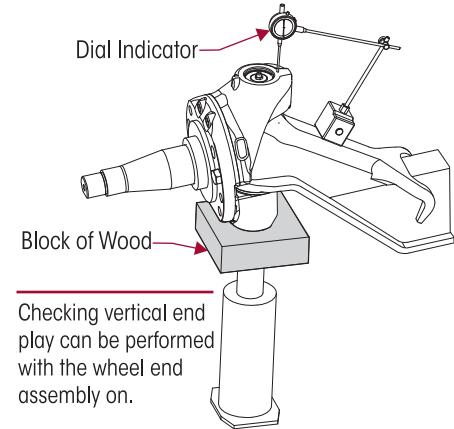
FIGURE 9-81



1. Install the thrust bearing on the lower kingpin with the seal facing up toward axle (the black seal will designate the top side), see Figure 9-81.
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.
5. Install the lower steering knuckle on the lower kingpin and install the old socket head cap screws loose into the top two threaded holes.
6. Install a bottle jack under the lower knuckle and slightly raise the knuckle until it is possible to thread in the (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 9-82.



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.

**FIGURE 9-82**

**NOTE**

The vertical end play can be further adjusted with a shim **ONLY** for the vehicle built **PRIOR to October 2012** equipped with **STEERTEK** axle.

**STEERTEK Axle (PRIOR to October 2012)**

- 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 socket head cap screw comes with a pre-applied Loctite compound.


**WARNING**

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 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 175-200 foot pounds (237-271 Nm) torque.
16. Recheck the vertical end play with the dial indicator or a 0.010" feeler gauge, see Figure 9-83.
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 brake spider bolts to ensure that these bolts sustain the proper torque requirement of steering knuckle assembly.


19. Apply Loctite to the three brake spider bolts prior to installation into the brake spider. Tighten bolts to 175-200 foot pounds (237-271 Nm) torque.


**WARNING**

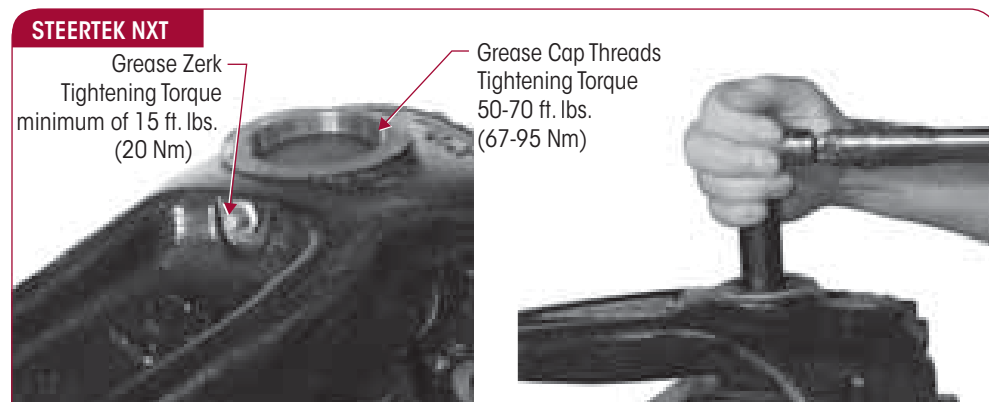
DO NOT GREASE KNUCKLES WITHOUT THE BRAKE SPIDER INSTALLED AND TIGHTENED TO PROPER TORQUE. FAILURE TO DO SO CAN CAUSE COMPONENT DAMAGE RESULTING IN FAILURE AND LOSS OF VEHICLE CONTROL, POSSIBLY CAUSING PERSONAL INJURY OR PROPERTY DAMAGE.

20. Install the tie rod end into the lower steering knuckle arm.
21. Tighten the castle nuts to 185 foot pounds (251 Nm) 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  50-70 foot pounds (67-95 Nm) torque. Allow 30 minutes for thread sealant to cure before greasing. Install new grease zerk and tighten to a minimum of 15 foot pounds (20 Nm), see Figure 9-83.

**FIGURE 9-83**



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

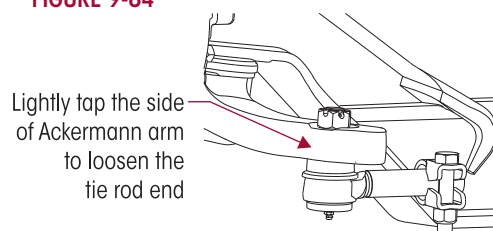
### NOTE

Hendrickson supplies different tie rod configurations. Prior to ordering find the part number on the tie rod tube, refer to Hendrickson Technical Bulletin Literature No. SEU-0223 for additional information or contact Hendrickson Truck Parts (e-mail: truckparts@hendrickson-intl.com).

### 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 9-84.
5. Repeat Steps 3 and 4 to remove the other tie rod end.
6. Remove the cross tube and tie rod ends from the vehicle.
7. Mount the cross tube in a soft jaw vice.
8. Remove the hardware from the clamp on the cross tube.
9. Count the exposed threads on the tie rod end being replaced.
10. Remove the tie rod end from the cross tube.

**FIGURE 9-84**



### 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 9-85. FAILURE TO DO SO CAN CAUSE COMPONENT DAMAGE, LOSS OF VEHICLE CONTROL AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

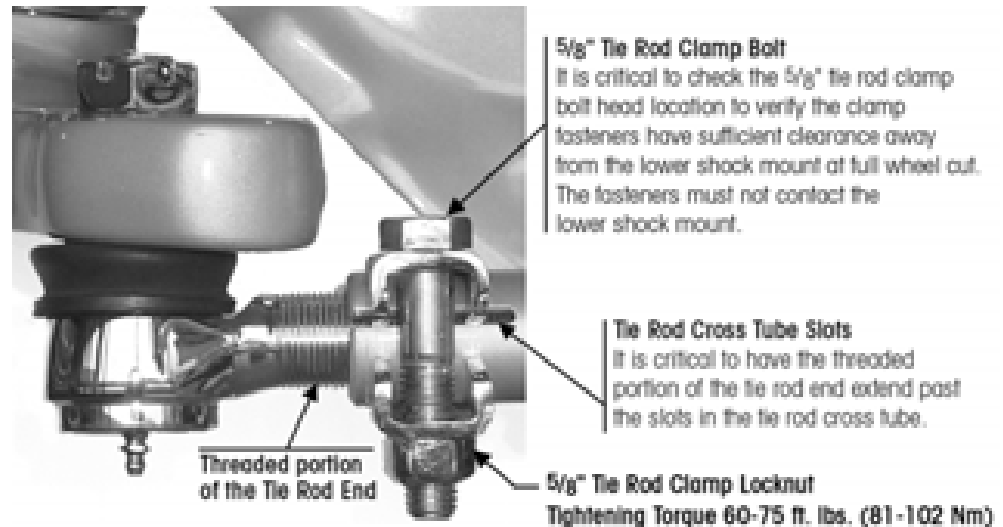


#### WARNING

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 9-85**



#### WARNING

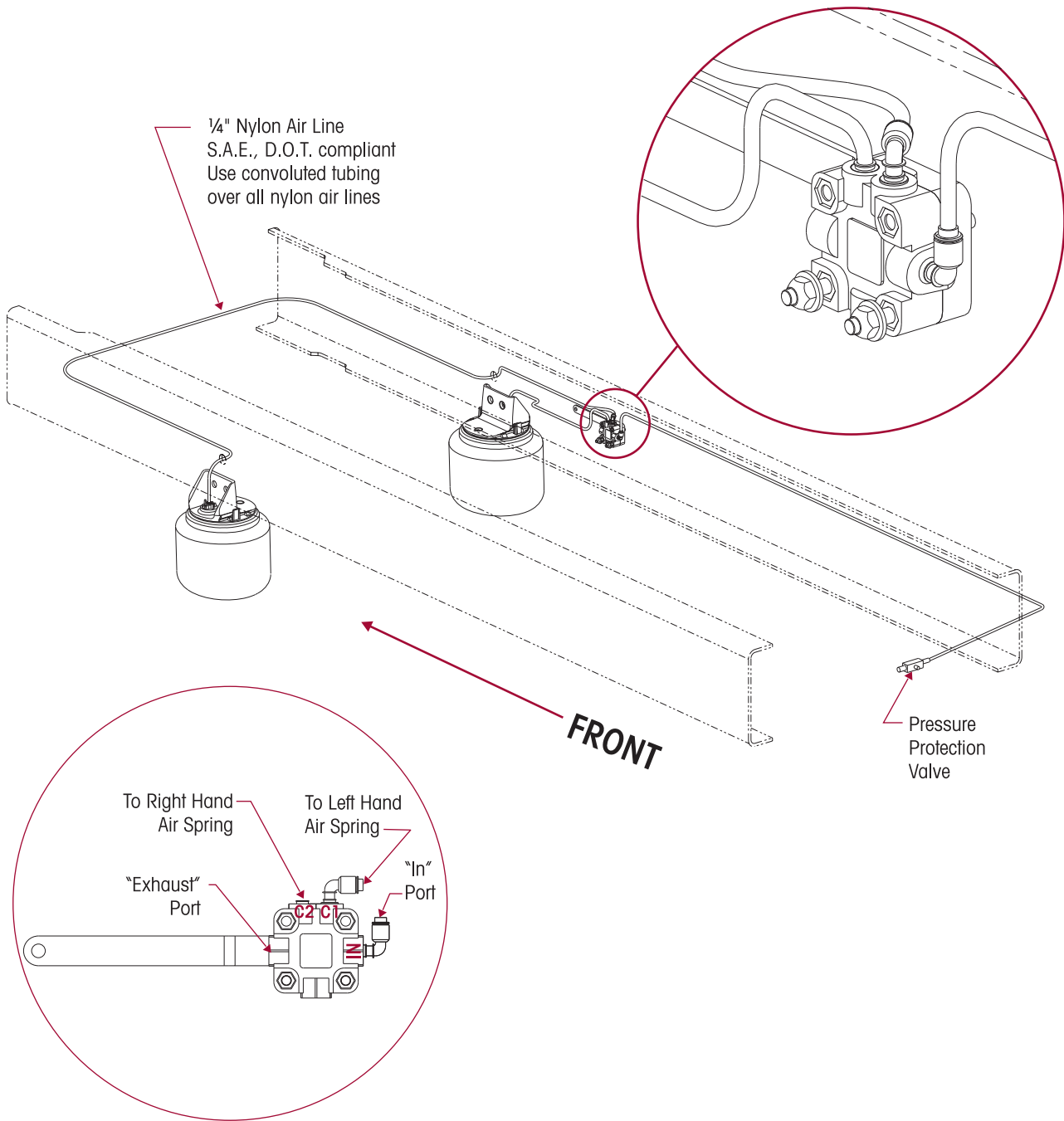
DO NOT HEAT THE CROSS TUBE WITH A TORCH TO ROTATE THE CROSS TUBE IN THE TIE ROD END. THE USE OF SUCH HEAT CAN ADVERSELY AFFECT THE STRENGTH OF THE CROSS TUBE. A COMPONENT DAMAGED IN THIS MANNER WILL RESULT IN LOSS OF WARRANTY, AND CAN RESULT IN THE LOSS OF VEHICLE CONTROL, AND POSSIBLE LOWER STEERING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

4. If replacing opposing tie rod end is not necessary it is critical that the cross tube will rotate in the opposing tie rod end.
5. Install the cross tube into the Ackermann arms.
6. Tighten the castle nuts to 185 (251 Nm) foot pounds torque then rotate the castle nut to the next castle slot and install cotter pin.
7. Grease tie rod ends. See Lubrication Chart for required lubricant in the Preventive Maintenance Section of this publication.
8. Set the toe, see Toe Adjustment Procedure in the Alignment & Adjustments Section of this publication.
9. Remove the wheel chocks.

## SECTION 10 Plumbing Diagrams

### AIRTEK SINGLE HEIGHT CONTROL VALVE – 10K

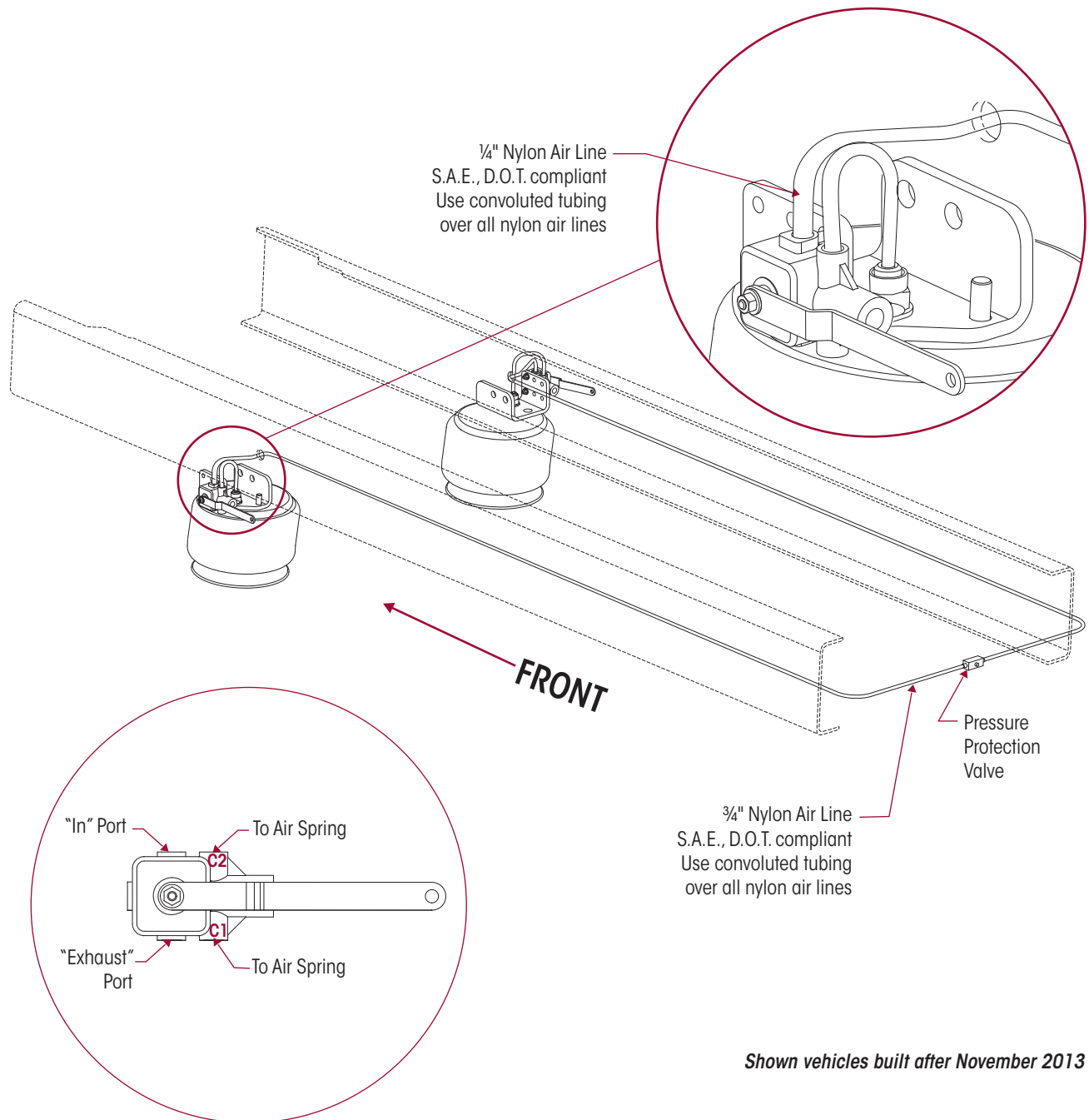
When replacing or installing nylon air line tubing into quick-connect fittings it is critical that the end of the air line is cut square. Improper cut of the end of the air line tubing can cause the air line to seat improperly in the quick connect fitting causing air leakage.





### AIRTEK DUAL HEIGHT CONTROL VALVES – 13.2K/14.6K

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.



*Shown vehicles built after November 2013*

## SECTION 11

# Troubleshooting Guide

### AIRTEK / SOFTEK for Blue Bird Buses

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	Set proper ride height then 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 (if equipped) and rear hanger clamps	Replace thrust washers (if equipped) and rear hanger clamps
	Broken engine mount	Replace engine mount
	Wheel bearing adjustment	Adjust wheel bearing to the vehicle manufacturers 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 manufacturers 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 clearance
	Incorrect steering arm geometry	Repair steering system as necessary
	Caster out of specification	Set proper ride height then 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 trouble shooting procedures per steering gear manufacturing guidelines.



## AIRTEK / SOFTEK for Blue Bird Buses

## TROUBLESHOOTING GUIDE

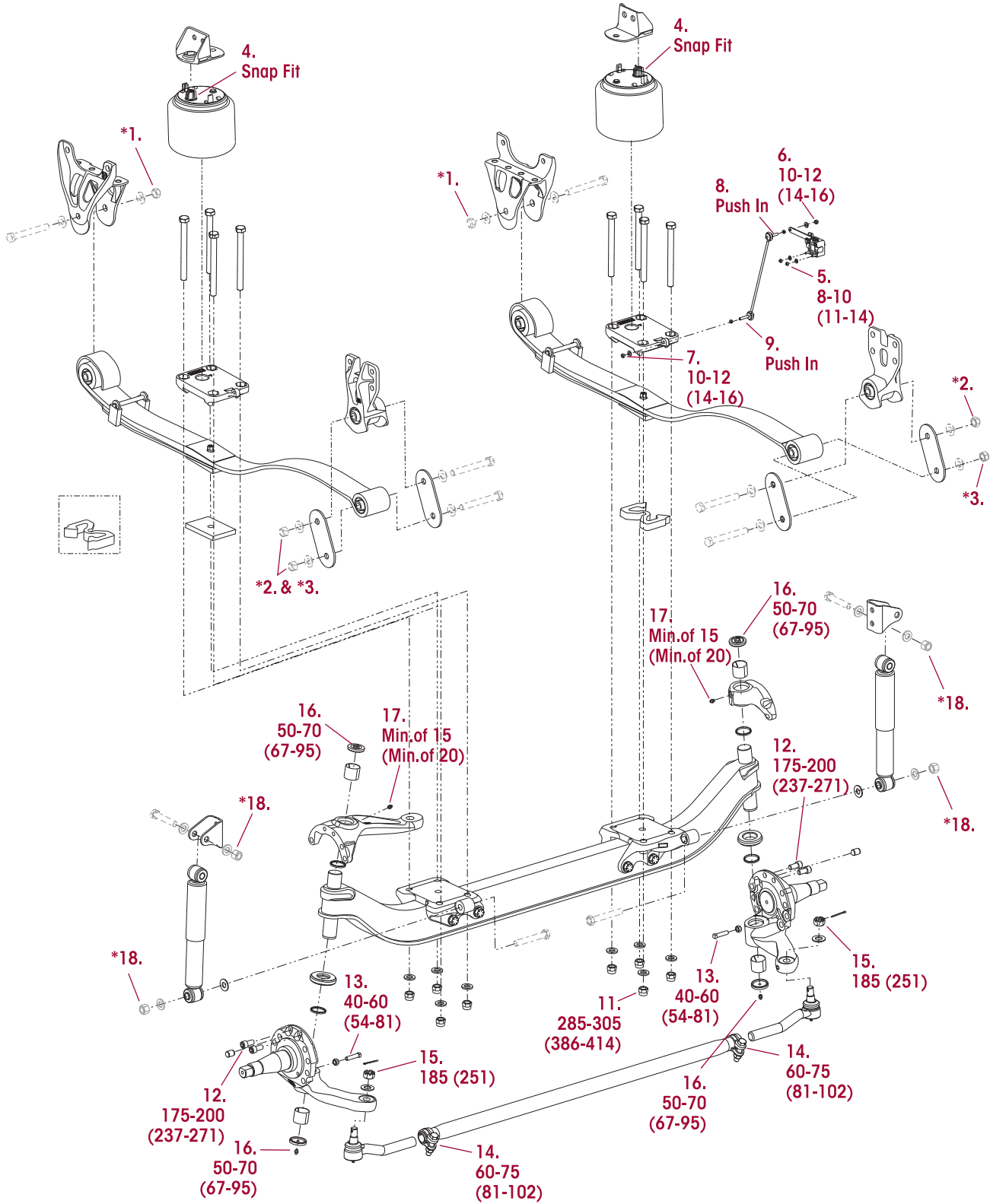
CONDITION	POSSIBLE CAUSE	CORRECTION
Tie rod ends are worn and require replacement	Tie rod ends need lubrication	Lubricate tie rod end. Make sure lubrication schedule is followed.
	Severe operating conditions	Increase frequency of inspection and lubrication intervals
	Damaged boot on tie rod end	Replace tie rod end
Bent or broken cross tube, tie rod end ball stud or tie rod end  NOTE: 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 OEM specifications
	Axle stops improperly set	Set axle stops to OEM 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 OEM 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
	Suspension is not torqued correctly at installation	Perform spring eye re-torque procedure. See Torque Specification Section of this publication
	Leaf spring broken	Replace leaf spring
	Excessive weight bias	Contact the vehicle manufacturer or Hendrickson Tech Services
Vehicle wanders	Caster out of specifications	Set proper ride height then 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

# SECTION 12

## Torque Specifications

■ AIRTEK with STEERTEK NXT for Blue Bird Vision Buses built  
AFTER October 2012 – 10K Capacity

Hendrickson Recommended Torque Values  
Provided in Foot Pounds and in (Nm)







**AIRTEK with STEERTEK NXT Axle for Blue Bird Vision 10K Buses**  
**Built AFTER October 2012**

HENDRICKSON RECOMMENDED TORQUE SPECIFICATIONS					
NO.	COMPONENT	QTY.	SIZE	TORQUE VALUE	
				Foot Pounds	Nm
1	Front Frame Hanger to Front Leaf Spring Eye	2	M20	*	*
2	Rear Shackle Bracket to Shackle Plate	2	M20	*	*
3	Rear Shackle Bracket to Spring Eye	2	M20	*	*
4	Air Spring	2	Self-Locking	Snap Fit	
5	Height Control Valve to Frame	2	¼"	8-10	11-14
6	HCV Linkage to HCV Arm	2	5/16"	10-12	14-16
7	HCV Linkage to Top Pad	2	5/16"	10-12	14-16
8	HCV Linkage Grommet to HCV Arm	1	Grommet	Push In	
9	HCV Linkage Grommet to Top Pad	1	Grommet	Push In	
10	Spring Center Aligning Dowel Pin (Flat Floor Bus)	2	¾"	***Loose Fit	
11	Clamp Group Hardware	8	¾"	285-305	386-414
	<div style="background-color: #800000; color: white; padding: 2px;"> <b>WARNING</b></div> 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.				
12	Knuckle Attachment Bolt (Socket Head Cap Screw)	4	5/8"	175-200	237-271
13	Knuckle / Axle Wheel Stop Bolt	2	5/8" Jam Nut	40-60	54-81
14	Tie Rod Tube to Tie Rod Ends	2	5/8"	60-75	81-102
15	Tie Rod Ends to Lower Steering Knuckle	2	7/8" Castle Nut	**185	**251
16	Grease Cap Assembly, Upper and Lower	4	½"	50-70	67-95
17	Grease Zerk	2		Minimum of 15	Minimum of 20
18	Shocks Eye Bolts	2	¾"	*	*
<b>• All hardware ¼" and greater is Grade 8 with no additional lubrication.</b> <b>Frame mount hardware in most cases are Huck style fasteners supplied by the OEM.</b>					
<b>NOTE:</b> * All hardware information in the matrix denotes recommended torques for fasteners originally supplied by the vehicle manufacturer. If Hendrickson supplied fasteners are used, tighten to Hendrickson torque values, if non Hendrickson fasteners are used, follow torque specifications listed in the vehicle manufacturer's service manual. Hendrickson is not responsible for maintaining vehicle manufacturer's torque values. ** Torque to 185 foot pounds (251 Nm), advance nut to next hex face to install cotter pin. Do not back off nut for cotter pin installation. *** Denote items not shown on illustration.					

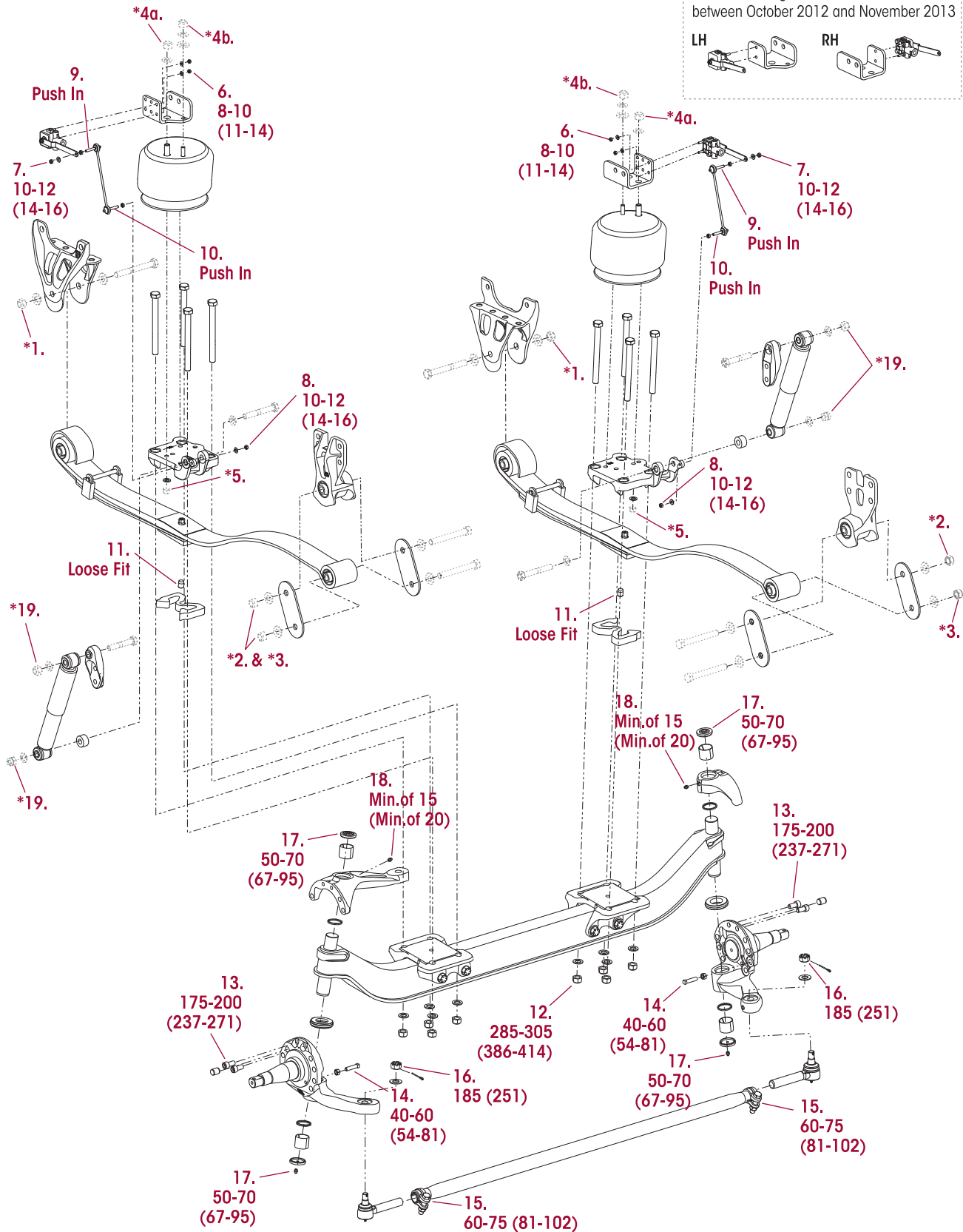
**\*Blue Bird Vision Model**

AIRTEK	RIDE HEIGHT	SHOCK ABSORBER LENGTH
Equipped with STEERTEK NXT / STEERTEK	12½"	18 5/16"
COMFORT AIR	Referenced Ride Height 4 7/8"	Referenced Shock Absorber Length 22 3/4"
*Refer to the Alignment & Adjustments Section of this publication for more information.		

■ AIRTEK with STEERTEK NXT Axle for Blue Bird All American Buses built AFTER October 2012 – 13.2K/14.6K Capacity

Hendrickson Recommended Torque Values Provided in Foot Pounds and in (Nm)

\*\*\*\*\*HCV Configuration for Vehicles built between October 2012 and November 2013





**AIRTEK with STEERTEK NXT Axle for Blue Bird All American 13.2/14.6K Buses  
Built AFTER October 2012 –**

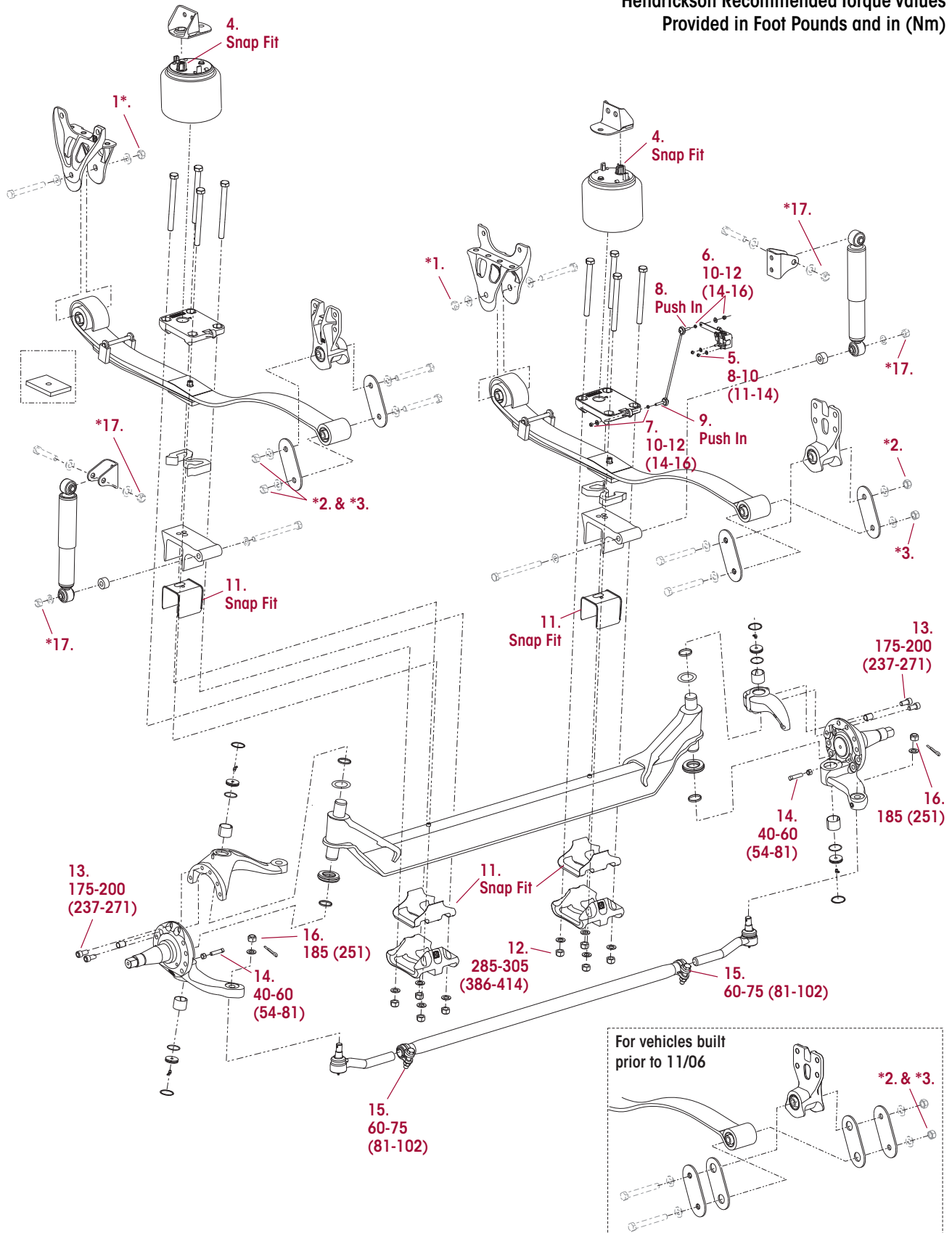
HENDRICKSON RECOMMENDED TORQUE SPECIFICATIONS					
NO.	COMPONENT	QTY.	SIZE	TORQUE VALUE	
				Foot Pounds	Nm
1	Front Frame Hanger to Front Leaf Spring Eye	2	M20	*	*
2	Rear Shackle Bracket to Shackle Plate	2	M20	*	*
3	Rear Shackle Bracket to Spring Eye	2	M20	*	*
4	Air Spring to Air Spring Bracket	2	¾"	*	*
5	Air Spring to Top Pad	2	½"	20-30	27-41
6	Height Control Valve to Air Spring Bracket	2	¼"	8-10	11-14
7	HCV Linkage to HCV Arm	2	5/16"	10-12	14-16
8	HCV Linkage to Top Pad	2	5/16"	10-12	14-16
9	HCV Linkage Grommet to HCV Arm	1	Grommet	Push In	
10	HCV Linkage Grommet to Top Pad	1	Grommet	Push In	
11	Spring Center Aligning Dowel Pin (Flat Floor Bus)	2	¾"	Loose Fit	
12	Clamp Group Hardware	8	¾"	285-305	386-414
<div style="display: flex; align-items: center;"> <div style="background-color: #800000; color: white; padding: 2px 5px; font-weight: bold; margin-right: 5px;"> <b>WARNING</b> </div> <div> <p style="margin: 0;">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.</p> </div> </div>					
13	Knuckle Attachment Bolt (Socket Head Cap Screw)	4	5/8"	175-200	237-271
14	Knuckle / Axle Wheel Stop Bolt	2	5/8" Jam Nut	40-60	54-81
15	Tie Rod Tube to Tie Rod Ends	2	5/8"	60-75	81-102
16	Tie Rod Ends to Lower Steering Knuckle	2	7/8" Castle Nut	**185	**251
17	Grease Cap Assembly, Upper and Lower	4	½"	50-70	67-95
18	Grease Zerk	2		Minimum of 15	Minimum of 20
19	Shocks Eye Bolts	2	¾"	*	*
<p>• All hardware ¼" and greater is Grade 8 with no additional lubrication. Frame mount hardware in most cases are Huck style fasteners supplied by the OEM.</p>					
<p><b>NOTE:</b> * All hardware information in the matrix denotes recommended torques for fasteners originally supplied by the vehicle manufacturer. If Hendrickson supplied fasteners are used, tighten to Hendrickson torque values, if non Hendrickson fasteners are used, follow torque specifications listed in the vehicle manufacturer's service manual. Hendrickson is not responsible for maintaining vehicle manufacturer's torque values. ** Torque to 185 foot pounds (251 Nm), advance nut to next hex face to install cotter pin. Do not back off nut for cotter pin installation.</p>					

**\*Blue Bird All American Model**

AIRTEK	FRONT ENGINE		REAR ENGINE	
	RIDE HEIGHT	SHOCK ABSORBER LENGTH	RIDE HEIGHT	SHOCK ABSORBER LENGTH
With STEERTEK NXT after October 2012	14 <sup>7</sup> / <sub>8</sub> "	17 <sup>15</sup> / <sub>16</sub> "	14 <sup>7</sup> / <sub>8</sub> "	18 <sup>5</sup> / <sub>32</sub> "
COMFORT AIR	Referenced Ride Height 4 <sup>7</sup> / <sub>8</sub> "		Referenced Shock Absorber Length 22 <sup>3</sup> / <sub>4</sub> "	
*Refer to the Alignment & Adjustments Section of this publication for more information.				

■ AIRTEK with STEERTEK Axle for Blue Bird Vision Buses built PRIOR to October 2012 – 10K Capacity

Hendrickson Recommended Torque Values Provided in Foot Pounds and in (Nm)





**AIRTEK with STEERTEK Axle for Blue Bird Vision 10K Buses  
Built PRIOR to October 2012**

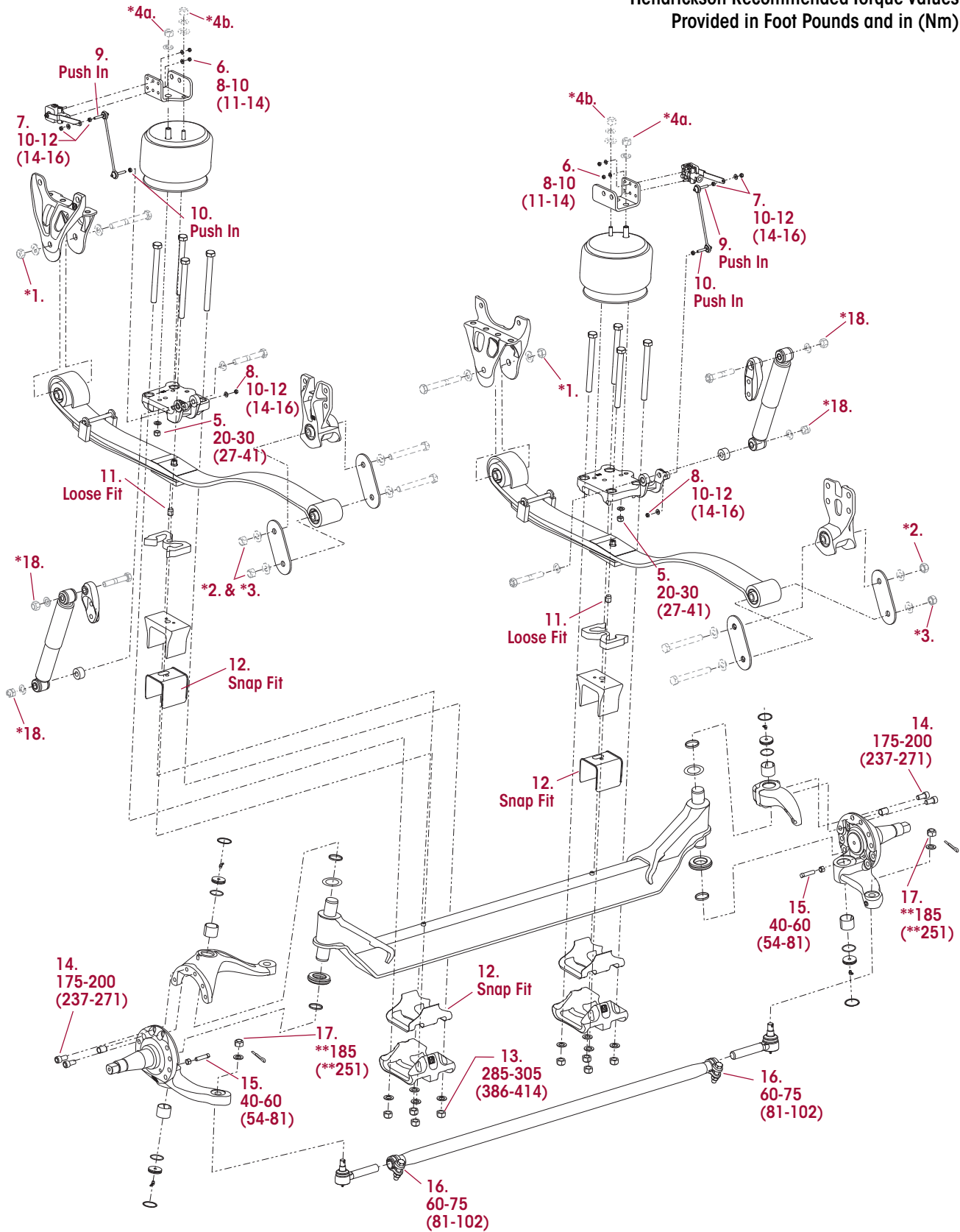
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NO.	COMPONENT	QTY.	SIZE	TORQUE VALUE	
				Foot Pounds	Nm
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2	Rear Shackle Bracket to Shackle Plate	2	M20	*	*
3	Rear Shackle Bracket to Spring Eye	2	M20	*	*
4	Air Spring	2	Self-Locking	Snap Fit	
5	Height Control Valve to Frame	2	¼"	8-10	
6	HCV Linkage to HCV Arm	2	5/16"	10-12	
7	HCV Linkage to Top Pad	2	5/16"	10-12	
8	HCV Linkage Grommet to HCV Arm	1	Grommet	Push In	
9	HCV Linkage Grommet to Top Pad	1	Grommet	Push In	
10	Spring Center Aligning Dowel Pin (Flat Floor Bus)	2	¾"	***Loose Fit	
11	Axle Wrap Liners for Clamp Group	2	Formed	Snap Fit	
	<div style="background-color: #800000; color: white; padding: 2px;"> <b>WARNING</b></div> DO NOT ASSEMBLE CLAMP GROUP WITHOUT AXLE WRAP LINERS. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE OR PERSONAL INJURY.				
12	Clamp Group Hardware	8	¾"	285-305	386-414
	<div style="background-color: #800000; color: white; padding: 2px;"> <b>WARNING</b></div> 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.				
13	Knuckle Attachment Bolt (Socket Head Cap Screw)	4	5/8"	175-200	237-271
14	Knuckle / Axle Wheel Stop Bolt	2	5/8" Jam Nut	40-60	54-81
15	Tie Rod Tube to Tie Rod Ends	2	5/8"	60-75	81-102
16	Tie Rod Ends to Lower Steering Knuckle	2	7/8" Castle Nut	**185	**251
17	Shocks Eye Bolts	2	¾"	*	*
<b>• All hardware ¼" and greater is Grade 8 with no additional lubrication. Frame mount hardware in most cases are Huck style fasteners supplied by the OEM.</b>					
<b>NOTE:</b> * All hardware information in the matrix denotes recommended torques for fasteners originally supplied by the vehicle manufacturer. If Hendrickson supplied fasteners are used, tighten to Hendrickson torque values, if non Hendrickson fasteners are used, follow torque specifications listed in the vehicle manufacturer's service manual. Hendrickson is not responsible for maintaining vehicle manufacturer's torque values. ** Torque to 185 foot pounds (251 Nm), advance nut to next hex face to install cotter pin. Do not back off nut for cotter pin installation. *** Denote items not shown on illustration.					

**\*Blue Bird Vision Model**

AIRTEK	RIDE HEIGHT	SHOCK ABSORBER LENGTH
Equipped with STEERTEK NXT / STEERTEK	12½"	18 5/16"
COMFORT AIR	Referenced Ride Height 4 7/8"	Referenced Shock Absorber Length 22 3/4"
*Refer to the Alignment & Adjustments Section of this publication for more information.		

■ AIRTEK with STEERTEK Axle for Blue Bird All American Buses built  
PRIOR to October 2012 – 13.2K/14.6K Capacity

Hendrickson Recommended Torque Values  
Provided in Foot Pounds and in (Nm)





**AIRTEK with STEERTEK Axle for Blue Bird All American 13.2K/14.6K Buses  
Built PRIOR to October 2012**

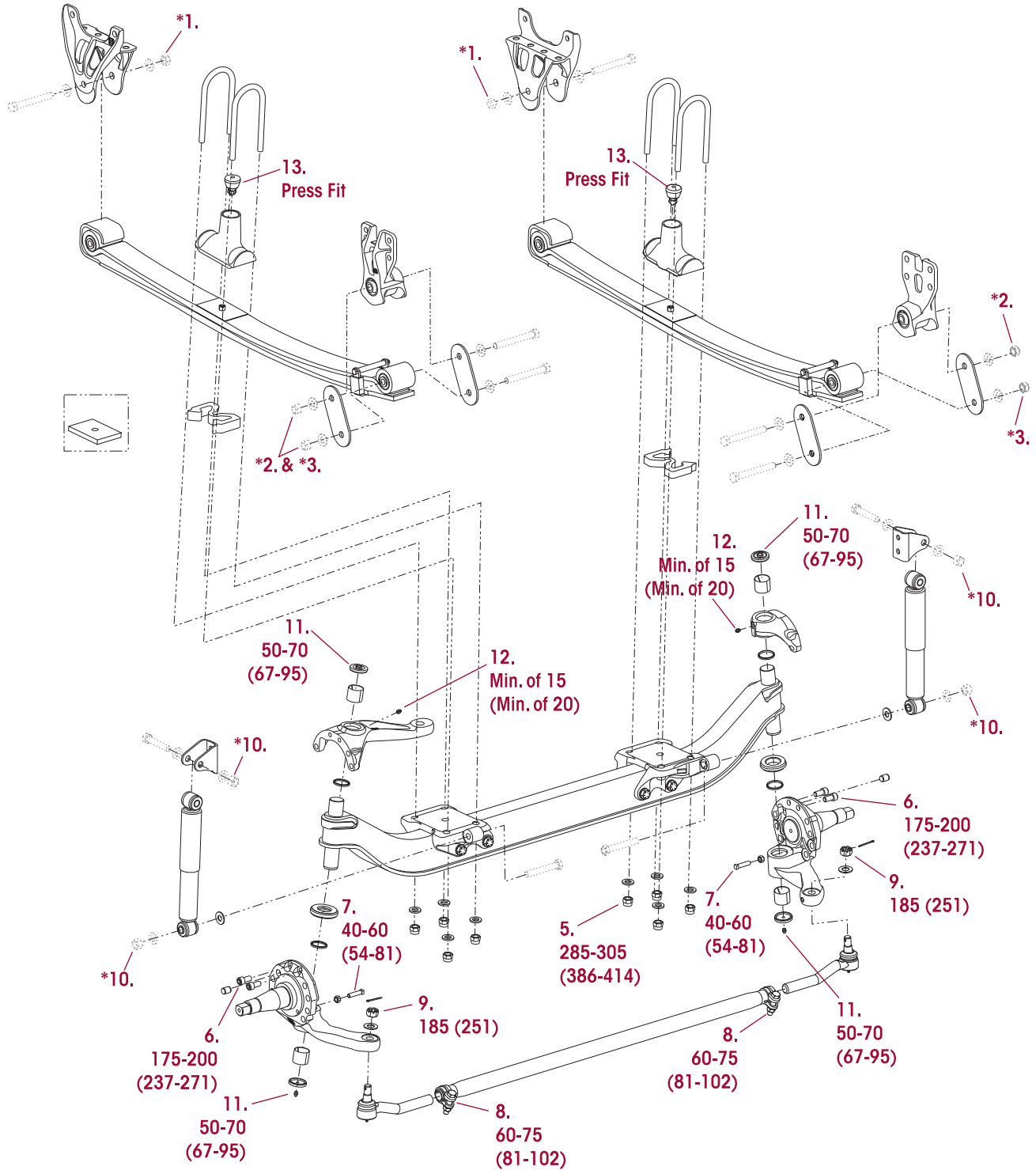
HENDRICKSON RECOMMENDED TORQUE SPECIFICATIONS					
NO.	COMPONENT	QTY.	SIZE	TORQUE VALUE	
				Foot Pounds	Nm
1	Front Frame Hanger to Front Leaf Spring Eye	2	M20	*	*
2	Rear Shackle Bracket to Shackle Plate	2	M20	*	*
3	Rear Shackle Bracket to Spring Eye	2	M20	*	*
4	Air Spring to Air Spring Bracket	2	¾"	*	*
5	Air Spring to Top Pad	2	½"	20-30	27-41
6	Height Control Valve to Air Spring Bracket	2	¼"	8-10	11-14
7	HCV Linkage to HCV Arm	2	5/16"	10-12	14-16
8	HCV Linkage to Top Pad	2	5/16"	10-12	14-16
9	HCV Linkage Grommet to HCV Arm	1	Grommet	Push In	
10	HCV Linkage Grommet to Top Pad	1	Grommet	Push In	
11	Spring Center Aligning Dowel Pin (Flat Floor Bus)	2	¾"	Loose Fit	
12	Axle Wrap Liners for Clamp Group	2	Formed	Snap Fit	
<b>⚠ WARNING</b> DO NOT ASSEMBLE CLAMP GROUP WITHOUT AXLE WRAP LINERS. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE OR PERSONAL INJURY.					
13	Clamp Group Hardware	8	¾"	285-305	386-414
<b>⚠ WARNING</b> 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.					
14	Knuckle Attachment Bolt (Socket Head Cap Screw)	4	5/8"	175-200	237-271
15	Knuckle / Axle Wheel Stop Bolt	2	5/8" Jam Nut	40-60	54-81
16	Tie Rod Tube to Tie Rod Ends	2	5/8"	60-75	81-102
17	Tie Rod Ends to Lower Steering Knuckle	2	7/8" Castle Nut	**185	**251
18	Upper and Lower Shocks Eye Locknuts	2	¾"	*	*
<b>• All hardware ¼" and greater is Grade 8 with no additional lubrication. Frame mount hardware in most cases are Huck style fasteners supplied by the OEM.</b>					
<b>NOTE:</b> * All hardware information in the matrix denotes recommended torques for fasteners originally supplied by the vehicle manufacturer. If Hendrickson supplied fasteners are used, tighten to Hendrickson torque values, if non Hendrickson fasteners are used, follow torque specifications listed in the vehicle manufacturer's service manual. Hendrickson is not responsible for maintaining vehicle manufacturer's torque values. ** Torque to 185 foot pounds (251 Nm), advance nut to next hex face to install cotter pin. Do not back off nut for cotter pin installation.					

**\*Blue Bird All American Model**

AIRTEK	FRONT ENGINE		REAR ENGINE	
	RIDE HEIGHT	SHOCK ABSORBER LENGTH	RIDE HEIGHT	SHOCK ABSORBER LENGTH
With STEERTEK prior to October 2012	14 <sup>7</sup> / <sub>8</sub> "	17 <sup>1</sup> / <sub>4</sub> "	14 <sup>7</sup> / <sub>8</sub> "	17 <sup>1</sup> / <sub>2</sub> "
COMFORT AIR	Referenced Ride Height 4 <sup>7</sup> / <sub>8</sub> "		Referenced Shock Absorber Length 22 <sup>3</sup> / <sub>4</sub> "	
*Refer to the Alignment & Adjustments Section of this publication for more information.				

■ SOFTEK with STEERTEK NXT Axle for Blue Bird Vision Buses built  
AFTER October 2012 – 8.5K/10K Capacity

Hendrickson Recommended Torque Values  
Provided in Foot Pounds and in (Nm)





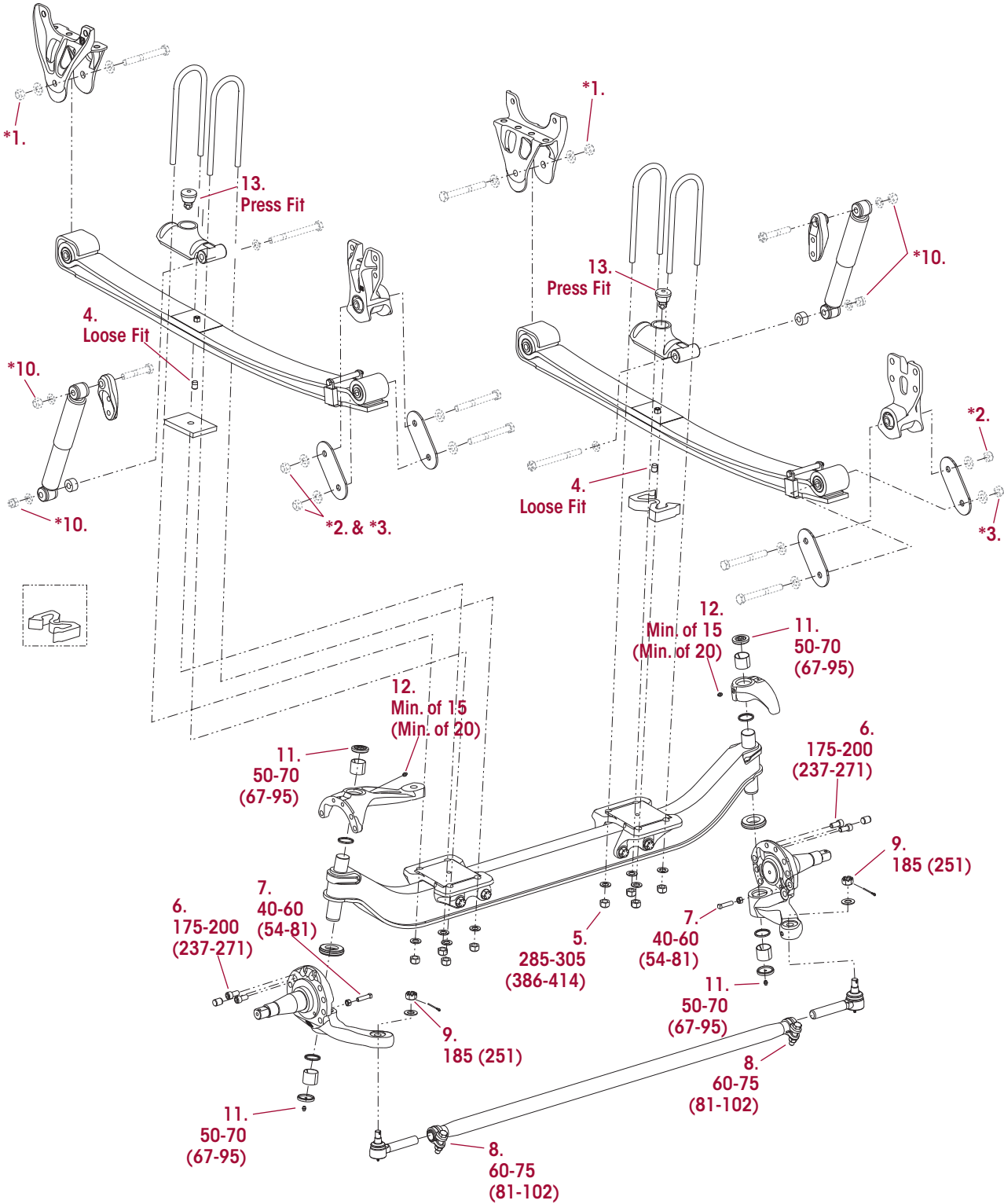


**SOFTEK with STEERTEK NXT Axle for Blue Bird Vision 8.5K/10K Buses  
Built AFTER October 2012**

HENDRICKSON RECOMMENDED TORQUE SPECIFICATIONS					
NO.	COMPONENT	QTY.	SIZE	TORQUE VALUE	
				Foot Pounds	Nm
1	Front Frame Hanger to Front Leaf Spring Eye	2	M20	*	*
2	Rear Shackle Bracket to Shackle Plate	2	M20	*	*
3	Rear Shackle Bracket to Spring Eye	2	M20	*	*
4	Spring Center Aligning Dowel Pin (Flat Floor Bus)	2	¾"	***Loose Fit	
5	Clamp Group Hardware	8	¾"	285-305	386-414
	<div style="background-color: #800000; color: white; padding: 2px;"> <b>WARNING</b></div> 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.				
6	Knuckle Attachment Bolt (Socket Head Cap Screw)	4	5/8"	175-200	237-271
7	Knuckle / Axle Wheel Stop Bolt	2	5/8" Jam Nut	40-60	54-81
8	Tie Rod Tube to Tie Rod Ends	2	5/8"	60-75	81-102
9	Tie Rod Ends to Lower Steering Knuckle	2	7/8" Castle Nut	**185	**251
10	Upper and Lower Shocks Eye Locknuts	4	¾"	*	*
11	Grease Cap Assembly, Upper and Lower	4	½"	50-70	67-95
12	Grease Zerk	2		Minimum of 15	Minimum of 20
13	Rubber Axle Stop	2	—	Press Fit	
<ul style="list-style-type: none"> <li>• All hardware ¼" and greater is Grade 8 with no additional lubrication.</li> <li>Frame mount hardware in most cases are Huck style fasteners supplied by the OEM.</li> </ul>					
<p><b>NOTE:</b> * All hardware information in the matrix denotes recommended torques for fasteners originally supplied by the vehicle manufacturer. If Hendrickson supplied fasteners are used, tighten to Hendrickson torque values, if non Hendrickson fasteners are used, follow torque specifications listed in the vehicle manufacturer's service manual. Hendrickson is not responsible for maintaining vehicle manufacturer's torque values.</p> <p>** Torque to 185 foot pounds (251 Nm), advance nut to next hex face to install cotter pin. Do not back off nut for cotter pin installation.</p> <p>*** Denote items not shown on illustration.</p>					

■ SOFTEK with STEERTEK NXT Axle for Blue Bird Vision Buses built  
AFTER October 2012 – 13.2K/14.6K Capacity

Hendrickson Recommended Torque Values  
Provided in Foot Pounds and in (Nm)





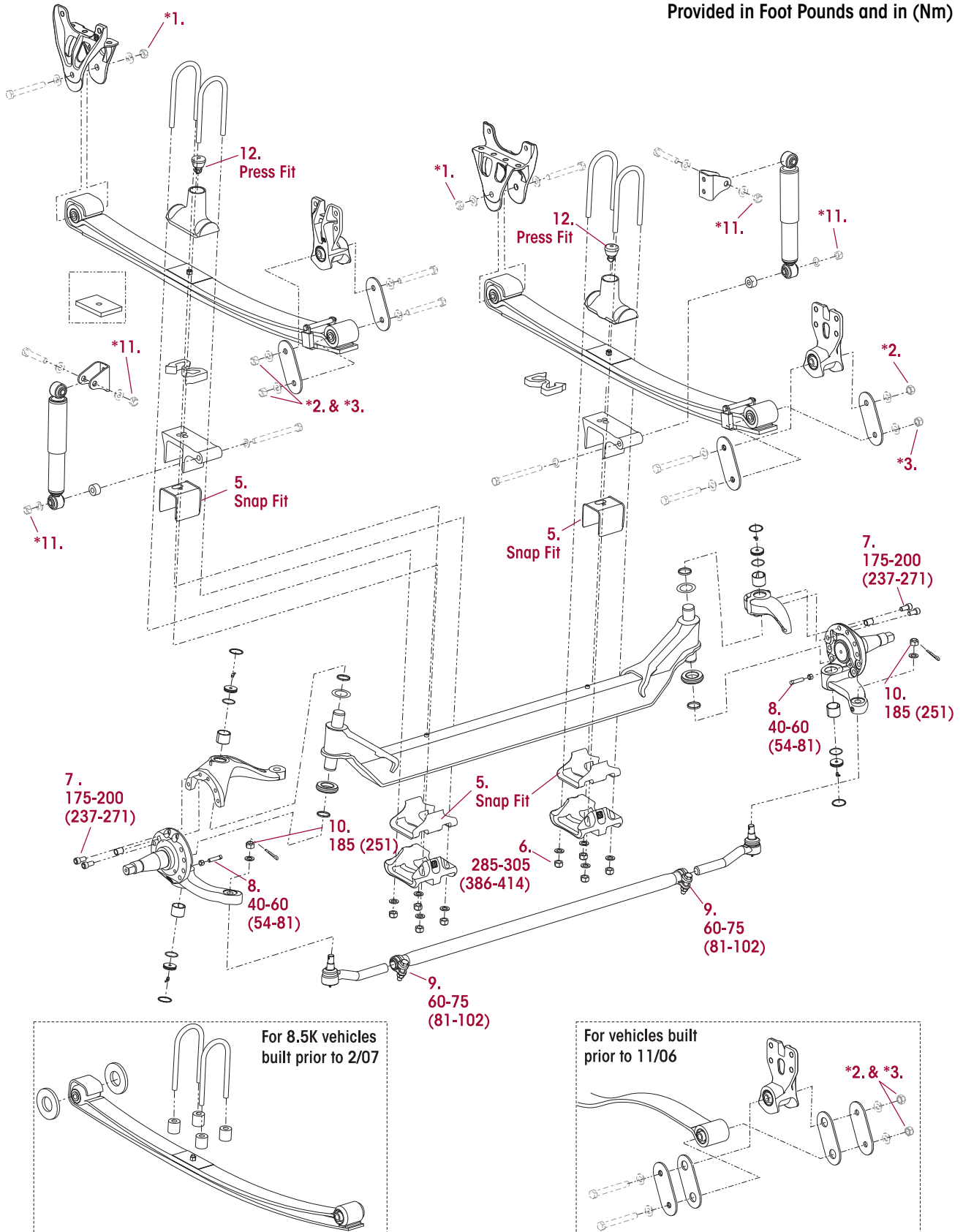
**SOFTEK with STEERTEK NXT Axle for Blue Bird All American 13.2K/14.6K Buses  
Built AFTER October 2012**

HENDRICKSON RECOMMENDED TORQUE SPECIFICATIONS					
NO.	COMPONENT	QTY.	SIZE	TORQUE VALUE	
				Foot Pounds	Nm
1	Front Frame Hanger to Front Leaf Spring Eye	2	M20	*	*
2	Rear Shackle Bracket to Shackle Plate	2	M20	*	*
3	Rear Shackle Bracket to Spring Eye	2	M20	*	*
4	Spring Center Aligning Dowel Pin (Flat Floor Bus)	2	¾"	Loose Fit	
5	Clamp Group Hardware	8	¾"	285-305	386-414
	<div style="display: flex; align-items: center;"> <div style="background-color: #800000; color: white; padding: 2px 5px; margin-right: 5px;"> <b>WARNING</b></div> <div>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.</div> </div>				
6	Knuckle Attachment Bolt (Socket Head Cap Screw)	4	5/8"	175-200	237-271
7	Knuckle / Axle Wheel Stop Bolt	2	5/8" Jam Nut	40-60	54-81
8	Tie Rod Tube to Tie Rod Ends	2	5/8"	60-75	81-102
9	Tie Rod Ends to Lower Steering Knuckle	2	7/8" Castle Nut	**185	**251
10	Shocks Eye Bolts	4	¾"	*	*
11	Grease Cap Assembly, Upper and Lower	4	½"	50-70	67-95
12	Grease Zerk	2		Minimum of 15	Minimum of 20
13	Rubber Axle Stop	2	—	Press Fit	
<ul style="list-style-type: none"> <li>• All hardware ¼" and greater is Grade 8 with no additional lubrication.</li> <li>Frame mount hardware in most cases are Huck style fasteners supplied by the OEM.</li> </ul>					
<p><b>NOTE:</b> * All hardware information in the matrix denotes recommended torques for fasteners originally supplied by the vehicle manufacturer. If Hendrickson supplied fasteners are used, tighten to Hendrickson torque values, if non Hendrickson fasteners are used, follow torque specifications listed in the vehicle manufacturer's service manual. Hendrickson is not responsible for maintaining vehicle manufacturer's torque values.</p> <p>** Torque to 185 foot pounds (251 Nm), advance nut to next hex face to install cotter pin. Do not back off nut for cotter pin installation.</p>					



■ SOFTEK with STEERTEK Axle for Blue Bird All American Buses built PRIOR to October 2012 – 8.5K/10K Capacity

Hendrickson Recommended Torque Values Provided in Foot Pounds and in (Nm)



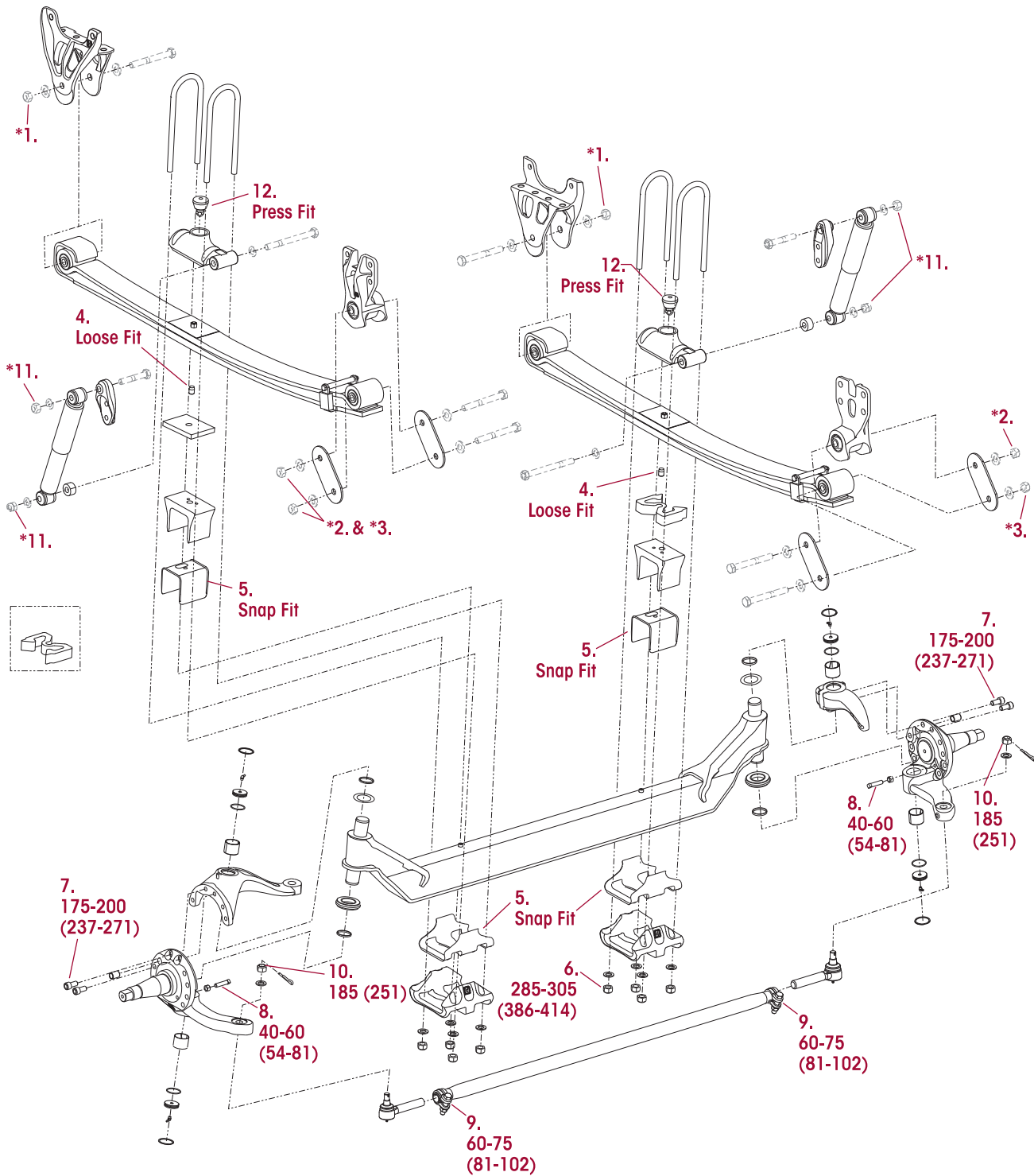


**SOFTEK with STEERTEK Axle for Blue Bird Vision Buses built  
PRIOR to October 2012 – 8.5K/10K Capacity**

HENDRICKSON RECOMMENDED TORQUE SPECIFICATIONS					
NO.	COMPONENT	QTY.	SIZE	TORQUE VALUE	
				Foot Pounds	Nm
1	Front Frame Hanger to Front Leaf Spring Eye	2	M20	*	*
2	Rear Shackle Bracket to Shackle Plate	2	M20	*	*
3	Rear Shackle Bracket to Spring Eye	2	M20	*	*
4	Spring Center Aligning Dowel Pin (Flat Floor Bus)	2	¾"	***Loose Fit	
5	Axle Wrap Liners for Clamp Group	2	Formed	Snap Fit	
<div style="background-color: #800000; color: white; padding: 2px;"><b>⚠ WARNING</b></div> 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	Clamp Group Hardware	8	¾"	285-305	386-414
<div style="background-color: #800000; color: white; padding: 2px;"><b>⚠ WARNING</b></div> 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.					
7	Knuckle Attachment Bolt (Socket Head Cap Screw)	4	5/8"	175-200	237-271
8	Knuckle / Axle Wheel Stop Bolt	2	5/8" Jam Nut	40-60	54-81
9	Tie Rod Tube to Tie Rod Ends	2	5/8"	60-75	81-102
10	Tie Rod Ends to Lower Steering Knuckle	2	7/8" Castle Nut	**185	**251
11	Shocks Eye Bolts	4	¾"	*	*
12	Rubber Axle Stop	2	—	Press Fit	
<b>• All hardware ¼" and greater is Grade 8 with no additional lubrication. Frame mount hardware in most cases are Huck style fasteners supplied by the OEM.</b>					
<b>NOTE:</b> * All hardware information in the matrix denotes recommended torques for fasteners originally supplied by the vehicle manufacturer. If Hendrickson supplied fasteners are used, tighten to Hendrickson torque values, if non Hendrickson fasteners are used, follow torque specifications listed in the vehicle manufacturer's service manual. Hendrickson is not responsible for maintaining vehicle manufacturer's torque values. ** Torque to 185 foot pounds (251 Nm), advance nut to next hex face to install cotter pin. Do not back off nut for cotter pin installation. *** Denote items not shown on illustration.					

■ SOFTEK with STEERTEK Axle for Blue Bird Vision Buses built  
PRIOR to October 2012 – 13.2K/14.6K Capacity

Hendrickson Recommended Torque Values  
Provided in Foot Pounds and in (Nm)



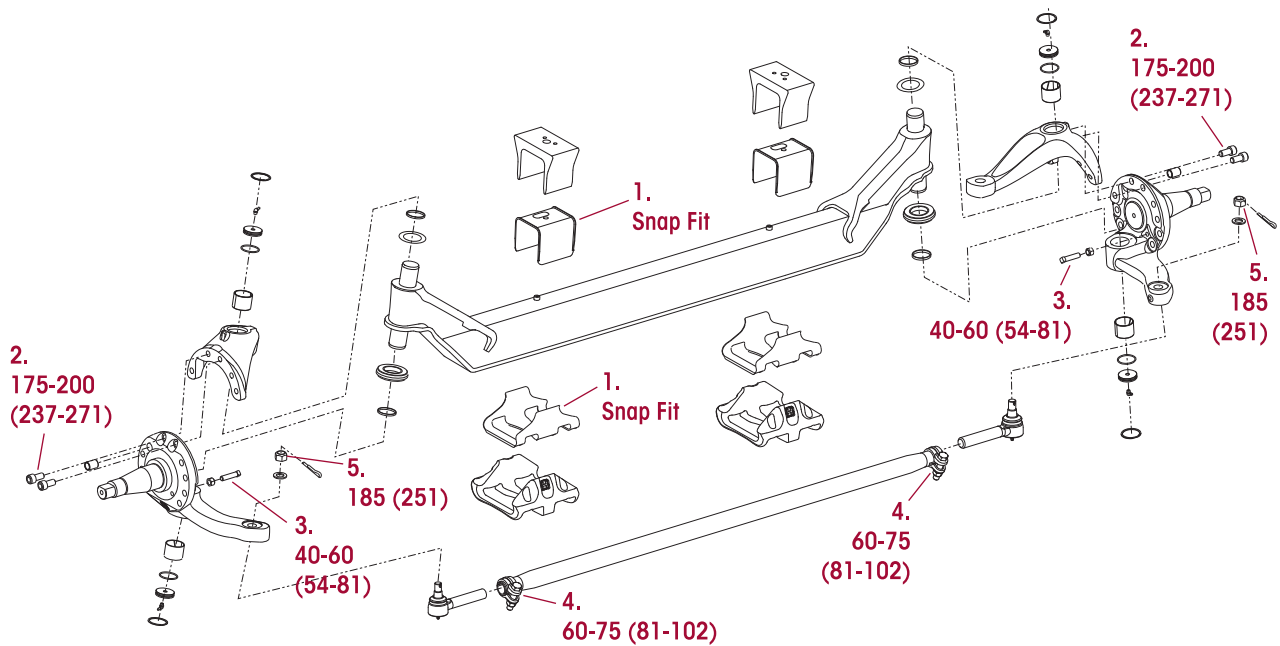


**SOFTEK with STEERTEK Axle for Blue Bird All American Buses built  
PRIOR to October 2012 – 13.2K/14.6K**

HENDRICKSON RECOMMENDED TORQUE SPECIFICATIONS					
NO.	COMPONENT	QTY.	SIZE	TORQUE VALUE	
				Foot Pounds	Nm
1	Front Frame Hanger to Front Leaf Spring Eye	2	M20	*	*
2	Rear Shackle Bracket to Shackle Plate	2	M20	*	*
3	Rear Shackle Bracket to Spring Eye	2	M20	*	*
4	Spring Center Aligning Dowel Pin (Flat Floor Bus)	2	¾"	Loose Fit	
5	Axle Wrap Liners for Clamp Group	2	Formed	Snap Fit	
<div style="background-color: #f0f0f0; padding: 5px;"> <b>WARNING</b> DO NOT ASSEMBLE CLAMP GROUP WITHOUT AXLE WRAP LINERS. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE OR PERSONAL INJURY.         </div>					
6	Clamp Group Hardware	8	¾"	285-305	386-414
<div style="background-color: #f0f0f0; padding: 5px;"> <b>WARNING</b> 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.         </div>					
7	Knuckle Attachment Bolt (Socket Head Cap Screw)	4	5/8"	175-200	237-271
8	Knuckle / Axle Wheel Stop Bolt	2	5/8" Jam Nut	40-60	54-81
9	Tie Rod Tube to Tie Rod Ends	2	5/8"	60-75	81-102
10	Tie Rod Ends to Lower Steering Knuckle	2	7/8" Castle Nut	**185	**251
11	Shocks Eye Bolts	4	¾"	*	*
12	Rubber Axle Stop	2	—	Press Fit	
<ul style="list-style-type: none"> <li>• All hardware ¼" and greater is Grade 8 with no additional lubrication.</li> <li>Frame mount hardware in most cases are Huck style fasteners supplied by the OEM.</li> </ul>					
<b>NOTE:</b> * All hardware information in the matrix denotes recommended torques for fasteners originally supplied by the vehicle manufacturer. If Hendrickson supplied fasteners are used, tighten to Hendrickson torque values, if non Hendrickson fasteners are used, follow torque specifications listed in the vehicle manufacturer's service manual. Hendrickson is not responsible for maintaining vehicle manufacturer's torque values. ** Torque to 185 foot pounds (251 Nm), advance nut to next hex face to install cotter pin. Do not back off nut for cotter pin installation.					

■ **STEERTEK Right Hand Drive Axle built for Blue Bird All American Buses built PRIOR to October 2012 – 13.2K/14.6K Capacity**

Hendrickson Recommended Torque Values Provided in Foot Pounds and in (Nm)



**STEERTEK Right Hand Drive Axle – 13.2K/14.6K**

HENDRICKSON RECOMMENDED TORQUE SPECIFICATIONS					
NO.	COMPONENT	QTY.	SIZE	TORQUE VALUE	
				Foot Pounds	Nm
1	Axle Wrap Liners for Clamp Group	2	Formed	Snap Fit	
<p><b>⚠ WARNING</b> DO NOT ASSEMBLE CLAMP GROUP WITHOUT AXLE WRAP LINERS. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE OR PERSONAL INJURY.</p>					
2	Knuckle Attachment Bolt (Socket Head Cap Screw)	4	5/8"	175-200	237-271
3	Knuckle / Axle Wheel Stop Bolt	2	5/8" Jam Nut	40-60	54-81
4	Tie Rod Tube to Tie Rod Ends	2	5/8"	60-75	81-102
5	Tie Rod Ends to Lower Steering Knuckle	2	7/8" Castle Nut	**185	**251
<p><b>NOTE:</b> * All hardware information in the matrix denotes recommended torques for fasteners originally supplied by the vehicle manufacturer. If Hendrickson supplied fasteners are used, tighten to Hendrickson torque values, if non Hendrickson fasteners are used, follow torque specifications listed in the vehicle manufacturer's service manual. Hendrickson is not responsible for maintaining vehicle manufacturer's torque values.</p> <p>** Torque to 185 foot pounds (251 Nm), advance nut to next hex face to install cotter pin. Do not back off nut for cotter pin installation.</p>					





## SECTION 13

# Reference Material

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

### ■ TMC

To obtain copies of the following RPs, videos, or charts, contact TMC at:

TMC/ATA  
2200 Mill Road  
Alexandria, VA 22314

Phone: 703-838-1763  
website: [tmc.truckline.com](http://tmc.truckline.com)  
online ordering: [www.truckline.com/store](http://www.truckline.com/store)

### Important References

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

### Videos

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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## SECTION 14

# Front Wheel Alignment Specifications

### AIRTEK FOR BLUE BIRD BUSES

FRONT AIR MODULE SUSPENSION ALIGNMENT SPECIFICATION					
CAMBER <sup>1</sup>	DESIGN SPECIFICATION	RANGE			
		MINIMUM		MAXIMUM	
LEFT	0.00° ± 1.0°	-1.0°		+1.0°	
RIGHT	-0.25° ± 1.0°	-1.25°		+0.75°	
CROSS	Max 2.0°	—		—	

**CAMBER NOTES:**

<sup>1</sup> The camber angle is not adjustable. Do not bend axle or otherwise try to adjust camber. If found out of specification, notify Hendrickson Tech Services for further information.

CASTER <sup>1,2</sup>	DESIGN SPECIFICATION	RANGE			
		10K		13.2K/14.6K	
		MINIMUM	MAXIMUM	MINIMUM	MAXIMUM
LEFT	4.1° ± 1°	+3.1°	+5.1°	+3.1°	+5.1°
RIGHT	4.1° ± 1°	+3.1°	+5.1°	+3.1°	+5.1°
CROSS <sup>3</sup>	Max 1.0°	—	—	—	—

**CASTER NOTES:**

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

<sup>4</sup> **Example of caster adjustment:** 2.5° RH/3° LH, would require one, 1.0 shim on each side to increase caster and achieve 3.5° RH/4.0° LH, which is in specification. Do not attempt to use uneven shims.

**Hendrickson recommends following TMC<sup>2</sup> practices:**

	DESIGN SPECIFICATION <sup>1</sup>	RANGE	
		MINIMUM	MAXIMUM
<b>TOTAL TOE<sup>2</sup></b>	1/16" ± 1/32" (0.06" ± 0.03")	1/32" (0.03")	3/32" (0.09")

**TOE-IN NOTES:**

<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.



## SOFTEK FOR BLUE BIRD BUSES

## FRONT AIR MODULE SUSPENSION ALIGNMENT SPECIFICATION

CAMBER <sup>1</sup>	DESIGN SPECIFICATION	RANGE	
		MINIMUM	MAXIMUM
LEFT	0.00° ± 1.0°	-1.0°	+1.0°
RIGHT	- 0.25° ± 1.0°	-1.25°	+0.75°
CROSS	Max 2.0°	—	—

## CAMBER NOTES:

- <sup>1</sup> The camber angle is not adjustable. Do not bend axle or otherwise try to adjust camber. If found out of specification, notify Hendrickson Tech Services for further information.

CASTER <sup>1,2</sup>	DESIGN SPECIFICATION		RANGE			
			8.5K/10K		13.2K/14.6K	
	8.5K/10K	13.2K/14.6K	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM
LEFT	4.5° ± 1°	4.5° ± 1.5°	+3.5°	+5.5°	+3.0°	+6.0°
RIGHT	4.5° ± 1°	4.5° ± 1.5°	+3.5°	+5.5°	+3.0°	+6.0°
CROSS <sup>3</sup>	Max 1.0°		—	—	—	—

## CASTER NOTES:

- <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> **The Cross caster angle is not adjustable** – Do not bend axle or otherwise try to adjust cross caster. If found out of specifications notify Hendrickson Tech Services for further information. Changes to caster can be attained by using caster shims as provided by the vehicle manufacturer or chassis and body manufacturer. Caster shims must match, side to side, to reduce uneven loading to the suspension components. **The use of two different angle caster shims will not correct cross caster.**
- <sup>4</sup> **Example of caster adjustment:** 2.5° RH/3° LH, would require one, 1.0 shim on each side to increase caster and achieve 3.50° RH/4.00° LH, which is in specification. Do not attempt to use uneven shims.

Hendrickson recommends following TMC<sup>2</sup> practices:

TOTAL TOE <sup>2</sup>	DESIGN SPECIFICATION <sup>1</sup>	RANGE	
		MINIMUM	MAXIMUM
	$1/16" \pm 1/32"$ (0.06" ± 0.03")	$1/32"$ (0.03")	$3/32"$ (0.09")

## TOE-IN NOTES:

- <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.

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