



H TECHNICAL PROCEDURE

AIRTEK® Front Air Suspension with STEERTEK™ NXT Axle for Freightliner • Western Star

(Sterling vehicles built prior to 04/2009)

SUBJECT: Service Instructions

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SECTION 1

Introduction

This publication is intended to acquaint and assist maintenance personnel in the preventive maintenance, service, repair, and rebuild of the following suspension systems as installed on applicable Freightliner, Western Star, and Sterling vehicles:

- **AIRTEK®** (Referred to by Freightliner Trucks as Front AirLiner) — An integrated front air suspension and steer axle system that utilizes the STEERTEK™ NXT fabricated axle assembly

See Parts List Section in this publication to determine the components that are manufactured by Hendrickson. For components not manufactured or supplied by Hendrickson contact the vehicle manufacturer for proper preventive maintenance and rebuild instructions.

- **STEERTEK™ NXT** — 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 Suspension and the STEERTEK NXT axle.

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

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

SECTION 2 Product Description

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 including on-highway line and bulk haul operations. 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.

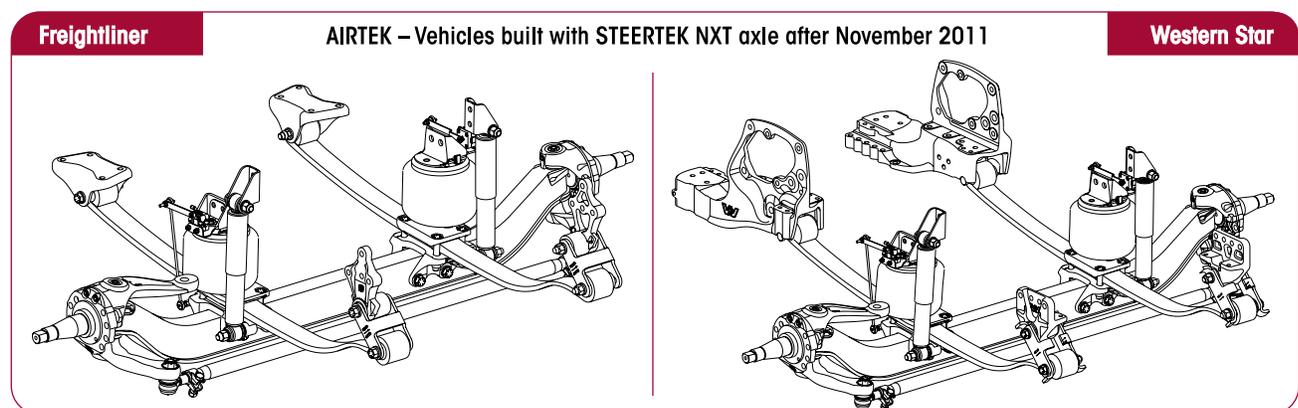
- **Air Springs** — Exclusive to Hendrickson, the lightweight air springs deliver an extremely soft ride. The air springs are engineered to support 50% of the vertical load while providing very low spring rate. The quick “snap” design and “push-to-connect” air supply design also provide fast and easy 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.
- **Shock Absorbers** — AIRTEK utilizes premium shocks that have been tested and tuned specifically for the AIRTEK system
- **Front and Rear Frame Brackets** — Optimized designs deliver weight reduction and proven durability

STEERTEK NXT — Integrated into the AIRTEK 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, ¾" hex bolts, washers, and nylon locknuts
- **Adjustable Tie Rod** — To help maximize tire life, the tie rod easily adjusts toe-in / out
- **Steering Knuckles** — The steering and tie rod arms are integrated for increased strength and reduced weight. The unique steering knuckle packaging delivers 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.

FIGURE 2-1

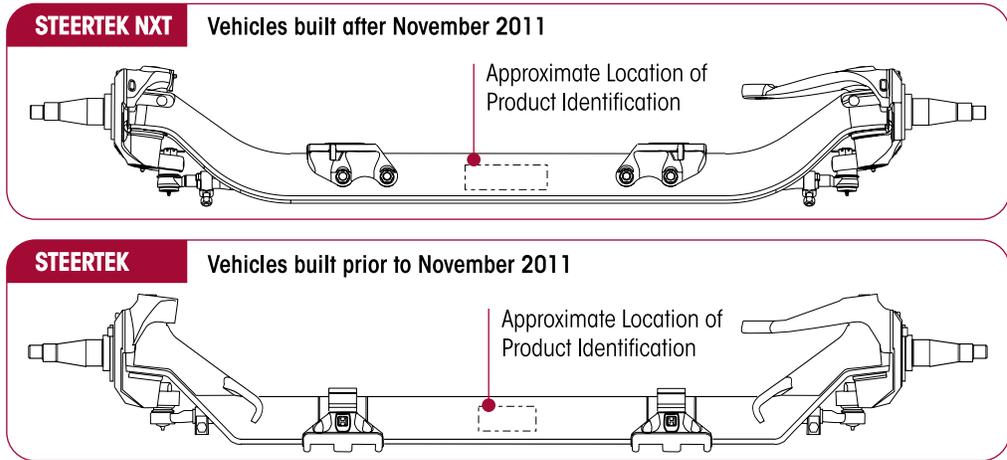
FIGURE 2-2



TECHNICAL NOTES

1. AIRTEK is approved for 100% on-highway use with up to 10% off-highway uses; other applications that exceed 10% off-highway use must be pre-approved by Hendrickson. This system has a 12,000 / 12,500 / 13,500 pound capacity. System capacity represents maximum loads on tires at ground level.
2. The STEERTEK NXT axle is available with 69.0" or 70.97" kingpin intersections (KPI).
3. The STEERTEK NXT axle offers 4.25" and 5.36" axle beam drop heights. Axle beam drop is measured from the kingpin intersection to the top of the axle.
4. AIRTEK is 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.

FIGURE 2-3 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.

The following definitions indicate the use of these signal words as they appear throughout the publication.



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



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



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

NOTE

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

SERVICE HINT

A helpful suggestion that 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.

WARNING

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

WHEN SERVICING THE VEHICLE OR ATTACHING AN AIR SPRING, PRIOR TO AIRING UP THE SUSPENSION SYSTEM, MAKE CERTAIN THE AIR SPRING LOCATOR IS INDEXED INTO THE UPPER AIR SPRING BRACKET PROPERLY, THE LOCK TABS ARE SNAPPED INTO PLACE, AND THE AIR SPRING IS FULLY SEATED ON THE AIR SPRING BRACKET. FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN PREMATURE AIR SPRING FAILURE AND CAUSE PERSONAL INJURY, OR PROPERTY DAMAGE.

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

WARNING

LOAD CAPACITY

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

WARNING

SHOCK ABSORBERS

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

WARNING

REPAIR AND RECONDITIONING

THE REPAIR OR RECONDITIONING OF SUSPENSION OR AXLE COMPONENTS IS NOT ALLOWED, SEE LABEL IN FIGURE 3-1. 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.



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 FIGURE 3-1. BENDING THE AXLE BEAM TO CHANGE THE CAMBER ANGLE CAN DAMAGE THE AXLE AND REDUCE AXLE STRENGTH, WILL VOID HENDRICKSON'S WARRANTY AND CAN CAUSE LOSS OF VEHICLE CONTROL, POSSIBLY CAUSING PERSONAL INJURY OR PROPERTY DAMAGE.



WARNING

AXLE KINGPINS

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



WARNING

STEERTEK NXT AXLE SPRING SEATS

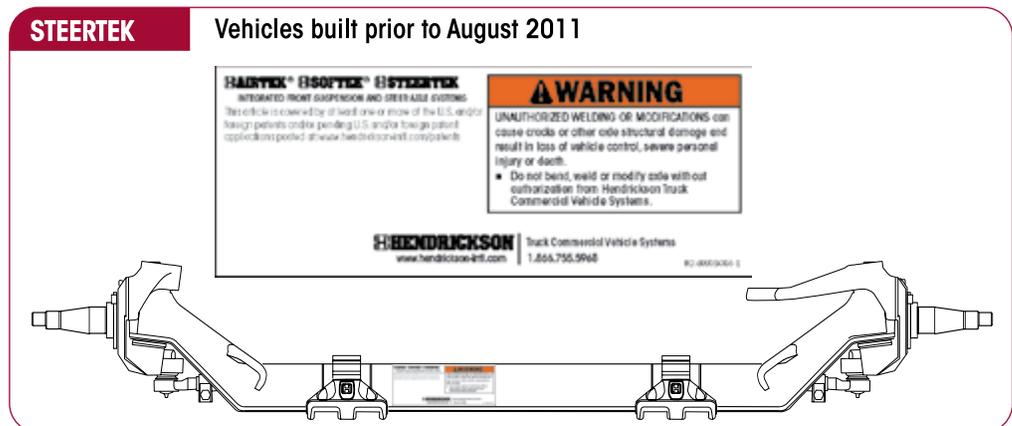
THE INTEGRATED AXLE SPRING SEATS ON THE STEERTEK NXT AXLE ARE NON-SERVICEABLE. UNAUTHORIZED TAMPERING OF INTEGRATED AXLE SPRING SEATS CAN CAUSE COMPONENT AND STRUCTURAL DAMAGE AND RESULT IN LOSS OF VEHICLE CONTROL, SEVERE PERSONAL INJURY OR DEATH, PROPERTY DAMAGE, AND WILL VOID ANY APPLICABLE WARRANTY. DO NOT REMOVE, MODIFY OR REPLACE INTEGRATED AXLE SPRING SEAT OR FASTENERS, SEE FIGURES 3-1 AND 3-2.

FIGURES 3-1 AND 3-2 REPLACE ANY SAFETY DECALS THAT ARE FADED, TORN, MISSING, ILLEGIBLE, OR OTHERWISE DAMAGED. CONTACT HENDRICKSON TO ORDER REPLACEMENT LABELS.

FIGURE 3-1



FIGURE 3-2



 **WARNING**

DAMAGED AXLE COMPONENTS

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

IN ADDITION, IN THE EVENT A CRASH RESULTS IN EXCESSIVE SIDE LOAD DAMAGE TO ADJACENT PARTS, SUCH AS A BENT WHEEL, HUB, OR SPINDLE, IT IS STRONGLY RECOMMENDED TO REPLACE THE COMPLETE AXLE ASSEMBLY.

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

 **WARNING**

MODIFYING COMPONENTS

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

 **WARNING**

OFF ROADWAY TOWING

WHEN A VEHICLE IS DISABLED AND EQUIPPED WITH A STEERTEK NXT / STEERTEK AXLE, CARE MUST BE TAKEN TO ENSURE THERE IS NO DAMAGE TO THE SUSPENSION OR AXLE WHEN TOWING THE VEHICLE. THE USE OF TOW STRAPS ARE NECESSARY TO TOW A DISABLED VEHICLE INTO 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



 **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.

⚠ WARNING

PROCEDURES AND TOOLS

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

⚠ WARNING

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.

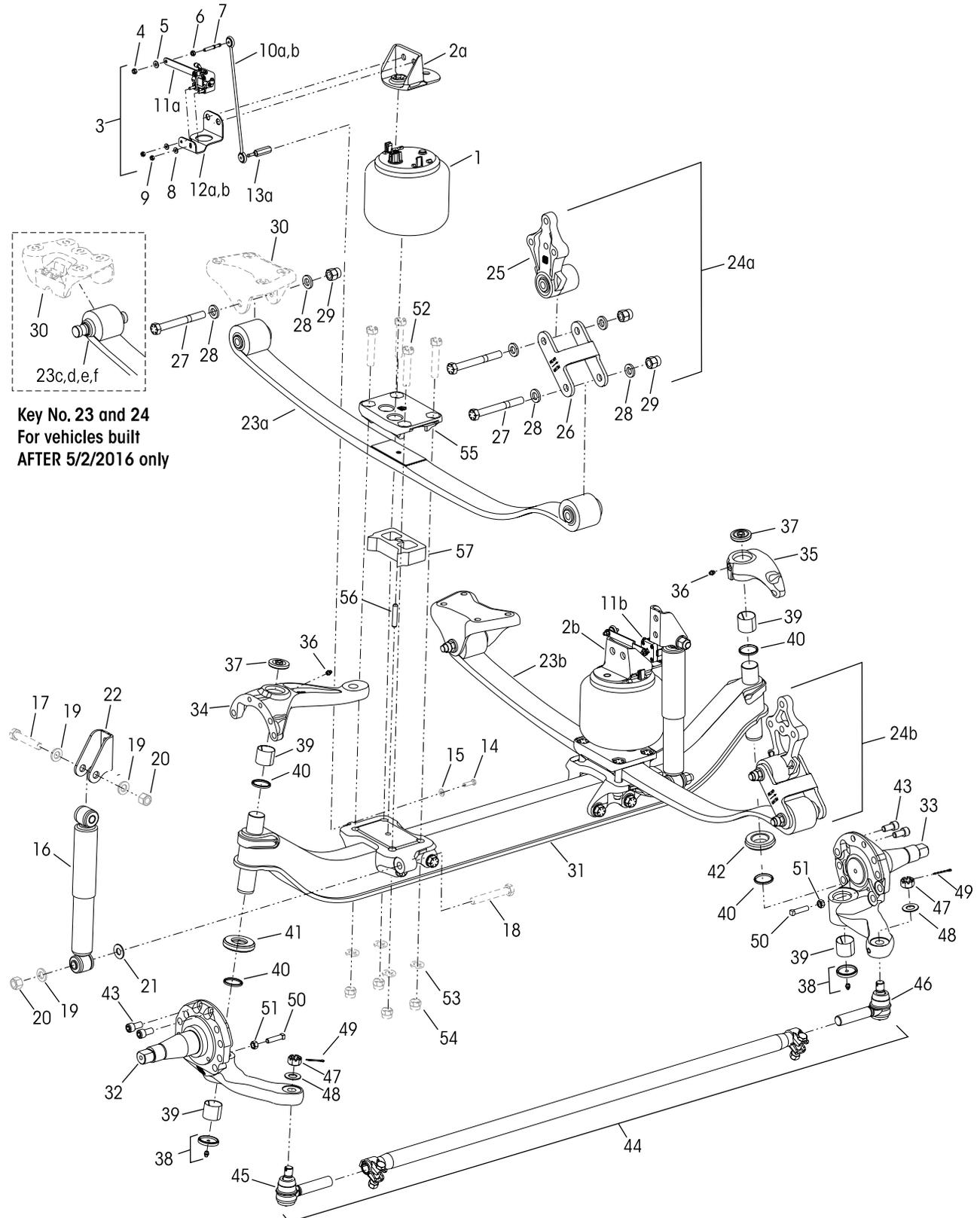
DO NOT USE HOT SOLUTION TANKS OR WATER AND ALKALINE SOLUTIONS TO CLEAN GROUND OR POLISHED PARTS. DOING SO WILL CAUSE DAMAGE TO THE PARTS AND VOID ANY APPLICABLE WARRANTY.

SECTION 4

Parts Lists

AIRTEK with STEERTEK NXT axle for Freightliner

Models Cascadia and Coronado • Vehicles built after November 2011

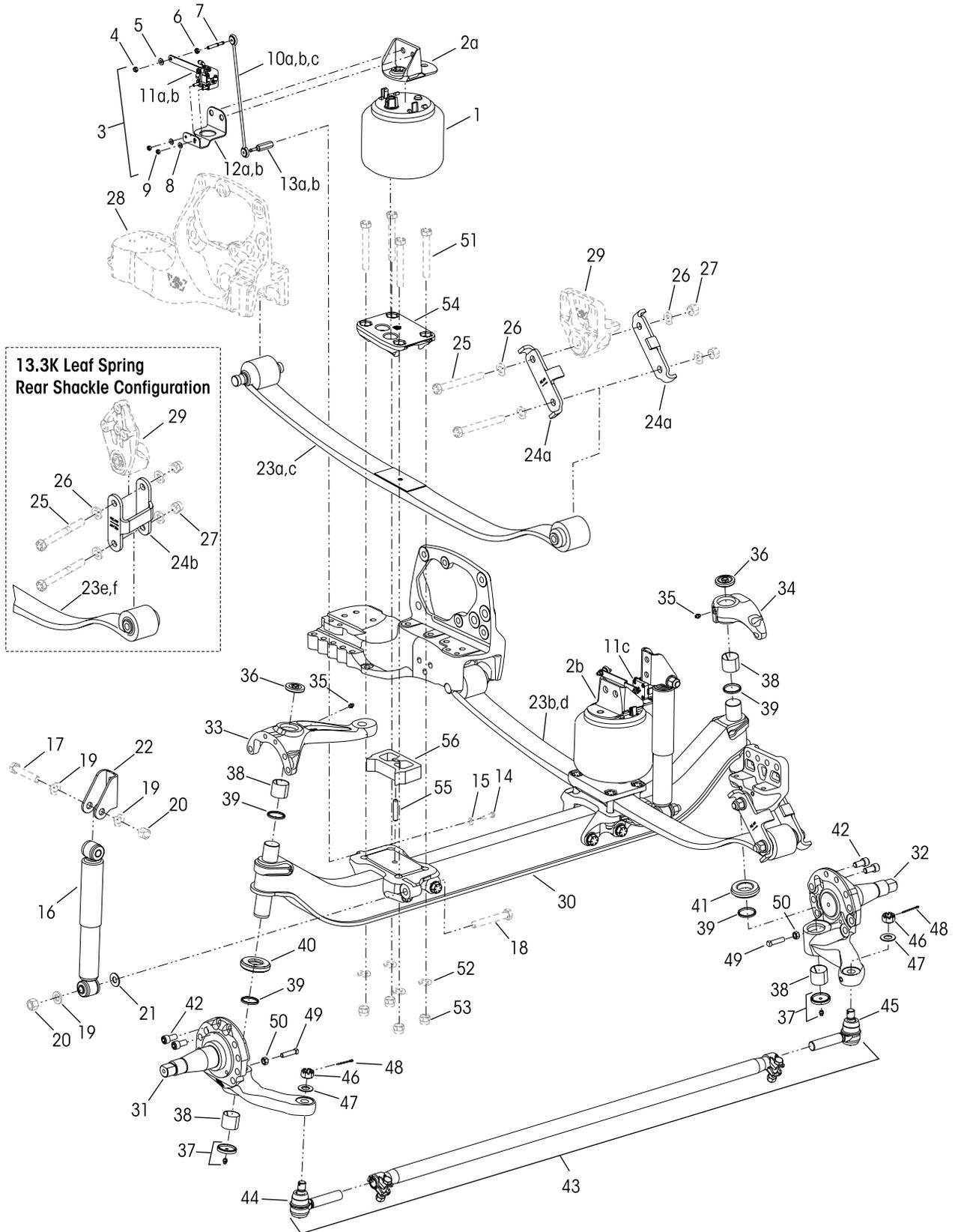




KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.	KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.
1	69116-002L	Air Spring	2	25		**Shackle Bracket with Bushing, <i>Replaces 68127-001</i>	2
2		Air Spring Bracket		26		**Shackle Plate, <i>Replaces 67754-004</i>	2
a	60850-001	Left Hand	1	27	68893-001	3/4"-16 UNF x 6 1/2" Bolt	6
b	60850-002	Right Hand	1	28	22962-044	3/4" Washer (thick washer)	12
3		HCV & Linkage Assembly	1/1	29	68894-001	3/4"-16 UNF Nylon Locknut	6
	59427-019L	Left Hand, Includes Key Nos. 4-9, 10a, 11a 4.25" Drop, 315 mm Ride Height 5.36" Drop, 280 mm Ride Height		30		*Freightliner Hanger, Left Hand / Right Hand Axle Assembly, Includes Key Nos. 31-51, <i>Contact Hendrickson Truck Parts for specific Part Number</i>	1/1
	59427-027L	Left Hand, Includes Key Nos. 4-9, 10b, 11a 4.25" Drop, 355 mm Ride Height 5.36" Drop, 315 mm Ride Height			68967-XXX		1
	59427-034L	Right Hand, Includes Key Nos. 4-9, 10a, 11b 4.25" Drop, 315 mm Ride Height 5.36" Drop, 280 mm Ride Height		31		Axle & Kingpin Assembly	1
	59427-036L	Right Hand, Includes Key Nos. 4-9, 10b, 11b 4.25" Drop, 355 mm Ride Height 5.36" Drop, 315 mm Ride Height			68966-001M 68966-002M	4.25" Drop 5.36" Drop	
4	59016-000	5/16"-18 UNC-2B Locknut	2	32		Left Hand Lower Steering Knuckle Assembly	1
5	22962-029	5/16" Flat washer	2		58900-401 58900-403 58900-405	250 Ackermann 200 Ackermann 150 Ackermann	
6	17491-011	5/16"-18 UNC Nut	2	33		Right Hand Lower Steering Knuckle Assembly	1
7	59169-000	5/16" Stud	2		58900-402 58900-404 58900-406	250 Ackermann 200 Ackermann 150 Ackermann	
8	22962-028	1/4" Flat Washer	4	34		Left Hand Upper Steering Knuckle Assembly, <i>See Table 1 on Page 23</i>	1
9	49983-000	1/4"-20 UNC Locknut	4	35	60904-432	Right Hand Upper Steering Knuckle Assembly	1
10		Height Control Valve Linkage	2			Kingpin Bushing and Bearing Service Kits	
a	59428-001	335 mm Length			60961-628 60961-629	Axle Set , Includes Kit Nos. 60961-629 & -630 Left Hand with Composite Thrust Bearing , Includes Key Nos. 36-41, 43, Loctite	
b	59428-002	370 mm Length			60961-630	Right Hand with Roller Thrust Bearing , Includes Key Nos. 36-40, 42-43, Loctite	
11		Height Control Valve		36	33117-000	Grease Zerk	2
a	59935-013L	Left Hand	1	37	68687-003	Grease Cap Assembly, Upper	2
b	59935-024	Right Hand	1	38	68687-002	Grease Cap Assembly, Lower	2
12		Left Hand HCV Support Bracket	1	39	58909-001	Kingpin Bushing	4
a	68675-002	Set Back				Thrust Bearing Service Kits	
b	68675-003	Set Forward			60961-631 60961-632	Axle Set , Includes Kit Nos. 60961-632 & -633 Left Hand Composite Thrust Bearing , Includes Key Nos. 40-41, 43 & Loctite	
13		Link Mount			60961-633	Right Hand Roller Thrust Bearing , Includes Key Nos. 40, 42-43 & Loctite	
a	59429-001	Left Hand	1	40	68731-000	Kingpin Seal	4
b	59429-002	Right Hand	1	41	59828-000	Left Hand Composite Thrust Bearing	1
14		*3/8"-16 UNC x 1 1/4" Hex Bolt	2	42	64256-000L	Right Hand Roller Thrust Bearing	1
15		*3/8" Flat Washer	2	43	60236-001	5/8" Socket Head Cap Screw	4
16	58913-012L	Shock Absorber	2	Not Shown	60937-000	Loctite® (Red) Compound Tube	1
17		*3/4"-10 UNC x 4" Upper Shock Bolt	2	44		Tie Rod Assembly, Includes Key Nos. 45-47 <i>See Selection Guide on Page 24</i>	1
18		*Lower Shock Bolt	2		60961-XXX	Tie Rod End Service Kits , <i>See Selection Guide on Page 24</i>	
19		*3/4" Hardened Washer	6			Tie Rod End, <i>See Selection Guide on Page 24</i>	
20		*3/4"-10 UNC Hex Locknut	4	45		Left Hand	1
21	22962-046	Shock Spacer	2	46		Right Hand	1
22	59423-001	Shock Bracket	2	47		**7/8" Castle Nut	2
		Leaf Spring and Shackle Bracket Assembly Conversion Kit for vehicles built between 5/10 and 5/2/16, see Page 21 for Kit Contents		48	22962-007	7/8" Flat Washer	2
	60961-827	Left Hand, Includes Key Nos. 23a-24a		49	17800-004	Tie Rod Nut Cotter Pin	2
	60961-828	Right Hand, Includes Key Nos. 23b-24b			60961-069	Stop Bolt Service Kit, One Side , Includes Key Nos. 50-51	
	60961-844	Left Hand, Includes Key Nos. 23c-24a		50	60238-001	1/2"-13 UNC Square Head Bolt	2
	60961-845	Right Hand, Includes Key Nos. 23d-24b		51	60240-000	1/2"-13 UNC Hex Jam Nut	2
	60961-846	Left Hand, Includes Key Nos. 23e-24a		52		*3/4"-16 UNF Hex Bolt	8
	60961-847	Right Hand, Includes Key Nos. 23f-24b		53		*3/4" Flat Washer	8
23		Leaf Spring Assembly for vehicles built after 5/2/16, Contact Hendrickson Tech Services	2	54		*3/4"-16 UNF Nylon Locknut	8
a		• With Front Eye Through Bolt Bushing Left Hand, Set Back, <i>Replaces 59930-061</i>		55	59826-000	Top Pad	2
b		Right Hand, Set Back, <i>Replaces 59930-062</i>		56		Dowel Pin, 1/2" Diameter, <i>See Table 1 on Page 23</i>	2
c		• With Front Eye Bar Pin Bushing Left Hand, Set Back, <i>Replaces 59930-057</i>		57		Front Axle Spacer, <i>See Table 1 on Page 23</i>	2
d		Right Hand, Set Back, <i>Replaces 59930-058</i>					
e		Left Hand, Set Forward, <i>Replaces 59930-059</i>					
f		Right Hand, Set Forward, <i>Replaces 59930-060</i>					
24		Single Shackle Bracket Assembly for vehicles built 2 after 5/2/16, Contact Hendrickson Tech Services , Includes Key Nos. 25-29	2				
a		Left Hand					
b		Right Hand					

AIRTEK® with STEERTEK NXT axle for Western Star

Models 4900 SA • 5700 • Vehicles built after November 2011

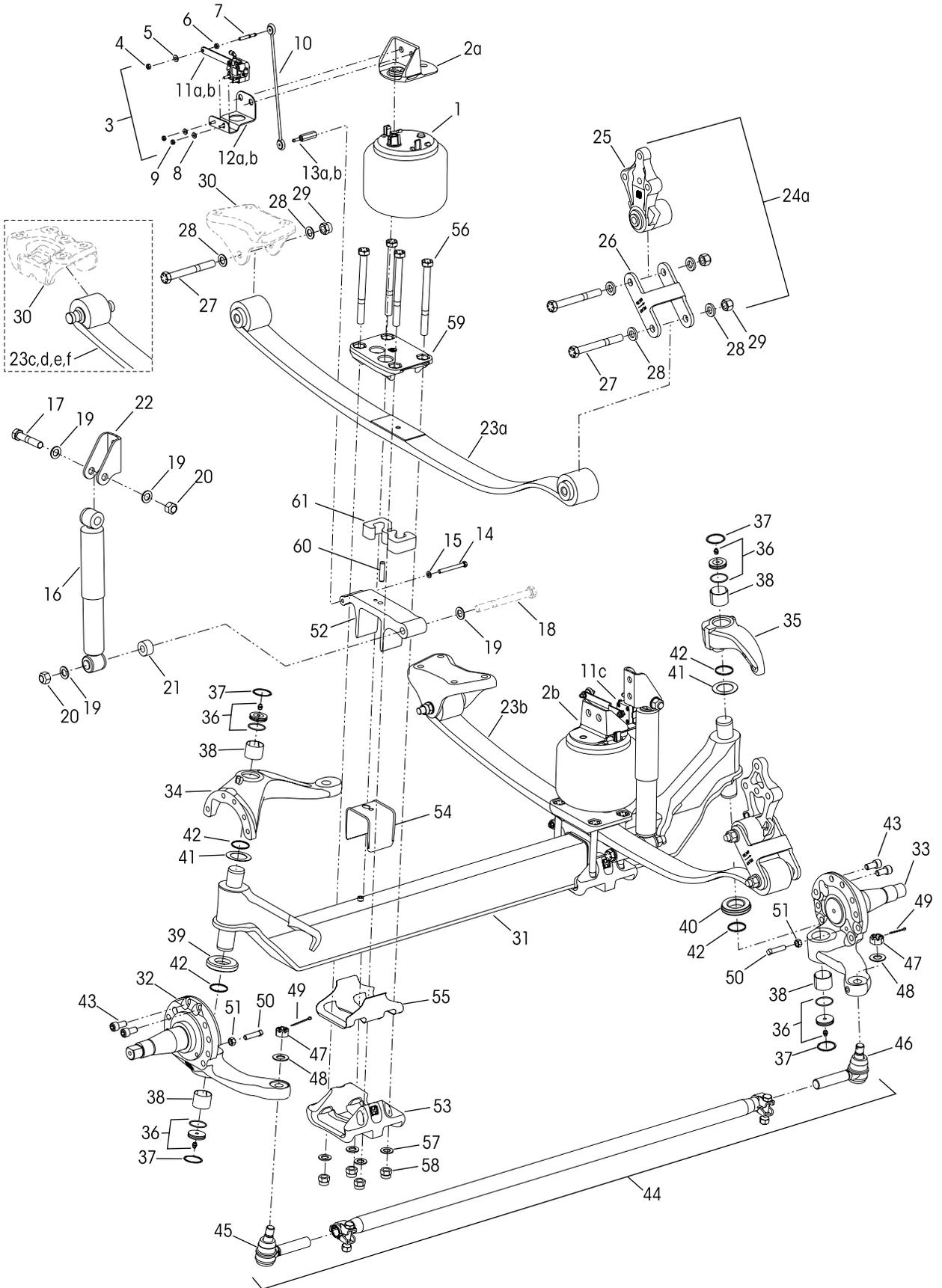




KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.	KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.
1	69116-002L	Air Spring	2	27		*¾"-10 UNC Nut	4
2		Air Spring Bracket		28		*Western Star Front Hanger, Left Hand / Right Hand	1/1
a	60850-001	Left Hand	1	29		*Western Star Rear Hanger	2
b	60850-002	Right Hand	1		68967-XXX	Axle Assembly, Includes Key Nos. 30-50, <i>Contact Hendrickson Truck Parts for specific Part Number</i>	1
3		HCV & Linkage Assembly	1/1	30		Axle & Kingpin Assembly	1
	59427-019L	Left Hand, Set Back, Ride Height 315 mm, Includes Key Nos. 4-9, 10a, 11a			68966-001M	12K	
	59427-027L	355 mm, Includes Key Nos. 4-9, 10b, 11a			68966-005M	13.3K	
	59427-033	385 mm, Includes Key Nos. 4-9, 10c, 11a Left Hand, Set Forward, Ride Height		31		Left Hand Lower Steering Knuckle Assembly	1
	59427-031	315 mm, Includes Key Nos. 4-9, 10a, 11b			58900-401	250 Ackermann	
	59427-032	355 mm, Includes Key Nos. 4-9, 10b, 11b			58900-403	200 Ackermann	
	59427-035L	385 mm, Includes Key Nos. 4-9, 10c, 11b Right Hand, Ride Height			58900-405	150 Ackermann	
	59427-034L	315 mm, Includes Key Nos. 4-9, 10a, 11c		32		Right Hand Lower Steering Knuckle Assembly	1
	59427-036L	355 mm, Includes Key Nos. 4-9, 10b, 11c			58900-402	250 Ackermann	
	59427-038L	385 mm, Includes Key Nos. 4-9, 10c, 11c			58900-404	200 Ackermann	
4	59016-000	5/16"-18 UNC-2B Locknut	2		58900-406	150 Ackermann	
5	22962-029	5/16" Flat washer	2	33		Left Hand Upper Steering Knuckle Assembly, <i>See Table 1 on Page 23</i>	1
6	17491-011	5/16"-18 UNC Nut	2	34	60904-432	Right Hand Upper Steering Knuckle Assembly	1
7	59169-000	5/16" Stud	2			Kingpin Bushing and Bearing Service Kits	
8	22962-028	¼" Flat Washer	4		60961-628	Axle Set , Includes Kit Nos. 60961-629 & -630	
9	49983-000	¼"-20 UNC Locknut	4		60961-629	Left Hand with Composite Thrust Bearing , Includes Key Nos. 35-40, 42 & Loctite	
10		Height Control Valve Linkage	2		60961-630	Right Hand with Roller Thrust Bearing , Includes Key Nos. 35-39, 41-42 & Loctite	
a	59428-001	315 mm Ride Height		35	33117-000	Grease Zerk	2
b	59428-002	355 mm Ride Height		36	68687-003	Grease Cap Assembly, Upper	2
c	59428-009	385 mm Ride Height		37	68687-002	Grease Cap Assembly, Lower	2
11		Height Control Valve		38	58909-001	Kingpin Bushing	4
		Left Hand	1			Thrust Bearing Service Kits	
a	59935-013L	Set Back			60961-631	Axle Set , Includes Kit Nos. 60961-632 & -633	
b	59935-023	Set Forward			60961-632	Left Hand Composite Thrust Bearing , Includes Key Nos. 39-40, 42 & Loctite	
c	59935-024	Right Hand	1		60961-633	Right Hand Roller Thrust Bearing , Includes Key Nos. 39, 41-42 & Loctite	
12		Left Hand HCV Support Bracket	1	39	68731-000	Kingpin Seal	4
a	68675-002	Set Back		40	59828-000	Left Hand Composite Thrust Bearing	1
b	68675-003	Set Forward		41	64256-000L	Right Hand Roller Thrust Bearing	1
13		Link Mount		42	60236-001	5/8" Socket Head Cap Screw	4
		Left Hand	1	Not Shown	60937-000	Loctite® (Red) Compound Tube	1
a	59429-001	Set Back		43		Tie Rod Assembly, Includes Key Nos. 44-46, <i>See Selection Guide on Page 24</i>	1
b	59429-002	Set Forward			60961-XXX	Tie Rod End Service Kits , <i>See Selection Guide on Page 24</i>	
c	59429-002	Right Hand	1			Tie Rod End, <i>See Selection Guide on Page 24</i>	
14		*¾"-16 UNC x 1 ¼" Hex Bolt	2	44		Left Hand	1
15		*¾" Flat Washer	2	45		Right Hand	1
16	58913-012L	Shock Absorber	2	46		**7/8" Castle Nut	2
17		*¾"-10 UNC x 4" Upper Shock Bolt	2	47	22962-007	7/8" Flat Washer	2
18		*Lower Shock Bolt	2	48	17800-004	Tie Rod Nut Cotter Pin	2
19		*¾" Hardened Washer	6		60961-069	Stop Bolt Service Kit, One Side , Includes Key Nos. 49-50	
20		*¾"-10 UNC Hex Locknut	4	49	60238-001	½"-13 UNC Square Head Bolt	2
21	22962-046	Shock Spacer	2	50	60240-000	½"-13 UNC Hex Jam Nut	2
22	59423-001	Shock Bracket	2	51		*¾"-16 UNF Hex Bolt	8
23		Leaf Spring Assembly, Includes Bushings	2	52		*¾" Flat Washer	8
		12K, Set Back		53		*¾"-16 UNF Nylon Locknut	8
a	59930-055	Left Hand		54	59826-000	Top Pad	2
b	59930-056	Right Hand		55		Dowel Pin, ½" Diameter, <i>See Table 1 on Page 23</i>	2
		12K, Set Forward		56		Front Axle Spacer, <i>See Table 1 on Page 23</i>	2
c	59930-053	Left Hand					
d	59930-054	Right Hand					
		13.3K, Set Back					
e	82430-000	Left Hand					
f	82440-000	Right Hand					
24		Shackle Plate					
a	68089-001	12K	4				
b	75836-004	13.3K	2				
25		*¾"-10 UNC Shackle Bolt	4				
26		*¾" Washer	8				

AIRTEK® with STEERTEK axle for Freightliner

Vehicles built between May 2010 and November 2011

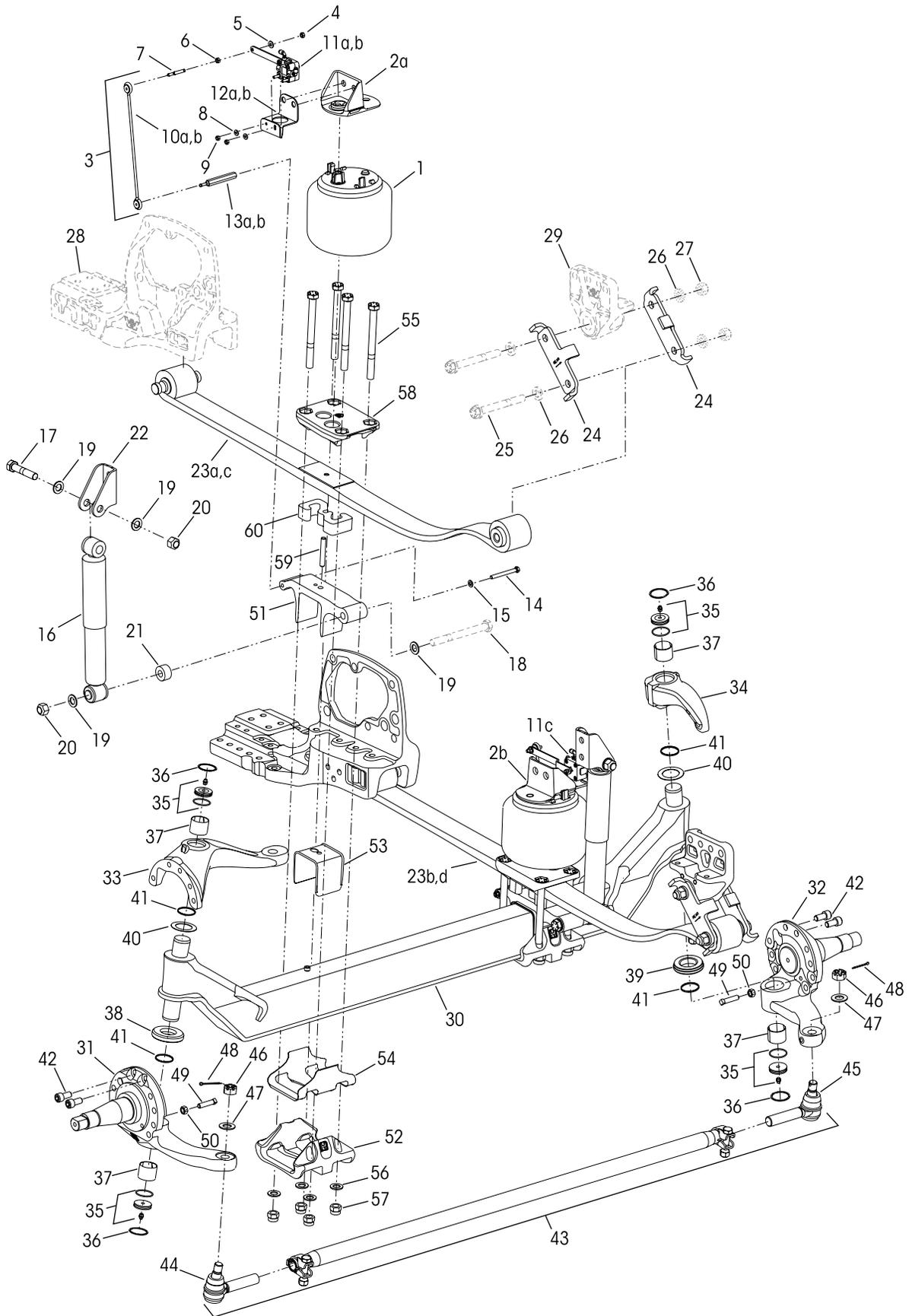




KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.	KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.
1	69116-002L	Air Spring	2		70952-XXX	Axle Assembly, Includes Key Nos. 31-55, <i>Contact Hendrickson Truck Parts for specific Part Number</i>	1
2		Air Spring Bracket					
a	60850-001	Left Hand	1				
b	60850-002	Right Hand	1	31		Axle & Kingpin Assembly	1
3		HCV & Linkage Assembly			64905-001	4.25" Drop	
		Left Hand	1		64905-003	5.36" Drop	
	59427-019L	Set Back - Cascadia, Columbia, Century S/T, Includes Key Nos. 4-10, 11a		32		Left Hand Lower Steering Knuckle Assembly	1
	59427-031	Set Forward - Coronado, Includes Key Nos. 4-10, 11b			58900-001	250 Ackermann	
	59427-005L	Right Hand, Includes Key Nos. 4-10, 11c	1		58900-003	200 Ackermann	
					58900-005	150 Ackermann	
4	59016-000	5/16"-18 UNC-2B Locknut	2	33		Right Hand Lower Steering Knuckle Assembly	1
5	22962-029	5/16" Flat washer	2		58900-002	250 Ackermann	
6	17491-011	5/16"-18 UNC Nut	2		58900-004	200 Ackermann	
7	59169-000	5/16" Stud	2		58900-006	150 Ackermann	
8	22962-028	1/4" Flat Washer	4	34		Left Hand Upper Steering Knuckle Assembly, <i>See Table 2 on Page 23</i>	1
9	49983-000	1/4"-20 UNC Locknut	4	35	60904-032	Right Hand Upper Steering Knuckle Assembly	1
10	59428-001	Height Control Valve Linkage	2			Kingpin Bushing and Bearing Service Kits,	
11		Height Control Valve			60961-040	Axle Set, Includes Kit Nos. 60961-009 &-039	
		Left Hand	1		60961-009	Left Hand with Composite Thrust Bearing,	
a	59935-013L	Set Back			60961-039	Right Hand with Roller Thrust Bearing, Includes Key Nos. 36-38, 40-43 & Loctite	
b	59935-023	Set Forward		36	59156-000	Grease Cap Assembly	4
c	59935-002L	Right Hand	1	37	58937-000	Retaining Ring	4
12		Left Hand HCV Support Bracket	1	38	58909-000	Kingpin Bushing	4
a	68675-002	Set Back				Thrust Bearing Service Kits	
b	68675-003	Set Forward			60961-043	Axle Set, Includes Kit Nos. 60961-041 &-042	
13		Link Mount			60961-041	Left Hand Composite Thrust Bearing,	
		Left Hand	1		60961-042	Right Hand Roller Thrust Bearing, Includes Key Nos. 40-43 & Loctite	
a	59429-001	Set Back		39	59828-000	Left Hand Composite Thrust Bearing	1
b	59429-002	Set Forward		40	64256-000L	Right Hand Roller Thrust Bearing	1
c	59429-002	Right Hand	1	41		Kingpin Shim	As Req.
14	58035-006	3/8"-16 UNC x 3 1/2" Hex Bolt	2		60259-001X	0.005" Thickness (Pack of 4)	
15	22962-015	3/8" Flat Washer	2		60259-002	0.047" Thickness	
16	58913-012L	Shock Absorber	2	42	58910-001	Kingpin Seal, <i>Replaces 58910-000</i>	4
17	50764-004	3/4"-10 UNC x 3 3/4" Upper Shock Bolt	2	43	60236-001	5/8" Socket Head Cap Screw	4
18		*Lower Shock Bolt	2	Not Shown	60937-000	Loctite® (Red) Compound Tube	1
19	22962-001	3/4" Hardened Washer	8	44		Tie Rod Assembly, Includes Key Nos. 45-47, <i>See Selection Guide on Page 24</i>	1
20	49842-000	3/4"-10 UNC Hex Locknut	4		60961-XXX	Tie Rod End Service Kits, <i>See Selection Guide on Page 24</i>	
21	59946-001	Shock Spacer	2			Tie Rod End, <i>See Selection Guide on Page 24</i>	
22	59423-001	Shock Bracket	2	45		Left Hand	1
		Leaf Spring and Shackle Bracket Assembly		46		Right Hand	1
		Conversion Kit for vehicles built between 5/10		47		**7/8" Castle Nut	2
		and 5/2/16, See Page 21 for Kit Contents		48	22962-007	7/8" Flat Washer	2
	60961-827	Left Hand, Includes Key Nos. 23a-24a		49	17800-004	Tie Rod Nut Cotter Pin	2
	60961-828	Right Hand, Includes Key Nos. 23b-24b			60961-069	Stop Bolt Service Kit, One Side,	
	60961-844	Left Hand, Includes Key Nos. 23c-24a				Includes Key Nos. 50-51	
	60961-845	Right Hand, Includes Key Nos. 23d-24b		50	60238-001	1/2"-13 UNC Square Head Bolt	2
	60961-846	Left Hand, Includes Key Nos. 23e-24a		51	60240-000	1/2"-13 UNC Hex Jam Nut	2
	60961-847	Right Hand, Includes Key Nos. 23f-24b		52		Top Wrap, <i>See Table 2 on Page 23</i>	2
23		Leaf Spring Assembly, <i>Contact Hendrickson Tech Services for Part Number</i>	2	53	64722-001	Bottom Wrap	2
		• With Front Eye Through Bolt Bushing				Clamp Group Service Kit, One Side,	
a		Left Hand, Set Back, <i>Replaces 59930-061</i>			60961-013	280 mm/315 mm Ride Height	
b		Right Hand, Set Back, <i>Replaces 59930-062</i>			60961-014	355 mm Ride Height	
		• With Front Eye Bar Pin Bushing		54	59449-000	Top Axle Wrap Liner	2
c		Left Hand, Set Back, <i>Replaces 59930-057</i>		55	59845-000	Bottom Axle Wrap Liner	2
d		Right Hand, Set Back, <i>Replaces 59930-058</i>		56		3/4"-10 UNC Hex Bolt	8
e		Left Hand, Set Forward, <i>Replaces 59930-059</i>			58917-016	8 1/2" Length, 280 mm/315 mm Ride Height	
f		Right Hand, Set Forward, <i>Replaces 59930-060</i>			58917-017	10" Length, 355 mm Ride Height	
24		Single Shackle Bracket Assembly, Includes Key Nos. 25-29, <i>Contact Hendrickson Tech Services for Part Number</i>	2	57	22962-001	3/4" Hardened Washer	8
a		Left Hand		58	17700-033	3/4"-10 UNC-2B Nylon Locknut	8
b		Right Hand		59	59826-000	Top Pad	2
25		**Shackle Bracket with Bushing, <i>Replaces 68127-001</i>	2	60		Dowel Pin, 1/2" Diameter, <i>See Table 2 on Page 23</i>	2
26		**Shackle Plate, <i>Replaces 67754-004</i>	2	61		Front Axle Spacer, <i>See Table 2 on Page 23</i>	2
27	68893-001	3/4"-16 UNF x 6 1/2" Bolt	6				
28	22962-044	3/4" Washer (thick washer)	12				
29	68894-001	3/4"-16 UNF Nylon Locknut	6				
30		*Freightliner Hanger, Left Hand / Right Hand	1/1				

AIRTEK® with STEERTEK axle for Western Star

Vehicles built between June 2010 and November 2011

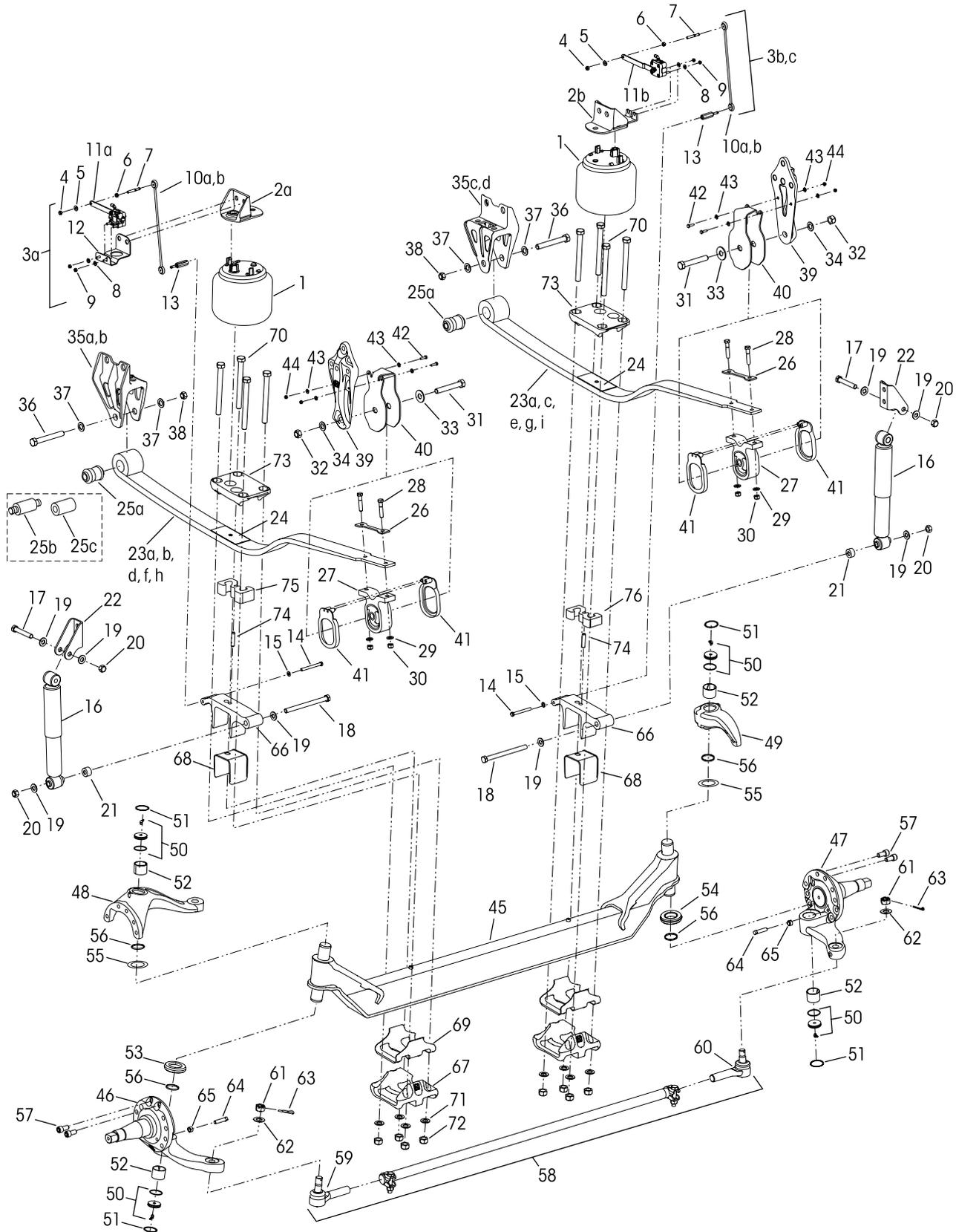




KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.	KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.
1	69116-002L	Air Spring	2	32		Right Hand Lower Steering Knuckle Assembly	1
2		Air Spring Bracket		58900-002		250 Ackermann	
a	60850-001	Left Hand	1	58900-004		200 Ackermann	
b	60850-002	Right Hand	1	58900-006		150 Ackermann	
3		HCV & Linkage Assembly	1/1	33		Left Hand Upper Steering Knuckle Assembly, <i>See Table 2 on Page 23</i>	1
	59427-019L	Left Hand, Set Back, Ride Height		34	60904-032	Right Hand Upper Steering Knuckle Assembly	1
	59427-027L	7.31", 8.81", Includes Key Nos. 4-9, 10a, 11a 10.06", Includes Key Nos. 4-9, 10b, 11a				Kingpin Bushing and Bearing Service Kits	
	59427-031	Left Hand, Set Forward, Ride Height		60961-040		Axle Set , Includes Kit Nos. 60961-009 & -039	
	59427-032	7.31", 8.81", Includes Key Nos. 4-9, 10a, 11b 10.06", Includes Key Nos. 4-9, 10b, 11b		60961-009		Left Hand with Composite Thrust Bearing , Includes Key Nos. 35-38, 40-42, Loctite	
	59427-005L	Right Hand, Ride Height		60961-039		Right Hand with Roller Thrust Bearing , Includes Key Nos. 35-37, 39-42 & Loctite	
	59427-009L	7.31", 8.81", Includes Key Nos. 4-9, 10a, 11c 10.06", Includes Key Nos. 4-9, 10b, 11c		35	59156-000	Grease Cap Assembly	4
4	59016-000	5/16" -18 UNC-2B Locknut	2	36	58937-000	Retaining Ring	4
5	22962-029	5/16" Flat washer	2	37	58909-000	Kingpin Bushing	4
6	17491-011	5/16" -18 UNC Nut	2			Thrust Bearing Service Kits	
7	59169-000	5/16" Stud	2	60961-043		Axle Set , Includes Kit Nos. 60961-041 & -042	
8	22962-028	1/4" Flat Washer	4	60961-041		Left Hand Composite Thrust Bearing , Includes Key Nos. 38, 40-42 & Loctite	
9	49983-000	1/4"-20 UNC Locknut	4	60961-042		Right Hand Roller Thrust Bearing , Includes Key Nos. 39-42 & Loctite	
10		Height Control Valve Linkage	2	38	59828-000	Left Hand Composite Thrust Bearing	1
a	59428-001	7.31", 8.81" Ride Height		39	64256-000L	Right Hand Roller Thrust Bearing	1
b	59428-002	10.06" Ride Height		40		Kingpin Shim	As Req.
11		Height Control Valve	1/1	60259-001X		0.005" Thickness (Pack of 4)	
a	59935-013L	Left Hand Set Back		60259-002		0.047" Thickness	
b	59935-023	Left Hand Set Forward		41	58910-001	Kingpin Seal, <i>Replaces 58910-000</i>	4
c	59935-002L	Right Hand		42	60236-001	5/8" Socket Head Cap Screw	4
12		Left Hand HCV Support Bracket	1	Not Shown	60937-000	Loctite® (Red) Compound Tube	1
a	68675-002	Set Back		43		Tie Rod Assembly, Includes Key Nos. 44-46, <i>See Selection Guide on Page 24</i>	1
b	68675-003	Set Forward				60961-XXX Tie Rod End Service Kits , <i>See Selection Guide on Page 24</i>	
13		Link Mount	1			Tie Rod End, <i>See Selection Guide on Page 24</i>	
a	59429-001	Left Hand Set Back		44		Left Hand	1
b	59429-002	Left Hand Set Forward		45		Right Hand	1
c	59429-002	Right Hand	1	46		**7/8" Castle Nut	2
14	58035-006	3/8"-16 UNC x 3 1/2" Hex Bolt	2	47	22962-007	7/8" Flat Washer	2
15	22962-015	3/8" Flat Washer	2	48	17800-004	Tie Rod Nut Cotter Pin	2
16	58913-012L	Shock Absorber	2			60961-069 Stop Bolt Service Kit, One Side , Includes Key Nos. 49-50	
17	50764-004	3/4"-10 UNC x 3 3/4" Upper Shock Bolt	2	49	60238-001	1/2"-13 UNC Square Head Bolt	2
18		*Lower Shock Bolt	2	50	60240-000	1/2"-13 UNC Hex Jam Nut	2
19	22962-001	3/4" Hardened Washer	8	51		Top Wrap, <i>See Table 2 on Page 23</i>	2
20	49842-000	3/4"-10 UNC Hex Locknut	4	52	64722-001	Bottom Wrap	2
21	59946-001	Shock Spacer	2			Clamp Group Service Kit, One Side , Includes Key Nos. 53-57	
22	59423-001	Shock Bracket	2	60961-013		7.31" Ride Height	
23		Leaf Spring Assembly, Includes Bushings	2	60961-014		8.81" Ride Height	
		Set Back		60961-019		10.06" Ride Height	
a	59930-055	Left Hand		53	59449-000	Top Axle Wrap Liner	2
b	59930-056	Right Hand		54	59845-000	Bottom Axle Wrap Liner	2
		Set Forward		55		3/4"-10 UNC Hex Bolt	8
c	59930-053	Left Hand		58917-016		8 1/2" Length, 7.31" Ride Height	
d	59930-054	Right Hand		58917-017		10" Length, 8.81" Ride Height	
24	68089-001	Shackle Plate	4	58917-018		11 1/2" Length, 10.06" Ride Height	
25		*3/4"-10 UNC Shackle Bolt	4	56	22962-001	3/4" Flat Washer	8
26		*3/4" Washer	8	57	17700-033	3/4"-10 UNC-2B Nylon Locknut	8
27		*3/4"-10 UNC Nut	4	58	59826-000	Top Pad	2
28		*Western Star Front Hanger, Left Hand / Right Hand	1/1	59		Dowel Pin, 1/2" Diameter, <i>See Table 2 on Page 23</i>	2
29		*Western Star Rear Hanger	2	60		Front Axle Spacer, <i>See Table 2 on Page 23</i>	2
	70952-XXX	Axle Assembly, Includes Key Nos. 30-54, <i>Contact Hendrickson Truck Parts for specific Part Number</i>	1				
30	64905-001	Axle & Kingpin Assembly, 12K, 70.9 KPI, 4.25 Drop	1				
31		Left Hand Lower Steering Knuckle Assembly	1				
	58900-001	250 Ackermann					
	58900-003	200 Ackermann					
	58900-005	150 Ackermann					

AIRTEK®

Freightliner – Vehicles built prior to May 2010 • Western Star – Vehicles built prior to June 2010 • Sterling – Vehicles built prior to April 2009



KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.
1	69782-002	Air Spring, <i>Replaces 59823-002L</i>	2
2		Air Spring Bracket	
a	60850-001	Left Hand	1
b	60850-002	Right Hand	1
3		HCV & Linkage Assembly	
a	59427-019L	Left Hand • Vehicles equipped with dual HCVs, Includes Key Nos. 4-9, 10a, 11a • <i>See Page 21 for vehicles equipped with a single HCV</i>	1
b	59427-005L	Right Hand <i>Replaces 59427-001L</i> , Includes Key Nos. 4-9, 10a, 11b, Century Class S/T, Columbia 1350, Coronado, LC Sterling (Set Back), Western Star (Set Back/ Set Forward) 7.31"/8" Ride Height	1
c	59427-009L	<i>Replaces 59427-002</i> , Includes Key Nos. 4-9, 10b, 11b, Western Star (Set Back & Set Forward) 8.81"/10.06" Ride Height	1
4	59016-000	5/16" -18 UNC-2B Locknut	2
5	22962-029	5/16" Flat washer	2
6	17491-011	5/16" -18 UNC Nut	2
7	59169-000	5/16" Stud	2
8	22962-028	1/4" Flat Washer	4
9	49983-000	1/4"-20 UNC Locknut	4
10		Height Control Valve Linkage	2
a	59428-001	335 mm Length	
b	59428-002	370 mm Length	
11		Height Control Valve	
a	59935-013L	Left Hand	1
b	59935-002L	Right Hand	1
12		Left Hand HCV Support Bracket	1
	66256-000	• For vehicles equipped with dual HCVs 280 mm/315 mm, 355 mm Ride Height Columbia, Century Class S/T, LC Sterling (Set Back) EPA 98/04, Coronado EPA 98/04/07	
	67637-000	315 mm, 355 mm Ride Height Columbia, Century Class S/T, LC Sterling (Set Back), Cascadia EPA 07	
	60961-008	Link Mount Service Kit, Axle Set, Includes Key Nos. 13-15	
13	59429-001	Link Mount, <i>Replaces 59310-001</i>	2
14	58035-006	3/8"-16 UNC x 3 1/2" Hex Bolt	2
15	22962-015	3/8" Flat Washer	2
16	58913-003L	Shock Absorber	2
17	50764-004	3/4"-10 UNC x 3 3/4" Upper Shock Bolt	2
18	58917-015	3/4"-10 UNC x 7 1/2" Lower Shock Bolt, <i>Replaces 58917-009</i>	2
19	22962-001	3/4" Hardened Washer	8
20	49842-000	3/4"-10 UNC Hex Locknut	4
21	59946-001	Shock Spacer	2
22	59423-001	Shock Bracket	2
23		Leaf Spring Assembly, Includes Key Nos. 24-30, 41	2
a	59930-021	Century Class S/T, Columbia 1350, Western Star (Set Back), <i>Replaces 59930-001</i> Coronado	
b	59930-023	Left Hand, <i>Replaces 59930-003</i>	
c	59930-024	Right Hand, <i>Replaces 59930-004</i> LC Sterling (Set Back)	
d	59930-025	Left Hand	
e	59930-026	Right Hand Western Star (Set Forward)	
f	59930-027	Left Hand	
g	59930-028	Right Hand Century, Cascadia	
h	59930-029	Left Hand	
i	59930-030	Right Hand	
24	59937-001	Galvanized Liner	2

KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.
25		Spring Eye Bushing	2
a		**Century Class S/T, Columbia, Western Star (Set Forward)	
b		**Coronado	
c		**LC Sterling (Set Back), Century, Cascadia	
	60961-616	Rear Spring Mount Service Kit, One Side, Includes Key Nos. 26-30	
26	58920-001	Spring End Plate, <i>Replaces 58920-000</i>	2
27	58918-000	Rear Spring Mount	2
28	30970-011	1/2"-20 UNF x 2 1/2" Hex Bolt, <i>Replaces 24531-004</i>	4
29	22962-014	1/2" Flat Washer	4
30	17700-034	1/2"-20 UNF Hex Nylock Nut, <i>Replaces 49846-000</i>	4
	60961-003	Rear Spring Eye Hardware Service Kit, One Side, Includes Key Nos. 31-34, 41	
31	50764-008	3/4"-10 UNC x 5" Hex Bolt	2
32	49842-000	3/4"-10 UNC Hex Locknut	2
33	22962-033	3/4" Washer (Large O.D.)	2
34	22962-001	3/4" Flat Washer	2
		Front Hanger Service Kits,	
	60961-004	Left Hand, Includes Key Nos. 35a-b, 36-38 Century Class S/T, Columbia, LC Sterling (Set Back)	
	60961-005	Century Class S/T 1350, Columbia 1350	
	60961-017	Western Star (Set Back)	
	60961-006	Right Hand, Includes Key Nos. 35c-d, 36-38 Century Class S/T, Columbia	
	60961-007	Century Class S/T 1350, Columbia 1350	
	60961-018	Western Star (Set Back)	
35		Front Hanger	
		Left Hand	1
a	59832-001	Century Class S/T, Columbia, Western Star	
b	60573-001	Century Class S/T 1350, Columbia 1350 *LC Sterling (Set Back) *Western Star (Set Forward)	
		Right Hand	1
c	59832-002	Century Class S/T, Columbia, Western Star (Set Back)	
d	60573-002	Century Class S/T 1350, Columbia 1350	
36	50764-002	3/4"-10 UNC x 5 1/2" Hex Bolt	2
37	22962-001	3/4" Flat Washer	4
38	49842-000	3/4"-10 UNC Hex Locknut	2
39	59829-001	Rear Hanger, <i>Replaces 59829-000</i>	2
	60961-016	Rear Hanger Clamp Service Kit, One Side, Includes Key Nos. 33, 40-44	
40	59830-001	Rear Hanger Clamp, <i>Replaces 59830-000</i>	2
41	59346-001	Thrust Washer, <i>Replaces 59346-000</i>	4
42	56935-001	1/4"-20 UNC x 1 1/4" Hex Bolt	4
43	22962-028	1/4" Hardened Washer	8
44	49983-000	1/4"-20 UNC Locknut	4
	70952-XXX	Axle Assembly, Includes Key Nos. 45-69, <i>Contact Hendrickson Truck Parts for specific Part Number</i>	1
45		Axle & Kingpin Assembly, 12K	1
	64905-001	<i>Replaces 59924-001</i> - 4 1/4 Drop, 70.9 KPI Coronado, LC Sterling (Set Back) 315 mm/355 mm Ride Height Western Star (Set Back) 8.81"/10.06" Ride Height	
	64905-002	<i>Replaces 59924-002</i> - 4 1/4 Drop, 69 KPI Century Class S/T, Columbia, 315 mm/355 mm Ride Height Western Star (Set Forward) 8.81"/10.06" Ride Height	
	64905-004	<i>Replaces 59924-004</i> - 5.36" Drop, 69 KPI Century Class S/T, Columbia, 280 mm/315 mm Ride Height LC Sterling (Set Back) 280 mm Ride Height Western Star (Set Forward) 7.31" Ride Height	
46		Left Hand Lower Steering Knuckle Assembly	1
	58900-001	250 Ackermann	
	58900-003	200 Ackermann	
	58900-005	150 Ackermann	

KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.
47	58900-002 58900-004 58900-006	Right Hand Lower Steering Knuckle Assembly 250 Ackermann 200 Ackermann 150 Ackermann	1
48	60903-031 60903-032 60903-033 60903-035 60903-036 60903-038L 60903-039	***Left Hand Upper Steering Knuckle Assembly <i>Replaces 60903-001</i> , 5.36" Drop, 69 KPI, Century Class S/T, Columbia, 280 mm Ride Ht. Western Star (Set Forward), 7.31" Ride Height LC Sterling (Set Back), 280 mm Ride Height <i>Replaces 60903-002</i> , 4.25"/ 5.36" Drop, 69 KPI, Century Class S/T, Columbia, 315 mm Ride Ht. Western Star (Set Forward), 8.81" Ride Height LC Sterling (Set Back), 315 mm Ride Height ***Left Hand Upper Steering Knuckle Assembly <i>Replaces 60903-003</i> , 4.25" Drop, 69 KPI, Century Class S/T, Columbia, 355 mm Ride Ht. Western Star (Set Forward), 10.06" Ride Height LC Sterling (Set Back), 355 mm Ride Height <i>Replaces 60903-005</i> , 4.25" Drop, 70.9 KPI, Western Star (Set Back), 8.81" Ride Height LC Sterling (Set Back), 315 mm Ride Height <i>Replaces 60903-006</i> , 4.25" Drop, 70.9 KPI, Western Star (Set Back), 10.06" Ride Height LC Sterling (Set Back), 355 mm Ride Height <i>Replaces 60903-008</i> , 4.25"/ 5.36" Drop, 70.9 KPI, Coronado, 315 mm Ride Height <i>Replaces 60903-009</i> , 4.25" Drop, 70.9 KPI, Coronado, 355 mm Ride Height	1
49	60903-002 60961-040 60961-009 60961-039	***Right Hand Upper Steering Knuckle Assembly Kingpin Bushing and Bearing Service Kits Axle Set , Includes Kit Nos. 60961-009 &-039 Left Hand with Composite Thrust Bearing , Includes Key Nos. 50-53, 55-57, Loctite Right Hand with Roller Thrust Bearing , Includes Key Nos. 50-52, 54-57 & Loctite	1
50	59156-000	Grease Cap Assembly	4
51	58937-000	Retaining Ring	4
52	58909-000	Kingpin Bushing	4
	60961-043 60961-041 60961-042	Thrust Bearing Service Kits Axle Set , Includes Kit Nos. 60961-041 & -042 Left Hand Composite Thrust Bearing , Includes Key Nos. 53, 55-57 & Loctite Right Hand Roller Thrust Bearing , Includes Key Nos. 54-57 & Loctite	
53	59828-000	Left Hand Composite Thrust Bearing,	1
54	64256-000L	Right Hand Roller Thrust Bearing	1
55	60259-001X 60259-002	Kingpin Shim 0.005" Thickness (Pack of 4) 0.047" Thickness	As Req.
56	58910-001	Kingpin Seal, <i>Replaces 58910-000</i>	4
57	60236-001	5/8" Socket Head Cap Screw	4
Not Shown	60937-000	Loctite® (Red) Compound Tube	1
58	60961-XXX	Tie Rod Assembly, Includes Key Nos. 59-61 <i>See Selection Guide on Page 24</i> Tie Rod End Service Kits , <i>See Selection Guide on Page 24</i> Tie Rod End, <i>See Selection Guide on Page 24</i>	1
59		Left Hand	1
60		Right Hand	1
61		**7/8" Castle Nut	2
62	22962-007	7/8" Flat Washer	2
63	17800-004 60961-069	Tie Rod Nut Cotter Pin Stop Bolt Service Kit, One Side , Includes Key Nos. 64-65	2
64	60238-001	1/2"-13 UNC Square Head Bolt	2
65	60240-000	1/2"-13 UNC Hex Jam Nut	2
66	59952-001	Top Wrap Century Class S/T, Columbia, LC Sterling (Set Back), 4.25" Drop, 315 mm Ride Height 5.36" Drop, 280 mm Ride Height Coronado, 5.36" Drop, 280 mm/315 mm Ride Height	2

KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.
	59952-002	Century Class S/T, Columbia, Coronado 4.25" Drop, 355 mm Ride Height 5.36" Drop, 315 mm Ride Height LC Sterling (Set Back) 4.25" Drop, 355 mm Ride Height	
	59952-007	Western Star (Set Back), 4.25" Drop, 8.81", 10.06" Ride Height Western Star (Set Forward), 4.25" Drop, 10.06" Ride Height	
	59952-016	Western Star (Set Forward), 4.25" Drop, 8.81" Ride Height 5.36" Drop, 7.31" Ride Height	
67	64722-001	Bottom Wrap, <i>Replaces 59440-001</i> Clamp Group Service Kit, One Side , Includes Key Nos. 68-72	2
	60961-013	Century Class S/T, Columbia 280 mm/315 mm Ride Height	
	60961-014	Century Class S/T, Columbia 355 mm Ride Ht. Western Star 8.81" Ride Height	
	60961-019	Western Star 10.06" Ride Height	
68	59449-000	Top Axle Wrap Liner	2
69	59845-000	Bottom Axle Wrap Liner	2
70	58917-016 58917-017 58917-018	3/4"-10 UNC Hex Bolt 8 1/2" Length - Century Class S/T, Columbia 10" Length - Western Star 8.81" Ride Height 11 1/2" Length - Western Star 10.06" Ride Height	8
71	22962-001	3/4" Flat Washer	8
72	17700-033	3/4"-10 UNC-2B Nylock Nut	8
73	59826-000	Top Pad	2
74	57159-004 57159-005 57159-006 57159-012	Dowel Pin, 1/2" Diameter Century Class S/T, Columbia, Coronado, LC Sterling (Set Back), 280 mm/315 mm Ride Height Century Class S/T, Columbia, Coronado, LC Sterling (Set Back), 5.36" Drop, 355 mm and 315 mm Ride Height Western Star (Set Back & Set Forward), 8.81" Ride Height, 4.25" Drop, Western Star (Set Back & Set Forward) 10.06" Ride Height, 4.25" Drop Western Star (Set Forward) Western Star (Set Forward) 7.31" Ride Height, 5.36" Drop	2
75	60244-010 60244-030 60244-035 60244-045 60244-080	Left Hand Front Axle Spacer 280 mm/315 mm Ride Height - 10 mm 280 mm/315 mm Ride Height - 30 mm • For vehicles equipped with dual HCVs, Century Class S/T, Columbia, LC Sterling (Set Back) EPA 98/04, Coronado, Classic XL (Set Forward) EPA 98/04/07 - 35 mm Century Class S/T, Columbia, LC Sterling (Set Back), 355 mm Ride Height, 4.25" Drop - 45 mm 315 mm Ride Height, 5.36" Drop - 45 mm Western Star (Set Back & Set Forward) 8.81" Ride Height, 4.25" Drop - 45 mm Western Star (Set Back & Set Forward) 10.06" Ride Height, 4.25" Drop - 80 mm	1
76	60244-020 60244-035 60244-070	Right Hand Front Axle Spacer Western Star (Set Forward) 7.31" Ride Height, 5.36" Drop - 20 mm Century Class S/T, Columbia, LC Sterling (Set Back) 355 mm Ride Height, 4.25" Drop - 35 mm 315 mm Ride Height, 5.36" Drop - 35 mm Western Star (Set Back & Set Forward) 8.81" Ride Height, 4.25" Drop - 35 mm Western Star (Set Back & Set Forward) 10.06" Ride Height, 4.25" Drop - 70 mm	1



Single to Dual Height Control Valve Conversion Kits

Freightliner – Vehicles built prior to May 2010 • Sterling – Vehicles built prior to April 2009

Kit No.	Vehicle	EPA	Ride Height																										
58525-029	• Columbia • Century Class S/T • LC Sterling (Set back)	98/04	280 mm/ 315 mm		<p>Service Kit Contents</p> <table border="1"> <thead> <tr> <th>NO.</th> <th>DESCRIPTION</th> <th>QTY.</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>LH HCV, & Linkage Assembly, Includes Fasteners</td> <td>1</td> </tr> <tr> <td>2</td> <td>Upper Air Spring Bracket</td> <td>1</td> </tr> <tr> <td>3</td> <td>*LH HCV Support Bracket</td> <td>1</td> </tr> <tr> <td>4</td> <td>Link Mount</td> <td>1</td> </tr> <tr> <td>5</td> <td>*LH Front Axle Spacer</td> <td>1</td> </tr> <tr> <td>6</td> <td>3/8"-16 UNC x 3 1/2" Bolt</td> <td>1</td> </tr> <tr> <td>7</td> <td>3/8" Hardened Washer</td> <td>1</td> </tr> </tbody> </table> <p>* May not be included in all kits</p>	NO.	DESCRIPTION	QTY.	1	LH HCV, & Linkage Assembly, Includes Fasteners	1	2	Upper Air Spring Bracket	1	3	*LH HCV Support Bracket	1	4	Link Mount	1	5	*LH Front Axle Spacer	1	6	3/8"-16 UNC x 3 1/2" Bolt	1	7	3/8" Hardened Washer	1
	NO.	DESCRIPTION				QTY.																							
1	LH HCV, & Linkage Assembly, Includes Fasteners	1																											
2	Upper Air Spring Bracket	1																											
3	*LH HCV Support Bracket	1																											
4	Link Mount	1																											
5	*LH Front Axle Spacer	1																											
6	3/8"-16 UNC x 3 1/2" Bolt	1																											
7	3/8" Hardened Washer	1																											
	• Coronado	98/04/07																											
58525-031	• Columbia • Century Class S/T • LC Sterling (Set back)	98/04	355 mm																										
	• Coronado	98/04/07																											
58525-033	• Classic XL (Set Forward)	98/04/07	355 mm																										
58525-034	• Columbia • Century Class S/T • LC Sterling (Set back) • Cascadia	07	355 mm																										
58525-036	• Classic XL (Set Forward)	98/04/07	315 mm																										
58525-037	• Columbia • Century Class S/T • LC Sterling (Set back) • Cascadia	07	315 mm																										

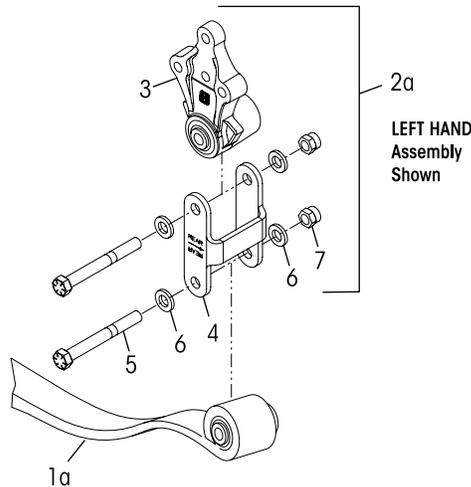
NOTE: The recommendation of the vehicle manufacturer is that dual height control valves are only to be installed on the front suspension when the rear suspension is equipped with a single height control valve system. This arrangement is best suited to keep the vehicle level versus having dual height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

Leaf Spring and Shackle Bracket Assembly Conversion Kits

Vehicles built prior to May 2, 2016

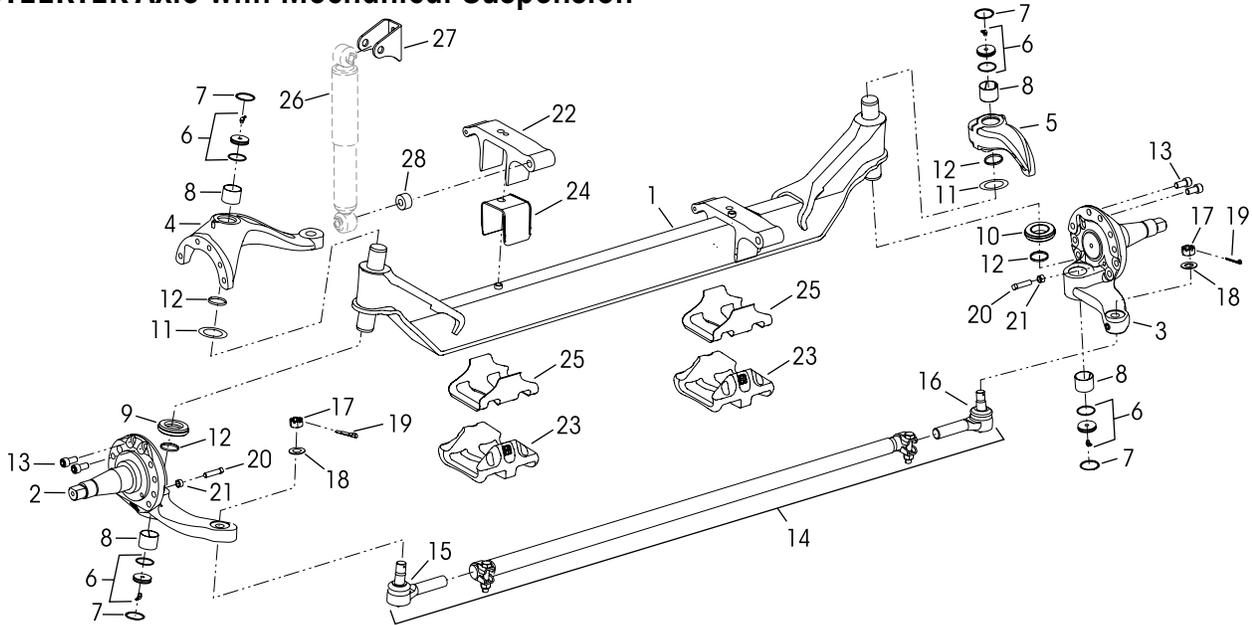
Service Kit Nos.
60961-827 • 60961-828
60961-844 • 60961-845
60961-846 • 60961-847
 Reference Lit. No. 59310-065

Leaf Spring and Shackle Bracket Assembly Conversion Kits



KEY NO.	PART NO.	DESCRIPTION	QTY.
		Leaf Spring and Shackle Bracket Assembly Conversion Kit for vehicles built prior to 5/2/16	
	60961-827	Left Hand, Includes Key Nos. 1a-2a	
	60961-828	Right Hand, Includes Key Nos. 1b-2b	
	60961-844	Left Hand, Includes Key Nos. 1c-2a	
	60961-845	Right Hand, Includes Key Nos. 1d-2b	
	60961-846	Left Hand, Includes Key Nos. 1e-2a	
	60961-847	Right Hand, Includes Key Nos. 1f-2b	
1		Leaf Spring Assembly equipped with:	2
	a	• Front Eye Through Bolt Bushing	
	b	Left Hand, Set Back, <i>Replaces 59930-061</i>	
		Right Hand, Set Back, <i>Replaces 59930-062</i>	
		• Front Eye Bar Pin Bushing	
	c	Left Hand, Set Back, <i>Replaces 59930-057</i>	
	d	Right Hand, Set Back, <i>Replaces 59930-058</i>	
	e	Left Hand, Set Forward, <i>Replaces 59930-059</i>	
	f	Right Hand, Set Forward, <i>Replaces 59930-060</i>	
2		**Shackle Bracket Assembly, Includes Key Nos. 3-7, <i>Replaces 68274-001</i>	2
	a	Left Hand	
	b	Right Hand	
3		Shackle Bracket with Bushing Assembly, <i>Replaces 68127-001</i>	2
4		**Shackle Plate, <i>Replaces 67754-004</i>	2
5		**3/4"-16 UNF x 6 1/2" Bolt, <i>Replaces 50764-018</i>	2
6		**3/4" Washer (0.217" thick), <i>Replaces 22962-040</i>	4
7		**3/4"-16 UNF Nylock Nut, <i>Replaces 68596-000</i>	2

STEERTEK Axle with Mechanical Suspension



KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.	KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.
	70952-XXX	Axle Assembly, Includes Key Nos. 1-25, Contact Hendrickson Tech Services for proper Axle Assembly Part Number	1	9	59828-000	Left Hand Composite Thrust Bearing,	1
1		Axle & Kingpin Assembly	1	10	64256-000L	Right Hand Roller Thrust Bearing	1
	64905-001	Replaces 59924-001, Coronado, 4¼ Drop, 70.9 KPI, 315 mm/355 mm Ride Height		11		Kingpin Shim	As Req.
	64905-002	Replaces 59924-002, CST/Columbia, 4¼ Drop, 69 KPI, 315 mm/355 mm Ride Height			60259-001X	0.005" Thickness (Pack of 4)	
	64905-004	Replaces 59924-004, CST/Columbia, 5.36" Drop, 69 KPI, 280 mm/315 mm Ride Ht.			60259-002	0.047" Thickness	
2		Left Hand Lower Steering Knuckle Assembly	1	12	58910-001	Kingpin Seal, Replaces 58910-000	4
	58900-001	250 Ackermann		13	60236-001	5/8" Socket head cap screw	4
	58900-003	200 Ackermann		Not Shown	60937-000	Loctite® (Red) Compound Tube	1
	58900-005	150 Ackermann		14		Tie Rod Assembly, Includes Key Nos. 15-17, See Selection Guide on Page 24	1
3		Right Hand Lower Steering Knuckle Assembly	1		60961-XXX	Tie Rod End Service Kits, See Selection Guide on Page 24	
	58900-002	250 Ackermann				Tie Rod End, See Selection Guide on Page 24	
	58900-004	200 Ackermann		15		Left Hand	1
	58900-006	150 Ackermann		16		Right Hand	1
4		***Left Hand Upper Steering Knuckle Assembly	1	17		**7/8" Castle Nut	2
	60903-034	12K, 4.25" Drop, 69 KPI, 280 mm Ride Height, Replaces 60903-004		18	22962-007	7/8" Flat Washer	2
	60903-035	315 mm Ride Height, Replaces 60903-005		19	17800-004	Tie Rod Nut Cotter Pin	2
	60903-036	355 mm Ride Height, Replaces 60903-006		20	60238-000	½"-13 UNC Square Head Bolt	2
	60903-038	12K, 4.25"/ 5.36" Drop, 70.9 KPI, 315 mm Ride Height, Replaces 60903-008		21	60240-000	½"-13 UNC Hex Jam Nut	2
	60903-039	355 mm Ride Height, Replaces 60903-009		22		Top Axle Wrap	2
5		***Right Hand Upper Steering Knuckle Assembly	1		59952-003	CST/Columbia 69 KPI, 4.25" Drop, 315 mm Ride Height	
		Kingpin Bushing and Bearing Service Kits			59952-004	5.36" Drop, 260 mm/280 mm Ride Height	
	60961-040	Axle Set, Includes Kit Nos. 60961-009 & -039			59952-005	4.25" Drop, 355 mm Ride Height	
	60961-009	Left Hand w/Composite Thrust Bearing, Includes Key Nos. 6-9, 11-13, Loctite			59952-006	4.25" Drop, 315 mm Ride Height	
	60961-039	Right Hand w/Roller Thrust Bearing, Includes Key Nos. 6-8, 10-13, Loctite				5.36" Drop, 315 mm Ride Height	
6	59156-000	Grease Cap Assembly	4	23	64723-002	Bottom Axle Wrap, Replaces 59440-002	2
7	58937-000	Retaining Ring	4		60961-015	Top/Bottom Axle Wrap Liner Service Kit, One Side, Includes Key Nos. 24-25	
8	58909-000	Kingpin Bushing	4	24	60508-000	Top Axle Wrap Liner	2
		Thrust Bearing Service Kits		25	59845-000	Bottom Axle Wrap Liner	2
	60961-043	Axle Set, Includes Kit Nos. 60961-041 & -042		26		*Shock Absorber	2
	60961-041	Left Hand Composite Thrust Bearing, Includes Key Nos. 9, 11-13 & Loctite		27	59423-002	Shock Bracket	2
	60961-042	Right Hand Roller Thrust Bearing, Includes Key Nos. 10-13 & Loctite		28	59946-001	Shock Spacer	2

■ Selection Guide – Upper Steering Knuckle • Dowel Pin • Front Axle Spacer

TABLE 1

STEERTEK NXT AXLE	Vehicle	Axle Drop	Ride Height	LH Upper Steering Knuckle Assembly Part Number	Dowel Pin Part Number	Front Axle Spacer Part Number	
	Vehicles built after November 2011						
	Freightliner	Page 10		Key No. 34	Key No. 56	Key No. 57	
	Cascadia SET BACK	4.25"	315 mm	60903-435	57159-004	No Spacer	
			355 mm	60903-436	57159-005	69594-040	
		5.36"	280 mm	60903-434	57159-004	No Spacer	
			315 mm	60903-435	57159-005	69594-040	
	Coronado SET FORWARD	4.25"	315 mm	60903-438	57159-004	No Spacer	
			355 mm	60903-439	57159-005	69594-040	
	Western Star	Page 12		Key No. 33	Key No. 55	Key No. 56	
4900 SA • 5700 SET BACK	4.25"	315 mm	60903-435	57159-004	No Spacer		
		355 mm	60903-436	57159-005	69594-040		
		385 mm	60903-436	57159-006	69594-070		
4900 SA SET FORWARD	4.25"	315 mm	60903-438	57159-004	No Spacer		
		355 mm	60903-439	57159-005	69594-040		
		385 mm	60903-439	57159-006	69594-070		

■ Selection Guide – Upper Steering Knuckle • Top Wrap • Dowel Pin • Front Axle Spacer

TABLE 2

STEERTEK AXLE	Vehicle	Axle Drop	Ride Height	LH Upper Steering Knuckle Assembly Part Number	Top Wrap Part Number	Dowel Pin Part Number	Front Axle Spacer Part Number	
	Vehicles built between May 2010 and November 2011							
	Freightliner	Page 14		Key No. 34	Key No. 52	Key No. 60	Key No. 61	
	SET BACK	4.25"	315 mm/7.31"	60903-035	59952-021	57159-004	No Spacer	
			355 mm/8.81"	60903-036	59952-002	57159-005	60244-040	
		5.36"	280 mm	60903-034	59952-021	57159-004	No Spacer	
			315 mm	60903-035	59952-002	57159-005	69594-040	
	SET FORWARD	4.25"	315 mm/7.31"	60903-038	59952-021	57159-004	No Spacer	
			355 mm/8.81"	60903-039	59952-002	57159-005	60244-040	
	Vehicles built between June 2010 and November 2011							
Western Star	Page 16		Key No. 33	Key No. 51	Key No. 59	Key No. 60		
SET BACK	4.25"	315 mm/7.31"	60903-035	59952-021	57159-004	No Spacer		
		355 mm/8.81"	60903-036	59952-002	57159-005	60244-040		
		385 mm/10.06"	60903-036	59952-002	57159-006	60244-070		
SET FORWARD	4.25"	315 mm/7.31"	60903-038	59952-021	57159-004	No Spacer		
		355 mm/8.81"	60903-039	59952-002	57159-005	60244-040		
		385 mm/10.06"	60903-039	59952-002	57159-006	60244-070		

■ Selection Guide – Tie Rod

		Axle Model	Wheel Base	KPI	Tie Rod Assembly Part Number	Tie Rod End Part Number	Tie Rod End Service Kit No.	
STRAIGHT TIE RODS	1 1/8" Threads	Vehicles built after November 2014						
		STEERTEK NXT 12K	150"	70.9	76877-001	70995-001 (LH) 70995-002 (RH)	60961-734 (Axle Set) 60961-736 (LH) 60961-741 (RH)	
			200"		76877-002			
			250"		76877-003			
		STEERTEK NXT 13.3K	150"	70.9	76879-001	76876-001 (LH) 76876-002 (RH)	60961-735 (Axle Set) 60961-742 (LH) 60961-743 (RH)	
			200"		76879-002			
	250"		76879-003					
	Vehicles built prior to November 2014							Tie Rod Assembly Replacement Part No.
	STEERTEK NXT STEERTEK	150"	70.9	60239-001	♦ Tie rod end kits are no longer available for these assembly numbers, requires complete tie rod assembly replacement.	76877-001		
		200"		60239-002		76877-002		
		250"		60239-003		76877-003		
		150"	69	60239-004		76877-004		
200"		60239-005		76877-005				
250"		60239-006		76877-006				

		Axle Model	Wheel Base	KPI	Tie Rod Assembly Part Number	Tie Rod End Part Number	Tie Rod End Service Kit No.	
DROP TIE RODS	1 1/4" Threads	Vehicles built after November 2014						
		STEERTEK NXT	150"/200"	70.9	76878-001	76875-001 (LH) 76875-002 (RH)	60961-737 (Axle Set) 60961-739 (LH) 60961-740 (RH)	
			250"		76878-002			
	Vehicles built prior to November 2014							Tie Rod Assembly Replacement Part No.
	STEERTEK NXT STEERTEK	150"/200"	70.9	66699-001	♦ Tie rod end kits are no longer available for these assembly numbers, requires complete tie rod assembly replacement.	76878-001		
		250"		66699-002		76878-002		
150"/200"		69	66699-003	76878-003				

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

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

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

*** All new replacement STEERTEK axles and upper steering knuckle components for Freightliner, Sterling and Western Star Vehicles will incorporate 5/8" fine threaded holes for brake spider mounting bolts. Vehicles built prior to 6/28/2004 that are receiving a replacement of the STEERTEK axle or upper knuckle will require — a change from coarse thread brake spider mounting bolts to fine thread brake spider mounting bolts. The brake spider mounting bolts are supplied separately by Freightliner, Sterling and Western Star, refer to vehicle manufacturer for bolt dimensions and torque specifications. Hendrickson will not be responsible for any damage to the STEERTEK upper knuckle components resulting from using the improper brake spider mounting bolts.

Hendrickson AIRTEK Ride Height Gauge (Literature No. 45745-159) for Freightliner and Western Star Vehicles can be obtained online at www.hendrickson-intl.com/Litform

SECTION 5 Special Tools

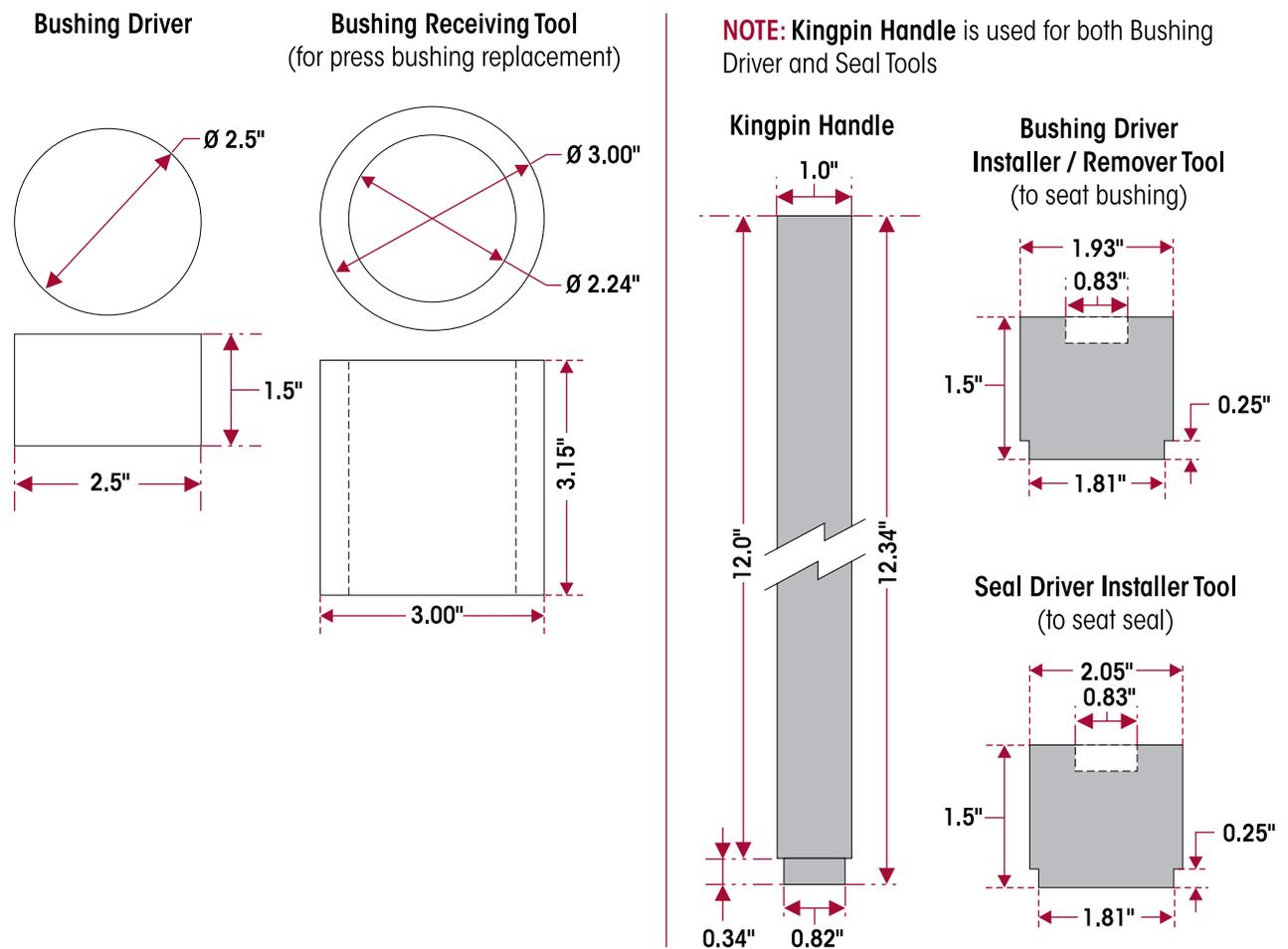
KING PIN BUSHING TOOL – ADJUSTABLE STRAIGHT FLUTE REAMER

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



KINGPIN BUSHING AND SEAL SHOP TOOLS

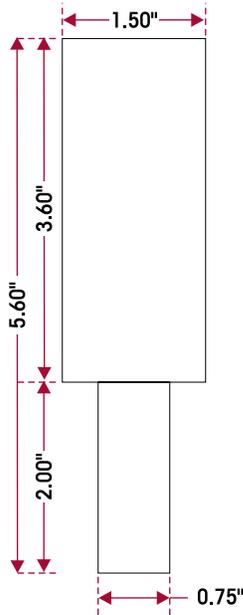
These shop made tools are designed to install and remove kingpin bushings. Bushing tools are made from cold rolled steel or equivalent. Drawings are for reference only. Hendrickson does not supply these tools.



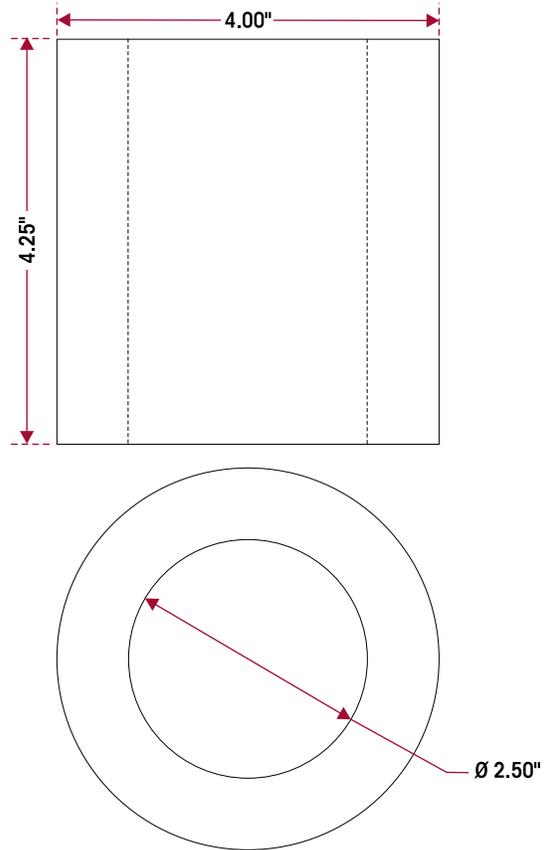
STEEL LEAF SPRING EYE BUSHING TOOLS

NOTE Leaf spring eye bushing tools used to replace the bushing (Part Number 59259-002) only for vehicles built prior to: **Freightliner** – May 2010 • **Western Star** – June 2010, • **Sterling** – April 2009.

**Leaf Spring Driver
For Installation and Removal**



Leaf Spring Receiver



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
- **METHOD 4** — Spring eye and hanger lift method (may require the removal of fairings)

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

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

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

METHOD 1 — WHEEL LIFT

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

FIGURE 6-1



METHOD 2 — TOWING VEHICLE FROM THE REAR

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

METHOD 3 — AXLE FORK LIFT

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

NOTE

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

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

STEERTEK NXT — Vehicles built after November 2011

1. Use a tow fork with a minimum of 4½" 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 — Vehicles built prior to November 2011

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

FIGURE 6-4

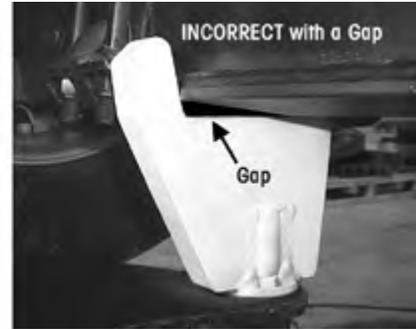


FIGURE 6-5



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



METHOD 4 — SPRING EYE AND HANGER LIFT METHOD

This method is permitted for under lift equipped units, caution must be taken as not to damage leaf spring, see Figure 6-7 for proper installation.

- Inspect ends of spring cradles for burrs or sharp edges that could damage spring
- When securing the vehicle to the boom, it is preferred to use nylon safety straps. Chains have a tendency to bind and may cause damage to the axle.

FIGURE 6-7



NOTE

When lifting a vehicle with the under lift boom, see Figures 6-7 and 6-8, care must be taken as not to damage the engine oil pan. It may be necessary to remove the front fairing. If necessary place a block of wood between the top of the boom and the bottom of the axle.

FIGURE 6-8



OFF-ROADWAY TOWING

 **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 A TOW STRAP IS NECESSARY TO TOW A DISABLED VEHICLE TO A REPAIR FACILITY PARKING LOT INTO THE SHOP BAY. THE TOW STRAPS SHOULD BE CONNECTED TO THE TOW HOOKS PROVIDED BY THE VEHICLE MANUFACTURER AT THE FRONT OF THE BUMPER. IF THE USE OF TOW HOOKS IS NOT AN OPTION, THEN A TOW STRAP MAY BE WRAPPED AROUND THE FRONT AXLE, (SEE FIGURE 6-9) IN A MANNER THAT IS ACCEPTABLE FOR TOWING THE VEHICLE FROM A REPAIR FACILITY PARKING LOT INTO THE SHOP BAY. DO NOT USE A TOW CHAIN AROUND THE FRONT AXLE OR WITH A SINGLE POINT LOCATION TO TOW THE VEHICLE. DOING SO WILL DAMAGE THE AXLE AND VOID ANY APPLICABLE WARRANTY, SEE FIGURE 6-9.

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

FIGURE 6-9



SECTION 7 Preventive Maintenance

Following appropriate inspection procedures is important to help ensure the proper maintenance and operation of the suspension systems and components function to their highest efficiency. Hendrickson recommends the AIRTEK equipped with STEERTEK NXT axle front suspension systems be inspected at pre-delivery, the first 1,000 miles of service and at the regular preventive maintenance intervals. Off-highway and severe service operating conditions require more frequent inspections than on-highway service operation.

NOTE Torque values shown in this publication apply only if Hendrickson supplied fasteners are used. If non-Hendrickson fasteners are used, follow the torque specifications listed in the vehicle manufacturer's service manual.

HENDRICKSON RECOMMENDED INSPECTION INTERVALS	PRE-DELIVERY INSPECTION	FIRST IN-SERVICE INSPECTION	PREVENTIVE MAINTENANCE
Visual inspection for proper assembly and function. Check for all of the following and replace components as necessary: <ul style="list-style-type: none"> • Signs of unusual movement, loose or missing components • Signs of abrasive or adverse contact with other components • Damaged, or cracked parts • Improper suspension function or alignment 	Within the first 100 miles (500 km)	Within the first 1,000 miles (1,600 km) or 100 hours	<p>ON-HIGHWAY 50,000 miles (80,000 km) every 6 months or whichever comes first</p>
Visually inspect the overall condition, torque and for any signs of damage to: <ul style="list-style-type: none"> • Air springs and air lines • Axle assembly • Front and rear spring eye connection • Leaf spring assembly • Rear shackle brackets and shackle plates • Clamp group (top pad, spring seat, top and bottom axle wrap, clamp fasteners) 			<p>ON-HIGHWAY 100,000 miles (161,000 km) every 12 months or whichever comes first</p>
Inspect all fasteners for proper torque using a calibrated torque wrench with special attention to the front and rear spring eye and rear shackle connections.			
Verify the ride height is within specification, use Hendrickson Ride Height Gauge 45745-159.			

See vehicle manufacturer's applicable publications for other preventive maintenance requirements.

COMPONENT INSPECTION

- **Air Spring** (if equipped) — 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 and rear spring hangers** — Check for cracks or loose mounting hardware. Replace if necessary, see Component Replacement Section of this publication for replacement procedure.
- **Steering operation** — All steering components on the axle assembly must move freely through the full range of motion from axle stop to axle stop.
- **Shackle bracket** — Look for any signs of excessive wear to shackle and shackle bracket.
- **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 springs** — Look for cracks. Replace if cracked or broken. Check the front and rear bushings for any wear or deterioration. Replace spring assembly if any of the previous conditions are observed. See Component Replacement Section of this publication for replacement procedure.
- **Steering pivot points** — Check for looseness at all pivot points on the axle assembly. Refer to the Lubrication Intervals in this section.
- **STEERTEK NXT / STEERTEK axle** — The axle should be free of any nicks or gouges. Inspect for any cracks or dents on axle.
- **Thrust washers and rear hanger clamp** — Look for any signs of excessive wear to the thrust washers and rear hanger clamp. See Thrust Washer Inspection detailed in this section.
- **Tire wear** — Inspect tires for wear patterns that may indicate suspension damage or misalignment. See Tire Inspection in this section.
- **Top and bottom axle wrap liners (If equipped)** — Look for any cracking or broken pieces on liner in load bearing areas. See Axle Wrap Liner Inspection in this section.
- **Top pad** — Look for cracks. 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 the vehicle manufacturer's applicable publications for other preventive maintenance requirements.

LUBRICATION INTERVALS

For vehicles equipped with the STEERTEK NXT • STEERTEK axle, regular lubrication intervals should be followed to help prevent premature wear to the kingpin bushings and tie rod ends, see Lubrication Specifications in Table 7-1.

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

TABLE 7-1

STEERTEK NXT • STEERTEK — Greasing and Lubrication Specifications				
Application	Component	Greasing Interval	Grease	Outside Temperature
GENERAL Does not include linehaul or medium-duty applications	Kingpin Bushings	Maximum of 25,000 miles (40,225 km) or 90 days, whichever comes first	Multipurpose Grease NLGI Grade 2	Refer to the lubricant manufacturer's specifications for the temperature service limits applicable to your area
	Tie Rod Ends			
	Drag Link	See Vehicle Manufacturer		
Application Specific Recommendations				
ON-HIGHWAY Linehaul Only High Mileage Accumulation 95% Highway Surface No off-roadway operation Greater than 50,000 miles per year (80,500 kilometers per year)	Kingpin Bushings	Maximum of 100,000 miles (161,000 km) or 1 year, whichever comes first	Multipurpose Grease NLGI Grade 2	Refer to the lubricant manufacturer's specifications for the temperature service limits applicable to your area
	Tie Rod Ends			
	Drag Link	See Vehicle Manufacturer		

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

KINGPIN LUBRICATION

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

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

1. Place vehicle on the ground.
2. Prior to greasing the kingpins on the vehicle, the suspension must be in a loaded condition.
3. Clean off all the grease Zerk and grease gun tip with a clean shop towel prior to lubrication.
4. Lubricate the kingpins through the grease Zerk 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 Zerk, 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
STEERTEK NXT
Upper Grease Zerk



FIGURE 7-2

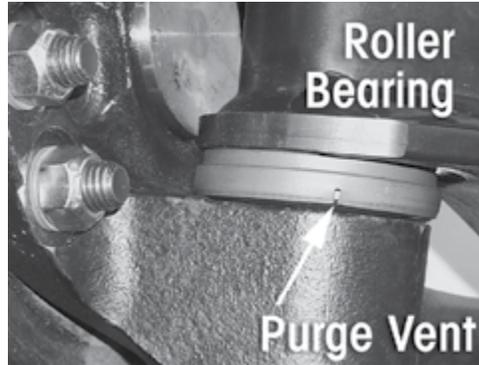


FIGURE 7-3



NOTE

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

FIGURE 7-4



TIE ROD END LUBRICATION

LUBRICATION PROCEDURE

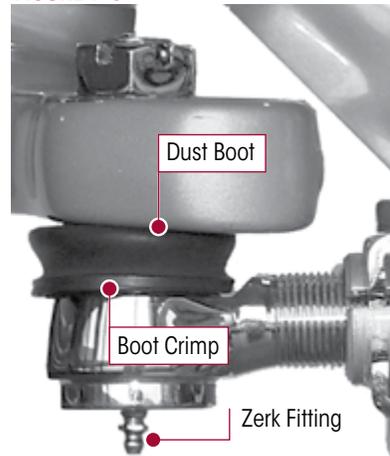
1. Turn the vehicle wheels straight ahead.
2. Wipe the grease Zerk and grease gun tip with clean shop towels.
3. Wipe the seal/boot clean with shop towels.
4. Attach a grease gun to the grease Zerk. Either a hand or pneumatic grease gun is acceptable. If air operated grease gun is used, system air pressure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



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

5. Dirt, water, and discolored old grease should flow from the relief vents or purge holes near the boot crimp or bellows area, see Figure 7-5. 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, see Tie Rod End replacement in the Component Replacement Section of this publication.
7. Apply grease until all the old grease is purged from the boot.

FIGURE 7-5



TIE ROD ENDS

INSPECTION

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

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 the rear wheels of the 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 CORRECT COTTER PIN MUST BE INSTALLED 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 $\frac{5}{8}$ " TIE ROD CLAMP BOLT HEAD LOCATION TO VERIFY THE CLAMP FASTENERS HAVE SUFFICIENT CLEARANCE AWAY FROM THE LOWER SHOCK MOUNT AT FULL WHEEL CUT. THE FASTENERS MUST NOT CONTACT THE LOWER SHOCK MOUNT. FAILURE TO DO SO CAN CAUSE ONE OR MORE COMPONENTS TO FAIL CAUSING LOSS OF VEHICLE CONTROL AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

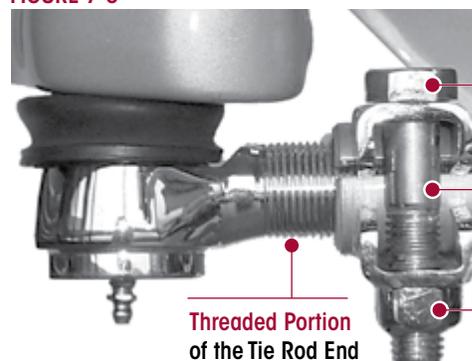
6. Verify the $\frac{5}{8}$ " tie rod clamp bolt head does not contact the lower shock mount at full wheel cut, see Figure 7-6.

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.

FIGURE 7-6



$\frac{5}{8}$ " Tie Rod Clamp Bolt

It is critical to check the $\frac{5}{8}$ " tie rod clamp bolt head location to verify the clamp fasteners have sufficient clearance away from the lower shock mount at full wheel cut. The fasteners must not contact the lower shock mount.

Tie Rod Cross Tube Slots

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

$\frac{5}{8}$ " Tie Rod Clamp Locknut

Tightening Torque
 68 ± 7 ft. lbs. (92 ± 9 Nm)

Threaded Portion of the Tie Rod End

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

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

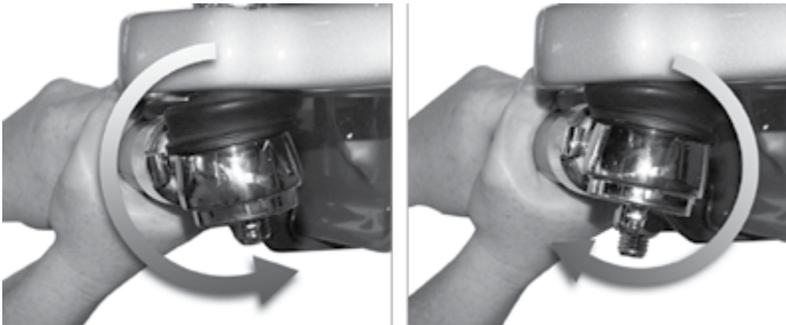
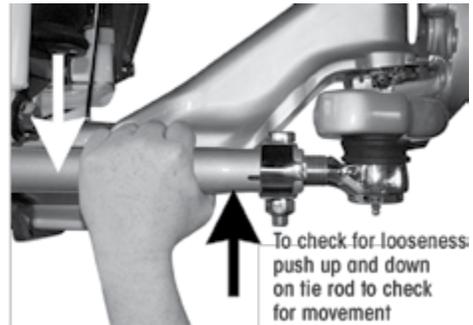


FIGURE 7-8



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

FIGURE 7-9



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 75 ± 25 pounds of force. Observe the reading on the dial indicator.
14. If the reading is more than 0.060", replace both tie rod ends at the next service interval.
15. If a tie rod end exhibits ≥ 0.125 " of movement by hand, the vehicle should be removed immediately from use and the tie rod end be replaced.

NOTE

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

WARNING

CLAMP GROUP RE-TORQUE INTERVAL

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.

Clamp group locknuts must be tightened to specification

- At preparation for delivery and re-torqued at 1,000 miles
- Thereafter follow the every 50,000 miles / six months visual inspection and an annual re-torque interval

FIGURE 7-10

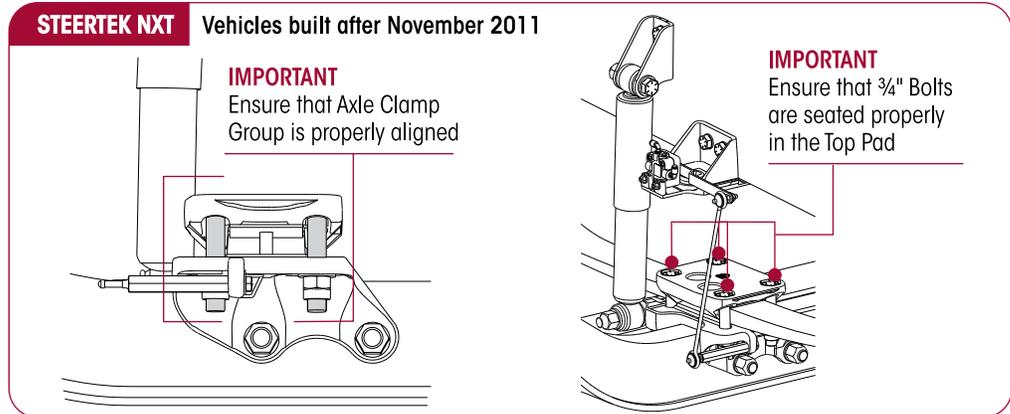
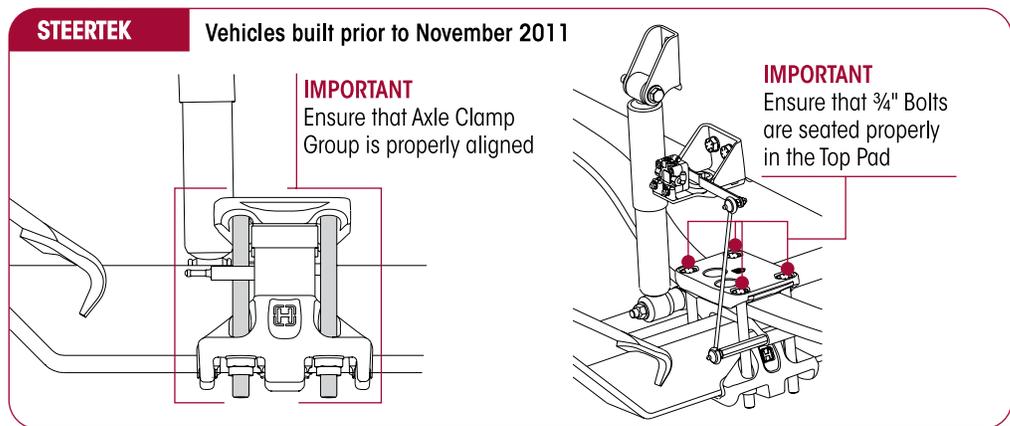


FIGURE 7-11

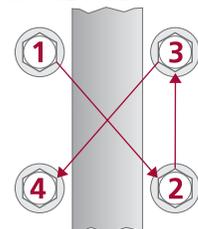


1. **STEERTEK NXT Axle** — Ensure that the clamp group is properly aligned and the Hex Bolts are seated in the top pad, and the top pad is centered on the axle spring seat, see Figure 7-10.

STEERTEK Axle — Ensure that the clamp group is properly aligned and the Hex Bolts are seated in the top pad, and the bottom axle wrap is centered on the top axle wrap, see Figure 7-11.

2. Check for signs of component or bolt movement. If signs of movement are present, disassemble the clamp group fasteners, check for component wear or damage and replace as necessary. Install new clamp group fasteners and repeat Step 1.
3. Tighten the clamp group locknuts evenly in 50 foot pounds increments in the proper pattern to achieve uniform bolt tension, see Figure 7-12.

FIGURE 7-12



- **STEERTEK NXT Axle** — Refer to vehicle manufacturer's torque specifications
- **STEERTEK Axle** — Tighten to $\boxed{295} \pm 10$ foot pounds torque

SHACKLE BRACKET & FRONT/REAR SPRING EYE CONNECTION

VISUAL INSPECTION

In normal use these components will function satisfactorily, even though the components may show some wear. Some signs of a loose or worn connection that can result in component damage may include the following. If any of the below are present, then a Torque Inspection is necessary.

- The vehicle exhibits a popping or clunking sound when turning
- Excessive lateral movement of the leaf spring
- The rear spring eye is in contact with the shackle plates

TORQUE INSPECTION



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.

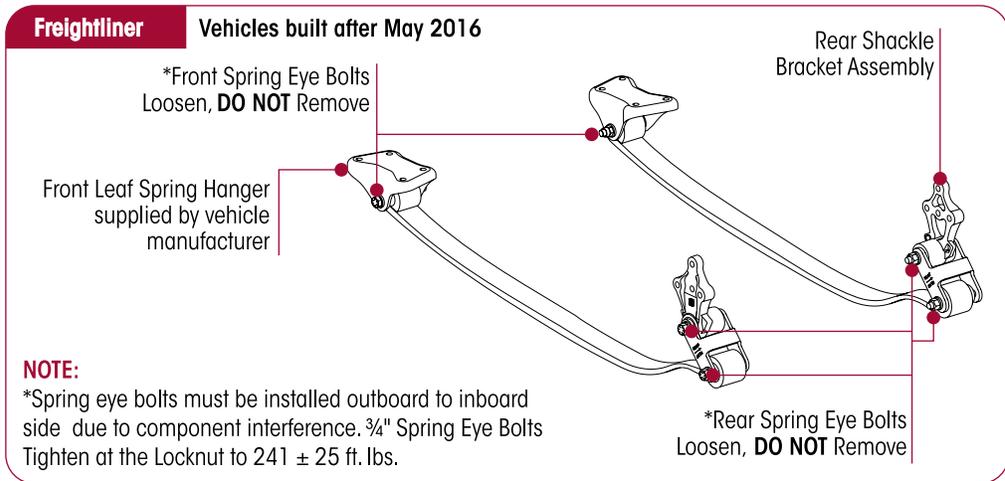
1. Chock the wheels.
2. Verify the ride height is within specification by using Ride Height Gauge 45745-159.
3. If ride height is out of specification, adjust the ride height to the correct specification; refer to Ride Height Adjustment in the Alignment & Adjustment Section of this publication.

NOTE

Any adjustment of the ride height will still require a loosening and re-torque of the two (2) spring eye fasteners and the four (4) rear shackle bracket fasteners at the corrected ride height, regardless of prevailing torque, see Steps 7 through 9.

4. Check prevailing torque load at the two (2) front spring eye fasteners and four (4) rear shackle bracket fastener locations.

FIGURE 7-13



5. Set the torque wrench to  200 foot pounds and check the torque at all six locations as shown in Figure 7-13. Use a calibrated torque wrench and a wrench to hold the fastener, check torque in a tightening direction.
 - If **no locknut movement is observed**, set the torque wrench to  241 ± 25 foot pounds to achieve proper torque value. After proper torque is achieved, no further action is necessary.
 - If **locknut movement is observed** and torque value is below 200 foot pounds, proceed to Step 6.

6. See the appropriate action below:
 - If the torque value is **below 200** foot pounds, disassemble the shackle/spring eye connection and remove and discard fasteners. Inspect all mating components for wear or damage, replace as necessary, see Physical Inspection in this section.
 - If a **ride height adjustment** was performed, re-torque is necessary, see Steps 7 through 9.
7. With the truck at the correct ride height, loosen the two (2) front spring eye fasteners and four (4) rear shackle bracket fasteners, see Figure 7-13.
8. With the truck at the correct ride height, tighten all six (6) fasteners to $\boxed{241} \pm 25$ foot pounds of torque.
9. Remove the wheel chocks.

PHYSICAL INSPECTION

1. Chock the wheels.
2. Remove and discard fasteners from the spring eye connection(s).

FIGURE 7-14

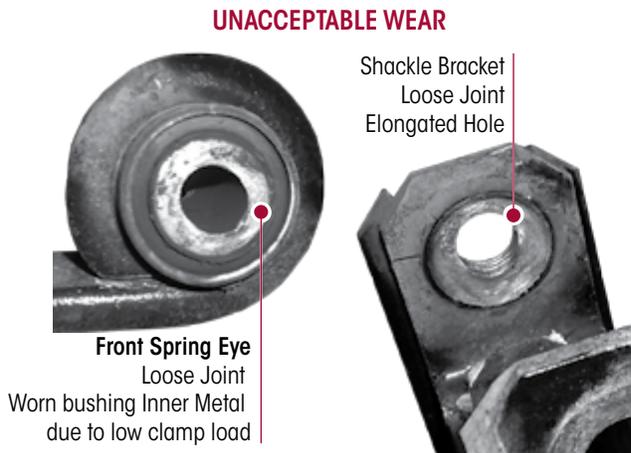
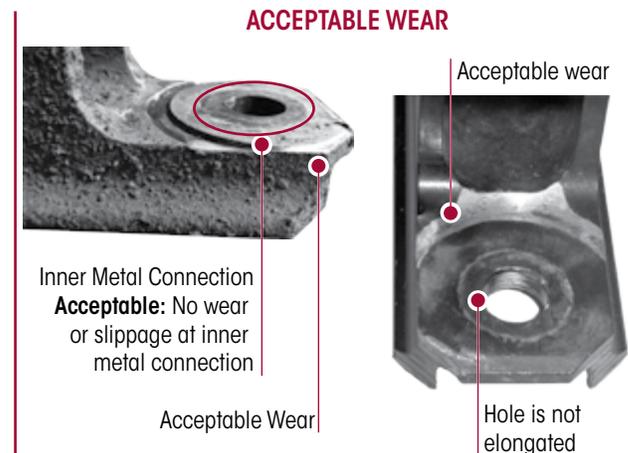


FIGURE 7-15



3. Inspect the hanger, shackle plate, shackle bracket and mating components. If any of the components exhibit any signs of damage or excessive wear, the component and/or mating components require replacement, see Figures 7-14 and 7-15. Refer to the Component Replacement Section of this publication.
4. When component replacement is complete with new fasteners and the truck is at the correct ride height, tighten all six (6) fasteners to $\boxed{241} \pm 25$ foot pounds of torque.
5. Remove the wheel chocks.
6. If components replacement was performed, follow initial 1,000 mile inspection procedure and preventive maintenance.

STEERING KNUCKLE

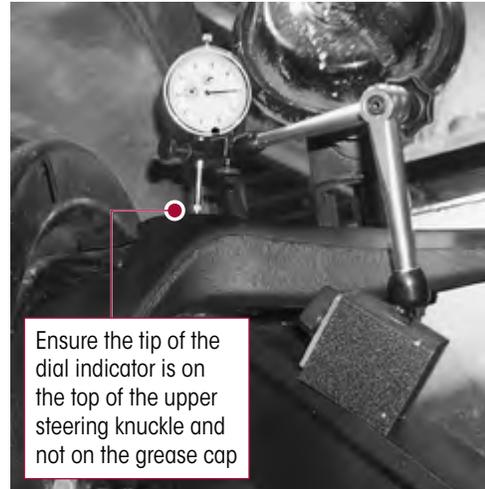
CHECKING VERTICAL END PLAY (UP AND DOWN MOVEMENT)

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.
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 7-16.

- 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", than an upper knuckle adjustment is necessary.

FIGURE 7-16



STEERTEK NXT Axle — Vehicles built **after** November 2011, 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
 - **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
8. Retighten the socket head cap screws to  190 ± 10 foot pounds torque.

NOTE

ONLY if the vehicle is built prior to November 2011 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 — Vehicles built **prior** to November 2011, if the 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
- **Less than 0.008"** — remove shims (Hendrickson part no. 60259-002) between the top of the axle and the bottom of the upper steering knuckle to obtain the proper vertical end play specification

KINGPIN BUSHING WEAR

CHECKING STEERING KNUCKLE LATERAL MOVEMENT

NOTE

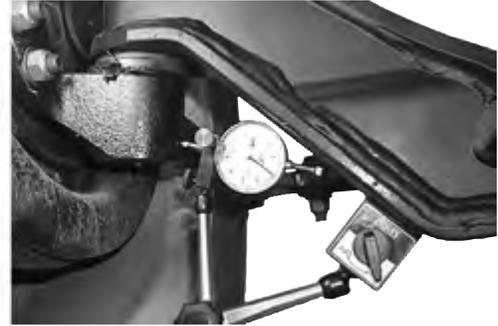
If one (1) bushing is worn or damaged, it is mandatory to replace both the upper and lower bushings on that knuckle assembly.

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 a dial indicator so that the base is onto the axle beam and the indicator tip is on the side of steering knuckle, see Figure 7-17.
 - a. Set the dial indicator to "0" zero.
 - b. Move the top of the tire in and out by applying reasonable constant pressure and then release, see Figure 7-19.
 - c. Check the reading on the dial indicator. If the dial indicator moves more than 0.015", the upper bushing is worn or damaged and replacement is necessary. It is mandatory to replace both the upper and lower kingpin bushings on that knuckle assembly. Refer to the Component Replacement Section of this publication.

FIGURE 7-17
CHECKING UPPER KINGPIN BUSHING



FIGURE 7-18
CHECKING LOWER KINGPIN BUSHING



4. **Checking the lower kingpin bushing**

- a. 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 7-18.
- b. Set the dial indicator to "0" zero.
- c. If one (1) bushing is worn or damaged,
- d. 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 and replacement is necessary. It is mandatory to replace both the upper and lower kingpin bushings on that knuckle assembly. Refer to the Component Replacement Section of this publication.

FIGURE 7-19



SHOCK ABSORBER

NOTE

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

Hendrickson uses a long service life, premium shock absorber on all AIRTEK 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 any applicable warranty. See vehicle manufacturer's applicable publications for other shock absorber inspection requirements.

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

FIGURE 7-20



HEAT TEST

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



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

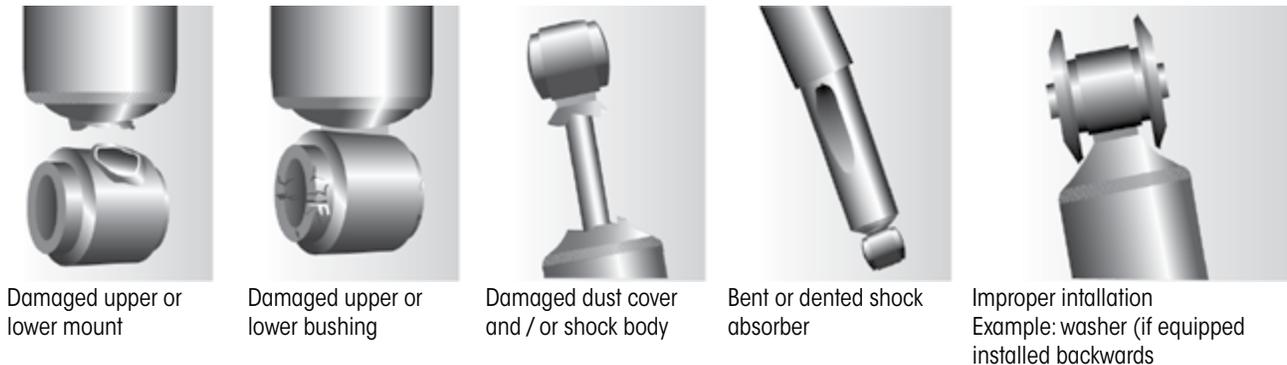
2. Use an infrared thermometer to check the temperature of the shock absorber. This can also be performed by carefully touching the shock absorber body below the dust cover. Touch the frame to get an ambient reference, see Figure 7-20. A warm shock absorber is acceptable, a cold shock absorber should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

VISUAL INSPECTION

Look for these potential problems, see Figure 7-21, when doing a visual inspection. Inspect the shock absorbers fully extended. Replace as necessary.

FIGURE 7-21

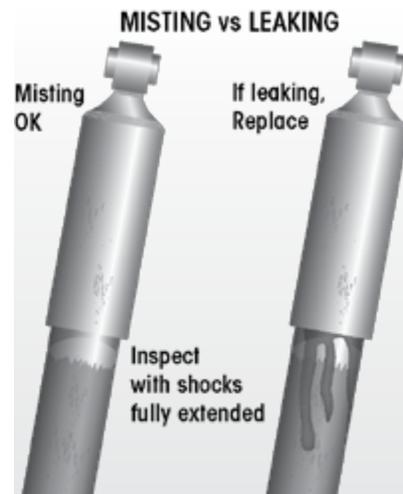
SHOCK ABSORBER VISUAL INSPECTION - UNACCEPTABLE CONDITIONS



LEAKING VS. MISTING SHOCK VISUAL INSPECTION

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

FIGURE 7-22



NOTE

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

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

THRUST WASHER (If equipped)

- **Freightliner** – Vehicles built prior to May 2010 • **Western Star** – Vehicles built prior to June 2010 • **Sterling** – Vehicles built prior to April 2009

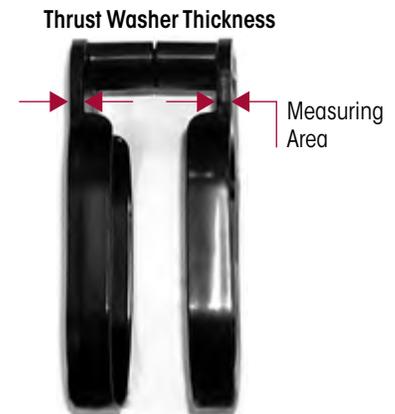
An indication that the rear mount / thrust washers are worn, or need replacement is when the suspension exhibits one or more of the following conditions:

1. Excessive lateral movement of the leaf spring.
2. The leaf spring taper is making contact with the rear hanger clamp or the rear hanger.
3. The location to measure the thrust washer thickness is shown in Figure 7-23. Thickness can be measured with a micrometer or a ruler.
 - The **normal** thickness of a new thrust washer is $\frac{7}{32}$ " (0.22") or 5.6 mm
 - The **minimum** thickness allowable for a thrust washer is $\frac{3}{32}$ " (0.090") or 2.3 mm

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

If one (1) thrust washer is worn out, Hendrickson recommends both thrust washers on that side of the suspension be replaced. The rear hanger clamp should also be replaced with the thrust washers. Inspect the thrust washers on the other side of the vehicle and replace if necessary, see Thrust Washer replacement procedure in the Component Replacement Section of this publication.

FIGURE 7-23



AXLE WRAP LINER (If equipped)

NOTE

Axle wrap liners are only equipped on vehicles built with **STEERTEK** axles built prior to November 2011.

VISUAL INSPECTION

- Axle wrap liners are installed on the STEERTEK axle to help prevent any type of abrasion on the axle at the clamp group area. Any time an axle wrap is removed it is mandatory that the axle wrap liner be replaced.
- Liner Crack Criteria: It is possible for the axle wrap liner to crack during service. If the liner is cracked and all the pieces are intact it is not necessary to replace the liner. If the liner is broken out and there are pieces missing the liner must be replaced immediately, see Figure 7-24. Refer to Axle Wrap replacement in the Component Replacement Section of this publication.

FIGURE 7-24



TIRE INSPECTION

The leading potential causes of tire wear according to TMC (The Technology & Maintenance Council) are the following in order of importance:

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

The following tire inspection guidelines are based upon TMC recommended practices. Any issues regarding irregular tire wear where Hendrickson is asked for assistance, will require tire and alignment maintenance records as described in the TMC literature number RP 642 or TMC "Guidelines for Total Vehicle Alignment" publication.

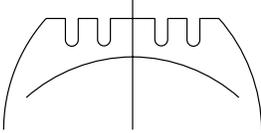
Tire wear is normally the best indicator of vehicle alignment condition. If tires are wearing too rapidly or irregularly, alignment corrections may be needed. The tire wear patterns described below can help isolate specific alignment problems.

The most common conditions of concern are:

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

FIGURE 7-25

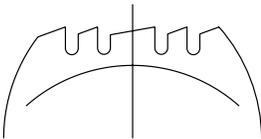
**OVERALL FAST WEAR
(Miles per 32nd)**



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 7-26

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:

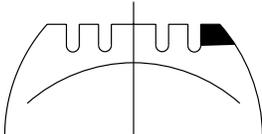
With one hand flat on the tread of the tire and a firm down pressure, slide your hand across the tread of the tire. In one direction, the tire will feel smooth and in the opposite direction there will be a sharp edge to the tread. Typical causes of feather wear include: excessive side force scrubbing, 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 7-27

**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.

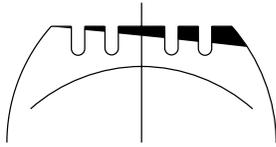
This wear condition is usually caused by excessive toe or excessive camber. These conditions can be created by a misaligned or bent axle and can also be caused by loose or worn wheel bearings.

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 7-28

ONE-SIDED WEAR



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

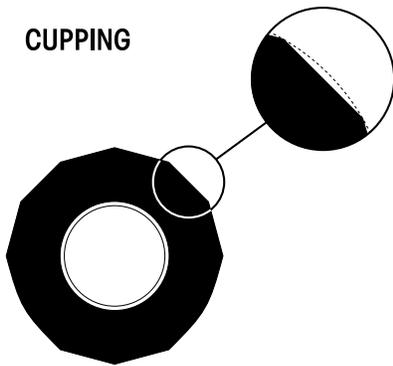
One-sided wear is usually caused by improper alignment, worn kingpins, loose wheel bearings, excessive camber, excessive axle loads, non-parallel axles, or non-uniform tire and wheel assembly caused by improper bead seating or bent wheel.

To correct one-sided wear:

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

FIGURE 7-29

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:

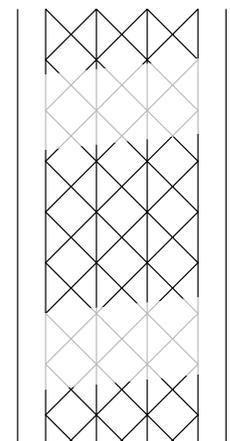
- *Tires* – Correct mismount or balance problem. If ride complaints arise, steer tires may be rotated to drive or trailer axle.
- *Vehicle* – Diagnose component imbalance condition, i.e., wheel, rim, hub, brake, drum. Correct as necessary.

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

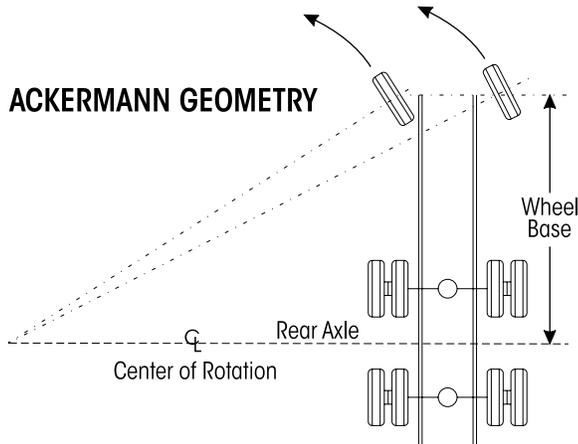
FIGURE 7-30
DIAGONAL WEAR



SECTION 8 Alignment & Adjustments

ALIGNMENT DEFINITIONS

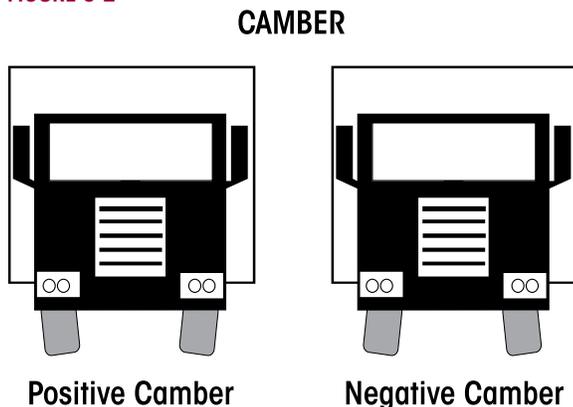
FIGURE 8-1



ACKERMANN STEERING GEOMETRY — The geometry of the four bar linkage consisting of the front axle 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 on one side of the vehicle than the other due to the operational route of the vehicle.

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

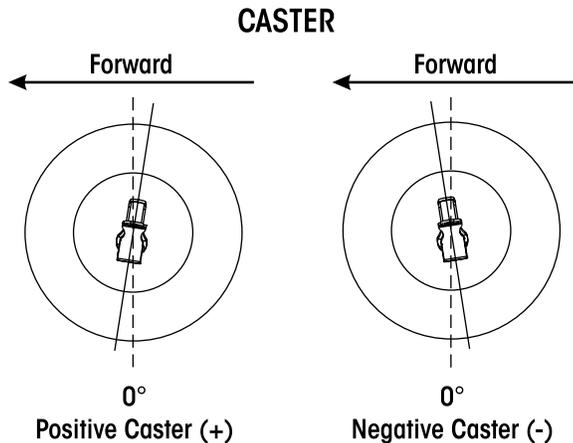
FIGURE 8-2



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

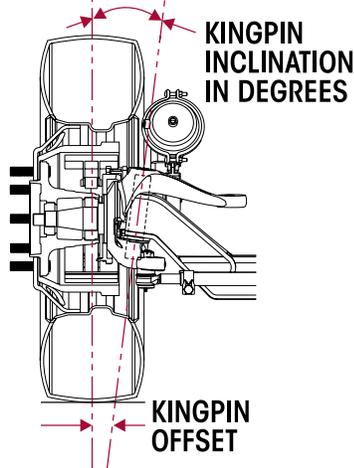
Excessive positive camber may cause smooth wear on the outer half of the tire tread. Excessive negative camber may cause wear on the inner half of the tread. Static-unloaded camber angles are built into the axle to put the loaded tire perpendicular to the road.

FIGURE 8-3



Caster — The forward or rearward tilt of the steering axle kingpin in reference to a vertical line. The angle is measured in degrees. Caster is positive when the top of the steering axis is tilted rearward and is negative when the tilt is forward. Proper caster is important for directional stability and returnability. Too much positive caster can cause shimmy, excessive steering effort and is normally a vehicle performance and handling consideration. Uneven positive caster may create a steering pull toward the side with the lower caster. This attribute may be used to compensate for crowned roads.

FIGURE 8-4

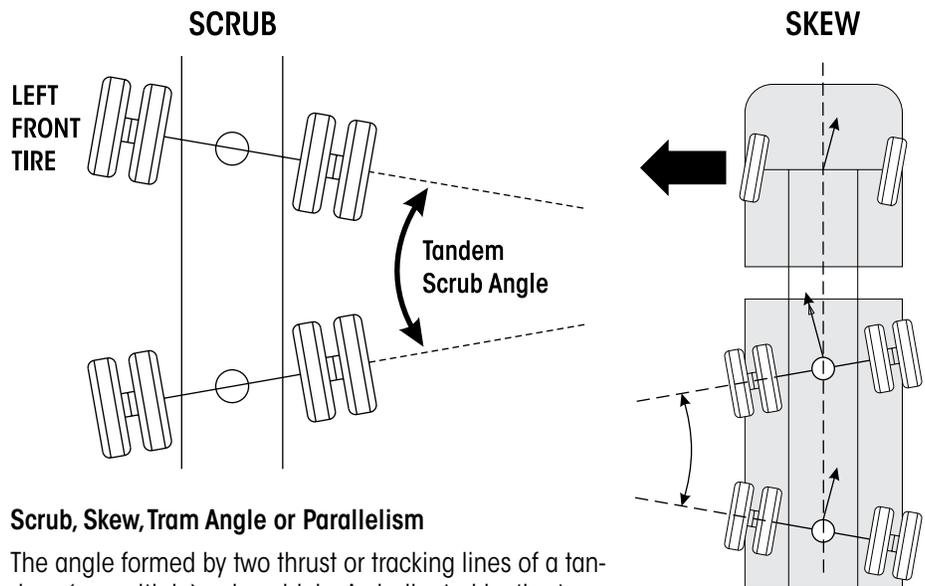


Kingpin Inclination — The inward tilt of the kingpin from the vertical. This front suspension parameter has a pronounced effect on steering effort and returnability. As the front wheels are turned around an inclined kingpin, the front of the truck is lifted. This lifting of the vehicle is experienced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

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

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

FIGURE 8-5

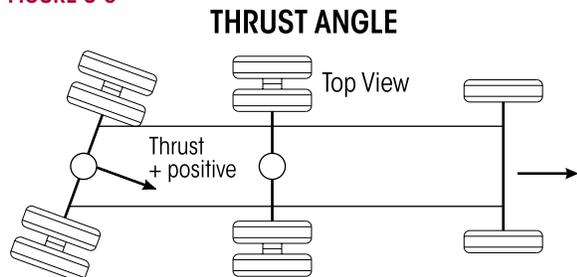


Scrub, Skew, Tram Angle or Parallelism

The angle formed by two thrust or tracking lines of a tandem (or multiple) axle vehicle. As indicated by the term "parallelism", the ideal condition is when the two thrust lines form a 0° angle, or are parallel to each other. Positive skew or tram is when the distance between the right axle ends is less than the distance between the left.

Any scrub angle other than 0° will cause the tandem axles to work against each other. The steer axle must be turned to offset the "push" of the tandem axles to keep the vehicle moving straight ahead. This causes every tire on the vehicle to "scrub". Tire wear from tandem scrubbing occurs at the leading edge of the steer tires in a pattern called "inside / outside" wear, that is, the inside edge of the left steer tire and the outside edge of the right steer tire will exhibit irregular wear for example. Additional tire wear may occur on all tandem axle tires.

FIGURE 8-6

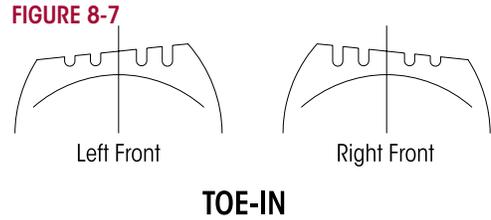


Thrust Angle, Tracking, or Square — The angle formed by the centerline of the vehicle frame (geometric centerline) and the direction that an axle points. As indicated by the term "square", the ideal value for the angle is 0° or when the axle centerline is at 90° or perpendicular to the geometric centerline.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

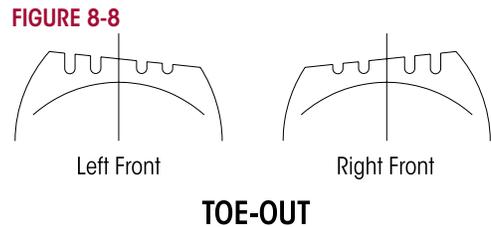
A steering correction is required to offset the effect of the thrust angles and keeps the vehicle traveling in a straight line. It results in a lateral offset between the steer and drive axle tires commonly referred to as "dog tracking."

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.

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.

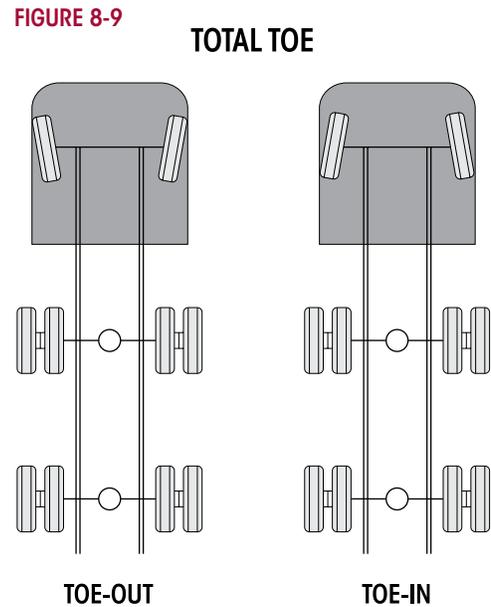


Toe-out — Is when the horizontal lines intersect behind the wheels, or the wheels are closer together in back than in front. Toe-in is commonly designated as positive, toe-out as negative. Excessive toe-out wears the inside edge of the tires. Steer axle toe is adjustable to reduce wear to the leading 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 turning angles, the more that toe and camber change. If you have any doubt regarding the optimum turning angles for your operation, contact the vehicle's manufacturer, axle OEM, tire OEM and alignment equipment manufacturer for advice.

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



INSPECTION PRIOR TO ALIGNMENT

WHEELS AND TIRES

Examine the following items:

- The tires are inflated to the vehicle manufacturer's specified tire pressure
- The steer axle tires are the same size and type
- The lug nuts are tightened to the vehicle 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 vehicle manufacturer's 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 the vehicle 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 vehicle manufacturer on rear axles and suspensions. Reference the TMC (The Technology & Maintenance Council) Guidelines for Total Vehicle Alignment.

FRONT WHEEL ALIGNMENT

Hendrickson recommends technicians review The Technology & Maintenance Council's publication (TMC) "Guidelines for Total Vehicle Alignment" (TMC RP 642).

Check total (front and rear) vehicle wheel alignment when any of the following occurs:

- Every 80,000 to 100,000 miles, or 12-18 months (normal maintenance)
- When the vehicle does not steer correctly
- To correct a tire wear condition

For rear wheel alignment specifications and adjustments refer to the vehicle manufacturer. The AIRTEK front wheel alignment specifications can be found in the Alignment Specifications Section of this publication. There are two types of front wheel alignment:

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 toe.
4. Check and adjust the vehicle ride height as specified in the Preventive Maintenance Section of this publication.

MAJOR FRONT WHEEL ALIGNMENT

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

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

1. Inspect all the systems that influence the wheel alignment. Refer to "Inspection Prior to Alignment" in this section.
2. Check and adjust the maximum turn angle, refer to "Steering Stop Adjustment Procedure" in this section, see Figures 8-10 and 8-11.

FIGURE 8-10



FIGURE 8-11



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. Check the turning angle (toe-out during vehicle turns or the Ackermann angle). Refer to original equipment manufacturer specifications.

5. Check the kingpin (or steering axis) inclination. Refer to “Kingpin Inclination”, under Alignment Definitions in this section.



AXLE CAMBER IS NOT ADJUSTABLE. DO NOT CHANGE THE AXLE CAMBER ANGLE OR BEND THE AXLE BEAM. BENDING THE AXLE BEAM TO CHANGE THE CAMBER ANGLE CAN DAMAGE THE AXLE AND REDUCE AXLE STRENGTH, AND WILL VOID HENDRICKSON'S WARRANTY. A BENT AXLE BEAM CAN CAUSE LOSS OF VEHICLE CONTROL, POSSIBLY CAUSING PERSONAL INJURY OR PROPERTY DAMAGE, SEE FIGURE 8-12.



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 integrated axle spring seats and / or fasteners.

FIGURE 8-12



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

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.

7. Check and adjust caster angle. Refer to “Caster” under Alignment Definitions in this section.

NOTE

The **use of two (2) 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.

8. Check and adjust toe-in, refer to adjusting the “Toe-In” under Alignment Definitions of this section.

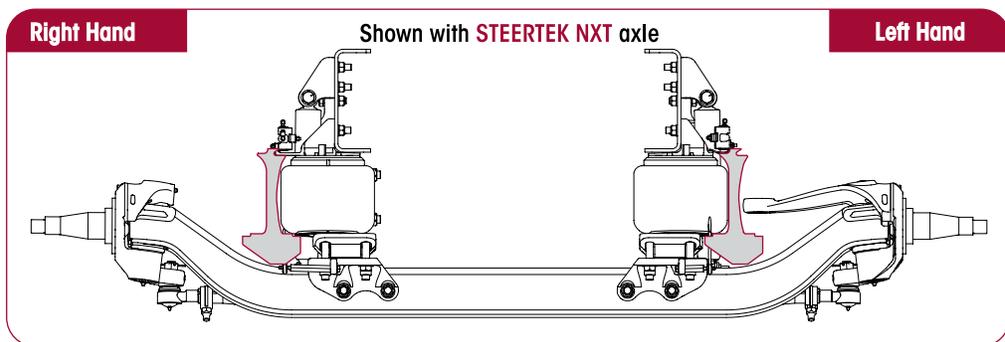
RIDE HEIGHT VERIFICATION

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

1. Drive the vehicle onto a level surface.
2. Free and center all suspension joints by slowly moving vehicle back and forth several times without using the brakes. It is **IMPORTANT** when coming to a complete stop to verify the brakes are released.
3. Chock drive wheels. **DO NOT** set parking brake.

4. Verify that the air system is at full operating pressure.
5. See Air Spring Safety Notice in the Important Safety Notice Section of this publication prior to deflating or inflating the suspension system.
6. 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 arms.
7. Re-attach the upper grommet of the height control valve linkages onto the upper studs to fill the suspension system with air. Wait until the airflow to the front air springs has stopped.
8. The ride height is measured at the front of the air spring. Place the gauge, (Hendrickson AIRTEK ride height gauge, Literature Number 45745-159) so the flat surface of the gauge is against the side of the frame rail, the horizontal flat is sitting below the height control valve brackets on each side. Align the bottom of the height gauge to the air spring piston flange as shown in Figure 8-13. Verify that the air spring height is within the **"ACCEPTABLE"** tolerance indicated on the gauge.

FIGURE 8-13



9. If the air spring piston flange edge is in contact to the **"BELOW SPEC"** region, the ride is set too low. If the air spring piston flange contacts the **"ABOVE SPEC"** region, the ride height is set too high. If the ride height is out of specification it will be necessary to adjust the ride height.
10. If a ride height gauge is not available, measure the suspension referenced ride height on the front axle (top front of the air spring to the bottom of the air spring piston flange height $7\frac{7}{8} \pm \frac{1}{8}$ "). If the referenced ride height is out of specification, it will be necessary to adjust the ride height.

ADJUSTMENT PROCEDURE

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

SERVICE HINT

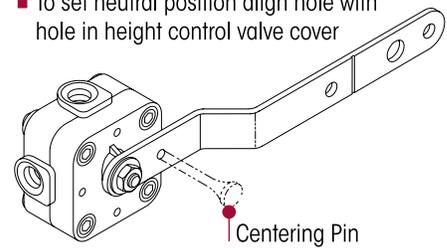
It is very important that the leveling valve be cycled completely before and after any ride height adjustments. Cycling of the leveling valve will help make the adjustment more accurate.

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 upper rubber grommet(s) of the height control valve linkage(s) from the upper 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.

FIGURE 8-14

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



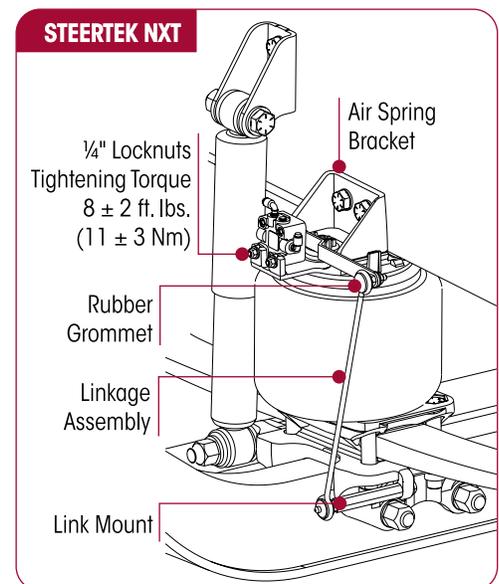
NOTE

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.

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.
9. 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.
10. If equipped with:
 - **Single height control valve** – Facing the air spring from the outboard side of the vehicle, pivot the valve body counter clockwise to increase the ride height and clockwise to decrease the ride height.
 - **Dual height control valve** – Facing the air spring from the outboard side for the **left** side of the vehicle, pivot the valve body clockwise to increase the ride height and counter clockwise to decrease the ride height. For the **right** side of the vehicle, pivot the valve body counter clockwise to increase the ride height and clockwise to decrease the ride height.

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

FIGURE 8-15



16. Repeat adjustment Steps 2 through 12 until the air spring piston flange aligns into the "ACCEPTABLE" region of the gauge, see Figure 8-13.

DAY CAB RIDE HEIGHT ADJUSTMENT

1. Chock the wheels.
2. See Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to deflating or inflating the air system.
3. Inflate the air system to the vehicle operating air pressure.
4. Disconnect the height control valve link from the height control valve arm.
5. Lower the height control valve arm to exhaust the air from the air springs.
6. Inflate the suspension by raising the height control valve arm.
7. Continue to inflate the air springs until the height of the air springs are above 7 $\frac{7}{8}$ " as measured from the bottom of the upper air spring bracket to the bottom of the air spring piston flange.
8. If the ride height gauge is being used continue inflation until the air springs are above specification as noted on the gauge.
9. Lower the arm to deflate the air springs until the air springs are at the height of 7 $\frac{7}{8}$ " as measured from the designated points or until the air spring height is in the acceptable range on the gauge.
10. Once the air springs are at the 7 $\frac{7}{8}$ " ride height center the height control valve arm in the center of the dead band.
11. Insert a golf tee through the height control valve arm and into the height control valve body.
12. Move the height control link so it is in-line with the mounting stud on the height control valve arm.
13. The tapered tip of the mounting stud should index the hole in the rubber grommet on the height control valve link.
14. If the tapered stud does not line up with the grommet, loosen the two (2) $\frac{1}{4}$ " mounting nuts on the upper air spring bracket.
15. Rotate the height control valve until the tapered stud lines up with the hole in the rubber grommet.
16. Tighten the two (2) mounting nuts.
17. Remove the golf tee and lower the height control valve arm to deflate the suspension.
18. Reconnect the height control valve arm to the height control valve link.
19. Allow the suspension to completely inflate.
20. Recheck the ride height with the gauge or by measuring from the previously designated points.
21. Repeat until the proper ride height is achieved.

STEERING STOP

ADJUSTMENT PROCEDURE

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



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

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

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 8-16.

FIGURE 8-16

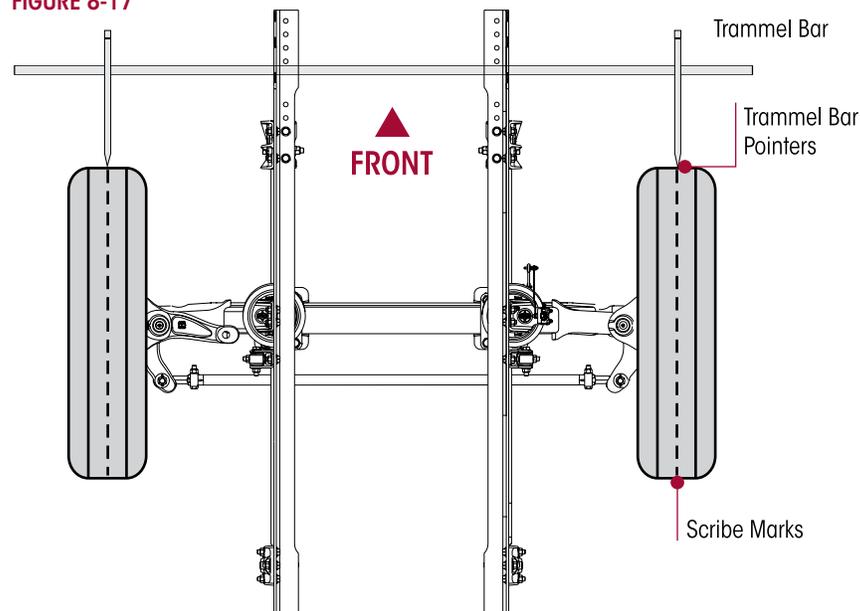
5. Decrease the wheel cut by loosening the jam nuts and screw the axle stops out counter-clockwise.
6. Tighten the jam nuts to 50 ± 10 foot pounds.
7. Measure the wheel cut and check for any interference with related steering components.



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.

FIGURE 8-17



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 8-17.

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.

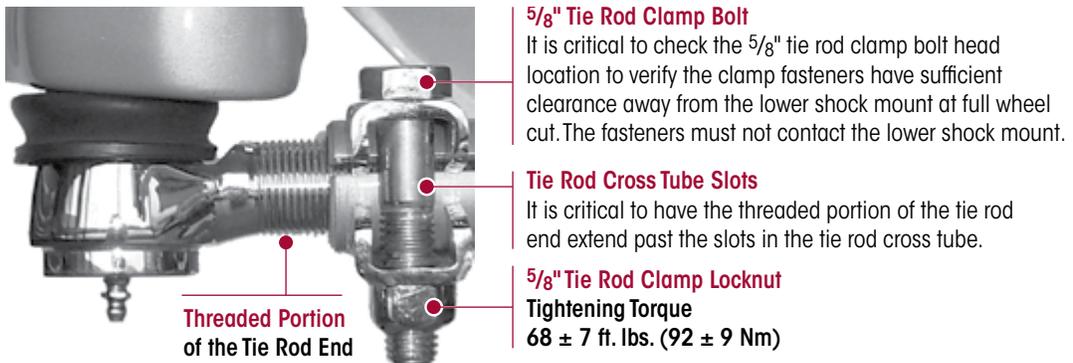
9. To calculate the toe setting subtract the front measurement from the rear measurement, the difference between the two will equal the toe-in / toe-out measurement.
10. If the toe measurement is not within the specifications of $\frac{1}{16}'' \pm \frac{1}{32}''$ (0.060 ± 0.030), it will be necessary to adjust the toe setting. Refer to the following procedure.
 - a. Loosen the tie rod cross tube clamp bolts and locknuts.
 - b. Turn the tie rod cross tube until the specified toe-in distance is achieved.

WARNING

THE THREADED PORTION OF THE TIE ROD END MUST EXTEND PAST THE SLOTS INTO THE TIE ROD CROSS TUBE, SEE FIGURE 8-18. FAILURE TO DO SO CAN CAUSE COMPONENT TO FAIL CAUSING LOSS OF VEHICLE CONTROL AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

- c. Tighten the bolt and locknut on the tie rod cross tube to  68 ± 7 foot pounds torque.

FIGURE 8-18



WARNING

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

11. Verify the $\frac{5}{8}''$ tie rod clamp bolt head does not contact the lower shock mount at full wheel cut.
12. Repeat Steps 1-9 until the correct toe setting is achieved.

SPRING EYE RE-TORQUE

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

NOTE After January 2007, Hendrickson front hangers, (Part Nos. 59832-001, 59832-002, 60573-001, 60573-002) were no longer used in production in the United States, although still available for component replacement in the aftermarket. Vehicles equipped with a non-Hendrickson hangers, see the vehicle manufacturer for assistance with maintenance and rebuild instructions.

RE-TORQUE PROCEDURE

1. Chock the wheels.
2. Remove the front fairing or air tank(s) if equipped.



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.

3. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to deflating or inflating the air system.
4. Deflate the air springs by removing the height control valve linkage and lowering the linkage arm. This will exhaust the air pressure in the air springs.



CAUTION

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.

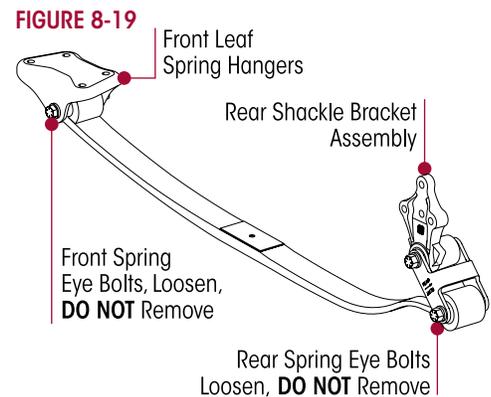
5. Disconnect the air lines to the air springs.
6. Raise the truck and install frame stands in front of the leaf spring hangers under the radiator area or behind the rear spring mounts.



WARNING

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

7. Lower the front axle. Allow at least 3" of wheel clearance to the ground. The shock absorbers must be connected. **DO NOT** reverse arch springs.
8. Loosen all four (4) front and rear spring eye bolts, see Figure 8-19. The suspension may drop down slightly. **DO NOT** remove the spring eye bolts. The tires must not contact the ground.



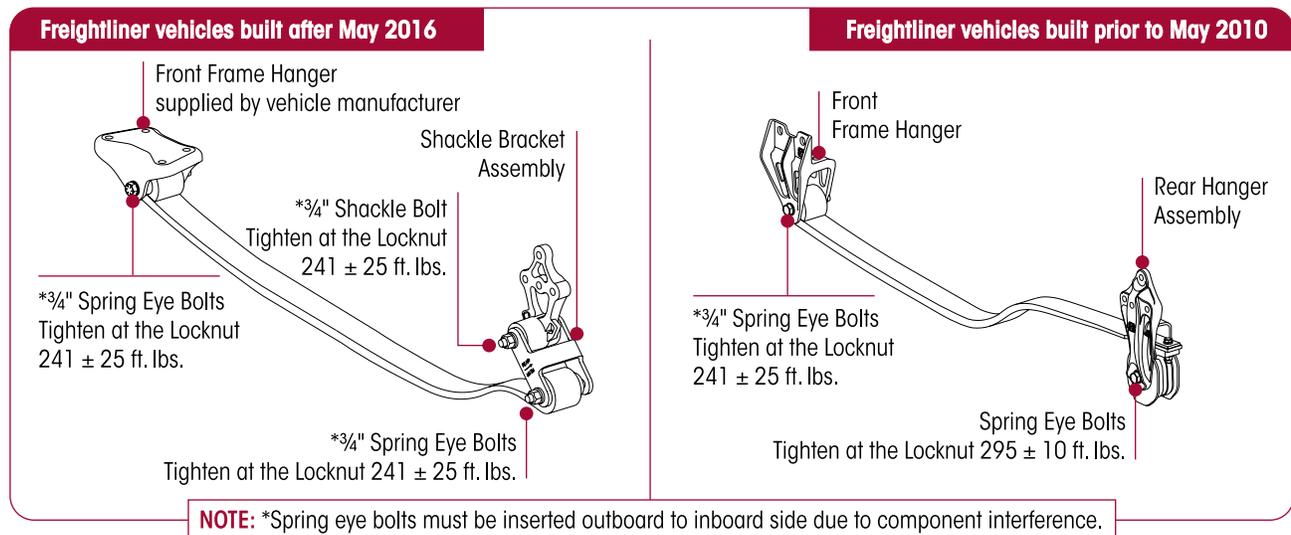
9. Let the suspension settle.
10. Tighten the front spring eye locknuts to:
 - **STEERTEK NXT Axle** — Refer to vehicle manufacturer's torque specifications
 - **STEERTEK Axle** — Refer to Torque Specifications Section of this publication
11. Tighten the rear spring eye locknuts to the torque specified in the Torque Specifications Section of this publication, see Figure 8-20.
12. Jack the front axle and remove the frame stands.
13. Lower the vehicle.
14. Check the air springs to verify that they are seated properly and install the air lines into the air springs.



WARNING

WHEN SERVICING THE VEHICLE OR ATTACHING AN AIR SPRING, PRIOR TO AIRING UP THE SUSPENSION SYSTEM, MAKE CERTAIN THE AIR SPRING LOCATOR IS INDEXED INTO THE UPPER AIR SPRING BRACKET PROPERLY, THE LOCK TABS ARE SNAPPED INTO PLACE, AND THE AIR SPRING IS FULLY SEATED ON THE AIR SPRING BRACKET. FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN PREMATURE AIR SPRING FAILURE AND CAUSE PERSONAL INJURY, OR PROPERTY DAMAGE.

FIGURE 8-20



15. Reconnect the height control valve and air up the system.
16. Affix a straight edge to the bottom of the frame rail in front of the air spring, see Figure 8-21.
17. 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.
18. Measure the difference from one side to the other.
19. Do a road test and repeat measurement Steps 14 to 17.
20. If the measurement is less than 3/8" then attach the front fairing. If measurement is more than 3/8" contact Hendrickson Tech Services.

FIGURE 8-21



SECTION 9 Component Replacement

FASTENERS

Hendrickson recommends that when servicing the vehicle to replace the removed fasteners with new equivalent fasteners for AIRTEK and STEERTEK NXT / STEERTEK components. Maintain correct torque values at all times. Check torque values as specified. See Hendrickson's Torque Specification Section of this publication. If non-Hendrickson fasteners are used follow torque specifications listed in the vehicle manufacturer's service manual.

HEIGHT CONTROL VALVE

DISASSEMBLY

1. Drain the air from the secondary air tank.



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.

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



CAUTION

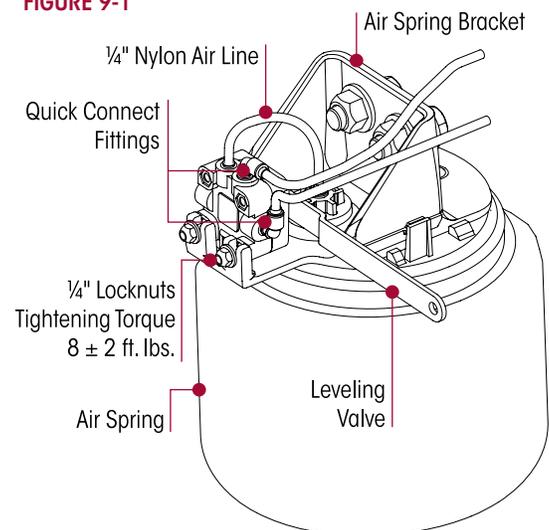
THE PUSH TO CONNECT FITTINGS ON AIRTEK AIR SPRING AND HEIGHT CONTROL VALVES ARE NON SERVICEABLE. IF THE AIR SPRING IS TO BE REINSTALLED; CARE MUST BE TAKEN TO REMOVE DIRT AND DEBRIS FROM THE PUSH-TO-CONNECT FITTING. FAILURE TO DO SO CAN RESULT IN THE PUSH-TO-CONNECT FITTING FAILING TO SEAL PROPERLY WITH THE AIR LINE.

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 (2) ¼" mounting nuts and washers.
6. Remove the height control valve.

ASSEMBLY

1. Attach the height control valve on the mounting bracket 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 the flange of the upper air spring bracket, see Figure 9-2.

FIGURE 9-1



SERVICE HINT

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

3. Attach the air lines to the height control valve, 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 ± 2 pounds torque.

FIGURE 9-2

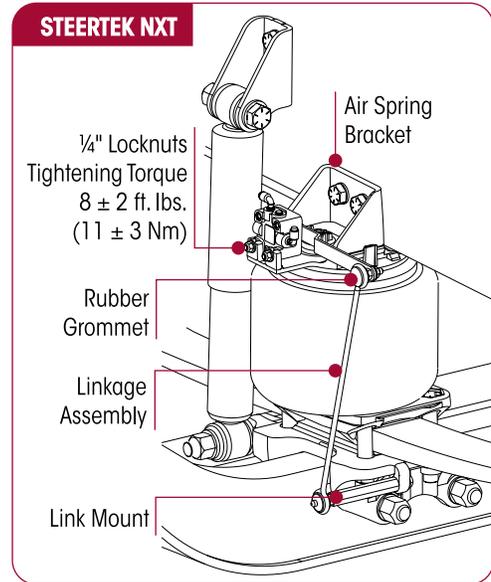
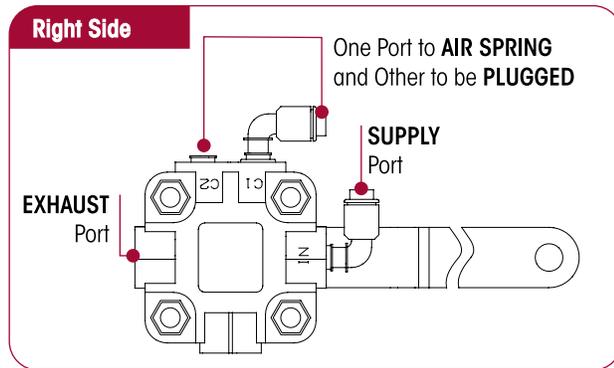
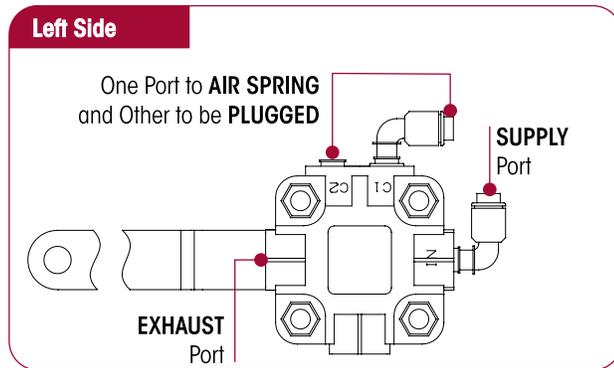


FIGURE 9-3



AIR SPRING

DISASSEMBLY

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



WHEN SERVICING THE VEHICLE OR ATTACHING AN AIR SPRING, PRIOR TO AIRING UP THE SUSPENSION SYSTEM, MAKE CERTAIN THE AIR SPRING LOCATOR IS INDEXED INTO THE UPPER AIR SPRING BRACKET PROPERLY, THE LOCK TABS ARE SNAPPED INTO PLACE, AND THE AIR SPRING IS FULLY SEATED ON THE AIR SPRING BRACKET. FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN PREMATURE AIR SPRING FAILURE AND CAUSE PERSONAL INJURY, OR PROPERTY DAMAGE.



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 COULD RESULT IN THE PUSH-TO-CONNECT FITTING FAILING TO SEAL WITH THE AIR LINE.



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.

3. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to deflating or inflating the air system.
4. Raise the truck with floor jack.

5. Support the frame with frame stands.
6. Lower the axle.
7. Remove the air from the air system by disconnecting the height control valve linkage at the rubber grommet and allowing the lever to drop. This will exhaust air from the system.
8. Separate the air spring from the upper air spring bracket by applying downward pressure on air spring, see Figure 9-4, pushing outward on the lock-tabs outside the bracket, and inward on inlet lock-tabs, see Figure 9-6 for lock locations. This will dislodge the air spring from the upper air spring bracket.
9. 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 9-5.
10. Remove the air spring.

FIGURE 9-4



FIGURE 9-5



FIGURE 9-6

ASSEMBLY

1. 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. Make sure the lock tabs click in place.
2. 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 (4) lock-tabs are engaged, see Figure 9-6.
3. Properly seat the air spring piston into the top axle pad and install the air line into the air spring.



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.

WARNING

WHEN SERVICING THE VEHICLE OR ATTACHING AN AIR SPRING, PRIOR TO AIRING UP THE SUSPENSION SYSTEM, MAKE CERTAIN THE AIR SPRING LOCATOR IS INDEXED INTO THE UPPER AIR SPRING BRACKET PROPERLY, THE LOCK TABS ARE SNAPPED INTO PLACE, AND THE AIR SPRING IS FULLY SEATED ON THE AIR SPRING BRACKET. FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN PREMATURE AIR SPRING FAILURE AND CAUSE PERSONAL INJURY, OR PROPERTY DAMAGE.

 **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.
5. Raise the vehicle.
6. Remove the frame stands and lower the frame.
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.

SHOCK ABSORBER

NOTE

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

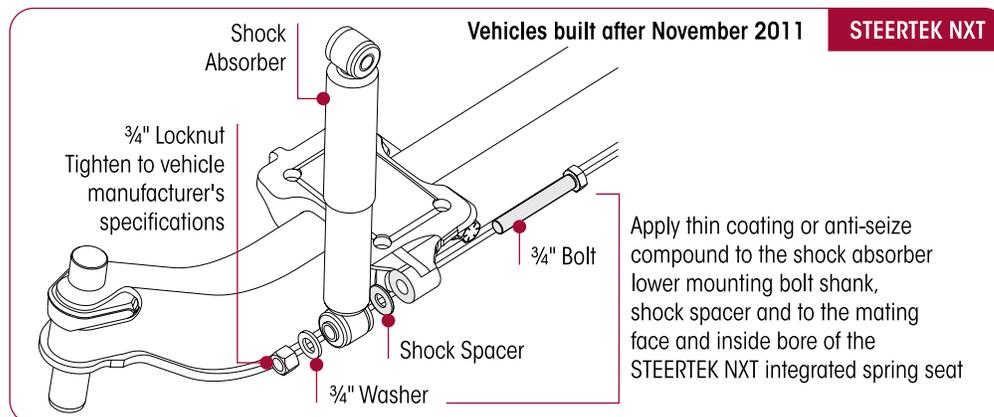
DISASSEMBLY

1. Place the vehicle on a level floor.
2. Chock the wheels.
3. Remove the lower mounting bolts, fasteners, and spacer.
4. Remove the upper mounting bolts and fasteners.
5. Slide out the shock absorber.
6. Inspect the shock absorber mounting brackets and hardware for damage or wear, replace as necessary.

ASSEMBLY

1. Install the shock absorber into the upper mounting bracket.
2. Install the upper shock mounting bolt, washers and locknut.
3. Vehicles built with:
 - **STEERTEK NXT Axle**, Figure 9-7
 - 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 9-7.
 - 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 9-7.
 - c. Tighten the shock eye locknuts to vehicle manufacturer's specifications.
 - d. Proceed to Step 4.

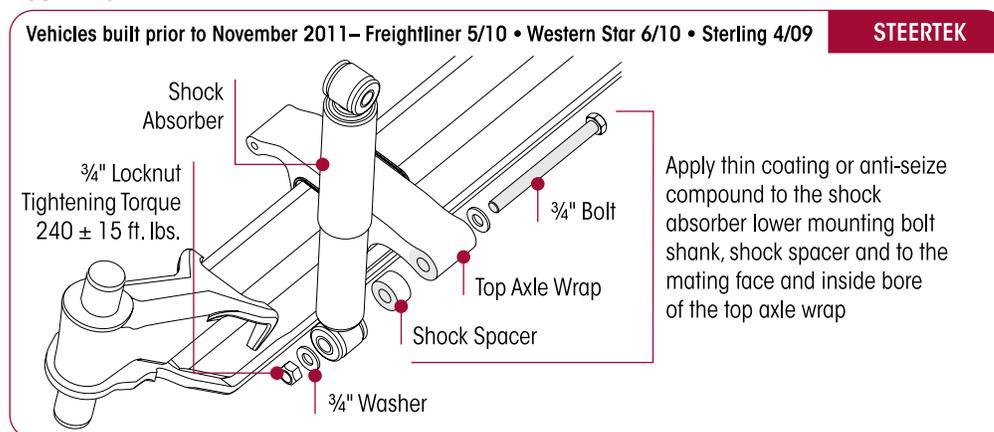
FIGURE 9-7



■ **STEERTEK Axle**, Figure 9-8

- 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 9-8.
 - 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 9-8.
 - c. Proceed to Step 4.
4. Tighten the shock eye locknuts to \mathbb{R} 240 \pm 15 foot pounds torque.
 5. Remove the wheel chocks.

FIGURE 9-8



FRONT LEAF SPRING HANGER

NOTE

After January 2007, Hendrickson front hangers, (Part Nos. 59832-001, 59832-002, 60573-001, 60573-002) were no longer used in production in the United States, although still available for component replacement in the aftermarket. Vehicles equipped with a non-Hendrickson hangers, see the vehicle manufacturer for assistance with maintenance and rebuild instructions.

DISASSEMBLY

1. Place the vehicle on level floor.
2. Chock the wheels.
3. Raise the frame.
4. Support the frame with frame stands.
5. Suspend the front axle from the shock absorbers.

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.

6. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to deflating or inflating the air system.
7. Deflate the air springs by removing the height control valve linkage at the rubber grommet and lowering the height control linkage arm. This will exhaust the air pressure in the air springs.

CAUTION

THE PUSH TO CONNECT FITTINGS ARE NON SERVICEABLE. IF THE AIR SPRING IS TO BE REINSTALLED; 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 PROPERLY WITH THE AIR LINE.

8. Disconnect the air lines at the air springs.
9. Remove the front leaf spring eye mounting bolt and hardware.

SERVICE HINT

A bottle jack may be required to raise the axle slightly in order to remove mounting bolt, then lower until front spring eye is clear of hanger.

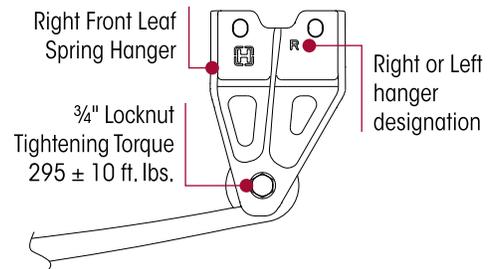
10. Remove the frame mounting fasteners from the hanger. See the vehicle manufacturer's guidelines for huck removal, if equipped.
11. Remove the front hanger.
12. Inspect the front hanger mounting surfaces on the frame for cracks or fretting.
13. Inspect the front spring eye bushing for damage or excessive wear. If damaged or worn excessively replacement is necessary, see the Spring Eye Bushing Replacement in this section.

ASSEMBLY

1. Install the new hanger flush to the bottom of the frame. Left and Right hanger designation is located on outboard of the hanger, see Figure 9-9.

2. Install the new frame hardware. See vehicle manufacturer's guidelines.

FIGURE 9-9



SERVICE HINT

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

3. Install the 3/4" spring eye bolt. Tighten 3/4" locknut to  295 ± 10 foot pounds torque. See Spring Eye Re-torque Procedure in the Alignment & Adjustments Section of this publication.
4. Raise the truck and remove the jack stands or frame support.
5. Lower the vehicle and reconnect the air lines to the air springs.

WARNING

WHEN SERVICING THE VEHICLE OR ATTACHING AN AIR SPRING, PRIOR TO AIRING UP THE SUSPENSION SYSTEM, MAKE CERTAIN THE AIR SPRING LOCATOR IS INDEXED INTO THE UPPER AIR SPRING BRACKET PROPERLY, THE LOCK TABS ARE SNAPPED INTO PLACE, AND THE AIR SPRING IS FULLY SEATED ON THE AIR SPRING BRACKET. FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN PREMATURE AIR SPRING FAILURE AND CAUSE PERSONAL INJURY, OR PROPERTY DAMAGE.

6. Check the air springs to verify that they are properly seated to the air spring brackets and top pad.
7. Install the height control valve linkage assembly.
8. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to deflating or inflating the air system.
9. Air up the system.
10. Remove wheel chocks.

SHACKLE BRACKET ASSEMBLY

- **Freightliner** – Vehicles built after May 2016
- **Western Star** – Vehicles built after June 2010

NOTE Shackle bracket assemblies and leaf springs for vehicles built prior to May 2016 are no longer available and require a conversion replacement to current production Leaf Spring Assembly and Shackle Bracket Assembly components, refer to the Parts List Section of this publication for the proper aftermarket service kits for your vehicle.

DISASSEMBLY

1. Place the vehicle on level floor.
2. Chock the wheels.
3. Raise the frame. Support the vehicle with frame stands.
4. Suspend the front axle from the shocks.

WARNING

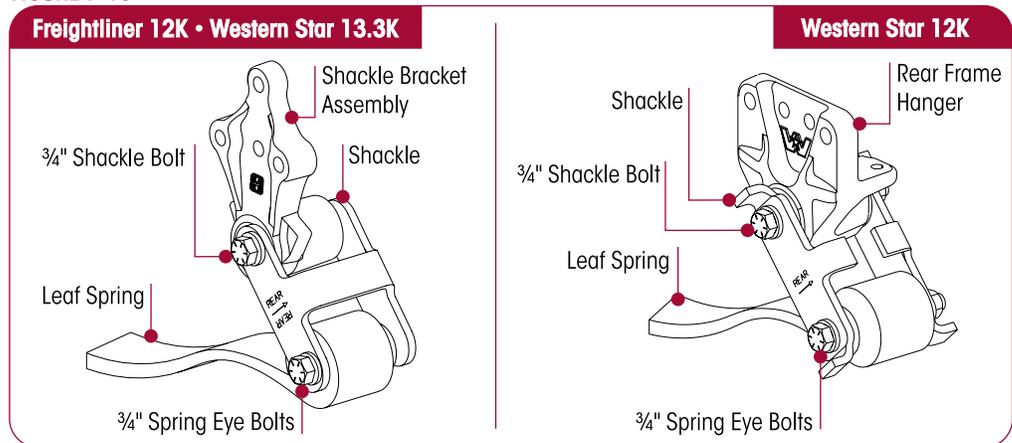
PRIOR TO AND DURING DEFLATION AND INFLATION OF THE FRONT AIR SUSPENSION SYSTEM, ENSURE THAT ALL PERSONNEL AND EQUIPMENT ARE CLEAR FROM UNDER THE VEHICLE AND AROUND THE SERVICE AREA, FAILURE TO DO SO CAN CAUSE SERIOUS PERSONAL INJURY, DEATH, OR PROPERTY DAMAGE.

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. Deflate the air springs by removing the height control valve linkage and lowering the leveling valve arm. This will exhaust the air pressure in the air springs.
7. Remove the air lines from the air springs.
8. Remove the rear 3/4" 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 rear spring eye bolt.

9. Remove the frame fasteners from the shackle bracket per vehicle manufacturer's guidelines.
10. Remove the shackle bracket assembly from the vehicle, see Figure 9-10.
11. Inspect the shackle and shackle bracket assembly for excessive wear or damage.
12. If damaged or worn excessively, replace with Genuine Hendrickson Parts.

FIGURE 9-10



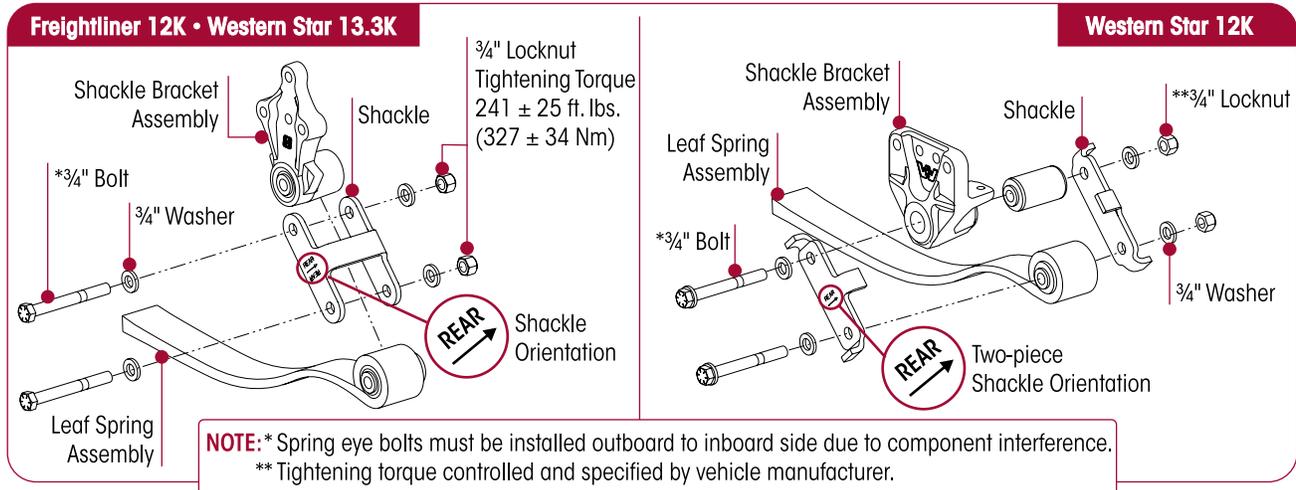
ASSEMBLY

NOTE Verify the orientation of the shackle prior to installation, see Figure 9-11.

1. Install the shackle bracket assembly on the frame.

2. Install new frame fasteners per the vehicle manufacturer's guidelines.
3. Install the shackle to shackle bracket assembly with the 3/4" bolts, washers and locknuts. Snug the shackle bolts, **DO NOT** tighten at this time.

FIGURE 9-11



4. Install the shackle to leaf spring assembly. Ensure the spring eye bolts are installed outboard to inboard side due to component interference, see Figure 9-11. **DO NOT** tighten at this time.
5. Remove the frame stands and lower frame.
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. Install the air lines into the air springs.
8. Install the height control valve linkage and inflate the suspension to normal ride height.
9. With the vehicle at the proper ride height, tighten 3/4" shackle locknuts to  241 ± 25 foot pounds torque, see Figure 9-11.
10. Remove the wheel chocks.

REAR SPRING HANGER

- **Freightliner** – Vehicles built prior to May 2010 • **Western Star** – Vehicles built prior to June 2010 • **Sterling** – Vehicles built prior to April 2009

DISASSEMBLY

1. Place the vehicle on level floor.
2. Chock the wheels.
3. Raise the frame.
4. Support the frame with frame stands.
5. Suspend the front axle from the shock absorbers.



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.

6. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to deflating or inflating the air system.
7. Deflate the air springs by detaching the upper rubber grommet of the height control valve linkage from the upper stud and exhaust the suspension system air by lowering the height control valve linkage arm.

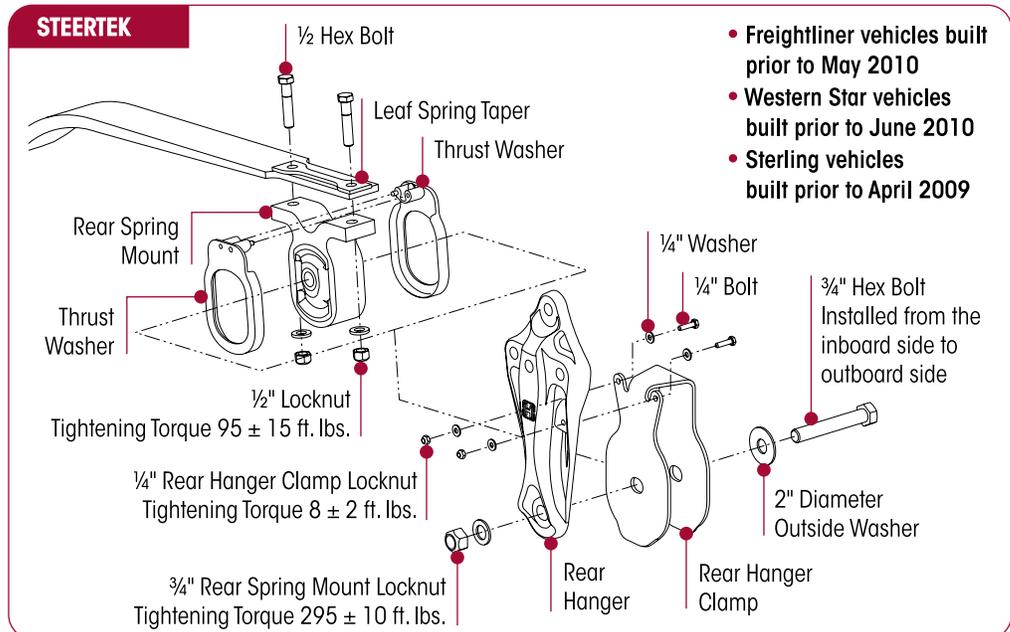
- Remove the air lines from air springs.

SERVICE HINT

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

- Remove the 3/4" rear spring mount fasteners, see Figure 9-12.
- Remove the two (2) 1/4" x 1" hex bolts from the rear hanger and clamp, see Figure 9-12.
- Remove and discard the rear spring hanger frame mounting fasteners per the vehicle manufacturer's guidelines.
- Remove the rear hanger from the vehicle, see Figure 9-12.

FIGURE 9-12



- Remove the rear hanger clamp from the rear spring mount.
- Remove the two (2) thrust washers from the rear spring mount.

INSPECTION

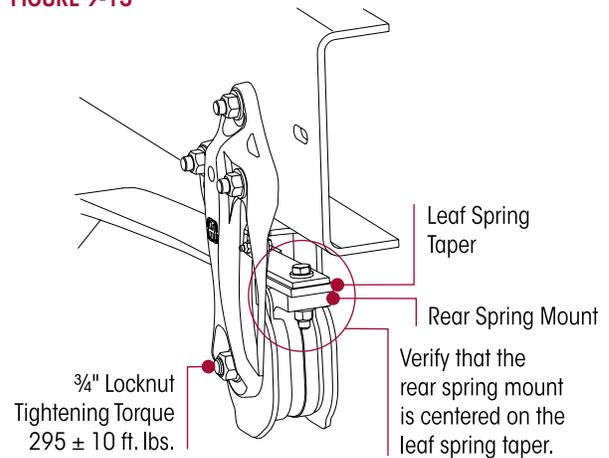
- Inspect the rear spring mount, rear hanger clamp and both thrust washers for excessive wear or damage, see Thrust Washer Inspection in the Preventive Maintenance Section of this publication.
- If damaged or worn excessively, replace with Genuine Hendrickson Parts as detailed in this section.

ASSEMBLY

- Install the thrust washers on the rear spring mount.
- Install the rear spring hanger on the frame.
- Install new frame mounting fasteners. Follow vehicle manufacturer's guidelines.
- Slide the rear hanger clamp over the rear spring mount.
- Install the two (2) 1/4" bolts and fasteners into rear hanger clamp and rear hanger assembly. Tighten 1/4" locknuts to 8 ± 2 foot pounds torque, see Figure 9-12.
- Raise the axle to install the rear spring mounts into the rear hanger clamps.
- Place the 2" outside diameter washer against the rear hanger clamp on the inboard side, see Figure 9-12.

8. Install $\frac{3}{4}$ " x 5" rear spring mount bolt from the inboard side.
9. Install the $\frac{3}{4}$ " washer and locknut. Tighten the $\frac{3}{4}$ " locknuts to \mathbb{R} 295 ± 10 foot pounds torque, see Figure 9-13.

FIGURE 9-13



10. Raise the vehicle and remove the frame stands.
11. Lower the vehicle and remove the jack.
12. Install the air lines into the air springs.
13. See Air Spring Warnings and instructions in the Important Safety Notice Section of this publication prior to deflating or inflating the suspension system.
14. Inflate the suspension to normal operating pressure.
15. Remove wheel chocks.

THRUST WASHERS AND REAR HANGER CLAMP

- **Freightliner** – Vehicles built prior May 2010 • **Western Star** – Vehicles built prior to June 2010 • **Sterling** – Vehicles built prior to April 2009

DISASSEMBLY

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

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.

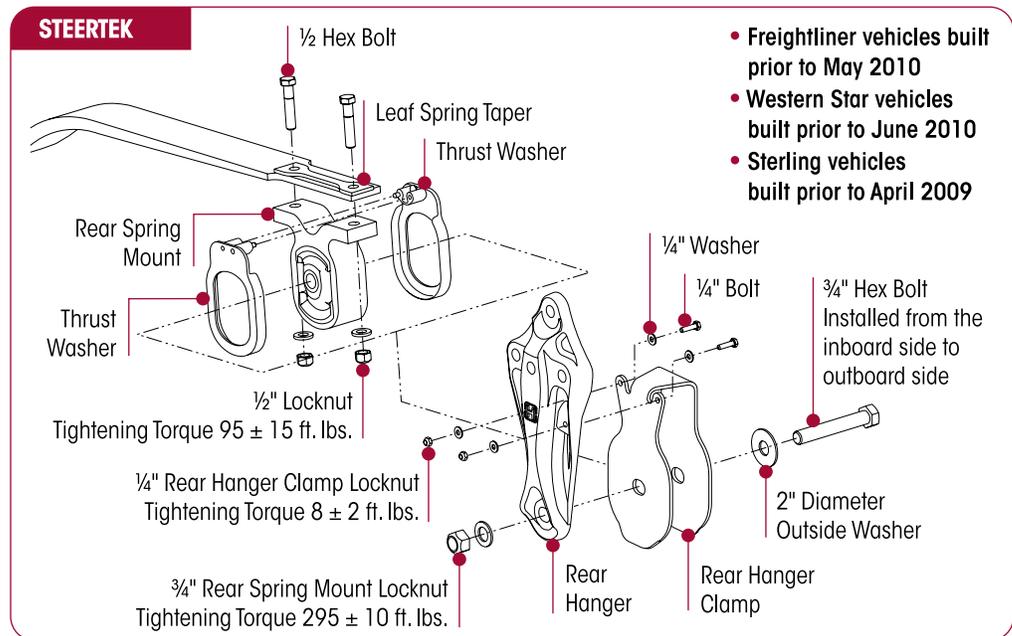
3. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to deflating or inflating the air system.
4. Deflate the air springs by detaching the upper rubber grommet of the height control valve linkage from the upper stud and exhaust the suspension system air by lowering the height control valve linkage arm.
5. Remove the air lines from the air springs.
6. Raise the frame.
7. Support the frame with frame stands.
8. Suspend the front axle. There must be enough clearance to allow the rear spring mount to clear the bottom of the rear spring hanger.
9. Support the axle with a floor jack.

SERVICE HINT

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

10. Loosen both front $\frac{3}{4}$ " x $5\frac{1}{2}$ " spring eye bolts, **DO NOT** remove the bolts.
11. Remove both rear $\frac{3}{4}$ " x 5" rear spring mount hex bolts.
12. Remove the lower shock mounting bolts.
13. Lower the jack until the rear spring mounts are below the spring hangers.

FIGURE 9-14



14. Remove the ¼" x 1¼" rear hanger clamp bolts and remove the rear hanger clamp, see Figure 9-14.
15. Remove the two (2) thrust washers from the rear spring mount, see Figure 9-14.
16. Inspect the spring mount for torn rubber, if the metal sleeve is worn through or if the housing is cracked. If any of these conditions exist replacement is necessary.

ASSEMBLY

1. Install two (2) new thrust washers on the rear spring mount.
2. Install the new rear hanger clamp and snug the ¼" x 1¼" mounting bolts.
3. Tighten bolts to 8 ± 2 foot pounds torque.
4. Raise the axle to install the rear spring mounts into the rear hanger clamps.
5. Install the rear spring eye mounting bolts from the inside facing out.
6. Apply a thin coating of anti-seize to the lower shock mounting bolts.
7. Install the lower shock mounting bolts from the inside facing out, see Shock Absorber in this section.
8. Remove the jack and let the suspension hang.
9. Tighten the front spring eye locknuts:
 - To vehicle manufacturer's specifications for the front hanger **not supplied** by Hendrickson
 - To 295 ± 10 foot pounds for the front hanger **supplied** by Hendrickson
10. Tighten the rear spring mount ¾" locknuts to 295 ± 10 foot pounds torque.
11. Raise the frame and remove the frame stands.
12. Install the air lines into the air springs.
13. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to deflating or inflating the air system.
14. Inflate the suspension to normal operating pressure.
15. Remove wheel chocks.

LEAF SPRING ASSEMBLY

NOTE

Shackle bracket assemblies and leaf springs for vehicles built prior to May 2016 are no longer available and require a conversion replacement to current production Leaf Spring Assembly and Shackle Bracket Assembly components, refer to the Parts List Section of this publication for the proper aftermarket service kits for your vehicle.

DISASSEMBLY

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

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.

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

WARNING

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.

6. Disconnect the air lines at the air springs.
7. Raise the vehicle.
8. Support the vehicle with frame stands.
9. Suspend the front axle to remove the load from leaf spring assembly.
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 spring eye bolts and fasteners.

SERVICE HINT

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

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.

13. Remove the 3/4" Grade 8 clamp group locknuts and discard.

CAUTION

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.

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.

14. Vehicles built with:

- **STEERTEK NXT Axle** — after November 2011

NOTE

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

- a. Remove the top pad, galvanized liner from the leaf spring assembly, see Figure 9-15. Proceed to Step 15.

- **STEERTEK Axle** — prior to November 2011

- a. Remove the top pad, front axle spacer (if equipped), galvanized liner and the bottom axle wrap from the leaf spring that requires replacement, see Figure 9-16.

15. Remove the leaf spring assembly.

ASSEMBLY

1. Vehicles built with:

- **STEERTEK NXT Axle**

- a. Install the new leaf spring assembly on the axle. Verify that the dowel pin is engaged properly in the axle spring seat, see Figure 9-15.
- b. Install the new galvanized liner and the top pad onto the leaf spring.
- c. Proceed to Step 2.

FIGURE 9-15

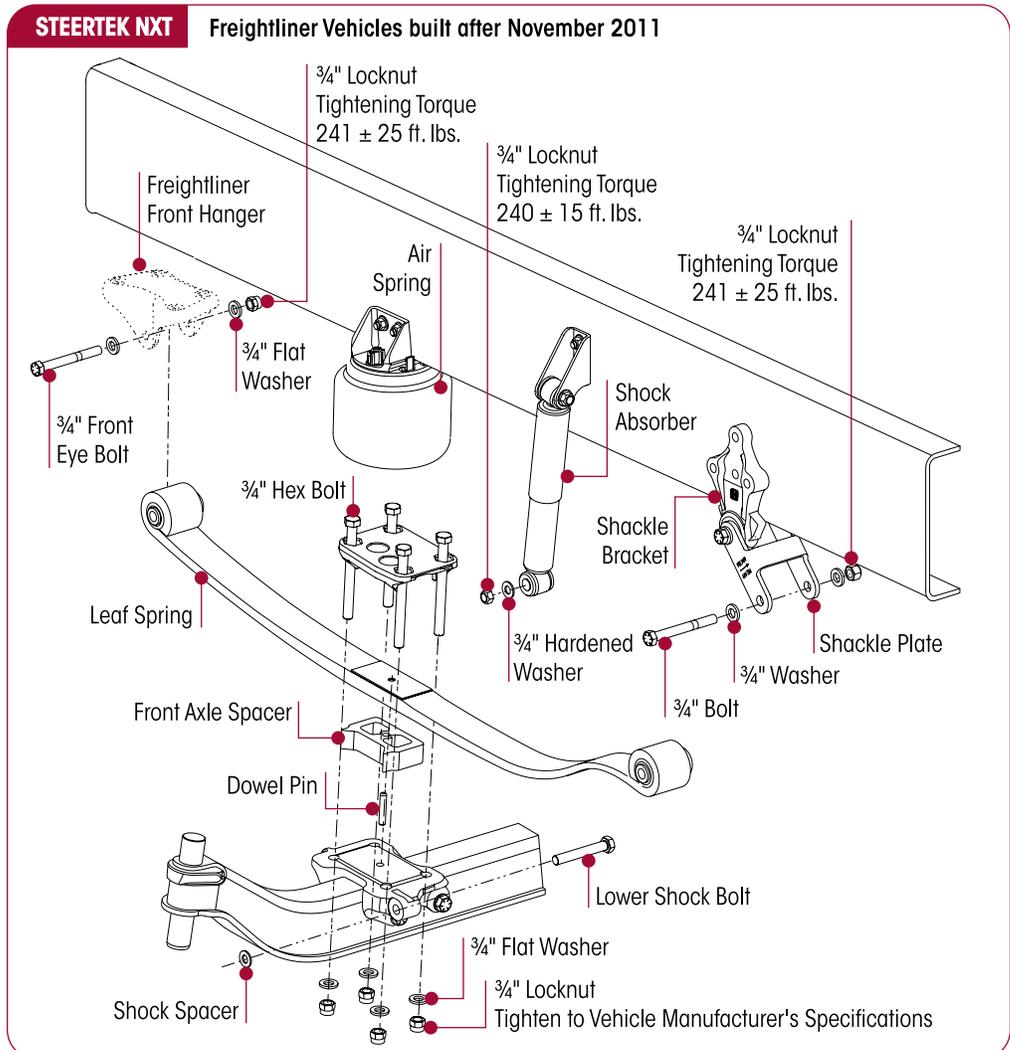
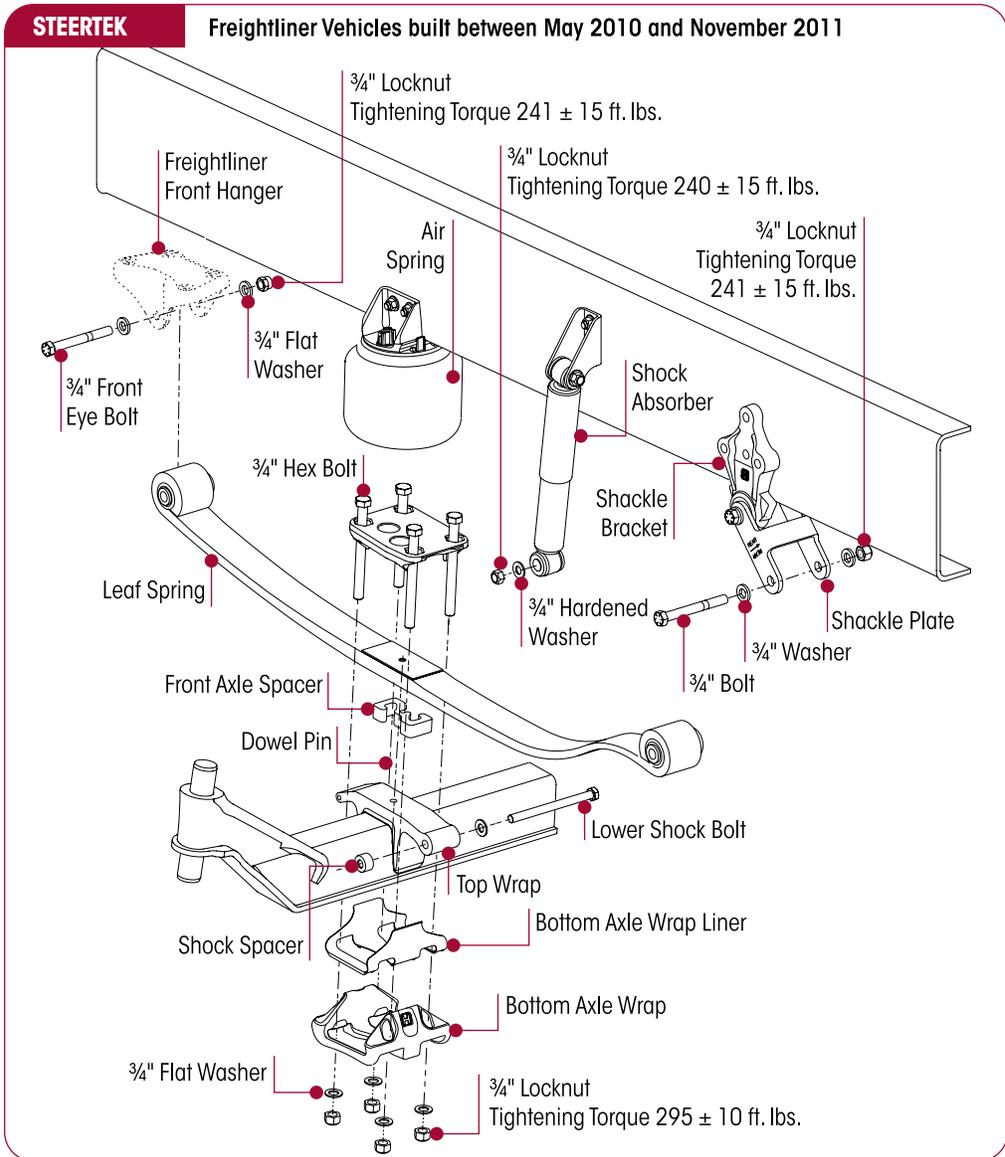


FIGURE 9-16



■ **STEERTEK Axle**

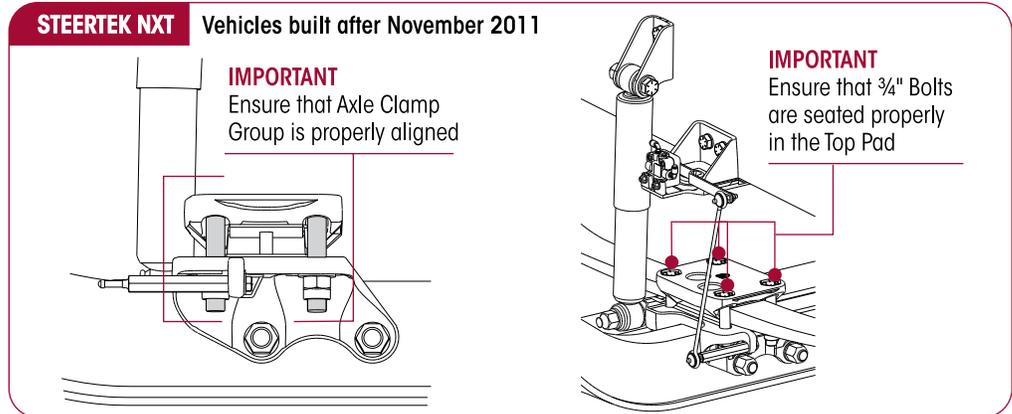
- a. Install the new leaf spring and axle spacer onto the axle over dowel pin located on the top axle wrap, see Figure 9-16.
- b. Install the new galvanized liner and the top pad onto the leaf spring.
- c. Remove and replace the bottom axle wrap liner located in bottom axle wrap.
- d. Install the bottom axle wrap.
2. Install the new 3/4" clamp group fasteners. The locknuts must be replaced when the clamp group is removed to prevent premature bolt fatigue.
3. Snug the clamp group, **DO NOT** tighten at this time.
4. Raise the axle and the leaf spring assembly into the front hanger and rear shackle.
5. Install the 3/4" hex bolt in the front hanger. Snug bolt, **DO NOT** tighten at this time.
6. Install the 3/4" hex bolt in the shackle bracket. Snug bolt, **DO NOT** tighten at this time.

7. Vehicles built with:

■ **STEERTEK NXT Axle**

- a. Ensure that the clamp group is properly aligned and the hex bolts are seated in the top pad, and the top pad is centered with the axle spring seat see Figure 9-17.

FIGURE 9-17



- b. Tighten the clamp group locknuts evenly in 50 foot pounds increments in the proper pattern to achieve uniform bolt tension, see Figure 9-18, to vehicle manufacturer's specifications.

c. Proceed to Step 9.

■ **STEERTEK Axle**

- a. Ensure that the clamp group is properly aligned and the hex bolts are seated in the top pad, and the bottom axle wrap is centered on the top axle wrap, see Figure 9-19.

FIGURE 9-18

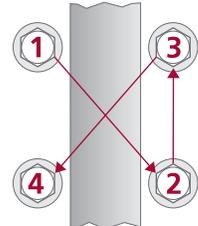
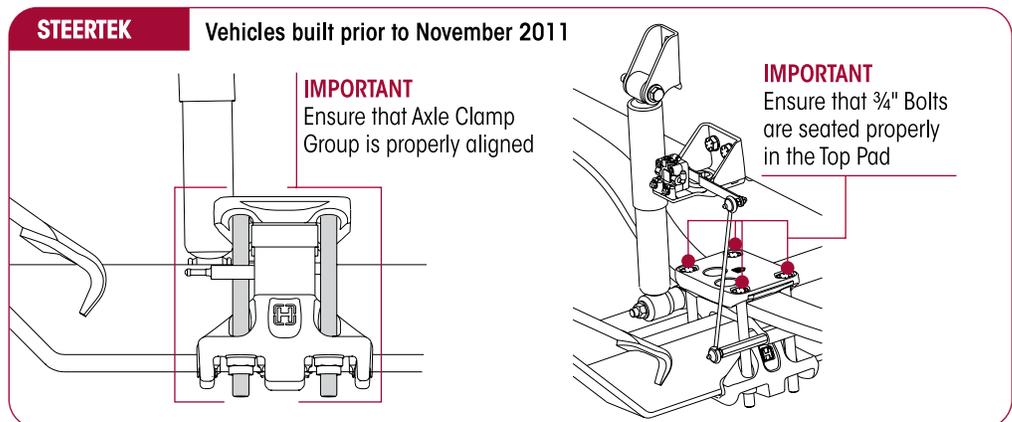


FIGURE 9-19



8. Tighten the clamp group locknuts evenly in 50 foot pounds increments to $\boxed{295} \pm 10$ foot pounds torque in the proper sequence to achieve uniform bolt tension, see Figure 9-18.

9. Install the air spring.

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

11. Install the air lines, and air up the vehicle.

12. Install the height control valve linkage and inflate the suspension to normal operating pressure (ride height).

13. Verify the vehicle is at the proper ride height. See Alignment and Adjustment Section of this publication.

14. Tighten the front spring eye Locknut to  241 ± 25 foot pounds torque.
15. Install and tighten the adapter bolts to vehicle manufacturer's specification.
16. Tighten the rear spring eye Locknuts to  241 ± 25 foot pounds torque.
17. Remove the wheel chocks.

LEAF SPRING ASSEMBLY

STEERTEK Axle – Freightliner – Vehicles built prior to May 2010 • **Western Star** – Vehicles built prior to June 2010 • **Sterling** – Vehicles built prior to April 2009

DISASSEMBLY

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



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.

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

SERVICE HINT

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

12. Disconnect both air springs from the top pads of the clamp groups.
13. Loosen the clamp group Grade 8 nylon locknuts for the leaf spring that is not being replaced.



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.

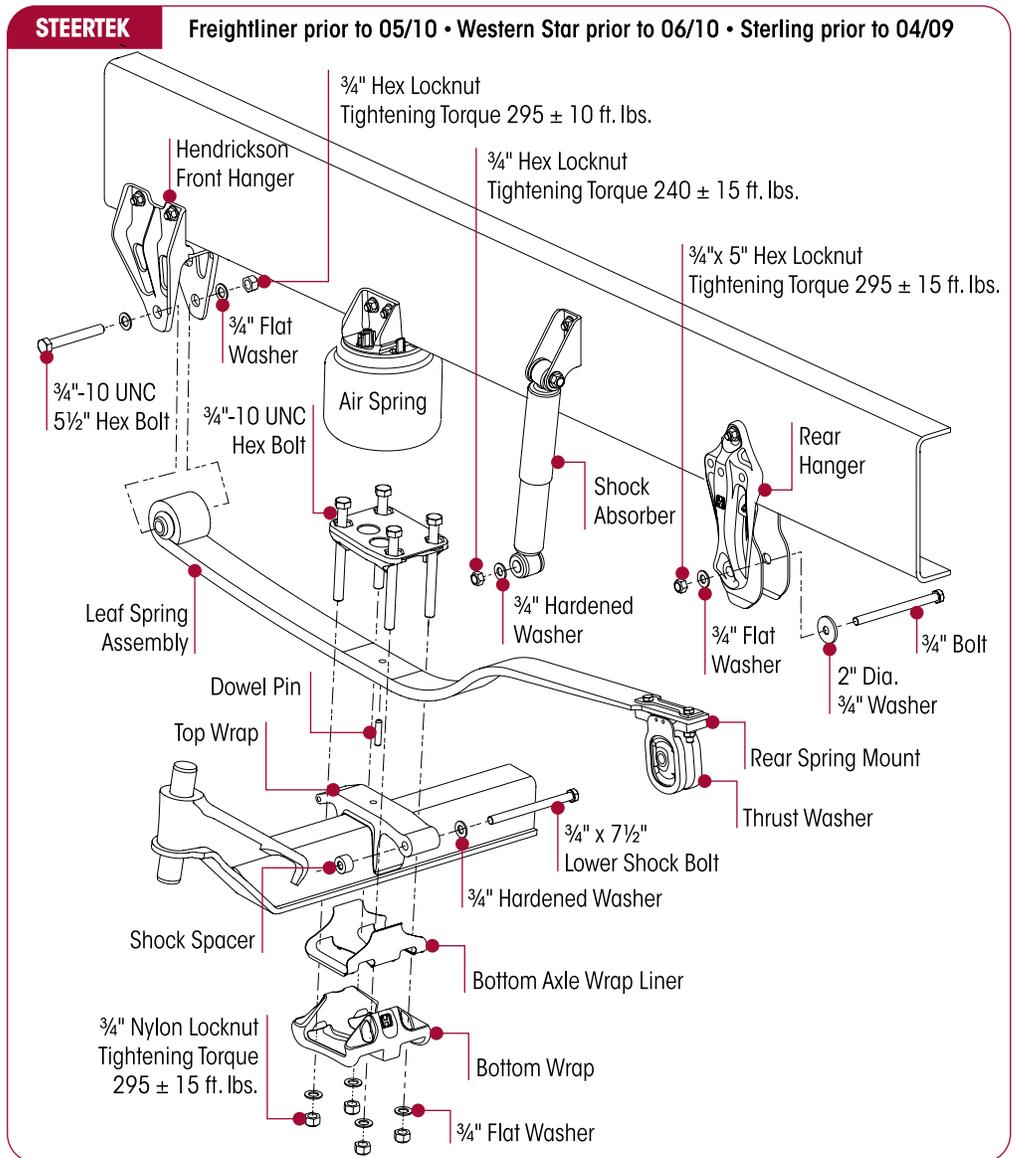
14. Remove the 3/4" clamp group bolts, nuts, washers, top pad, front axle spacer, galvanized liner, and the bottom axle wrap from the spring that is going to be removed, see Figure 9-20.
15. Lower the jack allowing the suspension to pivot down out of the rear hanger clamps.
16. Remove the 3/4" front spring eye bolt from the leaf spring that is being removed.
17. Remove the leaf spring assembly. Approximate weight of the leaf spring is 48 pounds.

ASSEMBLY

1. Lubricate the front spring eye bushing and the front hanger with a vegetable base oil (cooking oil). **DO NOT** use petroleum or soap base lubricant, it can cause an adverse reaction with the spring eye bushing material.

2. Install the spring over the axle and into the front spring hanger.
3. Install the 3/4" front spring eye bolt and fastener, but **DO NOT** tighten.
4. Engage the spring to the axle with the dowel pin located on the top axle wrap. It may be necessary to loosen the other clamp group to allow the axle to pivot when installing the spring on the dowel pin.
5. Install the new galvanized liner and the top pad onto the leaf spring.
6. Install a new bottom axle wrap liner in the bottom axle wrap.
7. Install the bottom axle wrap.
8. Install the new 3/4" clamp group bolts, washers, and the new locknuts. The locknuts must be replaced when the clamp group is removed, to prevent premature bolt fatigue.
9. Snug the clamp group, **DO NOT** torque at this time.
10. Raise the axle and the rear spring assembly into the rear spring hanger.
11. Install the 3/4" rear spring mount bolts in the rear hangers. The bolt must be installed from the inboard side to the outboard side with the large 2" diameter washer against the rear hanger clamp on the inboard side, see Figure 9-20.

FIGURE 9-20



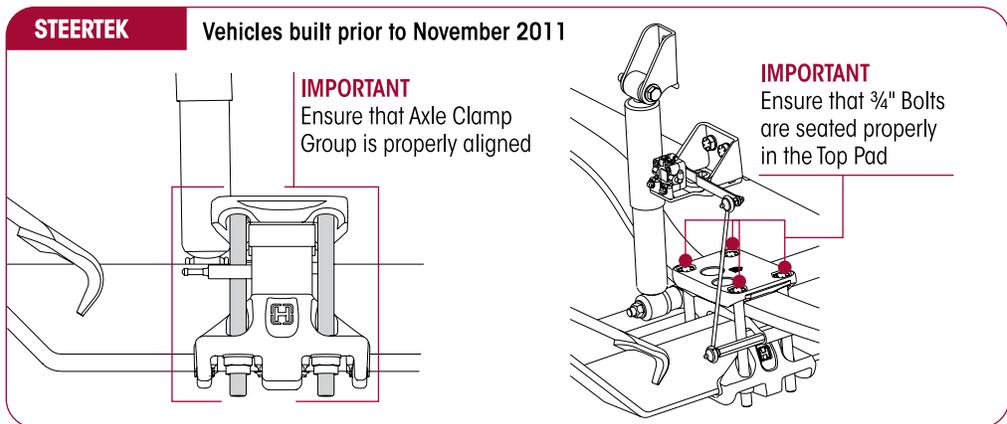
12. Lubricate the lower shock mounting bolts with anti-seize and install the bolts from the inboard side to the outboard side.
13. Lower the floor jack allowing the suspension to hang by the eye bolts and shock mounts.

IMPORTANT NOTE

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

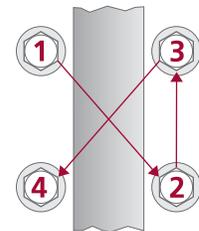
14. Tighten the lower shock mounting bolts to \mathbb{N} 240 ± 15 foot pounds torque.
15. Tighten the front spring eye and rear spring mount ¾" locknuts to \mathbb{N} 295 ± 10 foot pounds torque.
16. Install the tires.
17. Install air springs into the top pads. Make sure the air spring piston seats into the top pad correctly.
18. Remove the frame supports and load the front axle with the trucks weight.
19. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to deflating or inflating the air system.
20. Install air lines, and air up system.
21. Verify proper ride height. See Alignment and Adjustment Section of this publication.
22. Ensure that the clamp group is properly aligned and the hex bolts are seated in the top pad, and the bottom axle wrap is centered on the top axle wrap, see Figure 9-21.

FIGURE 9-21



23. Tighten the clamp group locknuts evenly in 50 foot pounds increments to \mathbb{N} 295 ± 10 foot pounds torque in the proper sequence to achieve uniform bolt tension, see Figure 9-22.
24. Remove the wheel chocks.

FIGURE 9-22



REAR SPRING MOUNT (If equipped)

- **Freightliner** – Vehicles built prior to May 2010 • **Western Star** – Vehicles built prior to June 2010 • **Sterling** – Vehicles built prior to April 2009

DISASSEMBLY

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



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.

3. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to deflating or inflating the air system.
4. Deflate the air springs by detaching the upper rubber grommet of the height control valve linkage from the upper stud and exhaust the suspension system air by lowering the height control valve linkage arm.
5. Support the vehicle with frame stands. It may be necessary to remove peripheral components for installation of the frame stands.
6. Install a floor jack with a 4" lifting plate below the axle and raise the truck.
7. Remove the tires, if necessary,
8. Lower the jack allowing the axle to hang, but **DO NOT** remove the jack from the axle.

SERVICE HINT

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

9. Loosen both front leaf spring eye bolts, but **DO NOT** remove the bolts.
10. Remove both rear leaf spring mount bolts.
11. Remove both lower shock absorber mounting bolts.
12. Disconnect both air springs from the top pads of the clamp groups.
13. Loosen the clamp group Grade 8 nylon locknuts.
14. Lower the jack allowing the suspension to pivot down out of the rear hanger clamps.
15. Remove the ½" rear spring mounting fasteners.
16. Remove rear spring mount.
17. Inspect the leaf spring taper for cracks or damage. Replace spring if damaged.

ASSEMBLY

1. Install the spring end plate so that it is centered on the spring taper, see Figure 9-23.
2. Install new ½" bolts through the spring end plate and spring taper.
3. Install the rear spring mount centered on the underside of the leaf spring taper.
4. Install new washers and locknuts to snug. **DO NOT** tighten at this time.
5. Align the rear spring mount and the leaf spring taper so that the mating surfaces are flush with each other, see Figure 9-24.

FIGURE 9-23



FIGURE 9-24



6. Tighten rear spring mount locknuts to 95 ± 15 foot pounds torque.
7. Install the thrust washers on the rear spring mount.
8. Raise the leaf springs into the rear hangers.
9. Place the 2" outside diameter washer against the rear hanger clamp on the inboard side.
10. Install the rear spring eye mounting bolts from the inside facing out.
11. Snug rear spring eye bolts. **DO NOT** tighten.

12. Apply a thin coating of anti-seize to the lower shock mounting bolts. Install lower shock absorber mounting bolts.
13. Install the air spring into the top pad. Make sure the air spring piston seats into the top pad correctly.
14. Install tires, if removed.
15. Raise the vehicle and remove the frame supports.
16. Lower the vehicle and remove the floor jacks.
17. Install air lines to the air spring.
18. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to deflating or inflating the air system.
19. Install the height control valve linkage and inflate the suspension to normal operating pressure.
20. 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 9-21.
21. Tighten the clamp group locknuts evenly in 50 foot pounds increments to  293 ± 12 foot pounds torque in the proper pattern to achieve uniform bolt tension, see Figure 9-22.
22. Tighten the lower shock mounting bolts to vehicle manufacturer's specifications.
23. Tighten the front and rear spring eye fasteners to vehicle manufacturer's specifications.
24. Verify proper ride height, see Alignment & Adjustments Section of this publication.
25. Remove wheel chocks.

FRONT LEAF SPRING EYE BUSHING (If equipped)

- **Freightliner** – Vehicles built prior to May 2010 • **Western Star** – Vehicles built prior to June 2010 • **Sterling** – Vehicles built prior to April 2009

NOTE

For **Freightliner** vehicles built after May 2010 and **Western Star** vehicles built after June 2010, spring eye bushings are not serviceable. The Coronado spring eye bushing is non-serviceable, refer to the Parts List Section of this publication.

The AIRTEK spring eye bushing is designed for the life of the leaf spring, if premature wear occurs careful consideration must be given to the contributing factor that cause the wear. This must be corrected in order to prevent the new bushing from wearing in the same manner. Hendrickson recommends that in the event of a high mileage bushing wear that the front leaf spring be replaced.

DISASSEMBLY

Follow the procedure for the Front Leaf Spring removal shown in this section.



DO NOT USE HEAT OR A CUTTING TORCH TO REMOVE THE BUSHING FROM THE STEEL SPRING. THE USE OF SUCH HEAT CAN ADVERSELY AFFECT THE STRENGTH OF THE SPRING. A COMPONENT DAMAGED IN THIS MANNER CAN RESULT IN THE LOSS OF VEHICLE CONTROL AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

Once the leaf spring is removed from the chassis, you will need:

- A hydraulic press with an minimum operating capacity of 5 tons
- A receiving tool – see specifications in the Special Tools Section of this publication
- Removal and installation driver, see Figure 9-25, see specifications in the Special Tools Section of this publication
- 3M Scotch® #890T black fiber tape (duct tape or equivalent)

1. Support and center the steel leaf spring end hub on the receiving tool. The steel leaf spring must be level to distribute the vertical pushing load equally on the bushing.
2. Place the bushing driver center on the spring eye bushing.
3. Press out the spring eye bushing. Push directly on the driver until the bushing clears the steel leaf spring eye bore, see Figure 9-26.
4. Inspect the spring eye for any cracks or burrs. If cracks are present replacement of the steel leaf spring is necessary.
5. Remove any nicks or burrs with an emery cloth or a rotary sander to provide a smooth surface for the bushing installation.
6. Cut a strip of 3M Scotch® #890T black fiber tape (duct tape or equivalent) 1" x 6" long.
7. Feed the tape into the spring eye, adhesive side facing gap in the eye. Center the tape equally around each end, see Figure 9-27.
8. Support and center the steel spring on the receiving tool.
9. Center the new bushing on spring eye bore and line up on the hydraulic press.

FIGURE 9-25



FIGURE 9-26

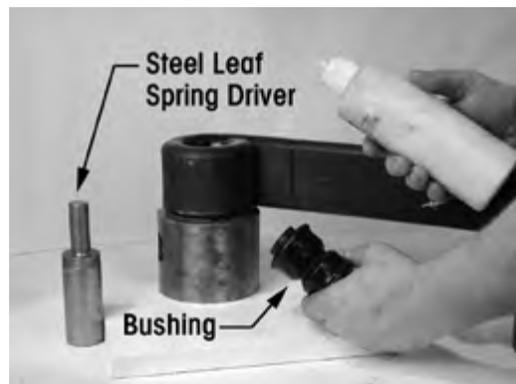
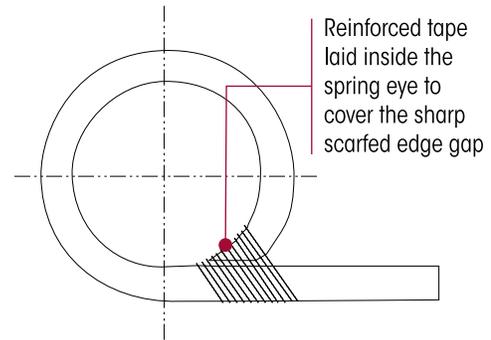


FIGURE 9-27



10. Press the bushing into spring eye bore. It will be necessary to overshoot the desired final position by approximately $\frac{3}{16}$ ". Press the bushing again from the opposite side to center the bushing in the spring eye bore, see Figure 9-28.
11. Once the bushing is installed follow procedure for Front Leaf Spring component replacement in this section.

FIGURE 9-28



STEERTEK AXLE BOTTOM AXLE WRAP (If equipped)

Vehicles built prior to November 2011

DISASSEMBLY

1. Chock the wheels.
2. Support the frame with frame stands.

 **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.

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

 **WARNING**

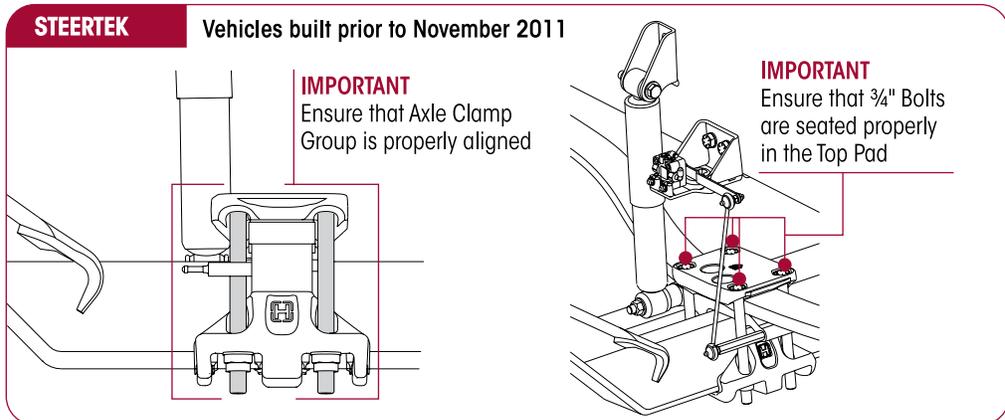
DO NOT USE A CUTTING TORCH TO REMOVE CLAMP GROUP BOLTS OR ATTACHING FASTENERS. THE USE OF SUCH HEAT ON SUSPENSION COMPONENTS CAN ADVERSELY AFFECT THE STRENGTH OF THESE PARTS. A COMPONENT DAMAGED IN THIS MANNER CAN RESULT IN THE LOSS OF VEHICLE CONTROL AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

5. Remove air spring on side being replaced, see Air Spring instructions in this section.
6. Remove $\frac{3}{4}$ " hex bolts if necessary to remove bottom axle wrap. Remove and discard $\frac{3}{4}$ " clamp group fasteners.
7. Remove bottom axle wrap. It may be necessary to use a dead blow mallet to dislodge axle wrap.
8. Once removed inspect axle wrap for damage. Replace if necessary.
9. Discard used bottom axle wrap liner.

ASSEMBLY

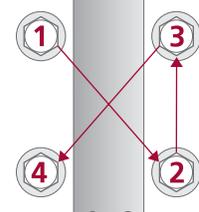
1. Install new bottom axle wrap liner onto bottom axle wrap and place onto axle.

FIGURE 9-29



2. Install new $\frac{3}{4}$ " hex bolts (if removed) and fasteners. Ensure that the clamp group is properly aligned and the hex bolts are seated properly in the top pad, and the bottom axle wrap is centered on the top axle wrap, see Figure 9-29.
3. Tighten the clamp group locknuts evenly in 50 foot pounds increments to \mathbb{T} 295 \pm 10 foot pounds torque in the proper sequence to achieve uniform bolt tension, see Figure 9-30.
4. Install the air spring (if removed) per the Air Spring Assembly instructions in this section.

FIGURE 9-30



5. Remove the frame stands.
6. Remove the wheel chocks.

TOP AXLE WRAP (In chassis - If equipped)

STEERTEK Axle — Vehicles built prior to November 2011

DISASSEMBLY

1. Chock the wheels.

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.

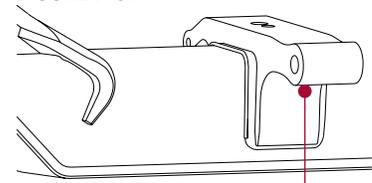
2. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to deflating or inflating the air system.
3. Deflate the air springs by disconnecting the height control valve linkage and lowering the height control valve linkage arm. This will exhaust the air pressure in the air springs.
4. Disconnect the air lines at the air springs.
5. Raise the truck and remove the tires.
6. Support the frame with frame stands.
7. Lower the floor jack and suspend the front axle to remove the load from the leaf springs.
8. Remove the air springs, see Air Spring Disassembly in this section.
9. Install a floor jack that has a 4" lifting plate in the center of the axle.
10. Secure the axle on the jack to prevent the axle from rolling off the floor jack.

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.

11. Remove the 3/4" clamp group hex bolts and fasteners.
12. Remove the top pad casting, the bottom axle wrap and liner.
13. Remove the lower shock mounting bolts.
14. Lower the axle from the leaf springs.
15. Remove the dowel pin, alignment shim and spacer (if equipped).
16. 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 9-31.
17. Clean and inspect the axle wrap and axle for cracks or damage, replace each if cracks or damage are present.

FIGURE 9-31



Carefully strike upward with dead blow mallet on both ends

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 9-32.
4. Protect the top surface of the axle wrap with a block of wood, cardboard, or shop towels.

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.

SERVICE HINT

To facilitate the installation of the top axle wrap, it may be helpful to slide the axle outside of the frame rail to obtain a clear path to strike the axle with a dead blow mallet.

5. Using a dead blow mallet drive the axle wrap onto the axle indexing the axle guide pin until the axle wrap is firmly seated on the axle.
6. Install the dowel pin(s) into the axle wrap.
7. Install the alignment shims and spacer (if equipped).
8. Raise the axle assembly and engage the dowel pins in the leaf spring bore.
9. Install the top pad with the arrows facing inboard on the leaf spring.
10. Install new clamp group hex bolts into the top pad.
11. Remove and replace the bottom axle wrap liner.
12. Install the bottom axle wrap.
13. Install the new clamp group washers and Grade 8 nylon locknuts.
14. 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 9-33.

FIGURE 9-32

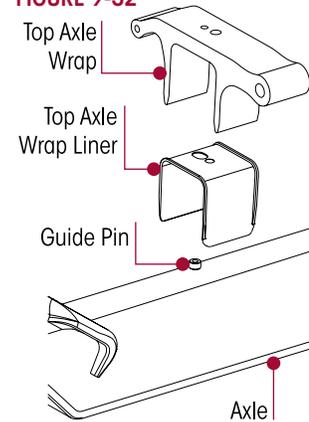
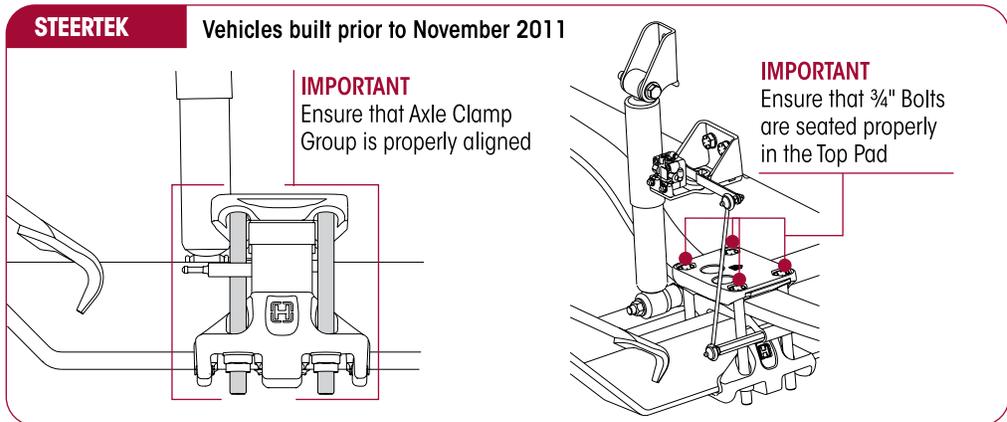
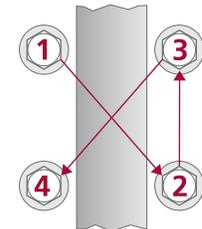


FIGURE 9-33



15. Tighten the clamp group locknuts evenly in 50 foot pounds increments to 295 ± 10 foot pounds torque in the proper sequence to achieve uniform bolt tension, see Figure 9-34.
16. Apply a thin coating of anti-seize to the lower shock mounting bolt.
17. Install the lower shock bolt from the inboard side to the outboard side of the top axle wrap and attach the spacer, washer, and locknut.
18. Tighten the shock eye locknuts to 240 ± 15 foot pounds torque.
19. Install the air springs.
20. Raise the vehicle and remove the frame stands.
21. Lower the vehicle and remove the jack from the axle.
22. Attach the air lines to the air springs.
23. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to deflating or inflating the air system.

FIGURE 9-34



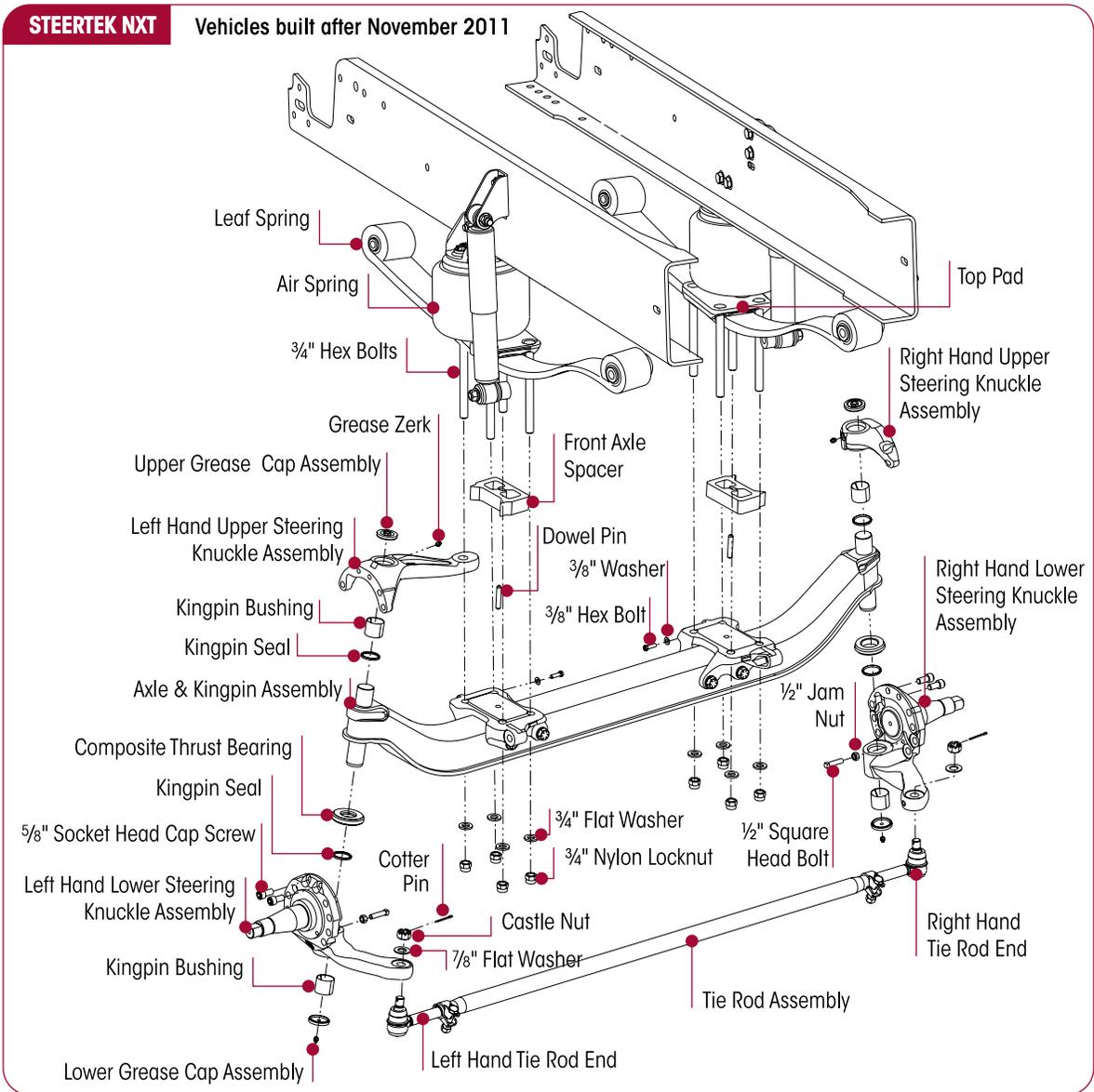
24. Air up the system to normal operating pressure.
25. Remove the wheel chocks.

STEERTEK NXT Axle — Vehicles built after November 2011

AXLE REMOVAL

Refer to Figure 9-35 when replacing the components of the STEERTEK NXT axle.

FIGURE 9-35



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.

 **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.

3. 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.

4. Deflate the air springs by disconnecting the height control valve linkage and lowering the height control valve linkage arm. This will exhaust the air pressure in the air springs (if equipped).
5. Raise the vehicle.
6. Support the vehicle with frame stands.

 **WARNING**

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

7. Suspend the front axle with the shocks attached.
8. Remove the front wheels, hubs, brake shoes, ABS sensors, and backing plate assembly.
9. Disconnect the drag link from the steering arm.

 **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.

10. Unseat both of the air springs at the axle top pad.
11. 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.

12. Disconnect and remove the lower shock mounting fasteners.
13. Remove the 3/4" clamp group bolts and fasteners.
14. Lower the axle and remove from the vehicle.

AXLE REMOVAL (REMOVED FROM CHASSIS)

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

 **WARNING**

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

2. Remove the two (2) 5/8" socket head cap screws from the steering knuckle assembly.
3. Remove the steering knuckle and thrust bearing.

4. After complete removal of the one side, repeat Steps 1 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.

STEERTEK NXT AXLE INSTALLATION

1. Place the new axle on the floor jack and position the axle under the vehicle.
2. Raise the axle into position, see Figure 9-36. Care must be taken at this point to ensure that the dowel pins align correctly with the front leaf springs.

FIGURE 9-36

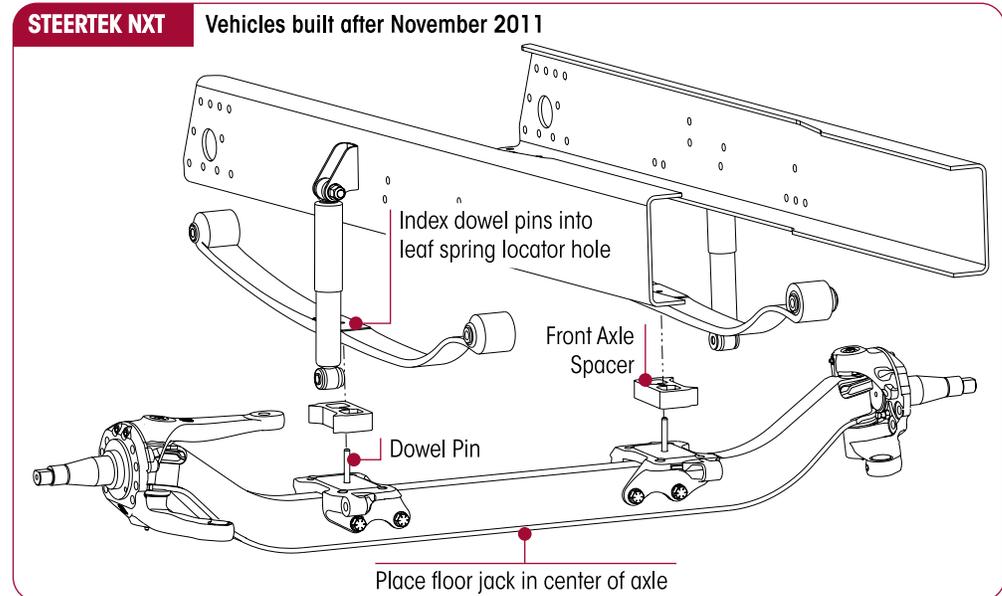


FIGURE 9-37

3. Install the galvanized liner between the main spring and the top pad. The top pad is installed with the air spring bores positioned outboard, see Figure 9-37.
4. Install the new clamp group $\frac{3}{4}$ " hex bolts and the new $\frac{3}{4}$ " Grade 8 nylon lock nuts. Snug the $\frac{3}{4}$ " bolts, **DO NOT** tighten to torque at this time.
5. Ensure that the clamp group is properly aligned and the hex bolts are seated in the top pad, and the top pad is centered on the axle spring seat, see Figures 9-38.

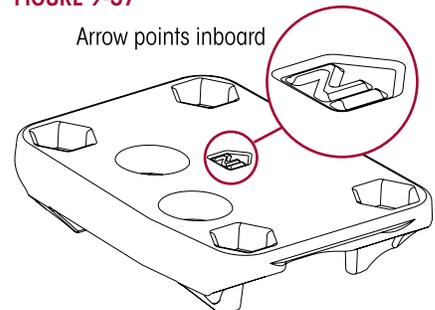
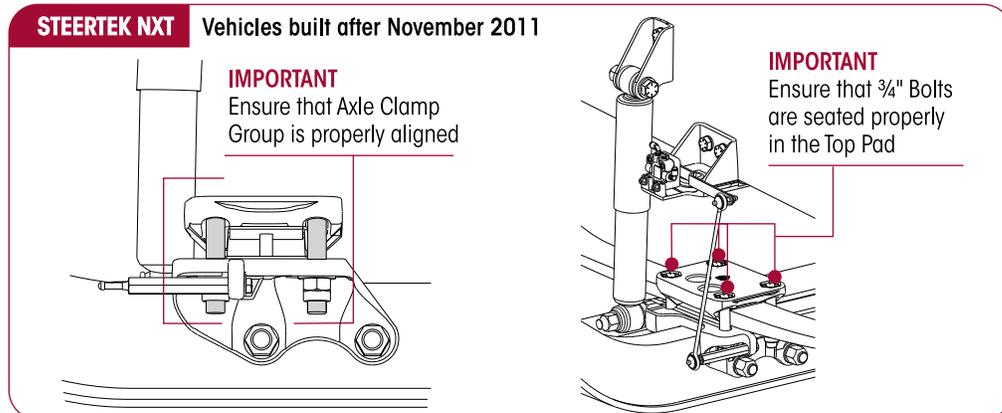
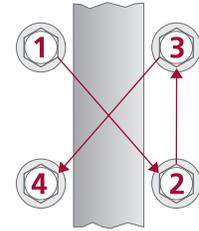


FIGURE 9-38



6. Tighten the clamp group locknuts evenly in 50 foot pounds increments to $\boxed{295} \pm 10$ foot pounds torque in the proper sequence to achieve uniform bolt tension, see Figure 9-39.
7. Install the steering knuckles as per the Steering Knuckle replacement instructions in this section.
8. Install the tie rod assembly in the Ackermann arms.
9. Install the $\frac{7}{8}$ " hardened washers on the Ackermann arm and the castle nuts. Tighten the castle nuts to $\boxed{185}$ foot pounds, then rotate until the first castle slot lines up with the cotter pin bore in the tie rod end. **DO NOT** back off nut for cotter pin installation.
10. Install the tie rod end cotter pins.
11. Connect the drag link in the steering arms.
12. Install the castle nut to install the steering arm. Tighten the castle nut to $\boxed{185}$ foot pounds, then rotate until the first castle slot lines up with the cotter pin bore in the drag link. **DO NOT** back off nut for cotter pin installation.
13. Install the drag link cotter pin.
14. Install the lower shock mounting bolts and tighten to $\boxed{240} \pm 15$ foot-pounds torque.
15. Install the brake backing plate assemblies and ABS sensor.
16. Install the brakes, hubs, and wheels as per the vehicle manufacturer's guidelines.
17. Fill the hubs with the proper lube, see vehicle manufacturer's guidelines for recommended lubrication, if required.
18. Grease the front steering components as per lubrication guidelines in the Preventive Maintenance Section of this publication.
19. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to deflating or inflating the air system.
20. Reconnect the height control valve and air up the system.
21. Check ride height per instructions in the Alignment & Adjustments Section of this publication.
22. Remove the wheel chocks.

FIGURE 9-39



STEERTEK Axle — Vehicles built prior to November 2011

AXLE REMOVAL

Refer to Figure 9-40 when replacing the components of the STEERTEK axle as shown.

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.

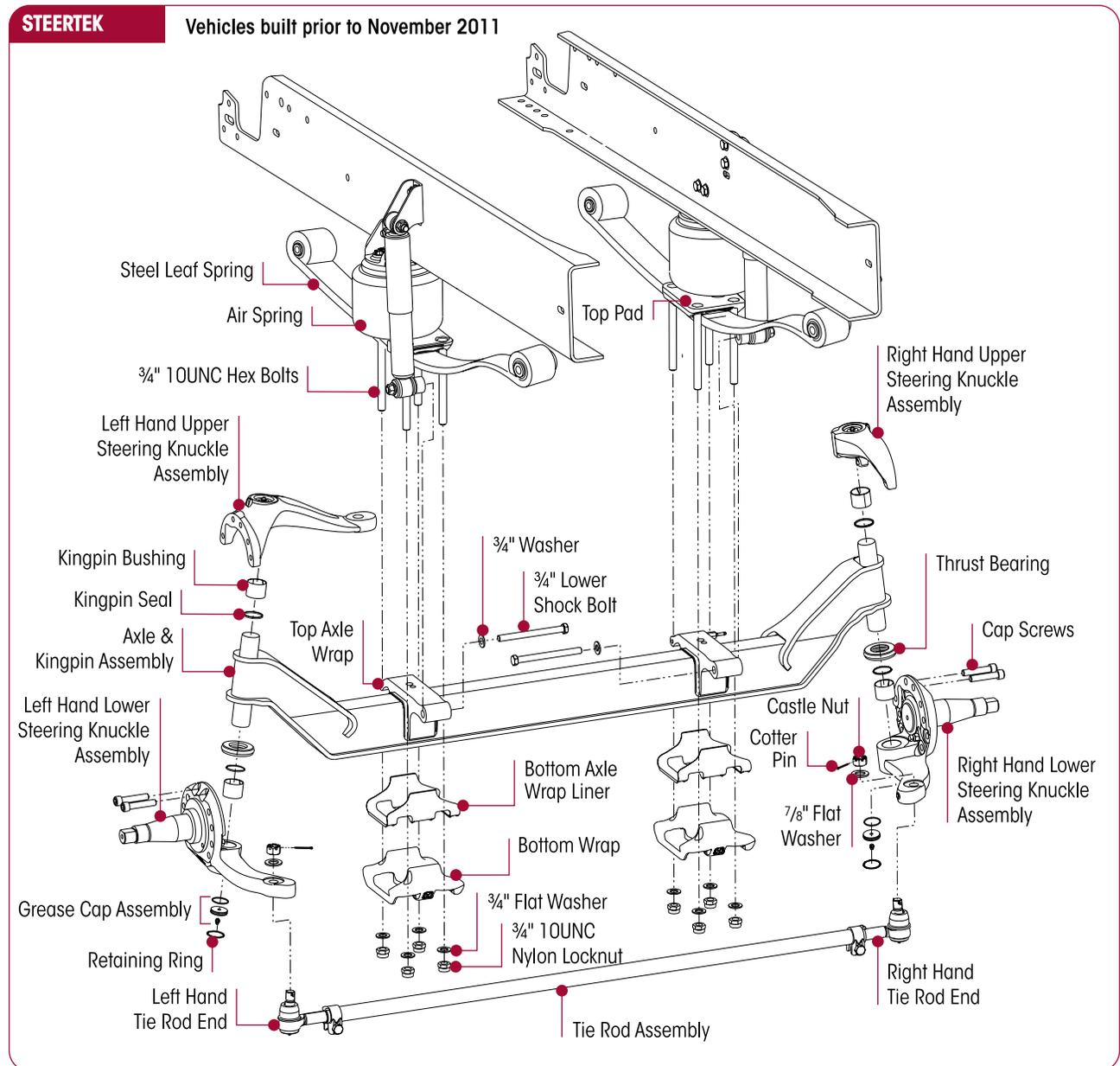
1. Place the vehicle on level floor.
2. Chock the wheels.

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.

3. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to deflating or inflating the air system.
4. Deflate the air springs by disconnecting the height control valve linkage and lowering the height control valve linkage arm. This will exhaust the air pressure in the air springs (if equipped).

FIGURE 9-40



5. Raise the vehicle.
6. Support the vehicle with frame stands.
7. Suspend the front axle with the shocks attached.
8. Remove the front wheels, hubs, brake shoes, ABS sensors, and backing plate assembly.
9. Disconnect the drag link from the steering arm.



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.

10. Unseat both of the air springs at the axle top pad.
11. Support the axle with a floor jack.

WARNING

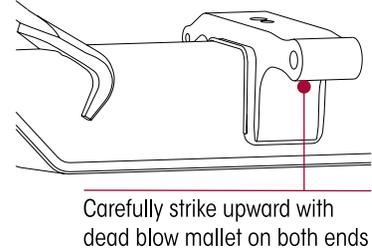
DO NOT REPAIR OR RECONDITION SUSPENSION OR AXLE COMPONENTS FOUND TO BE DAMAGED OR OUT OF SPECIFICATIONS. ALL SUCH DAMAGED OR OUT OF SPECIFICATION COMPONENTS MUST BE REPLACED. ALL MAJOR HENDRICKSON COMPONENTS ARE HEAT TREATED AND TEMPERED. AIRTEK COMPONENTS CANNOT BE BENT, WELDED, HEATED, OR REPAIRED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

12. Disconnect and remove the lower shock mounting bolts.
13. Remove the 3/4" clamp group bolts and fasteners.
14. Lower the axle and remove from the vehicle.

AXLE CLAMP GROUP REMOVAL (REMOVED FROM CHASSIS)

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 9-41.
3. After removal of the top axle wrap from the axle inspect for cracks or fretting.
4. Remove the tie rod assembly. See Tie Rod Disassembly in this section.

FIGURE 9-41

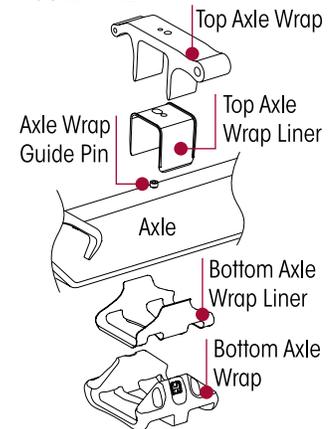


WARNING

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

5. Remove the two (2) 5/8" socket head cap screws from the steering knuckle assembly.
6. Remove the steering knuckle, thrust bearing, and shim pack if equipped.
7. After complete removal of the one side, repeat Steps 1 through 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.

FIGURE 9-42



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 9-42.

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.

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.

CAUTION

WARNING

SERVICE HINT

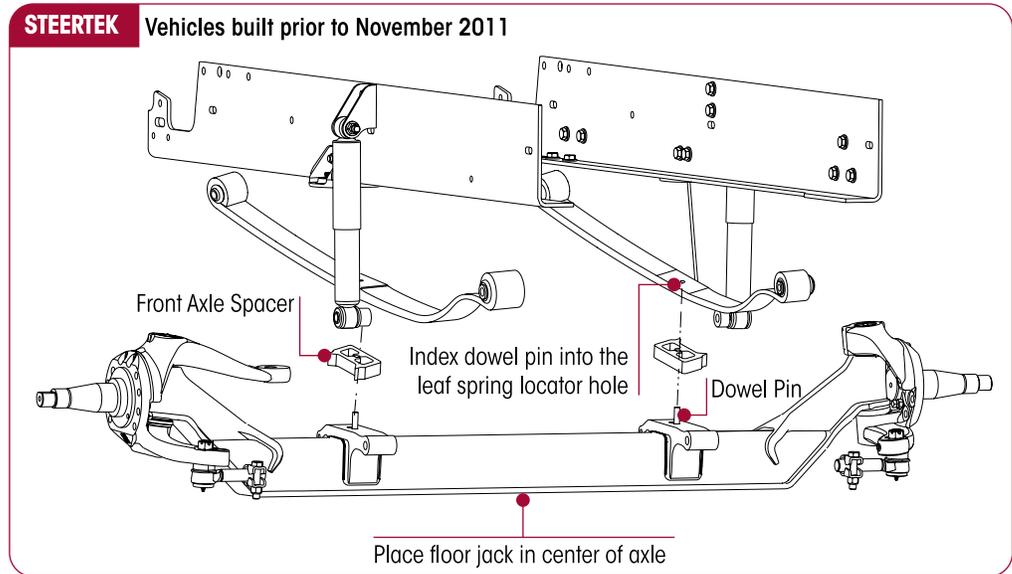
Apply a lubricant (such as an aerosol silicone) to the outer surface of the plastic liner to aid in assembly of the top axle wrap.

2. Install the top axle wrap, the axle wrap must be aligned with the guide pin on the axle.
3. **IMPORTANT:** Install the dowel pin into the top axle wrap.
4. 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. Raise the axle into position, see Figure 9-43. Care must be taken at this point to ensure that the dowel pins align correctly with the front leaf springs.

FIGURE 9-43



3. Install the galvanized liner between the main spring and the top pad. The top pad is installed with the air spring bores positioned outboard, see Figure 9-44.
4. Install the new bottom axle wrap liner and front axle spacer on the bottom axle wrap.
5. Install the bottom axle wrap on the axle.
6. Install the new clamp group $\frac{3}{4}$ " hex bolts and the new $\frac{3}{4}$ " Grade 8 nylon lock nuts. Snug the $\frac{3}{4}$ " bolts, **DO NOT** tighten to torque at this time.
7. Install the lower shock mounting bolts and tighten to \mathbb{E} 240 \pm 15 foot-pounds torque.
8. 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 9-45.

FIGURE 9-44

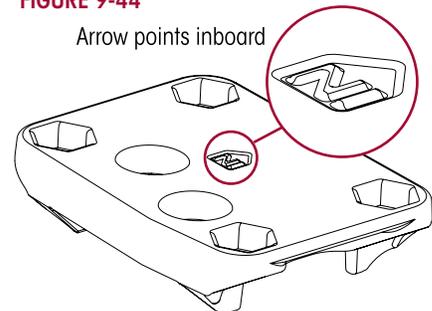
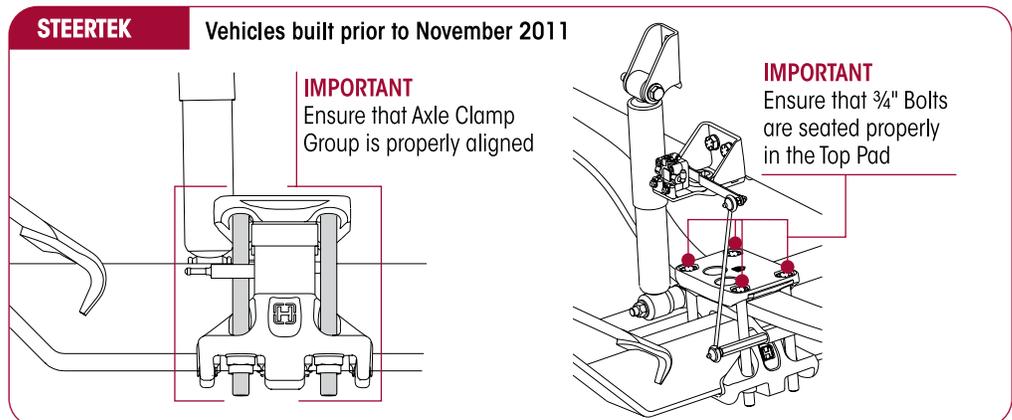
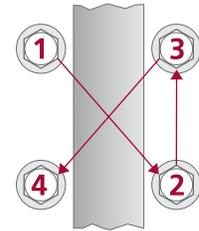


FIGURE 9-45



9. Tighten the clamp group locknuts evenly in 50 foot pounds increments to $\pm 295 \pm 10$ foot pounds torque in the proper sequence to achieve uniform bolt tension, see Figure 9-46.
10. Install the steering knuckles as per the Steering Knuckle replacement instructions in this section.
11. Install the tie rod tube.
12. Install the $\frac{7}{8}$ " hardened washers on the Ackermann arm and the castle nuts. Tighten the castle nuts to ± 185 foot pounds, then rotate until the first castle slot lines up with the cotter pin bore in the tie rod end. **DO NOT** back off nut for cotter pin installation.
13. Install the cotter pins.
14. Connect the drag link. Install the castle nut to install the steering arm. Tighten the castle nut to ± 185 foot pounds, then rotate until the first castle slot lines up with the cotter pin bore in the drag link. **DO NOT** back off nut for cotter pin installation.
15. Install cotter pin.
16. Install the brake backing plate assemblies and ABS sensor.
17. Install the brakes, hubs, and wheels as per the vehicle manufacturer's guidelines.
18. Fill the hubs with the proper lube, see vehicle manufacturer's guidelines for recommended lubrication, if required.
19. Grease the front steering components as per lubrication guidelines in the Preventive Maintenance Section of this publication.
20. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to deflating or inflating the air system.
21. Reconnect the height control valve and air up the system.
22. Check ride height per instructions in the Alignment & Adjustments Section of this publication.
23. Remove the wheel chocks.

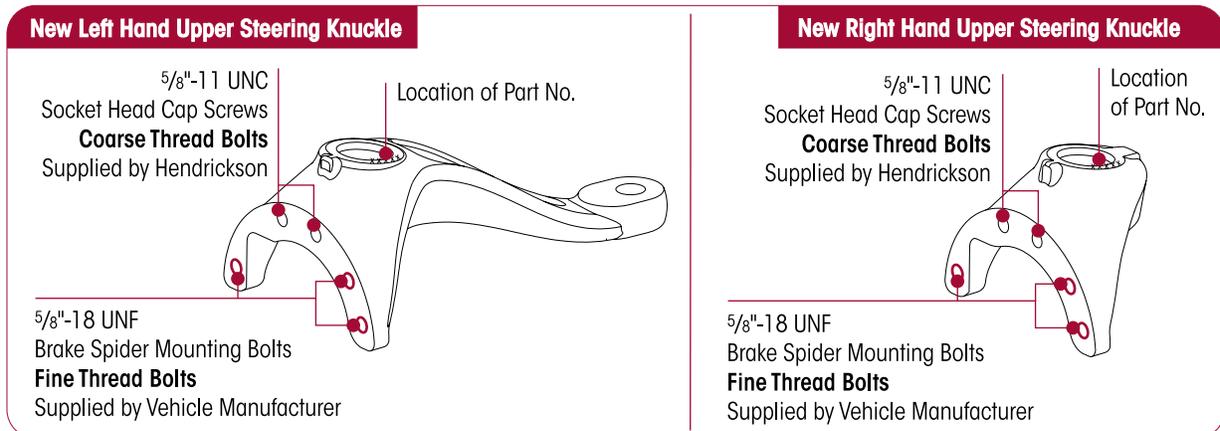
FIGURE 9-46



STEERING KNUCKLE

All new replacement STEERTEK axles and upper steering knuckle components for Freightliner, Sterling and Western Star Vehicles will incorporate $\frac{5}{8}$ " fine threaded holes for brake spider mounting bolts. Vehicles built prior to June 28, 2004 that are receiving a replacement of the STEERTEK axle or upper knuckle **will require** — a change from coarse thread brake spider mounting bolts to fine thread brake spider mounting bolts. The brake spider mounting bolts are supplied separately by Freightliner, Sterling and Western Star, refer to vehicle manufacturer for bolt dimensions and torque specifications.

FIGURE 9-47



NOTE

Hendrickson will not be responsible for any damage to the STEERTEK upper knuckle components resulting from using the improper brake spider mounting bolts.

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. Remove the wheel and hub assembly.
2. Remove the brake components from steering knuckle.
3. 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 9-48.

4. Remove the drag link from the knuckle.

WARNING

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

5. Remove the two (2) socket head cap screws that connect upper kingpin connection to the steering knuckle, see Figure 9-49.

SERVICE HINT

Remove the grease zerks from the knuckle assemblies. This will allow the knuckle assemblies to freely slide up and down the kingpins without creating back pressure.

6. Remove the lower steering knuckle from the kingpin by sliding it down the kingpin.
7. Remove the upper steering knuckle by sliding it up off the kingpin.

FIGURE 9-48

Lightly tap the side of Ackermann arm to loosen the tie rod end

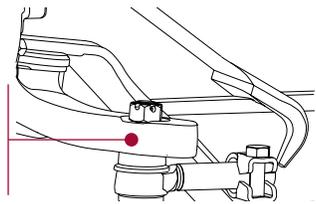


FIGURE 9-49



KINGPIN BUSHINGS

PREPARATION AND MEASUREMENT

Cleaning the Ground or 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.

Cleaning the Rough Parts

- Rough parts can be cleaned with the ground or polished parts. Rough parts can also be cleaned in hot solution tanks with a weak alkaline solution. The parts must remain in the hot solution tanks until they are completely cleaned and heated.

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.



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



SOLVENT CLEANERS CAN BE FLAMMABLE, POISONOUS AND CAUSE BURNS. TO HELP AVOID SERIOUS PERSONAL INJURY, CAREFULLY FOLLOW THE VEHICLE 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, SOLVENTS OR OTHER MATERIALS THAT CONTAIN GASOLINE THAT CAN EXPLODE.

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



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



THE STEERTEK NXT / 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. IF THE KINGPIN SHOWS SIGNS OF MOVEMENT, CONTACT HENDRICKSON PRODUCT ENGINEERING - TECH SERVICES.

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

FIGURE 9-50



FIGURE 9-51



FIGURE 9-52



FIGURE 9-53



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

Kingpin minimum dimension is 1.802"

FIGURE 9-54



FIGURE 9-55



FIGURE 9-56



FIGURE 9-57



KINGPIN BUSHING REMOVAL

You will need:

- A hydraulic shop press with a minimum forcing capacity of 2.5 tons (or use an arbor press)
- Kingpin Bushing Tools, see Special Tool Section in this publication
 - Push-out Tool, Driver Tool, Receiving Tool
 - **STEERTEK NXT** — Vehicles built after November 2011 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 9-57 AND 9-58. IMPROPER SUPPORT TO THE STEERING KNUCKLES CAN CAUSE COMPONENT DAMAGE.

1. **STEERTEK NXT Axle** — Vehicles built after November 2011
 - a. Remove the threaded grease cap and grease Zerk.
 - b. Ensure that each part of the steering knuckle assembly is squarely supported on the receiving tool before applying hydraulic pressure to press out the kingpin bushings, see Figure 9-58 through 9-60.
 - c. Place the STEERTEK NXT installer / remover tool in the steering knuckle / kingpin bore. Then place the kingpin bushing push-out tool on top of the installer / remover.
 - d. Press out the kingpin bushing.
 - e. Proceed to Step 3.

FIGURE 9-58



FIGURE 9-59



2. **STEERTEK Axle** — Vehicles built prior to November 2011
 - a. Remove the grease cap retaining ring.
 - b. Ensure that each part of the steering knuckle assembly is squarely supported on the receiving tool before applying hydraulic pressure to press out the kingpin bushings, see Figure 9-58 through 9-60.
 - c. Remove the grease Zerk in the grease cap.
 - d. Place a driver on top of the grease cap and press out the kingpin bushing and seal using the grease cap.
 - e. Proceed to Step 3.
3. Clean the parts and inspect for reassembly, see Figure 9-61.

FIGURE 9-60



FIGURE 9-61



STEERING KNUCKLE BORE MEASUREMENT

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

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

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

FIGURE 9-62



FIGURE 9-63



FIGURE 9-64



KINGPIN BUSHING INSTALLATION

You will need:

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



WARNING

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

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

FIGURE 9-65



FIGURE 9-66



FIGURE 9-67



KINGPIN BUSHING REAMING



CAUTION

REAM THE KINGPIN BUSHINGS WITH AN ADJUSTABLE STRAIGHT FLUTE REAMER. 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.

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

SERVICE HINT

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

2. Install the reamer into the lower steering knuckle until the blades touch the kingpin bushing.
3. Rotate the reamer with light downward pressure. Rotate the reamer smoothly. **DO NOT** apply too much pressure, see Figures 9-68 and 9-69.

FIGURE 9-68

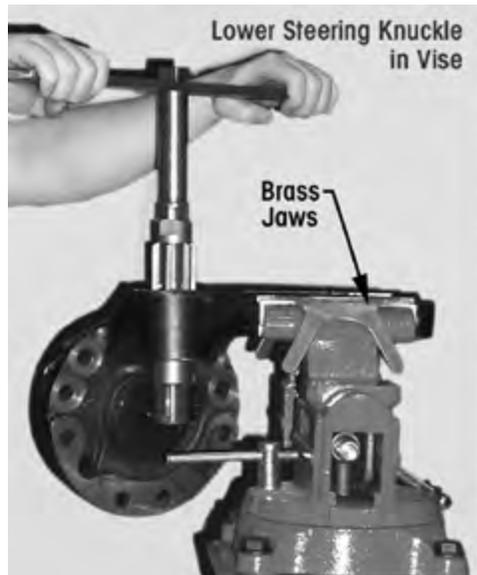
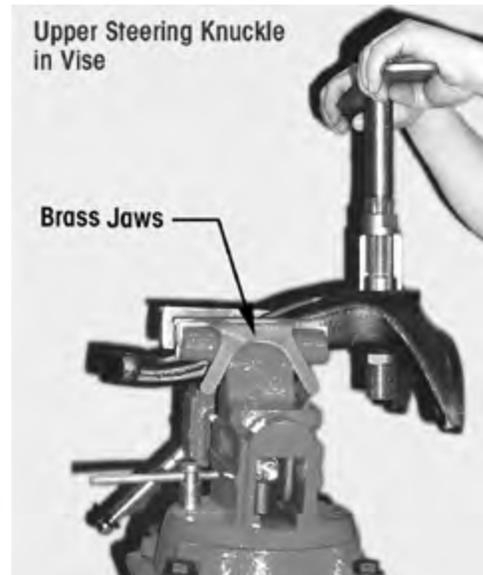


FIGURE 9-69



4. 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.
5. Clean and remove all kingpin bushing material from the knuckle assembly. Take special attention to remove material from the grease channels and dimples.
6. Clean the 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.

FIGURE 9-70



FIGURE 9-71



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.

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

7. Temporarily install the upper/lower knuckle on the kingpin to check for fit.
8. Rotate the upper/lower knuckle back and forth to verify there is no binding on the kingpin, see Figures 9-70 and 9-71.
9. If the bushing is too tight repeat Steps 1 through 8 until the proper clearance is achieved.

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

10. Proceed to Kingpin Seal installation.

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 9-72.
3. Use a kingpin bushing driver tool (see Special Tool Section) and press seal firmly into the steering knuckle assembly.
4. For Vehicles equipped with:
 - **STEERTEK NXT** — Double Lip design, see Figure 9-73. Install the kingpin seal until it bottoms out in the kingpin bore.
 - **STEERTEK** — Single Lip design, see Figure 9-74. Install the kingpin seal until it makes contact with the kingpin bushing.

FIGURE 9-72
Magnification of lip seal
Lip seal faces toward axle



FIGURE 9-73
STEERTEK NXT
Magnification of the kingpin bushing and a **DOUBLE** lip seal installed in the steering knuckle.



FIGURE 9-74
STEERTEK
Magnification of the kingpin bushing and a **SINGLE** lip seal installed in the steering knuckle.



STEERING KNUCKLE

ASSEMBLY

After replacement of the kingpin bushings it is necessary to re-assemble the steering knuckle assemblies. The STEERTEK NXT / STEERTEK axle is equipped with two (2) 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 9-75. **DO NOT** substitute aftermarket components when servicing.

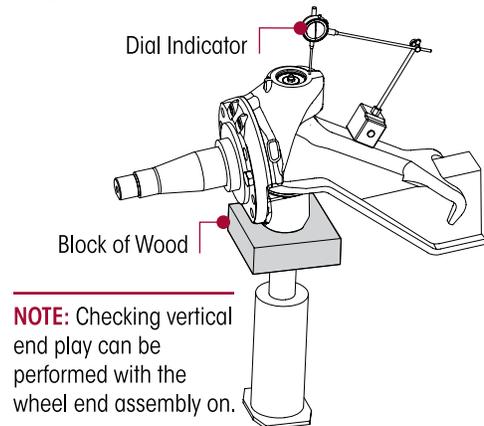
1. Install the thrust bearing on the lower kingpin with the seal facing up toward axle (the black seal will designate the top side), see Figure 9-75.
2. Install the shim, if equipped, on the upper kingpin.
3. Pack the bushing dimples on the upper and lower steering knuckles with multi purpose Lithium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

FIGURE 9-75



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

FIGURE 9-76



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

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

NOTE

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

STEERTEK Axle — Vehicles built prior to November 2011

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

NOTE

The 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 (1) old socket head cap screw and replace with new socket head cap screw.
15. Remove second socket head cap screw and replace with new socket head cap screw. Tighten both socket head cap screws to 188 ± 12 foot pounds torque.
16. Recheck the vertical end play with the dial indicator or a 0.010" feeler gauge, see Figure 9-76.
17. Remove the brake spider bolts, they should thread out freely.
18. Remove the bottle jack and continue assembling the wheel ends.

IMPORTANT NOTE

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

19. Apply Loctite to the three (3) brake spider bolts prior to installation into the brake spider. Tighten bolts to 188 ± 12 foot pounds torque.

WARNING

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

20. Install the tie rod end into the lower steering knuckle arm.
21. Tighten the castle nuts to 185 foot pounds torque then rotate the castle nut to the next castle slot and install cotter pin.
22. Install the drag link into the steering arm and tighten to the vehicle manufacturer's specifications.
23. Install new O-rings on the grease caps and lubricate O-rings with grease.
24. For vehicles equipped with:
 - **STEERTEK NXT Axle** — Install new grease caps. Note the grease caps on the STEERTEK NXT axle are threaded, tighten to 60 ± 10 foot pounds torque. Install new grease Zerk and tighten to a minimum of 15 foot pounds, see Figure 9-77.
 - **STEERTEK Axle** — Install new grease caps and retaining rings.
25. Install brakes, drums, wheels and tires.

FIGURE 9-77

STEERTEK NXT

Grease Zerk
Tightening Torque
minimum of 15 ft. lbs.

Grease Cap Threads
Tightening Torque 60 ± 10 ft. lbs.



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

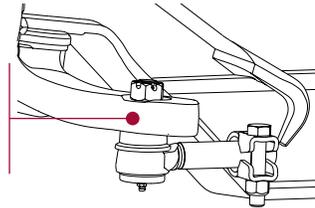
Hendrickson supplies different tie rod configurations. Prior to ordering find the part number on the tie rod tube. See Hendrickson Technical Bulletin Literature No. SEU-0223 for additional information or contact Hendrickson Truck Parts (email: truckparts@hendrickson-intl.com).

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 9-78.
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 9-78

Lightly tap the side of Ackermann arm to loosen the tie rod end



WARNING

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

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

ASSEMBLY

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

NOTE

When installing the cross tube the thread direction of the tie rod ends are as follows:

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

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

WARNING

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

WARNING

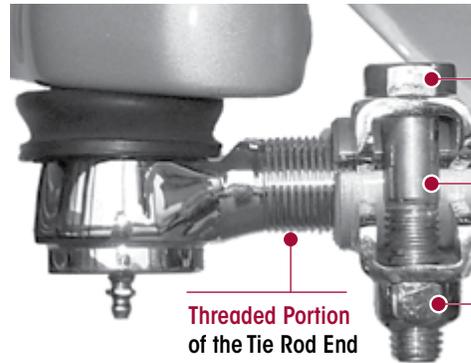
IT IS CRITICAL TO CHECK THE 5/8" TIE ROD CLAMP BOLT HEAD LOCATION TO VERIFY THE CLAMP FASTENERS HAVE SUFFICIENT CLEARANCE AWAY FROM THE LOWER SHOCK MOUNT AT FULL WHEEL CUT. THE FASTENERS MUST NOT CONTACT THE LOWER SHOCK MOUNT. FAILURE TO DO SO CAN CAUSE ONE OR MORE COMPONENTS TO FAIL CAUSING LOSS OF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

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

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.

FIGURE 9-79



5/8" Tie Rod Clamp Bolt

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

Tie Rod Cross Tube Slots

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

5/8" Tie Rod Clamp Locknut

Tightening Torque
68 ± 7 ft. lbs. (92 ± 9 Nm)

**Threaded Portion
of the Tie Rod End**

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 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.

DUAL HEIGHT CONTROL VALVE CONVERSION

Vehicles built prior to May 2010

NOTE

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

1. Place vehicle on level floor.
2. Chock the wheels.
3. Install frame stands to maintain ride height.

WARNING

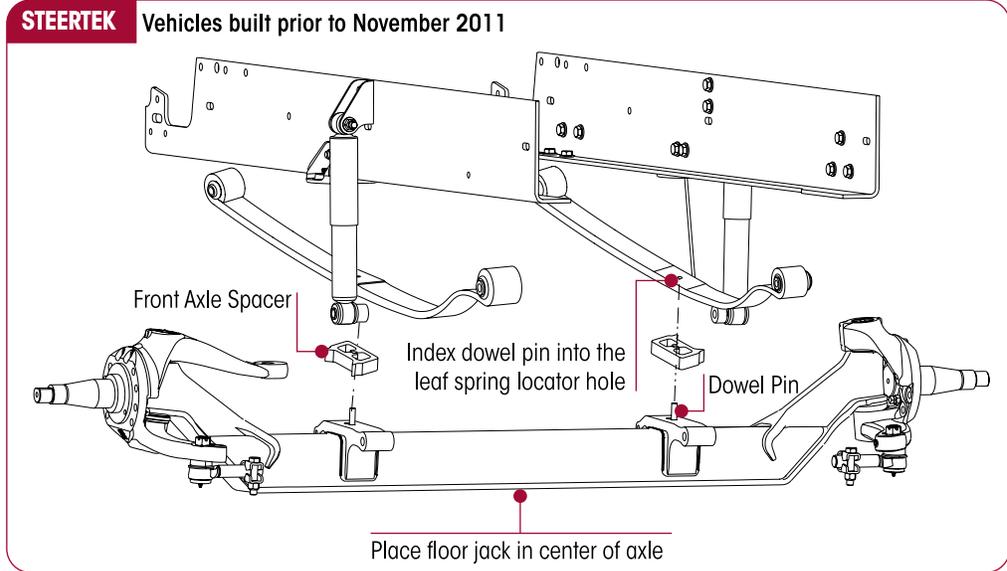
IF THE AIR SPRING IS TO BE RE-INSTALLED; INSPECT LOCK-TABS FOR DAMAGE OR CRACKS PRIOR TO RE-INSTALLATION. CARE MUST BE TAKEN TO REMOVE DIRT AND DEBRIS FROM THE PUSH-TO-CONNECT FITTING. FAILURE TO DO SO COULD RESULT IN THE PUSH-TO-CONNECT-FITTING FAILING TO SEAL WITH THE AIR LINE.

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.
5. Deflate the air spring by disconnecting the height control valve linkage and lowering the height control valve linkage arm. This will exhaust the air pressure in the air spring.
6. Remove the delivery line from the left air spring.
7. Remove the left air spring.
8. Loosen the right side clamp group.
9. Loosen and remove the left clamp group mounting fasteners and discard.
10. Install a jack underneath the left leaf spring in front of the axle.
11. Raise the jack and lift the left leaf spring off the axle seat. Position the jack far enough away from the axle to allow removal of the axle spacer, see Figure 9-80.

FIGURE 9-80



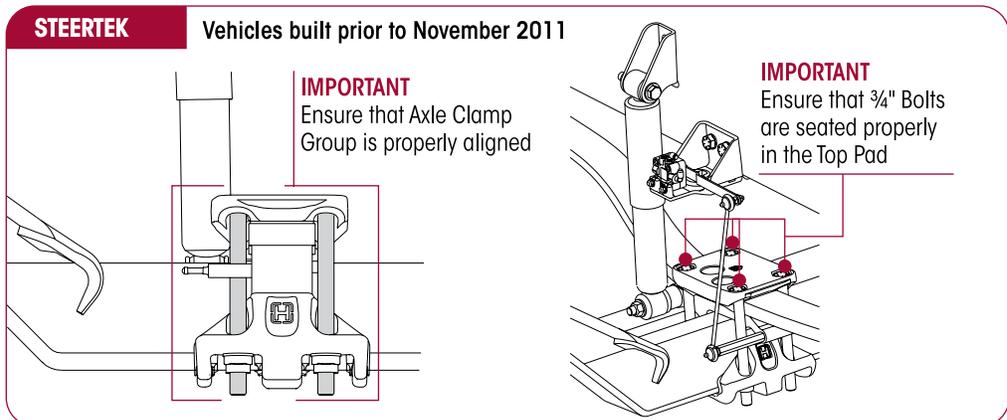
12. Remove the axle spacer from the left leaf spring and clamp group and replace with the new axle spacer provided in the kit which reduces the spacer by 10 mm. If there is no spacer in the kit, **DO NOT** use a spacer on the left hand side. It is not necessary to cut the dowel pin.

SERVICE HINT

It may be necessary to remove the dowel pin to get the axle spacer out.

13. Reinstall the dowel pin in the axle wrap if removed.
14. Lower the leaf spring onto the axle wrap. Ensure the dowel pin engages the leaf spring and the top pad.
15. Install new 3/4" clamp group fasteners.
16. Ensure that the clamp group is properly aligned and the hex bolts are seated in the top pad, and the bottom axle wrap is centered on the top axle wrap, see Figure 9-81.

FIGURE 9-81



17. Tighten the clamp group locknuts evenly in 50 foot pounds increments to 295 ± 10 foot pounds torque in the proper pattern to achieve uniform bolt tension, see Figure 9-82.
18. Remove the left upper air spring bracket and discard. Follow the vehicle manufacturer's procedure for Huck bolt removal.
19. Install the new left upper air spring bracket and height control valve mounting bracket, see Figure 9-83.

FIGURE 9-82

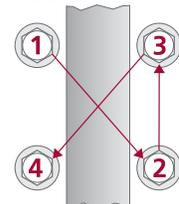
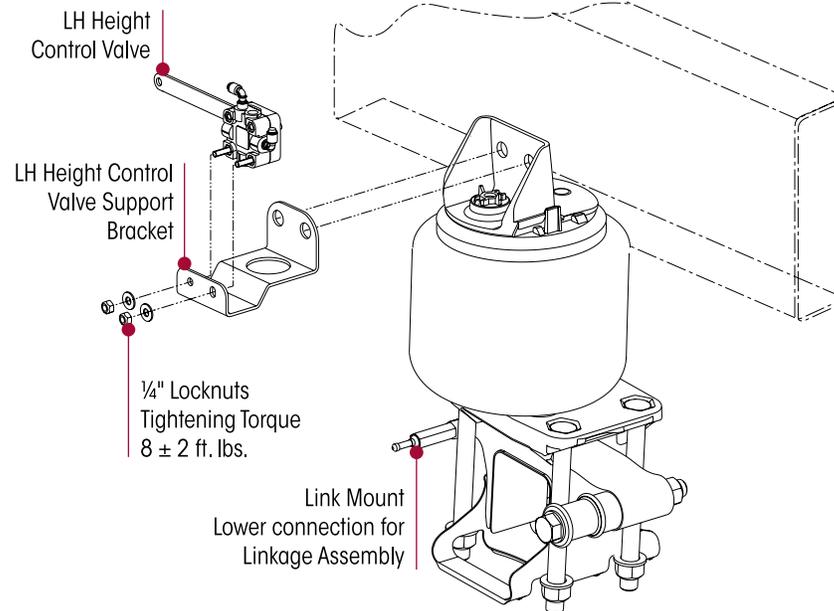


FIGURE 9-83



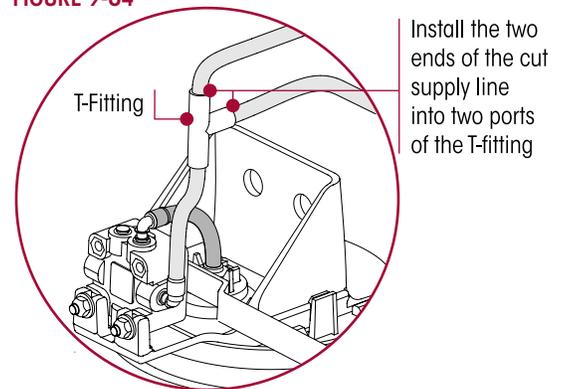
20. Tighten the upper left air spring fasteners to vehicle manufacturer's specifications.
21. Install the new left side height control valve assembly on the left side upper air spring mounting bracket. The height control valve mounts on the inboard side of the bracket.
22. Install the left air spring.
23. Install the new height control valve link mount on the left top wrap.
24. Install the left air spring delivery line into the new height control valve supply port.
25. Install a new ¼" air line from the left height control valve delivery port and into the left air spring fitting.
26. Cut the new line to length. Ensure that the ends of the line are cut square and air lines are fully seated in the fittings.

NOTE

The supply line from the tank will continue to be the supply line for both height control valves.

27. It will be necessary to cut the supply line where it is routed (through the right frame rail hole or underneath the frame rail) and install a T-fitting at this location, see Figure 9-84.
28. Install the two ends of the cut supply line into the two (2) T-fitting ports.
29. Remove the former left air spring delivery line from the right height control valve, this will now be converted to the left height control valve supply line.
30. Install the air line into the remaining port on the T-fitting supply line inside the right frame rail. Trim line if necessary.
31. There are two options to plumb the right height control valve to the right air spring, see Figure 9-85.

FIGURE 9-84



OPTION 1:

- Plug one (1) delivery port on the right height control valve with a suitable fitting
- Install an air line from the remaining delivery port to the right air spring
- It is acceptable to reuse the old line if it is in good condition

OPTION 2:

- Install two (2) air lines into the delivery ports of the right height control valve
- Cut one (1) line and install a T-fitting
- Insert the other delivery line into the T-fitting
- Cut to length and install a line out of the T-fitting and into the air spring

32. Secure all air lines inside the frame rail with plastic ties as necessary.

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

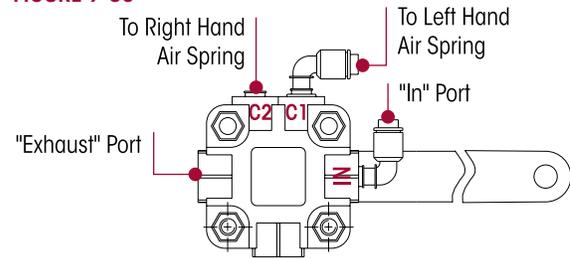
34. Air up the suspension.

35. Install the height control valve linkage(s) and inflate the suspension to normal operating pressure.

36. Remove the wheel chocks.

37. Verify proper ride height and adjust if necessary. Refer to the Alignment & Adjustments Section of this publication.

FIGURE 9-85



SECTION 10

Front Wheel Alignment Specifications

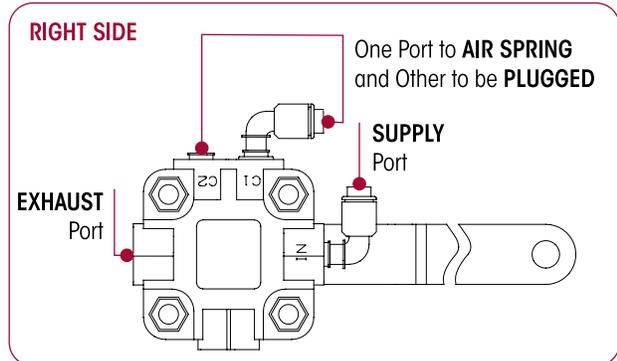
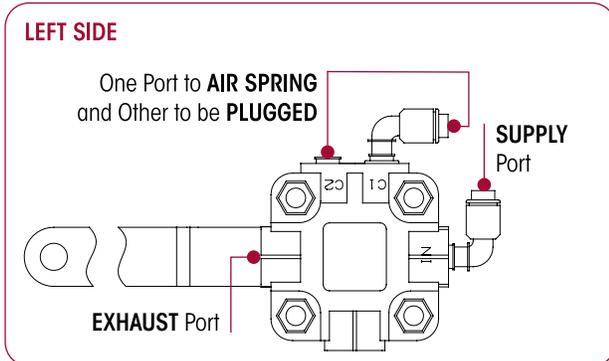
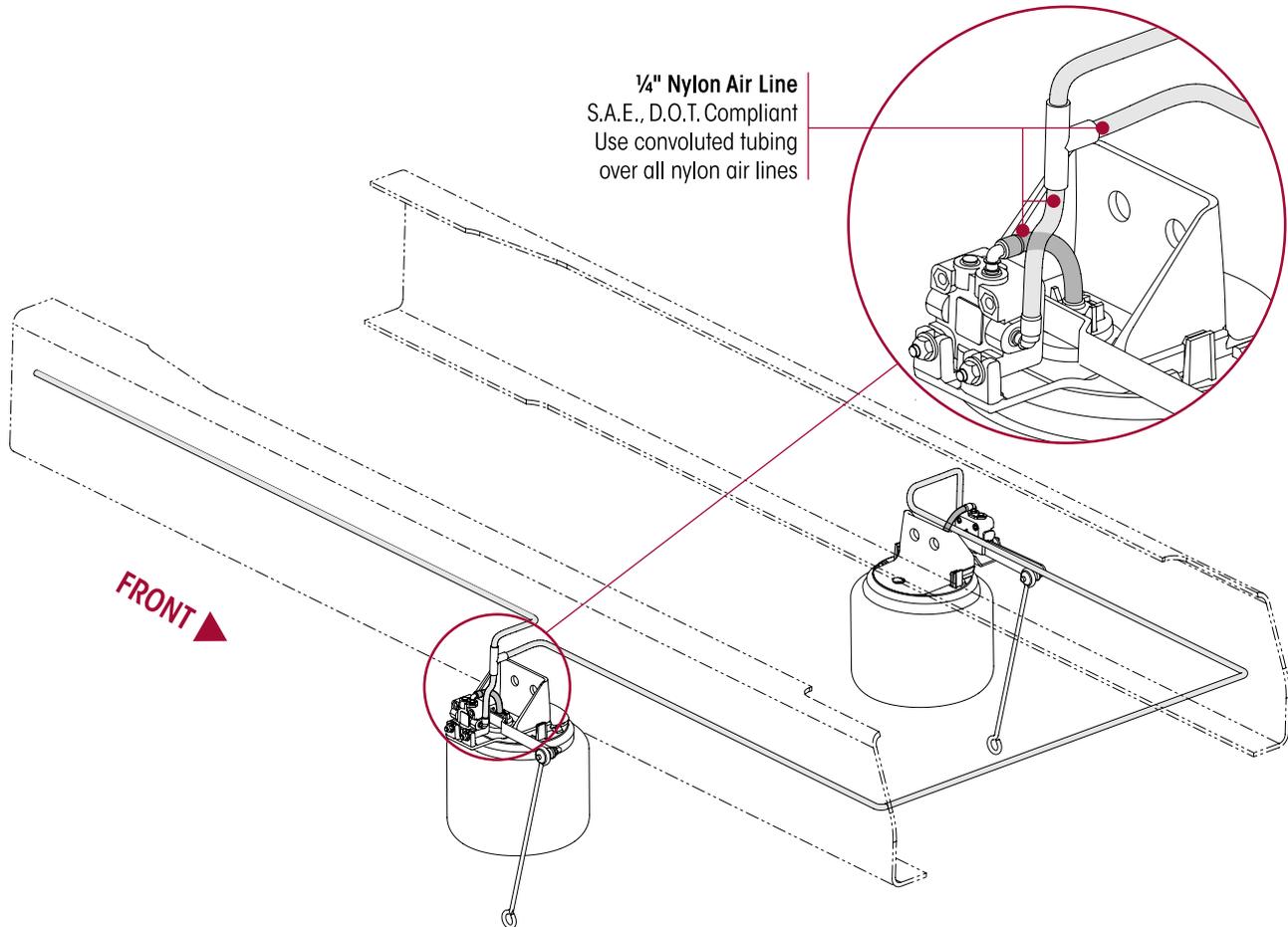
AIRTEK equipped with STEERTEK NXT • STEERTEK Axle

FRONT AIR MODULE SUSPENSION ALIGNMENT SPECIFICATION			
CAMBER¹	DESIGN SPECIFICATION	RANGE	
		Minimum	Maximum
LEFT	0.0° ± 1.0°	-1.0°	+ 1.0°
RIGHT	-0.25° ± 1.0°	-1.25°	+ 0.75°
CROSS	Max 2.0°	—	—
CAMBER NOTE:			
1. The camber angle is not adjustable. DO NOT bend axle or otherwise try to adjust camber. If found out of specification, notify Hendrickson Tech Services for further information.			
CASTER^{2,3,5}	DESIGN SPECIFICATION	RANGE	
		Minimum	Maximum
LEFT	3.75° ± 1.0°	+2.75°	+4.75°
RIGHT	3.75° ± 1.0°	+2.75°	+4.75°
CROSS ³	Max 2.0°	—	—
CASTER NOTES:			
2. 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.			
3. 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.			
4. 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 (2) different angle caster shims will not correct cross caster.			
5. Example of caster adjustment: 2.5° Right Hand / 3° Left Hand, would require one (1), 1.0 shim on each side to increase caster and achieve 3.5° Right Hand / 4.0° Left Hand, which is in specification. DO NOT attempt to use uneven shims.			
Hendrickson recommends following TMC⁷ practices:			
	DESIGN SPECIFICATION⁶	RANGE	
		Minimum	Maximum
TOTAL TOE⁷	1/16" ± 1/32" (0.06" ± 0.03")	1/32" (0.03")	3/32" (0.09")
TOE-IN NOTES:			
6. 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.			
7. In most instances total toe is set by the vehicle manufacturer or body builder. Consult the vehicle manufacturer for specifications.			

SECTION 11 Plumbing Diagrams

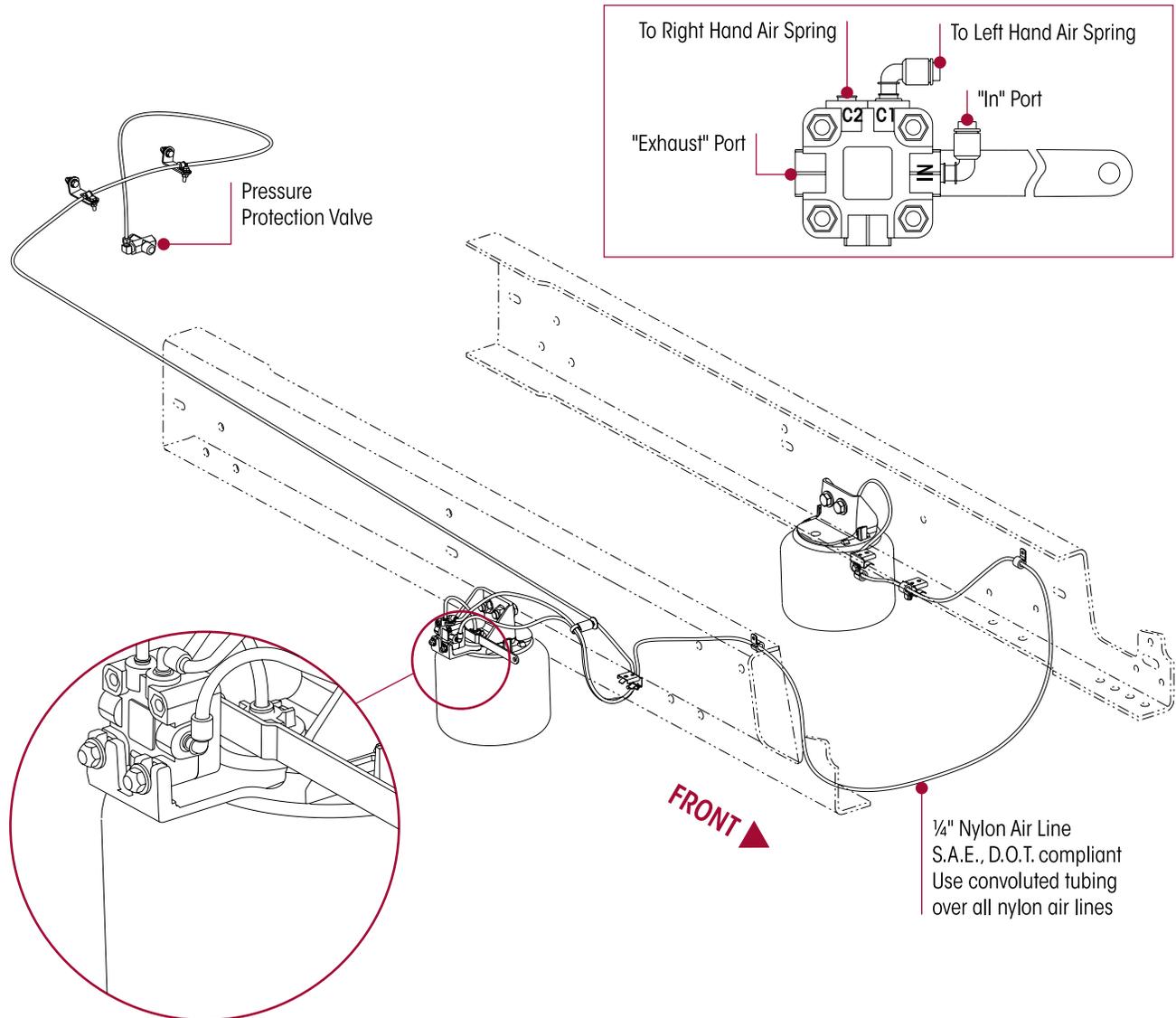
DUAL PLUMBING DIAGRAM

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.



SINGLE PLUMBING DIAGRAM

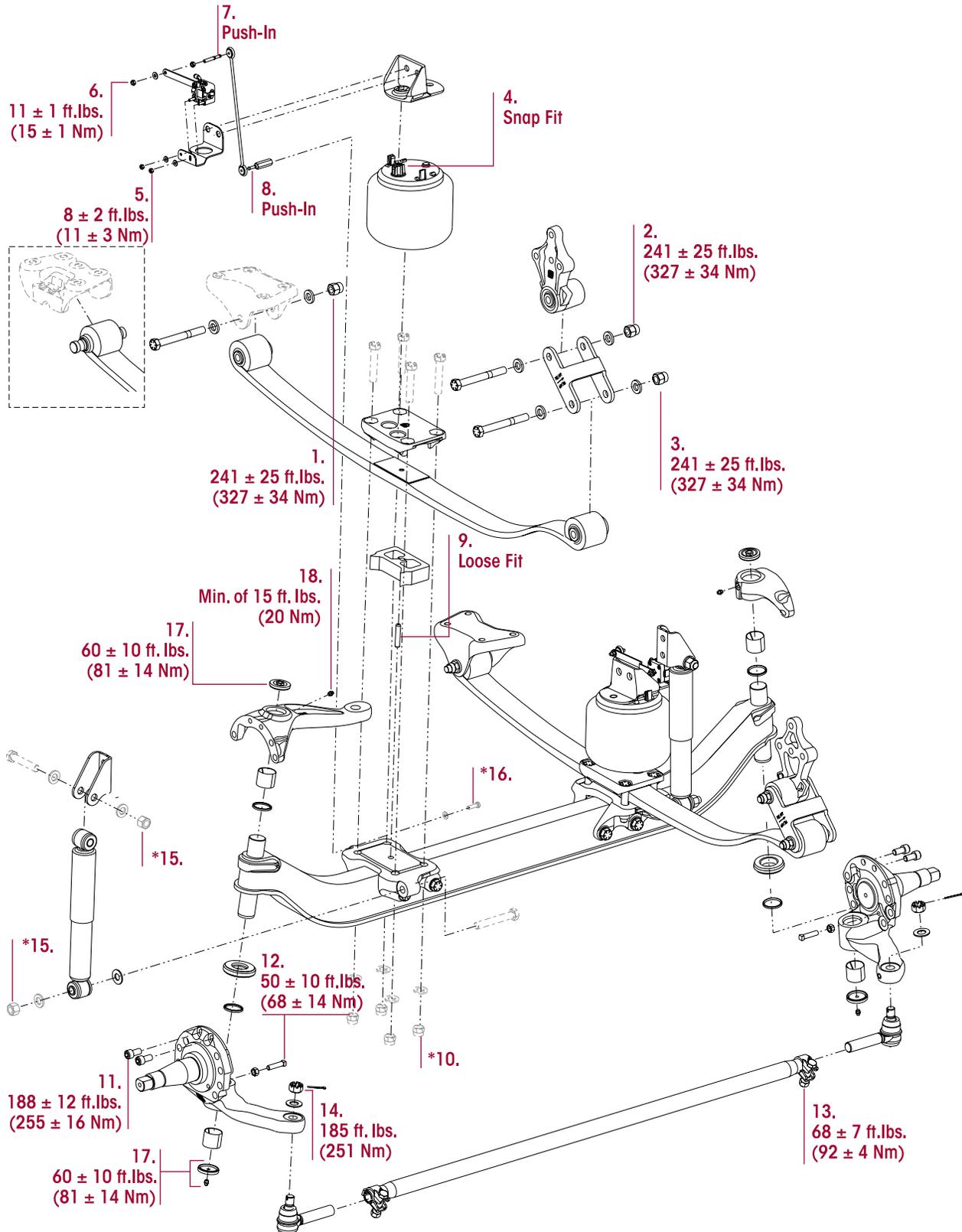
When replacing or installing nylon air line tubing into quick-connect fittings it is critical that the end of the air line is cut square. Improper cut of the end of the air line tubing can cause the air line to seat improperly in the quick connect fitting causing air leakage.



SECTION 12 Torque Specifications

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

■ AIRTEK with STEERTEK NXT axle for Freightliner – Vehicles built after November 2011

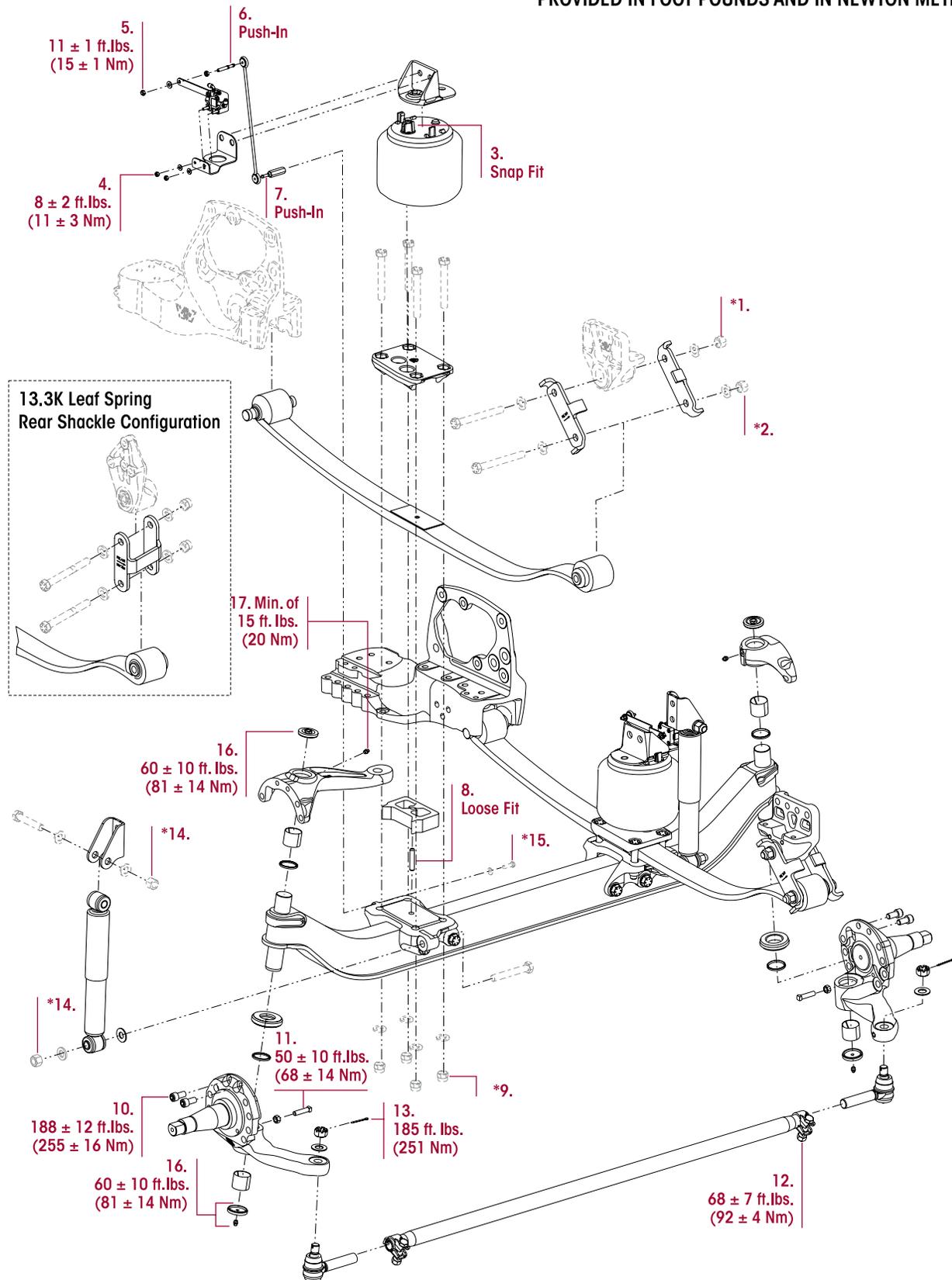


AIRTEK
Freightliner – Vehicles built after November 2011
HENDRICKSON RECOMMENDED TORQUE SPECIFICATIONS

NO.	COMPONENT	FASTENER		*TORQUE VALUE	
		Quantity	Size	Foot Pounds	Nm
Frame fasteners are furnished and installed by the vehicle manufacturer. Vehicle manufacturer may use an equivalent HUCK fastener at frame mount.					
1	Front Frame Hanger to Front Leaf Spring Eye at the Locknut	2	¾"	241 ± 25	327 ± 34
2	Shackle Bracket to Shackle at the Locknut	2	¾"	241 ± 25	327 ± 34
3	Shackle Bracket to Rear Leaf Spring Eye at the Locknut	2	¾"	241 ± 25	327 ± 34
4	Air Spring	None	Self Locking	Snap Fit	
5	Height Control Valve to Air Spring Bracket	2	¼"	8 ± 2	11 ± 3
6	Height Control Valve to Linkage Rod	1	⅝"	11 ± 1	15 ± 1
7	Height Control Valve Stud to Linkage Grommet	None	Grommet	Push In	
8	Link Mount to Linkage Grommet	None	Grommet	Push In	
9	Spring Center Alignment Pin	1	½"	Loose Fit	
10	Clamp Group Hardware	4	¾"	295 ± 10	400 ± 14
	 WARNING ENSURE CLAMP GROUP IS ALIGNED PROPERLY PRIOR TO TIGHTENING HARDWARE. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE OR PERSONAL INJURY.				
11	Knuckle Attachment Bolt (Socket Head Cap Screw)	2	⅝"	188 ± 12	255 ± 16
12	Knuckle / Axle Wheel Stop Bolt	1	⅝" Jam Nut	50 ± 10	68 ± 14
13	Tie Rod Tube to Tie Rod Ends	2	⅝"	68 ± 7	92 ± 4
14	Tie Rod Ends to Lower Steering Knuckle	2	⅞" Castle Nut	**185	**251
15	Shock Eye Bolts	2	¾"	240 ± 15	325 ± 20
16	Link Mount to Axle Seat	1	⅜"	35 ± 5	47 ± 7
17	Grease Cap Assembly, Upper and Lower	4	½"	60 ± 10	81 ± 14
18	Grease Zerk	2		Minimum of 15	Minimum of 20
• All hardware ¼" and greater is Grade 8 with no additional lubrication.					
NOTES: * All hardware shown in gray denotes fasteners originally supplied by the vehicle manufacturer. Torque values shown apply only if Hendrickson supplied fasteners are used. If non Hendrickson fasteners are used, follow the torque specification listed in the vehicle manufacturer's service manual. ** Tighten to 185 foot pounds torque, advance nut to next hex face to install cotter pin. DO NOT back off nut for cotter pin installation.					

■ **AIRTEK with STEERTEK NXT axle for Western Star**
Vehicles built after November 2011

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



AIRTEK

Western Star – Vehicles built after November 2011

HENDRICKSON RECOMMENDED TORQUE SPECIFICATIONS

NO.	COMPONENT	FASTENER		*TORQUE VALUE	
		Quantity	Size	Foot Pounds	Nm
Frame fasteners are furnished and installed by the vehicle manufacturer. Vehicle manufacturer may use an equivalent HUCK fastener at frame mount.					
1	Shackle Bracket to Shackle at the Locknut	2	¾"	*241 ± 25	*327 ± 34
2	Shackle Bracket to Rear Leaf Spring Eye at the Locknut	2	¾"	*241 ± 25	*327 ± 34
3	Air Spring	None	Self Locking	Snap Fit	
4	Height Control Valve to Air Spring Bracket	2	¼"	8 ± 2	11 ± 3
5	Height Control Valve to Linkage Rod	1	⅝"	11 ± 1	15 ± 1
6	Height Control Valve Stud to Linkage Grommet	None	Grommet	Push In	
7	Link Mount to Linkage Grommet	None	Grommet	Push In	
8	Spring Center Alignment Pin	1	½"	Loose Fit	
9	Clamp Group Hardware	*4	¾"	*295 ± 10	400 ± 14
 WARNING ENSURE THE CLAMP GROUP IS ALIGNED PROPERLY PRIOR TO TIGHTENING HARDWARE. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE OR PERSONAL INJURY.					
10	Knuckle Attachment Bolt (Socket Head Cap Screw)	*2	⅝"	188 ± 12	255 ± 16
11	Knuckle / Axle Wheel Stop Bolt	*1	⅝" Jam Nut	50 ± 10	68 ± 14
12	Tie Rod Tube to Tie Rod Ends	2	⅝"	68 ± 7	92 ± 4
13	Tie Rod Ends to Lower Steering Knuckle	2	⅞" Castle Nut	**185	**251
14	Shock Eye Bolts	2	¾"	*240 ± 15	325 ± 20
15	Link Mount to Axle Seat	1	³ / ₈ "	*35 ± 5	47 ± 7
16	Grease Cap Assembly, Upper and Lower	4	½"	60 ± 10	81 ± 14
17	Grease Zerk	2		Min. of 15	Min. of 20

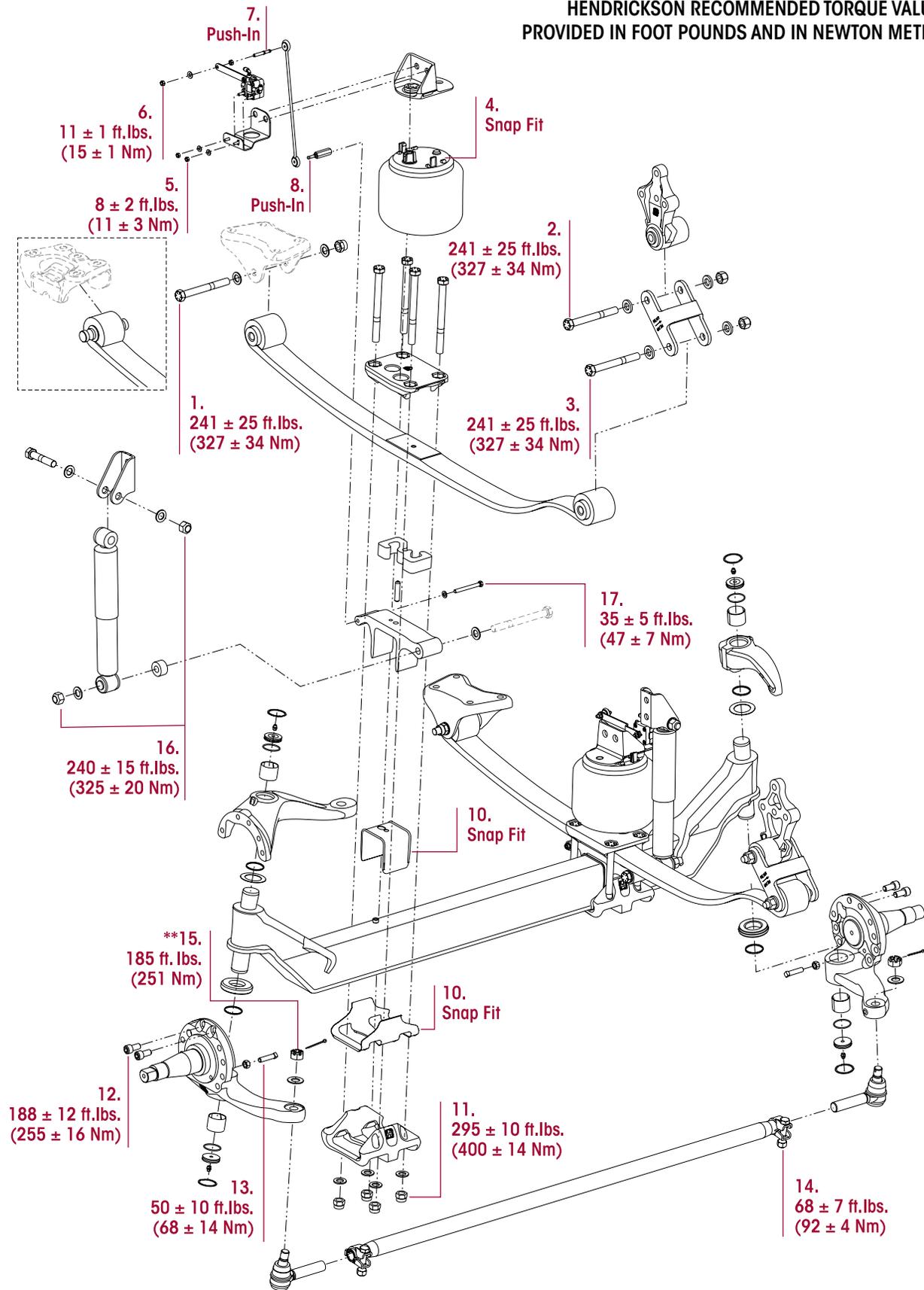
• All hardware ¼" and greater is Grade 8 with no additional lubrication.

NOTES: * All hardware shown in gray denotes fasteners originally supplied by the vehicle manufacturer. Torque values shown apply only if Hendrickson supplied fasteners are used. If non Hendrickson fasteners are used, follow the torque specification listed in the vehicle manufacturer's service manual.

** Tighten to 185 foot pounds torque, advance nut to next hex face to install cotter pin. **DO NOT** back off nut for cotter pin installation.

■ **AIRTEK with STEERTEK axle for Freightliner**
 Vehicles built between May 2010 and November 2011

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

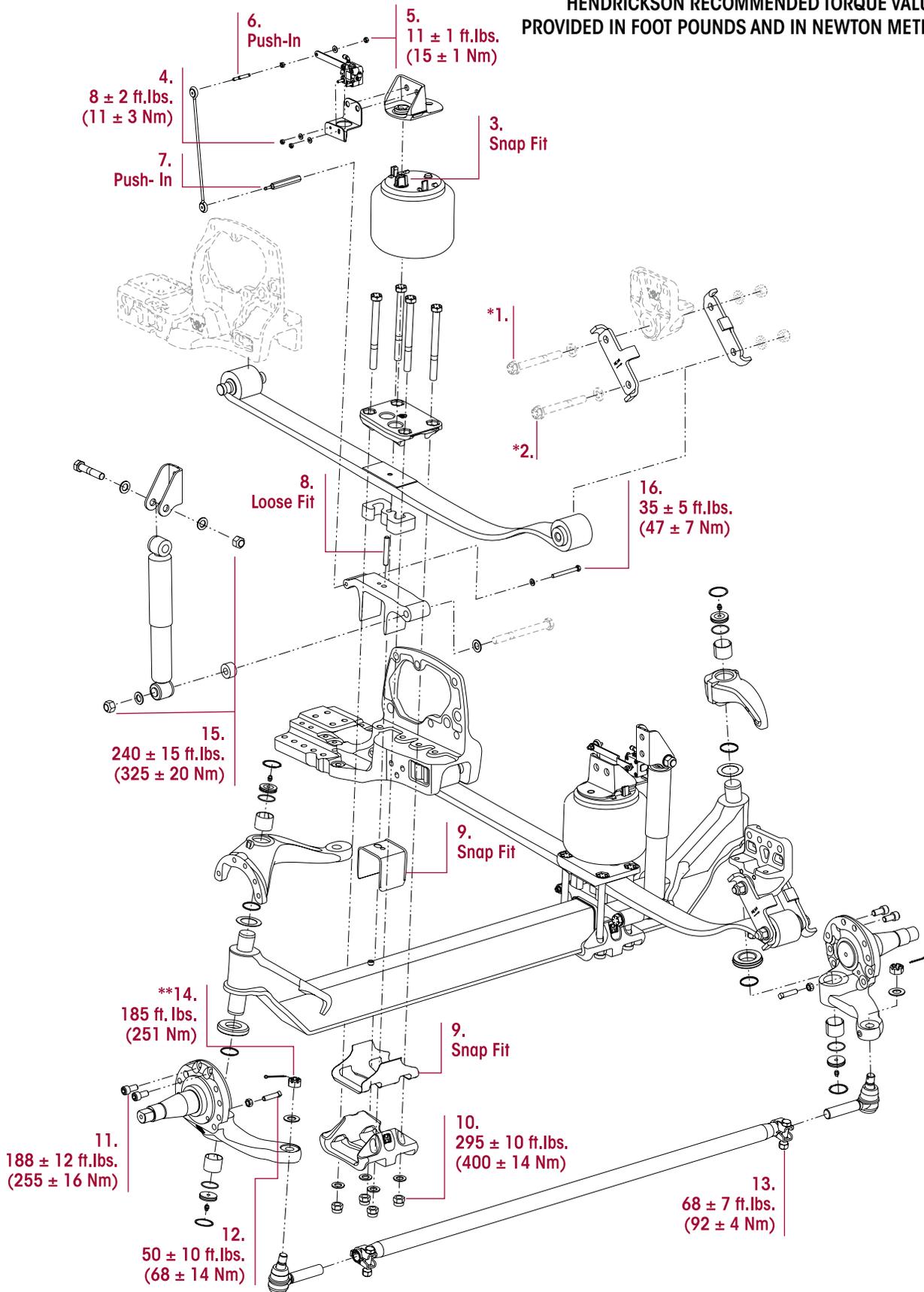


AIRTEK
Freightliner – Vehicles built between May 2010 and November 2011
HENDRICKSON RECOMMENDED TORQUE SPECIFICATIONS

NO.	COMPONENT	FASTENER		*TORQUE VALUE	
		Quantity	Size	Foot Pounds	Nm
Frame fasteners are furnished and installed by the vehicle manufacturer. Vehicle manufacturer may use an equivalent HUCK fastener at frame mount.					
1	Front Frame Hanger to Front Leaf Spring Eye at the Bolt Head	2	¾"	241 ± 25	327 ± 34
2	Shackle Bracket to Shackle at the Bolt Head	2	¾"	241 ± 25	327 ± 34
3	Shackle Bracket to Rear Leaf Spring Eye at the Bolt Head	2	¾"	241 ± 25	327 ± 34
4	Air Spring	None	Self Locking	Snap Fit	
5	Height Control Valve to Air Spring Bracket	2	¼"	8 ± 2	11 ± 3
6	Height Control Valve to Linkage Rod	1	⅝"	11 ± 1	15 ± 1
7	Height Control Valve Stud to Linkage Grommet	None	Grommet	Push In	
8	Link Mount to Linkage Grommet	None	Grommet	Push In	
9	Spring Center Alignment Pin	1	½"	Loose Fit	
10	Axle Wrap Liners for Clamp Group	None	Formed	Snap Fit	
	 WARNING DO NOT ASSEMBLE THE CLAMP GROUP WITHOUT AXLE WRAP LINERS. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE OR PERSONAL INJURY.				
11	Clamp Group Hardware	*4	¾"	295 ± 10	400 ± 14
	 WARNING ENSURE THE 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)	*2	⅝"	188 ± 12	255 ± 16
13	Knuckle / Axle Wheel Stop Bolt	*1	⅝" Jam Nut	50 ± 10	68 ± 14
14	Tie Rod Tube to Tie Rod Ends	2	⅝"	68 ± 7	92 ± 4
15	Tie Rod Ends to Lower Steering Knuckle	2	⅞" Castle Nut	**185	**251
16	Shock Eye Bolts	2	¾"	240 ± 15	325 ± 20
17	Link Mount to Top Axle Wrap	1	⅜"	35 ± 5	47 ± 7
• All hardware ¼" and greater is Grade 8 with no additional lubrication.					
NOTES: * All hardware shown in gray denotes fasteners originally supplied by the vehicle manufacturer. Torque values shown apply only if Hendrickson supplied fasteners are used. If non Hendrickson fasteners are used, follow the torque specification listed in the vehicle manufacturer's service manual.					
** Tighten to 185 foot pounds torque, advance nut to next hex face to install cotter pin. DO NOT back off nut for cotter pin installation.					

■ **AIRTEK with STEERTEK axle for Western Star**
 Vehicles built between June 2010 and November 2011

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

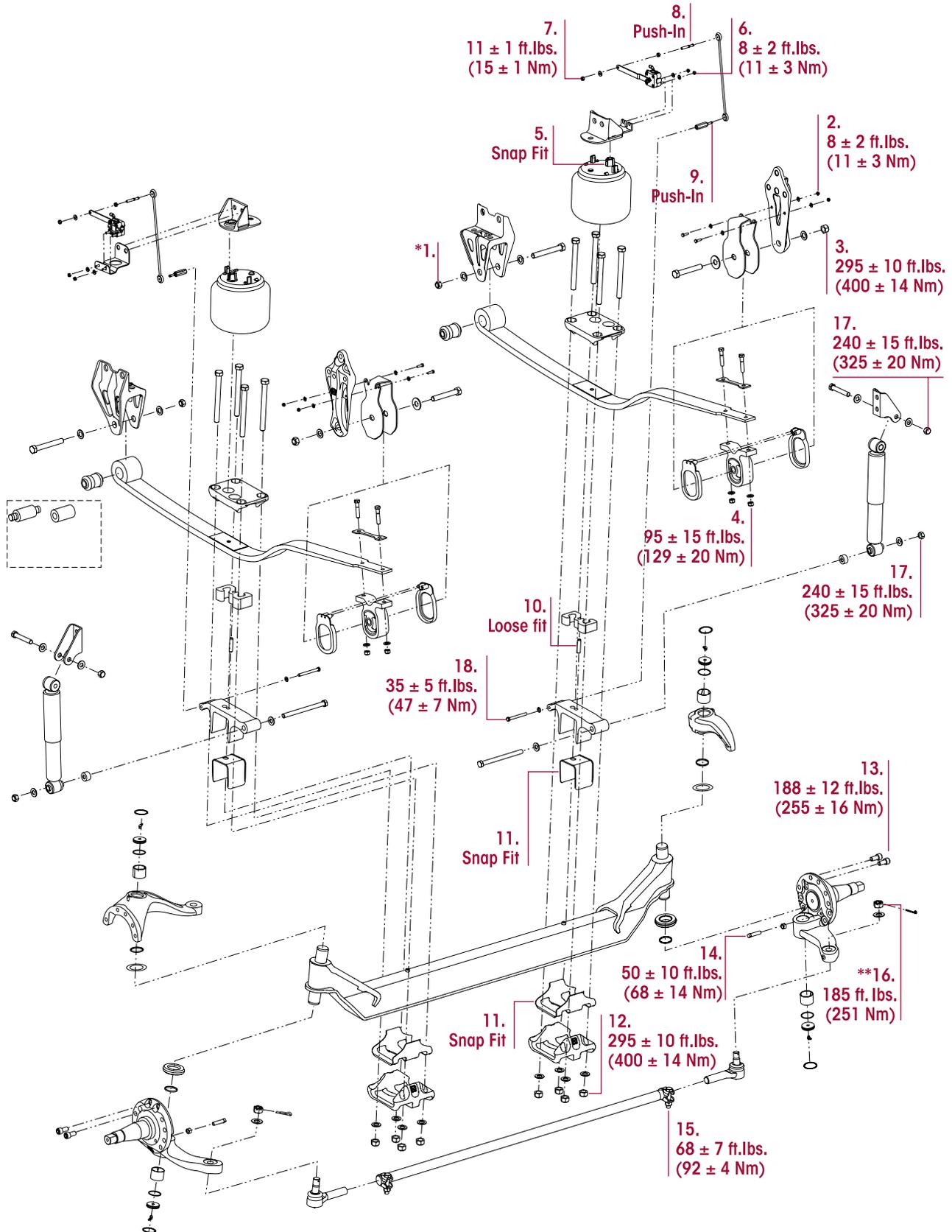


AIRTEK
Western Star – Vehicles built between June 2010 and November 2011
HENDRICKSON RECOMMENDED TORQUE SPECIFICATIONS

NO.	COMPONENT	FASTENER		*TORQUE VALUE	
		Quantity	Size	Foot Pounds	Nm
Frame fasteners are furnished and installed by the vehicle manufacturer. Vehicle manufacturer may use an equivalent HUCK fastener at frame mount.					
1	Shackle Bracket to Shackle at the bolt head	2	¾"	*241 ± 25	*327 ± 34
2	Shackle Bracket to Rear Leaf Spring Eye at the bolt head	2	¾"	*241 ± 25	*327 ± 34
3	Air Spring	None	Self Locking	Snap Fit	
4	Height Control Valve to Air Spring Bracket	2	¼"	8 ± 2	11 ± 3
5	Height Control Valve to Linkage Rod	1	⅝"	11 ± 1	15 ± 1
6	Height Control Valve Stud to Linkage Grommet	None	Grommet	Push In	
7	Link Mount to Linkage Grommet	None	Grommet	Push In	
8	Spring Center Alignment Pin	1	½"	Loose Fit	
9	Axle Wrap Liners for Clamp Group	None	Formed	Snap Fit	
⚠ WARNING DO NOT ASSEMBLE THE CLAMP GROUP WITHOUT AXLE WRAP LINERS. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE OR PERSONAL INJURY.					
10	Clamp Group Hardware	*4	¾"	295 ± 10	400 ± 14
⚠ WARNING ENSURE THE CLAMP GROUP IS ALIGNED PROPERLY PRIOR TO TIGHTENING HARDWARE. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE OR PERSONAL INJURY.					
11	Knuckle Attachment Bolt (Socket Head Cap Screw)	*2	⅝"	188 ± 12	255 ± 16
12	Knuckle / Axle Wheel Stop Bolt	*1	⅝" Jam Nut	50 ± 10	68 ± 14
13	Tie Rod Tube to Tie Rod Ends	2	⅝"	68 ± 7	92 ± 4
14	Tie Rod Ends to Lower Steering Knuckle	2	⅞" Castle Nut	**185	**251
15	Shock Eye Bolts	2	¾"	240 ± 15	325 ± 20
16	Link Mount to Top Axle Wrap	1	⅜"	35 ± 5	47 ± 7
• All hardware ¼" and greater is Grade 8 with no additional lubrication.					
NOTES: * All hardware shown in gray denotes fasteners originally supplied by the vehicle manufacturer. Torque values shown apply only if Hendrickson supplied fasteners are used. If non Hendrickson fasteners are used, follow the torque specification listed in the vehicle manufacturer's service manual.					
** Tighten to 185 foot pounds torque, advance nut to next hex face to install cotter pin. DO NOT back off nut for cotter pin installation.					

- Vehicles built with **STEERTEK** axle for:
 - Freightliner** – Vehicles built prior to May 2010
 - Western Star** – Vehicles built prior to June 2010
 - Sterling** – Vehicles built prior to April 2009

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



AIRTEK

Freightliner – Vehicles built prior to May 2010 • **Western Star** – Vehicles built prior to June 2010
 • **Sterling** – Vehicles built prior to April 2009

HENDRICKSON RECOMMENDED TORQUE SPECIFICATIONS

NO.	COMPONENT	FASTENER		*TORQUE VALUE	
		Quantity	Size	Foot Pounds	Nm
Frame fasteners are furnished and installed by the vehicle manufacturer. Vehicle manufacturer may use an equivalent HUCK fastener at frame mount.					
1	Front Frame Hanger to Front Leaf Spring Eye	2	¾"	*295 ± 10	*400 ± 14
2	Rear Hanger to Rear Hanger Clamp	4	¼"	8 ± 2	11 ± 3
3	Rear Hanger to Rear Spring Mount	2	¾"	295 ± 10	400 ± 14
4	Rear Spring Mount to Rear Leaf Spring	2	½"	95 ± 15	129 ± 20
5	Air Spring	None	Self Locking	Snap Fit	
6	Height Control Valve to Air Spring Bracket	2	¼"	8 ± 2	11 ± 3
7	Height Control Valve to Linkage Rod	1	⅝"	11 ± 1	15 ± 1
8	Height Control Valve Stud to Linkage Grommet	None	Grommet	Push In	
9	Link Mount to Linkage Grommet	None	Grommet	Push In	
10	Spring Center Alignment Pin	1	½"	Loose Fit	
11	Axle Wrap Liners for Clamp Group	None	Formed	Snap Fit	
 WARNING DO NOT ASSEMBLE THE 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	*4	¾"	295 ± 10	400 ± 14
 WARNING ENSURE THE 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)	*2	⅝"	188 ± 12	255 ± 16
14	Knuckle / Axle Wheel Stop Bolt	*1	⅝" Jam Nut	50 ± 10	68 ± 14
15	Tie Rod Tube to Tie Rod Ends	2	⅝"	68 ± 7	92 ± 4
16	Tie Rod Ends to Lower Steering Knuckle	2	⅞" Castle Nut	**185	**251
17	Shock Eye Bolts	2	¾"	240 ± 15	325 ± 20
18	Link Mount to Top Axle Wrap (Right side only if equipped with a single height control valve, both Sides if equipped with dual height control valves)	1	⅜"	35 ± 5	47 ± 7

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

NOTES: * All hardware shown in gray denotes fasteners originally supplied by the vehicle manufacturer. Torque values shown apply only if Hendrickson supplied fasteners are used. If non Hendrickson fasteners are used, follow the torque specification listed in the vehicle manufacturer's service manual.

** Tighten to 185 foot pounds torque, advance nut to next hex face to install cotter pin. **DO NOT** back off nut for cotter pin installation.

SECTION 13 Troubleshooting Guide

AIRTEK

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

AIRTEK

TRUBLESHOOTING GUIDE (Continued)		
CONDITION	POSSIBLE CAUSE	CORRECTION
Tie rod ends are worn and require replacement	Tie rod ends need lubrication	Lubricate tie rod end. Make sure lubrication schedule is followed.
	Severe operating conditions	Increase frequency of inspection and lubrication intervals
	Damaged boot on tie rod end	Replace tie rod end
Bent or broken cross tube, tie rod end ball stud or tie rod end 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 AIRTEK spring hanger re-torque procedure. See Torque Specification Section of this publication
	Leaf spring broken	Replace leaf spring
	Excessive weight bias	Contact vehicle manufacturer or Hendrickson Tech Services
Vehicle wanders	Caster out of specifications	Check ride height prior and adjust caster to specification
	Incorrect toe setting	Adjust toe to specification
	Fifth wheel not greased	Grease fifth wheel
	Air in the power steering system	Remove air form 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

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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	Adjust caster
	Wheels and/or tires out of balance	Balance or replace wheels and/or tires
	Worn shock absorbers	Replace shock absorbers
	Wheel bearing adjustment	Adjust wheel bearing to vehicle manufacturer's specifications.
Excessive wear on tires or uneven tire tread wear	Tires have incorrect air pressure	Adjust tire pressure to the 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 the vehicle manufacturer's specification
	Incorrect steering arm geometry	Repair steering system as necessary
	Excessive wheel bearing end play	Check specified wheel nut torque, replace worn or damaged wheel bearings
	Wheel bearing adjustment	Adjust wheel bearing to the vehicle manufacturer's specifications.
Vehicle is hard to steer	Low pressure in the power steering system	Repair power steering system
	Steering linkage needs lubrication	Lubricate steering linkage
	Steering knuckles are binding	Check vertical clearance
	Incorrect steering arm geometry	Repair steering system as necessary
	Caster out of adjustment	Adjust caster as necessary
	Tie rod ends hard to move	Replace tie rod ends
	Worn thrust bearing	Replace thrust bearing

STEERTEK NXT / STEERTEK

TROUBLESHOOTING GUIDE (Continued)		
CONDITION	POSSIBLE CAUSE	CORRECTION
Tie rod ends are worn and require replacement	Tie rod ends need lubrication	Lubricate tie rod end. Make sure lubrication schedule is followed.
	Severe operating conditions	Increase frequency of inspection and lubrication intervals
	Damaged boot on tie rod end	Replace tie rod end
Bent or broken cross tube, tie rod end ball stud or tie rod end 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
	Axle stops improperly set	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	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	Leaf spring broken	Replace leaf spring
	Excessive weight bias	Contact the vehicle manufacturer or Hendrickson Tech Services
Vehicle wanders	Caster out of specification	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

SECTION 14

Reference Material

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

TMC

To obtain copies of the following RP's, video's, or charts, contact TMC at:

TMC / ATA	Phone: 703-838-1763
2200 Mill Road	website: tmc.truckline.com
Alexandria, VA 22314	online ordering: www.truckline.com/store

Important References

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

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

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



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