TECHNICAL PROCEDURE

PRIMAAX® EX Medium-duty Rear Air Suspension for Europe

SUBJECT: Service Instructions
LIT NO: 17730-360
DATE: February 2025 **REVISION:** A

TABLE OF CONTENTS

SECTION 1
Introduction

This publication is intended to acquaint and assist maintenance personnel in the preventive maintenance, service, repair, and rebuild of PRIMAAX® EX suspension systems used in tractor and rigid truck applications in Europe.

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, and proper maintenance, service, repair and rebuild instructions for the above referenced PRIMAAX EX suspensions.

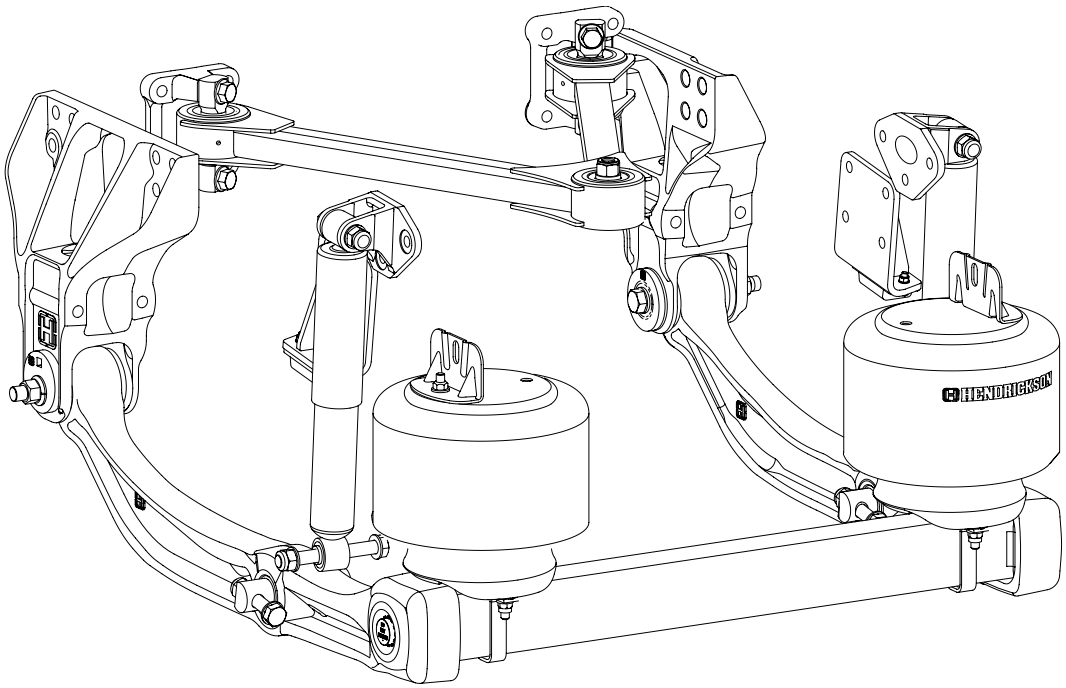
Hendrickson reserves the right to make changes and improvements to its products and publications at any time. For information on the latest version of this manual, contact:

- Hendrickson United Kingdom Ltd at +44 1604 493 161, e-mail:ukaftermarket@hendrickson-intl.com

The latest revision of this publication is available online at www.hendrickson-intl.com/en-eu/products/primaax/primaax-ex

SECTION 2
Product Description

FIGURE 2-1



PRIMAAX EX Medium-duty drive axle air suspension system — Superior ride and handling provide enhanced driver comfort and protection to vehicle loads and body. With advanced control of brake and acceleration torque, the roll-resistant design simplifies installation and maintenance. PRIMAAX EX is proven in arduous conditions. Hendrickson's torsion bar eliminates the need for a costly anti-roll bar. The reduced weight increases load, ensuring maximum profitability for the end user and improves packaging.

PRIMAAX EX is suitable for tractor and rigid applications. The unique suspension geometry and parallelogram design significantly control suspension wind up and corresponding frame rise. Driveline angles are maintained throughout axle travel, thereby reducing suspension-induced driveline vibration and extending component life.

This integrated feature delivers greater stability for improved control.

- **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 help 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.
- **Frame hangers** — Robust frame hangers enhance system durability to meet a variety of grueling vocational applications.
- **Shock absorbers** — Positioned and tuned for optimum damping characteristics and protect air springs from over-extension.
- **QUIK-ALIGN®** — Allows for easy axle alignment without shims. Reduces maintenance time and helps extend tire life.

PRIMAAX EX SPECIFICATIONS

	Single Axle Configuration	Tandem Axle Configuration
Suspension Capacity Rating	Up to 11.5t	Up to 23t
Installed Weight*	240 kg per Axle	

* Installed weight excludes axle, wheel ends and brakes.

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 of this publication.

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

SAFETY PRECAUTIONS

WARNING

FASTENERS

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

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

WARNING

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, POSSIBLE PERSONAL INJURY, OR PROPERTY DAMAGE.

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, PERSONAL INJURY OR PROPERTY DAMAGE AND WILL VOID ANY APPLICABLE WARRANTIES. FOLLOW THE 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, POSSIBLE PERSONAL INJURY, OR PROPERTY DAMAGE.

WARNING

SUPPORT THE VEHICLE PRIOR TO SERVICING

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

WARNING

WHEN LIFTING THE VEHICLE TO PERFORM ANY VEHICLE SERVICE, ENSURE THE REAR AIR SUSPENSION DOES NOT FREELY HANG IN AN UNSUPPORTED CONDITION. USE SAFETY STANDS OR BLOCKS AS NEEDED TO FULLY SUPPORT THE SUSPENSION. FAILURE TO DO SO CAN CAUSE COMPONENT DAMAGE, MISALIGNMENT, PERSONAL INJURY, OR PROPERTY DAMAGE.

CAUTION

PROCEDURES AND TOOLS

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

WARNING

MODIFYING COMPONENTS

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

WARNING

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, POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

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

⚠ WARNING

AIR SPRING INFLATION AND DEFLATION

PRIOR TO THE 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 THE PRESSURES RECOMMENDED BY THE AIR SPRING MANUFACTURER, CONTACT HENDRICKSON TECHNICAL SERVICES FOR DETAILS. IMPROPER USE OR OVER INFLATION MAY CAUSE AIR SPRING ASSEMBLIES TO BURST, CAUSING PROPERTY DAMAGE AND/OR SEVERE PERSONAL INJURY.

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.

⚠ 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

V-ROD ASSEMBLY

THIS PRIMAAX EX SUSPENSION CONFIGURATION INCORPORATE V-RODS FOR VEHICLE STABILITY. OPERATING THE VEHICLE WITH DISCONNECTED OR NON-FUNCTIONAL V-ROD WOULD RESULT IN ADVERSE VEHICLE HANDLING AND POSSIBLE TIRE CONTACT WITH THE FRAME, CONTACT THE VEHICLE MANUFACTURER FOR MORE INFORMATION.

WARNING

SHOCK ABSORBERS

THE SHOCK ABSORBERS ARE THE REBOUND TRAVEL STOPS FOR THE SUSPENSION. ANYTIME THE AXLE INSTALLED ON THE SUSPENSION IS SUSPENDED IT IS MANDATORY THAT THE SHOCK ABSORBERS REMAIN CONNECTED. REPLACEMENT OF SHOCK ABSORBERS WITH NON-HENDRICKSON PARTS CAN ALTER THE REBOUND TRAVEL OF THE SUSPENSION AND WILL VOID HENDRICKSON'S WARRANTY.

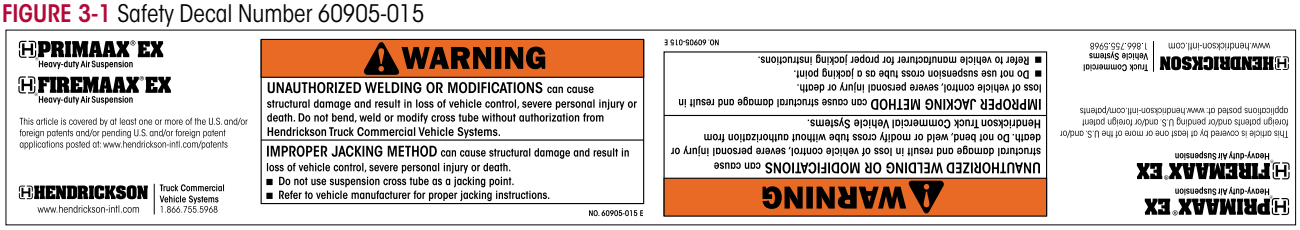
WARNING

CROSS TUBE

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

- 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 CHANNEL AS A JACKING POINT
- REFER TO VEHICLE MANUFACTURER FOR PROPER JACKING INSTRUCTIONS

FIGURE 3-1 Safety Decal Number 60905-015



- DO NOT USE THE SUSPENSION CROSS TUBE AS A JACKING POINT TO RAISE THE VEHICLE, SEE FIGURE 3-2
- REFER TO THE 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 PROCEDURE:

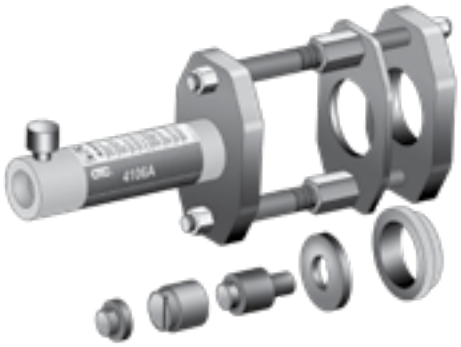
1. WEAR PROPER EYE PROTECTION
2. WEAR CLOTHING THAT PROTECTS YOUR SKIN
3. WORK IN A WELL VENTILATED AREA
4. DO NOT USE GASOLINE, OR SOLVENTS THAT CONTAIN GASOLINE. GASOLINE CAN EXPLODE
5. ACIDIC SOLUTIONS CANNOT BE USED ON ALUMINUM COMPONENTS.
6. HOT SOLUTION TANKS OR ALKALINE SOLUTIONS MUST BE USED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

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

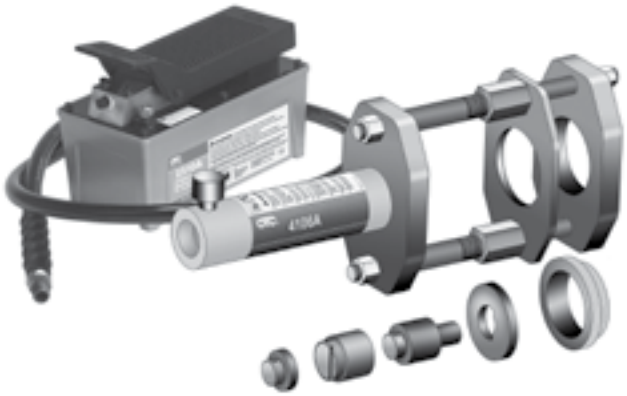
SECTION 4
Special Tools

D-PIN / QUIK-ALIGN PIVOT BUSHING SERVICE TOOLS

OTC Part No. 4246 Visit otctools.com



OTC Part No. 4247 Visit otctools.com



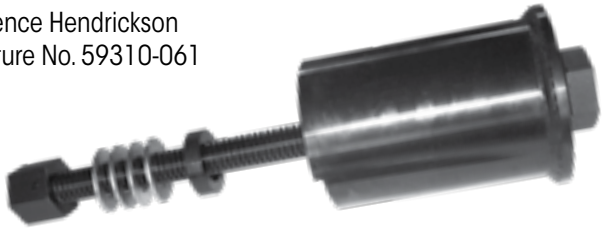
QUIK-ALIGN SOCKET TOOL

OTC Part No. 1767

Visit otctools.com

QUIK-ALIGN PIVOT BUSHING SERVICE TOOL
Hendrickson Part No. 66086-203L

Reference Hendrickson
Literature No. 59310-061

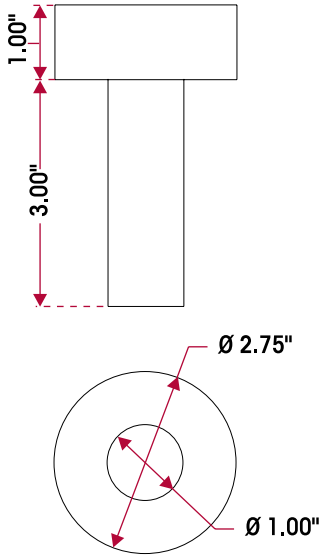


D-PIN / QUIK-ALIGN PIVOT BUSHING SHOP MADE SERVICE TOOLS

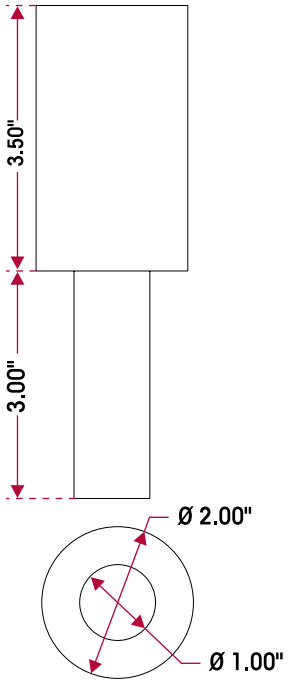
These shop made tools are designed to service D-pin and QUIK-ALIGN pivot bushings. These tools are made from cold rolled steel or equivalent. Drawings are for reference only. Hendrickson does not supply these tools.

QUIK-ALIGN TOOLS

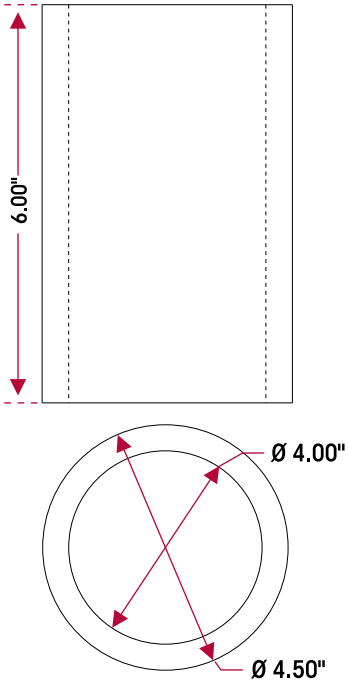
Pivot Bushing Installer



Pivot Bushing Remover

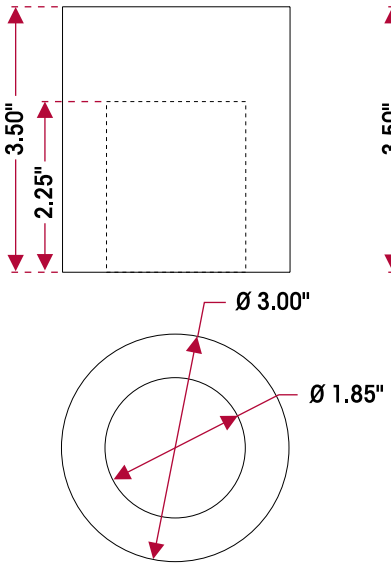


Pivot Bushing Receiver

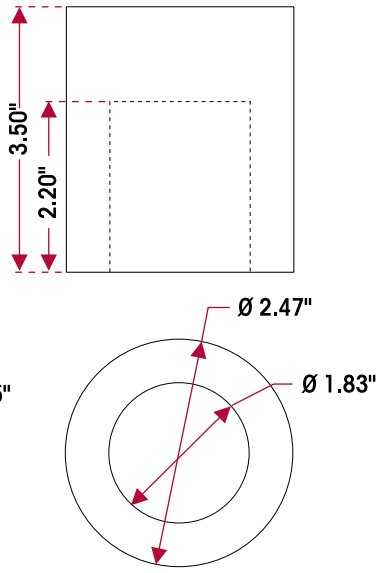


D-PIN TOOLS

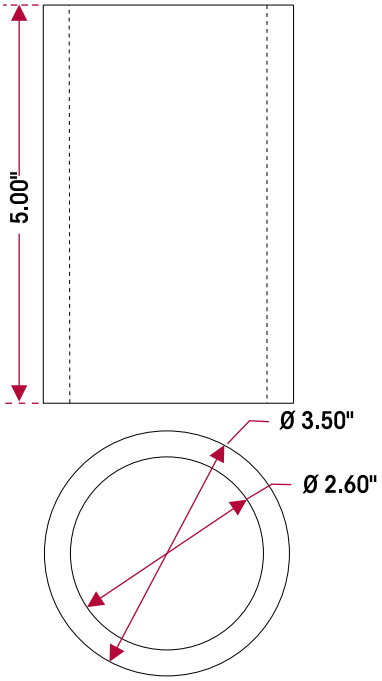
Installer



Remover



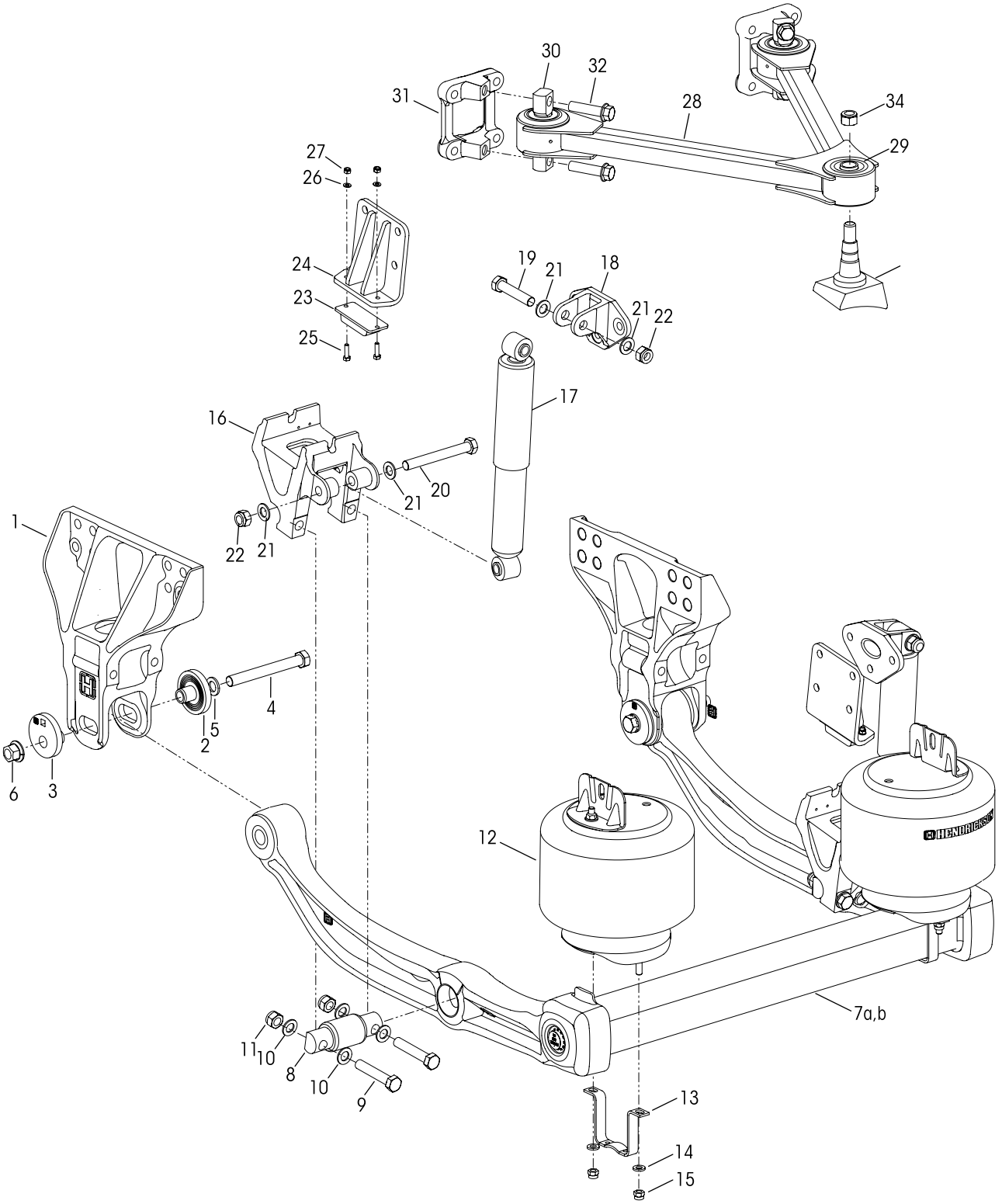
Receiver



SECTION 5

Parts Lists

■ Up to 11.5t (Single) • 23t (Tandem)



KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.
1	067706-000	Frame Hanger	2
	01AXC0029	**QUIK-ALIGN® Pivot Bushing Service Kit, One Wheel End,** Includes Keys Nos. 2-7	
2	060662-000	*QUIK-ALIGN Concentric Collar	2
3	060661-000	*QUIK-ALIGN Eccentric Collar	2
4	01AXC0029	*M22 x 1.5 x 190LG QUIK-ALIGN Hex Bolt	2
5	QP100007	*M22 Hardened Washer	4
6	QP100006	*M22 x 1.5 Nut	2
7		U Beam Assembly - 41"	
a	067249-036	46K Front	1
b	12AXC0400	Rear	1
8	060383-000	*D-pin Bushing	2
9	HF100229	M20 x 2.5 x 110LG Hex Bolt	4
10	NF1014	M20 Hardened Washer	8
11	HF100188	M20 x 2.5 Prevailing Torque Nut	4
12	067043-002	Air Spring Assembly	2
13	060911-002	Lower Air Spring Mounting Bracket	2
	049177-006	**Single Lower Air Spring Fastener Service Kit,** Includes Key Nos. 14-15	
14	022962-014	*½" Flat Washer	4
15	017700-010	*½"-13 UNC Locknut	4
16		**Bottom Cap	
	13CLC0008	Left Hand	1
	13CRC0008	Right Hand	1

KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.
17	50AXC0005	Shock Absorber	2
18	15CXC0031	Upper Shock Bracket	2
19	HF100196	M20 x 2.5 x 110LG Upper Shock Hex Bolt	2
20	HF100309	M20 x 2.5 x 170 LG Lower Shock Hex Bolt	2
21	NF1014	M20 Hardened Washer	4
22	HF100186	M20 x 2.5 Prevailing Torque Nut	4
23	NS500444	Bump Stop	2
24	15AXC0017	Bump Stop Mounting Bracket	2
25	NF1602	M8 x 1.25 x 30 LG Hex Head Bolt	4
26	NF1152	M8 Hardened Washer	4
27	NF1113	M8 x 1.25 Prevailing Torque Nut	4
28	NS140270-43	V-rod Assembly, Includes Bushings Key Nos. 29-30	1
29	NS140059	Taper Bushing	1
30	NS140179	Straddle Bushing	2
31	NS140215	Torque Arm Mounting Bracket	2
32	NF1136	M20 x 2.5 x 80LG Durlok Bolt	4
33		**Pin Assembly	2
a	13AXC0187	Leading Pillar	
b	13AXC0188	Trailing Pillar	
34	NF1011	M22 x 2.5 Prevailing Torque Nut	2

NOTES: Quantities specified are shown for a single suspension. Adjust quantities for tandem or tridem suspensions. Quantities of service kit components may vary from amount shown in lists.

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

** These parts are welded to the axle and not sold separately.

SECTION 6
Preventive Maintenance

HENDRICKSON RECOMMENDED INSPECTION INTERVALS

Following appropriate inspection procedures are important to help ensure the proper maintenance and operation of this PRIMAAX EX rear suspension configuration and it's components function to their highest efficiency.

Hendrickson recommends to visually inspect for proper assembly and function, overall condition and any signs of damage. Check for all of the following as per the inspection intervals shown and replace components as necessary:

- Signs of unusual movement, loose or missing components, abrasive or adverse contact with other components, damaged or cracked parts and improper suspension function or alignment

	PRE-DELIVERY / VISUAL INSPECTION	FIRST IN-SERVICE	PREVENTIVE MAINTENANCE
	Within the first 160 km (100 miles)	**1,600 km (1,000 miles), 100 hours or whichever comes first**	**80,000 km (50,000 miles), every 12 months or whichever comes first**
All Fasteners	■	■	■
♦Air Springs and Air Supply	■	■	■
D-pin and Pivot Bushings	■	■	■
Frame Hangers	■	■	■
Lateral Alignment	■	■	■
♦QUIK-ALIGN Connection	■	■	■
Ride Height	■	■	■
Shock Absorbers	■		■
Tire Wear			■
♦U-beam Assembly	■	■	■
♦V-rod assembly	■	■	■
Wear and Damage			

♦ Signifies performance critical components group

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

COMPONENT INSPECTION

IMPORTANT NOTE Replace all worn or damaged parts.

- **All Fasteners** — Visually inspect for any loose or damaged fasteners on the entire suspension. Make sure all fasteners are tightened to the specified torque. Refer to the Torque Specifications section of this publication. Use a calibrated torque wrench to check torque in a tightening direction. As soon as the fastener starts to move, record the torque. Correct the torque if necessary. Replace any worn or damaged fasteners.

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.

- **Air springs** — 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. A 3 mm of slippage in either direction is acceptable. Verify all mounting hardware have the proper torque values maintained. Refer to the Torque Specifications section in this publication.

- **Air supply (Pneumatic components)** — The air supply to the system plays a large role in the air springs' performance. Inspect, clean and replace as necessary any support products to the air springs, valves, regulators and air lines. See Air Fittings in this section if an air leak is suspected.
- **D-pin and pivot bushings** — Visually inspect the connection for signs of looseness or movement. Visually inspect the bushing for wear.
- **Frame hangers** — 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.
- **Lateral alignment** — Verify the lateral alignment of the drive axles are within the vehicle manufacturer's tolerances.
- **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 the QUIK-ALIGN Fastener Warning in the Important Safety Notice section of this publication prior to installing the QUIK-ALIGN connection.
- **Ride height** — Verify the ride height, refer to the Alignment & Adjustments section of this publication.
- **Shock absorbers** — Visually inspect for any signs of dents or leakage. Misting is not considered a leak, see Shock Absorber Inspection in this section.
- **Tire wear** — Visually inspect the tires for wear patterns that may indicate suspension damage or misalignment.
- **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.
- **V-rod assembly** — All V-rod assembly must be inspected for looseness, torn or shredded rubber, and proper fastener torque. See V-rod inspection in this section.
- **Wear and damage** — Visually inspect all parts of the suspension for wear and damage. Look for bent or cracked parts.

QUIK-ALIGN Pivot Bushing & D-pin Bushing

⚠ WARNING

THE QUIK-ALIGN PIVOT BUSHING AND THE D-PIN BUSHING ARE CRITICAL COMPONENTS OF THE PRIMAAX EX SUSPENSION. 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 ALIGNMENT, ADVERSE VEHICLE HANDLING, PROPERTY DAMAGE, OR PERSONAL INJURY.

There are two types of pivot bushing inspections for the PRIMAAX EX suspension. 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.

QUIK-ALIGN PIVOT BUSHING

VISUAL INSPECTION

It is not necessary to disassemble the pivot bushing connection to perform the pivot bushing visual inspection. 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 of the U-beam assembly. 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 6-1 and 6-2, 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 6-3, this could be a result of axle misalignment. If this condition is evident, pivot bushing replacement is required.

FIGURE 6-1 FIGURE 6-2 FIGURE 6-3

VISUAL INSPECTION – Torn, Disconnected or Missing Rubber Flange

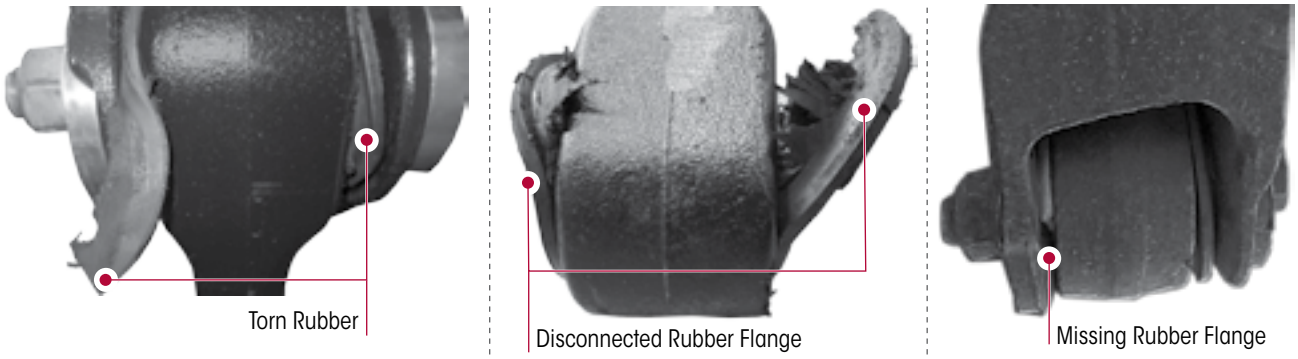
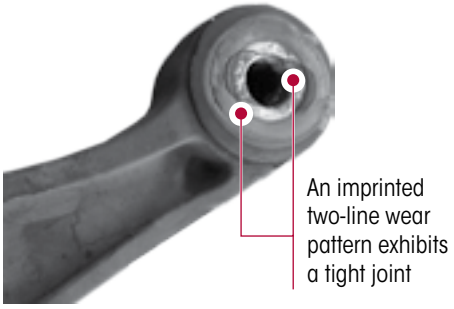


FIGURE 6-4

GOOD JOINT – No Replacement Needed

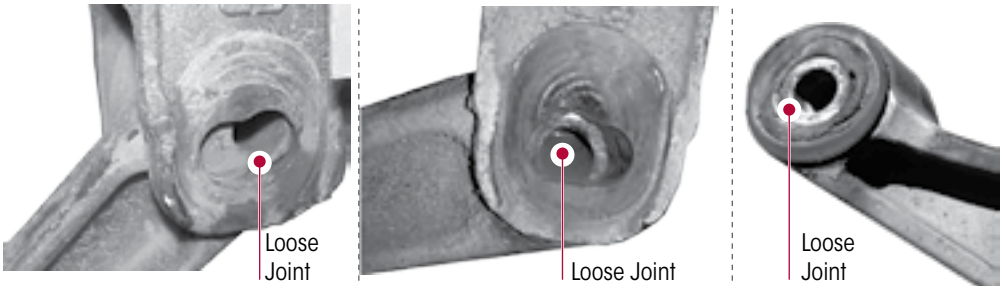


PHYSICAL INSPECTION

1. Remove the U-beam assembly as detailed in the Component Replacement section of this publication.
2. After removal, inspect the pivot bushing connection, examine the pivot bushing inner metal area.
   - **No replacement is needed** if the bushing exhibits a tight joint, see Figure 6-4. An imprinted two-line wear pattern on the bushing inner metal indicates the pivot bushing is securely clamped in the frame hanger.
   - **Replacement is necessary** if any indications of the following are apparent, see Figure 6-5: Signs of rust, distorted, separated or torn rubber, elongated or damaged bore. This could be a result of axle misalignment or loose fasteners.

FIGURE 6-5

PHYSICAL INSPECTION – Indications of a Loose Joint



3. 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
4. Check the suspension alignment and adjust if necessary. Refer to Alignment & Adjustments section of 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 6-6.

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

- Metal to metal contact wear marks on the D-pin outer metal are evident, see Figure 6-7
- D-pin outer metal is distorted, see Figure 6-7

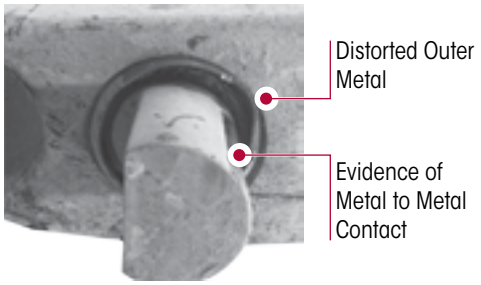
Refer to D-pin Component Replacement section of this publication.

FIGURE 6-6

ACCEPTABLE D-PIN

FIGURE 6-7

UNACCEPTABLE D-PIN



SHOCK ABSORBER

NOTE

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

Hendrickson uses a long service life, premium shock absorber on all PRIMAAX EX 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 of this publication.

FIGURE 6-8

HEAT TEST AND PHYSICAL INSPECTION

⚠ WARNING

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

1. **Heat Test:** Drive the vehicle at moderate speeds on a rough road for a minimum of fifteen minutes.
   a. Perform a 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 6-8. 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. The 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 6-9. Inspect the shock absorbers fully extended. Replace as necessary.

FIGURE 6-9

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 6-10

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 a 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 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 6-10. These streams can easily be seen, underneath the main body (dust cover) of the shock absorber. Replace as necessary.

AIR FITTINGS

INSPECTION

1. If an air leak is suspected, begin the inspection 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.

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.

V-ROD ASSEMBLY

WARNING

THIS PRIMAAX EX SUSPENSION CONFIGURATION INCORPORATE V-RODS FOR VEHICLE STABILITY. OPERATING THE VEHICLE WITH DISCONNECTED OR NON-FUNCTIONAL V-ROD WOULD RESULT IN ADVERSE VEHICLE HANDLING AND POSSIBLE TIRE CONTACT WITH THE FRAME, CONTACT THE VEHICLE MANUFACTURER FOR MORE INFORMATION.

VISUAL INSPECTION

All V-rod assemblies equipped on the PRIMAAX EX suspensions need to be inspected during preventive maintenance and service for looseness by one of the following methods.

V-rod looseness — 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) V-rod bushings** for any torn or shredded rubber material interfaces or elongated oval shapes and **(2) V-rod assembly** for any metal to metal contact, bent, cracked, or broken components. The V-rod and/or the V-rod bushings will require replacement if any of these conditions are encountered.

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 10.9 bolts and Class 10 locknuts for all straddle mount V-rod attachments.

SECTION 7

Alignment & Adjustments

RIDE HEIGHT

The height control valve for the PRIMAAX EX suspension 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, consult the vehicle service manual.

AXLE ALIGNMENT

- **The primary control for axle alignment** is the location of the frame hanger assemblies on the frame rail as installed by the vehicle manufacturer, and the location of the axle brackets on the axles as installed by the axle or vehicle manufacturer.
- **Axle centering and pinion angles** are controlled by the V-rods.

AXLE LATERAL ALIGNMENT

Lateral alignment with a V-rod is not adjustable.

AXLE PINION ANGLE

FIGURE 7-1

Drive axle pinion angles are established by the vehicle manufacturer.

To check the pinion angle:

1. Verify the suspension is at the proper ride height as per vehicle manufacturer.
2. Place a digital protractor on the axle housing as shown in Figure 7-1.
3. Verify the pinion angle is within the range specified by the vehicle manufacturer.
4. Adjust the Pinion Angle if necessary to fine-tune the pinion angle as per the vehicle manufacturer.

DRIVE AXLE ALIGNMENT

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.
4. Chock the front wheels of the vehicle.
5. Verify and maintain the air system at full operating pressure.
6. Verify the vehicle is at the correct ride height. Refer to Ride Height Adjustment in this section. Correct as necessary.
7. Verify all suspension components are in good condition. Repair or replace any worn or damaged suspension components before proceeding with the alignment process.

8. Ensure all drive axle tires are the same size and inflated to the correct tire pressure.
9. Use an alignment machine to calculate the drive axle readings.

NOTE

Depending on your alignment equipment, enter the vehicle year, make, model and design into the system's computer to determine the vehicle manufacturer's alignment specifications per the alignment equipment instructions. That data will be compared to the vehicle's actual alignment status to determine necessary corrections. Some systems allow you to simply scan the VIN to recall specs. Vehicle manufacturers have set specific alignment specifications.

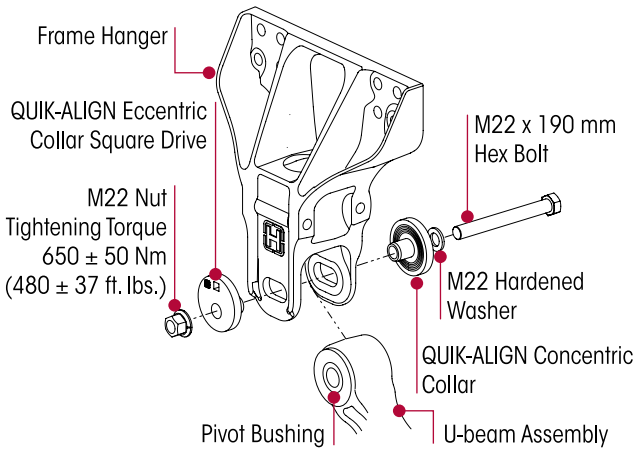
10. If the measurements are within the vehicle manufacturer's specifications, then the rear drive axle alignment is acceptable. Proceed to check the pinion angles of the drive axles (Step 11).
    a. If the alignment of the rear drive axle **IS NOT** within the vehicle manufacturer's specifications, then the alignment of this axle **MUST** be corrected **BEFORE** checking the drive axle pinion angles.
    b. Correct the alignment of this axle by following the Alignment Adjustment instructions as shown in this section.
11. After all drive axles are aligned, check the pinion angle of each drive axle with a digital protractor, see Figure 7-1. 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 12.
    b. If any pinion angle is out of the vehicle manufacturer's specifications it must be corrected. Follow the the vehicle manufacturer's
12. Recheck measurements to confirm adjustments until the correct alignment and pinion angles are achieved.
13. When all drive axle alignments and pinion angles are within the vehicle manufacturer's specifications then the alignment procedure is complete.
14. Remove the wheel chocks.

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 7-2. The total range of fore / aft axle adjustment is 1.0" ± ½".

FIGURE 7-2



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 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.
4. Using the measurements from the **Drive Axle Alignment Inspection** procedure**,** in this section, determine which QUIK-ALIGN collar requires an adjustment 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 Fastener Service kit (see the Parts List section in this publication) 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. 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 correct ride height, refer to vehicle manufacturer's specifications.
9. Use a QUIK-ALIGN socket tool, see Figure 7-3 (refer to the Tool section in this publication) and an impact gun, see Figure 7-4, or a ½" square drive breaker bar to rotate the QUIK-ALIGN eccentric collar to align the axle.
   a. 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.
   b. Check that the V-rod fasteners are torqued up to their proper specification
   c. Verify the ride height is within the vehicle manufacturer's specifications, refer to vehicle manufacturer's specifications. Then proceed to the Drive Axle Alignment Inspection procedure in this section.

FIGURE 7-3

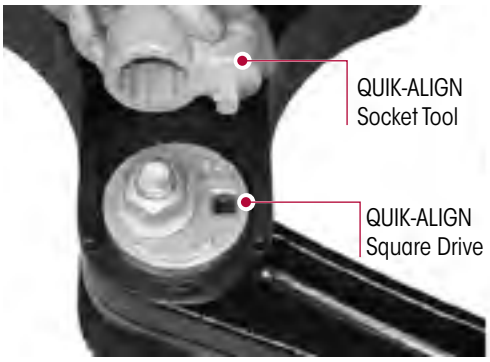


FIGURE 7-4

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

HEIGHT CONTROL VALVE

The height control valve for the PRIMAAX EX suspension 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, consult the vehicle service manual.

AIR SPRING • UPPER AIR SPRING BRACKET

DISASSEMBLY

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

⚠ WARNING

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

3. See additional Air Spring Cautions and Warnings in the Important Safety Notice section of this publication prior to deflating or inflating the air system.
4. Exhaust the air in the air springs and deflate the rear suspension as per 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.

5. 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.

6. 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 to prevent damage to the lower mounting stud.
7. Remove and discard the lower air spring mounting fasteners using **HAND TOOLS** only.
8. Remove the lower air spring mounting bracket from the cross tube.
9. Remove and discard the upper air spring mounting bracket fasteners from the frame per the vehicle manufacturer's instructions.
10. Remove the air spring.
11. Remove the upper air spring bracket.
12. Inspect the upper air spring bracket assembly, mounting surfaces, and the lower air spring mounting bracket for any damage. Replace as necessary.

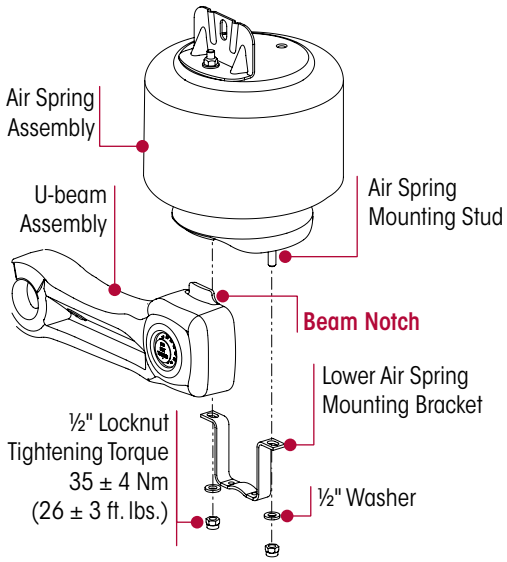
ASSEMBLY

WARNING

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

1. Press the upper air spring bracket assembly firmly against the underside of the frame and tighten frame fasteners to the proper torque per the vehicle manufacturer's specifications.
2. Attach the air spring to the upper air spring bracket assembly and tighten the fasteners to the proper torque per the Torque Specifications section of this publication.

FIGURE 8-1



3. Install the air spring between the frame and the cross tube.
4. Ensure the air spring slot in the bottom of the air spring engages the **beam notch** on the top of the beam, see Figure 8-1.
5. Install the lower air spring mounting bracket around the cross tube, engaging the mounting air spring studs, see Figure 8-1.
6. Use **HAND TOOLS** only to install the lower mounting locknuts and tighten to 35 ± 4 Nm torque, see Figure 8-1.
7. Install the air line fitting to the air spring using Teflon (or equivalent) thread seal.
8. Reconnect the air line to the air spring.
9. See additional Air Spring Cautions and Warnings in the Important Safety Notice section of this publication prior to deflating or inflating the air system.
10. Inflate the suspension as per vehicle manufacturer's instructions.
11. Inflate the suspension slowly and verify that the air spring bladder inflates uniformly without binding.
12. Remove the frame safety stands.
13. Verify proper ride height. Refer to vehicle manufacturer.
14. Remove the wheel chocks.

SHOCK ABSORBER

NOTE Hendrickson recommends to replace shock absorbers in pairs.

WARNING

THE SHOCK ABSORBERS ARE THE REBOUND TRAVEL STOPS FOR THE SUSPENSION. ANYTIME THE AXLE INSTALLED ON THE SUSPENSION IS SUSPENDED IT IS MANDATORY THAT THE SHOCK ABSORBERS REMAIN CONNECTED. REPLACEMENT OF SHOCK ABSORBERS WITH NON-HENDRICKSON PARTS CAN ALTER THE REBOUND TRAVEL OF THE SUSPENSION.

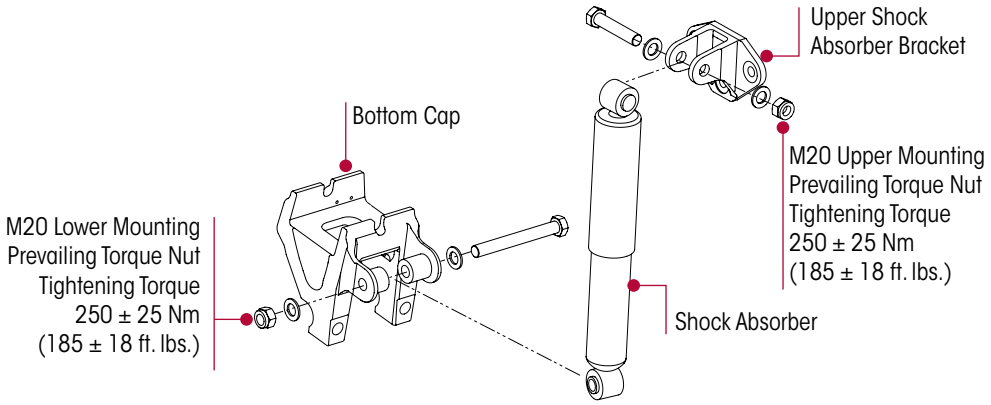
DISASSEMBLY

1. Chock the wheels of the vehicle.
2. Remove and discard the **lower** shock absorber mounting fasteners, see Figure 8-2.
3. Remove and discard the **upper** shock absorber mounting fasteners.
4. Slide the shock absorber out of the **upper** mounting bracket.
5. Inspect the shock absorber mounting brackets and hardware for damage or wear, replace as necessary. Refer to Preventive Maintenance section of this publication.

ASSEMBLY

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

FIGURE 8-2



4. Slide the lower shock absorber mount into the bottom cap.
5. Install the lower shock absorber mounting fasteners.
6. Tighten the upper and lower shock absorber mounting locknut to 250 ± 25 Nm torque, see Figure 8-2.
7. Install the linkage bracket per the marked position if removed.
8. Verify proper ride height. Refer to vehicle manufacturer.
9. Remove the wheel chocks.

U-BEAM ASSEMBLY

DISASSEMBLY

1. Chock the front wheels.
2. Support the frame at ride height with safety stands.
3. Raise and support the axle being serviced with safety stands.
4. Remove the wheel assembly 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 of this publication prior to deflating or inflating the air system.
6. Exhaust the air in the air springs and deflate the rear suspension as per vehicle manufacturer's instructions.
7. 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.

8. 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.

9. Remove and discard the lower air spring mounting fasteners using **HAND TOOLS** only.
10. Remove both lower air spring mounting brackets to disconnect the air springs from the cross tube, refer to the Air Spring instructions 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.

11. Install a floor jack with a 100 mm 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 the type of QUIK-ALIGN collar removed from which frame hanger location to facilitate the assembly process. The QUIK-ALIGN eccentric collar (with square drive feature, see Figure 8-3) 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.

12. 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, see Figure 8-3.
13. Loosen both the QUIK-ALIGN fasteners, **DO NOT** remove at this time.
14. Remove and discard D-pin fasteners on both sides of the suspension.

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

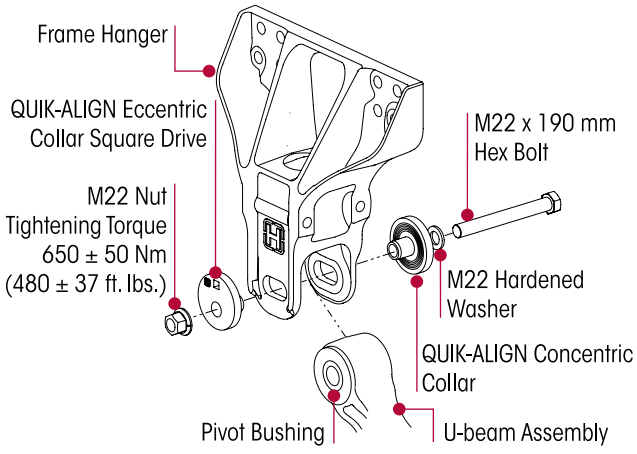
It may be necessary to raise the front of the differential to allow the D-pins to disengage the bottom caps.

WARNING

THE WEIGHT OF THE U-BEAM ASSEMBLY IS APPROXIMATELY 100 KILOGRAMS. CARE SHOULD BE TAKEN AT REMOVAL AND INSTALLATION TO PREVENT PERSONAL INJURY OR DAMAGE TO COMPONENTS.

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

FIGURE 8-3



NOTE

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

18. Remove the U-beam assembly from the hangers.
19. Remove the U-beam assembly from the vehicle.

ASSEMBLY

1. Clean the QUIK-ALIGN slots in the hangers and collars of any dirt and debris and 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 100 KILOGRAMS. 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, POSSIBLE PERSONAL INJURY, OR PROPERTY DAMAGE.

WARNING

DO NOT ASSEMBLE 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 OF 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 Parts List section of this publication) 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 65-135 Nm 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

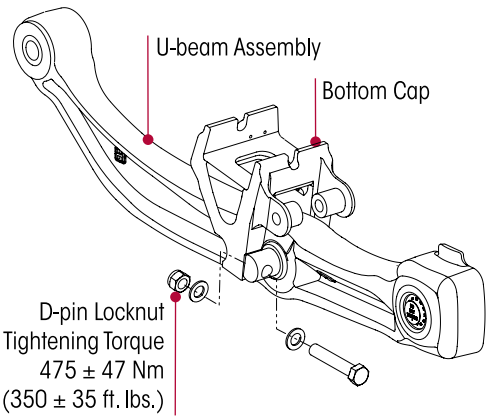
It may be necessary to rotate the QUIK-ALIGN eccentric collars to allow the full engagement of the D-pins into the bottom caps.

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 8-4.

FIGURE 8-4



9. Remove the floor jack supporting the U-beam assembly.
10. Tighten D-pin fasteners to 475 ± 47 Nm torque.
11. Install the air spring between the frame and cross tube, refer to Air Spring in this section.
12. Install the wheel assemblies per the vehicle manufacturer's instructions.
13. Remove the axle safety stands.
14. See additional Air Spring Cautions and Warnings in the Important Safety Notice section of this publication prior to deflating or inflating the air system.
15. Inflate the suspension as per vehicle manufacturer's instructions.
16. Remove frame safety stands.
17. Remove the wheel chocks.

NOTE

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

18. Check the alignment and adjust if necessary. See Alignment & Adjustments section of this publication.
19. Once the correct axle alignment is achieved, use a calibrated torque wrench to tighten M22 QUIK-ALIGN locknut to 650 ± 50 Nm torque.

D-PIN BUSHING

You will need:

- OTC Tool Part Nos. 4247 • 4246, refer to the Special Tools section of this publication.

REMOVAL		✔	✔	✔
INSTALLATION	✔		✔	✔
D-PIN BUSHING	 **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 8-5.
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 8-6.

FIGURE 8-5

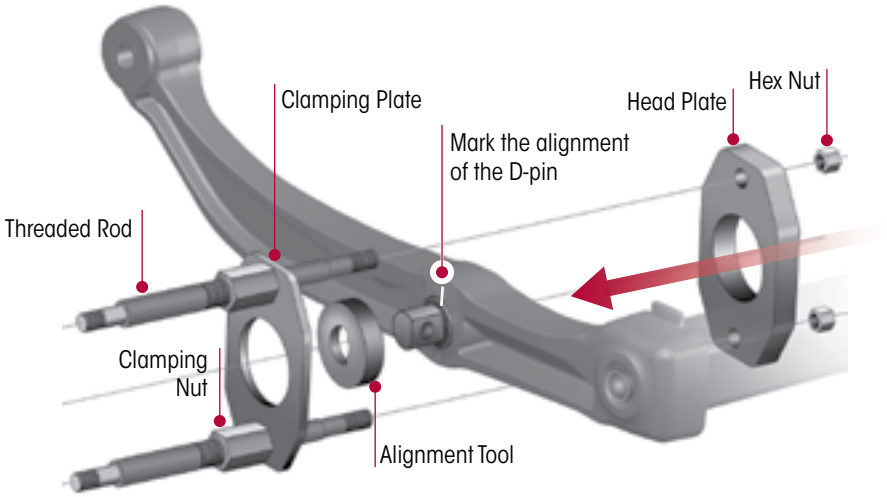
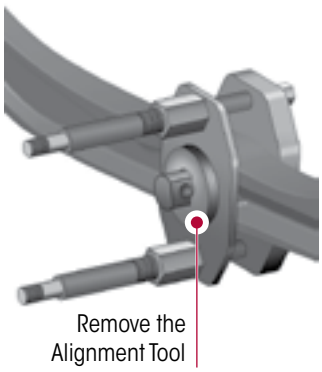


FIGURE 8-6

TOOL ASSEMBLY
After Steps 1-5



6. Ensure the clamping plate and head plate are parallel to each other.
7. Remove the alignment tool.

⚠ WARNING

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

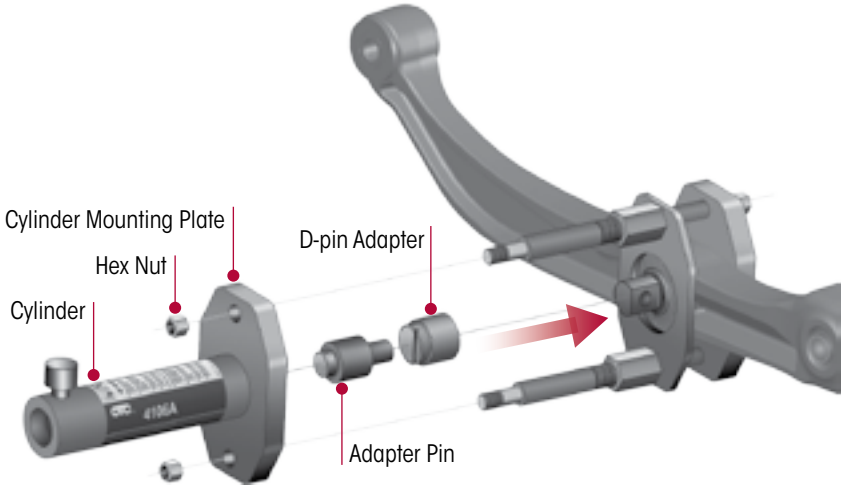
8. Thread the cylinder into the cylinder mounting plate, see Figure 8-7.
9. Install the cylinder mounting plate onto the end of the threaded rods. Adjust the clamping nuts as needed to fit the threaded rods through the holes in the cylinder mounting plate. Assemble the hex nuts on the threaded rods.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

⚠ WARNING

TO HELP PREVENT PERSONAL INJURY, THE HYDRAULIC PUMP RATING MUST NOT EXCEED 68948 kPa (10,000 PSI).

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

FIGURE 8-7



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 D-pin out of the support beam of the U-beam assembly.

ASSEMBLY

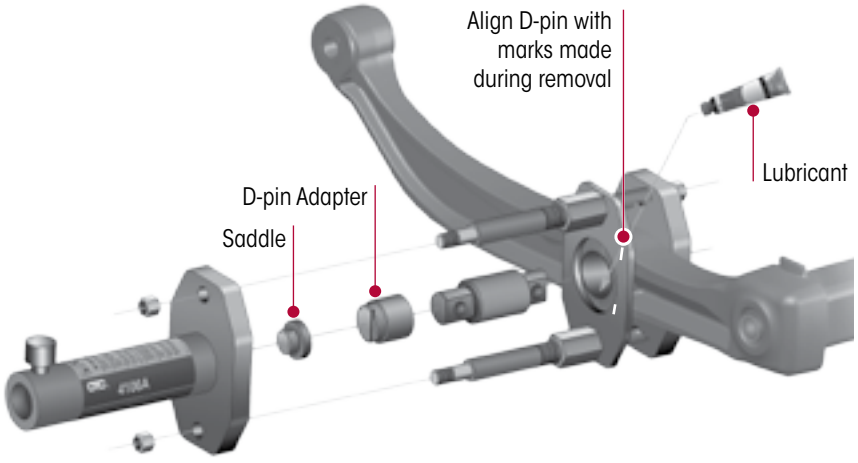
1. Clean and thoroughly lubricate the entire surface of the inside diameter of the U-beam assembly d-pin hub, see Figure 8-8.
2. Insert the saddle tool into the head of the cylinder.
3. Assemble the D-pin and the D-pin adapter as shown. Align the D-pin adapter with the alignment marks made during the 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 D-pin hub.

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 support beam of the U-beam assembly.

FIGURE 8-8



QUIK-ALIGN PIVOT BUSHING

You will need:

- **Method A:** OTC Tool Part Nos. 4246 • 4247 and **Method B:** Hendrickson Part No. 66086-203L, refer to the Special Tools section in this publication

METHOD A – Using Tool Nos. OTC 4246, 4247

REMOVAL	✔	✔	✔	✔
INSTALLATION	✔		✔	✔
QUIK-ALIGN BUSHING	 **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 8-9.
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.
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 8-10.

FIGURE 8-9

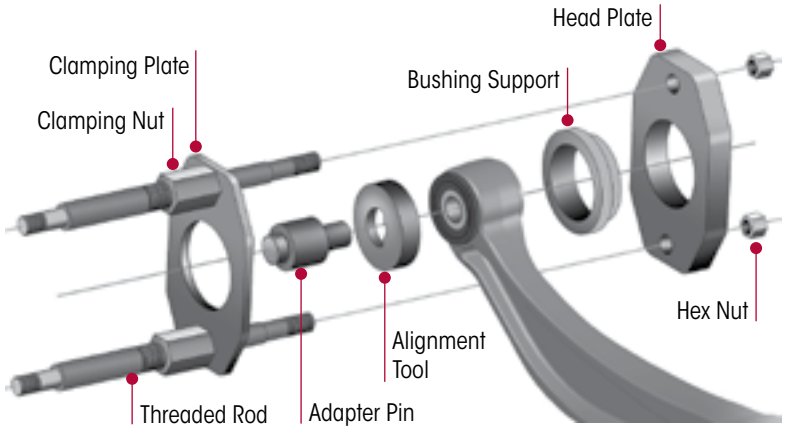
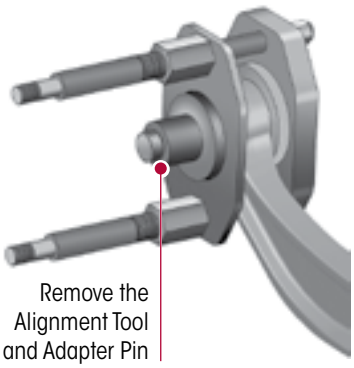


FIGURE 8-10
Tool assembly after Steps 1-6



7. Remove the alignment tool and adapter pin.

⚠ WARNING

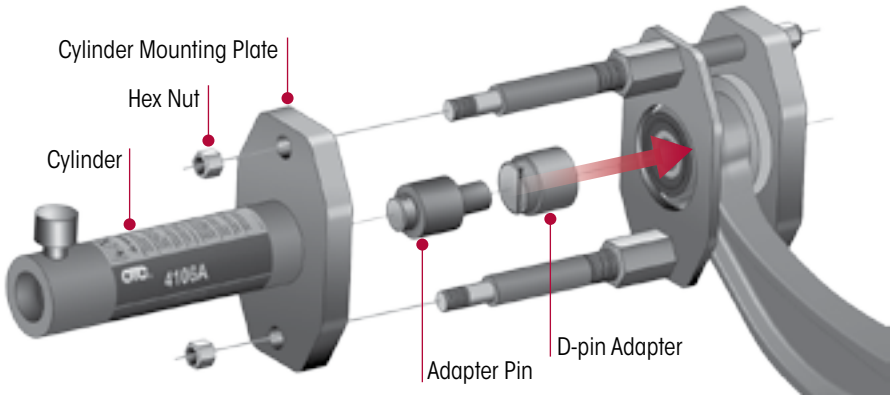
TO HELP PREVENT PERSONAL INJURY, THE CYLINDER MUST BE FULLY THREADED INTO THE CYLINDER MOUNTING PLATE.

8. Thread the cylinder into the cylinder mounting plate, see Figure 8-11.
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, THE HYDRAULIC PUMP RATING MUST NOT EXCEED 68948 kPa (10,000 PSI).

FIGURE 8-11



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

WARNING

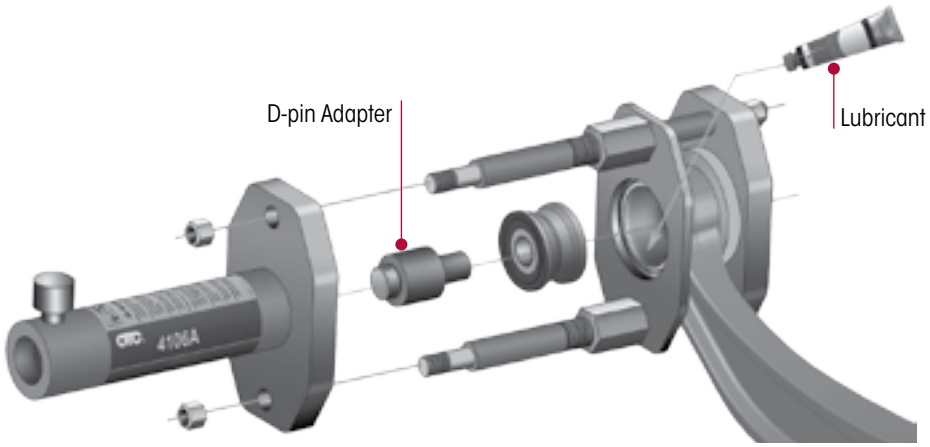
TO HELP PREVENT PERSONAL INJURY STAY CLEAR OF THE HYDRAULIC PUMP, ADJACENT TOOLS, AND THE DIRECTION OF THE HYDRAULIC FORCE WHILE THE D-PIN IS BEING EXTRACTED.

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 support beam of the U-beam assembly.

ASSEMBLY

1. Clean and thoroughly lubricate the entire surface of the inside diameter of the support beam of the U-beam assembly, see Figure 8-12.
2. Insert the adapter pin into the head of the cylinder.
3. Place the pivot bushing on the end of the adapter pin as shown.

FIGURE 8-12



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 support beam of the U-beam assembly.

METHOD B – Using Hendrickson Part No. 66086-203L

SERVICE HINT

Use the QUIK-ALIGN Pivot Bushing Tool Part 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 8-13.

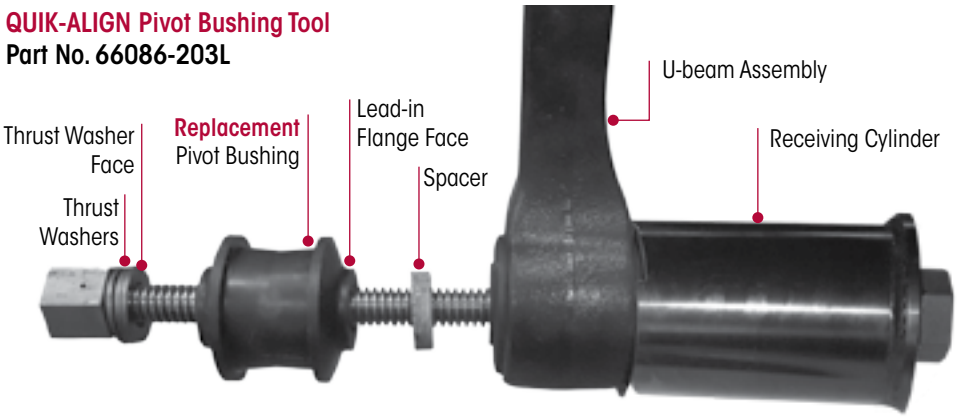
FIGURE 8-13

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 HIMSELF THAT NEITHER HIS SAFETY NOR THE VEHICLE'S SAFETY WILL BE JEOPARDIZED BY THE METHOD OR TOOL SELECTED. INDIVIDUALS DEVIATING IN ANY MANNER FROM THE INSTRUCTIONS PROVIDED 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 suitable work area.

PIVOT BUSHING REMOVAL

NOTE

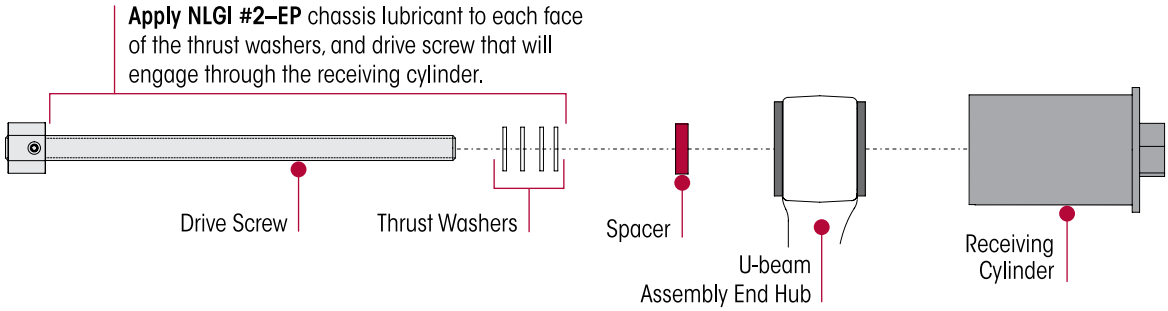
When replacing a pivot bushing it is recommended to replace both pivot bushings on the U-beam assembly.

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

- QUIK-ALIGN pivot bushing service tool (Part No. 66086-203L), see Figure 8-13.
- 20 mm Impact wrench (impact gun), some 13 mm impact wrenches may work.

1. Install the pivot bushing tool as shown in Figure 8-14.
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 8-14.

FIGURE 8-14



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 8-15.

5. Using a 20 mm 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 8-16.
6. Remove and discard pivot bushing.
7. Repeat Steps 1 through 6 for the other side of the U-beam assembly, as recommended.

FIGURE 8-15

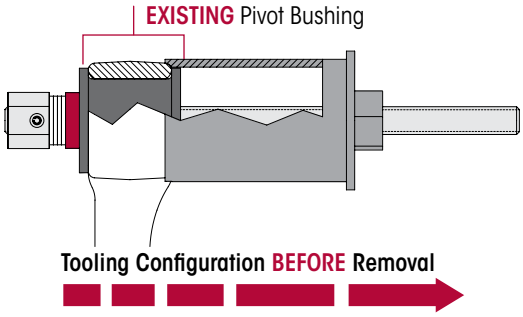
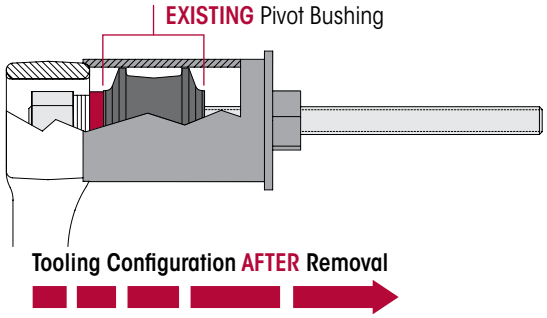


FIGURE 8-16



END HUB INSPECTION

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

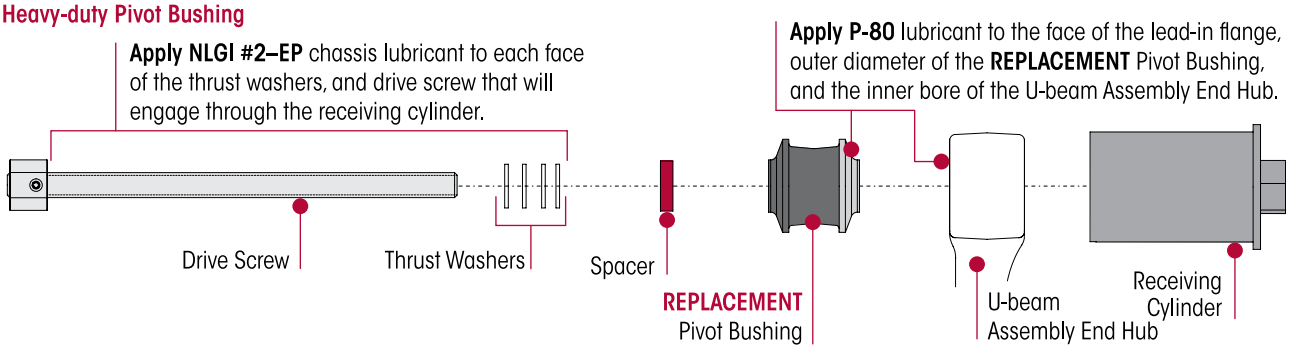
PIVOT BUSHING INSTALLATION

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 Figure 8-17.

NOTE **DO NOT** use petroleum or soap based 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 face of the lead-in flange, the outer diameter of the replacement pivot bushing, and the inner diameter of the U-beam assembly end hub, see Figure 8-17.

FIGURE 8-17
Heavy-duty Pivot Bushing



4. Snug the threaded drive screw to hold the thrust washers, spacer, pivot bushing, and the U-beam assembly with the receiving cylinder in place, see Figure 8-18.
5. Using a 20 mm 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 Figure 8-19.
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 Figure 8-20. Center the pivot bushing to help prevent bulging and bushing preload. This is known as the "Bump Back" procedure.

FIGURE 8-18

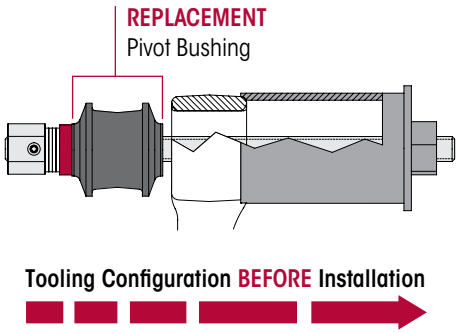


FIGURE 8-19

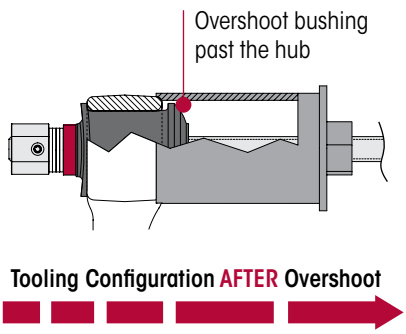
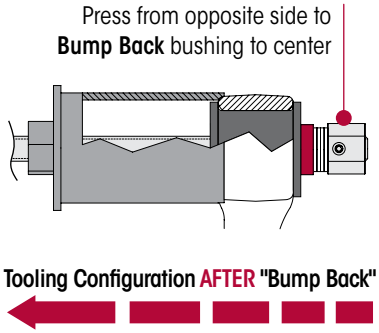


FIGURE 8-20



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

FRAME HANGER

WARNING

THIS PROCEDURE TO REPLACE A FRAME HANGER MUST BE CONDUCTED WITH THE REMAINING FRAME HANGERS CONNECTED TO THE FRAME AND THE U-BEAM ASSEMBLY AND THE V-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 slightly. This will increase the pinion angle slightly easing disassembly/assembly.

DISASSEMBLY

1. Chock the front wheels.
2. Support the frame at ride height with safety stands.
3. Raise and support the axle being serviced.
4. Remove the wheel assembly 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.

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

WARNING

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. Exhaust the air in the air springs and deflate the rear suspension as per vehicle manufacturer's instructions.
7. Mark the position of the QUIK-ALIGN square drive in relation to the frame hanger with a paint stick prior to loosening the QUIK-ALIGN connection. This will facilitate the axle alignment process after the repair is complete.
8. Remove and discard QUIK-ALIGN fasteners. Remove and note the QUIK-ALIGN collar and fastener orientation, see Figure 8-21. The collars may be reused if they are not damaged.

SERVICE HINT

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

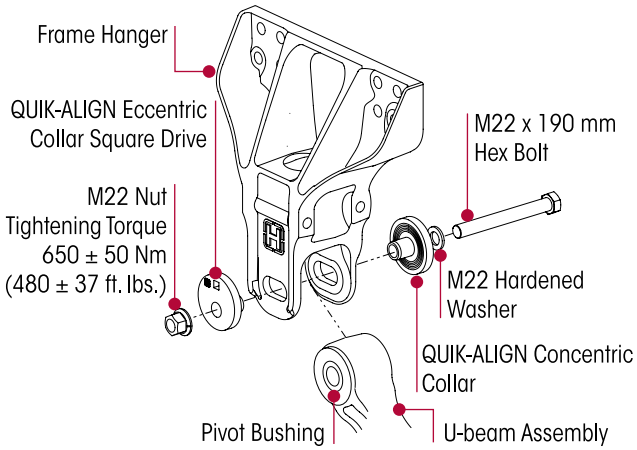
9. Remove the frame hanger fasteners from the vehicle frame rail per the vehicle manufacturer's specifications.
10. Remove the frame hanger.

11. Inspect the mounting surface for any damage or wear.
12. Inspect the QUIK-ALIGN pivot bushing for wear or damage, replace as necessary. Refer to Pivot Bushing in the Preventive Maintenance section of this publication.

ASSEMBLY

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

FIGURE 8-21



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, POSSIBLE PERSONAL INJURY, OR PROPERTY DAMAGE.

WARNING

DO NOT ASSEMBLE 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 OF 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 specific parts list for PRIMAAX EX suspension equipped on your vehicle available online) 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 new QUIK-ALIGN collars and fasteners that attach to the frame hanger with the eccentric collar on the outboard side of the vehicle, see Figure 8-21. 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 65-135 Nm torque, **DO NOT** tighten at this time.
4. See additional Air Spring Cautions and Warnings in the Important Safety Notice section of this publication prior to deflating or inflating the air system.
5. Inflate the suspension properly as per vehicle manufacturer's instructions.
6. Remove frame safety stands.
7. Verify that the axle is in proper alignment, see Alignment & Adjustments section of this publication.

NOTE

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

8. Once the correct axle alignment is achieved, use a calibrated torque wrench to tighten QUIK-ALIGN locknut to 650 ± 50 Nm torque..
9. Verify the correct pinion angle on the axle per the original equipment manufacturer's specifications. Adjust as necessary per the Alignment & Adjustments section of this publication.
10. Remove the wheel chocks.

V-ROD ASSEMBLY

WARNING

THIS PRIMAAX EX SUSPENSION CONFIGURATION INCORPORATE V-RODS FOR VEHICLE STABILITY. OPERATING THE VEHICLE WITH DISCONNECTED OR NON-FUNCTIONAL V-ROD WOULD RESULT IN ADVERSE VEHICLE HANDLING AND POSSIBLE TIRE CONTACT WITH THE FRAME, CONTACT THE VEHICLE MANUFACTURER FOR MORE INFORMATION.

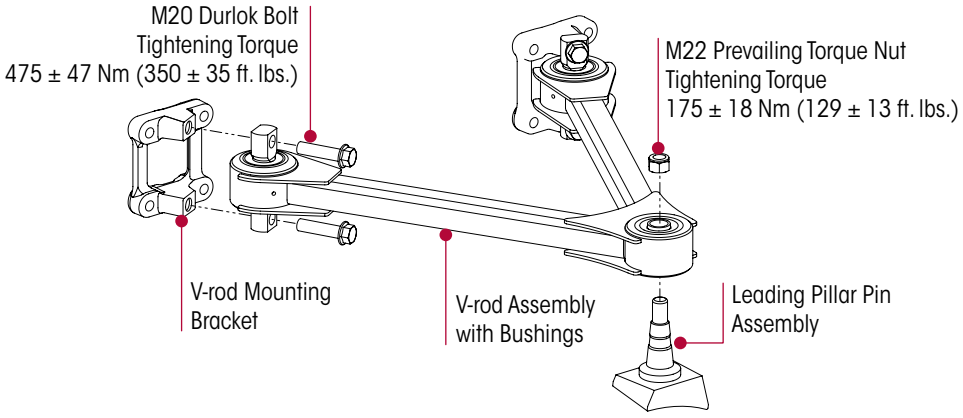
NOTE

V-rod assemblies equipped on the PRIMAAX EX suspension are bushable. Refer to the Parts Lists section of this publication for bushing requirements.

DISASSEMBLY

1. Chock the wheels of the vehicle.
2. Remove and discard the M20 V-rod assembly to V-rod mounting bracket fasteners, see Figure 8-22.
3. Remove the V-rods.
4. Remove M22 Nut from the V-rod to leading pillar pin assembly, see Figure 8-22.
5. Remove leading pillar pin assembly
6. Inspect the mounting surfaces for any wear or damage. Repair or replace as necessary.

FIGURE 8-22

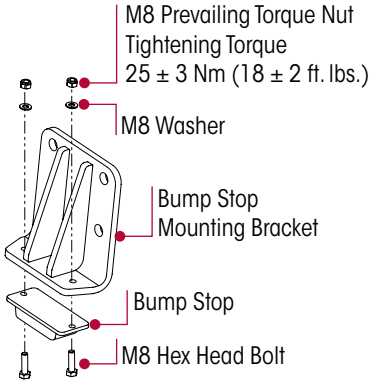


ASSEMBLY

1. Install the V-rods.
2. Install the M20 mounting fasteners to V-rod assembly to V-rod mounting bracket.
3. Prior to tightening, ensure that the vehicle is at the proper ride height.
4. Tighten M20 Durlok bolts to 475 ± 47 Nm torque.
5. Install leading pillar pin into the corner bushing, see Figure 8-22.
6. Tighten the M22 prevailing torque nut to 175 ± 18 Nm torque.
7. Remove the wheel chocks.

BUMP STOP ASSEMBLY

FIGURE 8-23



DISASSEMBLY

1. Chock the wheels of the vehicle.
2. Remove the fasteners connecting the bump stop mounting bracket to the frame.
3. Remove and discard the M8 bump stop fasteners that connects to bump stop mounting bracket, see Figure 8-23.
4. Remove the bump stop.
5. Inspect the bump stop assembly for any wear or damage. Replace as necessary.

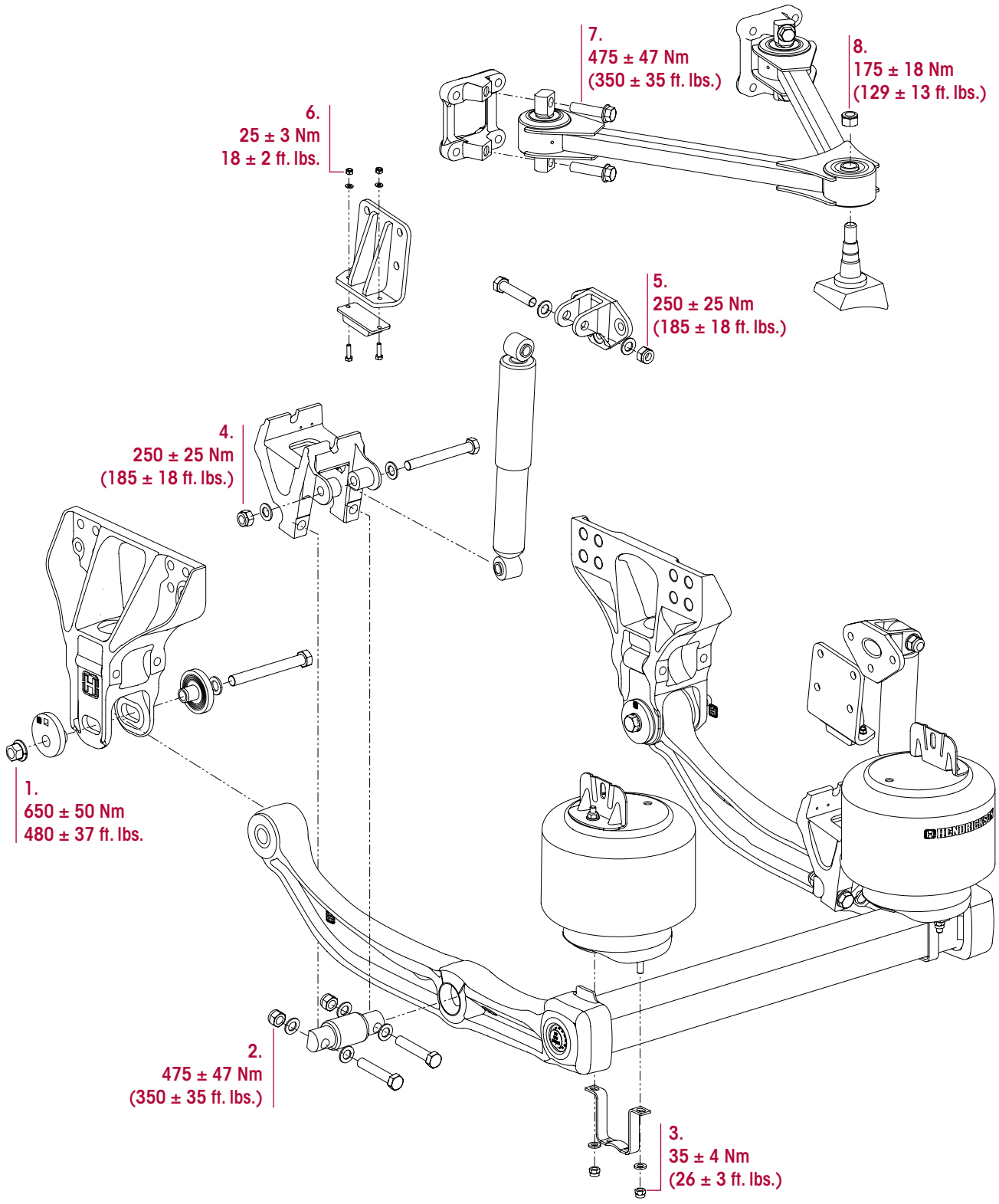
ASSEMBLY

1. Install the bump stop mounting bracket to the frame and tighten the fasteners to vehicle manufacturer's torque specifications.
2. Install the bump stop to bump stop mounting bracket.
3. Install the M8 mounting fasteners and tighten to 25 ± 3 Nm torque.
4. Remove the wheel chocks.

SECTION 9

Torque Specifications

Hendrickson recommended torque values provided in Newton Meters and in Foot Pounds



PRIMAAX EX Rear Air suspension for Europe

HENDRICKSON RECOMMENDED TORQUE SPECIFICATIONS					
NO.	COMPONENT	QUANTITY	SIZE	*TORQUE VALUE	
				(In Nm)	(In Foot Pounds)
	Frame fasteners furnished and installed per the vehicle manufacturer. Torque values listed below apply only if Hendrickson supplied fasteners are used. If non-Hendrickson fasteners are used, refer to the vehicle manufacturer's torque specifications				
1	QUIK-ALIGN Fasteners	2	M22	650 ± 50	480 ± 37
2	U-beam Assembly to D-pin Bushing	4	M20	475 ± 47	350 ± 35
3	**Lower Air Spring Assembly To Cross Tube	4	½"-13 UNC	35 ± 4	26 ± 3
4	Lower Shock Absorber	2	M20	250 ± 25	185 ± 18
5	Upper Shock Absorber	2	M20	250 ± 25	185 ± 18
6	Bump Stop	4	M8	25 ± 3	18 ± 2
7	V-rod assembly to V-rod Bracket	4	M20	475 ± 47	350 ± 35
8	Leading Pillar Pin Assembly	1	M22	175 ± 18	129 ± 13

NOTE Quantities specified are shown for a single suspension. Adjust quantities for tandem or tridem suspensions.

* Torque values listed above apply only if Hendrickson supplied fasteners are used. If non Hendrickson fasteners are used, follow torque specification listed in vehicle manufacturer's service manual.

** Apply anti-seize to lower air spring mounting stud threads prior to installing the fasteners.

SECTION 10
Troubleshooting Guide

PRIMAAX EX Rear Air suspension for Europe

TROUBLESHOOTING GUIDE		
CONDITION	**POSSIBLE CAUSE**	**CORRECTION**
Suspension has harsh or bumpy ride	Air spring is not inflated to specification or damaged	Repair the air system and check the ride height. Refer to vehicle manufacturer.
	Ride height set incorrectly	Adjust the ride height to the proper setting. Refer to vehicle manufacturer.
	Suspension is overloaded	Redistribute the load to correct weight.
	Broken support beam	Replace the broken 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 of this publication.
	Worn QUIK-ALIGN bushing	Replace the QUIK-ALIGN bushing.
	Loose QUIK-ALIGN attachment	Replace the QUIK-ALIGN connection, and check vehicle alignment. Adjust if necessary. Check frame hanger for wear around QUIK-ALIGN plates and replace if necessary.
	Worn V-rod bushings	Replace the V-rod bushings as necessary.
Excessive driveline vibration	Incorrect pinion angle(s)	Adjust the pinion angle(s), refer to the vehicle manufacturer for 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 is set incorrectly	Adjust the ride height to proper setting. Refer to vehicle manufacturer.
	Broken support beam	Replace the 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 the QUIK-ALIGN plates and replace if necessary.
	Worn bushings	Replace the bushings as necessary.
Vehicle is bouncing excessively	Damaged or leaking shock absorber	Replace the shock absorber.
	Ride height set incorrectly	Adjust the ride height to proper setting. Refer to vehicle manufacturer.

PRIMAAX EX Rear Air suspension for Europe

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. Refer to vehicle manufacturer.
	Load not centered	Redistribute the load.
	Frame twisted	Straighten the frame per vehicle manufacturer's guidelines.
	Broken support beam	Replace the broken U-beam assembly.
	Axle housing bent or broken	Replace the axle housing per vehicle manufacturer guidelines and align the vehicle.
	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 the air system	Inspect the air fittings, see Air Fitting in the Preventive Maintenance section of this publication. If necessary, repair air system and check the ride height. Refer to vehicle manufacturer.
	Air line obstructed or improperly connected	Repair the air system and check the ride height. Refer to vehicle manufacturer.
Air springs deflate when parked	Leak in the air system	Inspect the air fittings, see Air Fittings in the Preventive Maintenance section of this publication. If necessary, repair the air system and check the ride height. Refer to vehicle manufacturer.
Excessive frame slope	Ride height set incorrectly	Adjust the ride height to proper setting. Refer to vehicle manufacturer.
	Suspension is overloaded	Redistribute the load to correct weight.

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 or visit our global websites for additional information.

HENDRICKSON

eu.hendrickson-intl.com

HENDRICKSON COMMERCIAL VEHICLE SYSTEMS EUROPE GmbH
Gussstahlwerkstraße 21
8750 Judenburg, Austria
+43 664 817 1419

HENDRICKSON UNITED KINGDOM LTD
1-9 Booth Drive,
Park Farm Industrial Estate
Wellingborough, UK NN8 6GR
+44 160 449 3161

HENDRICKSON TRUCK COMMERCIAL VEHICLE SYSTEMS
800 South Frontage Road
Woodridge, IL 60517-4904 USA
1 630 910 2800
Fax 1 630 910 2899

17730-360 Rev A 02-25