TECHNICAL PROCEDURE

PRIMAAX® EX • PRIMAAX® Rear Air Suspension for Kenworth Vehicles

SUBJECT: Service Instructions
LIT NO: 17730-263
DATE: November 2021 **REVISION:** G

TABLE OF CONTENTS

HENDRICKSON
The World Rides On Us®

SECTION 1
Introduction

This publication is intended to acquaint and assist maintenance personnel in the preventive maintenance, service, repair, and rebuild of the PRIMAAX® EX • PRIMAAX® rear air suspension systems as installed on applicable Kenworth Vehicles.

NOTE Use only Hendrickson Genuine parts for servicing this suspension system.

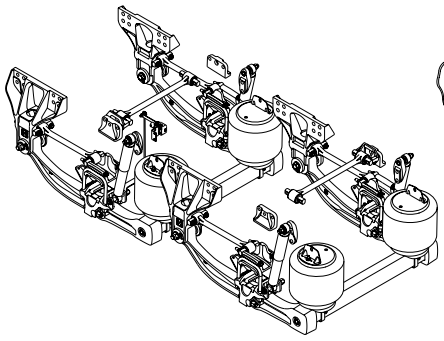
It is important to read and understand this entire Technical Procedure publication prior to performing any maintenance, service, repair, or rebuild of this product. The information in this publication contains parts lists, safety information, product specifications, features, proper maintenance, service, repair, and rebuild instructions for the PRIMAAX EX • PRIMAAX suspensions.

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

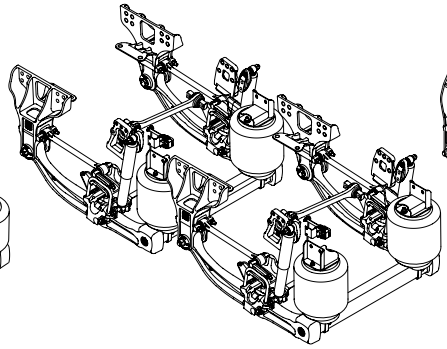
The latest revision of this publication is also available online at www.hendrickson-intl.com.

SECTION 2
Product Description

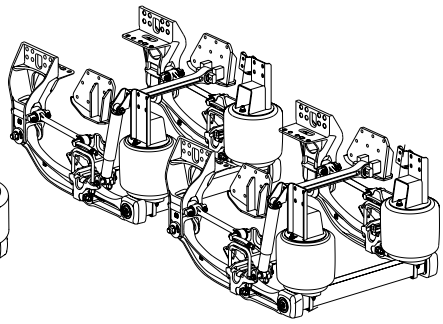
FIGURE 2-1 Current Production Shown



23K•46K•69K | 26K S•52K S•78K S
8½", 10" Ride Height



23K•46K•69K | 26K S•52K S•78K S
12" Ride Height



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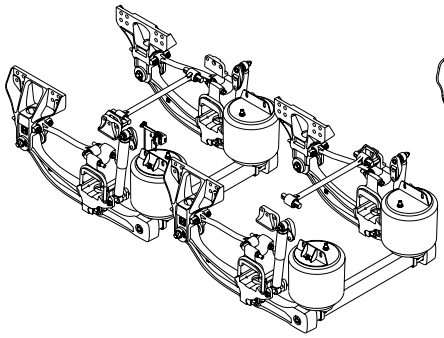
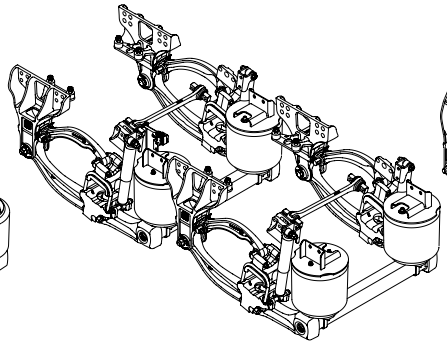
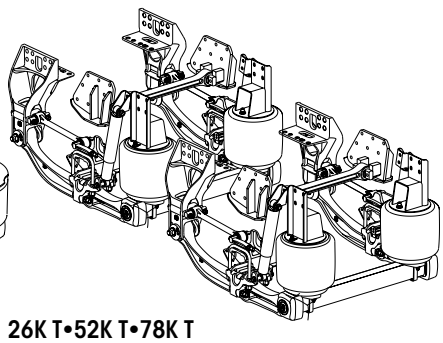
15½" Ride Height



26K • 52K • 78K
8½", 10" Ride Height



26K • 52K•78K
12" Ride Height



26K T•52K T•78K T
15½" Ride Height

***PRIMAAX EX** — MAAXimize the performance of vocational and heavy-haul vehicles with a suspension engineered specifically for demanding on- and off- highway conditions. With 100 years of robust suspension design, Hendrickson delivers another premium suspension with PRIMAAX EX. Rugged, dependable and extensively tested in challenging applications, PRIMAAX EX paves a new road for suspension technology. Drivers, cargo and vehicles are major investments that require protection. PRIMAAX EX adjusts to variations in load and road conditions for optimal ride and performance. This low-maintenance design delivers greater stability for improved control on and off the job site.

- **Air springs** — Large volume, low frequency design for improved ride. Advanced design air springs lift and support the load with less air pressure.
- **Cast structural beams** — Integrated end caps for increased reliability. Utilize premium materials to improve durability. Robust rubber bushings improve service life and eliminate lubrication requirements. Designed for increased disc brake clearance and compatibility.
- **D-pin axle connection and clamp group** — Decreases torsional axle stress for reduced maintenance and increased joint integrity. Integrated axle stop contact pads reduce axle stress. Newly designed torque rod bar-pin connection for increased reliability and reduced maintenance time.
- **Heavy-duty shock absorbers** — Positioned and tuned for optimum damping characteristics and protect air springs from over-extension.
- **QUIK-ALIGN® Axle Alignment System —** Allows for easy axle alignment without shims. Reduces maintenance time and helps extend tire life.
- **Torque rods** — Optimized configuration helps improve handling and roll stiffness for expanded applications. Premium retained rubber bushings for increased service life and resistance to walk-out. Designed for optimum clearance and articulation. Alternative torque rods available for disc brake use.

*Current production only benefits featured.

*PRIMAAX EX SPECIFICATIONS

	Single Axle Configuration						Tandem Axle Configuration					
	23K	**23K T**	**26K**	**26K T**	**26K S**	**26K ST**	**46K**	**46K T**	**52K**	**52K T**	**52K S**	**52K ST**
Suspension Capacity Rating	23,000 lbs		26,000 lbs				46,000 lbs		52,000 lbs			
Job-Site Travel Rating[1]	30,000 lbs		33,000 lbs		33,000 lbs		60,000 lbs		66,000 lbs		66,000 lbs	
Ground Clearance	10.75"		9"	10.75"	9.25"		10.75"		10.5"		10.75"	
Ride Height[2]	8.5" 10" 12"	15.5"	8.5" 10" 12"	15.5"	8.5" 10" 12"	15.5"	8.5" 10" 12"	15.5"	8.5" 10" 12"	15.5"	8.5" 10" 12"	15.5"
Gross Combination Weight Approval[3]	95,000		142,000				190,000		245,000			
Axle Travel[4]	8"						8"					
Lift Axles	Approved						Approved					
Axle Spacing	N/A						52" to 72.5"		54" to 72.5"			

	Tridem Axle Configuration					
	69K	**69K T**	**78K**	**78K T**	**78K S**	**78K ST**
Suspension Rating	69,000 lbs		78,000 lbs			
Job-Site Travel Rating[1]	90,000 lbs		99,000 lbs		99,000 lbs	
Ground Clearance	10.75"		10.5"		10.75"	
Ride Heights[2]	8.5" 10" 12"	15.5"	8.5" 10" 12"	15.5"	8.5" 10" 12"	15.5"
Gross Combination Weight Approval[3]	Contact Vehicle Manufacturer					
Axle Travel[4]	8"					
Lift Axles	Approved					
Axle Spacing	52" to 60"		54" to 60"			

S – designates **Small Clamp Group**

T – designates **Tall Ride Height 15½"**

*Current production specifications shown. PRIMAAX EX is approved for vocational and heavy-haul vehicle applications including, but not limited to: truck, tractor, dump, front and rear discharge mixers, logging, crane mounted, platform, fire/rescue, specialty, and vehicles equipped with outriggers.

Contact Hendrickson or your truck manufacturer / dealer for further information.

1. Suspension must be paired with appropriate axle rating.
2. Job-site travel rating — operators using vehicles equipped with liftable pusher or tag axles must not exceed published ratings. Job-site travel ratings are limited to no more than five percent of vehicle operation at a speed not to exceed five mph. Liftable pusher or tag axles should be raised (or unloaded) to improve vehicle maneuverability in job-site applications or when the vehicle is empty. Job-site travel ratings are consistent with published axle manufacturer's limitations. Axle and suspension job-site travel specifications must not be exceeded.
3. For different ride height options, please contact Hendrickson, your truck manufacturer or dealer for further information.
4. Suspension articulation may exceed vehicle's capability and may be limited by the vehicle manufacturer; vehicle manufacturer installed axle stops may restrict suspensions articulation.

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.

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

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

EXPLANATION OF SIGNAL WORDS

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

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

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

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

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

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

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 in this publication.

The torque symbol alerts you to tighten fasteners to a specified torque value. Refer to Torque Specifications section in 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, ADVERSE VEHICLE HANDLING, PERSONAL INJURY, OR PROPERTY DAMAGE.

LOOSE OR OVER TORQUED FASTENERS CAN CAUSE COMPONENT DAMAGE, ADVERSE VEHICLE HANDLING, 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 SPECIFICATIONS LISTED IN THE VEHICLE MANUFACTURER'S SERVICE MANUAL.

⚠ WARNING

QUIK-ALIGN FASTENERS

DISCARD USED QUIK-ALIGN FASTENERS. ALWAYS USE NEW QUIK-ALIGN FASTENERS TO COMPLETE A REPAIR. FAILURE TO DO SO COULD RESULT IN FAILURE OF THE PART, OR MATING COMPONENTS, ADVERSE VEHICLE HANDLING, PERSONAL INJURY, OR PROPERTY DAMAGE.

⚠ WARNING

DO NOT ASSEMBLE THE QUIK-ALIGN JOINT WITHOUT THE PROPER FASTENERS. USE ONLY HENDRICKSON COATED GENUINE FASTENERS TO SUSTAIN PROPER CLAMP FORCE. ENSURE THAT THE QUIK-ALIGN FASTENER'S TORQUE VALUES ARE SUSTAINED AS RECOMMENDED IN THE TORQUE SPECIFICATIONS SECTION IN THIS PUBLICATION. FAILURE TO FOLLOW THE ABOVE ITEMS CAN CAUSE ADVERSE VEHICLE HANDLING RESULTING IN PERSONAL INJURY OR PROPERTY DAMAGE AND WILL VOID ANY APPLICABLE WARRANTIES. FOLLOW VEHICLE MANUFACTURER'S FASTENER ORIENTATION WHEN PERFORMING ANY MAINTENANCE, SERVICE, OR REPAIR.

⚠ WARNING

LOAD CAPACITY

ADHERE TO THE PUBLISHED CAPACITY RATINGS FOR THE SUSPENSION. ADD-ON AXLE ATTACHMENTS AND OTHER LOAD TRANSFERRING DEVICES, SUCH AS LIFTABLE AXLES, CAN INCREASE THE SUSPENSION LOAD ABOVE ITS RATED AND APPROVED CAPACITIES, WHICH CAN RESULT IN COMPONENT DAMAGE AND ADVERSE VEHICLE HANDLING, POSSIBLY CAUSING PERSONAL INJURY OR PROPERTY DAMAGE.

⚠ 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.

⚠ CAUTION

PROCEDURES AND TOOLS

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

⚠ WARNING

SUPPORT THE VEHICLE PRIOR TO SERVICING

PLACE THE VEHICLE ON A LEVEL FLOOR AND CHOCK THE WHEELS TO PREVENT THE VEHICLE FROM MOVING OR ROLLING. DO NOT WORK AROUND OR UNDER A RAISED VEHICLE SUPPORTED BY ONLY A FLOOR JACK OR OTHER LIFTING DEVICE. ALWAYS SUPPORT A RAISED VEHICLE WITH RIGID SAFETY STANDS. FAILURE TO DO SO CAN CAUSE SERIOUS PERSONAL INJURY OR DAMAGE TO EQUIPMENT.

⚠ WARNING

TORQUE RODS

THIS HENDRICKSON SUSPENSION REQUIRES TORQUE RODS FOR SUSPENSION PERFORMANCE AND VEHICLE STABILITY. IF THESE TORQUE RODS ARE DISCONNECTED OR ARE NON-FUNCTIONAL, DO NOT OPERATE THE VEHICLE. OPERATING A VEHICLE WITH DISCONNECTED OR NON-FUNCTIONAL TORQUE RODS CAN RESULT IN ADVERSE VEHICLE HANDLING, COMPONENT DAMAGE, SUSPENSION/VEHICLE DAMAGE, AND/OR SEVERE PERSONAL INJURY.

⚠ WARNING

PERSONAL PROTECTIVE EQUIPMENT

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

⚠ WARNING

TORCH/WELDING

DO NOT USE A CUTTING TORCH TO REMOVE ANY FASTENERS. THE USE OF HEAT ON SUSPENSION COMPONENTS WILL ADVERSELY AFFECT THE STRENGTH OF THESE PARTS. A COMPONENT DAMAGED IN THIS MANNER CAN RESULT IN THE ADVERSE VEHICLE HANDLING AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

EXERCISE EXTREME CARE WHEN HANDLING OR PERFORMING MAINTENANCE IN THE AREA OF THE SUPPORT BEAM. DO NOT CONNECT ARC WELDING GROUND LINE TO THE SUPPORT BEAM. DO NOT STRIKE AN ARC WITH THE ELECTRODE ON THE SUPPORT BEAM. DO NOT USE HEAT NEAR THE SUPPORT BEAM ASSEMBLY. DO NOT NICK OR GOUGE THE SUPPORT BEAM. SUCH IMPROPER ACTIONS CAN DAMAGE THE SUPPORT BEAM ASSEMBLY AND CAUSE ADVERSE VEHICLE HANDLING AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

⚠ WARNING

WORK SITE DUMPING

WHEN THE TRUCK/TRAILER BODY/BOOM/AND OR ATTACHMENT IS LIFTED IT IS MANDATORY TO COMPLETELY EXHAUST THE AIR FROM THE SUSPENSION SYSTEM TO HELP PROVIDE STABILITY WHEN LIFTED. FAILURE TO DO SO CAN RESULT IN ADVERSE VEHICLE HANDLING, ROLL-OVER, OR VEHICLE INSTABILITY, POSSIBLE PERSONAL INJURY, PROPERTY DAMAGE, OR DEATH. FIRST RAISE ANY AUXILIARY AXLES AND THEN EXHAUST ALL PRESSURE FROM REAR TRACTOR / TRAILER AND TRUCK AIR SUSPENSION SYSTEMS PRIOR TO RAISING THE BODY / BOOM OR ATTACHMENTS. FOLLOW THE VEHICLE MANUFACTURER'S OPERATING INSTRUCTIONS FOR MAINTAINING PROPER STABILITY.

⚠ CAUTION

AIR SPRING LOWER MOUNTING STUDS

IF THE AIR SPRING IS BEING REMOVED FOR AN ALTERNATE REPAIR, IT IS MANDATORY TO LUBRICATE THE LOWER AIR SPRING FASTENERS WITH PENETRATING OIL AND REMOVE WITH HAND TOOLS TO PREVENT DAMAGE TO THE LOWER AIR SPRING MOUNTING STUD. FAILURE TO DO SO CAN CAUSE COMPONENT DAMAGE AND VOID WARRANTY.

⚠ WARNING

AIR SPRING PRESSURE RETENTION

SOME VEHICLE APPLICATIONS, SUCH AS VEHICLES EQUIPPED WITH OUTRIGGERS, RETAIN SOME AIR PRESSURE IN THE AIR SPRINGS AT ALL TIMES. PRIOR TO PERFORMING ANY MAINTENANCE, SERVICE, OR REPAIR OF THE SUSPENSION, VERIFY EACH AIR SPRING IS COMPLETELY DEFLATED. FAILURE TO DO SO COULD RESULT IN SERIOUS PROPERTY DAMAGE AND/OR SEVERE PERSONAL INJURY.

⚠ WARNING

FAILURE TO PRESS THE AIR SPRING AGAINST THE UNDERSIDE OF THE FRAME WHILE TIGHTENING THE UPPER AIR SPRING BRACKET CAN RESULT IN COMPONENT DAMAGE AND PERSONAL INJURY OR PROPERTY DAMAGE.

⚠ WARNING

AIR SPRING INFLATION AND DEFLATION

PRIOR TO DISASSEMBLY OF THE SUSPENSION, AIR SPRING ASSEMBLIES MUST BE DEFLATED. 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 .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.

PRIOR TO AND DURING DEFLATION AND INFLATION OF THE AIR SUSPENSION SYSTEM, ENSURE 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.

⚠ CAUTION

AIR SPRING INFLATION

INFLATE THE SUSPENSION SLOWLY AND MAKE SURE THE RUBBER BLADDER OF THE AIR SPRING INFLATES UNIFORMLY AND IS NOT BINDING. FAILURE TO DO SO CAN CAUSE DAMAGE TO THE AIR SPRING AND/OR MOUNTING BRACKETS AND VOID WARRANTY.

⚠ WARNING

SHOCK ABSORBERS

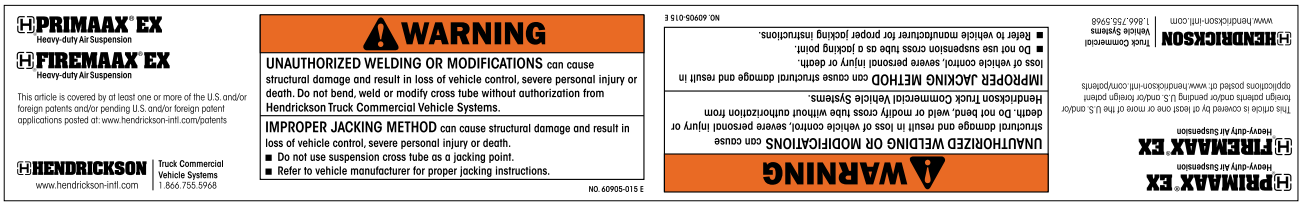
THE SHOCK ABSORBERS ARE THE REBOUND TRAVEL STOPS FOR THE SUSPENSION. ANYTIME THE AXLE ON A PRIMAAX EX • PRIMAAX SUSPENSION IS SUSPENDED IT IS MANDATORY THAT THE SHOCK ABSORBERS REMAIN CONNECTED. FAILURE TO DO SO CAN CAUSE THE AIR SPRINGS TO SEPARATE FROM THE PISTON AND RESULT IN PREMATURE AIR SPRING FAILURE. REPLACEMENT OF SHOCK ABSORBERS WITH NON-HENDRICKSON PARTS CAN ALTER THE REBOUND TRAVEL OF THE SUSPENSION.

⚠ WARNING

CROSS TUBE

IMPROPER JACKING METHODS CAN CAUSE STRUCTURAL DAMAGE (SEE SAFETY DECAL, FIGURE 3-1) AND RESULT IN ADVERSE VEHICLE HANDLING, SEVERE PERSONAL INJURY OR DEATH AND WILL VOID HENDRICKSON'S WARRANTY.

FIGURE 3-1 SAFETY DECAL PART NUMBER 60905-015



- REPLACE ANY SAFETY DECALS THAT ARE FADED, TORN, MISSING, ILLEGIBLE, OR OTHERWISE DAMAGED. CONTACT HENDRICKSON TO ORDER REPLACEMENT LABELS
- DO NOT USE THE SUSPENSION CROSS TUBE AS A JACKING POINT TO RAISE THE VEHICLE, SEE FIGURE 3-2
- REFER TO VEHICLE MANUFACTURER FOR PROPER JACKING INSTRUCTIONS, SEE FIGURE 3-3

FIGURE 3-2

FIGURE 3-3

⚠ 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 WARRANTY.

SECTION 4
Parts Lists

Refer to Hendrickson Literature Number **SP-164** available online at www.hendrickson-intl.com/products/primaax.

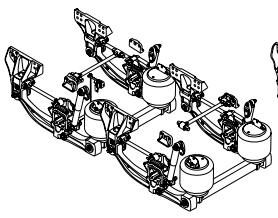
FIGURE 4-1

PARTS LIST

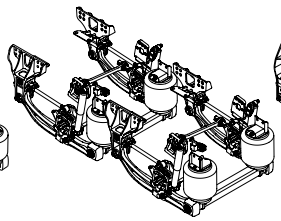
PRIMAAX® EX • PRIMAAX®
Heavy-duty Rear Air Suspension

LIT NO: SP-164
DATE: November 2021 **REVISION:** M

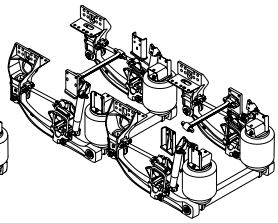
CONTENTS



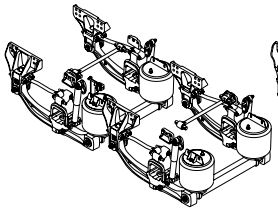
23K 46K 69K | 26KS 52KS 78KS
8½", 10" Ride Height



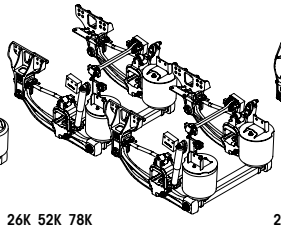
23K 46K 69K | 26KS 52KS 78KS
12" Ride Height



23KT 46KT 69KT | 26KST 52KST 78KST
12½", 14⅜", 15½" Ride Height



26K 52K 78K
8½", 10" Ride Height



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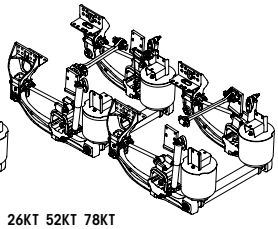
12" Ride Height



26KT 52KT 78KT
12½", 14⅜", 15½" Ride Height

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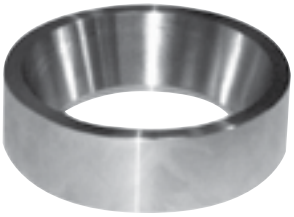
SECTION 5
Special Tools

TORQUE ROD BUSHING SERVICE TOOLS

Hendrickson Part No. 66086-001L

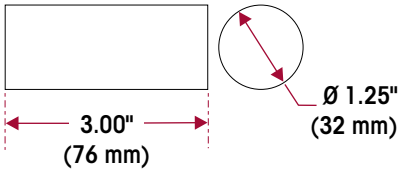


NOTE: TRAAX ROD and some ULTRA ROD torque rod assemblies equipped on the PRIMAAX EX • PRIMAAX suspensions are not rebushable. The entire torque rod assembly must be replaced. This feature provides superior bushing retention in the torque rod end hub.

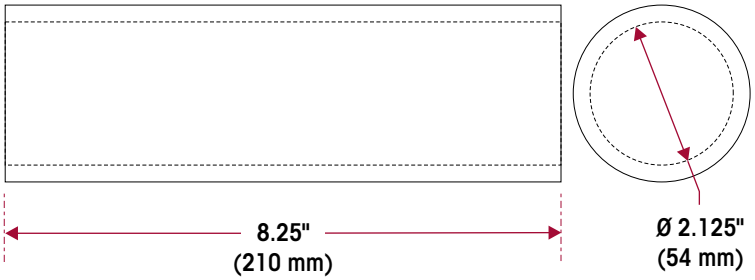
These torque rods can be identified by the part number: 67428-XXX • 67219-XXX • 65302-XXX or the suffix N after any part number (i.e. 62000-615N).

These shop made tools are designed to service torque rod bushing. These tools are made from cold rolled steel or equivalent. Drawings are for reference only. Hendrickson does not supply these tools.

INSTALLATION / REMOVAL TOOL



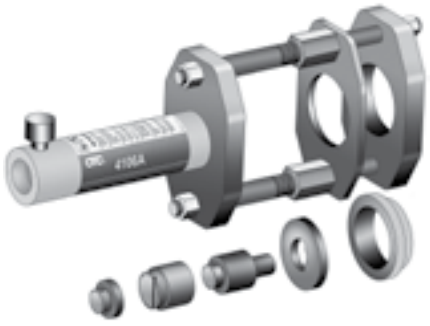
RECEIVING TOOL



D-PIN / QUIK-ALIGN PIVOT BUSHING SERVICE TOOLS

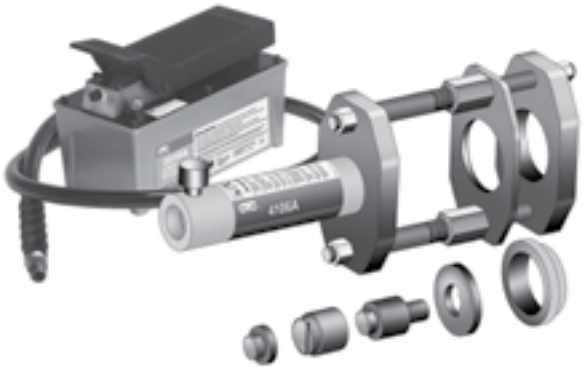
Hendrickson Part No. 66086-202

OTC Part No. 4246 Visit otctools.com



Hendrickson Part No. 66086-204

OTC Part No. 4247 Visit otctools.com



QUIK-ALIGN SOCKET TOOL

Hendrickson Part No. 66086-200

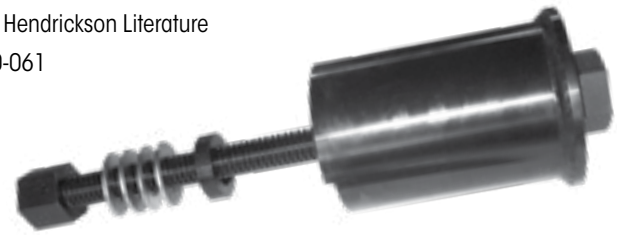
OTC Part No. 1767

Visit otctools.com

QUIK-ALIGN PIVOT BUSHING SERVICE TOOL

Hendrickson Part No. 66086-203L

Reference Hendrickson Literature No. 59310-061

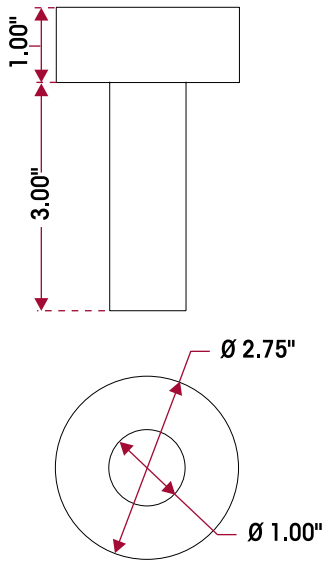


D-PIN / QUIK-ALIGN PIVOT BUSHING SHOP MADE SERVICE TOOLS

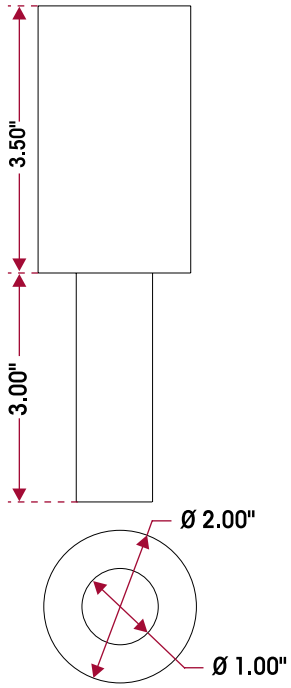
These shop made tools are designed to service D-pin and QUIK-ALIGN pivot bushings. These tools are made from cold rolled steel or equivalent. Drawings are for reference only. Hendrickson does not supply these tools.

QUIK-ALIGN TOOLS

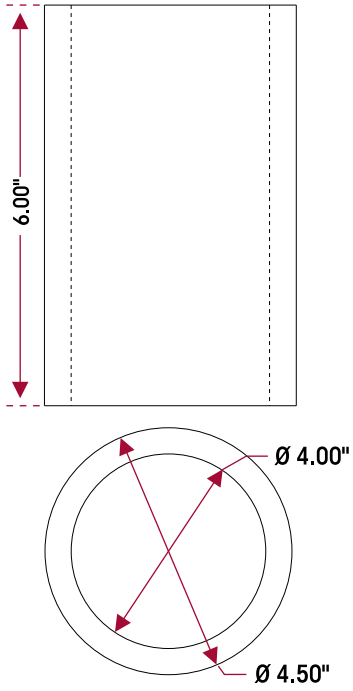
Pivot Bushing Installer



Pivot Bushing Remover

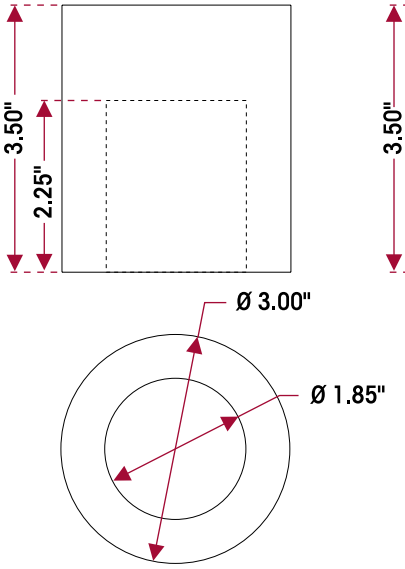


Pivot Bushing Receiver

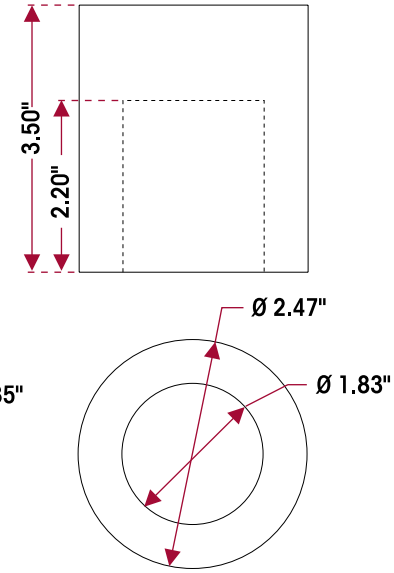


D-PIN TOOLS

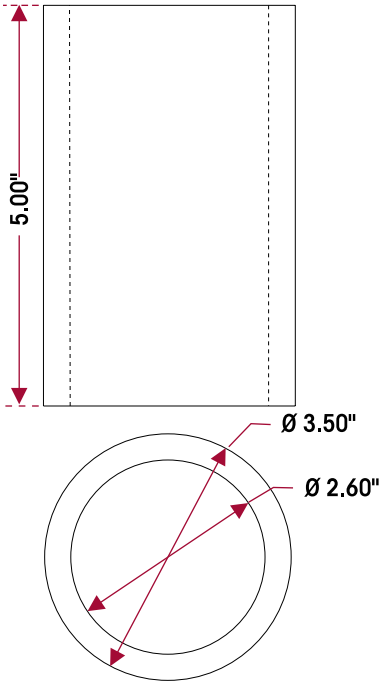
Installer



Remover



Receiver



SECTION 6
Preventive Maintenance

Following appropriate inspection procedures is important to help ensure the proper maintenance and operation of the PRIMAAX EX • PRIMAAX heavy-duty rear suspension systems and components function to their highest efficiency.

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.

AREAS OF INSPECTION

- ■ Air springs
- • Air supply and fittings
- • All fasteners
- ■ Clamp group
- • Frame hanger bracket
- • Height control valve
- • Longitudinal Torque rods
- ■ QUIK-ALIGN® connections
- • S-cam support tube bracket (if equipped)
- • Shock absorbers
- • Tire wear
- • Top pad
- ■ Transverse Torque rods
- ■ U-beam assembly: Cross tube / Support beam / End cap
- • U-bolt locknuts

■ Signifies performance critical components group

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: • 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 500 miles (500 km)	Within the first 1,000 miles (1,600 km) or 100 hours	**OFF-HIGHWAY** every 6 months /1,200 hours or 25,000 miles / 40,000 km, whichever comes first **ON-HIGHWAY** every 12 months or 50,000 miles, whichever comes first
Visually inspect the overall condition of and for any signs of damage to: • U-beam assembly • Air springs and air lines			
Inspect fasteners for proper torque as recommended in the Torque Specifications section in this publication: • QUIK-ALIGN fasteners, and the torque rod to top pad fasteners • Clamp group U-bolt fasteners, see Figure 6-1 • **DO NOT** re-torque Integrated End Cap, see Figure 6-2 • Transverse torque rod fasteners, see vehicle manufacturer's torque specifications			Every 12 months / 2400 hours
Verify the lateral alignment of the drive axles are within the vehicle manufacturer's tolerances			
Verify the ride height. Refer to the vehicle manufacturer for proper specifications and procedure.			

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

NOTE Figures 6-1 illustrate basic connections for PRIMAAX EX and Figure 6-2 illustrates U-beam connections for PRIMAAX EX and PRIMAAX.

FIGURE 6-1
Clamp Group & D-pin Fasteners

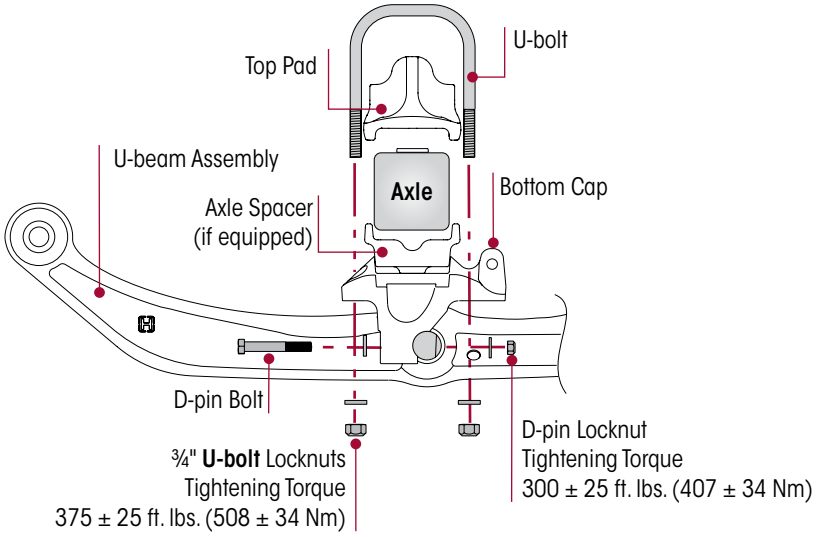
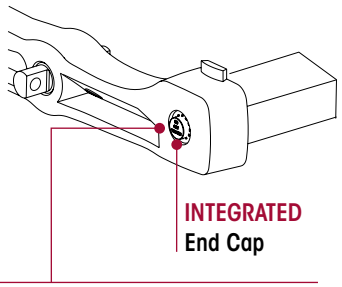
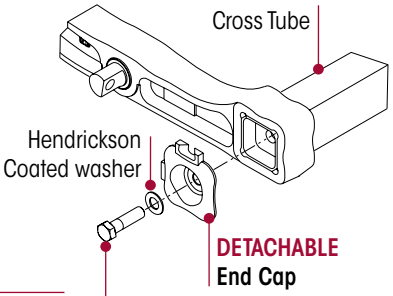


FIGURE 6-2
Integrated End Cap
PRIMAAX EX
vehicles built
After May 2010



DO NOT re-torque the **Integrated End Cap**
The **Tamper Resistant Cap** attached to the integrated end cap bolts with SIKAFLEX 221 sealant applied around the cap.

Detachable End Cap
PRIMAAX vehicles built
Prior to May 2010



Check for proper torque values on the detachable end cap connection fasteners

⅞" Hex Bolt
Tightening Torque
550 ± 25 ft. lbs. (746 ± 34 Nm)

COMPONENT INSPECTION

IMPORTANT NOTE Replace all worn or damaged parts.

- **Air spring** — Visually inspect the outer surface of the air spring for chafing, uneven wear, cracks or any signs of component damage. Ensure that the upper bead plate is tight against the underside of the frame. Check for any lateral slippage at the lower air spring bracket. An ⅛" of slippage in either direction is acceptable. Verify all mounting hardware have the proper torque values maintained. See the Torque Specifications section in this publication for recommended torque requirements.
- **Air supply (Pneumatic components)** — The air supply to the system plays a large role in the air springs' performance. Inspect, clean and replace, if necessary, any support products to the air springs, valves, regulators and air lines. See Air Fittings in this section for proper inspection.
- **Clamp group** — Visually inspect for any loose or damaged fasteners. Verify the U-bolt locknuts have the proper torque values maintained. See the U-bolt Locknuts in this section.
- **Cross tube** — Visually inspect for cracks, damage, metal shavings, or looseness at the beam connection.

- **End cap** (if equipped, vehicles built prior to March 2009) – Visually inspect the end cap connection for signs of movement or damage. Verify the support beam/cross tube connection bolts have the proper torque values maintained. See the Torque Specifications section in this publication for recommended torque requirements.
- **Fasteners** — Visually inspect for any loose or damaged fasteners on the entire suspension. Make sure all fasteners are tightened to a torque value within the specified torque range. See Torque Specifications section in 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 and correct the torque if necessary.
- **Frame hanger** — Visually inspect for any signs of loose fasteners, movement, or damage. Verify the frame attaching fasteners have the proper torque values maintained. See the vehicle manufacturer for proper torque specifications.
- **Height control valve and air lines** — Check the suspension air system for air leaks. Check all air lines for proper routing. Check for chafing or pinched air lines. Check the height control valve linkage for damage or interference with peripheral components.
- **QUIK-ALIGN connection** — Visually inspect the connection for signs of looseness or movement. Visually inspect the bushing for wear. Verify the connections have the proper torque values maintained. See the Torque Specifications section in this publication for recommended torque requirements.

  Refer to QUIK-ALIGN Fasteners Warnings in the Important Safety Notice section in this publication prior to installing QUIK-ALIGN connection.
- **S-Cam support tube bracket** (If equipped) — Visually inspect the bracket for damage and check for any loose or damaged fasteners.
- **Shock absorbers** — Visually inspect for any signs of dents or leakage. Misting is not considered a leak, see Shock Absorbers in this section for proper inspection.
- **Tire wear** — Visually inspect the tires for wear patterns that may indicate suspension damage or misalignment.
- **Top pad/Longitudinal torque rod connection** — Visually inspect the connection for signs of movement or damage. Use a lever check to help assess movement in this joint, see Longitudinal and Transverse Torque Rods in this section for proper inspection. Verify the top pad/longitudinal torque rod connections have the proper torque values maintained. See the Torque Specifications section in this publication for recommended torque requirements.
- **Torque rods (longitudinal and transverse)** — All torque rods must be inspected for looseness, torn or shredded rubber and for proper fastener torque, see Longitudinal and Transverse Torque Rod inspection in this section.
- **U-beam assembly** — Visually inspect the overall condition of the support beam for dents, dings, or other damage on the outer edges of the beam flanges. Visually inspect the D-pin bushings for tearing or extreme bulging. Check for any metal-to-metal contact in the bushed joints.
- **Wear and damage** — Visually inspect all parts of the suspension for wear and damage. Look for bent or cracked parts.

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

U-BOLT LOCKNUTS

NOTE

U-bolt clamp group hardware for the PRIMAAX EX • PRIMAAX suspensions are ¾"-16 UNF Grade C locknuts and ¾"-16 UNF Grade 8 U-bolts which are phosphate and oil coated.

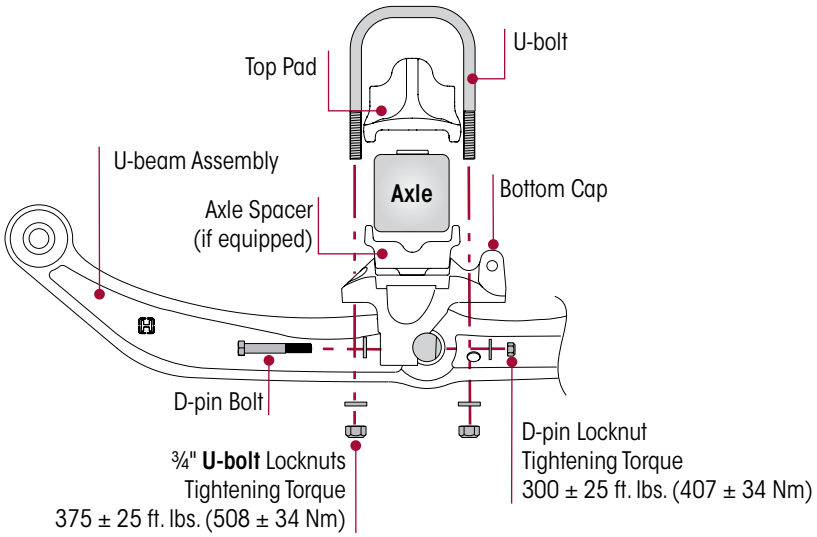
1. U-bolt locknuts must be torqued to specification at preparation for delivery.
2. U-bolt locknuts must be re-torqued at 1,000 miles.
3. Thereafter, follow the inspection and re-torque intervals below:
   - **Off-highway and severe service** – Every 25,000 miles or 6 months, whichever comes first
   - **100% On-highway** – Every 50,000 miles or 12 months, whichever comes first

Off-highway and severe service operating conditions require more frequent inspections than on-highway service operation.

SERVICE HINT

Due to certain pinion angle configurations, the removal of the D-pin bolts may be necessary to access the U-bolt locknuts, see Figure 6-3.

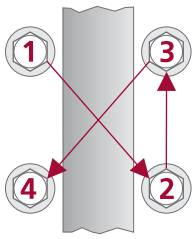
FIGURE 6-3
Clamp Group & D-pin Fasteners



WARNING

IT IS IMPORTANT THAT THE U-BOLT CLAMP GROUP CONNECTION BE PROPERLY ALIGNED AND HAVE THE PROPER TORQUE VALUES MAINTAINED. METAL SURFACES CAN WORK AND WEAR AGAINST OTHER RELATED CLAMP GROUP COMPONENTS IF NOT PROPERLY ALIGNED OR PROPERLY TIGHTENED TO MAINTAIN THE PROPER CLAMP FORCE. FAILURE TO DO SO CAN CAUSE PREMATURE COMPONENT WEAR, POSSIBLE SEPARATION OF THE CLAMP GROUP, CAUSING ADVERSE VEHICLE HANDLING, PROPERTY DAMAGE, OR PERSONAL INJURY.

FIGURE 6-4



4. Tighten the U-bolt locknuts evenly in 50 foot pounds increments to 375 ± 25 foot pounds torque in the proper pattern to achieve uniform bolt tension, see Figures 6-4.

PIVOT BUSHING AND D-PIN BUSHING

⚠ WARNING

THE PIVOT BUSHING AND THE D-PIN BUSHING ARE CRITICAL COMPONENTS OF THE PRIMAAX EX • PRIMAAX SUSPENSIONS. IF ANY SUCH COMPONENTS APPEAR DAMAGED OR WORN THE COMPONENT MUST BE REPLACED. FAILURE TO REPLACE SUCH WORN OR DAMAGED COMPONENTS CAN RESULT IN THE DEFORMATION OF PARTS, LOSS OF CLAMP FORCE, BOLT FAILURE, LOSS OF THE AXLE'S ALIGNMENT, ADVERSE VEHICLE HANDLING, PROPERTY DAMAGE, OR PERSONAL INJURY.

There are two types of pivot bushing inspections for the PRIMAAX EX • PRIMAAX suspensions. The pivot bushing can be visually inspected by looking at the outer rubber flange(s) of the bushing. If the visual inspection warrants, a physical inspection can be conducted in which disassembly is required.

PIVOT BUSHING VISUAL INSPECTION

To perform pivot bushing visual inspection, it is not necessary to disassemble the pivot bushing connection. If the pivot bushing rubber flange(s) are intact and there are no signs of metal to metal contact the bushing does not require replacement.

- The support beam is designed with the pivot bushing centered in the support beam end hub. If the pivot bushing is not centered in the end hub, it is an indication that the pivot bushing could be worn and a pivot bushing physical inspection is required.
- If the pivot bushing shows signs of torn, separated or disconnected rubber, see Figures 6-5 and 6-6, this could be a result of axle misalignment. If this condition is evident, a pivot bushing physical inspection is required.
- If the outer rubber flange(s) is missing, or there are shards of rubber visible, see Figure 6-7, this could be a result of axle misalignment. If this condition is evident, pivot bushing replacement is required.

FIGURE 6-5 FIGURE 6-6 FIGURE 6-7

VISUAL INSPECTION – Torn, Disconnected or Missing Rubber Flange

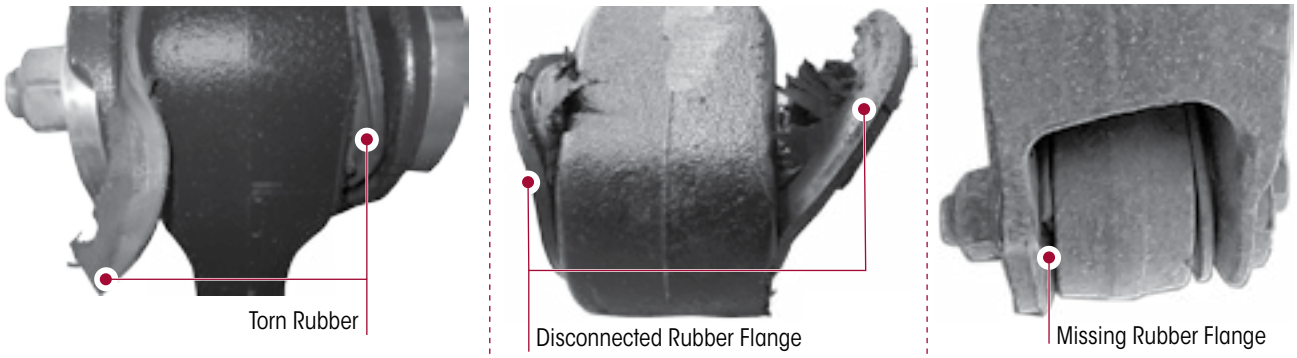
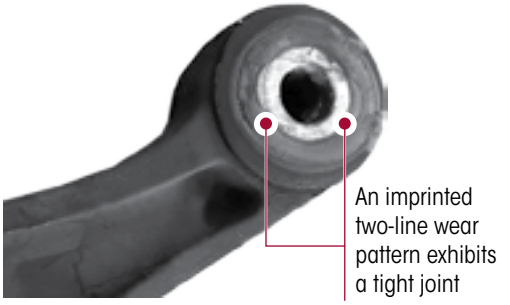


FIGURE 6-8

GOOD JOINT – No Replacement Needed



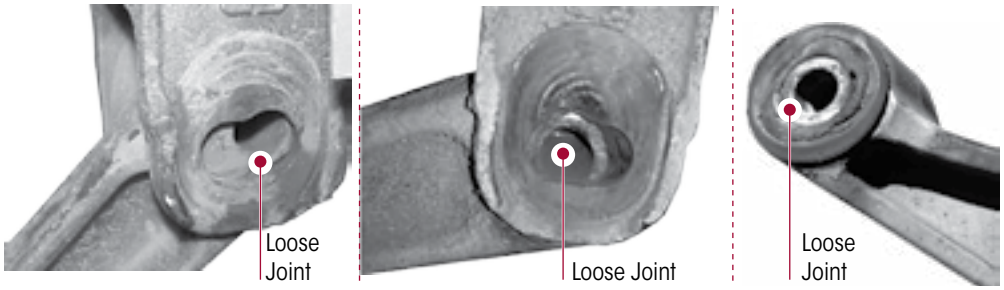
PIVOT BUSHING PHYSICAL INSPECTION

1. Remove the U-beam assembly, refer to U-beam Assembly in the Component Replacement in this publication.
2. After removal, inspect the pivot bushing connection, examine the pivot bushing inner metal area.
3. No replacement is needed if the bushing exhibits a tight joint, see Figure 6-8. An imprinted two-line wear pattern on the bushing inner metal indicates the pivot bushing is securely clamped in the frame hanger.

4. Inspect pivot bushing, replacement is necessary if any indications of the following are apparent, see Figure 6-9:
   - Signs of rust, distorted, separated or torn rubber, elongated or damaged bore. This could be a result of axle misalignment or loose fasteners.

FIGURE 6-9

PHYSICAL INSPECTION – Indications of a Loose Joint



5. Inspect the inside of the frame hanger legs and the QUIK-ALIGN collars. If any of the following are present, the pivot bushing and one (1) or more of the mating components may require replacement:
   - Evidence of wear marks on the inside of the frame hanger legs indicating metal to metal contact or movement
   - The snout of the QUIK-ALIGN concentric or eccentric collar is elongated or damaged
6. Check the suspension alignment and adjust if necessary. Refer to the Alignment & Adjustments section in this publication.

D-PIN BUSHING VISUAL INSPECTION

It is not necessary to disassemble the D-pin connection to perform a D-pin visual inspection. The D-pin bushing is designed with a layer of rubber in the bushing, it is acceptable to see a bead of rubber protruding from the bushing, see Figure 6-10.

FIGURE 6-10

ACCEPTABLE D-PIN

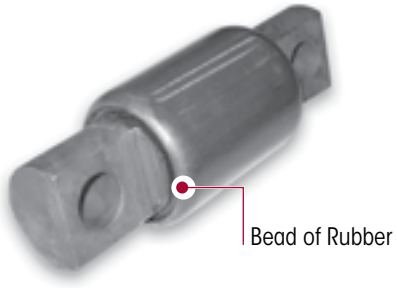
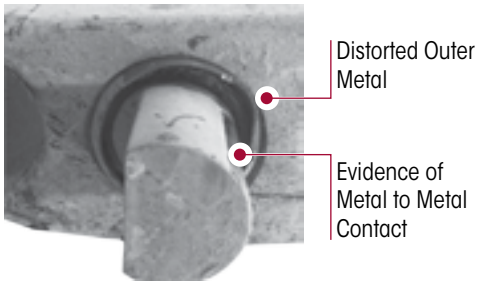


FIGURE 6-11

UNACCEPTABLE D-PIN



D-pin bushing replacement **IS REQUIRED** only when:

- Metal to metal contact wear marks on the D-pin outer metal are evident, see Figure 6-11
- D-pin outer metal is distorted, see Figure 6-11

Refer to D-pin Component Replacement section in this Publication.

LONGITUDINAL AND TRANSVERSE TORQUE RODS

⚠ WARNING

THIS HENDRICKSON SUSPENSION REQUIRES TORQUE RODS FOR SUSPENSION PERFORMANCE AND VEHICLE STABILITY. IF THESE TORQUE RODS ARE DISCONNECTED OR ARE NON-FUNCTIONAL, DO NOT OPERATE THE VEHICLE. OPERATING A VEHICLE WITH DISCONNECTED OR NON-FUNCTIONAL TORQUE RODS CAN RESULT IN ADVERSE VEHICLE HANDLING, COMPONENT DAMAGE, SUSPENSION/VEHICLE DAMAGE, AND/OR SEVERE PERSONAL INJURY.

INSPECTION

All torque rods equipped on the PRIMAAX EX • PRIMAAX suspensions need to be inspected during preventive maintenance and service for looseness by one of the following methods.

Torque rod looseness inspection is necessary per one of the following methods below.

- **Method 1** — Due to visibility, this procedure is for **ONLY on-highway tractor applications.** With the brakes applied, slowly rock the empty vehicle with power while a second technician visually checks the action at both ends.
- **Method 2** — with the vehicle shut down, a lever check can be made with a long pry bar placed under each rod end and pressure applied

Visually inspect **(1) torque rod bushings** for any torn or shredded rubber material interfaces or elongated oval shapes and **(2) torque rods** for any metal to metal contact, bent, cracked or broken components. The torque rod and/or the torque rod bushings will require replacement if any of these conditions are encountered.

- **Longitudinal ULTRA ROD torque rod length** is determined by the original vehicle manufacturer for optimum driveline angle(s). The longitudinal torque rods along with the bottom caps maintain these angles and control acceleration and brake forces, (refer to the Pinion Angle Chart in the Hendrickson Parts Lists literature number SP-164).
  - **Some ULTRA ROD** Longitudinal torque rod assemblies are designed with non-rebushable bushings. These torque rods can be identified by the part number: 67428-XXX • 67219-XXX • 65302-XXX or the **Suffix N** after any part number (i.e. 62000-615N).
  - **For rebushable** longitudinal torque rod bushings equipped with **straddle, taper stud, or hollow mount**, see Figures 6-12 and 6-13, they can be replaced by pressing out the worn components and installing new Hendrickson bushings.

FIGURE 6-12

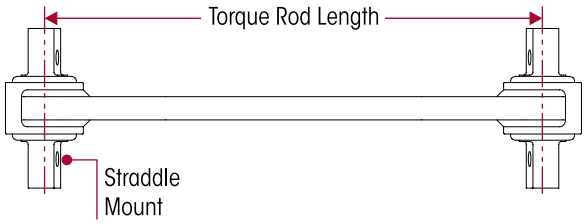
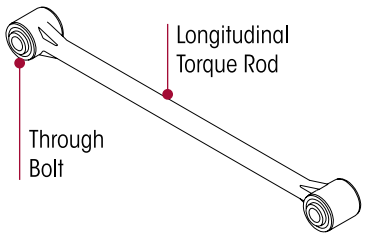


FIGURE 6-13



- **Transverse TRAAX ROD torque rod length** is also determined by the vehicle manufacturer to center the axles under the frame.
  - If the lateral alignment of the axles is incorrect, it may be necessary to shim the transverse torque rod at the straddle mount end. Shims can be installed between the transverse torque rod and the transverse torque rod frame bracket or between the transverse torque rod and axle tower bracket. Refer to vehicle manufacturer for proper shim location; also see Lateral Alignment in the Alignment & Adjustments section in this publication.

- The TRAAX ROD transverse torque rods control axle walk-out during cornering. The mounting brackets at the axle housing end of the torque rods are furnished and welded into position on the axle housings by the axle or vehicle manufacturer.
- **TRAAX ROD torque rods are not rebushable**. The entire torque rod assembly must be replaced. This feature provides superior bushing retention in the torque rod end hub.

NOTE It is important that the **tightening torque** of the locknuts be checked during preventive maintenance and service. Follow the tightening torque specifications and all applicable preventive maintenance, service and safety instructions issued by the respective vehicle and suspension manufacturers.

NOTE Hendrickson recommends the use of Grade 8 bolts and Grade C locknuts for all straddle mount torque rod attachments.

Hendrickson provides **two-piece torque rods** that are available to cut and weld to the desired length, for more information refer to Hendrickson Literature No. 45745-148.

SHOCK ABSORBERS

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 PRIMAAX EX • PRIMAAX 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. Replace as necessary, refer to the Component Replacement section in this publication.

FIGURE 6-14

HEAT TEST AND PHYSICAL INSPECTION

1. **Heat Test:** Drive the vehicle with the lift axle down at moderate speeds on a rough road for minimum of fifteen minutes.

⚠ WARNING

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

   a. Perform heat test by carefully touching or placing a hand near the shock absorber body below the dust cover. Touch the frame to get an ambient reference, see Figure 6-14. A shock absorber that is warm to the touch is acceptable, a cold shock absorber should be replaced.

2. **Physical Inspection:** To inspect for an internal failure, remove and shake the suspected shock absorber. Listen for the sound of metal parts rattling inside. Rattling of metal parts can indicate that the shock absorber has an internal failure and the shock absorber should be replaced.

VISUAL INSPECTION

Look for these potential problems when doing a visual inspection, see Figure 6-15. Inspect the shock absorbers fully extended. Replace as necessary.

FIGURE 6-15

SHOCK ABSORBER VISUAL INSPECTION – UNACCEPTABLE CONDITIONS

Damaged upper or lower mount

Damaged upper or lower bushing

Damaged dust cover and / or shock body

Bent or dented shock absorber

Improper installation
Example: washer (if equipped) installed backwards

LEAKING VS. MISTING SHOCK ABSORBER

INSPECTION

FIGURE 6-16

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.

NOTE

The PRIMAAX EX • PRIMAAX 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**, see Figure 6-16. These streams can easily be seen, underneath the main body (dust cover) of the shock absorber. Replace as necessary.

AIR FITTINGS

1. If an air leak is suspected, begin by building up the air system to normal operating pressure.
2. Spray all nylon tube air fittings with a soapy water solution to detect the leak location.

NOTE

Air lines and fittings may be inspected for leaks using a soapy water solution. The height control valve, however, cannot be inspected using this method. All height control valves have an allowable leakage rate. The height control valve is not supplied by Hendrickson, although it is a required component. Hendrickson is not responsible for components supplied by the vehicle manufacturer. For assistance with inspection, maintenance and rebuild instructions on these components see vehicle manufacturer.

3. If an air leak is located, ensure the tubing end is clean and in good condition and the end is cut square. Check to see if the tubing is binding, bent or being pulled upon.
4. Visually inspect the air fitting's O-ring seal for signs of damage or contamination.

SECTION 7
Alignment & Adjustments

RIDE HEIGHT

NOTE

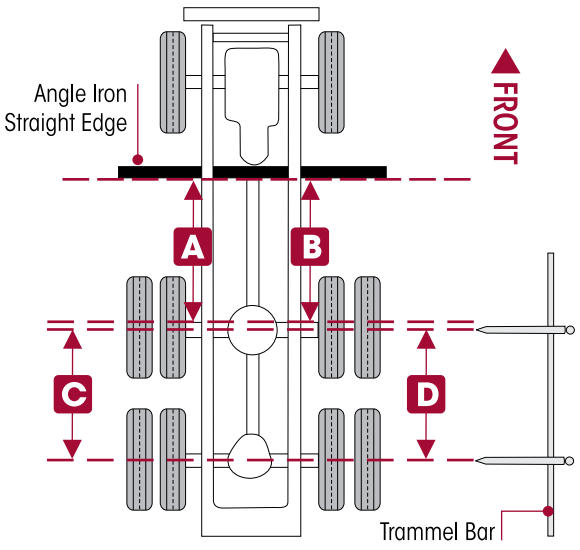
The height control valve is not supplied by Hendrickson, although it is a required component. Hendrickson is not responsible for components supplied by the vehicle manufacturer. For assistance with inspection, maintenance and rebuild instructions on these components see vehicle manufacturer.

DRIVE AXLE ALIGNMENT INSPECTION

Proper alignment is essential for maximum ride quality, performance, and tire service life, the recommended alignment procedure is described below. This procedure should be performed if excessive or irregular tire wear is observed, or any time the QUIK-ALIGN connection is loosened or removed.

1. Use a work bay with a level surface.
2. Relax the suspension by slowly moving the vehicle back and forth several times in a straight line without using the brakes. This will slacken or loosen the suspension as the vehicle is positioned. End with all wheels positioned straight ahead.
3. **DO NOT** set the parking brake. Chock the front wheels of the vehicle.
4. Verify and maintain the air system at full operating pressure.
5. Verify the vehicle is at the correct ride height. Correct as necessary. Refer to Ride Height Adjustment in this section.
6. Verify all suspension components are in good condition. Repair or replace any worn or damaged suspension components before proceeding with the alignment process.

FIGURE 7-1



7. Ensure all drive axle tires are the same size.
8. If axle alignment equipment is not available, using "C" clamps, securely clamp a six-foot piece of STRAIGHT bar stock or angle iron across the lower frame flange as shown in Figure 7-1. Select a location for the angle iron as far forward of the drive axle as possible where components will not interfere.
9. Accurately square the straight edge to the frame using a carpenter's square.
10. Using a measuring tape, measure from the straight edge to the forward face of the front drive axle arms at the centerline on both sides of the vehicle as shown in Figure 7-1, **A** and **B**.
11. Calculate the difference between measurements **A** and **B**.
    a. If the front drive axle is within vehicle manufacturer's specifications, proceed to check the rear drive axle (Step 12).

b. If alignment of the front drive axle **IS NOT** within the vehicle manufacturer's specifications, then the alignment in this axle **MUST** be corrected **BEFORE** measuring the rear drive axle alignment (Step 12). Correct the alignment of this axle by following the alignment instructions as shown in this section.

NOTE

Since the remaining drive axle(s) will be aligned relative to the front drive axle, it is essential that the front drive axle is aligned within the vehicle manufacturer's specifications prior to the alignment of the remaining drive axle(s).

12. Using a trammel bar, measure the distance from the spindle center of the front drive axle to the spindle center of the rear drive axle on both sides of the vehicle, see Figure 7-1, **C** and **D**.
13. Calculate the difference between measurements **C** and **D**.
    a. If the measurements are within the vehicle manufacturer's specifications, then the rear drive axle alignment is acceptable. Proceed to check the pinion angles of the drive axles (Step 15).
    b. If alignment of the rear drive axle **IS NOT** within the vehicle manufacturer's specifications, then the alignment of this axle **MUST** be corrected **BEFORE** checking the drive axle pinion angles. Correct the alignment of this axle by following the Alignment Adjustment Instructions as shown in this section.
14. Repeat Steps 12 and 13 for any remaining drive axle(s). Be sure all remaining drive axles are aligned relative to the front drive axle.
15. After all drive axles are aligned, check the pinion angle of each drive axle with a digital protractor, see Figure 7-2. Refer to the vehicle manufacturer specifications for the required pinion angles.
    a. If all pinion angles are within the vehicle manufacturer's specifications then proceed to Step 16.
    b. If any pinion angle is out of the vehicle manufacturer's specifications it must be corrected. Follow the Pinion Angle Adjustment in this section for your suspension model and ride height.
16. Recheck measurements to confirm adjustments. Repeat Steps 10 through 15 until the correct alignment and pinion angles are achieved.
17. When all drive axle alignments and pinion angles are within the vehicle manufacturer's specifications then the alignment procedure is complete.

AXLE PINION ANGLE

FIGURE 7-2

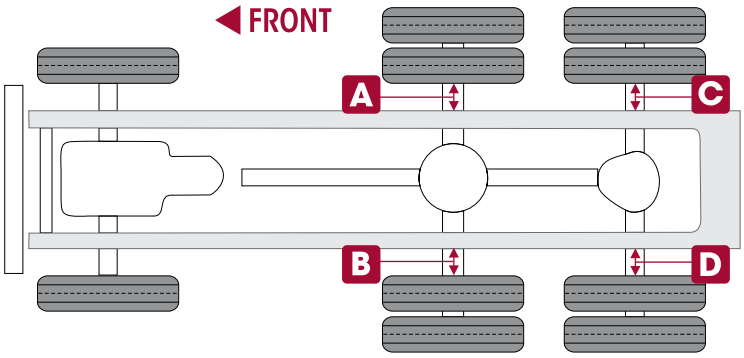
Drive axle pinion angles are established by the vehicle manufacturer. The suspension bottom caps called out in the Pinion Angle Chart are machined to specific angles to meet the vehicle manufacturer's specified requirements (refer to the Hendrickson Parts Lists literature number SP-164).

To check the pinion angle:

1. Verify the suspension is at the proper ride height (see the Ride Height Adjustment in this section).
2. Place a digital protractor on the axle housing as shown in Figure 7-2.
3. Verify the pinion angle is within the range specified by the vehicle manufacturer.
4. Follow the Pinion Angle Adjustment in this section if it is necessary to fine tune the pinion angle.

AXLE LATERAL ALIGNMENT

FIGURE 7-3



1. Use a work bay with a level floor. Drive the vehicle slowly, straight ahead. Try to slacken or loosen the suspension as the vehicle is positioned. End with all wheels positioned straight ahead. Try to roll to a stop without the brakes being used. **DO NOT** set the parking brake. Chock the front wheels of the vehicle.
2. Measure from the outside of the frame rail to the rim flange of the inner tire. Record the measurement **A** and **B**, see Figure 7-3.
3. Measure the same distance on the opposite side of the same axle. Record the measurement **C** and **D**, see Figure 7-3.
4. Verify the axle lateral alignment is within the vehicle manufacturer's specifications. Adding or removing shims that are located between the transverse torque rod and the frame rail will normally correct the axle lateral alignment.
   - A general rule of thumb is to use a torque rod shim with a thickness that is half of the difference between the two measurements.

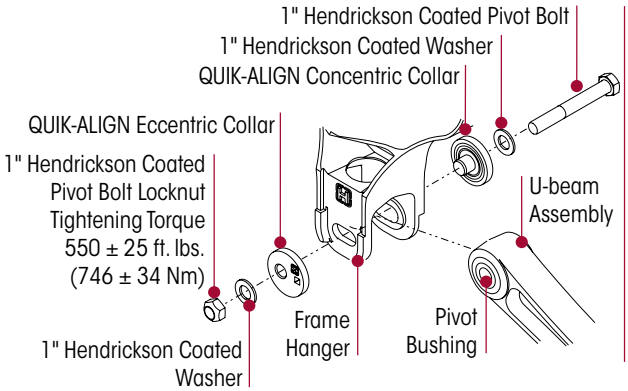
EXAMPLE If the axle lateral alignment is out of specification by ¼" (6 mm), remove or install a ⅛" (3 mm) torque rod shim between the transverse torque rod and frame rail as needed. Refer to Longitudinal and Transverse Torque Rod section in the Preventive Maintenance section in this publication.

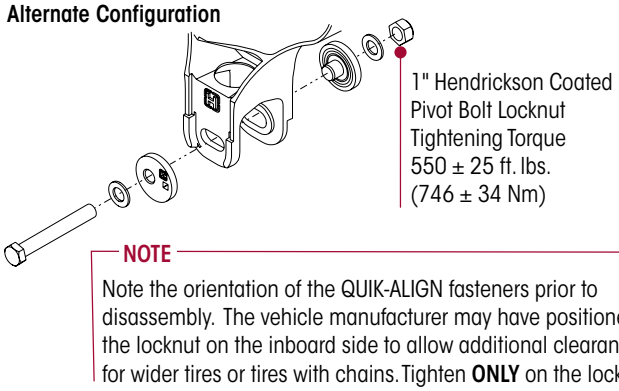
NOTE Hendrickson recommends the use of Grade 8 bolts and Grade C locknuts. Washers are not necessary when flanged fasteners are used.

ALIGNMENT ADJUSTMENT INSTRUCTIONS

SERVICE HINT The eccentric collars (with the square drive feature) are located on the outboard side of the frame hangers with the concentric collars on the inboard side, see Figure 7-4. The total range of fore/aft axle adjustment is 1.0".

FIGURE 7-4





NOTE

Note the orientation of the QUIK-ALIGN fasteners prior to disassembly. The vehicle manufacturer may have positioned the locknut on the inboard side to allow additional clearance for wider tires or tires with chains. Tighten **ONLY** on the locknut.

SERVICE HINT A suspension equipped with eccentric QUIK-ALIGN collars on both sides of an axle can be adjusted on both sides. A suspension equipped with an eccentric QUIK-ALIGN collar on only one side of the axle can be adjusted only on the side that has the eccentric QUIK-ALIGN collar. Contact the vehicle manufacturer for specifications.

⚠ WARNING

DISCARD USED QUIK-ALIGN FASTENERS. ALWAYS USE NEW QUIK-ALIGN FASTENERS TO COMPLETE A REPAIR. FAILURE TO DO SO COULD RESULT IN FAILURE OF THE PART, OR MATING COMPONENTS, ADVERSE VEHICLE HANDLING, PERSONAL INJURY, OR PROPERTY DAMAGE.

⚠ WARNING

DO NOT ASSEMBLE THE QUIK-ALIGN JOINT WITHOUT THE PROPER FASTENERS. USE ONLY HENDRICKSON COATED GENUINE FASTENERS TO SUSTAIN PROPER CLAMP FORCE. ENSURE THAT THE QUIK-ALIGN FASTENER'S TORQUE VALUES ARE SUSTAINED AS RECOMMENDED IN THE TORQUE SPECIFICATIONS SECTION IN THIS PUBLICATION. FAILURE TO FOLLOW THE ABOVE ITEMS CAN CAUSE ADVERSE VEHICLE HANDLING RESULTING IN PERSONAL INJURY OR PROPERTY DAMAGE AND WILL VOID ANY APPLICABLE WARRANTIES. FOLLOW VEHICLE MANUFACTURER'S FASTENER ORIENTATION WHEN PERFORMING ANY MAINTENANCE, SERVICE, OR REPAIR.

1. Support the frame at ride height.

⚠ 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 Warnings and Instructions in the Important Safety Notice section in this publication prior to deflating or inflating the suspension system.
3. Disconnect the height control linkage assembly from the height control valve arm. Lower the height control valve arm to exhaust the air in the air springs and deflate the rear suspension.

⚠ WARNING

SOME VEHICLE APPLICATIONS, SUCH AS VEHICLES EQUIPPED WITH OUTRIGGERS, RETAIN SOME AIR PRESSURE IN THE AIR SPRINGS AT ALL TIMES. PRIOR TO PERFORMING ANY MAINTENANCE, SERVICE, OR REPAIR OF THE SUSPENSION, VERIFY EACH AIR SPRING IS COMPLETELY DEFLATED. FAILURE TO DO SO COULD RESULT IN SERIOUS PROPERTY DAMAGE AND/OR SEVERE PERSONAL INJURY.

4. Using the measurements from the Drive Axle Alignment Inspection Procedure, Step 11, determine which QUIK-ALIGN collar will need adjusting to correct the axle alignment.

SERVICE HINT

If the axle can be adjusted on both sides, begin the adjustment on the side that is furthest out of specification.

NOTE

Use a new QUIK-ALIGN pivot bolt kit (refer to Hendrickson Parts Lists literature number SP-164) for any axle alignment or disassembly of the QUIK-ALIGN connection. This will help ensure that the proper clamp load is applied to the connection and help prevent the joint to slip in service.

5. On the side being adjusted, remove the old QUIK-ALIGN fastener and replace it with a new QUIK-ALIGN fastener. Snug the new QUIK-ALIGN fastener to 50-100 foot pounds. **DO NOT** tighten to the torque at this time. This will hold the eccentric flanged collar in place against the frame hanger face, and within the adjustment guide, but loose enough to permit the QUIK-ALIGN eccentric flanged collar to rotate freely.
6. See additional Air Spring Warnings and Instructions in the Important Safety Notice section in this publication prior to deflating or inflating the suspension system.
7. Inflate the suspension by connecting the height control valve linkage to the height control valve arm. Verify the air springs inflate uniformly without binding.
8. Verify proper ride height adjustment per the vehicle manufacturer's instructions.

NOTE

When adjusting the alignment of an axle, the fasteners connecting the longitudinal torque rod to the frame hanger, above the QUIK-ALIGN collar being adjusted, must be loose at the frame hanger. This will allow the longitudinal torque rod to move freely with the axle while the alignment is adjusted. Failure to do so will result in bushing preload in all rubber connections on that side of the axle, shortening component life.

9. On the side of the axle being adjusted, loosen the fasteners connecting the longitudinal torque rod to the frame hanger. Remove any existing shims from this connection. Leave connection loose at this time.

10. Use a QUIK-ALIGN socket tool (refer to the Special Tools section in this publication) and impact gun (Figures 7-5 and 7-6), or a ½" square drive breaker bar to rotate the QUIK-ALIGN eccentric collar to align the axle.

FIGURE 7-5

FIGURE 7-6

11. Once the correct axle alignment is achieved, use a calibrated torque wrench to tighten the 1" QUIK-ALIGN locknuts to 550 ± 25 foot pounds torque.
12. Fill any gap between the frame hanger and longitudinal torque rod with shims.
13. Tighten the longitudinal torque rod fasteners to the proper specification, see Torque Specifications section in this publication per model designation.
14. Re-check the ride height (see vehicle manufacturer for ride height inspection and adjustment) to verify it is within the vehicle manufacturer's specifications.
15. Return to the Drive Axle Alignment Inspection Procedure, Step 13, for the remaining drive axles.

PINION ANGLE ADJUSTMENT

ADJUSTMENT OF 1.5 DEGREES OR LESS

NOTE

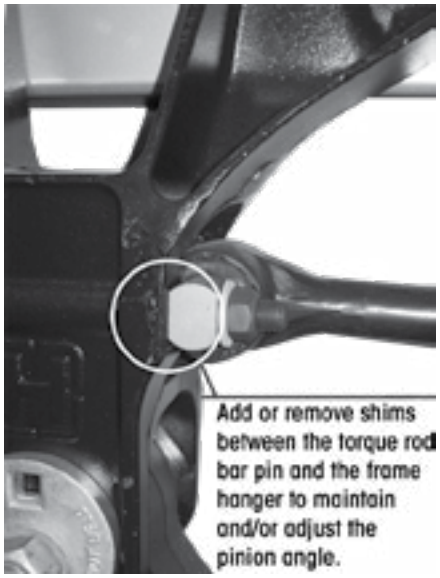
When correcting the pinion angle of an axle the correction must be in equal amounts on both sides of the axle. However, the total number of shims per side may differ due to axle alignment.

SERVICE HINT

A general rule of thumb is, ⅛" change in the shim pack thickness will increase or decrease the pinion angle by ½ degree.

1. Loosen the fasteners connecting the longitudinal torque rods to the frame hangers.
2. Install or remove shims as required in equal amounts, to both sides of the axle, to achieve the proper pinion angle, see Figure 7-7. To increase the pinion angle, install shims. To decrease the pinion angle, remove shims.

FIGURE 7-7



3. Tighten the longitudinal torque rod fasteners to the proper specification per the model designation, see Torque Specifications section in this publication.
4. Re-check the pinion angle and verify it is within the vehicle manufacturer's specifications.

ADJUSTMENT OF MORE THAN 1.5 DEGREES

If an adjustment of more than 1.5 degrees is required, it will be necessary to replace the bottom cap with a bottom cap that will achieve the desired pinion angle. After replacement of the bottom cap, perform the drive axle alignment procedure in the this section. Refer to the Pinion Angle Chart in the Hendrickson Parts Lists, literature number SP-164.

SECTION 8
Component Replacement

FASTENERS

When servicing a vehicle Hendrickson recommends replacing all removed fasteners with new equivalent fasteners. Maintain correct torque values at all times. Check torque values as specified. See Hendrickson's Torque Specifications section in this publication. If non-Hendrickson fasteners are used follow torque specifications listed in the vehicle manufacturer's service manual.

HEIGHT CONTROL VALVE

NOTE

The height control valve is not supplied by Hendrickson, although it is a required component. Hendrickson is not responsible for components supplied by the vehicle manufacturer. For assistance with inspection, maintenance and rebuild instructions on these components see vehicle manufacturer.

AIR SPRING

DISASSEMBLY

1. Chock the wheels.
2. Support the frame.
3. Disconnect the height control valve arm(s) from the rubber grommet.

⚠ 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 in this publication prior to deflating or inflating the air system.
5. Lower the height control valve arm(s) to exhaust the air in the air springs and deflate the rear suspension as per the vehicle manufacturer's instructions.

⚠ WARNING

SOME VEHICLE APPLICATIONS, SUCH AS VEHICLES EQUIPPED WITH OUTRIGGERS, RETAIN SOME AIR PRESSURE IN THE AIR SPRINGS AT ALL TIMES. PRIOR TO PERFORMING ANY MAINTENANCE, SERVICE, OR REPAIR OF THE SUSPENSION, VERIFY EACH AIR SPRING IS COMPLETELY DEFLATED. FAILURE TO DO SO COULD RESULT IN SERIOUS PROPERTY DAMAGE AND/OR SEVERE PERSONAL INJURY.

6. Remove the air line from the air spring.

⚠ CAUTION

IF THE AIR SPRING IS BEING REMOVED FOR AN ALTERNATE REPAIR, IT IS MANDATORY TO LUBRICATE THE LOWER AIR SPRING FASTENERS WITH PENETRATING OIL AND REMOVE WITH HAND TOOLS TO PREVENT DAMAGE TO THE LOWER AIR SPRING MOUNTING STUD. FAILURE TO DO SO CAN CAUSE COMPONENT DAMAGE AND VOID WARRANTY.

7. If the air spring is being removed for an alternate repair, it will be necessary to clean and lubricate the lower mounting fasteners with penetrating oil. This will help prevent the air spring mounting studs from breaking during the removal process. Remove the lower mounting fasteners from the air springs using **HAND TOOLS** only.
8. Remove the lower air spring mounting bracket from the cross tube.
9. Remove and discard the air spring fasteners that attach:
   - **8½",10", 12" Ride Height** – the upper air spring bracket to the frame
   - **15½" Ride Height** – the upper air spring assembly to the upper air spring frame bracket, see Figure 8-2.
10. Remove the air spring assembly.

ASSEMBLY

1. Inspect the lower and upper air spring bracket assemblies and mounting surfaces for any damage. Replace as necessary.
2. Loosely attach the upper air spring bracket assembly to the frame rail.

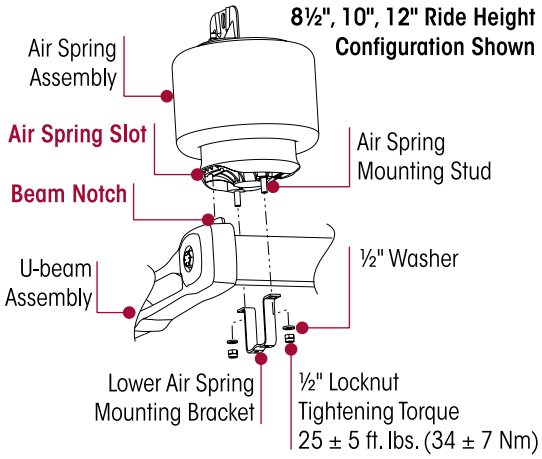
⚠ WARNING

FAILURE TO PRESS THE AIR SPRING AGAINST THE UNDERSIDE OF THE FRAME WHILE TIGHTENING THE UPPER AIR SPRING BRACKET CAN RESULT IN COMPONENT DAMAGE AND PERSONAL INJURY OR PROPERTY DAMAGE.

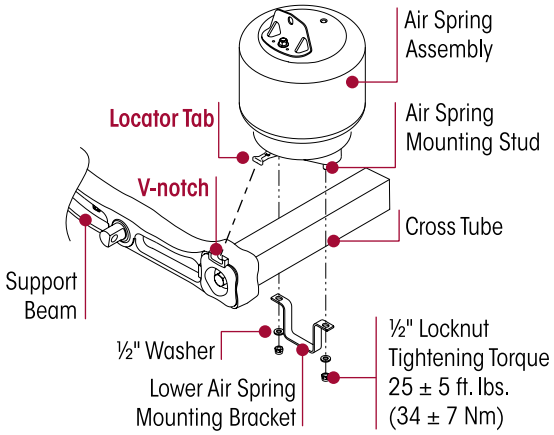
3. Press the upper air spring bracket assembly against the underside of the frame and tighten the frame fasteners to the proper torque per the vehicle manufacturer's specifications.
4. **15½" Ride Height** – attach the air spring to the upper air spring bracket assembly and tighten the locknuts to 35 ± 5 foot pounds torque, see Figure 8-2.
5. Install the air spring between the frame and the cross tube, see Figures 8-1 and 8-2.
   a. **PRIMAAX EX** — Ensure the **"air spring slot"** in the bottom of the air spring engages the "**beam notch**" on the top of the U-beam assembly.
   b. **PRIMAAX** — Ensure the **"V" notch** in the end cap engages the air spring **"locator tab"** on the air spring.

FIGURE 8-1

PRIMAAX EX | Vehicles built after May 2010
Equipped with Integrated End Cap

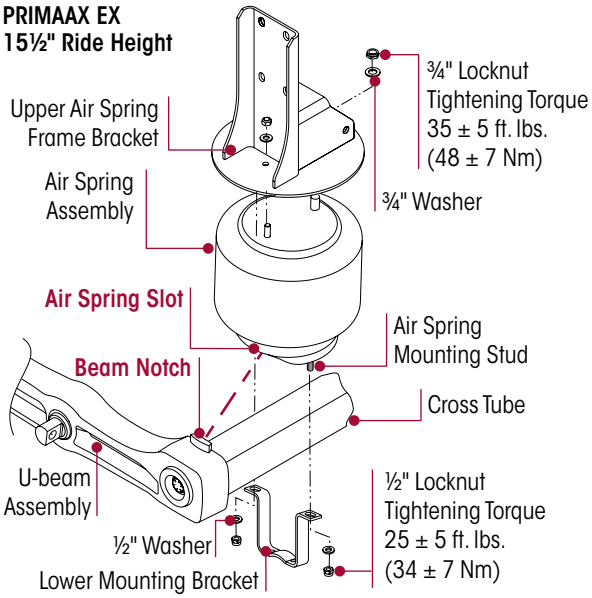


PRIMAAX | Out of production May 2010
Equipped with Detachable End Cap



6. Install the lower air spring mounting bracket around the cross tube, engaging the mounting air spring studs, see Figures 8-1 and 8-2.
7. Using **HAND TOOLS** only, install the lower mounting fasteners and tighten to 25 ± 5 foot pounds torque, see Figures 8-1 and 8-2.
8. Install the air line fitting to the air spring using Teflon (or equivalent) thread seal.
9. Connect the air line to the air spring.

FIGURE 8-2
PRIMAAX EX
15½" Ride Height



10. See additional Air Spring Cautions and Warnings in the Important Safety Notice section in this publication prior to deflating or inflating the air system.
11. Inflate the suspension slowly and verify that the air spring bladder inflates uniformly without binding.
12. Reconnect the height control linkage assembly to the height control valve arm.
13. Remove the frame supports.
14. Remove the wheel chocks.
15. Verify proper ride height adjustment as per the vehicle manufacturer's instructions.

SHOCK ABSORBER

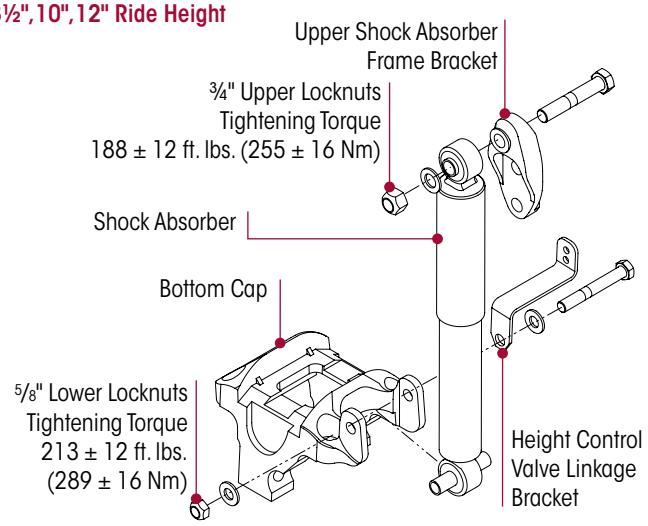
NOTE It is not necessary to replace shock absorbers in pairs if only one (1) shock absorber requires replacement.

DISASSEMBLY

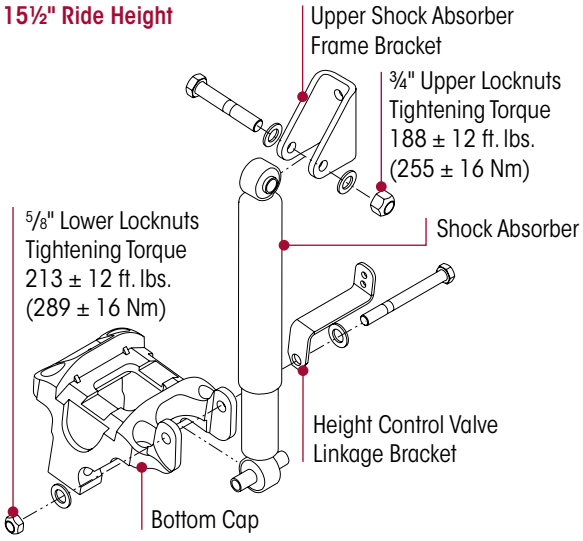
1. Chock the wheels of the vehicle.
2. Remove and discard the **lower** shock absorber fasteners.
3. Remove the height control valve linkage bracket, note the orientation of the bracket for re-installation, see Figure 8-3.
4. Remove and discard the **upper** shock absorber fastener.
5. Slide the shock absorber out of the upper shock frame brackets.
6. Inspect the shock absorber frame brackets and mating components for damage or wear. Replace as necessary.

FIGURE 8-3

8½",10",12" Ride Height



15½" Ride Height



ASSEMBLY

1. Install the upper shock absorber frame bracket (if removed).
2. Install the shock absorber into the upper shock frame bracket.
3. Install the upper shock absorber fasteners.

⚠ WARNING IF THE SUSPENSION IS EQUIPPED WITH THE CAST UPPER SHOCK FRAME BRACKET (PART NUMBER 67463-002), THE UPPER SHOCK BOLT MUST BE INDEXED INTO THE RECESSED HEX BORE OF THE UPPER SHOCK FRAME BRACKET FOR PROPER FASTENER INSTALLATION. FAILURE TO DO SO CAN CAUSE THE SHOCK FASTENERS TO BECOME LOOSE AND CAUSE PREMATURE COMPONENT DAMAGE.

4. Slide the lower shock absorber mount into the bottom cap.
5. Install the lower shock absorber fasteners and height control valve linkage bracket in the same orientation as prior to removal, see Figure 8-3.
6. Tighten the **upper** shock absorber locknut to 188 ± 12 foot pounds torque, see Figure 8-3.
7. Tighten the **lower** shock absorber locknut to 213 ± 12 foot pounds torque, see Figure 8-3.
8. Verify the vehicle ride height per the vehicle manufacturer's specifications.
9. Remove the wheel chocks.

TRAAX ROD TRANSVERSE TORQUE ROD

WARNING

THIS HENDRICKSON SUSPENSION REQUIRES TORQUE RODS FOR SUSPENSION PERFORMANCE AND VEHICLE STABILITY. IF THESE TORQUE RODS ARE DISCONNECTED OR ARE NON-FUNCTIONAL, DO NOT OPERATE THE VEHICLE. OPERATING A VEHICLE WITH DISCONNECTED OR NON-FUNCTIONAL TORQUE RODS CAN RESULT IN ADVERSE VEHICLE HANDLING, COMPONENT DAMAGE, SUSPENSION/VEHICLE DAMAGE, AND/OR SEVERE PERSONAL INJURY.

NOTE

TRAAX ROD torque rods are not rebushable. The entire torque rod assembly must be replaced. This feature provides superior bushing retention in the torque rod end hub.

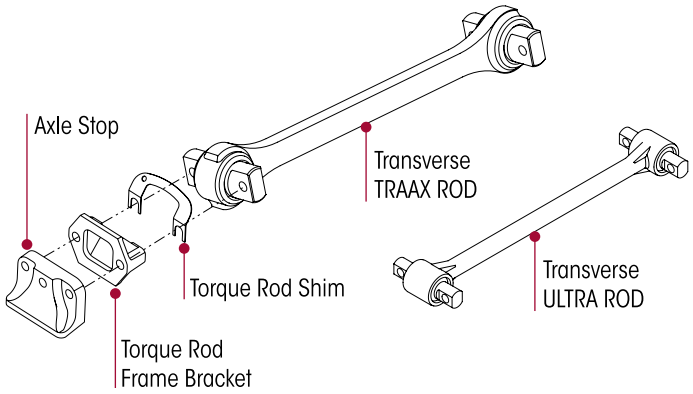
DISASSEMBLY

1. Chock the wheels of the vehicle.

SERVICE HINT

Note the quantity and location of shims, see Figure 8-4, removed to maintain the lateral alignment of the axle during assembly. See Alignment & Adjustments section in this publication.

FIGURE 8-4



2. Remove the torque rod mounting fasteners and shims (if equipped).
3. Remove the torque rod.
4. Inspect the mounting surfaces for any wear or damage. Repair or replace as necessary.

ASSEMBLY

1. Install the torque rod.
2. Install the mounting fasteners and any shims that were removed.

NOTE

Hendrickson recommends the use of Grade 8 bolts and Grade C locknuts for all torque rod attachments.

3. Prior to tightening, ensure that the vehicle is at the proper ride height, see vehicle manufacturer for ride height inspection and adjustment.
4. Tighten all fasteners to the required torque specification. Refer to the original equipment manufacturer for specifications.
5. Check the lateral alignment. If not within the vehicle manufacturer's specified range, a lateral alignment is necessary. See Axle Lateral Alignment in the Alignment & Adjustments section in this publication.
6. Remove the wheel chocks.

ULTRA ROD LONGITUDINAL TORQUE ROD

NOTE

Some ULTRA ROD Longitudinal torque rod assemblies are designed with non-rebushable bushings. These torque rods can be identified by the part number: 67428-XXX • 67219-XXX • 65302-XXX or the Suffix N after any part number (i.e. 62000-615N). **For rebushable longitudinal torque rod bushings** equipped with straddle, taper stud, or hollow mount, see Figures 6-12 and 6-13, they can be replaced by pressing out the worn components and installing new Hendrickson bushings.

DISASSEMBLY

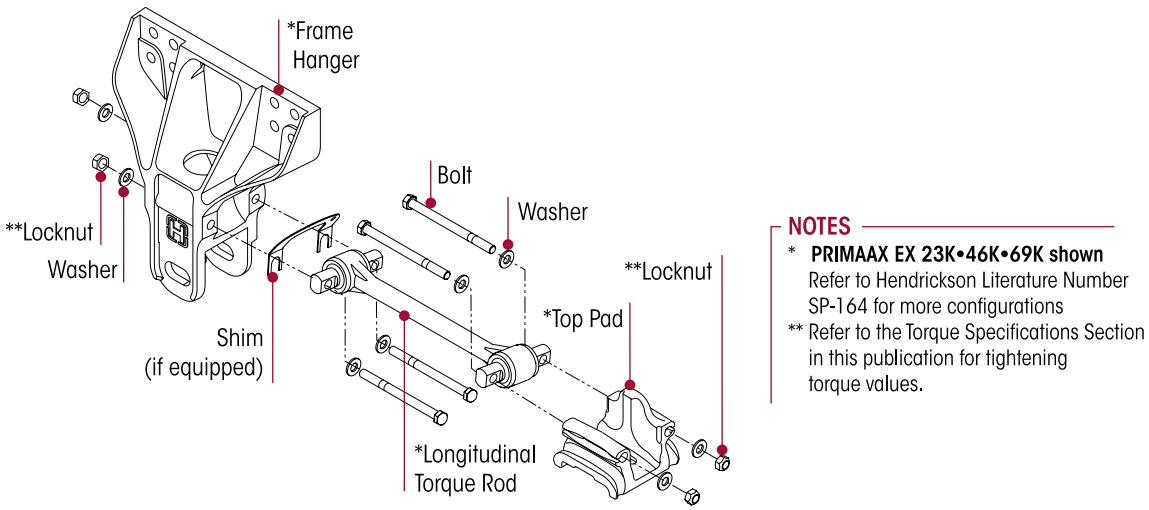
1. Chock the wheels of the vehicle.

SERVICE HINT

Note the quantity of shims removed to maintain the correct pinion angle of the axle at assembly. See Alignment & Adjustments section in this publication.

2. Remove and discard the torque rod mounting fasteners and shims (if equipped) that connect the longitudinal torque rod to the frame hanger, see Figure 8-5.
3. Remove and discard the torque rod mounting fasteners and shims (if equipped) that connect the longitudinal torque rod to the top pad, see Figure 8-5.
4. Remove the longitudinal torque rod.
5. Inspect the mounting surfaces for any wear or damage, replace if necessary.

FIGURE 8-5



ASSEMBLY

1. Install the longitudinal torque rod.
2. Install the mounting fasteners and any shims that were removed, see Figure 8-5.

NOTE

Hendrickson recommends the use of Grade 8 bolts and Grade C locknuts be used for all torque rod attachments.

NOTE

It is mandatory to have the vehicle at the proper ride height prior to tightening the fasteners, see vehicle manufacturer for ride height inspection and adjustment.

3. Tighten all fasteners to the required torque specification. Refer to the Torque Specifications section in this publication.
4. After assembly is complete, check the drive axle pinion angles, see the Alignment & Adjustments section in this publication.
5. Remove the wheel chocks.

ULTRA ROD LONGITUDINAL TORQUE ROD BUSHINGS

NOTE

Some ULTRA ROD Longitudinal torque rod assemblies are designed with non-rebushable bushings. These torque rods can be identified by the part number: 67428-XXX • 67219-XXX • 65302-XXX or the Suffix N after any part number (i.e. 62000-615N). **For rebushable longitudinal torque rod bushings** equipped with straddle, taper stud, or hollow mount, see Figures 6-12 and 6-13, they can be replaced by pressing out the worn components and installing new Hendrickson bushings.

YOU WILL NEED:

- A vertical press with a capacity of at least 10 tons
- A receiving, installation, and a funnel tool, see Special Tools section in this publication for funnel tools and shop-made tool specifications

DISASSEMBLY

⚠ CAUTION

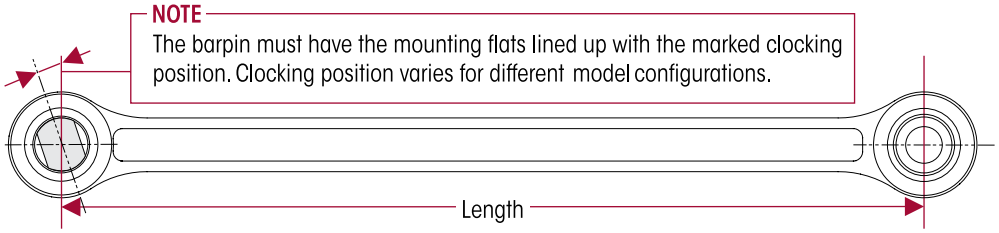
DO NOT USE HEAT OR USE A CUTTING TORCH TO REMOVE THE BUSHINGS FROM THE TORQUE ROD. THE USE OF HEAT WILL ADVERSELY AFFECT THE STRENGTH OF THE TORQUE ROD; HEAT CAN CHANGE THE MATERIAL PROPERTIES. A COMPONENT DAMAGED IN THIS MANNER CAN RESULT IN THE ADVERSE VEHICLE HANDLING, POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE AND VOID WARRANTY.

SERVICE HINT

When servicing a straddle mount bar pin type bushing assembly, mark the clocking position of the straddle mount bar pin flats on the torque rod end hub before disassembly. This clocking mark will serve as a guide when installing the new bushing assembly so the original clocking position can be retained.

1. Remove the torque rod as detailed in this section.
2. When replacing a straddle mount bar pin type bushing assembly, mark the clocking position of the bushing assembly's bar pin flats with a paint stick on the torque rod end hub prior to disassembly. Clocking varies for different model configurations, see Figure 8-6.

FIGURE 8-6



3. Install the torque rod in the press. Support the torque rod end on the receiving tool with the end of the torque rod centered on the tool. Be sure the torque rod is squarely supported on the press bed.
4. Push directly on the inner metal of the bushing assembly until the bushing assembly clears the torque rod end tube.
5. Clean and inspect the inner diameter of the torque rod ends.

ASSEMBLY

NOTE **DO NOT** use a petroleum or soap base lubricant. Such lubricants can cause adverse reactions with the bushing, such as deterioration of the rubber, causing premature failure.

1. Lubricate the inner diameter of the torque rod end hub and the new rubber bushing with light Naphthenic Base Oil, such as 60 SUS at 100°F, see Figure 8-7.
2. Support the torque rod end hub on the receiving tool with the end hub of the torque rod centered on the receiving tool.

NOTE When replacing a straddle mount bar pin type bushing assembly, verify the correct clocking position of the straddle mount bar pin flats prior to installing the bushing assembly in the torque rod end hub.

3. Center the new bushing assembly on the torque rod end hub. When installing a straddle mount type bushing assembly, verify the bushing assembly's bar pin flats are clocked correctly.
4. Press directly on the inner metal of the bushing assembly. The rubber bushings of the bar pin must be centered within the torque rod end tubes.
5. When pressing in the new bushings overshoot the desired final position by approximately 3⁄16", see Figure 8-8.
6. Press the inner metal of the bushing assembly again from the opposite side to center the bushing and inner metal within the torque rod end tube, see Figure 8-9.

FIGURE 8-7

FIGURE 8-8

FIGURE 8-9

⚠ CAUTION IF THE TORQUE ROD ASSEMBLY IS NOT ALLOWED THE ALLOTTED TIME FOR THE LUBRICANT TO DISSIPATE, THE BUSHING MAY SLIDE FROM THE TORQUE ROD END TUBE. THE BUSHING WILL THEN NEED TO BE REMOVED AND A NEW BUSHING RE-INSTALLED.

7. Wipe off excess lubricant. Allow the lubricant **four hours** to dissipate before operating the vehicle.
8. Install torque rod assembly as detailed in this section.

DISCONTINUED – SUPPORT BEAM ASSEMBLY AND CROSS TUBE

NOTE

Effective May 2010, the support beam assembly part numbers 66435-00X or 60831-00X (Forging Part Nos. 59363-001, 65082-000, 65284-000), cross tube, and previous U-beam assembly part numbers with the prefix 66659-XXX, for PRIMAAX suspension systems were discontinued, see Figure 8-11.

The U-beam assembly with integrated end caps, see Figure 8-10, is now a required replacement for any PRIMAAX support beam or cross tube component. Refer to the Support Beam and Cross Tube Replacement Guide table, refer to Hendrickson Parts Lists literature number SP-164.

FIGURE 8-10

REPLACEMENT U-BEAM ASSEMBLY KIT

Replacement

- U-beam Assembly Service Kit No. **60961-XXX**

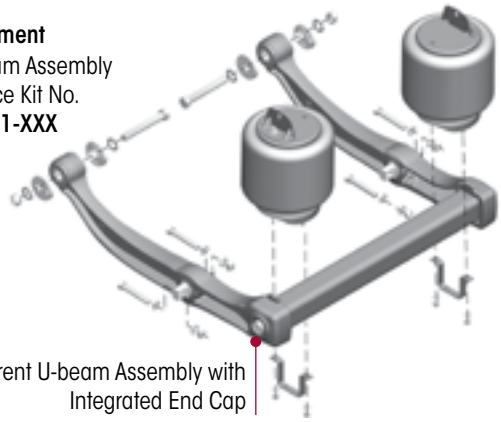
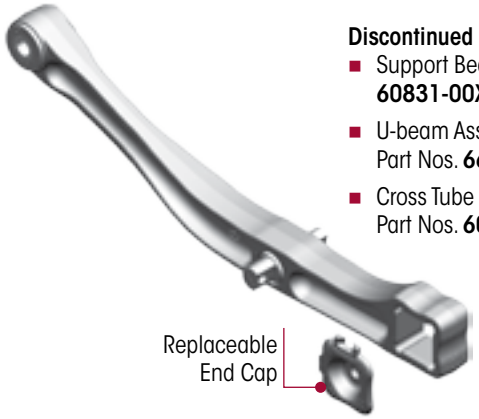


FIGURE 8-11

FORMER SUPPORT BEAM ASSEMBLY

Discontinued May 2010

- Support Beam Part Nos. **60831-00X** and **66435-00X**
- U-beam Assembly Part Nos. **66659-XXX**
- Cross Tube Part Nos. **60912-XXX**



U-BEAM ASSEMBLY

IMPORTANT NOTICE

As of April 2010, Hendrickson introduced the new enhanced U-beam assembly design for PRIMAAX EX suspensions equipped on new production vehicles and for the aftermarket. The new U-beam assembly results in a maintenance-free integrated end cap connection. See Hendrickson publication SEU-0229 for PRIMAAX support beam/cross tube assembly conversion to the new U-beam assembly enhancement or refer to Hendrickson Parts Lists literature number SP-164.

DISASSEMBLY

1. Chock the front wheels.
2. Support the frame at ride height.
3. Raise and support the axle being serviced. Remove the wheels.
4. Disconnect the height control valve linkage assembly from the height control valve arm(s) as per the vehicle manufacturer's instructions.

⚠ 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.

⚠ WARNING

SOME VEHICLE APPLICATIONS, SUCH AS VEHICLES EQUIPPED WITH OUTRIGGERS, RETAIN SOME PRESSURE IN THE AIR SPRINGS AT ALL TIMES. PRIOR TO PERFORMING ANY MAINTENANCE, SERVICE, OR REPAIR OF THE SUSPENSION, VERIFY EACH AIR SPRING IS COMPLETELY DEFLATED. FAILURE TO DO SO COULD RESULT IN SERIOUS PROPERTY DAMAGE AND/OR SEVERE PERSONAL INJURY.

5. See additional Air Spring Cautions and Warnings in the Important Safety Notice section in this publication prior to deflating or inflating the air system.
6. Lower the height control valve arm(s) to exhaust the air in the air springs and deflate the rear suspension as per the vehicle manufacturer's instructions.

⚠ CAUTION

IF THE AIR SPRING IS BEING REMOVED FOR AN ALTERNATE REPAIR, IT IS MANDATORY TO LUBRICATE THE LOWER AIR SPRING FASTENERS WITH PENETRATING OIL AND REMOVE WITH HAND TOOLS TO PREVENT DAMAGE TO THE LOWER AIR SPRING MOUNTING STUD. FAILURE TO DO SO CAN CAUSE COMPONENT DAMAGE AND VOID WARRANTY.

7. Lubricate the lower mounting fasteners of the air springs with penetrating oil. This will help prevent the air spring mounting studs from breaking during the removal process.
8. Remove the lower mounting fasteners from the air springs using **HAND TOOLS** only.
9. Remove both lower air spring mounting brackets to disconnect air springs from the cross tube, refer to Air Spring in this section.

⚠ WARNING

USE ONLY A FLOOR JACK EQUIPPED WITH A FOUR INCH CONTACT PLATE TO SUPPORT THE U-BEAM ASSEMBLY AT THE CROSS TUBE TO FACILITATE SAFE LOWERING AND RAISING OF THE U-BEAM ASSEMBLY. DO NOT USE A BOTTLE JACK, WHICH DOES NOT HAVE ENOUGH CONTACT AREA AND CAN BE UNSTABLE. FAILURE TO DO SO CAN CAUSE COMPONENT DAMAGE OR RESULT IN PERSONAL INJURY.

10. Install a floor jack with a 4" contact plate to support the U-beam assembly at the cross tube.

SERVICE HINT

Each frame hanger will have a pair of QUIK-ALIGN collars. Note which type of QUIK-ALIGN collar is removed from each frame hanger location to facilitate the assembly process. Any eccentric (with the square drive feature) QUIK-ALIGN collar should be mounted on the outboard side of the frame hanger. Axle thrust angles can only be corrected on frame hangers equipped with eccentric QUIK-ALIGN collars. Also, note the orientation of the fasteners per the vehicle manufacturer's specifications.

11. Mark the position of the QUIK-ALIGN **square drive** in relation to the frame hanger and note the **orientation of the fasteners** prior to loosening the QUIK-ALIGN connection. This will facilitate the axle alignment process after the repair is complete.
12. Loosen both the QUIK-ALIGN fasteners, **DO NOT** remove at this time.
13. Remove D-pin fasteners on both sides of the suspension and discard.

SERVICE HINT

It may be necessary to rotate the QUIK-ALIGN eccentric collars to allow the full disengagement of the D-pins into the bottom caps.

SERVICE HINT

It may be necessary to raise the front of the differential to allow the D-pins to disengage the bottom caps.

⚠ WARNING

THE WEIGHT OF THE U-BEAM ASSEMBLY IS APPROXIMATELY 225 POUNDS. CARE SHOULD BE TAKEN AT REMOVAL AND INSTALLATION TO PREVENT PERSONAL INJURY OR DAMAGE TO COMPONENTS.

14. Lower the floor jack and pivot the U-beam assembly down.
15. Remove and discard the QUIK-ALIGN fasteners.
16. Remove QUIK-ALIGN eccentric and concentric collars.

NOTE

It may be necessary to use a pry bar to push the U-beam assembly out of the frame hangers.

17. Remove the U-beam assembly from the frame hangers.
18. Remove the U-beam assembly from the vehicle.
19. Inspect the U-beam assembly for any damage or wear and replace as necessary.

ASSEMBLY

1. Clean the QUIK-ALIGN slots in the hangers and collars of any dirt and debris. Inspect for any wear or damage. Replace as necessary.
2. Prior to installing the U-beam assembly, verify the clamp group is tightened to the proper torque.

⚠ WARNING

THE WEIGHT OF THE U-BEAM ASSEMBLY IS APPROXIMATELY 225 POUNDS. CARE SHOULD BE TAKEN AT REMOVAL AND INSTALLATION TO PREVENT PERSONAL INJURY OR DAMAGE TO COMPONENTS.

3. Install the U-beam assembly into the frame hangers.

WARNING

DISCARD USED QUIK-ALIGN FASTENERS. ALWAYS USE NEW QUIK-ALIGN FASTENERS TO COMPLETE A REPAIR. FAILURE TO DO SO COULD RESULT IN FAILURE OF THE PART, OR MATING COMPONENTS, ADVERSE VEHICLE HANDLING, PERSONAL INJURY, OR PROPERTY DAMAGE.

WARNING

DO NOT ASSEMBLE THE QUIK-ALIGN JOINT WITHOUT THE PROPER FASTENERS. USE ONLY HENDRICKSON COATED GENUINE FASTENERS TO SUSTAIN PROPER CLAMP FORCE. ENSURE THAT THE QUIK-ALIGN FASTENER'S TORQUE VALUES ARE SUSTAINED AS RECOMMENDED IN THE TORQUE SPECIFICATIONS SECTION IN THIS PUBLICATION. FAILURE TO FOLLOW THE ABOVE ITEMS CAN CAUSE ADVERSE VEHICLE HANDLING RESULTING IN PERSONAL INJURY OR PROPERTY DAMAGE AND WILL VOID ANY APPLICABLE WARRANTIES. FOLLOW VEHICLE MANUFACTURER'S FASTENER ORIENTATION WHEN PERFORMING ANY MAINTENANCE, SERVICE, OR REPAIR.

NOTE

Use a new QUIK-ALIGN pivot bolt kit (refer to Hendrickson Parts Lists literature number SP-164) for any axle alignment or disassembly of the QUIK-ALIGN connection. This will help ensure that the proper clamp load is applied to the connection and help prevent the joint to slip in service.

4. Verify the correct QUIK-ALIGN collar (eccentric/concentric) is in the correct location as noted in the disassembly procedure.
5. Install QUIK-ALIGN connection with new Hendrickson fasteners and snug to about 50-100 foot pounds torque, **DO NOT** tighten at this time. The final torque must be done after the alignment is complete.
6. Position the U-beam assembly on a floor jack.
7. Raise the U-beam assembly until the D-pins engage in the bottom cap.

SERVICE HINT

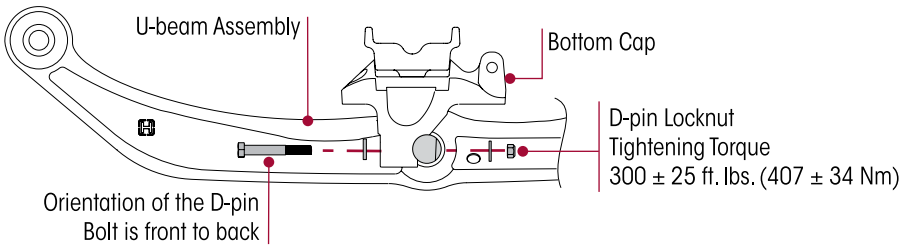
It may be necessary to rotate the QUIK-ALIGN eccentric collars to allow the full engagement of the D-pins into the bottom caps.

SERVICE HINT

It may be necessary to raise or lower the front of the differential to allow the D-pins to engage in the bottom cap. Use a drift pin if necessary to align the D-pins with the bottom cap.

8. Install the D-pin fasteners from front to back, see Figure 8-12.

FIGURE 8-12



9. Remove floor jack supporting the U-beam assembly.
10. Tighten D-pin fasteners to 300 ± 25 foot pounds torque.
11. Install the air spring between the frame and cross tube, refer to Air Spring in this section.
12. Install the wheels and remove axle support.
13. See additional Air Spring Cautions and Warnings in the Important Safety Notice section in this publication prior to deflating or inflating the air system.
14. Connect the linkage rod to the height control valve arm(s) to inflate the suspension as per the vehicle manufacturer's instructions.
15. Remove frame support(s).
16. Remove the wheel chocks.

NOTE

Alignment and QUIK-ALIGN final torque are necessary anytime the U-beam assembly is removed.

17. Check the alignment and adjust if necessary. See Alignment & Adjustments section in this publication.
18. After the correct axle alignment is achieved, use a calibrated torque wrench to tighten the 1" QUIK-ALIGN locknuts to 550 ± 25 foot pounds torque.

D-PIN BUSHING

You will need:

- Hendrickson Tool Part Nos. 66086-202 • 66086-204 (OTC Nos. 4246 • 4247), refer to the Special Tools section in this publication

REMOVAL		✔	✔	✔
INSTALLATION	✔		✔	✔
D-PIN BUSHING TOOLS	 **575164** Saddle	 **575163** Adapter Pin	 **576421** D-pin Adapter	 **575167** Alignment Tool

DISASSEMBLY

1. Mark the U-beam assembly to show the alignment of the existing D-pin. Install the alignment tool over the D-pin, and place the clamping plate over the alignment tool, see Figure 8-13.
2. Assemble the clamping nuts to the threaded rods.
3. Insert a threaded rod through the **upper** holes in the clamping plate and the head plate. Install a hex nut on the threaded rod, but **DO NOT** tighten at this time.
4. Insert a threaded rod through the **lower** holes in the clamping plate and the head plate. Install a hex nut on the threaded rod, but **DO NOT** tighten at this time.
5. Tighten the clamping nuts to the clamping plate, see Figure 8-14.

FIGURE 8-13

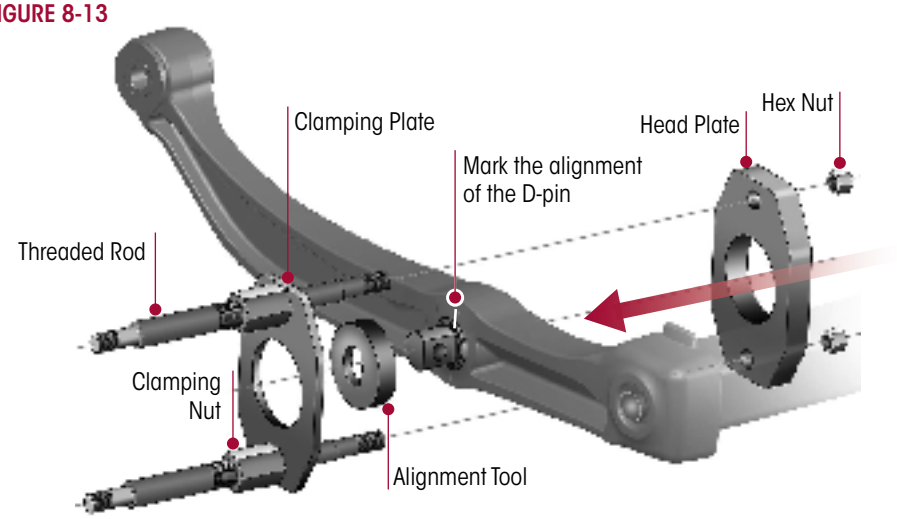
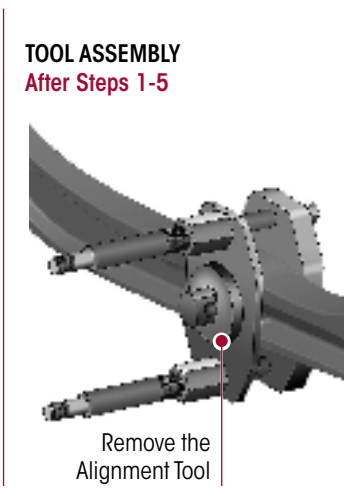


FIGURE 8-14



6. Remove the alignment tool.

⚠ WARNING

TO HELP PREVENT PERSONAL INJURY, THE CYLINDER MUST BE FULLY THREADED INTO THE CYLINDER MOUNTING PLATE.

7. Thread the cylinder into the cylinder mounting plate, see Figure 8-15.
8. Install the cylinder mounting plate onto the end of the threaded rods. Adjust the clamping nuts as needed to fit the threaded rods through the holes in the cylinder mounting plate. Assemble the hex nuts on the threaded rods. Tighten the hex nuts on both ends of the threaded rods.
9. Place the D-pin adapter over the D-pin.

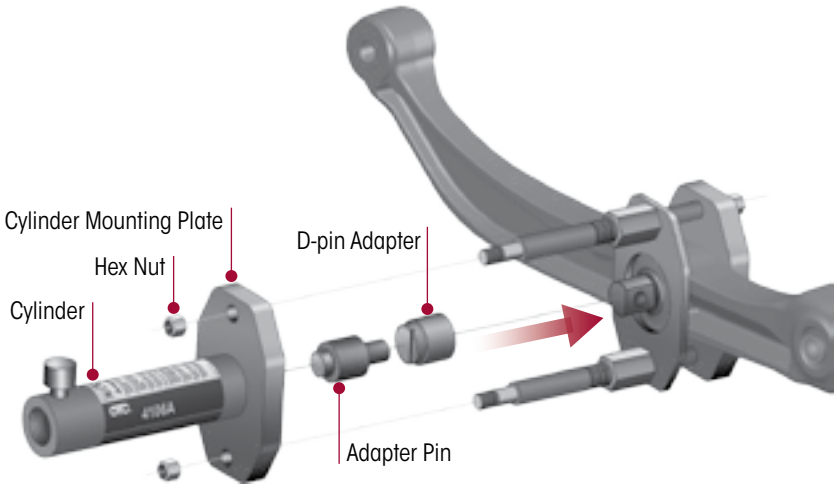
10. Insert the adapter pin into the head of the cylinder.

WARNING

TO HELP PREVENT PERSONAL INJURY, THE HYDRAULIC PUMP RATING MUST NOT EXCEED 10,000 PSI.

11. Prepare the hydraulic pump for use by following the manufacturer's instructions provided with the pump regarding hookup, venting, priming, and operation.

FIGURE 8-15



WARNING

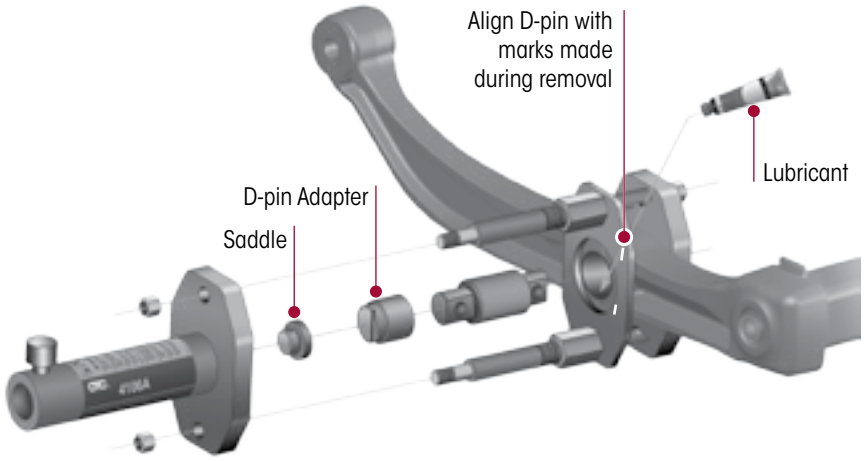
TO HELP PREVENT PERSONAL INJURY STAY CLEAR OF THE HYDRAULIC PUMP, ADJACENT TOOLS, AND THE DIRECTION OF THE HYDRAULIC FORCE WHILE THE D-PIN IS BEING EXTRACTED.

12. Connect the hydraulic hose from the hydraulic pump to the cylinder.
13. Operate the pump to extend the cylinder piston and apply pressure to push the D-pin out of the U-beam assembly D-pin hub.

ASSEMBLY

1. Clean and thoroughly lubricate the entire surface of the inside diameter of the U-beam assembly D-pin hub, see Figure 8-16.

FIGURE 8-16



2. Insert the saddle into the head of the cylinder.
3. Assemble the new D-pin and the D-pin adapter as shown. Align the line in the D-pin adapter with the alignment marks made during the removal procedure.
4. Operate the pump to extend the cylinder piston and apply enough pressure to hold the tool and components. Check the alignment of the D-pin. The centerline of the D-pin must be aligned with the centerline of the inside diameter of the U-beam assembly.

⚠ WARNING TO HELP PREVENT PERSONAL INJURY STAY CLEAR OF THE HYDRAULIC PUMP, ADJACENT TOOLS, AND THE DIRECTION OF THE HYDRAULIC FORCE WHILE THE D-PIN IS BEING EXTRACTED.

5. Operate the pump to apply pressure to install the D-pin completely into the U-beam assembly.

QUIK-ALIGN PIVOT BUSHING

- **METHOD A** – Hendrickson Tool Part Nos. 66086-202 • 66086-204 (OTC Nos. 4246 • 4247), refer to the Special Tools section in this publication
- **METHOD B** – Hendrickson Tool No. 66086-203L, see the procedure in this section.

METHOD A – Using Tool Nos. 66086-202 • 66086-204

You will need:

- Hendrickson Tool Part Nos. 66086-202 • 66086-204 (OTC Nos. 4246 • 4247), refer to the Special Tools section in this publication

REMOVAL	✔	✔	✔	✔
INSTALLATION	✔		✔	✔
QUIK-ALIGN BUSHING TOOLS	 **575163** Adapter Pin	 **576421** D-pin Adapter	 **575165** Bushing Support	 **575167** Alignment Tool

DISASSEMBLY

1. Insert the adapter pin through the alignment tool and into the pivot bushing hole as shown in Figure 8-17.
2. Insert the bushing support over the pivot bushing.
3. Assemble the clamping nuts to the threaded rods.
4. Insert a threaded rod through the upper holes in the clamping plate and the head plate while positioning the head plate over the bushing support. Install a hex nut on the threaded rod, but **DO NOT** tighten at this time.

FIGURE 8-17

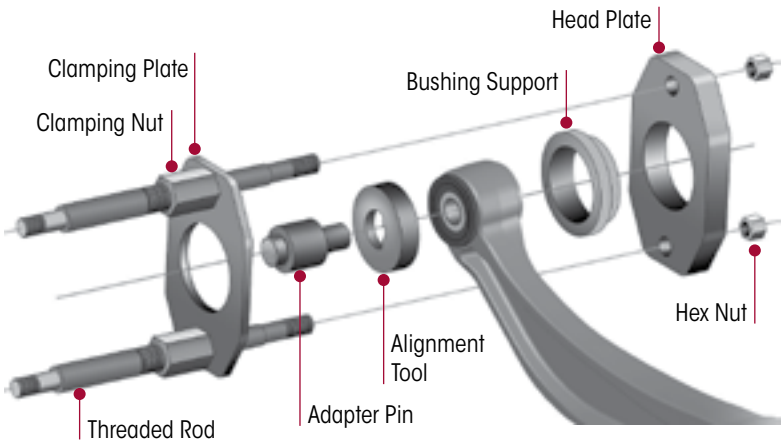
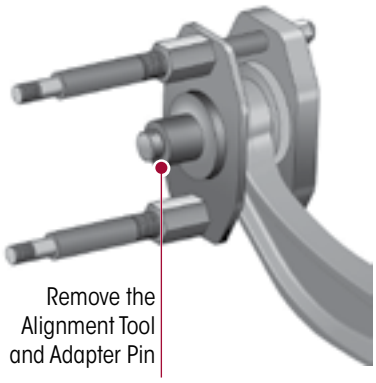


FIGURE 8-18

Tool assembly after Steps 1-6



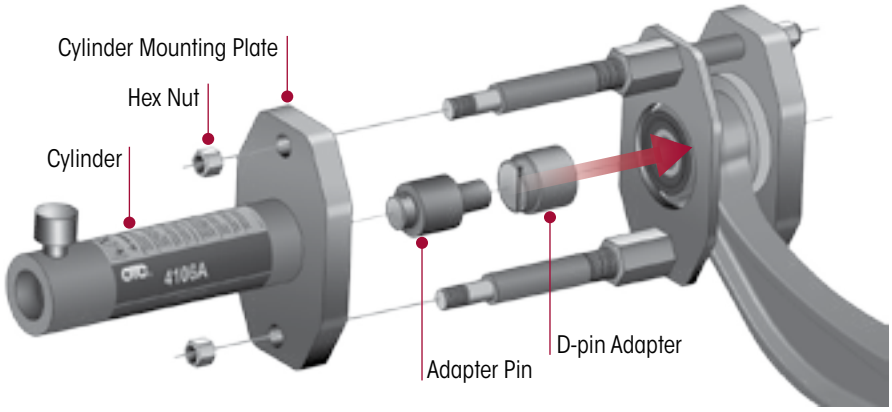
5. Insert a threaded rod through the lower holes in the clamping plate and the head plate. Install a hex nut on the threaded rod, but **DO NOT** tighten at this time.
6. Tighten the clamping nuts to the clamping plate, see Figure 8-18.
7. Remove the alignment tool and adapter pin.

⚠ WARNING

TO HELP PREVENT PERSONAL INJURY, THE CYLINDER MUST BE FULLY THREADED INTO THE CYLINDER MOUNTING PLATE.

8. Thread the cylinder into the cylinder mounting plate, see Figure 8-19.

FIGURE 8-19



9. Install the cylinder mounting plate onto the end of the threaded rods. Adjust the clamping nuts as needed to fit the threaded rods through the holes in the cylinder mounting plate. Assemble the hex nuts on the threaded rods. Tighten the hex nuts on both ends of the threaded rods.
10. Hold the D-pin adapter over the pivot bushing until contact is made with the adapter pin.
11. Insert the adapter pin into the head of the cylinder.

⚠ WARNING

TO HELP PREVENT PERSONAL INJURY, HYDRAULIC PUMP RATING MUST NOT EXCEED 10,000 PSI.

12. Prepare the hydraulic pump for use by following the instructions provided with the pump regarding hookup, venting, priming, and operation.

⚠ WARNING

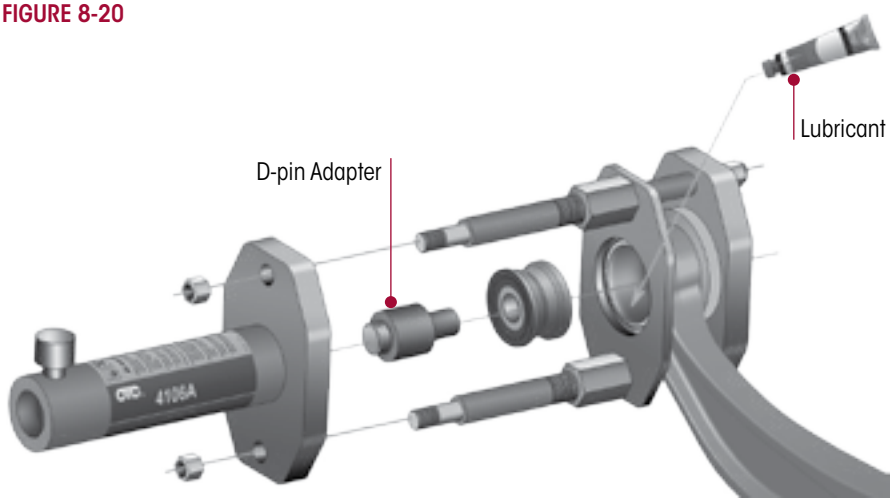
TO HELP PREVENT PERSONAL INJURY STAY CLEAR OF THE HYDRAULIC PUMP, ADJACENT TOOLS, AND THE DIRECTION OF THE HYDRAULIC FORCE WHILE THE D-PIN IS BEING EXTRACTED.

13. Connect the hydraulic hose from the hydraulic pump to the cylinder.
14. Operate the pump to extend the cylinder piston and apply pressure to push the pivot bushing out of the U-beam assembly.

ASSEMBLY

1. Clean and thoroughly lubricate the entire surface of the inside diameter of the U-beam assembly, see Figure 8-20.
2. Insert the adapter pin into the head of the cylinder.

FIGURE 8-20



3. Place the pivot bushing on the end of the adapter pin as shown.
4. Operate the pump to extend the cylinder piston and apply enough pressure to hold the tool and components. Check the alignment of the pivot bushing.

⚠ WARNING

TO HELP PREVENT PERSONAL INJURY STAY CLEAR OF THE HYDRAULIC PUMP, ADJACENT TOOLS, AND THE DIRECTION OF THE HYDRAULIC FORCE WHILE THE PIVOT BUSHING IS BEING EXTRACTED.

5. Operate the pump to apply pressure to install the pivot bushing completely into the U-beam assembly.

METHOD B – Using Tool No. 66086-203L

SERVICE HINT

Use the QUIK-ALIGN Pivot Bushing Tool No. 66086-203L to help with the installation and removal of QUIK-ALIGN pivot bushings. The tool allows the existing pivot bushing to be pushed out from the U-beam assembly into the receiving cylinder. Then follow a similar procedure to push in the replacement pivot bushing, see Figure 8-21.

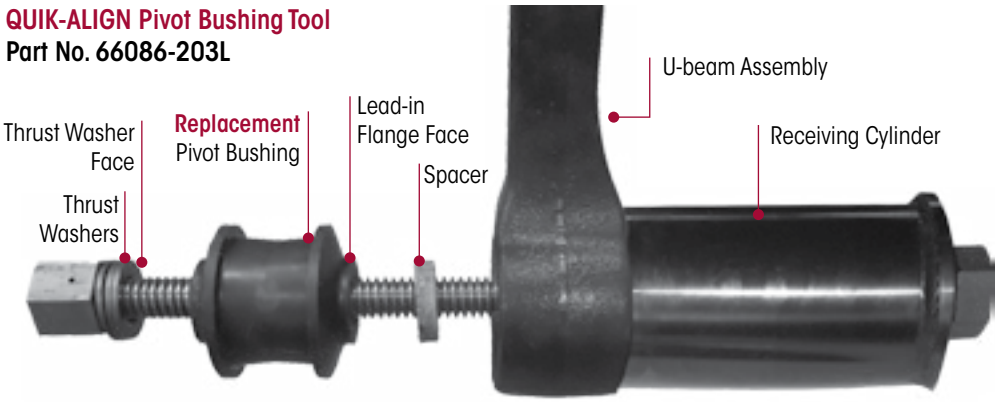
FIGURE 8-21

NOTE

Apply NLGI #2–EP chassis lubricant to each face of the thrust washers and to the drive screw that will engage through the receiving cylinder.

Apply P80 lubricant to the face of the lead-in flange and the outer diameter of **NEW** pivot bushing

QUIK-ALIGN Pivot Bushing Tool
Part No. 66086-203L



⚠ WARNING

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

1. Remove the U-beam assembly from the vehicle per the U-beam Disassembly procedure in this section.
2. After removal, place U-beam assembly on the floor or a suitable work area.

PIVOT BUSHING REMOVAL

NOTE

When replacing a pivot bushing it is recommended to replace both pivot bushings on the U-beam assembly.

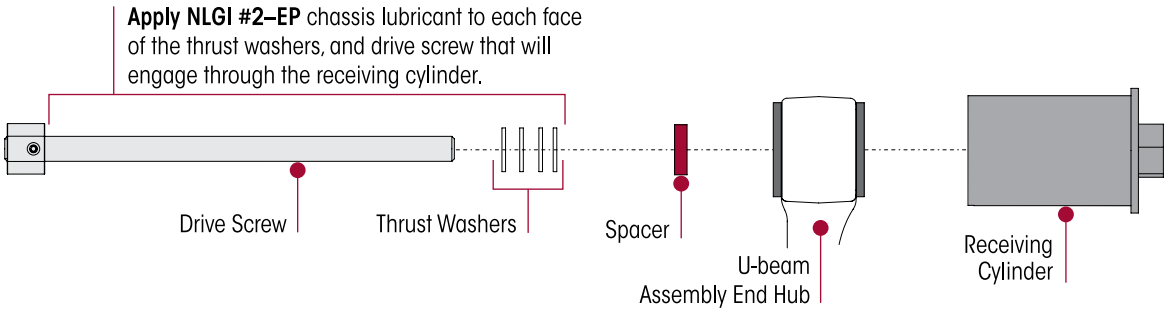
To replace the QUIK-ALIGN pivot bushing you will need:

- QUIK-ALIGN pivot bushing service tool (Part No. 66086-203L), see Figure 8-21
- ¾" Impact wrench (impact gun), some ½" impact wrenches may work

1. Install the pivot bushing tool as shown in Figure 8-23.
2. Remove and discard thrust washers (if equipped) and any loose rubber or debris from the existing pivot bushing.
3. Apply NLGI #2–EP (Extreme Pressure) chassis lubricant to each face of the thrust washers and to the drive screw that will engage through the receiving cylinder, see Figure 8-22.

4. Snug the threaded drive screw to hold the thrust washers, spacer, U-beam assembly with the existing pivot bushing and the receiving cylinder in place, see Figure 8-23.

FIGURE 8-22



5. Using a ¾" impact wrench, rotate the drive screw in a continuous motion without stopping until the pivot bushing is removed from the end hub. The existing pivot bushing will enter into the receiving cylinder, see Figure 8-24.

FIGURE 8-23

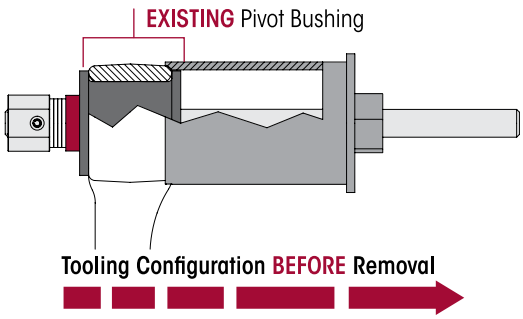
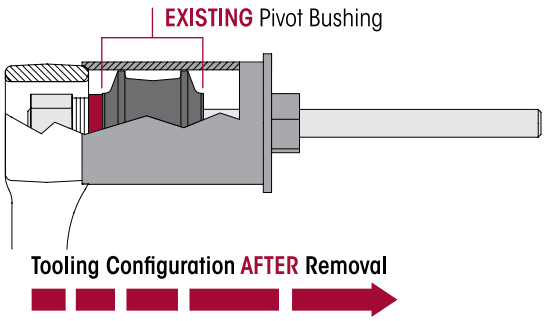


FIGURE 8-24



6. Remove and discard pivot bushing.
7. Repeat steps 1 through 6 for the other side of the U-beam assembly, as recommended.

END HUB INSPECTION

1. Inspect the inner bore of the U-beam assembly end hub and remove any loose debris or rubber residue from the bushing mating surface.

PIVOT BUSHING INSTALLATION

1. Clean the inner diameter of the U-beam assembly end hub with brake cleaner.
2. Apply NLGI #2–EP (Extreme Pressure) chassis lubricant to each face of the thrust washers and to the drive screw that will engage through the receiving cylinder, see Figures 8-25 and 8-26.

NOTE

DO NOT use petroleum or soap base lubricant, it can cause an adverse reaction with the bushing material, such as deterioration. P-80 lubricant is supplied in the QUIK-ALIGN Pivot Bushing Kits.

3. Apply P-80 lubricant to the:
   - **Heavy-duty Pivot Bushing** – the face of the lead-in flange, to the outer diameter of the replacement pivot bushing, and the inner diameter of the U-beam assembly end hub, see Figure 8-25.
   - **Severe-duty Pivot Bushing** – the face of the lead-in flange and to the outer diameter of the severe-duty pivot bushing, see Figure 8-26. **DO NOT** apply to the U-beam assembly end hub.

FIGURE 8-25
HEAVY-DUTY Pivot Bushing

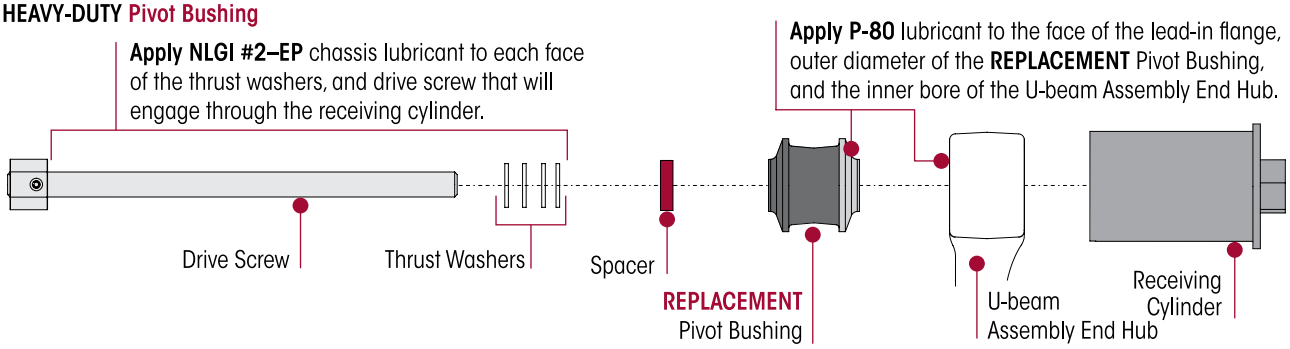
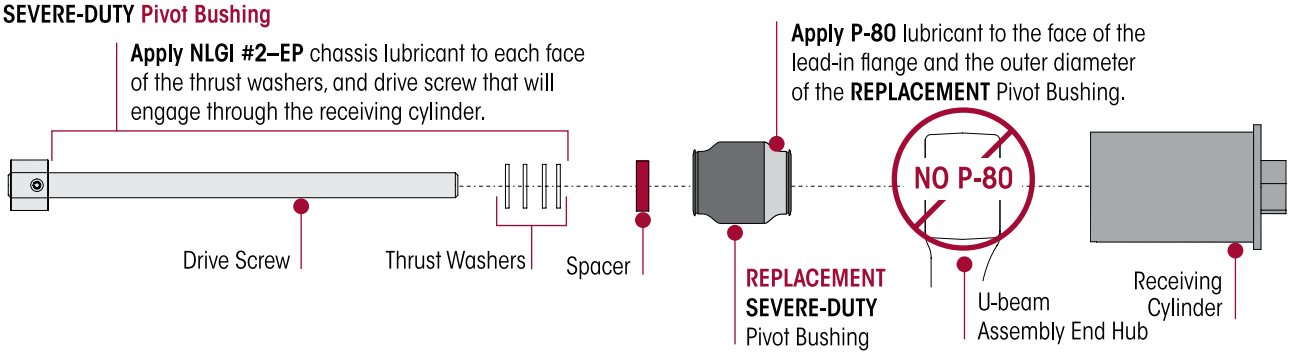


FIGURE 8-26
SEVERE-DUTY Pivot Bushing



4. Snug the threaded drive screw to hold the thrust washers, spacer, pivot bushing, and U-beam assembly with the receiving cylinder in place, see Figures 8-27 and 8-28.
5. Using a ¾" impact wrench, rotate the drive screw in a continuous motion without stopping until the pivot bushing is seated in the hub and slightly overshoots the opposite end of the hub. It is necessary to overshoot the desired final position, see Figures 8-29 and 8-30.
6. Remove and reverse the installation tool, then from the opposite side of the hub press the pivot bushing again to center the bushing within the beam end hub, see Figures 8-31 and 8-32. Center the pivot bushing to help prevent bulging and bushing preload. This is known as the "Bump Back" procedure.

SERVICE HINT

If the **severe-duty pivot bushing** comes out of the opposite end of the end hub during installation, less P-80 lubricant is required. Repeat the installation procedure to ensure only a light amount of lubricant is on the bushing itself.

FIGURE 8-27
HEAVY-DUTY Pivot Bushing

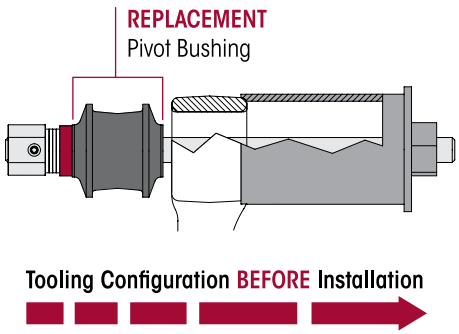


FIGURE 8-28
SEVERE-DUTY Pivot Bushing

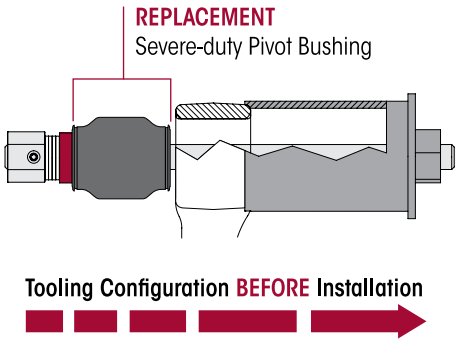


FIGURE 8-29
HEAVY-DUTY Pivot Bushing

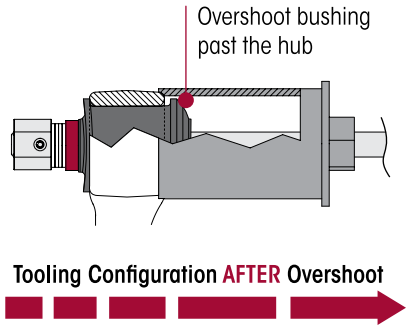


FIGURE 8-30
SEVERE-DUTY Pivot Bushing

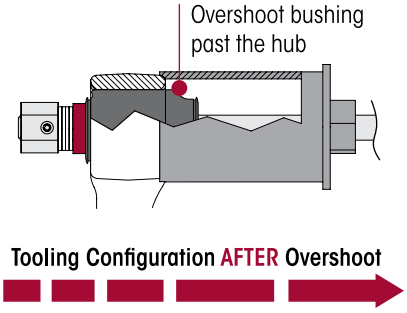


FIGURE 8-31
HEAVY-DUTY Pivot Bushing

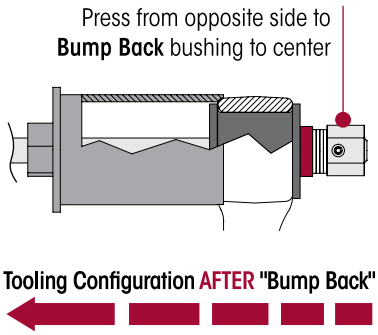
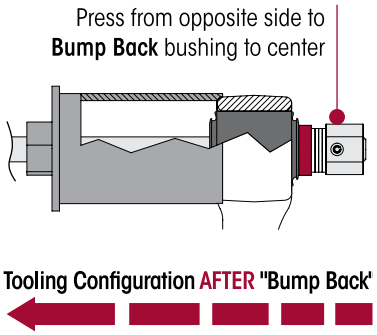


FIGURE 8-32
SEVERE-DUTY Pivot Bushing



7. **Severe-duty Pivot Bushings** – Snap the thrust washers onto the bushing, (see Figure 8-33) and ensure there is free play on both washers, see Figure 8-34. If one washer does not seat properly or is very snug use a dead blow hammer to center the bushing. If a dead blow hammer is not sufficient, the installation tool must be used to perform a secondary "Bump Back" procedure to center the bushing, refer to step 6 and see Figures 8-31 and 8-32.

FIGURE 8-33
Severe-duty Pivot Bushing

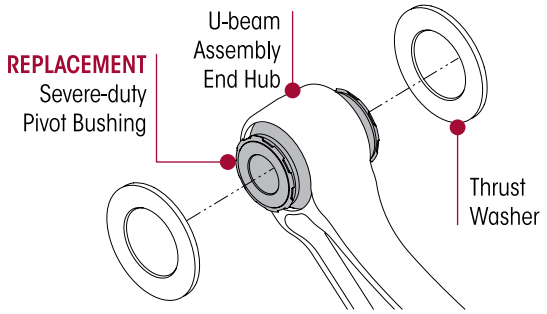
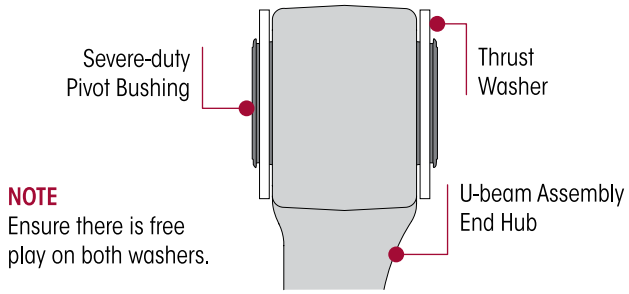


FIGURE 8-34
Severe-duty Pivot Bushing



8. Repeat for the other side of the U-beam assembly, as recommended:
   - **Heavy-duty Pivot Bushings** – Steps 1 through 6.
   - **Severe-duty Pivot Bushings** – Steps 1 through 7.
9. Allow the lubricant four (4) hours to dissipate before fully operating the vehicle.
10. Install the U-beam assembly, follow the installation procedure as detailed in this section.

TOP PAD

DISASSEMBLY

1. Chock the front wheels.
2. Support the frame at ride height.
3. Disconnect the height control valve linkage assembly from the height control valve arm(s) as per the vehicle manufacturer's instructions.

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 in this publication prior to deflating or inflating the air system.

WARNING

SOME VEHICLE APPLICATIONS, SUCH AS VEHICLES EQUIPPED WITH OUTRIGGERS, RETAIN SOME AIR PRESSURE IN THE AIR SPRINGS AT ALL TIMES. PRIOR TO PERFORMING ANY MAINTENANCE, SERVICE, OR REPAIR OF THE SUSPENSION, VERIFY EACH AIR SPRING IS COMPLETELY DEFLATED. FAILURE TO DO SO COULD RESULT IN SERIOUS PROPERTY DAMAGE AND/OR SEVERE PERSONAL INJURY.

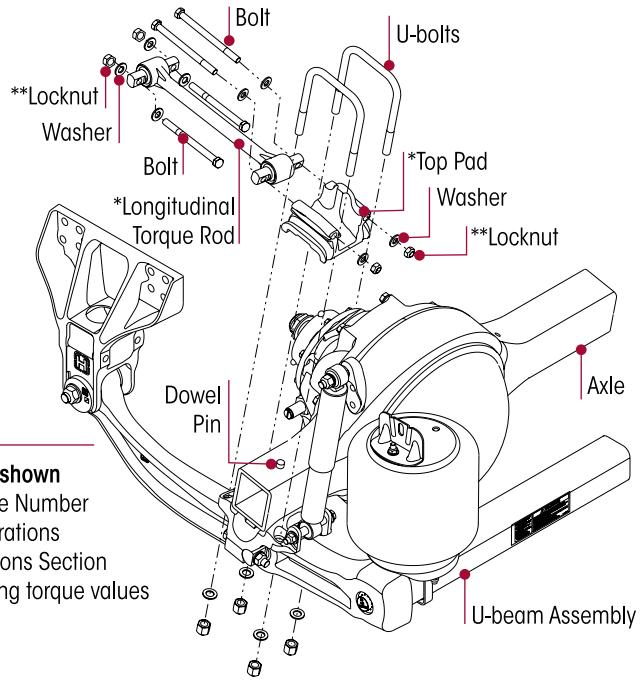
5. Lower the height control valve arm(s) to exhaust the air in the air springs and deflate the rear suspension as per the vehicle manufacturer's instructions.

SERVICE HINT

Note the quantity of shims removed to maintain the correct pinion angle of the axle at assembly. See Alignment & Adjustments section in this publication.

6. Remove and discard the longitudinal torque rod fasteners from the top pad connection and shims (if equipped), see Figure 8-35.

FIGURE 8-35



NOTES

* **PRIMAAX EX 23K•46K•69K shown**
Refer to Hendrickson Literature Number SP-164 for additional configurations

** Refer to the Torque Specifications Section in this publication for tightening torque values

NOTE

Due to certain pinion angle configurations, the removal of the D-pin bolts may be necessary to access the U-bolt locknuts.

⚠ WARNING

USE ONLY A FLOOR JACK EQUIPPED WITH A FOUR INCH CONTACT PLATE TO SUPPORT THE U-BEAM ASSEMBLY AT THE CROSS TUBE TO FACILITATE SAFE LOWERING AND RAISING OF THE U-BEAM ASSEMBLY. DO NOT USE A BOTTLE JACK, WHICH DOES NOT HAVE ENOUGH CONTACT AREA AND CAN BE UNSTABLE. FAILURE TO DO SO CAN CAUSE COMPONENT DAMAGE OR RESULT IN PERSONAL INJURY.

⚠ WARNING

THE WEIGHT OF THE U-BEAM ASSEMBLY IS APPROXIMATELY 225 POUNDS. CARE SHOULD BE TAKEN AT REMOVAL AND INSTALLATION TO PREVENT PERSONAL INJURY OR DAMAGE TO COMPONENTS.

7. Support the U-beam assembly with a floor jack or jack stand that is equipped with a 4" contact plate.
8. Remove and discard the U-bolt fasteners from the clamp group.
9. Remove the top pad.
10. Inspect the top pad and the axle housing for any cracks or damage. Replace if necessary.

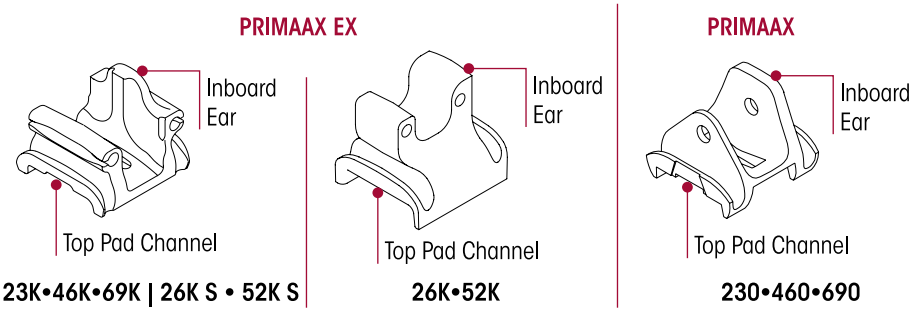
ASSEMBLY

NOTE

The models PRIMAAX EX 26K•52K, PRIMAAX 260•520, may be equipped with top pads and bottom caps that are contoured to fit the axle housing on the axle's short arm side. Ensure the correct parts are installed at each location, (refer to the Bottom Cap Selection Guide in the Hendrickson Parts List, Literature number SP-164) available online at www.hendrickson-intl.com.

1. Install the top pad on the top of the axle engaging the dowel pin. Care should be taken to ensure the taller ear of the top pad is mounted to the inboard side of the suspension. The top pad varies with different models and may appear different, see Figure 8-36.
2. Install the new U-bolts, washers, and locknuts.

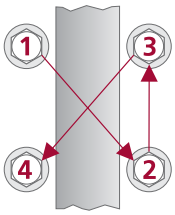
FIGURE 8-36



NOTE

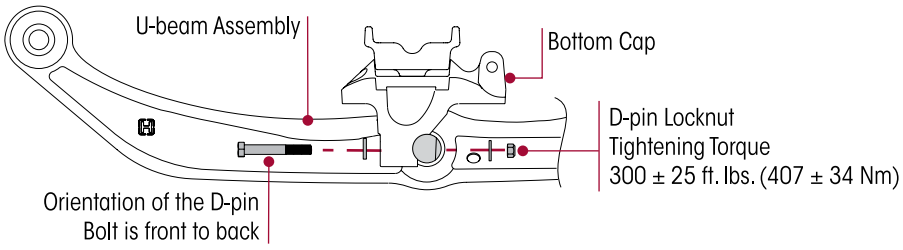
Current Hendrickson Truck Suspension Systems U-bolt locknuts for the PRIMAAX EX • PRIMAAX suspension are ¾"-16 Grade C and are phosphate and oil coated.

FIGURE 8-37



3. Verify that the U-bolts are seated properly in the top pad channels, see Figure 8-35.
4. Tighten the U-bolt locknuts evenly in 50 foot pounds increments in the proper pattern to achieve uniform bolt tension, see Figure 8-37.
5. Rap the top of the U-bolts with a dead blow mallet and retighten to the proper torque. **DO NOT** exceed specified torque on U-bolt locknuts. Tighten the ¾" locknuts to 375 ± 25 foot pounds torque.
6. Tighten the D-pin fasteners to 300 ± 25 foot pounds torque if loosened or removed during disassembly, see Figure 8-38.
7. Remove the support from the U-beam assembly.

FIGURE 8-38



8. Install the fasteners on the longitudinal torque rod, **DO NOT** tighten at this time.
9. See additional Air Spring Cautions and Warnings in the Important Safety Notice section in this publication prior to deflating or inflating the air system.
10. Connect the linkage rod(s) to the height control valve arm(s) to inflate the suspension as per the vehicle manufacturer's instructions.
11. Remove the frame stands.

NOTE It is mandatory to have the vehicle at proper ride height prior to tightening the 7/8" top pad through bolt locknut to torque specifications.

12. Tighten the longitudinal torque rod fasteners to the required specification, see Torque Specifications section in this publication.
13. Remove the wheel chocks.

BOTTOM CAP AND AXLE SPACER (if equipped)

NOTE It is not necessary to loosen the QUIK-ALIGN connection to service the bottom cap, therefore alignment is preserved during service. If the QUIK-ALIGN connection is loosened during service, alignment is required after service is completed.

DISASSEMBLY

1. Chock the wheels of the axle.
2. Raise the frame of the vehicle to remove the load from the suspension. Support the frame.
3. Raise and support the axle being serviced. Remove the tires.
4. Disconnect the height control linkage assembly from the height control valve arm, see vehicle manufacturer's instructions.

⚠ 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.

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

⚠ WARNING SOME VEHICLE APPLICATIONS, SUCH AS VEHICLES EQUIPPED WITH OUTRIGGERS, RETAIN SOME AIR PRESSURE IN THE AIR SPRINGS AT ALL TIMES. PRIOR TO PERFORMING ANY MAINTENANCE, SERVICE, OR REPAIR OF THE SUSPENSION, VERIFY EACH AIR SPRING IS COMPLETELY DEFLATED. FAILURE TO DO SO COULD RESULT IN SERIOUS PROPERTY DAMAGE AND/OR SEVERE PERSONAL INJURY.

6. Lower the height control valve arm(s) to exhaust the air in the air springs and deflate the rear suspension as per the vehicle manufacturer's instructions.
7. Clean and lubricate the lower mounting fasteners of both air springs with penetrating oil. This will help prevent the air spring mounting studs from breaking during the removal process.
8. Remove the lower mounting fasteners from both air springs using **HAND TOOLS** only, refer to Air Spring in this section.

⚠ WARNING

USE ONLY A FLOOR JACK EQUIPPED WITH A FOUR INCH CONTACT PLATE TO SUPPORT THE U-BEAM ASSEMBLY AT THE CROSS TUBE TO FACILITATE SAFE LOWERING AND RAISING OF THE U-BEAM ASSEMBLY. DO NOT USE A BOTTLE JACK, WHICH DOES NOT HAVE ENOUGH CONTACT AREA AND CAN BE UNSTABLE. FAILURE TO DO SO CAN CAUSE COMPONENT DAMAGE OR RESULT IN PERSONAL INJURY.

⚠ WARNING

THE WEIGHT OF THE U-BEAM ASSEMBLY IS APPROXIMATELY 225 POUNDS. CARE SHOULD BE TAKEN AT REMOVAL AND INSTALLATION TO PREVENT PERSONAL INJURY OR DAMAGE TO COMPONENTS.

9. Support the U-beam assembly with a floor jack that is equipped with a 4" contact plate.
10. Remove the D-pin fasteners from both sides of the support beam.
11. Raise the front of the differential to facilitate the removal of the D-pins from the bottom caps.
12. Lower the floor jack to pivot the U-beam assembly down from the bottom caps.
13. Remove the lower shock absorber mounting fastener from the side being serviced.
14. Pivot the lower shock mount out of the bottom cap.
15. Remove the S-cam support bracket fasteners and support bracket (if equipped), refer to S-cam Support Bracket in this section
16. Remove and discard the U-bolt fasteners from the clamp group.
17. Remove the bottom cap and inspect for damage or wear. Replace as necessary.

ASSEMBLY

NOTE

The models PRIMAAX EX 26K • 52K, PRIMAAX 260 • 520, may be equipped with top pads and bottom caps that are contoured to fit the axle housing on the axle's short arm side. Ensure the correct components are installed at each location in the proper orientation, (refer to the Bottom Cap Selection Guides in the Hendrickson Parts Lists literature number SP-164).

1. Install the top pad (if removed) on the top of the axle engaging the dowel pin. Care should be taken to ensure the taller ear of the top pad is mounted to the inboard side of the suspension, see Figure 8-39.

FIGURE 8-39

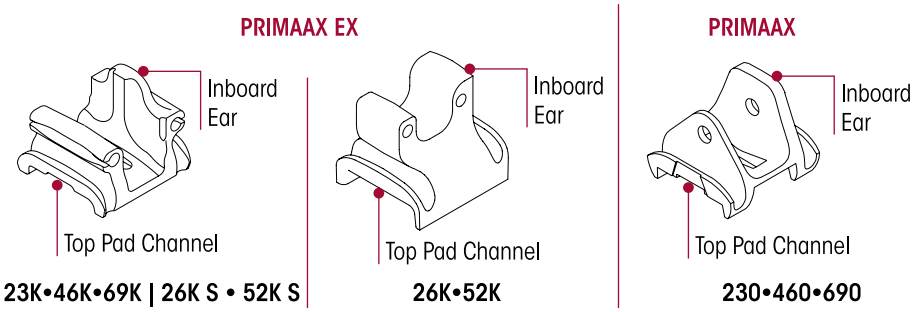
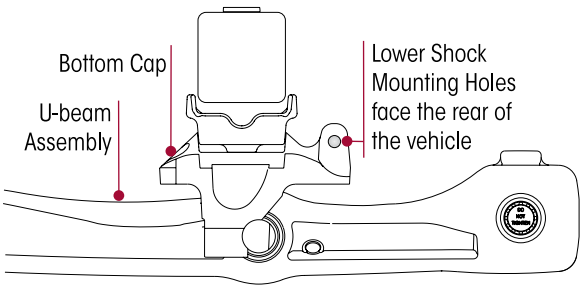


FIGURE 8-40



2. Install the bottom cap and axle spacer (if equipped) on the axle in the proper direction, with the lower shock mounting holes facing the rear of the vehicle, see Figure 8-40.
3. Install the new U-bolts. Verify that the U-bolts are seated properly in the top pad channels and through the bottom cap.

NOTE

Current Hendrickson Truck Suspension Systems U-bolt locknuts for the PRIMAAX EX • PRIMAAX suspension are ¾" -16 Grade C and are phosphate and oil coated.

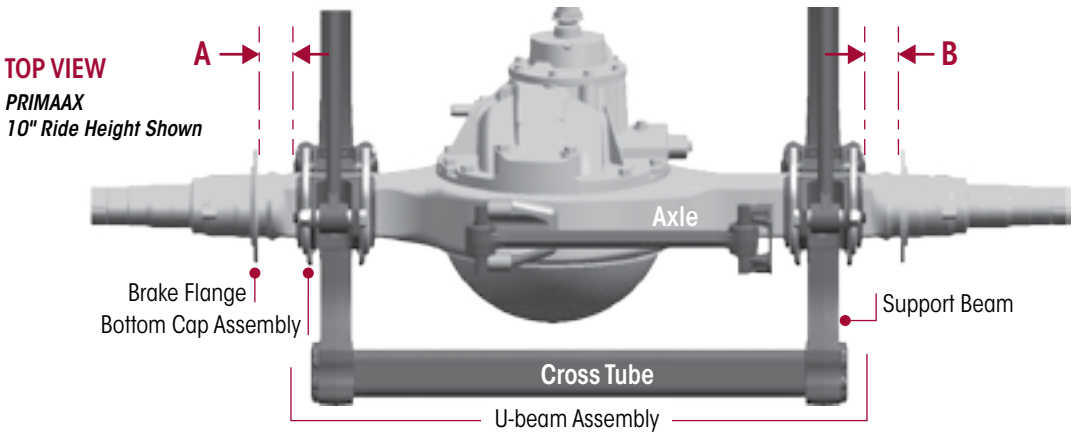
4. Install the U-bolt washers and the locknuts and hand tighten, **DO NOT** tighten to torque at this time.

⚠ CAUTION

PRIOR TO TIGHTENING THE U-BOLTS TO THE FINAL TORQUE, ENSURE THE U-BEAM ASSEMBLY AND THE BOTTOM CAP ASSEMBLY ARE CENTERED ON THE AXLE (**A** = **B** ± ⅛"), SEE FIGURE 8-41. FAILURE TO DO SO COULD CAUSE PREMATURE COMPONENT WEAR OR CAUSE UNEVEN LOAD DISTRIBUTION.

5. Center the cross tube, support beam, and the bottom cap assembly on the axle (**A** = **B** ± ⅛"), see Figure 8-41.

FIGURE 8-41

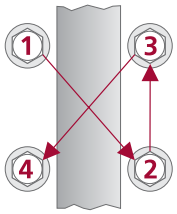


SERVICE HINT

It may be necessary to raise or lower the front of the differential to allow the D-pins to engage the bottom cap.

6. Raise the U-beam assembly until the D-pins engage in the bottom cap.
7. Install the D-pin fasteners with the bolt heads on the forward side of the bottom cap, see Figure 8-38.
8. Lower the front differential to allow the full engagement of the D-pins into the bottom caps.

FIGURE 8-42



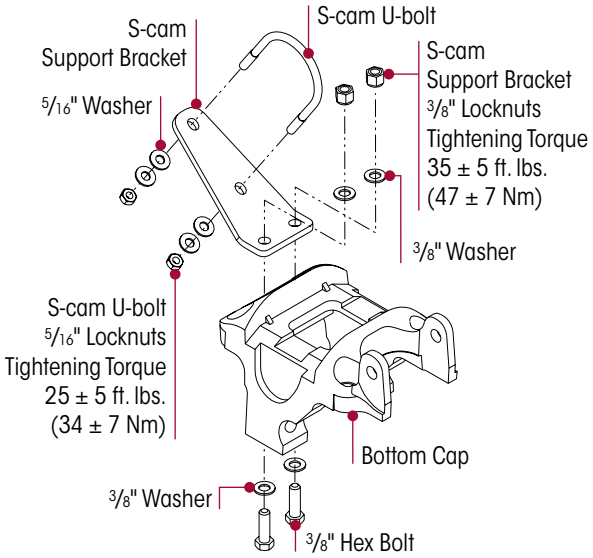
9. Prior to tightening the D-pin fasteners, verify the bottom cap is centered over the support beam.
10. Tighten the D-pin locknuts to 300 ± 25 foot pounds torque.
11. Tighten the U-bolt locknuts evenly in 50 foot pounds increments in the proper pattern to achieve uniform bolt tension, see Figure 8-42.
12. Rap the top of the U-bolts with a dead blow mallet and retighten to the proper torque. **DO NOT** exceed specified torque on U-bolt locknuts. Tighten the ¾" locknuts to 375 ± 25 foot pounds torque.
13. Pivot the shock back into the lower shock mount and install the lower shock absorber mounting fastener. Tighten the ⅝" locknuts to 213 ± 12 foot pounds torque.
14. Install the S-cam support bracket and fasteners (if equipped). Tighten the ⅜" locknuts to 35 ± 5 foot pounds torque. Tighten the 5/16" locknuts to 25 ± 5 foot pounds torque.
15. Install the air spring between the frame and the cross tube, refer to Air Spring in this section.
16. Install the tires (if removed).
17. Remove the jack stands and lower the frame of the vehicle.
18. See additional Air Spring Cautions and Warnings in the Important Safety Notice section in this publication prior to deflating or inflating the air system.
19. Connect the height control valve linkage rod(s) to the height control valve arm(s) to inflate the suspension as per the vehicle manufacturer's instructions.
20. Remove the wheel chocks from the vehicle.

S-CAM SUPPORT BRACKET (if equipped)

DISASSEMBLY

1. Chock the wheels.
2. Remove the S-cam U-bolt fasteners, see Figure 8-43.
3. Remove the S-cam U-bolt from the bracket and the S-cam housing.
4. Remove the fasteners connecting the S-cam support bracket from the bottom cap.
5. Remove the bracket and inspect components for wear or damage. Replace as necessary.

FIGURE 8-43



ASSEMBLY

1. Install the bracket on top of the bottom cap.
2. Install the S-cam 3/8" bolts, washers, and locknuts must be installed with the bolt heads on the underside of the bottom cap, see Figure 8-43. Tighten the locknuts to 35 ±5 foot pounds.

SERVICE HINT S-cam 3/8" bolts must be installed with the bolt heads on the underside of the bottom cap to prevent interference between the U-beam assembly and the bolt fasteners during articulation.

3. Install the U-bolt around the S-cam housing and through the S-cam support bracket.
4. Install the 5/16" washers and locknuts. Tighten the locknuts to 25 ± 5 foot pounds.
5. Remove the wheel chocks.

AXLE STOPS

DISASSEMBLY

1. Chock the wheels.
2. Remove the fasteners connecting the axle stop to the frame.
3. Remove the axle stop.
4. Inspect the frame rail mounting surfaces for any cracks or damage.

ASSEMBLY

1. Install the axle stop on the frame.
2. Install new mounting fasteners.
3. Tighten axle stop fasteners to the vehicle manufacturer's torque specifications.
4. Install any items removed
5. Remove the wheel chocks.

FRAME HANGER

⚠ WARNING

THIS PROCEDURE TO REPLACE A SINGLE FRAME HANGER MUST BE CONDUCTED WITH THE REMAINING FRAME HANGERS CONNECTED TO THE FRAME, THE U-BEAM ASSEMBLY, AND THE LONGITUDINAL TORQUE RODS. FAILURE TO DO SO COULD CAUSE THE AXLE TO SHIFT RESULTING IN POSSIBLE DAMAGE TO COMPONENTS OR PERSONAL INJURY.

SERVICE HINT

Increasing the pinion angle may facilitate the disassembly/assembly of the frame hanger. To increase the pinion angle, place a floor jack under the axle pinion and raise it slightly. This will increase the pinion angle slightly easing disassembly/assembly.

DISASSEMBLY

1. Chock the front wheels.
2. Support the frame.
3. Disconnect the height control valve assembly from the height control valve arm, see vehicle manufacturer's instructions.

⚠ 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 in this publication prior to deflating or inflating the air system.

⚠ WARNING

SOME VEHICLE APPLICATIONS, SUCH AS VEHICLES EQUIPPED WITH OUTRIGGERS, RETAIN SOME AIR PRESSURE IN THE AIR SPRINGS AT ALL TIMES. PRIOR TO PERFORMING ANY MAINTENANCE, SERVICE, OR REPAIR OF THE SUSPENSION, VERIFY EACH AIR SPRING IS COMPLETELY DEFLATED. FAILURE TO DO SO COULD RESULT IN SERIOUS PROPERTY DAMAGE AND/OR SEVERE PERSONAL INJURY.

5. Lower the height control valve arm(s) to exhaust the air in the air springs and deflate the rear suspension as per the vehicle manufacturer's instructions.

SERVICE HINT

Each frame hanger will have a pair of QUIK-ALIGN collars. Any eccentric (with the square drive feature) QUIK-ALIGN collar should be mounted on the outboard side of the frame hanger. Axle thrust angles can only be corrected on frame hangers equipped with eccentric QUIK-ALIGN collars.

NOTE

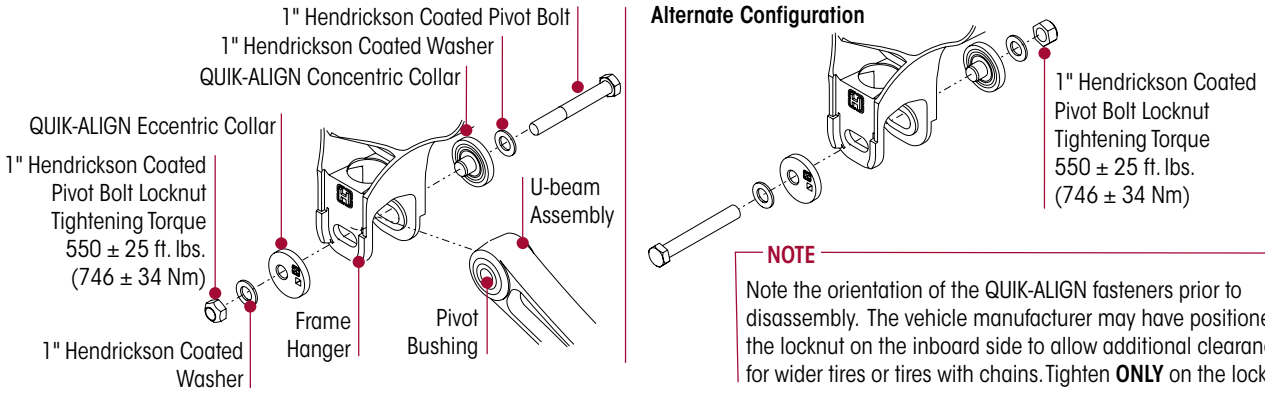
Mark the position of the QUIK-ALIGN **square drive** in relation to the frame hanger and note the **orientation of the fasteners** prior to loosening the QUIK-ALIGN connection. This will facilitate the axle alignment process after the repair is complete.

6. Remove the QUIK-ALIGN fasteners and collars, see Figure 8-44. Discard the fasteners. The collars may be reused if they are not damaged.

SERVICE HINT

Note the quantity of shims removed to maintain the correct pinion angle of the axle at assembly. See Alignment & Adjustments section in this publication.

FIGURE 8-44



7. Remove the fasteners and shim (if equipped) that attach the longitudinal torque rod to the frame hanger.
8. Remove the fasteners that attach the frame hanger to the vehicle per vehicle manufacturer's specifications.
9. Remove the frame hanger.
10. Inspect the mounting surface for any damage or wear.
11. Inspect the QUIK-ALIGN pivot bushing and torque rod bushings for wear or damage, replace as necessary. Refer to Pivot Bushing in the Preventive Maintenance section in this publication.

ASSEMBLY

1. Slide the new frame hanger over the QUIK-ALIGN pivot bushing.
2. Install the new fasteners that attach the frame hanger to the vehicle and tighten per the vehicle manufacturer's specifications.

⚠ WARNING DISCARD USED QUIK-ALIGN FASTENERS. ALWAYS USE NEW QUIK-ALIGN FASTENERS TO COMPLETE A REPAIR. FAILURE TO DO SO COULD RESULT IN FAILURE OF THE PART, OR MATING COMPONENTS, ADVERSE VEHICLE HANDLING, PERSONAL INJURY, OR PROPERTY DAMAGE.

⚠ WARNING DO NOT ASSEMBLE THE QUIK-ALIGN JOINT WITHOUT THE PROPER FASTENERS. USE ONLY HENDRICKSON COATED GENUINE FASTENERS TO SUSTAIN PROPER CLAMP FORCE. ENSURE THAT THE QUIK-ALIGN FASTENER'S TORQUE VALUES ARE SUSTAINED AS RECOMMENDED IN THE TORQUE SPECIFICATIONS SECTION IN THIS PUBLICATION. FAILURE TO FOLLOW THE ABOVE ITEMS CAN CAUSE ADVERSE VEHICLE HANDLING RESULTING IN PERSONAL INJURY OR PROPERTY DAMAGE AND WILL VOID ANY APPLICABLE WARRANTIES. FOLLOW VEHICLE MANUFACTURER'S FASTENER ORIENTATION WHEN PERFORMING ANY MAINTENANCE, SERVICE, OR REPAIR.

NOTE Use a new QUIK-ALIGN pivot bolt kit (refer to the Hendrickson Parts Lists literature number SP-164) for any axle alignment or disassembly of the QUIK-ALIGN connection. This will help ensure that the proper clamp load is applied to the connection and help prevent the joint to slip in service.

3. Install the QUIK-ALIGN collars and the new mounting hardware that attaches to the U-beam assembly to the frame hanger, see Figure 8-44. Verify that the nose of each QUIK-ALIGN collar is installed correctly into the pivot bushing sleeve, and the flanged side is flat against the frame hanger face within the alignment guides. Snug QUIK-ALIGN locknuts to 🔧 50-100 foot pounds torque, **DO NOT** tighten at this time.
4. Install the torque rod mounting fasteners and reinstall any shims that were removed during disassembly. Tighten the fasteners to the proper specification, see Torque Specifications section in this publication per model designation.
5. See additional Air Spring Cautions and Warnings in the Important Safety Notice section in this publication prior to deflating or inflating the air system.
6. Connect the height control valve linkage rod(s) to the height control valve arm(s) to inflate the suspension properly as per the vehicle manufacturer's instructions.
7. Remove frame supports(s).
8. Verify that the axle is in proper alignment, see the Alignment & Adjustments section in this publication.

NOTE It is mandatory to have the vehicle at proper ride height prior to tightening the 1.0" QUIK-ALIGN locknuts to torque specifications.

9. After the correct alignment of the axle is verified tighten the 1.0" QUIK-ALIGN locknuts to 🔧 550 ± 25 foot pounds torque.
10. Verify the correct pinion angle on the axle per original equipment manufacturer's specifications. Adjust as necessary per the Alignment & Adjustments section in this publication.
11. Remove the chocks from the front wheels.

SECTION 9
Troubleshooting Guide

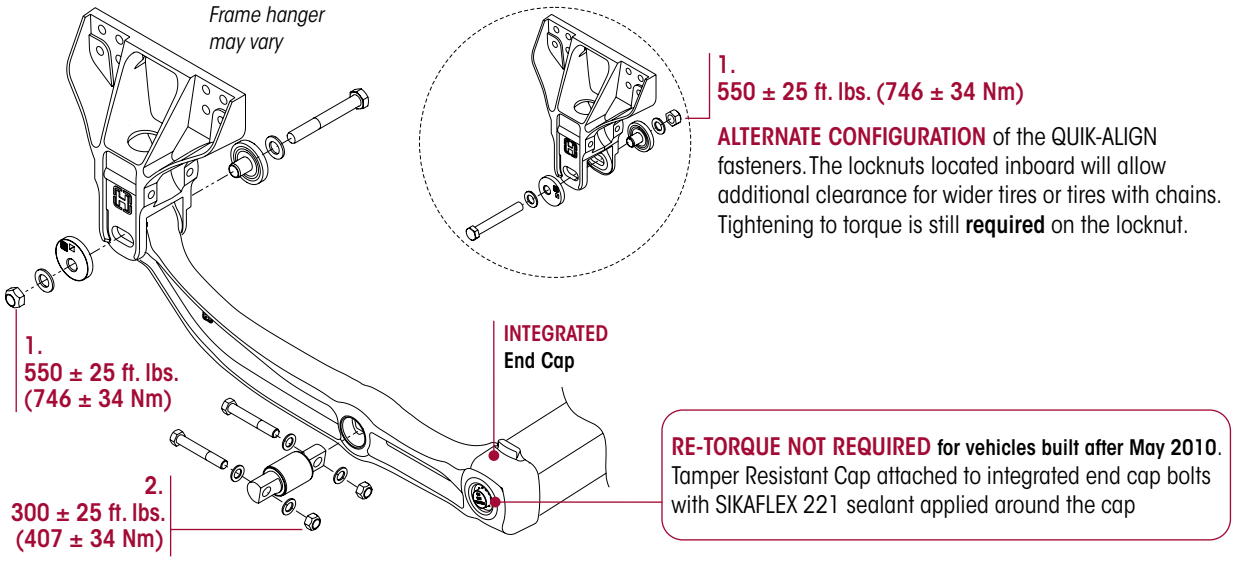
PRIMAAX EX • PRIMAAX TROUBLESHOOTING GUIDE		
CONDITION	**POSSIBLE CAUSE**	**CORRECTION**
Suspension has harsh or bumpy ride	Air spring not inflated to specification or damaged	Repair the air system and check the ride height. See vehicle manufacturer for ride height adjustment.
	Ride height set incorrectly	Adjust the ride height to proper setting. See vehicle manufacturer for ride height adjustment.
	Suspension is overloaded	Redistribute the load to correct weight.
	Broken support beam	Replace with U-beam assembly.
Irregular tire wear	Incorrect tire inflation pressure	Correct the tire pressure per the vehicle manufacturer and tire manufacturer specifications.
	Incorrect alignment	Correct the alignment. Refer to the Alignment & Adjustments section.
	Worn QUIK-ALIGN bushing	Replace the QUIK-ALIGN bushing.
	Loose QUIK-ALIGN attachment	Replace the QUIK-ALIGN connection, and check the vehicle alignment. Adjust if necessary. Check the frame hanger for wear around QUIK-ALIGN plates and replace if necessary.
	Worn torque rod bushings	Replace the torque rod bushings (if applicable) or torque rod assembly as necessary.
Excessive driveline vibration	Incorrect pinion angle(s)	Adjust the pinion angle(s), refer to the vehicle manufacturer's specifications.
	Loose QUIK-ALIGN attachment	Replace the QUIK-ALIGN connection, and check the vehicle alignment. Adjust if necessary. Check the frame hanger for wear around the QUIK-ALIGN collars and replace if necessary.
	Ride height set incorrectly	Adjust the ride height to the proper setting. See the vehicle manufacturer for ride height adjustment.
	Broken support beam	Replace with U-beam assembly.
Suspension is noisy	Loose QUIK-ALIGN attachment	Replace the QUIK-ALIGN connection, and check the vehicle alignment. Adjust if necessary. Check the frame hanger for wear around QUIK-ALIGN collars and replace if necessary.
	Loose U-bolts	Tighten the U-bolts to specifications, see the Preventive Maintenance section.
	Loose end caps (if equipped)	Inspect the end caps and the support beam to cross tube connection for damage. Repair as necessary, re-torque end cap to specification, see the Torque Specifications section.
	Worn bushings	Replace the bushings as necessary.
Vehicle bouncing excessively	Damaged or leaking shock absorber	Replace the shock absorber.
	Ride height set incorrectly	Adjust the ride height to the proper setting. See the vehicle manufacturer for proper ride height adjustment.

PRIMAAX EX • PRIMAAX TROUBLESHOOTING GUIDE (continued)		
CONDITION	**POSSIBLE CAUSE**	**CORRECTION**
Vehicle leaning	Air spring not inflated to specification or damaged	Repair the air system and check the ride height. See the vehicle manufacturer for proper ride height adjustment.
	Load not centered	Redistribute the load.
	Frame twisted	Straighten the frame per the vehicle manufacturer's guidelines.
	Broken support beam	Replace with U-beam assembly.
	Axle housing bent or broken	Replace the axle housing per the vehicle manufacturer's guidelines and align vehicle.
	Loose U-bolts	Tighten the U-bolts to specifications, see Preventive Maintenance section.
	Front suspension	Inspect and repair the front suspension.
Suspension will not reach ride height	Suspension is overloaded	Redistribute the load to correct weight.
	Air Spring leaking or damaged	Replace the air spring.
	Leak in air system	Inspect the air fittings, see Air Fitting Inspection in the Preventive Maintenance section in this publication. If necessary, repair the air system and check ride height. See the vehicle manufacturer for proper ride height adjustment.
	Air line obstructed or improperly connected	Repair the air system and check ride height. See the vehicle manufacturer for proper ride height adjustment.
	Height control valve dump port activated	Check the height control valve dump port for proper connection and function per the vehicle manufacturer's guidelines
Air springs deflate when parked	Leak in air system	Inspect the air fittings, see the Air Fittings inspection in the Preventive Maintenance section in this publication. If necessary, repair the air system and check the ride height. See the vehicle manufacturer for proper ride height adjustment.
	Malfunctioning height control valve	Replace the malfunctioning height control valve per the vehicle manufacturer's guidelines.
Excessive frame slope	Ride height set incorrectly	Adjust the ride height to proper setting per the vehicle manufacturer's guidelines.
	Suspension is overloaded	Redistribute the load to correct weight

SECTION 10
Torque Specifications

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

QUIK-ALIGN • D-PIN CONNECTION



1. 550 ± 25 ft. lbs. (746 ± 34 Nm)

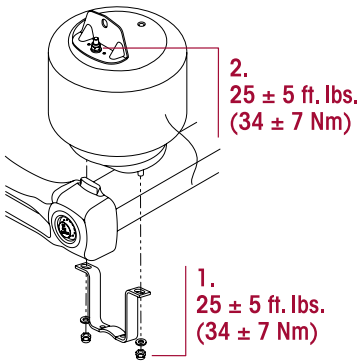
ALTERNATE CONFIGURATION of the QUIK-ALIGN fasteners. The locknuts located inboard will allow additional clearance for wider tires or tires with chains. Tightening to torque is still **required** on the locknut.

RE-TORQUE NOT REQUIRED for vehicles built after May 2010. Tamper Resistant Cap attached to integrated end cap bolts with SIKAFLEX 221 sealant applied around the cap

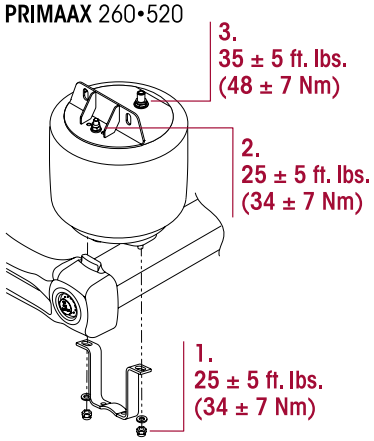
NO.	COMPONENT		*FASTENER		TORQUE VALUE	
			**Quantity	Size	Foot Pounds	Newton Meters
1	U-beam Assembly	QUIK-ALIGN Bushing Locknut	2	1"-14 UNF	550 ± 25	746 ± 34
2		D-Pin Bushing Locknut	4	¾"-16 UNF	300 ± 25	407 ± 34
				⅞"-14 UNF		

AIR SPRINGS

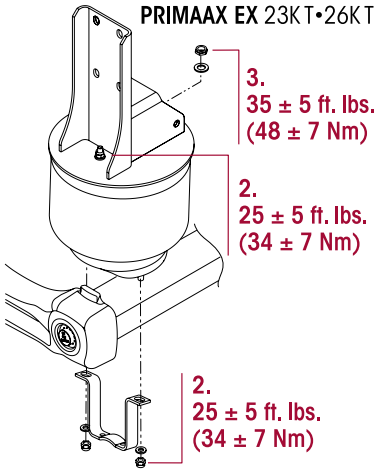
PRIMAAX EX 23K•46K•69K
PRIMAAX 230•460•690



PRIMAAX EX 26K•52K•26K S•52K S
PRIMAAX 260•520



PRIMAAX EX 23KT•26KT

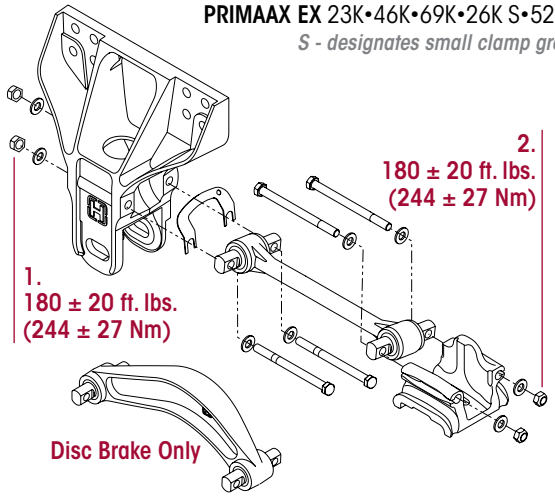


NO.	COMPONENT	*FASTENER		TORQUE VALUE	
		**Quantity	Size	Foot Pounds	Newton Meters
1	Lower Air Spring Bracket to Cross Tube	4	½"-13 UNC	25 ± 5	34 ± 7
2	Upper Air Spring Assembly	2	½"-13 UNC	25 ± 5	34 ± 7
3	Upper Air Spring Assembly to Air Spring Bracket	2	¾"-16 UNF	25 ± 5	34 ± 7

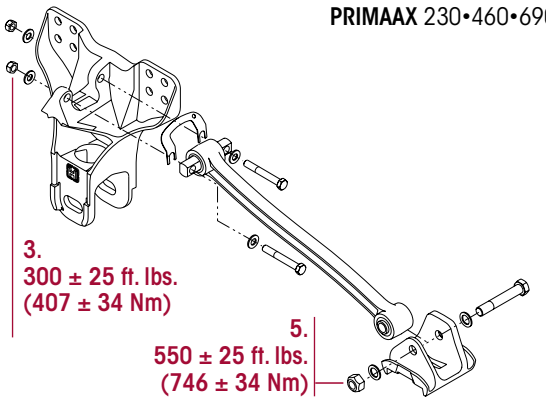
LONGITUDINAL TORQUE ROD

PRIMAAX EX 23K•46K•69K•26K S•52K S

S - designates small clamp group

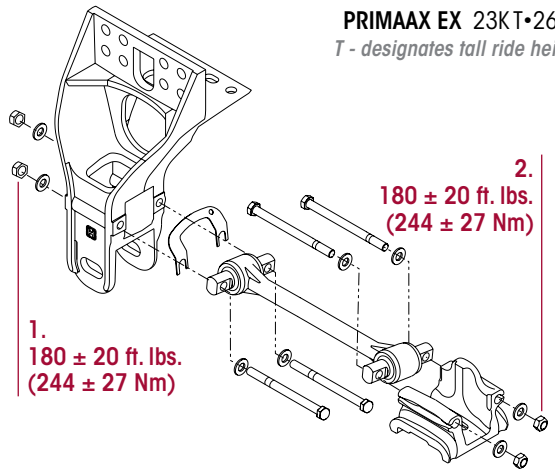


PRIMAAX 230•460•690

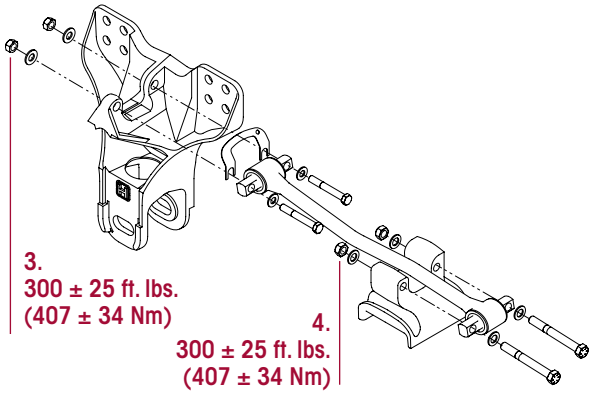


PRIMAAX EX 23KT•26KT

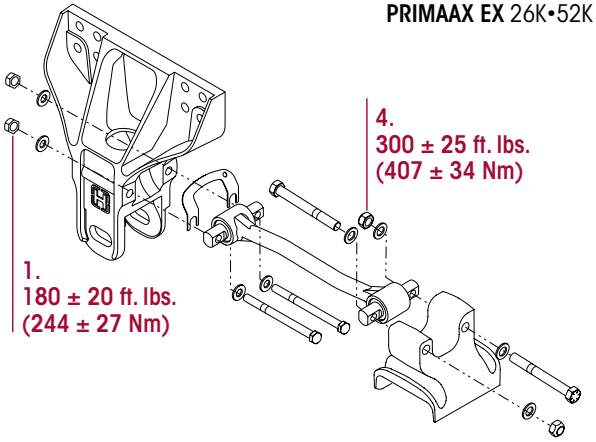
T - designates tall ride height



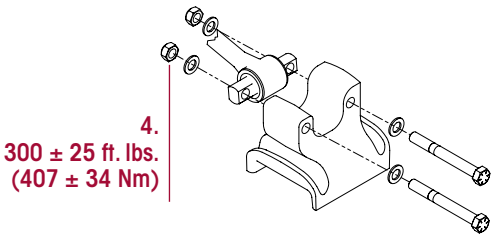
PRIMAAX 260•520



PRIMAAX EX 26K•52K

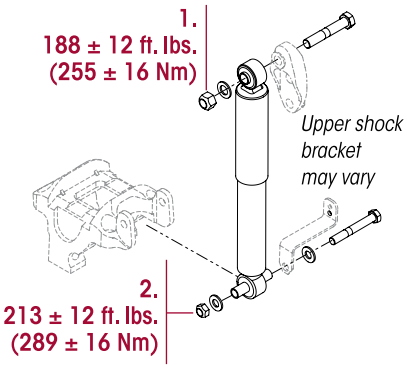


Rear Tandem and Tridem Axle
Longitudinal Torque Rod/Top Pad Assembly

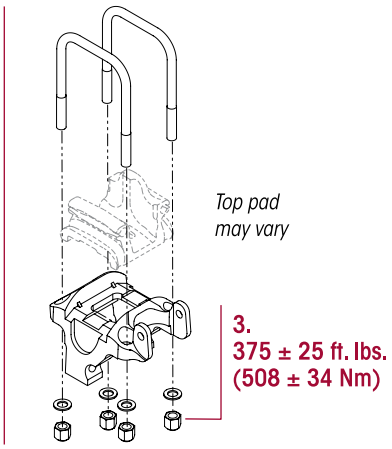


NO.	COMPONENT		*FASTENER		TORQUE VALUE	
			**Quantity	Size	Foot Pounds	Newton Meters
1	Longitudinal Torque Rod to	Forward Hanger Mount	4	5/8"-11 UNC	180 ± 20	244 ± 27
2		Rear Top Pad Mount	4	5/8"-11 UNC	180 ± 20	244 ± 27
3		Forward Hanger Mount	4	3/4"-16 UNF	300 ± 25	407 ± 34
4		Rear Top Pad Mount	4	3/4"-16 UNF	300 ± 25	407 ± 34
5		Rear Top Pad Mount	2	7/8"-14 UNF	550 ± 25	746 ± 34

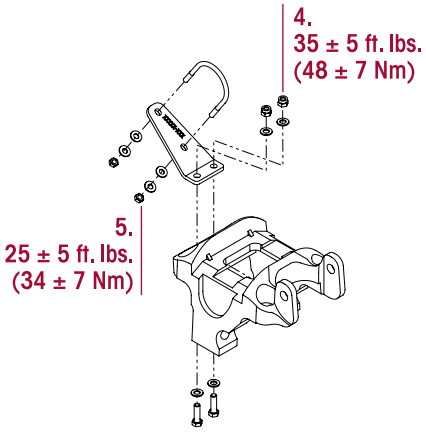
SHOCK ABSORBER



U-BOLTS

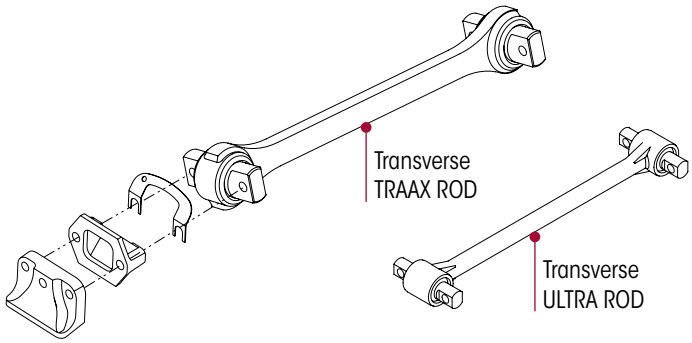


S-CAM



NO.	COMPONENT	*FASTENER		*TORQUE VALUE	
		**Quantity	Size	Foot Pounds	Newton Meters
1	Upper Shock Absorber Locknuts	2	¾"-10 UNC	188 ± 12	255 ± 16
2	Lower Shock Absorber Locknuts	2	⅝"-11 UNC	213 ± 12	289 ± 16
3	U-bolt Locknuts	8	¾"-16 UNF	375 ± 25	508 ± 34
4	S-cam Support Bracket To Bottom Cap Mount	4	⅜"-16 UNC	35 ± 5	48 ± 7
5	S-cam Support Bracket To U-bolt Locknuts	4	5⁄16"-18 UNC	25 ± 5	34 ± 7

TRANSVERSE TORQUE ROD



Transverse TRAAX ROD and ULTRA ROD
Torque rod fasteners are not supplied by Hendrickson. Refer to vehicle manufacturer's torque specifications.

NOTES: * Frame fasteners are furnished and installed by the vehicle manufacturer. Torque values listed apply only if Hendrickson supplied fasteners are used. If non-Hendrickson fasteners are used, refer to the vehicle manufacturer's torque specifications.

** Quantity shown are per axle, double quantity for tandem, and triple for tridem.

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.*

HENDRICKSON

www.hendrickson-intl.com

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