

TECHNICAL PROCEDURE

PRIMAAX® EX / PRIMAAX® for Volvo Vehicles

SUBJECT: Service Instructions

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SECTION 1

Introduction

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

NOTE

Use only Genuine  Hendrickson parts for servicing this suspension system.

It is important to read and understand the entire Technical Procedure publication prior to performing any maintenance, service, repair, or rebuild of 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 for Volvo vehicles.

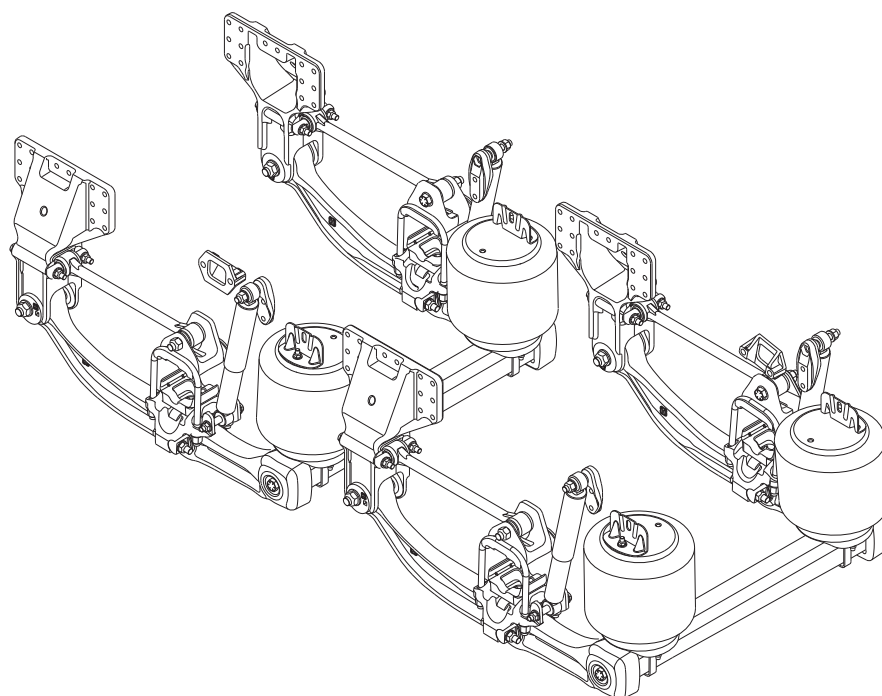
Hendrickson reserves the right to make changes and improvements to its products and publications at any time. Contact Hendrickson Tech Services for information on the latest version of this manual at 1-866-755-5968 (toll-free U.S. and Canada), 630-910-2800 (outside U.S. and Canada) or e-mail: techservices@hendrickson-intl.com.

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

SECTION 2

Product Description

PRIMAAX EX is intended for vocational and heavy-haul vehicle applications including, but not limited to: truck, tractor, dump, mixer, refuse, logging, platform, fire/rescue, specialty and vehicles equipped with outriggers as approved by Hendrickson and vehicle manufacturer — contact Hendrickson or vehicle manufacturer for specific application approval and additional information.





- **Genuine Hendrickson torque rods** — Optimized configuration helps improve handling and roll stiffness for expanded applications.
- **QUIK-ALIGN®** — Allows for easy axle alignment without shims. Reduces maintenance time and helps extend tire life.
- **Air springs** — Large volume, low frequency design for premium ride quality. Advanced design air springs lift and support the load with less air pressure.
- **Structural beams / cross beams** — Cast structural beams form a solid connection with the square cross brace to form a rigid torsion and stabilizer system. Redesigned structural beams utilize premium materials and are proven in some of the most challenging environments. Integrated beam end cap allows for a maintenance-free connection with the cross beam for increased uptime. Robust rubber bushings improve service life and eliminate lubrication requirements.
- **Heavy-duty shock absorbers** — Positioned and tuned for optimum damping characteristics.
- **Axle connections** — D-pin axle connection decreases torsional axle stress for reduced maintenance and increased joint integrity. Integrated axle stop contact pads reduce axle stress.

PRIMAAX EX SPECIFICATIONS FOR VOLVO VEHICLES

Capacity	46,000 lbs.	69,000 lbs.
Axle Configuration	Tandem	Tridem
Site Travel Rating ¹	60,000 lbs.	90,000 lbs.
Axle Travel ²	7.0", 7.5"	7.0", 7.5"
Ground Clearance	9.25"	9.25"
Lift Axles	Approved	Approved
Ride Heights ³	8.5", 10"	8.5", 10"
Engine Torque Restrictions	None	None
Axle Spacing	52" - 72.5"	108"

1. Operators using vehicles equipped with liftable push or tag axles must not exceed published ratings. 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 off-road use or when vehicle is empty. Site travel ratings are consistent with specifications and must not be exceeded.
2. Axle travel may be limited by vehicle manufacturer; axle stop settings may restrict suspension's articulation.
3. For different ride height options, please contact Hendrickson, your vehicle manufacturer or authorized vehicle dealer for further information.



SECTION 3

Important Safety Notice

Proper maintenance, service and repair are important to the reliable operation of the suspension. The procedures recommended by Hendrickson and described in this technical publication are methods of performing such maintenance, service and repair.

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

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

■ EXPLANATION OF SIGNAL WORDS

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



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

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

 **DANGER**

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

 **WARNING**

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

 **CAUTION**

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

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

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

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



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



■ SAFETY PRECAUTIONS



WARNING

FASTENERS

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

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



WARNING

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, LOSS OF VEHICLE CONTROL, PERSONAL INJURY, OR PROPERTY DAMAGE.

DO NOT ASSEMBLE QUIK-ALIGN JOINT WITHOUT THE PROPER FASTENERS. USE ONLY H-COATED FASTENERS TO SUSTAIN PROPER CLAMP FORCE. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE OR PERSONAL INJURY AND VOID WARRANTY. ENSURE THAT THE QUIK-ALIGN FASTENER'S TORQUE VALUES ARE SUSTAINED AS RECOMMENDED IN THE TORQUE SPECIFICATIONS SECTION OF THIS PUBLICATION. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL RESULTING IN PERSONAL INJURY OR PROPERTY DAMAGE.



WARNING

LOAD CAPACITY

ADHERE TO THE PUBLISHED CAPACITY RATINGS FOR THE SUSPENSION. ADD-ON AXLE ATTACHMENTS AND OTHER LOAD TRANSFERRING DEVICES CAN INCREASE THE SUSPENSION LOAD ABOVE ITS RATED AND APPROVED CAPACITIES, WHICH CAN RESULT IN COMPONENT DAMAGE AND LOSS OF VEHICLE CONTROL, 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, LOSS OF VEHICLE CONTROL, POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE, AND WILL VOID WARRANTY. USE ONLY HENDRICKSON AUTHORIZED REPLACEMENT PARTS.



WARNING

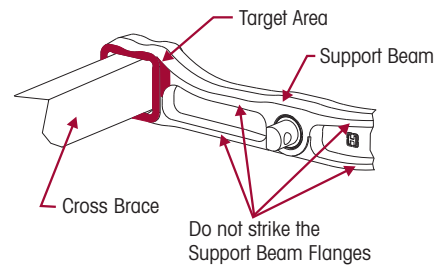
TORCH/WELDING

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

EXERCISE EXTREME CARE WHEN HANDLING OR PERFORMING MAINTENANCE IN THE AREA OF THE 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 LOSS OF VEHICLE CONTROL AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

**WARNING****CROSS TUBE, SUPPORT BEAM AND U-BEAM ASSEMBLY**

WHEN SEPARATING THE U-BEAM ASSEMBLY, PROTECT THE CROSS TUBE BY PLACING A PIECE OF PLYWOOD AGAINST OR CARDBOARD AROUND THE CROSS TUBE. CAREFULLY DISLODGE THE CROSS TUBE FROM THE SUPPORT BEAM WITH A LONG HANDLED SLEDGE HAMMER BY APPLYING BLUNT FORCE ON THE SUPPORT BEAM DIRECTLY IN FRONT OF THE INBOARD TOP CORNER JOINT. ALL BLUNT FORCE MUST BE APPLIED FLUSH TO THE THICKEST PART OF THE SUPPORT BEAM. FAILURE TO STRIKE THE SUPPORT BEAM SQUARELY MAY RESULT IN COMPONENT DAMAGE, PREMATURE FAILURE AND VOID WARRANTY, SEE FIGURE 3-1.

FIGURE 3-1**WARNING****CROSS TUBE**

IMPROPER JACKING METHODS CAN CAUSE STRUCTURAL DAMAGE (SEE SAFETY DECAL, FIGURE 3-2) AND RESULT IN LOSS OF VEHICLE CONTROL, SEVERE PERSONAL INJURY OR DEATH AND WILL VOID HENDRICKSON'S WARRANTY.

FIGURE 3-2

 <small>The EX platform is a next-generation version of PRIMAAX and FIREMAAX. This product is covered under one or more of the following patents: US 6,851,689, AU 2002248483, US 7,182,354, US 7,745,892. Other U.S. and foreign patents pending.</small> 	<div style="text-align: center;"> WARNING</div> <p>UNAUTHORIZED WELDING OR MODIFICATIONS can cause structural damage and result in loss of vehicle control, severe personal injury or death. Do not bend, weld or modify cross brace without authorization from Hendrickson Truck Suspension Systems.</p> <p>IMPROPER JACKING METHOD can cause structural damage and result in loss of vehicle control, severe personal injury or death.</p> <ul style="list-style-type: none"> ■ Do not use suspension cross brace as a jacking point. ■ Refer to vehicle manufacturer for proper jacking instructions. <p style="text-align: right;"><small>NO. 60905-015 A</small></p>
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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, SEE FIGURE 3-3.
- REFER TO VEHICLE MANUFACTURER FOR PROPER JACKING INSTRUCTIONS, SEE FIGURE 3-4.

FIGURE 3-3**FIGURE 3-4****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.

**CAUTION**

THE UPPER SHOCK BOLT MUST BE INDEXED INTO THE RECESSED HEX BORE OF THE UPPER SHOCK MOUNTING BRACKET FOR PROPER FASTENER INSTALLATION. FAILURE TO DO SO CAN CAUSE THE SHOCK FASTENERS TO BECOME LOOSE AND CAUSE PREMATURE COMPONENT DAMAGE.



WARNING

TRANSVERSE TORQUE RODS

PRIMAAX EX / PRIMAAX SUSPENSIONS INCORPORATE TRANSVERSE RODS FOR VEHICLE STABILITY. IF THESE COMPONENTS ARE DISCONNECTED OR ARE NON-FUNCTIONAL, THE VEHICLE SHOULD NOT BE OPERATED. FAILURE TO DO SO CAN RESULT IN ADVERSE VEHICLE HANDLING, LOSS OF VEHICLE CONTROL, POSSIBLE TIRE CONTACT WITH THE FRAME, PREMATURE COMPONENT DAMAGE, OR SEVERE PERSONAL INJURY.



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



WARNING

PRIOR TO AND DURING DEFLATION AND INFLATION OF THE 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 THAT THE RUBBER BLADDER OF THE AIR SPRING INFLATES UNIFORMLY AND IS NOT BINDING. FAILURE TO DO SO CAN CAUSE DAMAGE TO THE UPPER AIR SPRING MOUNTING BRACKET AND VOID WARRANTY.



CAUTION

AIR SPRING LOWER MOUNTING STUDS

IF THE AIR SPRING IS BEING REMOVED, 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 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

WORK SITE DUMPING



WHEN THE TRUCK/TRAILER BODY/BOOM/AND OR ATTACHMENT IS LIFTED IT IS MANDATORY TO COMPLETELY EXHAUST THE AIR FROM THE REAR SUSPENSION SYSTEM TO HELP PROVIDE STABILITY WHEN LIFTED. FAILURE TO DO SO CAN RESULT IN LOSS OF VEHICLE CONTROL, ROLL-OVER, OR VEHICLE INSTABILITY, POSSIBLY CAUSING SEVERE 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.



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.

**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****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.

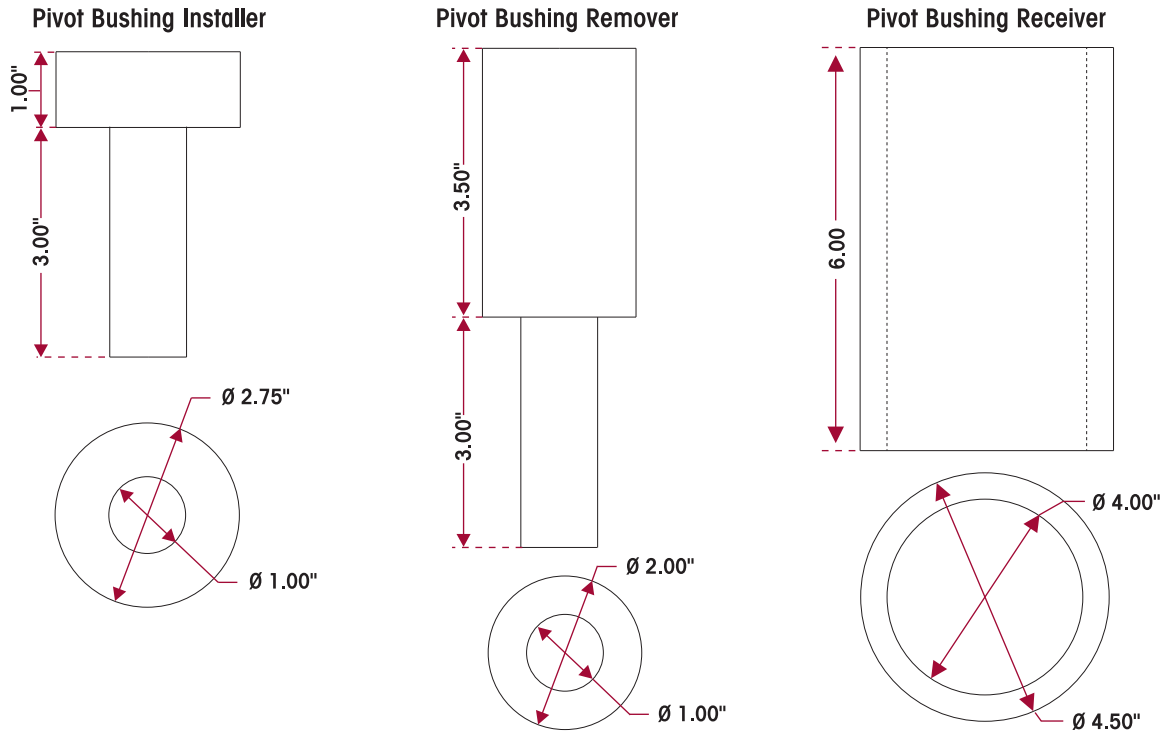
DO NOT USE HOT SOLUTION TANKS OR WATER AND ALKALINE SOLUTIONS TO CLEAN GROUND OR POLISHED PARTS. DOING SO WILL CAUSE DAMAGE TO THE PARTS AND VOID WARRANTY.

SECTION 4

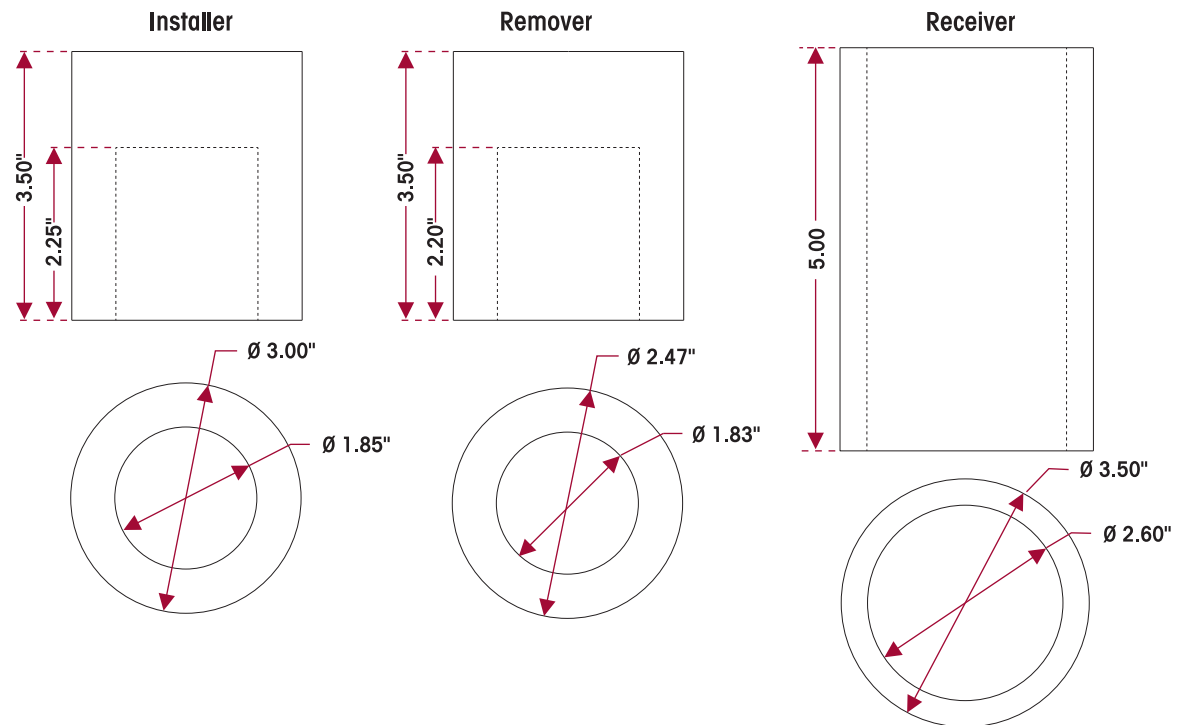
Special Tools

These shop made tools are designed to install and remove pivot bushing and D-Pin bushing. Bushing tools are made from cold rolled steel or equivalent. Drawings are for reference only. Hendrickson does not supply these tools.

QUIK-ALIGN TOOLS



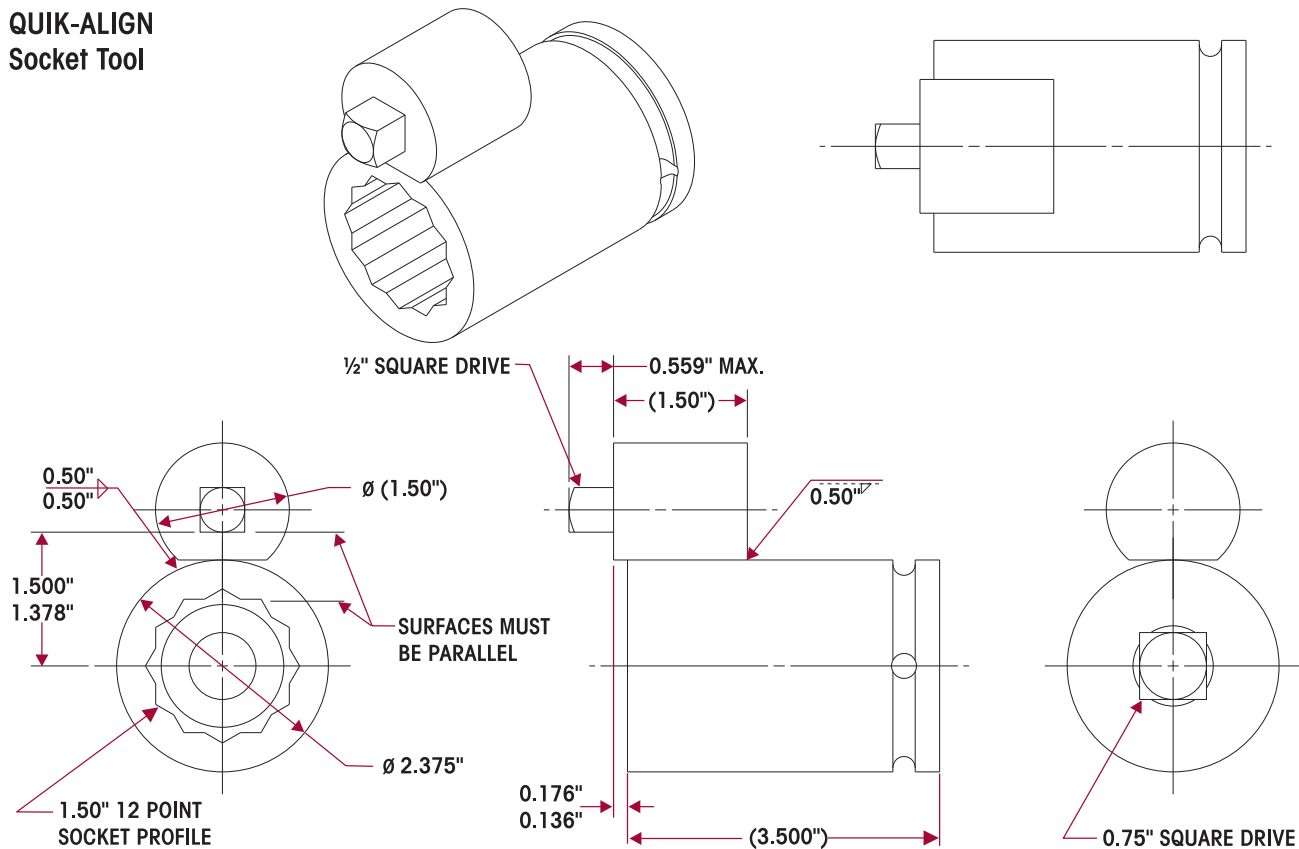
D-PIN TOOLS



QUIK-ALIGN SOCKET TOOL

Hendrickson PRIMAAX EX QUIK-ALIGN Socket Tool is available from the Owatonna Tool Corporation (Owatonna Tool No. 1767, website: www.otctools.com) or a shop made tool can be made from the drawing shown. Hendrickson does not supply QUIK-ALIGN tooling. Material: Optional per customer discretion, Grade 80 or better case harden per SAE requirements.

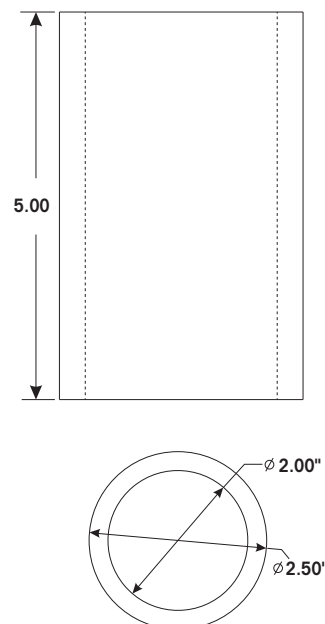
QUIK-ALIGN Socket Tool



TORQUE ROD BUSHING

This shop made tool is designed for the torque rod bushing. Bushing tools are made from cold rolled steel or equivalent. Drawing is for reference only, Hendrickson does not supply this tool.

TORQUE ROD Bushing Receiver



PRIMAAX EX / PRIMAAX QUICK WRENCH

FIGURE 4-1 OTC TOOL NO. 1768

Owatonna Tool Company (OTC) manufactures a Hendrickson approved tool (OTC Tool Number 1768) for use on PRIMAAX EX / PRIMAAX suspensions. Contact OTC for more information at 800-533-6127.



- Used to tighten to torque the longitudinal torque rod top pad bolts and cross tube end cap bolts (if equipped).
- Reduces maintenance time by eliminating the need to remove the tires to gain access to the detachable end cap bolt.

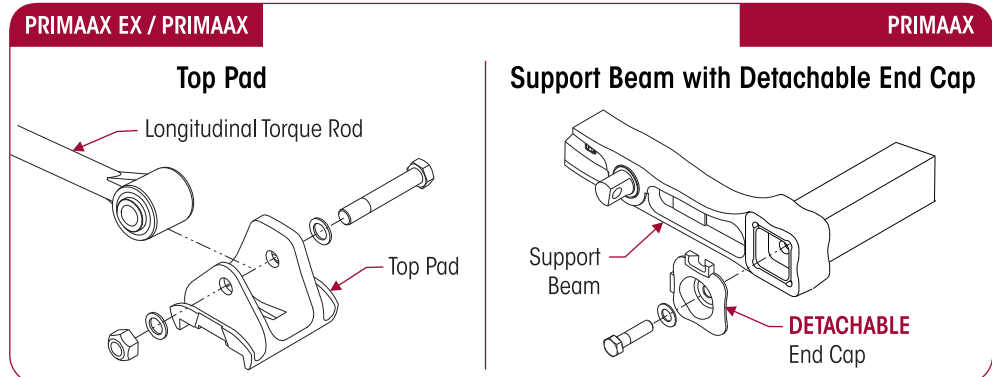
NOTE

Due to some vehicle configurations and/or tire sizes wheel removal may be required.

- Use the OTC Quick Wrench tool with Hendrickson PRIMAAX EX / PRIMAAX suspension longitudinal torque rod to top pad configuration illustrated in Figure 4-2 and with PRIMAAX suspensions detachable end cap, see Figure 4-3.

FIGURE 4-2

FIGURE 4-3



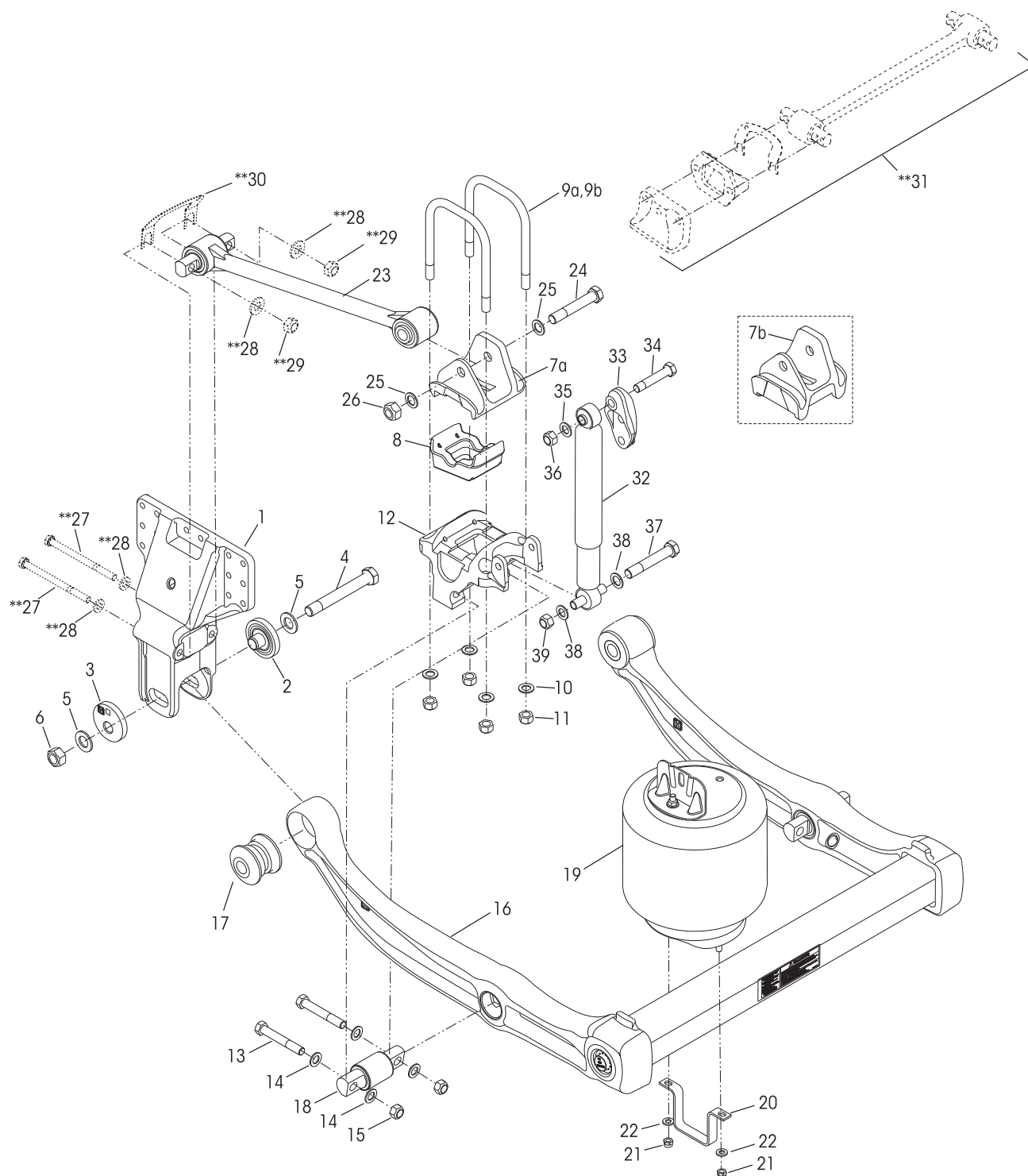
Any questions regarding the OTC Quick Wrench tooling applications contact Hendrickson Tech Services

- E-mail: techservices@hendrickson-intl.com
- Telephone: 866-755-5968

SECTION 5

Parts Lists

PRIMAAX EX





KEY NO.	PART NO.	DESCRIPTION	NO.REQ.	KEY NO.	PART NO.	DESCRIPTION	NO.REQ.
1	67222-000	Frame Hanger	4	17	58648-000	QUIK-ALIGN Pivot Bushing	4
	60632-021	QUIK-ALIGN Collar Service Kit, Axle Set, Includes Key Nos. 2-6		18	60383-000	D-Pin Bushing	4
	60632-020	QUIK-ALIGN Pivot Bushing Service Kit, One Axle, Includes Key Nos. 2-6, 17			60961-230	Air Spring Assembly Service Kit, One Wheel End, Includes Key Nos. 19-22	
	60632-019	QUIK-ALIGN Collar Service Kit, Per Wheel End, Includes Key Nos. 2-6		19	67043-002	Air Spring Assembly	4
	60632-018	QUIK-ALIGN Fasteners Service Kit, Per Wheel End, Includes Key Nos. 4-6		20	60911-002	Lower Air Spring Mounting Bracket	4
2	64633-000	QUIK-ALIGN Concentric Collar	4	21	17700-010	½"-13 UNC Locknut	8
3	64632-000	QUIK-ALIGN Eccentric Collar	4	22	22962-014	½" Flat Washer	8
4	68217-000	1.0"-14 UNF-2A H-Coat 7.5" Hex Bolt	4	23	67274-XXX	Longitudinal Torque Rod Assembly, <i>See pinion angle chart below, Replaces 64981-XXX</i>	4
5	68232-000	1.0" H-Coat Flat Washer	8		58821-012	Longitudinal Torque Rod Rear Bolt Service Kit, One Side Only, Includes Key Nos. 24-26	
6	68218-000	1.0"-14 UNF-2B H-Coat Locknut	4	24	30418-009	⅞"-14 UNF-2A 5.5" Hex Bolt	4
7		Top Pad	4	25	22962-034	⅞" Flat Washer	8
a	60877-001	8.5" Ride Height		26	29248-000	⅞"-14 UNF-2B Locknut	4
b	65641-000	10" Ride Height		27		**M16 x 2 6G Bolt	8
8	65139-003	Axle Spacer, 8.5" Ride Height (if equipped)	4	28		**M16 Washer	16
		U-bolt Service Kit, One Wheel End,		29		**M16 x 2 6H Locknut	8
	48718-125	8.5" Ride Height, Includes Key Nos. 9a, 10-11		30		**Shim (may or may not required)	As req.
	48718-126	10" Ride Height, Includes Key Nos. 9b, 10-11		31		**Transverse Rod Assembly	2
9		U-bolt	8		60961-106	Shock Absorber Service Kit, One Wheel End, Includes Key Nos. 32, 34-39	
a	59367-004	¾" Square 10.375"		32	60657-007	Shock Absorber	4
b	59367-009	¾" Square 10.0"		33	67463-006	Shock Upper Frame Bracket	4
10	22962-001	¾" Flat Washer	16	34	50764-010	¾"-10 UNC 4.25" Upper Shock Bolt	4
11	49685-000	¾"-16 UNF U-bolt Locknut	16	35	22962-001	¾" Flat Washer	4
12	60556-XXX	Bottom Cap, <i>See pinion angle chart below</i>	4	36	49842-000	¾"-10 UNC Locknut	4
	34013-107	D-Pin Service Kit, One Wheel End, Includes Key Nos. 13-15, 18		37	32043-017	⅝"-11 UNC 6.0" Lower Shock Bolt	4
13	21867-036	¾"-16 UNF 5.0" Bolt	8	38	22962-004	⅝" Flat Washer	8
14	22962-001	¾" Flat Washer	16	39	47764-000	⅝"-11 UNC-2B Locknut	4
15	30191-000	¾"-16 UNF Locknut	8	Not Shown		**Height Control Valve Assembly	1
16		***U-beam Assembly, See chart below		Not Shown		**Height Control Valve Linkage	1
		Includes Key Nos. 17-18					
	67249-003	Rear	1				
	67249-004	Front	1				

NOTE: * Quantities shown are for a tandem configuration.

** Item Required, component supplied by vehicle manufacturer. Hendrickson is not responsible for components not supplied by Hendrickson, for assistance with maintenance and rebuild instructions on these components see vehicle manufacturer.

Pinion Angle Chart

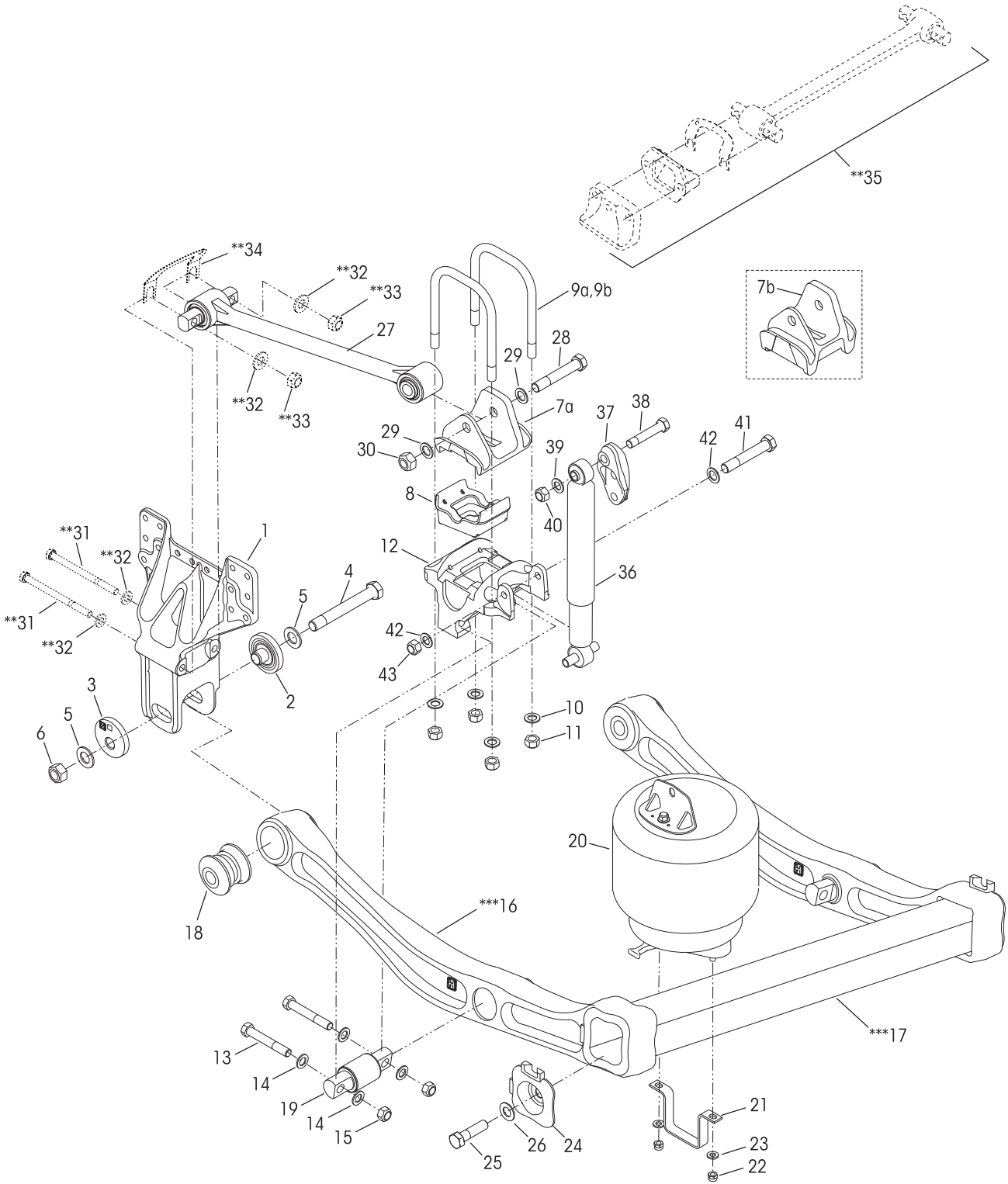
8.5" RIDE HEIGHT				10" RIDE HEIGHT			
Pinion Angle (degree)	Bottom Cap Part No.	Longitudinal Torque Rod		Pinion Angle (degree)	Bottom Cap Part No.	Longitudinal Torque Rod	
		Length (mm)	Part No			Length (mm)	Part No
2.9	60556-025	530 (front)	67274-530	2.9	60556-025	530 (front)	67274-530
6	60556-060			6.1	60556-060		
7.9	60556-120			8.2	60556-120		
10.3	60556-100	575 (rear)	67274-550	9.8	60556-100	570 (rear)	67274-550
10.7	60556-105			10.2	60556-105		
11.2	60556-110			10.7	60556-110		
11.6	60556-115			11.2	60556-115		
12.1	60556-120			11.6	60556-120		
13	60556-130			12.6	60556-130		
13.4	60556-135			13.1	60556-135		
Measured with Pinion QUIK-ALIGN at neutral position (12 O'Clock)							

***U-beam Assembly Enhancement

AFTERMARKET SERVICE KIT NO. 69565-001, AXLE SET		
CONTENTS		
PART NO.	DESCRIPTION	QTY.
69351-000	Sikaflex 221 Polyurethane Sealant, 300 ml Tube	1
69432-000	Tamper Resistant Cap	2
69570-000	Loctite® 277 - 10 ml Bottle	1
50104-006	⅞"-9 UNC 4.0" Hex Bolt	2
22962-042	⅞" H-Coat Flat Washer	2
*** In the event any service to the suspension requiring disassembly of a U-beam assembly equipped with integrated end caps, the Loctite 277, tamper resistant caps and Sikaflex 221 polyurethane sealant must be properly installed to ensure components function to their highest efficiency. The enhancement components can be purchased individually or as an aftermarket service kit.		



PRIMAAX





KEY NO.	PART NO.	DESCRIPTION	NO.REQ.	KEY NO.	PART NO.	DESCRIPTION	NO.REQ.
1	65702-001	Frame Hanger	4		60961-062	Air Spring Assembly Service Kit, One Wheel End , Includes Key Nos. 20-23	
	60632-021	QUIK-ALIGN Collar Service Kit, Axle Set , Includes Key Nos. 2-6		20	60271-002	Air Spring Assembly	4
	60632-020	QUIK-ALIGN Pivot Bushing Service Kit, One Axle , Includes Key Nos. 2-6, 18		21	60911-000	Lower Air Spring Mounting Bracket	4
	60632-019	QUIK-ALIGN Collar Service Kit, Per Wheel End , Includes Key Nos. 2-6		22	17700-010	½"-13 UNC Locknut	8
	60632-018	QUIK-ALIGN Fasteners Service Kit, Per Wheel End , Includes Key Nos. 4-6		23	22962-014	½" Flat Washer	8
2	64633-000	QUIK-ALIGN Concentric Collar	4	24	60822-000	End Cap	4
3	64632-000	QUIK-ALIGN Eccentric Collar	4	25	50104-003	⅞"-9 UNC 3.5" Hex Bolt	4
4	68217-000	1.0"-14 UNF-2A H-Coat 7.5" Hex Bolt <i>Replaces 64107-000</i>	4	26	22962-034	⅞" Dacromet Flat Washer	4
5	68232-000	1.0" H-Coat Flat Washer <i>Replaces 22962-035</i>	8	27	67274-XXX	Longitudinal Torque Rod Assembly, <i>See pinion angle chart on page 3, Replaces 64981-XXX</i>	4
6	68218-000	1.0"-14 UNF-2B H-Coat Locknut <i>Replaces 64108-000</i>	4		58821-012	Longitudinal Torque Rod Rear Bolt Service Kit, One Wheel End , Includes Key Nos. 28-30	
7		Top Pad	4	28	30418-009	⅞"-14 UNF-2A 5.50" Hex Bolt	4
a	60877-001	8.5" Ride Height		29	22962-034	⅞" Dacromet Flat Washer	8
b	65641-000	10" Ride Height		30	29248-000	⅞"-14 UNF-2B Locknut	4
8	65139-003	Axle Spacer, 8.5" Ride Height (if equipped)	4	31	**M16 x 2 6G Bolt		8
		U-bolt Service Kit, One Wheel End , 8.5" Ride Height, Includes Key Nos. 9a, 10-11		32	**M16 Washer		16
	48718-125	10" Ride Height, Includes Key Nos. 9b, 10-11		33	**M16 x 2 6H Locknut		8
	48718-126			34	**Shim (may or may not be required)	As Req	
9		U-bolt	8	35	**Transverse Rod Assembly		2
a	59367-004	¾" Square 10.375"			60961-106	Shock Absorber Service Kit, One Wheel End , Includes Key Nos. 36, 38-43	
b	59367-009	¾" Square 10.0"		36	60657-007	Shock Absorber	4
10	22962-001	¾" Flat Washer	16	37	67463-006	Shock Upper Frame Bracket <i>Replaces 65000-006</i>	4
11	49685-000	¾"-16 UNF U-bolt Locknut	16	38	50764-010	¾"-10 UNC 4.25" Upper Shock Bolt	4
12	60556-XXX	Bottom Cap, <i>See pinion angle chart on page 3</i>	4	39	22962-001	¾" Flat Washer	4
	34013-107	D-Pin Service Kit, One Wheel End , Includes Key Nos. 13-15, 19		40	49842-000	¾"-10 UNC Locknut	4
13	21867-036	¾"-16 UNF 5.0" Bolt	8	41	32043-017	⅝"-11 UNC 6.0" Lower Shock Bolt	4
14	22962-001	¾" Flat Washer	16	42	22962-004	⅝" Flat Washer	8
15	30191-000	¾"-16 UNF Locknut	8	43	47764-000	⅝"-11 UNC-2B Locknut	4
16		***Support Beam Assembly (60831-XXX, see replacement guide below)		Not Shown	**Height Control Valve Assembly		1
17		***Cross Tube (60912-001, see replacement guide below)		Not Shown	**Height Control Valve Linkage		1
18	58648-000	QUIK-ALIGN Pivot Bushing	4				
19	60383-000	D-Pin Bushing	4				

NOTE: * Quantities shown are for a tandem configuration.

** Item Required, component supplied by Vehicle Manufacturer. Hendrickson is not responsible for components not supplied by Hendrickson, for assistance with maintenance and rebuild instructions on these components see vehicle manufacturer.

*** No longer available for service, see replacement guide below. For more information, refer to Hendrickson Technical Bulletin SEU-0229 or contact Hendrickson Tech Services.

SUPPORT BEAM AND CROSS TUBE ASSEMBLY REPLACEMENT GUIDE				
Key No.	Description	Current Part No.	Replacement Kit No.	Comments
16	Support Beam Assembly	60831-003 (LHF) 60831-004 (RHF)	60961-237 (Forward)	Requires the replacement of associated suspension parts on one axle.
		60831-001 (LHR) 60831-002 (RHR)	60961-238 (Rear)	Replacement Kit includes two new support beam assemblies, one cross tube, two air spring assemblies, air spring fasteners, QUIK-ALIGN fasteners and D-pin fasteners.
17	Cross Tube	60912-001	60961-237 (Forward) 60961-238 (Rear)	

SECTION 6

Preventive Maintenance

Following appropriate inspection procedures is important to help ensure the proper maintenance and operation of the suspension system and component parts. Hendrickson recommends the PRIMAAX® EX • PRIMAAX® heavy-duty rear suspension is inspected at pre-delivery, the first 1,000 miles of service and at the regular preventive maintenance intervals. Off-highway and severe service operating conditions require more frequent inspections than on-highway service operation.

Following appropriate inspection procedures is important to help ensure the proper maintenance and operation of the PRIMAAX EX • PRIMAAX suspension system and component parts 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 specification listed in the vehicle manufacturer's service manual.

AREAS OF INSPECTION

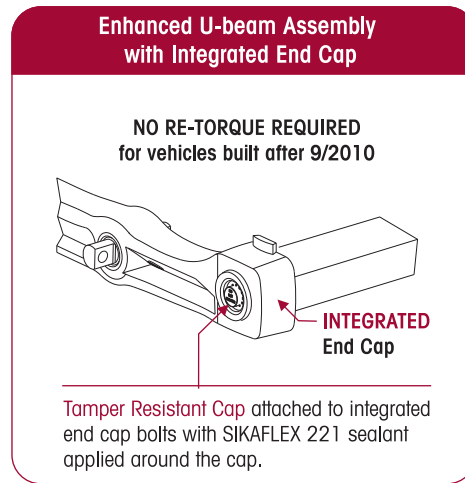
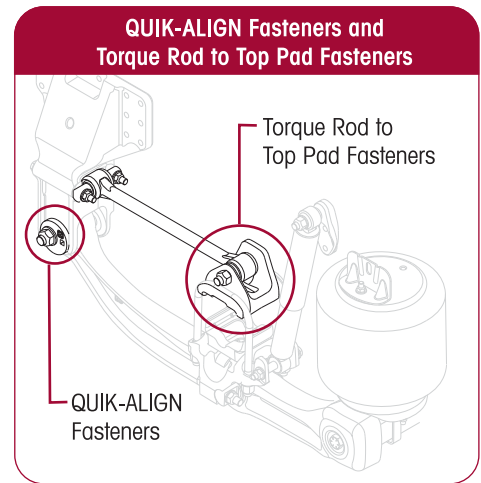
The inspection must include the following components:

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

➤ Signifies performance critical components.

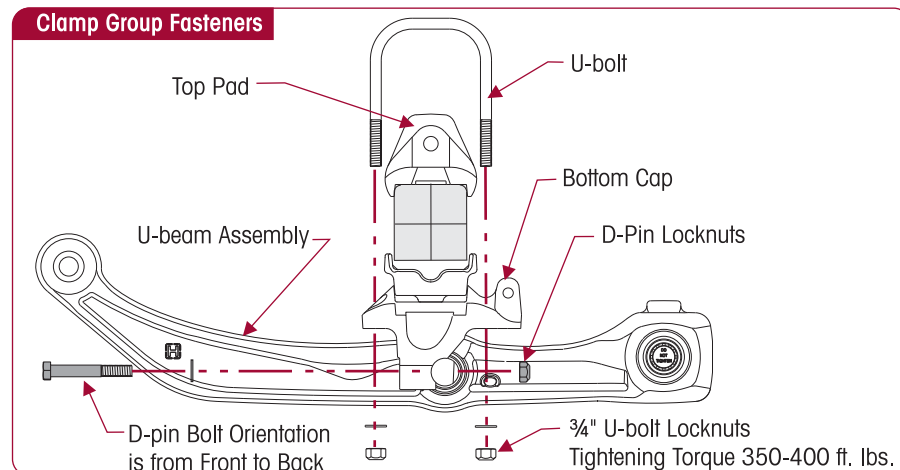
HENDRICKSON RECOMMENDED PREVENTIVE MAINTENANCE INTERVALS**PRE-DELIVERY INSPECTION**

1. Visually inspect the suspension for proper assembly.
2. Verify the lateral alignment of the drive axles are within the vehicle manufacturer's tolerances, contact the vehicle manufacturer for the correct lateral alignment instructions.
3. Visually inspect the overall condition of the U-beam assembly (support beam assembly, cross tube, and integrated end cap) for any damage.
4. **DO NOT RE-TORQUE** the integrated end cap (vehicles built **AFTER** April 2011), see Figure 6-1.
5. Check all other fasteners for proper torque with special attention to the following suspension connections:
 - QUIK-ALIGN fasteners, see Figure 6-2.
 - Torque rod to top pad fasteners, see Figure 6-2.
 - Clamp group fasteners (U-bolts), see Figure 6-3.
6. Verify the ride height is within specification. Ride height is measured from the bottom of the frame rail to the centerline of the axle.

FIGURE 6-1

FIGURE 6-2


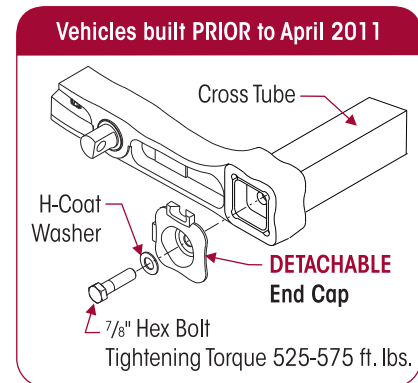
INSPECTION AT 1,000 MILES

1. Visually inspect suspension components with special attention to air springs and U-beam assembly (support beam assembly, cross tube, and integrated end cap). Check for:
 - Proper suspension function
 - Any signs of unusual movement, loose or missing components
 - Any signs of abrasive or adverse contact with other components
 - Any damaged, bent or cracked parts
2. Check all fasteners for proper torque with special attention to the following suspension connections.
 - QUIK-ALIGN fasteners, see Figure 6-2.
 - Torque rod to top pad fasteners, see Figure 6-2.
 - Clamp group fasteners (U-bolts), see Figure 6-3.

FIGURE 6-3


PREVENTIVE MAINTENANCE – PRIMAAX EX • PRIMAAX

- **Off highway and severe service** – Every 25,000 miles or six months, whichever comes first
 - **100% On-highway** – Every 50,000 miles or 12 months, whichever comes first
1. Visually inspect suspension components with special attention to air springs and U-beam Assembly (support beam assembly, cross tube, and integrated or detachable end cap). Check for:
 - Proper suspension function
 - Any signs of unusual movement, loose or missing components
 - Any signs of abrasive or adverse contact with other components
 - Any damaged, bent or cracked parts
 2. Check all fasteners for proper torque with special attention to the following suspension connections.
 - QUIK-ALIGN fasteners, see Figure 6-2.
 - Torque rod to top pad fasteners, see Figure 6-2.
 - Clamp group fasteners (U-bolts), see Figure 6-3.
 - Check detachable end cap connection fasteners on PRIMAAX vehicles (built **PRIOR** to April 2011), see Figure 6-4.
 3. Verify the ride height is within specification. Ride height is measured from the bottom of the frame rail to the centerline of the axle.
 4. Verify that the lateral alignment of the drive axle is within the vehicle manufacturer's tolerances, contact the vehicle manufacturer for the correct lateral alignment instructions.

FIGURE 6-4**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 $\frac{1}{8}$ " of slippage in either direction is acceptable. Verify all mounting hardware have the proper torque values maintained. See Torque Specification Section of 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 Fitting Inspection in this section if an air leak is suspected.
- **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.
- **End cap** (if equipped) — 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 Torque Specification Section of 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 Specification Section of this publication for recommended torque requirements. Use a calibrated torque wrench to check torque in a tightening direction. As soon as the fastener starts to move, record the torque and correct the torque if necessary.
- **Frame hanger bracket** — Visually inspect for any signs of loose fasteners, movement, or damage. Verify the frame attaching fasteners have the proper torque values maintained. See 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.
- **QUICK-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 Torque Specification Section of this publication for recommended torque requirements.
- **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.
- **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 Torque Specifications Section of this publication for recommended torque requirements.
- **Torque rods (longitudinal and transverse)** — All torque rods must be inspected for looseness, torn or shredded rubber, bushing walk-out, and for proper fastener torque. If there is metal-to-metal contact in the bushing joint, this is a sign of excessive bushing wear and the torque rod needs to be serviced, see Longitudinal 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 FASTENERS

SERVICE HINT

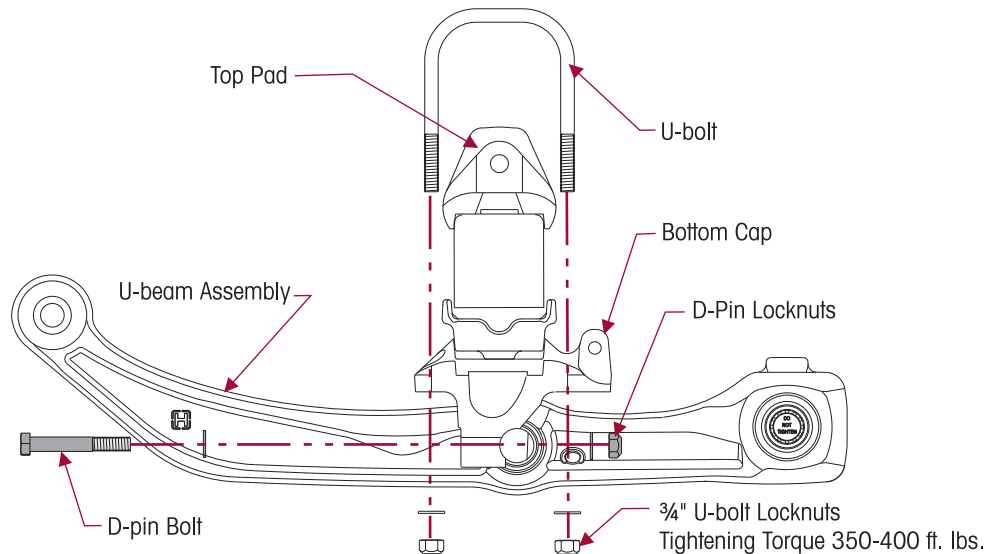
Due to certain pinion angle configurations, the removal of the D-pin bolts may be necessary to access the U-bolt locknuts, see Figure 6-5.

1. U-bolt locknuts must be torqued to specification at pre-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

NOTE

Current Hendrickson Truck Suspension Systems 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.

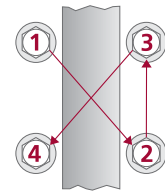
FIGURE 6-5

**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 LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE, OR PERSONAL INJURY.

4. Tighten the U-bolt locknuts evenly in 50 foot pounds increments to 350-400 foot pounds torque in the proper pattern to achieve uniform bolt tension, see Figure 6-6.

FIGURE 6-6

**TRANSVERSE TORQUE RODS**

The transverse torque rod 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.

**WARNING**

PRIMAAX EX / PRIMAAX SUSPENSIONS INCORPORATE TRANSVERSE RODS FOR VEHICLE STABILITY. IF THESE COMPONENTS ARE DISCONNECTED OR ARE NON-FUNCTIONAL, THE VEHICLE SHOULD NOT BE OPERATED. FAILURE TO DO SO CAN RESULT IN ADVERSE VEHICLE HANDLING, LOSS OF VEHICLE CONTROL, POSSIBLE TIRE CONTACT WITH THE FRAME, PREMATURE COMPONENT DAMAGE, OR SEVERE PERSONAL INJURY.

LONGITUDINAL TORQUE RODS

Torque rod looseness inspection is necessary during preventive maintenance and service intervals per one of the following methods below. Inspect attaching fasteners for proper torque.

- **Method 1** — For tractor applications only with brakes applied, slowly rock the empty vehicle with power while a mechanic 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.

NOTE

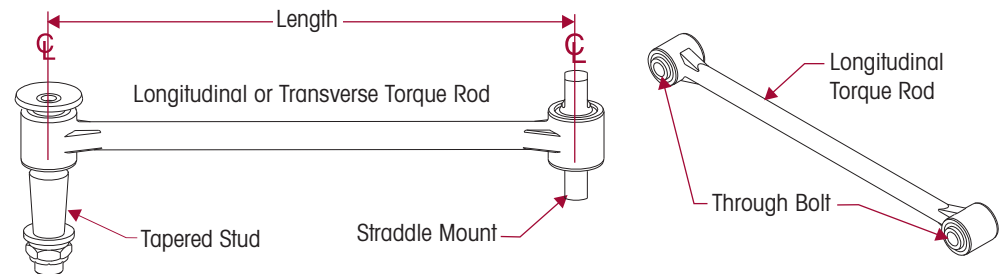
Hendrickson recommends the use of Grade 8 bolts and Grade C locknuts for all straddle mount torque rod attachments.

Longitudinal torque rod length is determined by the truck manufacturer for optimum driveline angles. 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 Parts Lists Section of this publication.

Longitudinal torque rods have attaching ends designated as “straddle mount,” “tapered stud,” or “through bolt” as shown in Figures 6-7. Most can be replaced by pressing out the worn torque rod bushing and installing a replacement bushing, others require complete torque rod assembly replacement. See Parts List Section of this publication.

Visually inspect torque rod bushings for torn or shredded rubber, inspect for bent, cracked, or broken torque rods, and for end hubs with an elongated “oval” shape. Any of these conditions will require component replacement.

FIGURE 6-7



SHOCK ABSORBER

Hendrickson uses a long service life, premium shock absorber on all PRIMAAX EX / PRIMAAX suspensions. If shock absorber replacement is necessary, Hendrickson recommends that the shock absorbers be replaced with identical Hendrickson Genuine parts for servicing. Failure to do so will affect the suspension performance, durability, and will void the warranty. Inspection of the shock absorber can be performed by doing a heat test, and a visual inspection. For instructions on shock absorber replacement see Component Replacement Section of this publication. It is not necessary to replace shock absorbers in pairs if one shock absorber requires replacement.

HEAT TEST

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

WARNING

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

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

FIGURE 6-8



VISUAL INSPECTION

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

FIGURE 6-9



LEAKING VS. MISTING SHOCK VISUAL INSPECTION

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

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

FIGURE 6-10



NOTE

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

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

AIR FITTING INSPECTION

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 only acceptable method for inspection of the height control valves is the height control valve test found in this section.

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 ADJUSTMENT

The Volvo PRIMAAX EX / PRIMAAX suspension is equipped with a height control valve located on the front drive axle. 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, adjustments, maintenance, replacement and rebuild instructions on these components, refer to the vehicle manufacturer.

LATERAL ALIGNMENT

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.
7. Ensure all drive axle tires are the same size and properly inflated.
8. Measure from the outside of the frame rail to the rim flange of the inner tire. Record the measurement.
9. Measure the same distance on the opposite side of the same axle. Record the measurement.
10. Subtract the two measurements to get a difference between the two. If the difference is greater than Hendrickson recommended $\frac{1}{8}$ " (3 mm), it will be necessary to correct the lateral alignment. Adding or removing shims that are located between the transverse torque rod and frame rail accomplishes this.
 - A general rule of thumb is to use a shim with a thickness that is half of the difference between the two measurements.

EXAMPLE

If the lateral alignment is out of specification by $\frac{1}{4}$ " (6mm), remove or install a $\frac{1}{8}$ " (3 mm) shim between the transverse torque rod and frame rail or between the torque rod and axle tower as needed.

NOTE

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

AXLE PINION ANGLE

Drive axle pinion angles are established by the vehicle manufacturer. The suspension axle brackets called out in the Pinion Angle Chart in the Parts Lists Section of this publication, are machined to specific angles to meet the vehicle manufacturer specified requirements. If it is necessary to fine tune the pinion angle see Alignment & Adjustments Section of this publication.

To check the pinion angle, verify first that the suspension is at the proper ride height (Refer to vehicle manufacturer for more information on Ride Height Adjustments). Place a digital protractor on the axle housing as shown in Figure 7-1. Check that the pinion angle is within the range specified by the vehicle manufacturer.

FIGURE 7-1



DRIVE AXLE ALIGNMENT INSPECTION PROCEDURE (SCRUB ANGLE)

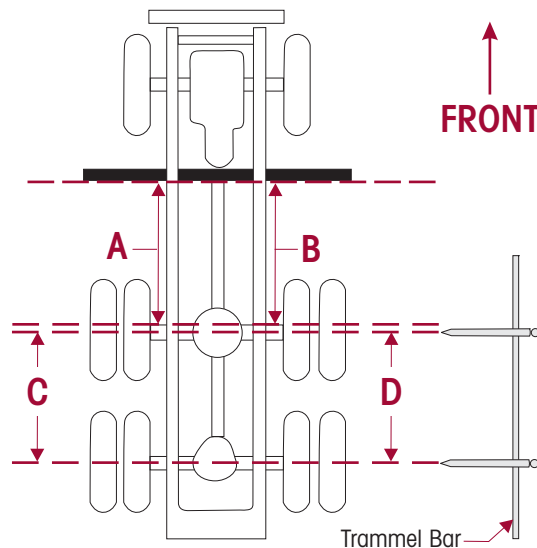
Proper alignment is essential for maximum ride quality, performance, and tire life, the recommended alignment procedure is described below. This procedure should be performed if excessive or irregular tire wear is observed, or any time the QUIK-ALIGN connection is loosened or removed.

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.
7. Ensure all drive axle tires are the same size and properly inflated.
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 7-2. 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 7-2, **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 of this axle **MUST** be corrected **BEFORE** measuring the rear drive axle alignment (Step 12). Correct the alignment of this axle by following the

proper alignment instructions for the PRIMAAX EX • PRIMAAX suspension model as determined by the ride height of the suspension.

NOTE

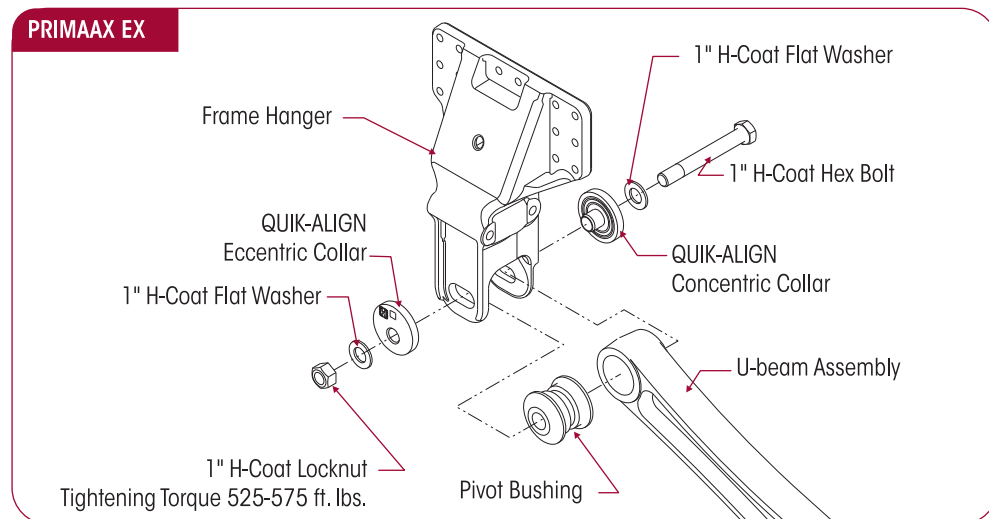
Since the remaining drive axle(s) will be aligned relative to the front drive axle, it is essential that the front drive axle is aligned within the vehicle manufacturer's specifications prior to the alignment of the remaining drive axle(s).

FIGURE 7-2


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 7-2, **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 proper alignment instructions for the PRIMAAX EX • PRIMAAX suspension model as determined by the ride height of the suspension.
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. Refer to the vehicle manufacturer specifications for the required pinion angles, see Figure 7-1.
 - 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 correct Pinion Angle Adjustment Suspension Procedure for the PRIMAAX EX • PRIMAAX 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.

ALIGNMENT ADJUSTMENT INSTRUCTIONS

FIGURE 7-3



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. The total range of fore/aft axle adjustment is 1.0".

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

DO NOT ASSEMBLE THE QUIK-ALIGN JOINT WITHOUT THE PROPER FASTENERS. USE ONLY HENDRICKSON H-COATED FASTENERS TO SUSTAIN THE PROPER CLAMP FORCE. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE OR PERSONAL INJURY. ENSURE THAT THE QUIK-ALIGN FASTENERS TORQUE VALUE IS SUSTAINED AS RECOMMENDED IN THE TORQUE SPECIFICATIONS SECTION OF THIS PUBLICATION, FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL RESULTING IN PERSONAL INJURY OR PROPERTY DAMAGE.

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 of 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. (See 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 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 (see Parts Lists Section of this publication) for any axle alignment or disassembly of the QUIK-ALIGN connection. This ensures that the proper clamp load is applied to the connection, so that the joint will not 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 of 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.

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, Figure 7-4 (also see Tool Section of this publication) and impact gun, see Figure 7-5, or a ½" square drive breaker bar to rotate the QUIK-ALIGN eccentric collar to align the axle.

FIGURE 7-4

FIGURE 7-5


11. Once the correct axle alignment is achieved, use a calibrated torque wrench to tighten the 1" QUIK-ALIGN locknuts to 525–575 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 Specification Section of this publication per model designation.
14. Re-check the ride height and the axle alignment to verify they are within the vehicle manufacturer's specifications. See Rear Axle Alignment Inspection in this Section.
15. Return to the Drive Axle Alignment Inspection Procedure, Step 12, 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.

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 7-6. To increase the pinion angle install shims. To decrease the pinion angle remove shims.

SERVICE HINT

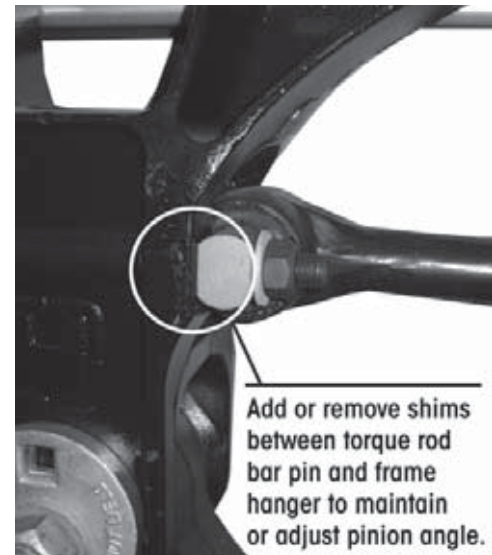
A general rule of thumb is, $\frac{1}{8}$ " change in the shim pack thickness will increase or decrease the pinion angle by $\frac{1}{2}$ degree.

3. Tighten the longitudinal torque rod fasteners to the proper specification, see Torque Specification Section of this publication per model designation.
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. See Pinion Angle Chart in the Parts List Section of this publication.

FIGURE 7-6



SECTION 8

Component Replacement

FASTENERS

When servicing a vehicle, Hendrickson recommends replacing all removed fasteners with new equivalent fasteners. Torque specs are for Hendrickson supplied fasteners. Maintain correct torque values at all times. Check torque values as specified in Torque Specifications Section of this publication. If non-Hendrickson fasteners are used follow torque specifications and re-torque intervals listed in the vehicle manufacturer's service manual.

HEIGHT CONTROL VALVE

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, adjustments, maintenance, replacement 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's leveling valve arm(s) from the rubber grommet (see vehicle manufacturers 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 of 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.

**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.

6. Remove the air line from the air spring.

**CAUTION**

IF THE AIR SPRING IS BEING REMOVED, 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 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 the fasteners from the upper air spring mounting bracket and the frame.
10. Remove the air spring.

ASSEMBLY

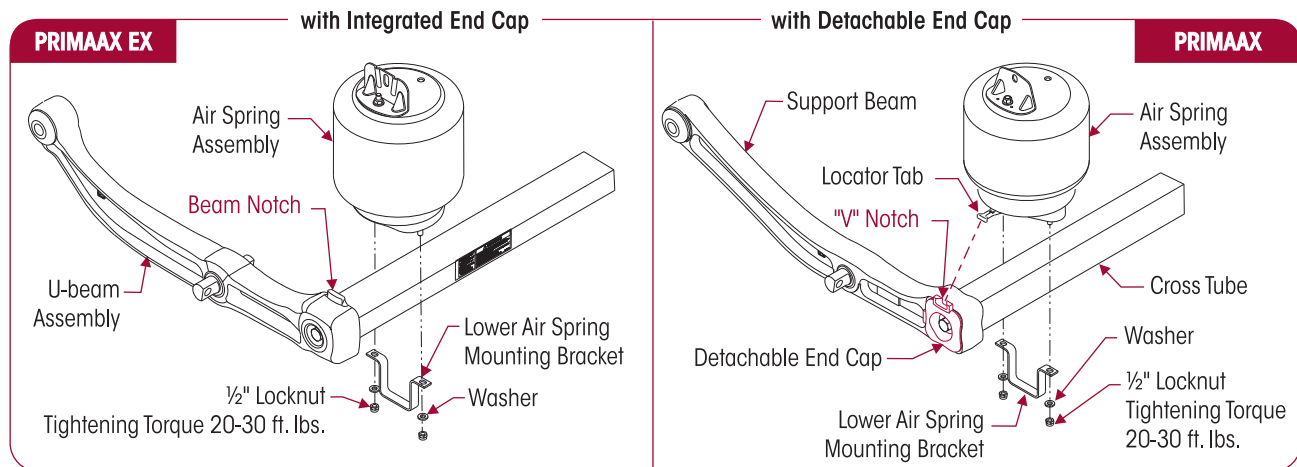
1. Inspect the mounting surfaces and lower air spring mounting bracket for any damage, replace if necessary.

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.

2. Hold the air spring tight against the frame flange and tighten the upper air spring mounting fastener per original equipment manufacturer's specifications.
3. Install the air spring between the frame and cross tube.
 - a. **PRIMAAX EX** — Ensure the slot in the bottom of the air spring engages the "beam notch" on the top of the beam, see Figure 8-1.
 - b. **PRIMAAX** — Ensure the "V" notch in the end cap engages the locator tab on the air spring, see Figure 8-1.

FIGURE 8-1



4. Install the lower air spring mounting bracket around the cross tube, engaging the mounting studs on the air spring.

CAUTION

IF THE AIR SPRING IS BEING REMOVED, 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.

5. Using hand tools install the lower mounting fasteners and tighten to 20-30 foot pounds torque.
6. Connect the air line to the air spring.
7. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to deflating or inflating the air system.
8. Connect the leveling valve link rod(s) to the height control valve arm(s) to inflate the suspension.
9. Remove the frame supports.
10. Verify proper ride height adjustment, (see vehicle manufacturer's specification for proper ride height adjustment).
11. Remove the wheel chocks.

SHOCK ABSORBER



WARNING

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.

DISASSEMBLY

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

ASSEMBLY

1. Install the shock absorber into the upper mounting bracket.
2. Install the upper shock absorber mounting fasteners. **DO NOT** tighten at this time.



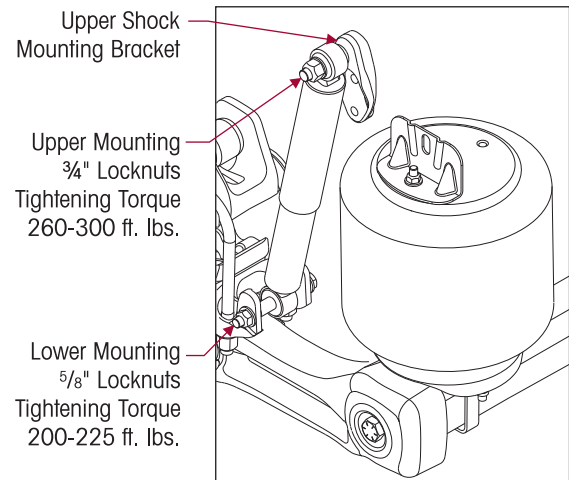
CAUTION

THE UPPER SHOCK BOLT MUST BE INDEXED INTO THE RECESSED HEX BORE OF THE UPPER SHOCK MOUNTING BRACKET FOR PROPER FASTENER INSTALLATION. FAILURE TO DO SO CAN CAUSE THE SHOCK FASTENERS TO BECOME LOOSE AND CAUSE PREMATURE COMPONENT DAMAGE.

3. Slide the lower shock absorber mount into the bottom cap. Install the lower shock absorber mounting fasteners.

4. Tighten the upper shock absorber mounting $\frac{3}{4}$ " locknuts to 175-200 foot pounds torque, see Figure 8-2.
5. Tighten the lower shock absorber mounting $\frac{5}{8}$ " locknuts to 200-225 foot pounds torque, see Figure 8-2.
6. If the height control valve linkage bracket was removed, verify the vehicle ride height. Refer to the Alignment & Adjustments Section of this publication.
7. Remove the wheel chocks.

FIGURE 8-2



TRANSVERSE TORQUE ROD

The transverse torque rod 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.



WARNING

PRIMAAX EX / PRIMAAX SUSPENSIONS INCORPORATE TRANSVERSE RODS FOR VEHICLE STABILITY. IF THESE COMPONENTS ARE DISCONNECTED OR ARE NON-FUNCTIONAL, THE VEHICLE SHOULD NOT BE OPERATED. FAILURE TO DO SO CAN RESULT IN ADVERSE VEHICLE HANDLING, LOSS OF VEHICLE CONTROL, POSSIBLE TIRE CONTACT WITH THE FRAME, PREMATURE COMPONENT DAMAGE, OR SEVERE PERSONAL INJURY.

LONGITUDINAL TORQUE ROD

NOTE

Some torque rods assemblies equipped on the PRIMAAX EX • PRIMAAX suspension have curled end hubs and are not re-bushable. 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 or the suffix N after any part number (i.e. 62000-615N).

DISASSEMBLY

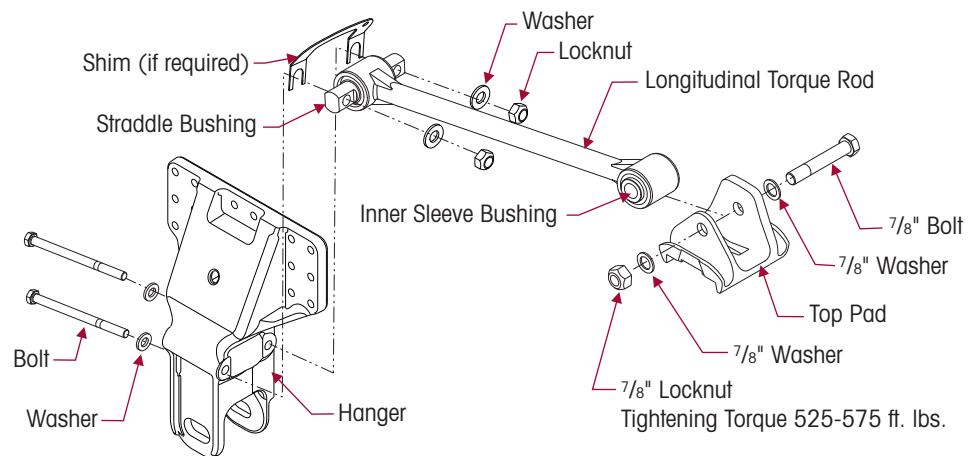
1. Chock the wheels of the vehicle.

SERVICE HINT

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

2. Remove the torque rod mounting fasteners and shims (if equipped), see Figure 8-3.
3. Remove the torque rod.
4. Inspect the mounting surfaces for any wear or damage, replace if necessary.

FIGURE 8-3



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 be used for all torque rod attachments.

NOTE

It is mandatory to have the vehicle at proper ride height prior to tightening the $\frac{3}{4}$ " straddle bushing and the $\frac{7}{8}$ " top pad through bolt locknuts to torque specifications.

3. Tighten all fasteners to the required specification, see Torque Specifications Section of this publication, see Figure 8-3.
4. When assembly is complete check the drive axle pinion angles, see Alignment & Adjustments Section of this publication.
5. Remove the wheel chocks.

LONGITUDINAL TORQUE ROD BUSHING

NOTE

Some torque rods assemblies equipped on the PRIMAAX EX • PRIMAAX suspension have curled end hubs and are not re-bushable. 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 or the suffix N after any part number (i.e. 62000-615N).

DISASSEMBLY

You will need:

- A vertical press with a capacity of at least 10 tons.
- A receiving tool, 5" long, 2" inner diameter by ¼" wall steel tubing. (See Special Tools Section of this publication)



WARNING

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 LOSS OF VEHICLE CONTROL, POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE AND VOID WARRANTY.

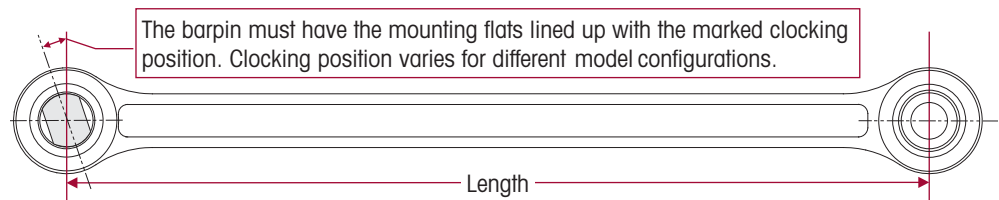
1. Remove the torque rod as detailed in this section.

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.

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 8-4.

FIGURE 8-4



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 bushing's straddle mount bar pin until the end of the straddle mount is level with the top of the torque rod end hub. Insert a spacer and press until the bushing clears the torque rod end hub.
5. Clean and inspect the inner diameter of the torque rod ends.

ASSEMBLY**NOTE**

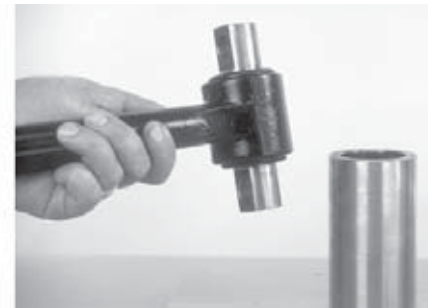
DO NOT use a petroleum or soap base lubricant. Such lubricants can cause adverse reactions with the bushing, such as deterioration of the rubber, causing premature failure.

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 8-5.
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

The straddle mount bar pin bushings must have the mounting flats positioned perpendicular to axis of the torque rod.

3. Press directly on the straddle mount bar pin. The rubber bushings of the bar pin must be centered within the torque rod end hubs.
4. When pressing in the new bushings overshoot the desired final position by approximately $\frac{3}{16}$ ", see Figure 8-6.
5. Press the straddle mount bar pin again from opposite side to center the bar pin within the torque rod end hub, see Figure 8-7.

FIGURE 8-5**FIGURE 8-6****FIGURE 8-7**

6. Wipe off excess lubricant. Allow the lubricant four hours to dissipate before operating vehicle.

**CAUTION**

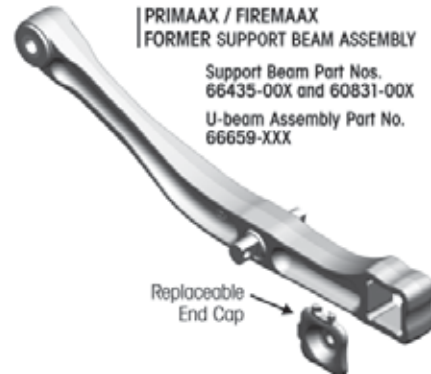
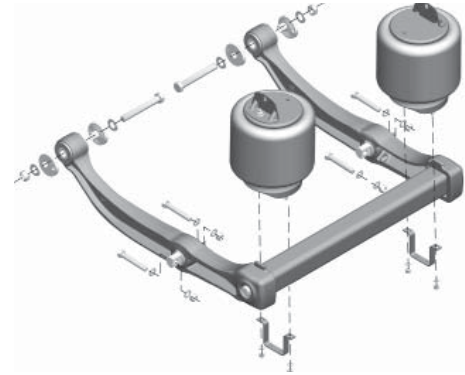
IF THE TORQUE ROD ASSEMBLY IS NOT ALLOWED THE ALLOTTED TIME FOR THE LUBRICANT TO DISSIPATE, THE BUSHING WILL SLIDE FROM THE TORQUE ROD END HUB. IF THIS OCCURS, THE BUSHING MAY BE DAMAGED AND THE BUSHING WILL THEN NEED TO BE REMOVED AND A NEW BUSHING RE-INSTALLED.

7. Install torque rod assembly as detailed in this section.

SUPPORT BEAM ASSEMBLY AND CROSS TUBE**NOTE**

Effective May 1, 2010, support beam assembly part number 60831-00X for PRIMAAX suspension systems are discontinued, see Figure 8-8.

U-beam assembly service kits part number 60961-235 (forward) and 60961-236 (rear), see Figure 8-9, must be used for any necessary replacement of PRIMAAX only support beam assemblies in the field. Refer to Hendrickson Technical Bulletin SEU-0229 for more information.

FIGURE 8-8

FIGURE 8-9


U-BEAM ASSEMBLY

IMPORTANT NOTICE

As of April 2010, Hendrickson introduced new U-beam assembly enhancements for PRIMAAX EX suspensions to be equipped on new production vehicles and for aftermarket U-beam assembly kits. The new enhancements to the U-beam assembly result in a maintenance-free integrated end cap connection. See SEU-0229 for PRIMAAX support beam/cross tube assembly conversion to the new U-beam assembly enhancement and refer to Parts List Section of this publication.

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) (see vehicle manufacturers 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 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 leveling valve arm(s) to exhaust the air in the air springs and deflate the rear suspension.

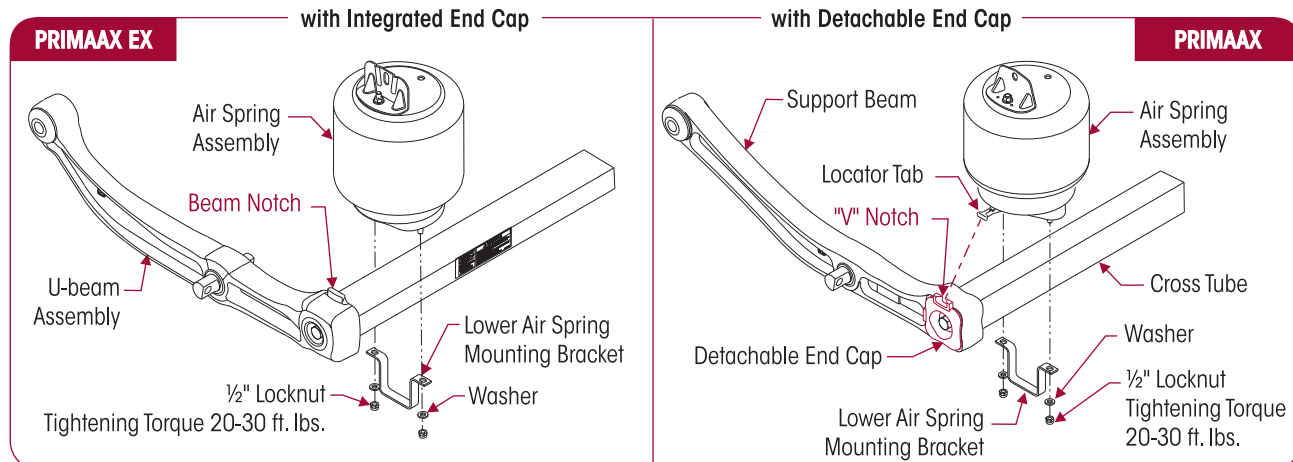


CAUTION

IF THE AIR SPRING IS BEING REMOVED, 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 the lower air spring mounting brackets to disconnect both air springs from the cross tube, see Figure 8-10.

FIGURE 8-10

**WARNING**

THE USE OF A FLOOR JACK EQUIPPED WITH A FOUR INCH SUPPORT PLATE IS MANDATORY TO SUPPORT THE SUPPORT BEAM AND CROSS TUBE U-BEAM ASSEMBLY. DO NOT USE A BOTTLE JACK. THE USE OF A BOTTLE JACK WILL NOT ENGAGE THE CROSS TUBE TO FACILITATE SAFE LOWERING AND RAISING OF THE SUPPORT BEAMS AND CROSS TUBE U-BEAM ASSEMBLY. FAILURE TO DO SO CAN CAUSE COMPONENT DAMAGE OR RESULT IN PERSONAL INJURY.

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

SERVICE HINT

Each frame hanger will have a pair of QUIK-ALIGN collars. Note which type of QUIK-ALIGN collar is removed from which frame hanger location to facilitate the assemble 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.

11. Mark the position of the QUIK-ALIGN square drive in relationship to the frame hanger 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.

14. Lower the floor jack and pivot the U-beam assembly down.

**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.

15. Remove the QUIK-ALIGN fasteners and discard.

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 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 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 hangers.

WARNING

DO NOT ASSEMBLE ANY QUIK-ALIGN JOINT WITHOUT THE PROPER FASTENERS. USE ONLY HENDRICKSON COATED FASTENERS TO SUSTAIN THE PROPER CLAMP FORCE. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE OR PERSONAL INJURY AND VOID WARRANTY.

ENSURE THAT THE QUIK-ALIGN FASTENERS TORQUE VALUE IS SUSTAINED AS RECOMMENDED IN TORQUE SPECIFICATIONS SECTION OF THIS PUBLICATION. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL RESULTING IN PERSONAL INJURY OR PROPERTY DAMAGE.

NOTE

Use new QUIK-ALIGN pivot bolt kit (see Parts List Section of this publication) for any axle alignment or disassembly of the QUIK-ALIGN connection. This ensures that the proper clamp load is applied to the connection, to ensure the joint will not 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

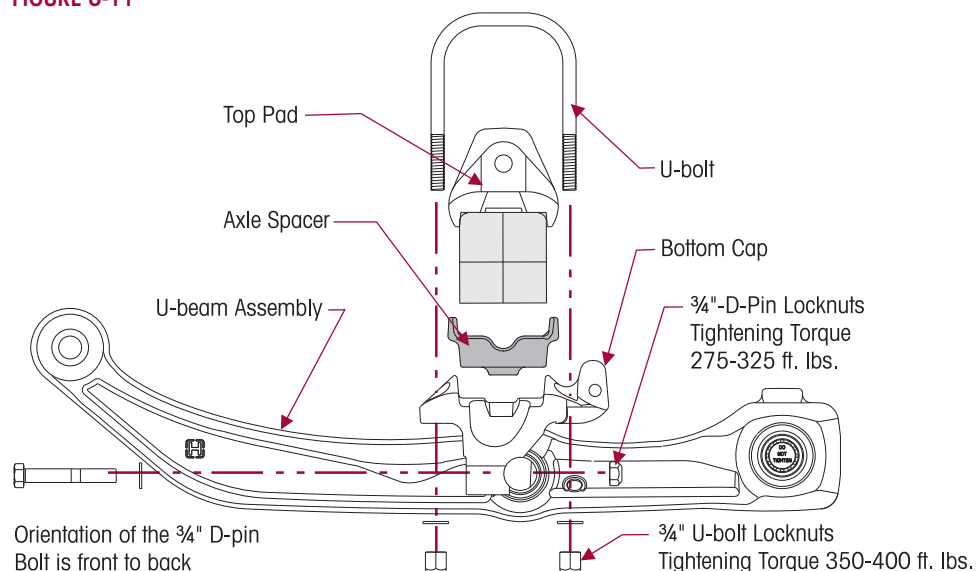
It may be necessary to rotate the QUIK-ALIGN eccentric collars to allow the full engagement of the D-pins into the bottom caps.

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.

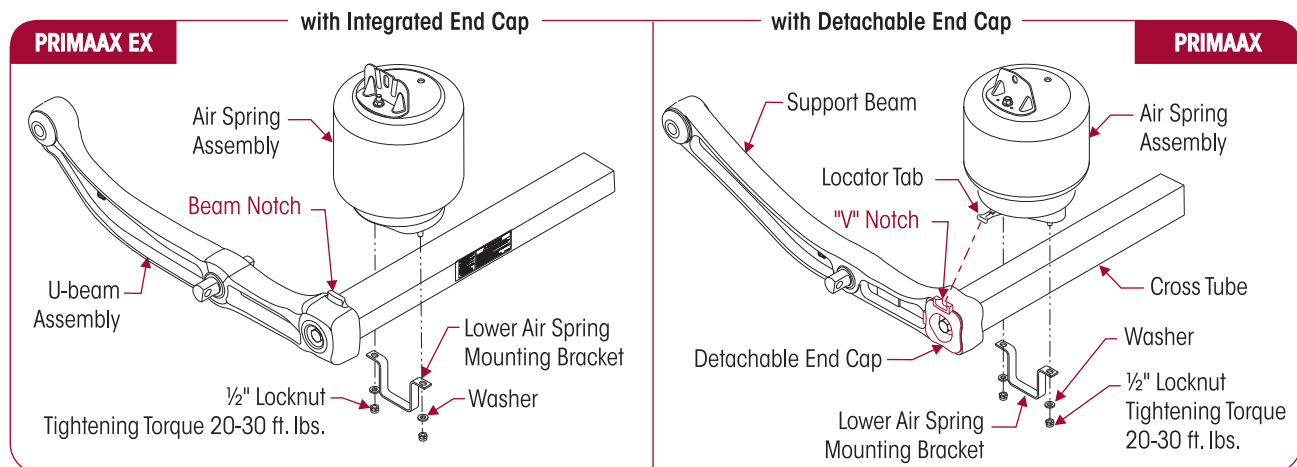
8. Install the D-pin fasteners from front to back, see Figure 8-11.

FIGURE 8-11



9. Remove the floor jack supporting the U-beam assembly.
10. Tighten D-Pin locknuts to 275-325 foot pounds torque, see Figure 8-11..
11. Install the air spring between the frame and cross tube.
 - a. **PRIMAAX EX** — Ensure the slot in the bottom of the air spring engages the “beam notch” on the top of the beam, see Figure 8-12.
 - b. **PRIMAAX** — Ensure the “V” notch in the end cap engages the air spring locator tab on the air spring, see Figure 8-12.
12. Install the lower air spring mounting bracket around the cross tube, engaging the mounting studs on the air spring, see Figure 8-12.

FIGURE 8-12



13. Using hand tools install the lower mounting fasteners and tighten to 20-30 foot pounds torque.
14. Install the wheels and remove axle support.
15. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to deflating or inflating the air system.
16. Connect the leveling valve link rod to the height control valve arm(s) to inflate the suspension. (See vehicle manufacturer's instructions)
17. Remove frame support(s).
18. Remove the wheel chocks.

NOTE

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

19. Check the alignment and adjust if necessary. See Alignment & Adjustments Section of this publication.
20. Once the correct axle alignment is achieved, use a calibrated torque wrench to tighten the 1" QUIK-ALIGN locknuts to 525–575 foot pounds torque.

D-PIN BUSHING**You will need:**

- A vertical shop press with a capacity of at least 10 tons.
- A D-Pin Removal Tool, Installation Tool, and Receiving Tool, see Special Tools Section of this publication.

DISASSEMBLY

1. Remove the U-beam assembly. Follow U-beam Assembly removal procedure in this section.

NOTE

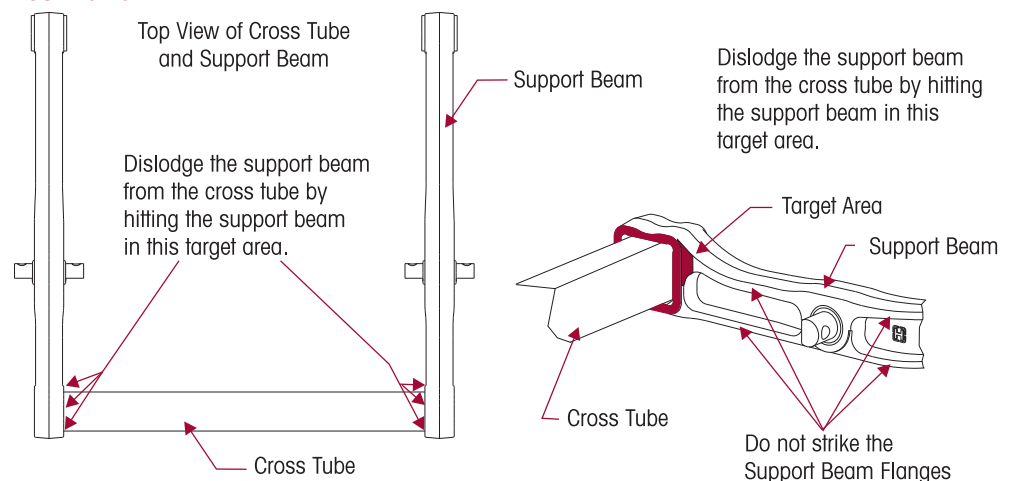
On PRIMAAX EX models built after September 2010 or equipped with the enhanced U-beam Assembly, it will be necessary to remove the existing sealant and tamper resistant cap for the support beam/cross tube connection to proceed with the bolt removal. Carefully remove sealant with a hand scraper to prevent damage to the U-beam assembly.

2. If applicable remove the existing sealant and tamper resistant cap for the support beam/cross tube connection to proceed with the bolt removal. Carefully remove sealant with a hand scraper to prevent damage to the U-beam assembly.
3. Remove the support beam/cross tube connection bolt from the end of the beam.
4. Remove the end cap (if equipped).

**WARNING**

WHEN SEPARATING THE U-BEAM ASSEMBLY, PROTECT THE CROSS TUBE BY PLACING A PIECE OF PLYWOOD AGAINST OR CARDBOARD AROUND THE CROSS TUBE. CAREFULLY DISLODGE THE CROSS TUBE FROM THE SUPPORT BEAM WITH A LONG HANDLED SLEDGE HAMMER BY APPLYING BLUNT FORCE ON THE SUPPORT BEAM DIRECTLY IN FRONT OF THE INBOARD TOP CORNER JOINT. ALL BLUNT FORCE MUST BE APPLIED FLUSH TO THE THICKEST PART OF THE SUPPORT BEAM. FAILURE TO STRIKE THE SUPPORT BEAM SQUARELY MAY RESULT IN COMPONENT DAMAGE, PREMATURE FAILURE AND VOID WARRANTY, SEE FIGURE 8-13.

5. Place a piece of plywood or cardboard around the cross tube prior to applying blunt force to the support beam.
6. Dislodge the support beam from the cross tube by hitting the support beam directly in front of the inboard corner joint. The support beam and cross tube joint requires shock load on the support beam, at the joint, to dislodge the two components. All blunt force must be applied flush to the thickest part of the support beam at the inboard corner joint, see Figure 8-13. Continue striking the support beam until it is completely dislodged from the cross tube.

FIGURE 8-13

7. Inspect all components for any damage or wear and replace as necessary.
8. Clean any loose debris or foreign material, and if applied remove all old sealant for inspection and reassembly.
9. Place the support beam in a shop press on top of a receiving tool with both ends of the support beam squarely supported on the press bed.
10. Mark the clocking position of the D-pin bushing on the support beam with a paint stick, see Figure 8-14.
11. Install the D-Pin Removal Tool centered on the D-Pin bushing, see Figure 8-15.

FIGURE 8-14

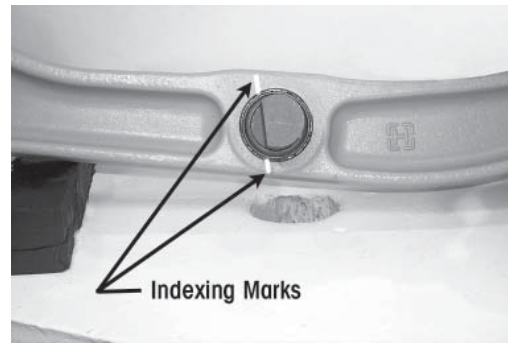
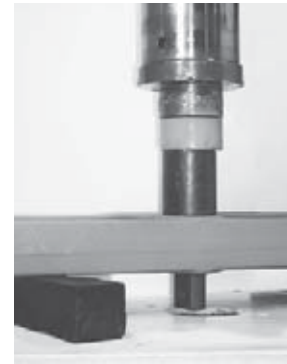


FIGURE 8-15



12. Push directly on the D-pin Removal Tool until the D-Pin bushing is pressed out of the support beam bore.
13. Clean the support beam bore with a wire wheel. Inspect the inner diameter of the D-Pin bore on the support beam, check for any damage to the support beam bore, replace as necessary.

ASSEMBLY

1. Place the support beam in a shop press on the receiving tool with the beveled edge of the D-Pin bore facing up. Both ends of the support beam must be supported squarely on the press bed.
2. Lubricate the support beam D-Pin bore and the D-Pin bushing retaining sleeve with chassis grease, see Figure 8-16.
3. Line up the D-Pin bushing with the clocking line that was put on the support beam prior to the removal of the D-Pin bushing, see Figure 8-17.
4. Install the D-Pin bushing installation tool and press in the new D-Pin bushing until the outer metal sleeve is centered in the support beam assembly, see Figures 8-18 and 8-19.

FIGURE 8-16



FIGURE 8-17



FIGURE 8-18



FIGURE 8-19



NOTE

If the service also requires the replacement of the QUIK-ALIGN pivot bushing, refer to QUIK-ALIGN Pivot Bushing Disassembly in this section.

5. Install the support beams into the hanger's one side at a time. Care should be taken to ensure the support beams are installed in the proper locations, for example: the left rear support beam is installed in the left rear hanger.

NOTE

All the old sealant **MUST** be removed carefully with a hand scraper as to not damage the U-beam assembly and the sealant application areas should be cleaned.

WARNING

DO NOT ASSEMBLE ANY QUIK-ALIGN JOINT WITHOUT THE PROPER FASTENERS. USE ONLY HENDRICKSON COATED FASTENERS TO SUSTAIN THE PROPER CLAMP FORCE. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE OR PERSONAL INJURY AND VOID WARRANTY.

WARNING

ENSURE THAT THE QUIK-ALIGN FASTENERS TORQUE VALUE IS SUSTAINED AS RECOMMENDED IN TORQUE SPECIFICATIONS SECTION OF THIS PUBLICATION. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL RESULTING IN PERSONAL INJURY OR PROPERTY DAMAGE.

NOTE

Use new QUIK-ALIGN pivot bolt kit (see Parts List Section of this publication) for any axle alignment or disassembly of the QUIK-ALIGN connection. This ensures that the proper clamp load is applied to the connection, to ensure the joint will not slip in service.

SERVICE HINT

Each frame hanger will have a pair of QUIK-ALIGN collars. Note which type of QUIK-ALIGN collar is removed from which frame hanger location to facilitate the assemble 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.

6. Verify the correct QUIK-ALIGN collar (eccentric/concentric) is in the correct location as noted in the disassembly procedure.
7. 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.
8. Spread the support beams to facilitate the installation of the cross tube.
9. Install the cross tube into the support beam one side at a time.
10. If equipped, install the end cap making sure the "V" notch in the end cap is on the top.

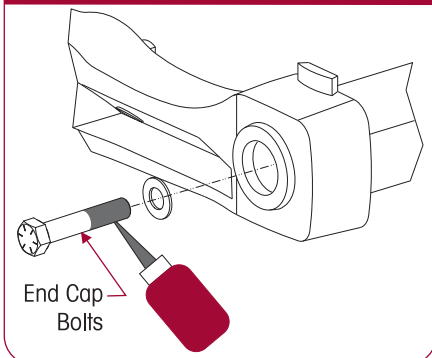
FIGURE 8-20

11. Apply Loctite 277 to the $\frac{7}{8}$ " fastener and install in end hub. **DO NOT** tighten at this time, see Figure 8-20.

WARNING

THE WEIGHT OF THE SUPPORT BEAMS AND CROSS TUBE ASSEMBLY IS APPROXIMATELY 225 POUNDS. CARE SHOULD BE TAKEN AT REMOVAL AND INSTALLATION TO PREVENT PERSONAL INJURY OR DAMAGE TO COMPONENTS.

12. Position the support beam and cross tube assembly on a floor jack equipped with a 4" support plate.
13. Raise the support beam and cross tube assembly until the D-Pins engage in the bottom cap.

**Loctite® 277 applied to
END CAP bolts**

SERVICE HINT

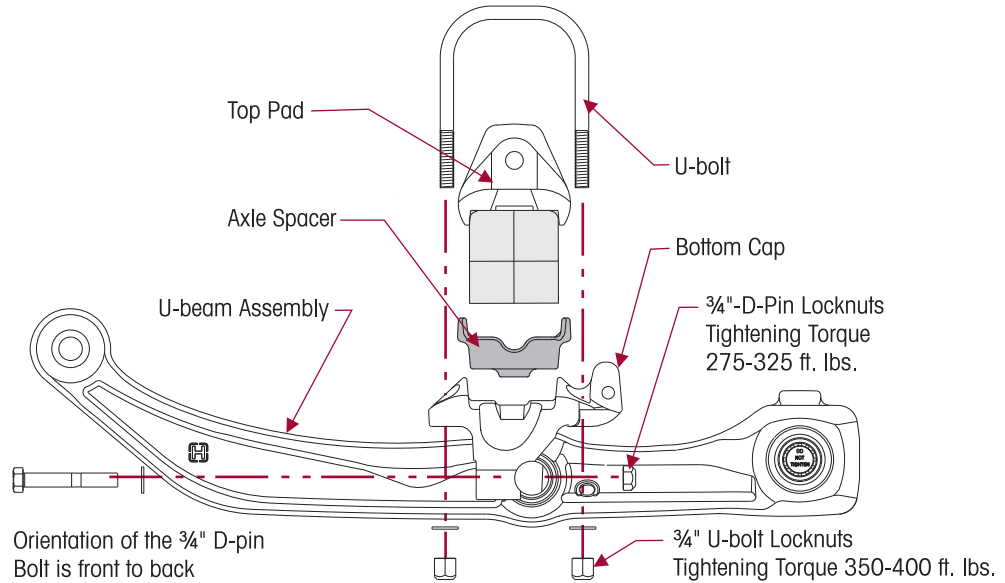
It may be necessary to rotate the QUIK-ALIGN eccentric collars to pull the axle forward to allow the full engagement of the D-Pins into the bottom caps.

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.

14. Install the D-Pin fasteners, installing them from front to back, see Figure 8-21.

FIGURE 8-21



15. Tighten the 7/8" cross tube retaining bolt head to 525-575 foot pounds torque.
16. Tighten D-Pin locknuts to 275-325 foot pounds torque and remove the cross tube support.
17. Carefully clean the application area using a wire brush to remove loose paint and debris.
18. De-grease area with suitable de-greaser such as mineral spirits or brake cleaner. Ensure the area is dry when done.
19. Install tamper resistant cap over fully tightened end cap bolt.

**WARNING**

IRRITANT, SENSITIZER. SIKAFLEX 221 CAUSES EYE IRRITATION. MAY CAUSE SKIN/RESPIRATORY IRRITATION. MAY CAUSE SKIN AND/OR RESPIRATORY SENSITIZATION AFTER PROLONGED CONTACT. MAY BE HARMFUL IF SWALLOWED. AVOID DIRECT CONTACT. WEAR PERSONAL PROTECTIVE EQUIPMENT (CHEMICAL RESISTANT GOGGLES/GLOVES/CLOTHING) TO PREVENT DIRECT CONTACT WITH SKIN AND EYES. USE ONLY IN WELL VENTILATED AREAS. OPEN DOORS AND WINDOWS DURING USE. USE A PROPERLY FITTED NIOSH RESPIRATOR IF VENTILATION IS POOR. WASH THOROUGHLY WITH SOAP AND WATER AFTER USE. REMOVE CONTAMINATED CLOTHING AND LAUNDRER BEFORE REUSE. STRICTLY FOLLOW ALL USAGE, HANDLING AND STORAGE INSTRUCTIONS AS PROVIDED BY THE MANUFACTURER.

NOTE

Sealant should be at room temperature when applying.

FIGURE 8-22

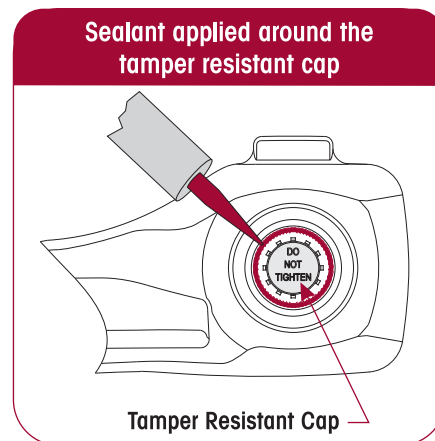
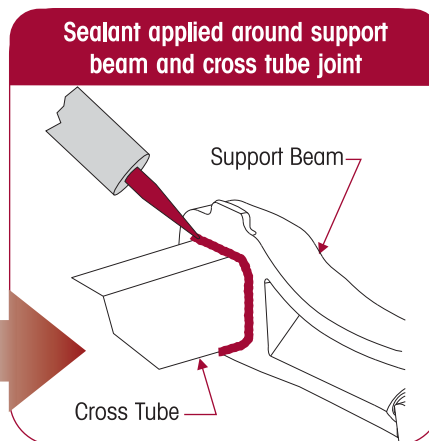


FIGURE 8-23





20. Use gloves when applying sealant; apply sealant 360 degrees over tamper resistant cap edges, ensure there are no voids or gaps in sealant after application, see Figure 8-22.
21. Use gloves when applying sealant; apply sealant 360 degrees around cross tube/support beam connection, ensure there are no voids or gaps in sealant after application, see Figure 8-23.

NOTE

DO NOT allow the sealant to interfere with air spring mounting.

22. Install the air spring between the frame and cross tube.
 - a. **PRIMAAX EX** — Ensure the slot in the bottom of the air spring engages the “beam notch” on the top of the beam.
 - b. **PRIMAAX** — Ensure the “V” notch in the end cap engages the air spring locator tab on the air spring.
23. Using HAND TOOLS only, install the lower mounting fasteners and tighten to 20-30 foot pounds torque.
24. Install the wheels and remove the axle support(s).



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.

25. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to deflating or inflating the air system.
26. Connect the height control valve linkage assembly to the height control valve arm(s) to inflate the suspension.
27. Remove the frame support
28. Remove the wheel chocks.
29. Verify the ride height is correct, refer to Alignment & Adjustments Section of this publication.

NOTE

Alignment and QUIK-ALIGN final torque is necessary anytime the support beam is removed.

30. Check the alignment and adjust if necessary, refer to Alignment & Adjustments Section of this publication.
31. Once the correct axle alignment is achieved, use a calibrated torque wrench to tighten the 1" QUIK-ALIGN locknuts to 525–575 foot pounds torque.

QUIK-ALIGN PIVOT BUSHING

DISASSEMBLY

You will need:

- A vertical shop press with a capacity of at least 10 tons.
 - A QUIK-ALIGN pivot bushing installer, remover and receiver tool. See Special Tools Section of this publication.
1. Remove the support beam assembly. Follow the D-pin Bushing Disassembly Steps 1 through 8 in this section.
 2. Center the pivot bushing remover tool on the inner sleeve and press out the old bushing, (these bushings are not cartridge type bushings, they do not have outer metals), see Figures 8-24 and 8-25.
 3. Clean and inspect the I.D. of the support beam eye.

ASSEMBLY

NOTE

DO NOT use petroleum or soap base lubricant, it can cause an adverse reaction with the bushing material, such as deterioration.

1. Lubricate the bushing and the inner diameter of the support beam eye with light Naphthenic Base Oil, such as 60 SUS at 100°F, see Figure 8-26.
2. Position the support beam on the pivot bushing receiver tool with the support beam eye centered on the tool. Ensure the support beam is squarely supported on the press bed.
3. Place the pivot bushing installer tool on the pivot bushing, see Figure 8-27.

FIGURE 8-24



FIGURE 8-25



FIGURE 8-26



FIGURE 8-27



FIGURE 8-28



4. Press in the new bushing. Bushings must be centered within the support beam eye. When pressing in the new bushings over-shoot desired final position by $\frac{3}{16}$ " and press again from the opposite side to center the bushing within the support beam eye bore, if necessary, see Figure 8-28.
5. Install the U-beam assembly. Follow D-pin Bushing Assembly Steps 5 through 31 in this section.

TOP PAD

DISASSEMBLY

1. Chock the front wheels.
2. Support the frame.
3. Disconnect the height control valve linkage assembly from the height control valve arm(s) from the rubber grommet (see vehicle manufacturers 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 of this publication prior to deflating or inflating the air system.

WARNING

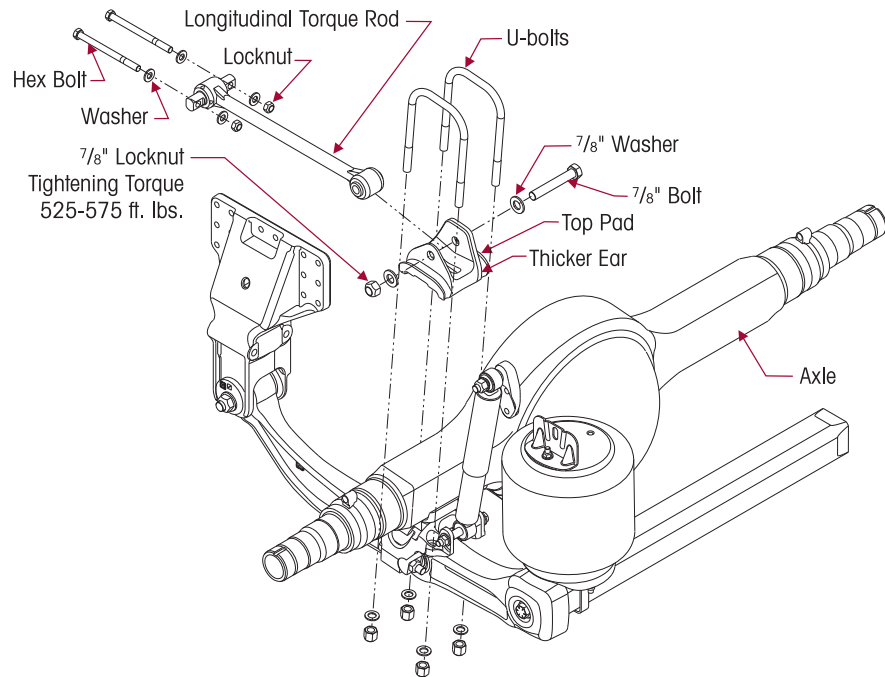
SOME VEHICLE APPLICATIONS, SUCH AS VEHICLES EQUIPPED WITH OUTRIGGERS, RETAIN SOME PRESSURE IN THE AIR SPRINGS AT ALL TIMES. PRIOR TO PERFORMING ANY MAINTENANCE, SERVICE, OR REPAIR OF THE SUSPENSION, VERIFY EACH AIR SPRING IS COMPLETELY DEFLATED. FAILURE TO DO SO COULD RESULT IN SERIOUS PROPERTY DAMAGE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

5. Lower the leveling valve arm(s) to exhaust the air in the air springs and deflate the rear suspension. Remove the through bolt from the longitudinal torque rod to top pad joint.

SERVICE HINT

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

6. Remove the fasteners from the longitudinal torque rod to top pad joint and shims (if equipped), see Figure 8-29.

FIGURE 8-29

SERVICE HINT

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

WARNING

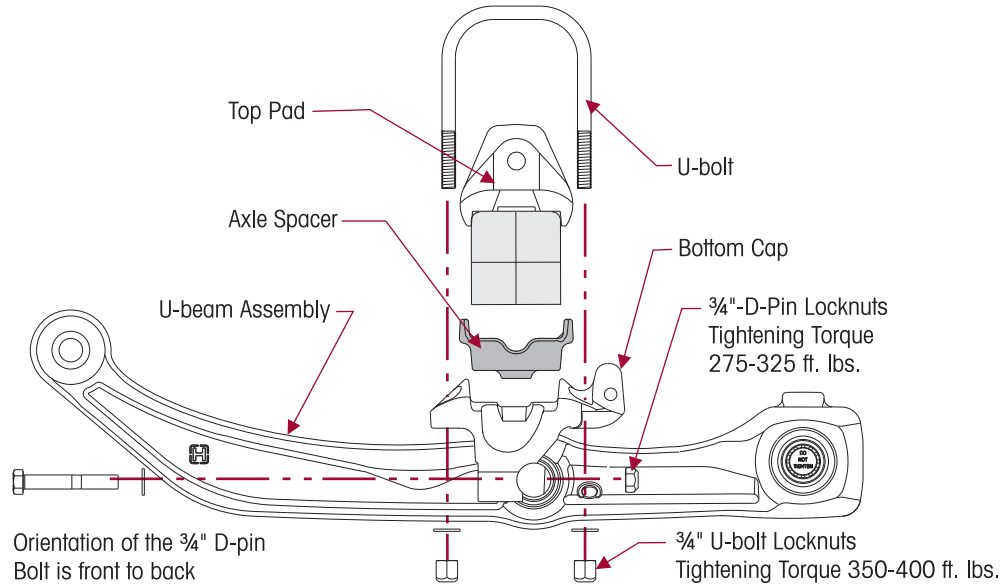
THE USE OF A FLOOR JACK EQUIPPED WITH A FOUR INCH SUPPORT PLATE IS MANDATORY TO SUPPORT THE SUPPORT BEAM AND CROSS TUBE ASSEMBLY. DO NOT USE A BOTTLE JACK. THE USE OF A BOTTLE JACK WILL NOT ENGAGE THE CROSS TUBE TO FACILITATE SAFE LOWERING AND RAISING OF THE SUPPORT BEAMS AND CROSS TUBE ASSEMBLY. FAILURE TO DO SO CAN CAUSE COMPONENT DAMAGE OR RESULT IN PERSONAL INJURY.

WARNING

THE WEIGHT OF THE SUPPORT BEAMS AND CROSS TUBE ASSEMBLY IS APPROXIMATELY 225 POUNDS. CARE SHOULD BE TAKEN AT REMOVAL AND INSTALLATION TO PREVENT PERSONAL INJURY OR DAMAGE TO COMPONENTS.

7. Support the support beams and cross tube assembly with a floor jack that is equipped with a four inch support plate.
8. Remove the U-bolts from the clamp group and discard, see Figure 8-30.
9. Remove the top pad.
10. Inspect the top pad and the axle housing for any cracks or damage. Replace as necessary.

FIGURE 8-30



ASSEMBLY

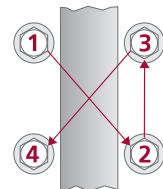
1. Install the top pad on the top of the axle engaging the dowel pin. Care should be taken to ensure the thicker ear of the top pad is mounted to the inboard side of the suspension, see Figure 8-29.
2. Install new U-bolts, washers, and locknuts.

NOTE

Current Hendrickson U-bolt locknuts for the PRIMAAX EX / PRIMAAX suspension are 3/4"-16 UNF Grade C and are phosphate and oil coated.

3. Verify that the U-bolts are seated properly in the channels of the top pad.
4. Tighten the U-bolt locknuts evenly in 50 foot pounds increments in the proper pattern to achieve uniform bolt tension, see Figure 8-31.
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 3/4" locknuts to 350-400 foot pounds torque.
6. Tighten the 3/4" D-pin bolts to 275-325 foot pounds torque, if loosened or removed during disassembly, see Figure 8-30.
7. Remove the support from the support beam assembly.
8. Install the through bolt 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 of this publication prior to deflating or inflating the air system.
10. Connect the leveling valve link rod(s) to the height control valve arm(s) to inflate the suspension.
11. Remove the frame stands.

FIGURE 8-31



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. Ensure the vehicle is at proper ride height.
13. Tighten the longitudinal torque rod through fasteners to 525-575 foot pounds torque.
14. Remove the wheel chocks.

BOTTOM CAP AND AXLE SPACER

NOTE

It is not necessary to loosen the QUIK-ALIGN connection to service the bottom cap and axle spacer, 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 wheels.
4. Disconnect the height control valve linkage assembly from the height control valve arm(s) from the rubber grommet (see vehicle manufacturers 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.

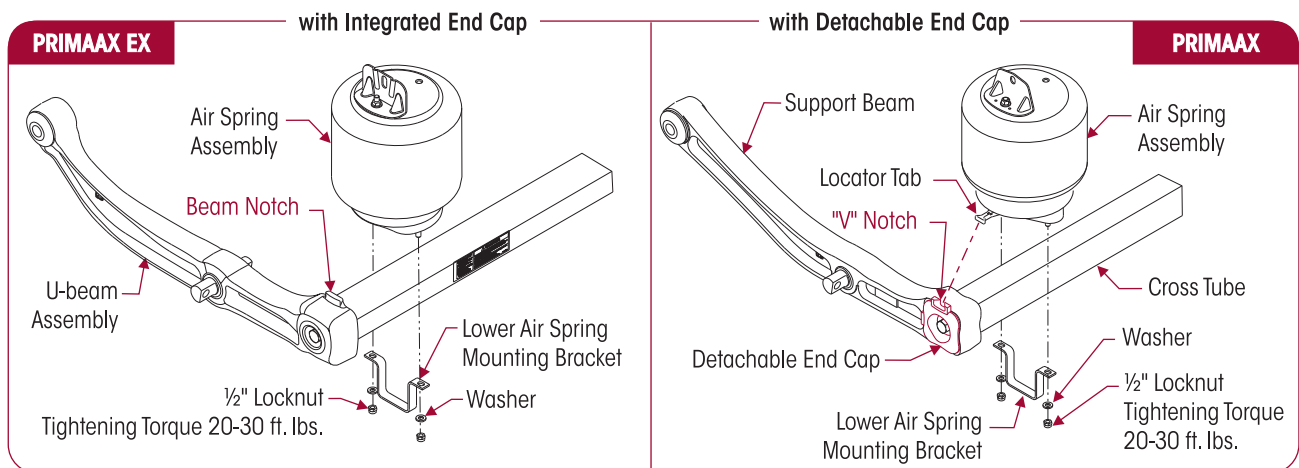


WARNING

SOME VEHICLE APPLICATIONS, SUCH AS VEHICLES EQUIPPED WITH OUTRIGGERS, RETAIN SOME 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 leveling valve arm(s) to exhaust the air in the air springs and deflate the rear suspension.
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 to disconnect from the cross tube, see Figure 8-32.

FIGURE 8-32



WARNING

THE USE OF A FLOOR JACK EQUIPPED WITH A FOUR INCH SUPPORT PLATE IS MANDATORY TO SUPPORT THE SUPPORT BEAM AND CROSS TUBE ASSEMBLY. DO NOT USE A BOTTLE JACK. THE USE OF A BOTTLE JACK WILL NOT ENGAGE THE CROSS TUBE TO FACILITATE SAFE LOWERING AND RAISING OF THE SUPPORT BEAMS AND CROSS TUBE ASSEMBLY. FAILURE TO DO SO CAN CAUSE COMPONENT DAMAGE OR RESULT IN PERSONAL INJURY.

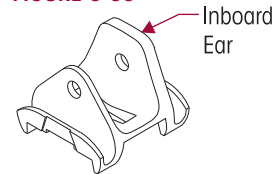
**WARNING**

THE WEIGHT OF THE SUPPORT BEAMS AND CROSS TUBE ASSEMBLY IS APPROXIMATELY **225 POUNDS**. CARE SHOULD BE TAKEN AT REMOVAL AND INSTALLATION TO PREVENT PERSONAL INJURY OR DAMAGE TO COMPONENTS.

9. Support the support beams and cross tube assembly with a floor jack that is equipped with a four inch support plate. Remove the D-Pin $\frac{3}{4}$ fasteners from both sides of the support beam.
10. Raise the front of the differential to facilitate removal of the D-Pins from the bottom caps.
11. Lower the floor jack to pivot the support beams and cross tube assembly down from the bottom caps.
12. Remove the lower shock absorber mounting fastener from the side being serviced.
13. Pivot the lower shock mount out of the bottom cap.
14. Remove the U-bolt fasteners from the clamp group and discard.
15. Remove the bottom cap and inspect for damage or wear. Replace as necessary.

ASSEMBLY

1. Install the top pad on the top of the axle engaging the dowel pin. Care should be taken to ensure the thicker ear of the top pad is mounted to the inboard side of the suspension, see Figure 8-33.
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 8-30.

FIGURE 8-33**SERVICE HINT**

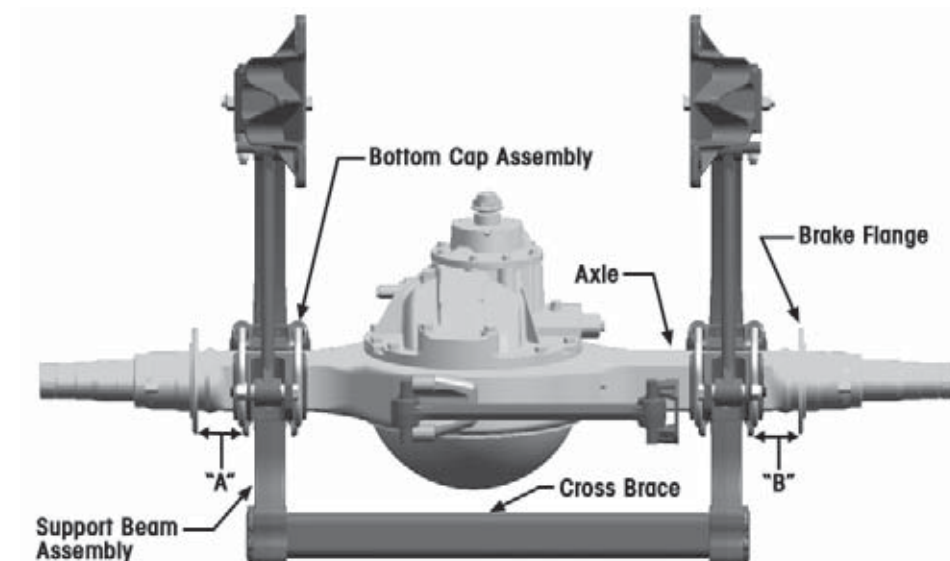
It may be necessary to squeeze the U-bolts slightly to facilitate installation through the bottom axle cap.

3. Install the new U-bolts. Verify that the U-bolts are seated properly in the channels of the top pad and through the bottom cap.

NOTE

Current Hendrickson Truck Suspension Systems U-bolt locknuts for the PRIMAAX EX / PRIMAAX suspension are $\frac{3}{4}$ "-16 Grade C and are phosphate and oil coated.

4. Install the U-bolt $\frac{3}{4}$ " washers and the locknuts and hand tighten, **DO NOT** tighten to torque at this time.

FIGURE 8-34


CAUTION

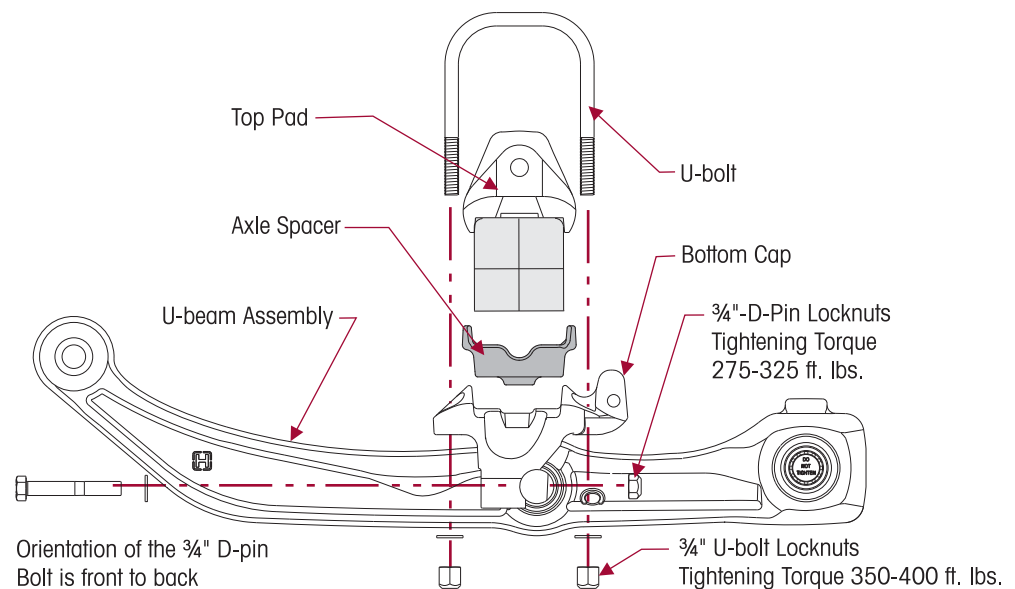
PRIOR TO TIGHTENING THE U-BOLTS TO THE FINAL TORQUE, ENSURE THAT THE CROSS TUBE, SUPPORT BEAM, AND THE BOTTOM CAP ASSEMBLY ARE CENTERED ON THE AXLE ($A = B \pm 1/8"$), SEE FIGURE 8-34. FAILURE TO DO SO COULD CAUSE PREMATURE COMPONENT WEAR OR CAUSE UNEVEN LOAD DISTRIBUTION.

5. Center cross tube, support beam, and the bottom cap assembly on the axle, ($A = B \pm 1/8"$), see Figure 8-34.

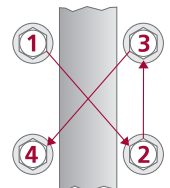
SERVICE HINT

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


6. Raise the support beam and cross tube assembly until the D-pins engage in the bottom cap.
7. Install D-pin fasteners with the bolt heads on the forward side of the bottom cap, see Figure 8-35.

FIGURE 8-35


8. Lower the front differential to allow the full engagement of the D-pins into the bottom caps.
9. Prior to tightening the D-pin fasteners, verify the bottom cap is centered over the support beam.
10. Tighten the D-Pin $3/4"$ locknuts to 275-325 foot pounds torque.

FIGURE 8-36


11. Tighten the U-bolt locknuts evenly in 50 foot pounds increments in the proper pattern to achieve uniform bolt tension, see Figure 8-36.
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 $3/4"$ locknuts to 350-400 foot pounds torque, see Figure 8-35.
13. Pivot the shock back into the lower shock mount and install the lower shock absorber mounting fastener. Tighten the $5/8"$ locknuts to 200-225 foot pounds torque.
14. Install the air spring between the frame and the cross tube.
 - a. **PRIMAAX EX:** Ensure the slot in the bottom of the air spring engages the notch on the top of the beam.
 - b. **PRIMAAX:** Ensure the "V" notch in the end cap engages the air spring locator tab on the air spring.

15. Install the lower air spring mounting bracket around the cross tube, engaging the mounting studs on the air Spring. Using **HAND TOOLS** install the lower mounting fasteners and tighten to  20-30 foot pounds torque.
16. Install the wheels and remove axle support.
17. Remove the jack stands and lower the frame of vehicle.
18. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to deflating or inflating the air system.
19. Connect the leveling valve link rod(s) to the height control valve arm(s) to inflate the suspension.
20. Alignment is necessary anytime the support beam is removed to complete the repair. See Alignment & Adjustments Section of this publication.
21. 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 manufacturers torque specifications.
4. Remove the wheel chocks.

FRAME HANGER



WARNING

THIS PROCEDURE TO REPLACE A FRAME HANGER, IS DONE WITH THE OTHER REMAINING FRAME HANGERS CONNECTED TO THE FRAME AND IT IS ALSO NECESSARY THAT THE SUPPORT BEAMS AND THE LONGITUDINAL TORQUE RODS ARE ATTACHED TO THE OTHER REMAINING FRAME HANGERS. FAILURE TO DO SO COULD CAUSE THE AXLE TO SHIFT RESULTING IN POSSIBLE DAMAGE TO COMPONENTS OR PERSONAL INJURY.

DISASSEMBLY

1. Chock the front wheels.
2. Support the frame.
3. Disconnect the height control valve linkage assembly from the height control valve arm(s) from the rubber grommet (see vehicle manufacturers 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 of this publication prior to deflating or inflating the air system.
5. Lower the leveling valve arm(s) to exhaust the air in the air springs and deflate the rear suspension.

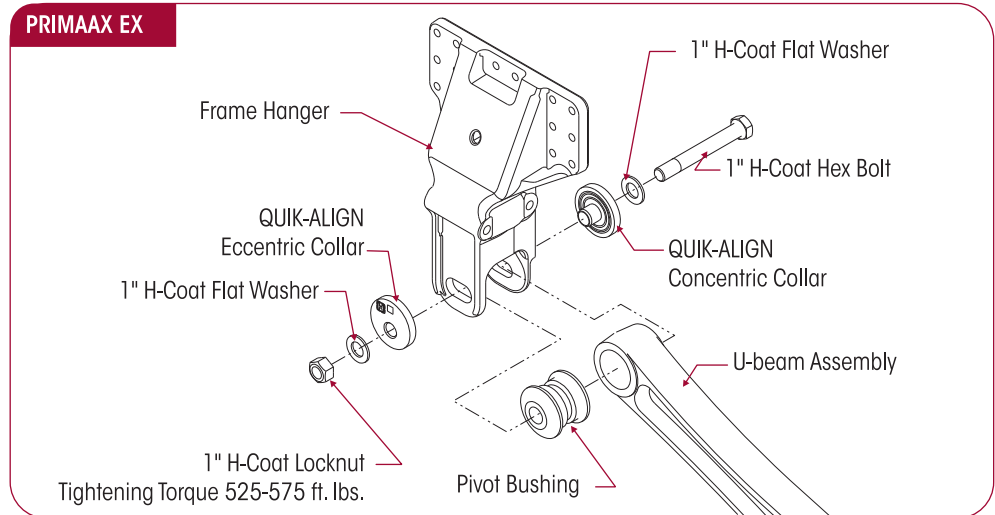

WARNING

SOME VEHICLE APPLICATIONS, SUCH AS VEHICLES EQUIPPED WITH OUTRIGGERS, RETAIN SOME 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.

SERVICE HINT

Mark the position of the QUIK-ALIGN square drive in relationship 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.

6. Remove the QUIK-ALIGN locknut and pivot bolt, see Figure 8-37.

FIGURE 8-37


7. Remove the QUIK-ALIGN collars that connect the support beam to the frame hanger.

SERVICE HINT

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

8. Remove the fasteners that attach the longitudinal torque rod to the frame hanger.
9. Remove the fasteners that attach the frame hanger to the vehicle per vehicle manufacturer specifications.
10. Remove the frame hanger.
11. Inspect mating components for any damage or wear, replace as necessary.
12. Inspect the QUIK-ALIGN pivot bushing and torque rod bushings for wear or damage, replace as necessary.

ASSEMBLY

1. Slide the new frame hanger over the support beam QUIK-ALIGN bushing.
2. Attach the new frame hanger to the vehicle using the appropriate fasteners and tighten per vehicle manufacturer's specifications.



WARNING

DO NOT ASSEMBLE ANY QUIK-ALIGN JOINT WITHOUT THE PROPER FASTENERS. USE ONLY HENDRICKSON DACROMET PLUS XL PLATED FASTENERS TO SUSTAIN THE PROPER CLAMP FORCE. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE OR PERSONAL INJURY AND VOID WARRANTY.

ENSURE THAT THE QUIK-ALIGN FASTENERS TORQUE VALUE IS SUSTAINED AS RECOMMENDED IN THE TORQUE SPECIFICATIONS SECTION OF THIS PUBLICATION. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL RESULTING IN PERSONAL INJURY OR PROPERTY DAMAGE.


NOTE

Use a new support beam QUIK-ALIGN Bolt Kit (see Parts List Section of this publication) for any axle alignment or disassembly of the QUIK-ALIGN connection. This ensures that the proper clamp load is applied to the connections, so that the joints will not slip in service.

3. Install the new QUIK-ALIGN collars with the eccentric collar on the outboard side of the vehicle, see Figure 8-37, and the new mounting hardware that attach the support beam to the frame hanger. Verify that the nose of each QUIK-ALIGN collar is installed correctly into pivot bushing sleeve, and the flanged side is flat against the frame hanger face within the alignment guides. Snug QUIK-ALIGN locknuts to  100 foot pounds torque.
4. Install the torque rod mounting fasteners and reinstall any shims that were removed during disassembly. Tighten fasteners as per vehicle manufacturer's specifications.
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. Connect the leveling valve link rod(s) to the height control valve arm(s) to inflate the suspension.
7. Remove the support from the support beam assembly.
8. 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 1.0" QUIK-ALIGN locknuts to torque specifications.

9. After the correct alignment of the axle is verified tighten the 1" QUIK-ALIGN locknuts to  525-575 foot pounds torque.
10. Verify the correct pinion angle on the axle per original equipment manufacturers specifications. Adjust as necessary per the Alignment & Adjustments Section of this publication.
11. Remove the chocks from the front wheels.

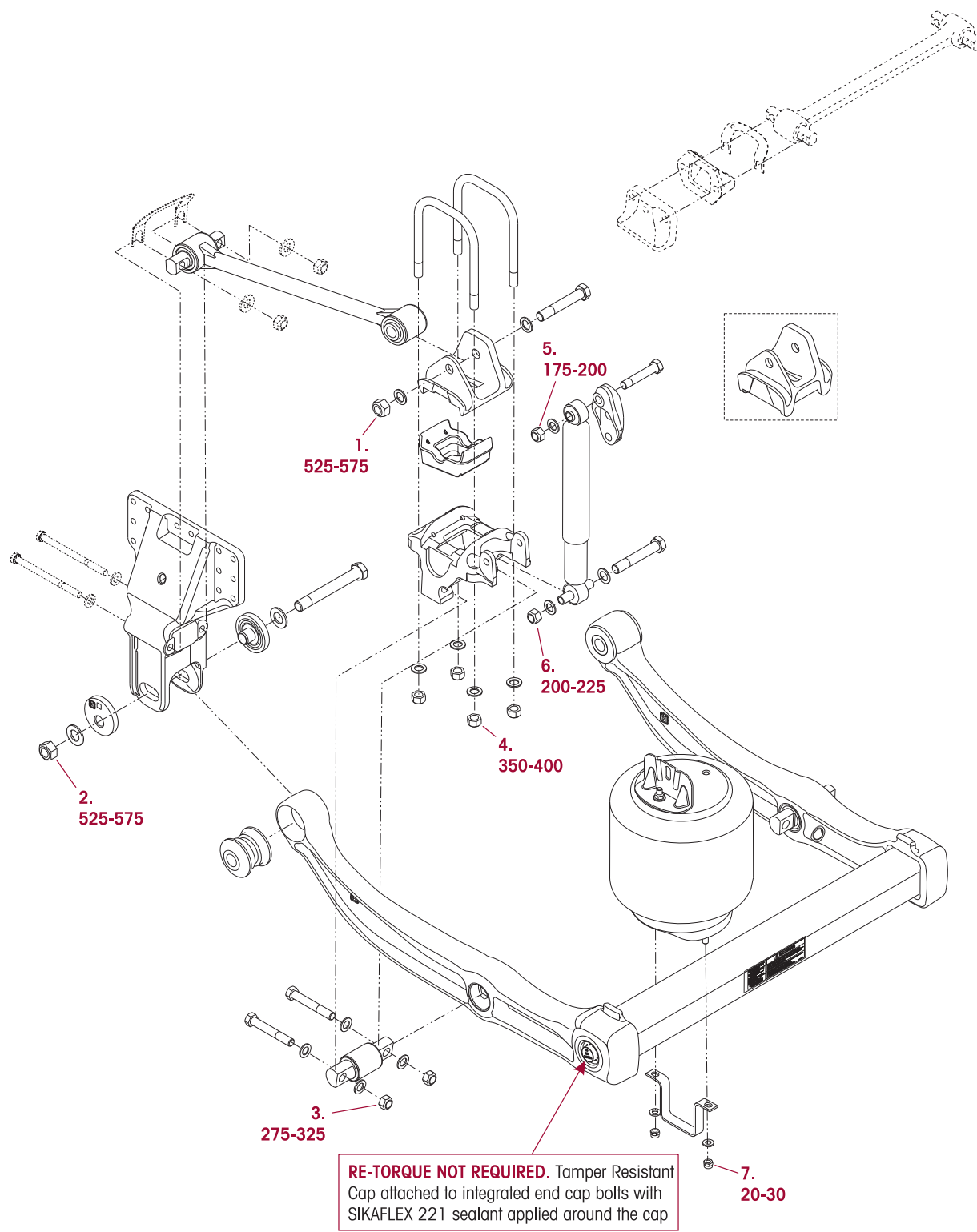


SECTION 9

Torque Specifications

PRIMAAX EX

HENDRICKSON RECOMMENDED TORQUE VALUES
PROVIDED IN FOOT POUNDS



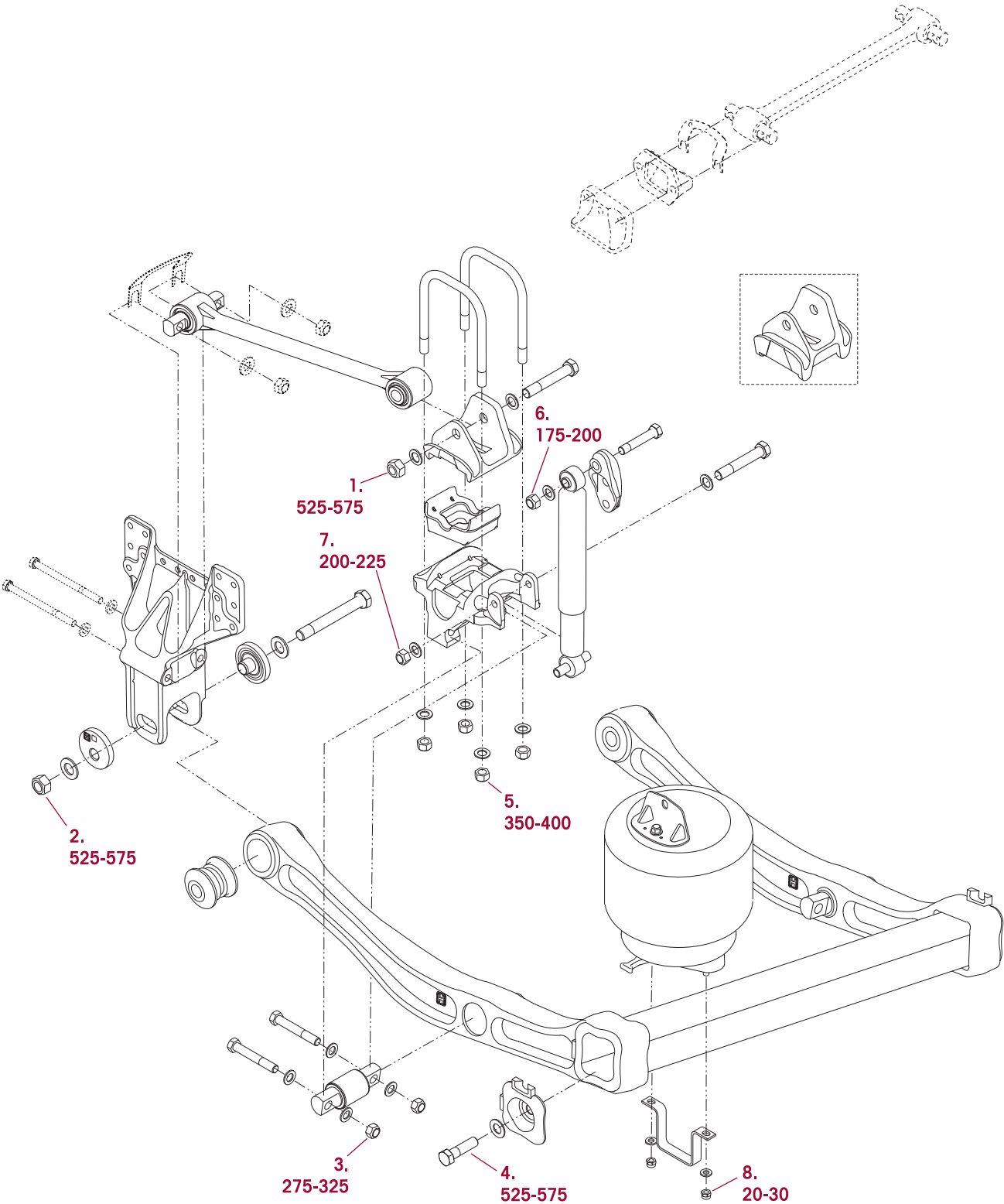


PRIMAAX EX for Volvo Vehicles

HENDRICKSON RECOMMENDED TORQUE SPECIFICATIONS				
NO	COMPONENT	*QUANTITY	SIZE	**TORQUE VALUE (in foot pounds)
	Frame fasteners are furnished and installed by the vehicle manufacturer. Vehicle manufacturer may use an equivalent HUCK fastener at frame mount. See vehicle manufacturer for torque requirements.			
1	Longitudinal Torque Rod To Top Pad	2	7/8"-14 UNF	***525-575
2	U-beam Assembly To QUIK-ALIGN Bushing	2	1"-8 UNC	***525-575
3	U-beam Assembly To Center D-pin Bushing	4	3/4"-16 UNF	275-325
4	U-bolt Locknuts	8	3/4"-16 UNF	***350-400
5	Upper Shock Mount Locknuts	2	3/4"-10 UNC	175-200
6	Lower Shock Mount Locknuts	2	5/8"-11 UNC	200-225
7	Air Spring Assembly To Lower Air Spring Mounting Bracket	4	1/2"-13 UNC	20-30
NOTE: * Quantities shown are per axle. Double for tandem, triple for tridem. ** Torque values shown apply only if Hendrickson supplied fasteners are used. If non Hendrickson fasteners are used, follow the torque specification listed in vehicle manufacturer's service manual. **** See Preventive Maintenance Section of this publication for re-torque intervals.				

PRIMAAX

HENDRICKSON RECOMMENDED TORQUE VALUES
PROVIDED IN FOOT POUNDS





PRIMAAX for Volvo Vehicles

HENDRICKSON RECOMMENDED TORQUE SPECIFICATIONS				
NO	COMPONENT	*QUANTITY	SIZE	**TORQUE VALUE (in foot pounds)
	Frame fasteners are furnished and installed by the vehicle manufacturer. Vehicle manufacturer may use an equivalent HUCK fastener at frame mount. See vehicle manufacturer for torque requirements.			
1	Longitudinal Torque Rod to Top Pad	2	7/8"-14 UNF	525-575
2	U-beam Assembly to QUIK-ALIGN Bushing	2	1"-8 UNC	525-575
3	U-beam Assembly to Center D-pin Bushing	4	3/4"-16 UNF	275-325
4	U-beam Assembly to Cross Tube End Cap	2	7/8"-9 UNC	525-575
5	U-bolt Locknuts	8	3/4"-16 UNF	***350-400
6	Upper Shock Mount Locknuts	2	3/4"-10 UNC	175-200
7	Lower Shock Mount Locknuts	2	5/8"-11 UNC	200-225
8	Air Spring Assembly to Lower Air Spring Mounting Bracket	4	1/2"-13 UNC	20-30
NOTE: * Quantities shown are per axle. Double for tandem, triple for tridem. ** Torque values shown apply only if Hendrickson supplied fasteners are used. If non Hendrickson fasteners are used, follow the torque specification listed in vehicle manufacturer's service manual. *** See Preventive Maintenance Section of this publication for re-torque intervals.				

SECTION 10

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 air system and check ride height. See Ride Height Adjustment in the Alignment & Adjustments Section.
	Ride height set incorrectly	Adjust ride height to proper setting. See Ride Height Adjustment in the Alignment & Adjustments Section.
	Suspension is overloaded	Redistribute load to correct weight.
	Broken support beam	Replace broken support beam assembly.
Irregular tire wear	Incorrect tire inflation pressure	Correct tire pressure per vehicle manufacturer and tire manufacturer specifications.
	Worn QUIK-ALIGN bushing	Replace QUIK-ALIGN bushing.
	Loose QUIK-ALIGN attachment	Replace QUIK-ALIGN connection, and check vehicle alignment. Adjust if necessary. Check frame hanger for wear around QUIK-ALIGN plates and replace if necessary.
	Worn torque rod bushings	Replace torque rod bushings as necessary.
Excessive driveline vibration	Incorrect pinion angle(s)	Adjust pinion angle(s), refer to the Vehicle Manufacturer for specifications.
	Ride height set incorrectly	Adjust ride height to proper setting. See Ride Height Adjustment in the Alignment & Adjustments Section.
	Broken support beam	Replace support beam assembly.
Suspension is noisy	Loose QUIK-ALIGN attachment	Replace QUIK-ALIGN connection, and check suspension alignment, adjust if necessary.
	Loose U-bolts	Tighten U-bolts to specifications, see Preventive Maintenance Section.
	Loose end caps	Inspect end caps and the support beam to cross tube connection for damage. Repair as necessary, re-torque end cap to specification, see Torque Specifications Section.
	Worn torque rod bushings	Replace torque rod bushings as necessary.
Vehicle bouncing excessively	Damaged or leaking shock absorber	Replace shock absorber.
	Ride height set incorrectly	Adjust ride height to proper setting. See Ride Height Adjustment in the Alignment & Adjustments Section.
Vehicle leaning	Air spring not inflated to specification or damaged	Repair air system and check ride height. See Ride Height Adjustment in the Alignment & Adjustments Section.
	Load not centered	Redistribute the load.
	Frame twisted	Straighten the frame per vehicle manufacturer guidelines.
	Broken support beam	Replace broken support beam assembly.
	Axle housing bent or broken	Replace axle housing per vehicle manufacturer guidelines and align vehicle.
	Loose U-bolts	Tighten U-bolts to specifications, see Preventive Maintenance Section.
	Front suspension	Inspect and repair front suspension.

**PRIMAAX EX • PRIMAAX TROUBLESHOOTING GUIDE (CONT.)**

CONDITION	POSSIBLE CAUSE	CORRECTION
Suspension will not reach ride height	Suspension is overloaded	Redistribute load to correct weight.
	Air Spring leaking or damaged	Replace air spring.
	Leak in air system	Inspect air fittings, see Air Fitting Inspection in the Preventive Maintenance Section of this publication. If necessary, repair air system and check ride height. See the vehicle manufacturer for proper ride height adjustment.
	Air line obstructed or improperly connected	Repair air system and check ride height. See the vehicle manufacturer for proper ride height adjustment.
	Height control valve dump port activated	Check height control valve dump port for proper connection and function
Air springs deflate when parked	Leak in air system	Inspect air fittings, see Air Fitting Inspection in the Preventive Maintenance Section of this publication. If necessary, repair air system and check ride height. See the vehicle manufacturer for proper ride height adjustment.
	Malfunctioning height control valve	Replace height control valve per the vehicle manufacturer's guidelines.
Excessive frame slope	Ride height set incorrectly	Adjust the vehicle's front and rear ride height to the proper setting per the vehicle manufacturer's guidelines.
	Suspension is overloaded	Redistribute load to correct weight.

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