

H TECHNICAL PROCEDURE

PRIMAAX® EX / PRIMAAX® Rear Air Suspension for International Truck 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 PRIMAAX® EX / PRIMAAX® rear suspension systems as installed on applicable International Truck vehicles.

NOTE

Use only  Hendrickson Genuine parts for servicing this suspension system.

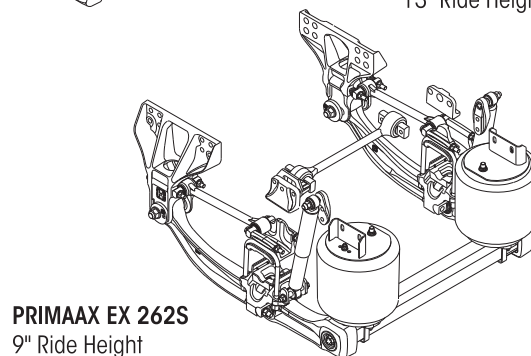
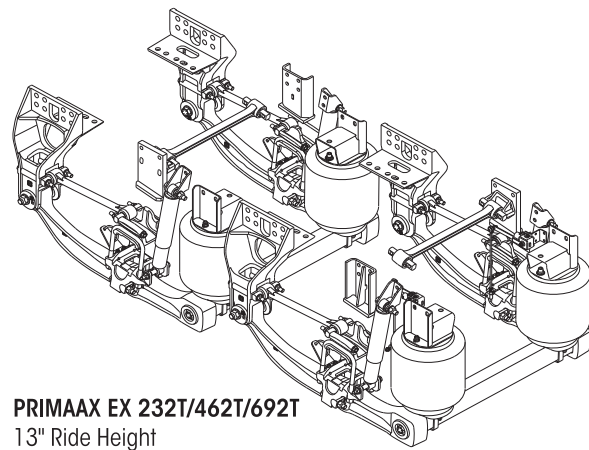
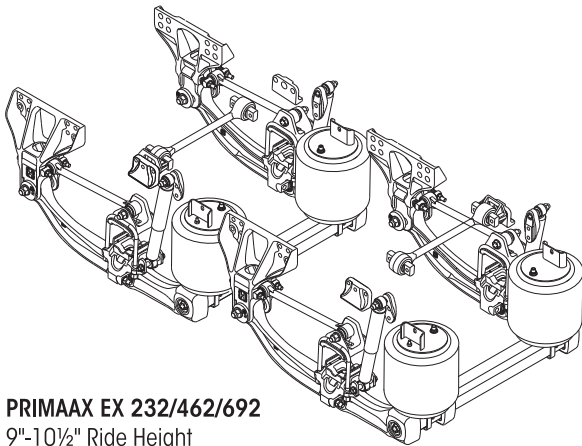
It is important to read and understand the entire Technical Procedure publication prior to performing any maintenance, service, repair, or rebuild of this product. The information in this publication contains parts lists, safety information, product specifications, features, proper maintenance, service,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

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



U.S. and foreign patents pending.



PRIMAAX EX — MAAximize the performance of vocational and heavy-haul vehicles with a suspension engineered specifically for demanding on- and off- road conditions including, but not limited to: truck, tractor, dump, front and rear discharge mixer, crane, refuse, drilling rig, logging, platform, specialty and vehicles equipped with outriggers*. With more than 95 years of robust suspension design, Hendrickson delivers another premium suspension with PRIMAAX EX. Rugged, dependable and extensively tested in challenging applications, PRIMAAX EX paves a new road for suspension technology.

- **Structural beams and cross beams** — Advanced structural beams utilize premium materials for high durability and reliability. Structural beams include integrated end caps that form a solid connection with the square cross tube to form a rigid torsion system for improved stability and control.
- **Unique suspension geometry** — Optimized suspension geometry contributes to more than twice the roll stability of competitive air suspensions, helps improve handling and roll stiffness for expanded applications, and significantly controls suspension-induced driveline vibration.
- **Large volume air springs** — Reduce noise, vibration and harshness to cab, chassis and body equipment for reduced total vehicle maintenance. Also reduce air pressure required to lift and support loads.
- **QUICK-ALIGN®** — Hendrickson's proven QUICK-ALIGN axle alignment system helps save time and money – offers a fast method to ensure proper alignment to reduce maintenance time and help extend tire life.
- **D-pin axle connection and clamp group** — Reduces stress input into the axle housing by transferring the torsional loads to the integrated stabilizer system, which helps extend axle and joint service life.
- **Heavy-duty shock absorbers** — Positioned and tuned for optimum damping characteristics and also protect air springs from overextension.
- **Premium heavy-duty torque rods and bushings** — The three-rod configuration reduces axle stress, welding and complexity. Optimized configuration contributes to exceptional handling. Premium rubber bushings increase service life and resistance to bushing walkout.

* Some vehicle configurations, such as vehicles equipped with outriggers, may require alternate suspension air valving. Contact vehicle manufacturer or Hendrickson for more information.

**PRIMAAX® EX SPECIFICATIONS**

	PAX 232	PAX 232T	PAX 262S	PAX 462	PAX 462T	PAX 692	PAX 692T
Rating	23,000 lbs.	23,000 lbs.	26,000 lbs.	46,000 lbs.	46,000 lbs.	69,000 lbs.	69,000 lbs.
Installed Weight¹	558 lbs.	624 lbs.	578 lbs.	1,116 lbs.	1,248 lbs.	1,674 lbs.	1,873 lbs.
Axle Configuration	Single	Single	Single	Tandem	Tandem	Tridem	Tridem
GCW Approval²	95,000 lbs.	95,000 lbs.	142,000 lbs.	190,000 lbs.	190,000 lbs.	*	*
Site Travel Rating³	30,000 lbs.	30,000 lbs.	33,000 lbs.	60,000 lbs.	60,000 lbs.	90,000 lbs.	90,000 lbs.
Axle Travel⁴	8"	8"	8"	8"	8"	8"	8"
Ground Clearance⁵	9.25"	9.25"	9.25"	9.25"	9.25"	9.25"	9.25"
Lift Axles	Approved	Approved	Approved	Approved	Approved	Approved	Approved
Ride Heights⁶	9", 10½"	13"	9"	9", 10½"	13"	9", 10½"	13"
Engine Torque Restrictions	None	None	None	None	None	None	None
Axle Spacing	N/A	N/A	N/A	52"- 72.5"	52"- 72.5"	52"- 60"	52"- 60"

* See vehicle manufacturer's recommendations.

1. Installed weight includes complete suspension, torque rods, axle and frame brackets and all hardware. Published weight is based on a standard PRIMAAX EX suspension compatible with drum brakes. Other configurations may vary.
2. Contact Hendrickson or vehicle manufacturer for applications that may exceed GVW / GCW approval ratings.
3. Site travel rating — operators using vehicles equipped with liftable pusher 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.
4. Axle travel may be limited by vehicle manufacturer; axle stop settings and shock absorber stroke may restrict suspension's articulation. Varying ride heights and configurations may restrict travel.
5. Ground clearance is based on a standard PRIMAAX EX suspension with 11R22.5 tire size (19.6" SLR).
6. For different ride height options, please contact Hendrickson, your truck manufacturer or 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 the manufacturer's warranty.

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

■ EXPLANATION OF SIGNAL WORDS

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



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

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



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



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



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

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

SERVICE HINT A helpful suggestion that will make the servicing being performed a little easier and/or faster. Also note that particular service operations may require the use of special tools designed for specific purposes. These special tools can be found in the "Special Tools" Section of this publication.



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

■ SAFETY PRECAUTIONS

WARNING

FASTENERS

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

LOOSE OR OVER TORQUED FASTENERS CAN CAUSE COMPONENT DAMAGE, LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE, OR SEVERE PERSONAL INJURY. MAINTAIN CORRECT TORQUE VALUE AT ALL TIMES. CHECK TORQUE VALUES ON A REGULAR BASIS AS SPECIFIED, USING A 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 HENDRICKSON GENUINE FASTENERS WITH SPECIAL COATING (H-COAT) 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, SUCH AS LIFTABLE AXLES, 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 U-BEAM ASSEMBLY. DO NOT NICK OR GOUGE THE SUPPORT BEAM. SUCH IMPROPER ACTIONS CAN DAMAGE THE U-BEAM ASSEMBLY AND CAUSE LOSS OF VEHICLE CONTROL AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.



WARNING

SHOCK ABSORBERS

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



WARNING

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



CAUTION

AIR SPRING LOWER MOUNTING STUDS

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



WARNING

AIR SPRING PRESSURE RETENTION

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



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

TRANSVERSE 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 AND POSSIBLE TIRE CONTACT WITH THE FRAME. OPERATING A VEHICLE WITH NON-FUNCTIONAL TRANSVERSE TORQUE RODS CAN RESULT IN LOSS OF VEHICLE CONTROL, SEVERE PERSONAL INJURY, AND PREMATURE COMPONENT DAMAGE.

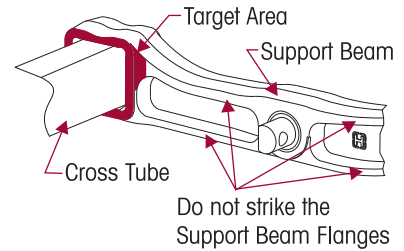


WARNING

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

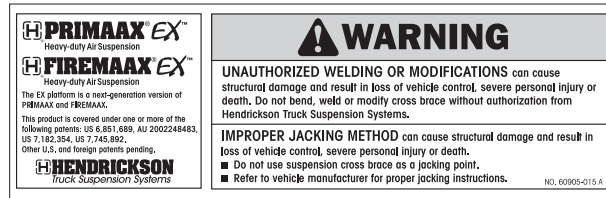


WARNING

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 Label number 60905-015



REPLACE ANY SAFETY DECALS THAT ARE FADED, TORN, MISSING, ILLEGIBLE, OR OTHERWISE DAMAGED. CONTACT HENDRICKSON TO ORDER REPLACEMENT LABELS.

- DO NOT USE THE SUSPENSION CROSS TUBE AS A JACKING POINT TO RAISE THE VEHICLE, SEE FIGURE 3-3.
- REFER TO VEHICLE MANUFACTURER FOR PROPER JACKING INSTRUCTIONS, SEE FIGURE 3-4.

FIGURE 3-3



FIGURE 3-4



WARNING

PERSONAL PROTECTIVE EQUIPMENT

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

WARNING

WORK SITE DUMPING



BEFORE THE TRUCK/TRAILER BODY/BOOM/AND OR ATTACHMENT IS LIFTED IT IS MANDATORY TO COMPLETELY EXHAUST THE AIR FROM THE REAR SUSPENSION SYSTEM AND AUXILIARY AXLE (IF EQUIPPED) TO HELP PROVIDE STABILITY. 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 OR TRUCK AIR SUSPENSION SYSTEMS PRIOR TO RAISING THE BODY / BOOM OR ATTACHMENTS. FOLLOW THE VEHICLE MANUFACTURER'S OPERATING INSTRUCTIONS FOR MAINTAINING PROPER STABILITY.



WARNING

PARTS CLEANING

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

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

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

SECTION 4 Parts Lists

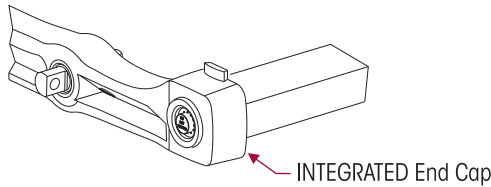
■ Technical Notes

The following information is intended to assist in determining which suspension is equipped on the vehicle on vehicle. As an example, in Figure 4-1, the end cap identifies if the suspension is a PRIMAAX EX or a PRIMAAX, Figure 4-2 identifies suspension capacity, and Figure 4-3 identifies the ride height.

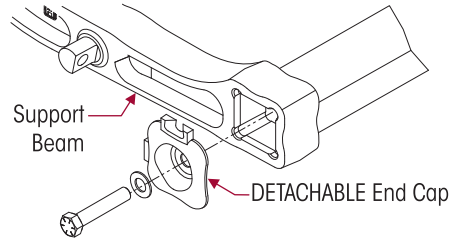
PRIMAAX EX / PRIMAAX

FIGURE 4-1

PRIMAAX EX | Enhanced U-beam Assembly with Integrated End Cap



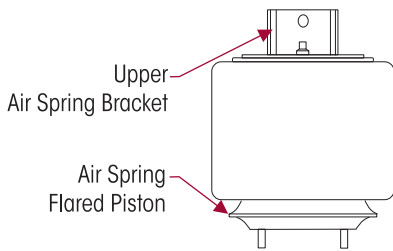
PRIMAAX | Support Beam with Detachable End Cap



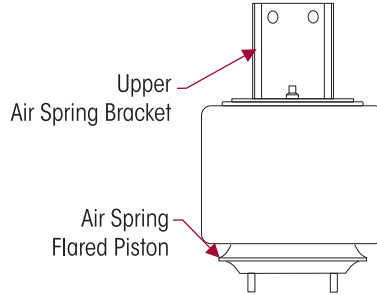
SUSPENSION RATING / CAPACITY

FIGURE 4-2

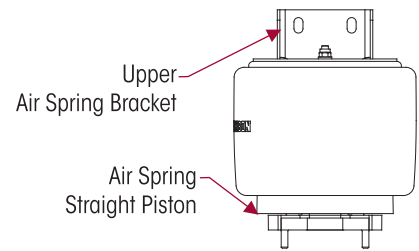
PRIMAAX EX 232/462/692



PRIMAAX EX 232T/462T/692T



PRIMAAX EX 262S

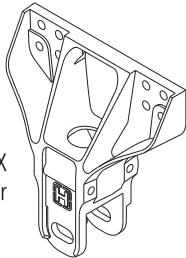


RIDE HEIGHT

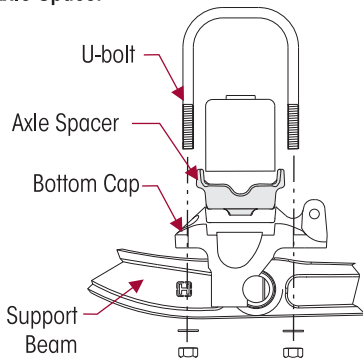
FIGURE 4-3

9" Ride Height

PRIMAAX EX / PRIMAAX
Frame Hanger

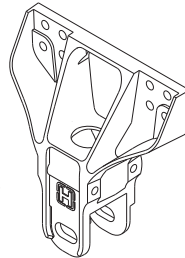


AND
Axle Spacer

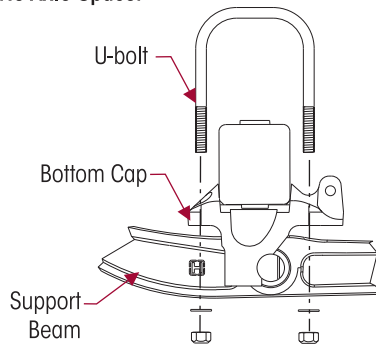


10½" Ride Height

PRIMAAX EX
Frame Hanger

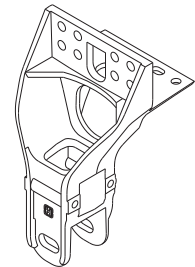


AND
No Axle Spacer

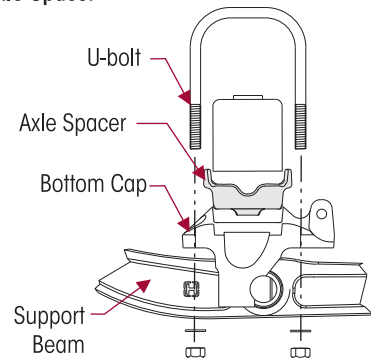


13" Ride Height

PRIMAAX EX
Frame Hanger

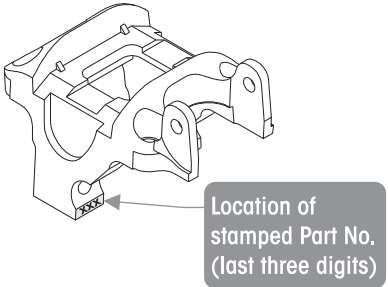


AND
Axle Spacer





■ Bottom Cap and Longitudinal Torque Rod Assembly and Torque Rod Spacer

PRIMAAX EX 232/462/692• PRIMAAX 230/460/690				
BOTTOM CAP	PINION ANGLE	BOTTOM CAP PART NO. (2 per axle)	LONGITUDINAL TORQUE ROD ASSEMBLY PART NO. (2 per axle)	TORQUE ROD SPACER PART NO. (4 per axle)
<p>■ Ride Height 9", 10½", 13"</p> <p>Locate the part number stamped on the bottom cap</p> 	**2.54	60556-035	*67274-510	**
	3.61			67045-072
	4.56			67045-071
	5.72			67045-070
	6.71			67045-069
	**6.62	60556-100	*67274-540	**
	7.67			67045-072
	8.62			67045-071
	9.77			67045-070
	10.75			67045-069
	**7.07	60556-105	*67274-540	**
	8.12			67045-072
	9.06			67045-071
	10.22			67045-070
	11.20			67045-069

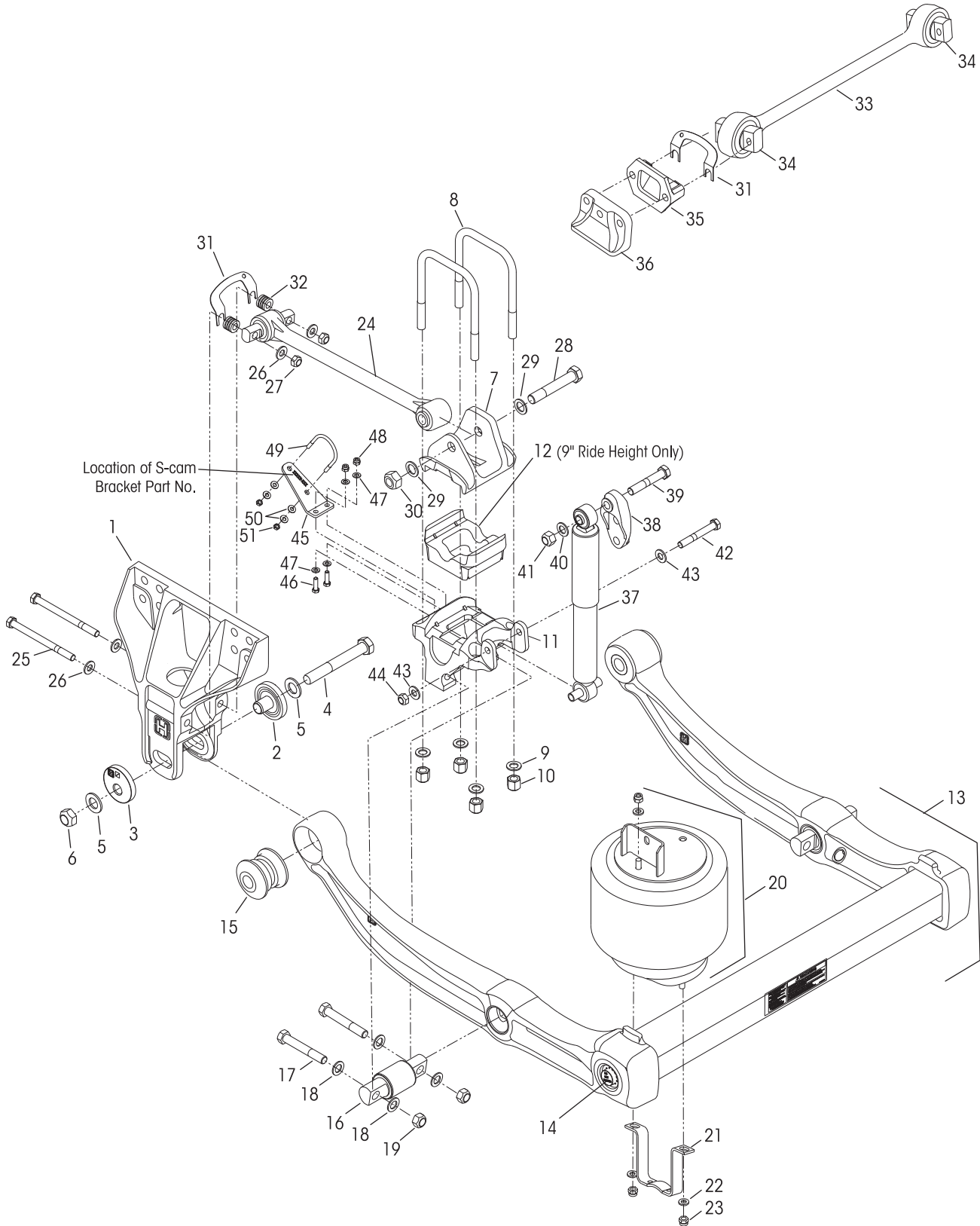
* Torque rod bushings are non-serviceable, replacement requires complete torque rod assembly with bushings.
 ** Torque rod spacer not required.

■ U-beam Assembly Enhancement Aftermarket Service Kit

PRIMAAX EX SERIES			
U-beam Assembly Enhancement Aftermarket Service Kit No. 69565-001, Axle Set			
PART NO.	DESCRIPTION	QTY.	COMMENTS
69351-000	Sikaflex 221 Polyurethane Sealant, 300 ml Tube	1	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.
69432-000	Tamper Resistant Cap	2	
69570-000	Loctite® 277 - 10 ml Bottle	1	
50104-006	⅝"-9 UNC 4.0" Hex Bolt	2	
22962-042	⅝" H-Coat Flat Washer	2	



■ 9", 10½" Ride Height





PRIMAAX® EX 232/462/692 for International Truck Vehicles

KEY NO.	PART NO.	DESCRIPTION	*NO.REQ.	KEY NO.	PART NO.	DESCRIPTION	*NO.REQ.
1	67706-000	EX Frame Hanger	4	17		¾"-16 UNF Bolt	8
	60632-020	QUIK-ALIGN Pivot Bushing Service Kit, AXLE Set , Includes Key Nos. 2-6, 15 <i>Replaces 60632-008</i>		a	21867-036	Length 5.0"	
	60632-021	QUIK-ALIGN Collar Service Kit, Axle Set , Includes Key Nos. 2-6, <i>Replaces 60632-012</i>		b	21867-026	Length 5.5"	
	60632-019	QUIK-ALIGN Collar Service Kit, One Wheel End , Includes Key Nos. 2-6, <i>Replaces 60632-006</i>		c	21867-043	Length 4.75"	
	60632-018	QUIK-ALIGN Pivot Bolt Service Kit, One Wheel End , Includes Key Nos. 4-6 <i>Replaces 60632-005</i>		18	22962-001	¾" Flat Washer	16
2	64633-000	QUIK-ALIGN Concentric Collar	4	19	30191-000	¾"-16 UNF Locknut	8
3	64632-000	QUIK-ALIGN Eccentric Collar	4		60961-664	Single Air Spring Service Kit , Includes Key Nos. 20-23	
4	68217-000	1.0"-14 UNF-2A H-Coat 7.5" Hex Bolt	4	20	67234-002	Air Spring Assembly, Includes Upper Frame Bracket and Fasteners	4
5	68232-000	1.0" H-Coat Flat Washer,	8	21	60911-002	Lower Air Spring Mounting Bracket	4
6	68218-000	1.0"-14 UNF-2B H-Coat Locknut	4	22	22962-014	½" Flat Washer	8
7	65290-001	Top Pad	4	23	17700-010	½"-13 UNC Locknut	8
	48718-108	U-bolt Service Kit, One Wheel End , 10½" Ride Height, Includes Key Nos. 8a,9-10		24		Longitudinal Torque Rod Assembly, See table on page 11	1
	48718-125	9" Ride Height, Includes Key Nos. 8b,9-10			49176-026	Longitudinal Torque Rod Fastener Service Kit, One Torque Rod , Includes Key Nos. 25-30	
8		¾" Square U-bolt	8	25	32043-016	⅝"-11 UNC-2B 8.0" Bolt	16
a	59367-002	10½" Ride Height, 8.825" Length		26	22962-004	⅝" Flat Washer	32
b	59367-004	9" Ride Height, 10.375" Length		27	47764-000	⅝"-11 UNC-2A Locknut	16
9	22962-001	¾" Flat Washer	16		58821-012	Longitudinal Torque Rod Rear Bolt Service Kit, One Torque Rod , Includes Key Nos. 28-30	
10	49685-000	¾"-16 UNF U-bolt Locknut	16	28	30418-009	⅞"-14 UNF-2A 5.5" Hex Bolt	4
11		Bottom Cap - Front and Rear (Casting No. 60272-000), See table on page 11	4	29	22962-034	⅞" H-Coat Flat Washer	8
12	65139-003	Axle Spacer, 9" Ride Height	4	30	29248-000	⅞"-14 UNF-2B Locknut	4
13		U-beam Assembly, Includes Key Nos. 15-16	2	31	49689-000	Shim (As Required)	
		• Front		32	67045-	Torque Rod Spacer, See table on page 11	
	67249-004	34.0" Frame Width		33	72000-XXXX	**ULTRA ROD® PLUS™ Transverse Torque Rod Assembly, Includes Key No. 34, Specify length in mm	2
	67249-012	34.3" Frame Width		34	64400-002L	Bushing - Straddle Bar Pin (⅝" Holes)	4
	67249-010	34.5" Frame Width		35	22186-000	Transverse Torque Rod Frame Bracket	2
	67249-024	34.8" Frame Width		36	60593-000	Axle Stop, Frame Mounted	4
	67249-018	35.0" Frame Width		37	60657-003	Shock Absorber	4
		• Rear		38	67463-002	Upper Shock Frame Bracket	4
	67249-003	34.0" Frame Width			50754-030	Single Shock Fastener Service Kit , Includes Key Nos. 39-44	
	67249-011	34.3" Frame Width		39	50764-010	¾"-10 UNC 4.25" Upper Shock Bolt	4
	67249-009	34.5" Frame Width		40	22962-001	¾" Flat Washer	4
	67249-023	34.8" Frame Width		41	49842-000	¾"-10 UNC Locknut	4
	67249-017	35.0" Frame Width		42	32043-017	⅝"-11 UNC 6.0" Lower Shock Bolt	4
14	69565-001	U-beam Assembly Enhancement Aftermarket Service Kit , See page 11 for contents		43	22962-004	⅝" Flat Washer	8
15	58648-000	QUIK-ALIGN Pivot Bushing	4	44	47764-000	⅝"-11 UNC-2B Locknut	4
	34013-107	Includes Key Nos. 16, 17a, 18-19		45	64508-XXX	S-cam Support Bracket See Part No. on component	4
	34013-116	Includes Key Nos. 16, 17b, 18-19		46	58035-004	⅝"-16 UNC 1.25" Hex Bolt	8
	34013-117	Includes Key Nos. 16, 17c, 18-19		47	22962-015	⅜" Hardened Washer	16
16	60383-000	D-Pin Bushing	4	48	17700-006	⅜"-16 UNC Locknut	8
		D-Pin Fastener Service Kit, Axle Set , Includes Key Nos. 17a, 18-19		49	64202-000	⅝"-16 S-Cam U-bolt	4
	56659-009	Includes Key Nos. 17a, 18-19		50	22962-029	⅝"-16 Hardened Washer	16
	56659-013	Includes Key Nos. 17b, 18-19		51	59016-000	⅝"-18 UNC Locknut	8
	56659-012	Includes Key Nos. 17c, 18-19					

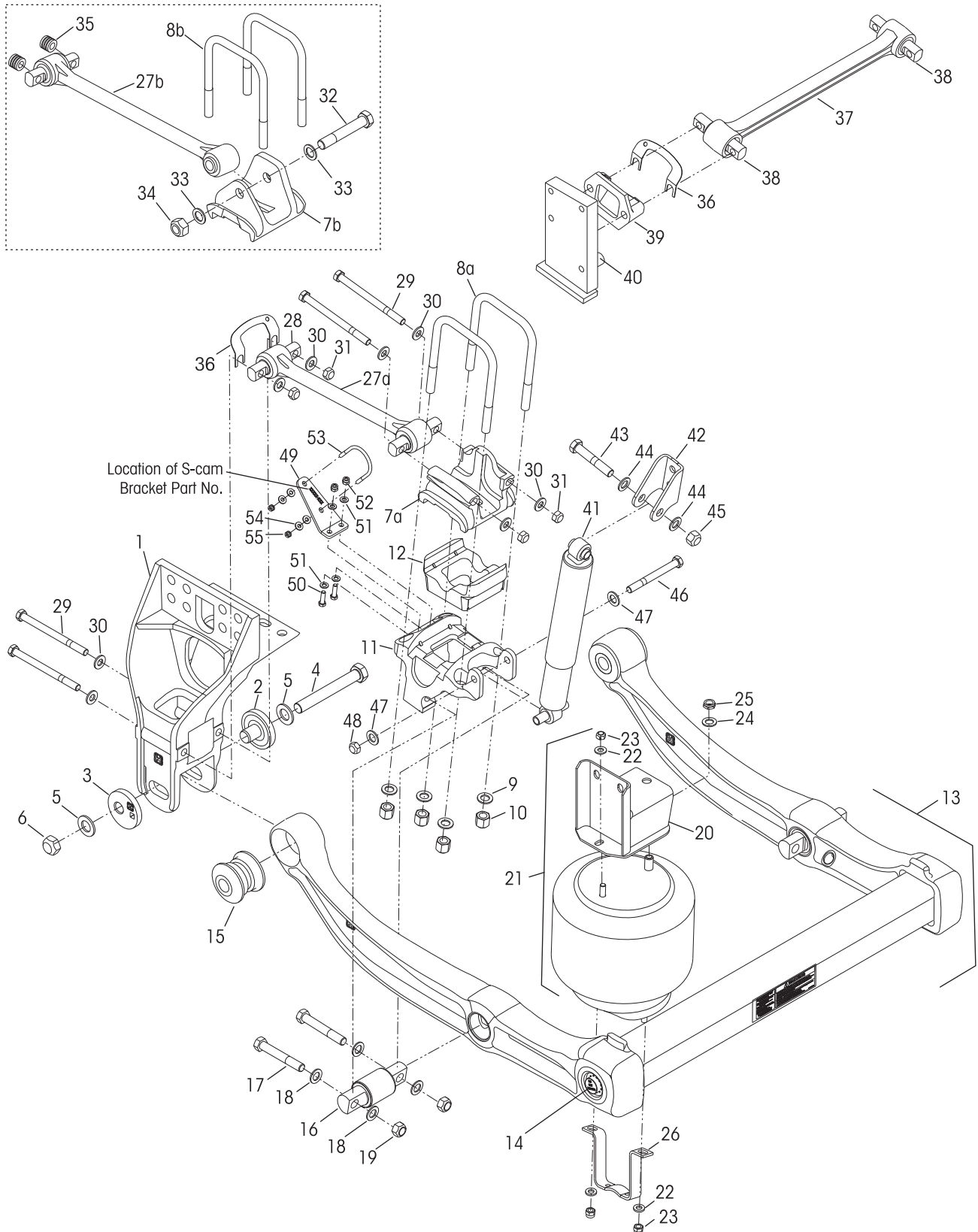
NOTES

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

** Transverse Rods are mandatory for PRIMAAX EX • PRIMAAX suspensions regardless of axle spacing, see Literature No. 59310-004 for more information.



■ 13" Ride Height





PRIMAAX® EX 232T/462T/692T for International Truck Vehicles

KEY NO.	PART NO.	DESCRIPTION	*NO.REQ.	KEY NO.	PART NO.	DESCRIPTION	*NO.REQ.
1		EX Frame Hanger	4	18	22962-001	¾" Flat Washer	16
	67299-001	LH		19	30191-000	¾"-16 UNF Locknut	8
	67299-002	RH			60961-666	Single Air Spring Service Kit, Includes Key Nos. 20-26	
	60632-020	QUIK-ALIGN Pivot Bushing Service Kit, AXLE Set, Includes Key Nos. 2-6, 15 <i>Replaces 60632-008</i>		20	65031-001	Upper Air Spring Bracket Assembly	4
	60632-021	QUIK-ALIGN Collar Service Kit, Axle Set, Includes Key Nos. 2-6, <i>Replaces 60632-012</i>		21	67923-002	Air Spring Assembly, Includes Upper Frame Bracket and Fasteners	4
	60632-019	QUIK-ALIGN Collar Service Kit, One Wheel End, Includes Key Nos. 2-6, <i>Replaces 60632-006</i>		22	22962-014	½" Flat Washer	12
	60632-018	QUIK-ALIGN Pivot Bolt Service Kit, One Wheel End, Includes Key Nos. 4-6 <i>Replaces 60632-005</i>		23	17700-010	½"-13 UNC Locknut	12
2	64633-000	Support Beam QUIK-ALIGN Concentric Collar	4	24	22962-001	¾" Flat Washer	4
3	64632-000	Support Beam QUIK-ALIGN Eccentric Collar	4	25	17700-031	¾"-16 UNF Locknut	4
4	68217-000	1.0"-14 UNF-2A H-Coat 7.5" Hex Bolt	4	26	60911-002	Lower Air Spring Mounting Bracket	4
5	68232-000	1.0" H-Coat Flat Washer	8	27		Longitudinal Torque Rod Assembly, Includes Bushings. Measure length in mm	2
6	68218-000	1.0"-14 UNF-2B H-Coat Locknut	4		a	62043-430N Length 430 mm	2
7 a	65289-000	Top Pad, Bar Pin Style	4		a	62039-440N Length 440 mm	
b	65290-001	Top Pad, Through Bolt Style	4		a	62040-475N Length 475 mm	
		U-bolt Service Kit, One Wheel End, Includes Key Nos. 8a, 9-10 (Bar Pin Style)			b	67274-510 Length 510 mm	
	48718-130	Includes Key Nos. 8a, 9-10 (Bar Pin Style)			b	67274-540 Length 540 mm	
	48718-125	Includes Key Nos. 8b, 9-10 (Through Bolt Style)		28	47691-000L	Torque Rod Bushing - Bar Pin	8
8 a	59367-014	¾" Square U-bolt (Bar Pin Style)	8		49176-026	Longitudinal Torque Rod Fastener Service Kit, One Torque Rod, Through Bolt Style, Includes Key Nos. 29-34	
b	59367-004	¾" Square U-bolt (Through Bolt Style)	8		49176-032	Longitudinal Torque Rod Fastener Service Kit, Axle Set, Bar Pin Style, Includes Key Nos. 29-31	
9	22962-001	¾" Flat Washer	16	29	32043-016	⅝"-11 UNC 8.0" Bolt	16
10	49685-000	¾"-16 UNF U-bolt Locknut	16	30	22962-004	⅝" Flat Washer	32
11	60556-	Bottom Cap, See page 11 for stamped part number location	4	31	47764-000	⅝"-11 UNC Locknut	16
12	65139-003	Axle Spacer (required)	4		58821-012	Longitudinal Torque Rod Rear Bolt Service Kit, One Torque Rod, Through Bolt Style, Includes Key Nos. 32-34	
13		U-beam Assembly, Includes Key Nos. 15-16	2	32	30418-009	⅞"-14 UNF-2A 5.5" Hex Bolt	4
		• Front		33	22962-034	⅞" H-Coat Flat Washer	8
	67249-004	34.0" Frame Width		34	29248-000	⅞"-14 UNF-2B Locknut	4
	67249-012	34.3" Frame Width		35	67045-	Torque Rod Spacer, See table on page 11	
	67249-010	34.5" Frame Width		36	49689-000	Shim (As Required)	
	67249-024	34.8" Frame Width		37	62011-XXXN	**Transverse Torque Rod Assembly, Includes Key No. 38, Specify length in mm	2
	67249-018	35.0" Frame Width		38	47691-000L	Straddle Torque Rod Bushing	4
		• Rear		39	22186-000	Transverse Torque Rod Frame Bracket	2
	67249-003	34.0" Frame Width		40	65510-001	Axle Stop, Frame Mounted	4
	67249-011	34.3" Frame Width		41	60665-011	Shock Absorber	4
	67249-009	34.5" Frame Width		42	59423-001	Upper Shock Frame Bracket	4
	67249-023	34.8" Frame Width			50754-030	Single Shock Fastener Service Kit, Includes Key Nos. 43-48	
	67249-017	35.0" Frame Width		43	50764-010	¾"-10 UNC 4.25" Upper Shock Bolt	4
14	69565-001	U-beam Assembly Enhancement Aftermarket Service Kit, See Page 11 for contents		44	22962-001	¾" Flat Washer	8
15	58648-000	QUIK-ALIGN Pivot Bushing	4	45	49842-000	¾"-10 UNC Locknut	4
		Single D-Pin Bushing Service Kit, Includes Key Nos. 16, 17a, 18-19		46	32043-017	⅝"-11 UNC 6.0" Lower Shock Bolt	4
	34013-107	Includes Key Nos. 16, 17a, 18-19		47	22962-004	⅝" Flat Washer	8
	34013-116	Includes Key Nos. 16, 17b, 18-19		48	47764-000	⅝"-11 UNC Locknut	4
	34013-117	Includes Key Nos. 16, 17c, 18-19		49	64508-XXX	S-cam Support Bracket See Part No. on component	4
16	60383-000	D-Pin Bushing	4	50	58035-004	⅜"-16 UNC 1.25" Hex Bolt	8
		D-Pin Fastener Service Kit, Axle Set, Includes Key Nos. 17a, 18-19		51	22962-015	⅜" Hardened Washer	16
	56659-009	Includes Key Nos. 17a, 18-19		52	17700-006	⅜"-16 UNC Locknut	8
	56659-013	Includes Key Nos. 17b, 18-19		53	64202-000	⅝" S-Cam U-bolt	4
	56659-012	Includes Key Nos. 17c, 18-19		54	22962-029	⅝" Hardened Washer	16
17		¾"-16 UNF Bolt	8	55	59016-000	⅝"-18 UNC Locknut	8
a	21867-036	Length 5.0"					
b	21867-026	Length 5.5"					
c	21867-043	Length 4.75"					

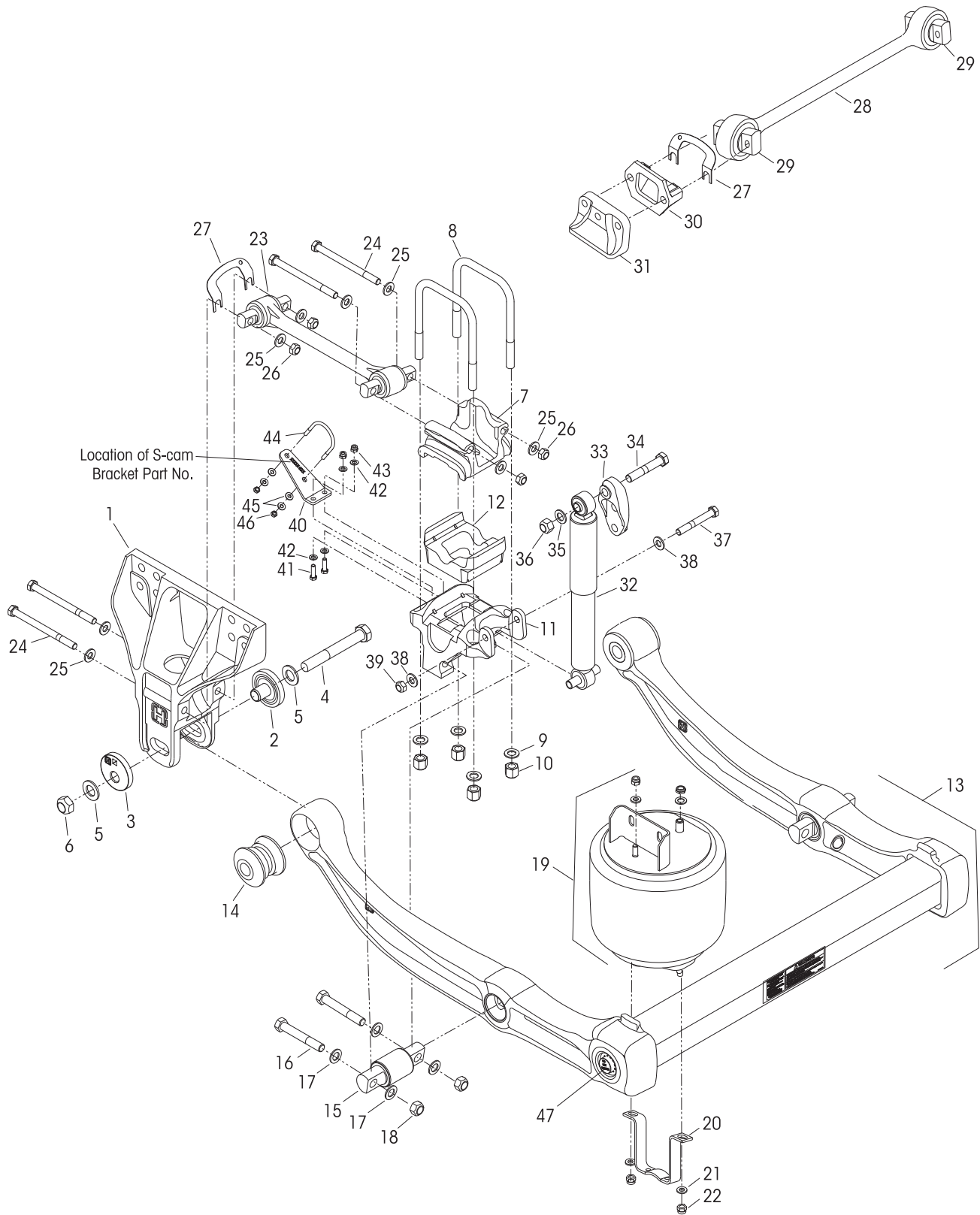
NOTES

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

** Transverse Rods are mandatory for PRIMAAX EX • PRIMAAX suspensions regardless of axle spacing, see Literature No. 59310-004 for more information.



■ 9" Ride Height





PRIMAAX® EX 262S for International Truck Vehicles

KEY NO.	PART NO.	DESCRIPTION	*NO.REQ.	KEY NO.	PART NO.	DESCRIPTION	*NO.REQ.
1	67706-000	EX Frame Hanger	2		60961-665	Single Air Spring Service Kit, Includes Key Nos. 19-22	
	60632-020	QUIK-ALIGN Pivot Bushing Service Kit, Axle Set, Includes Key Nos. 2-6, 14 <i>Replaces 60632-008</i>		19	68056-002	Air Spring Assembly, Includes Upper Frame Bracket and Fasteners	2
	60632-021	QUIK-ALIGN Collar Service Kit, Axle Set, Includes Key Nos. 2-6, <i>Replaces 60632-012</i>		20	60911-002	Lower Air Spring Mounting Bracket	2
	60632-019	QUIK-ALIGN Collar Service Kit, One Wheel End, Includes Key Nos. 2-6, <i>Replaces 60632-006</i>		21	22962-014	½" Flat Washer	4
	60632-018	QUIK-ALIGN Pivot Bolt Service Kit, One Wheel End, Includes Key Nos. 4-6 <i>Replaces 60632-005</i>		22	17700-010	½"-13 UNC Locknut	4
2	64633-000	QUIK-ALIGN Concentric Collar	2	23		Longitudinal Torque Rod Assembly See table on page 11	
3	64632-000	QUIK-ALIGN Eccentric Collar	2		49176-032	Longitudinal Torque Rod Fastener Service Kit, Axle Set, Includes Key Nos. 24-26	
4	68217-000	1.0"-14 UNF-2A H-Coat 7.5" Hex Bolt	2	24	32043-016	⅝"-11 UNF 8.0" Hex Bolt	8
5	68232-000	1.0" H-Coat Flat Washer	4	25	22962-004	⅝" Flat Washer	16
6	68218-000	1.0"-14 UNF-2B H-Coat Locknut	2	26	47764-000	⅝"-11 UNC Locknut	8
7		Top Pad		27	49689-000	Shim (As Required)	
	69361-031A	Left Hand	1	28	72000-xxxS	**ULTRA ROD® PLUS™ Transverse Torque Rod Assembly, Includes Key No. 29, Specify length in mm	1
	69361-032B	Right Hand	1	29	64400-002L	Bushing - Straddle Bar Pin - ⅝" Holes	2
	48718-130	U-bolt Service Kit, One Wheel End, Includes Key Nos. 8-10		30	22186-000	Transverse Torque Rod Frame Bracket	1
8	59367-014	¾" Square U-bolt	4	31	60593-000	Axle Stop, Frame Mounted	2
9	22962-001	¾" Flat Washer	8	32	60665-011	Shock Absorber	2
10	49685-000	¾"-16 UNF U-bolt Locknut	8	33	67463-002	Upper Shock Frame Bracket	2
11	60556-030	Bottom Cap	2		50754-029	Single Shock Fastener Service Kit, Includes Key Nos. 34-39	
12	65139-003	Axle Spacer	2	34	50764-010	¾"-10 UNC 4.25" Upper Shock Bolt	2
13		U-beam Assembly, Includes Key Nos. 14-15	2	35	22962-001	¾" Flat Washer	2
	67249-004	34.0" Frame Width		36	49842-000	¾"-10 UNC Locknut	2
	67249-012	34.3" Frame Width		37	32043-007	⅝"-11 UNC 7.0" Lower Shock Bolt	2
	67249-010	34.5" Frame Width		38	22962-004	⅝" Flat Washer	4
	67249-024	34.8" Frame Width		39	47764-000	⅝"-11 UNC Locknut	2
14	58648-000	QUIK-ALIGN Pivot Bushing	2	40	64508-XXX	S-cam Support Bracket See Part No. on component	2
	34013-107	Single D-Pin Bushing Service Kit, Includes Key Nos. 15-18		41	58035-004	⅜"-16 UNC-- 1.25" Hex Bolt	4
15	60383-000	D-Pin Bushing	2	42	22962-015	⅜" Hardened Washer	8
	56659-009	D-Pin Fastener Service Kit, Includes Key Nos. 16-18		43	17700-006	⅜"-16 UNC Locknut	4
16	21867-036	¾"-16 UNF 5.0" Bolt	4	44	64202-000	⅝" S-Cam U-bolt	2
17	22962-001	¾" Flat Washer	8	45	22962-029	⅝" Hardened Washer	8
18	30191-000	¾"-16 UNF Locknut	4	46	59016-000	⅝"-18 UNC Locknut	4
				47	69565-001	U-beam Assembly Enhancement Aftermarket Service Kit, See Page 11 for contents	

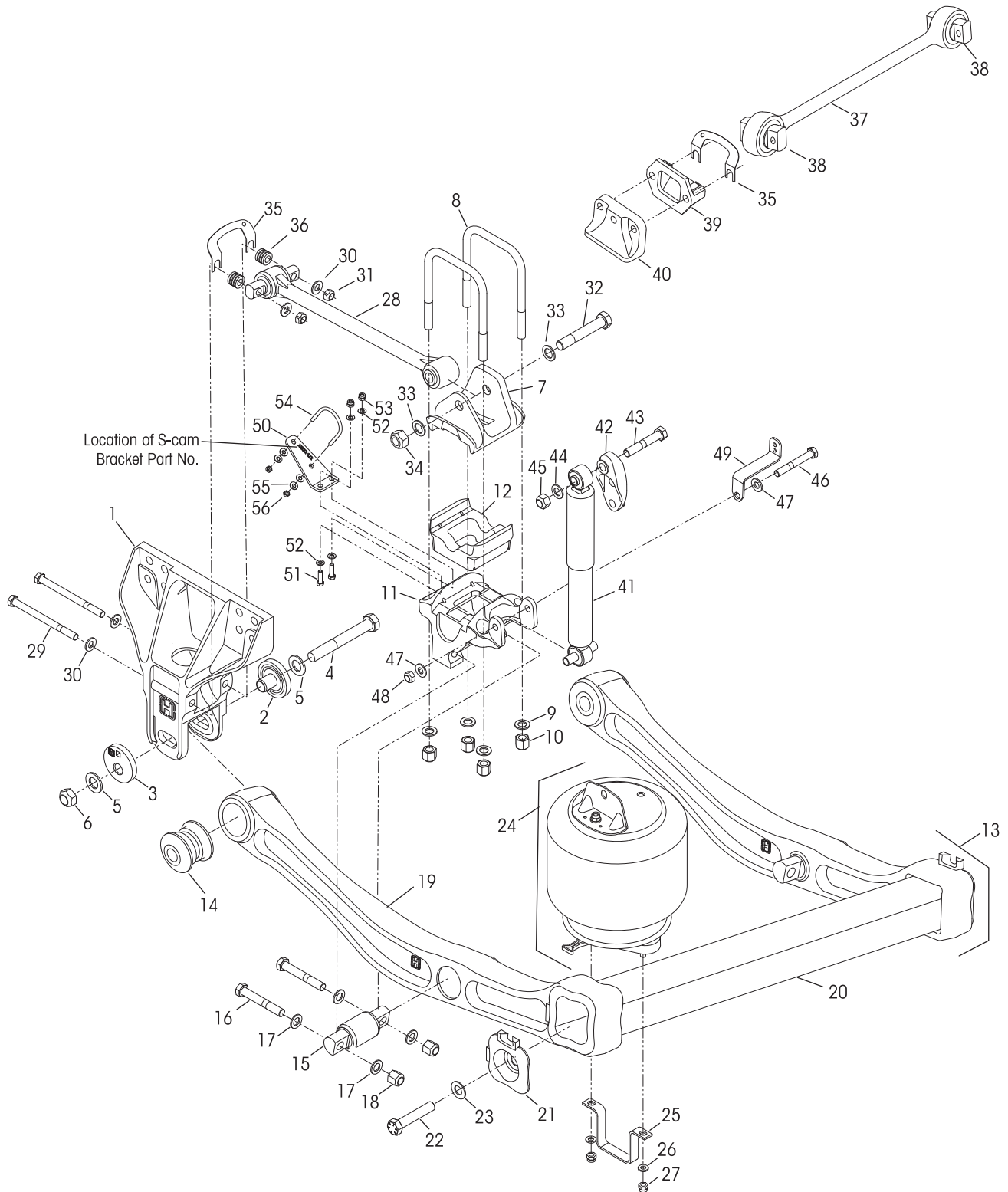
NOTES

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

** Transverse Rods are mandatory for PRIMAAX EX • PRIMAAX suspensions regardless of axle spacing, see Literature No. 59310-004 for more information.



■ 9" Ride Height





PRIMAAX® 230/460/690 for International Truck Vehicles

KEY NO.	PART NO.	DESCRIPTION	*NO.REQ.	KEY NO.	PART NO.	DESCRIPTION	*NO.REQ.
1	67706-000	Frame Hanger, <i>Replaces 65891-000</i>	4	21	60822-000	End Cap	4
	60632-020	QUIK-ALIGN Pivot Bushing Service Kit, AXLE Set , Includes Key Nos. 2-6, 14 <i>Replaces 60632-008</i>		22	50104-003	7/8"-9 UNC 3.5" Hex Bolt	4
	60632-021	QUIK-ALIGN Collar Service Kit, Axle Set , Includes Key Nos. 2-6, <i>Replaces 60632-012</i>		23	22962-034	7/8" H-Coat Flat Washer	4
	60632-019	QUIK-ALIGN Collar Service Kit, One Wheel End , Includes Key Nos. 2-6, <i>Replaces 60632-006</i>			60961-062	Single Air Spring Service Kit , Includes Key Nos. 24-27	
	60632-018	QUIK-ALIGN Pivot Bolt Service Kit, One Wheel End , Includes Key Nos. 4-6 <i>Replaces 60632-005</i>		24	60271-002L	Air Spring Assembly, Includes Upper Frame Bracket and Fasteners	4
2	64633-000	QUIK-ALIGN Concentric Collar	4	25	60911-000	Lower Air Spring Mounting Bracket	4
3	64632-000	QUIK-ALIGN Eccentric Collar	4	26	22962-014	1/2" Flat Washer	8
4	68217-000	1.0"-14 UNF-2A H-Coat 7.5" Hex Bolt <i>Replaces 64107-000</i>	4	27	17700-010	1/2"-13 UNC Locknut	8
5	68232-000	1.0" H-Coat Flat Washer, <i>Replaces 22962-035</i>	8	28		Longitudinal Torque Rod Assembly See table on page 11	1
6	68218-000	1.0"-14 UNF-2B H-Coat Locknut, <i>Replaces 64108-000</i>	4		49176-026	Longitudinal Torque Rod Fastener Service Kit, One Torque Rod , Includes Key Nos. 29-34	
7	65290-001	Top Pad	4	29	32043-016	5/8"-11 UNC-2B 8.0" Bolt	16
	48718-125	U-bolt Service Kit, One Wheel End , Includes Key Nos. 8-10		30	22962-004	5/8" Flat Washer	32
8	59367-004	3/4" Square U-bolt	8	31	47764-000	5/8"-11 UNC-2A Locknut	16
9	22962-001	3/4" Flat Washer	16		58821-012	Longitudinal Torque Rod Rear Bolt Service Kit, One Torque Rod , Includes Key Nos. 32-34	
10	49685-000	3/4"-16 UNF U-bolt Locknut	16	32	30418-009	7/8"-14 UNF-2A 5.5" Hex Bolt	4
11	60556-	Bottom Cap - Front and Rear, See table on page 11	4	33	22962-034	7/8" H-Coat Flat Washer	8
12	65139-003	Axle Spacer	4	34	29248-000	7/8"-14 UNF-2B Locknut	4
13		***U-beam Assembly, Includes Key Nos. 14-15 <i>(Replaces previous U-beam assembly, support beam and cross tube assembly, see replacement guide below)</i>	2	35	49689-000	Shim (As Required)	
14	58648-000	QUIK-ALIGN Pivot Bushing	4	36	67045-	Torque Rod Spacer, See table on page 11	
	34013-107	Single D-Pin Bushing Service Kit , Includes Key Nos. 15, 16a, 17-18		37	72000-XXXS	**ULTRA ROD® PLUS™ Transverse Torque Rod Assembly, Includes Key No. 38, Specify length in mm	2
	34013-116	Includes Key Nos. 15, 16b, 17-18		38	64400-002L	Bushing - Straddle Bar Pin (5/8" Holes)	4
	34013-117	Includes Key Nos. 15, 16c, 17-18		39	22186-000	Transverse Torque Rod Frame Bracket	2
15	60383-000	D-Pin Bushing	4	40	60593-000	Axle Stop, Frame Mounted	4
	56659-009	D-Pin Fastener Service Kit, Axle Set , Includes Key Nos. 16a, 17-18		41	60657-003	Shock Absorber	4
	56659-013	Includes Key Nos. 16b, 17-18		42	67463-002	Upper Shock Frame Bracket, <i>Replaces 65000-002</i>	4
	56659-012	Includes Key Nos. 16c, 17-18			50754-030	Single Shock Fastener Service Kit , Includes Key Nos. 43-48	
16		3/4"-16 UNF Bolt	8	43	50764-010	3/4"-10 UNC 4.25" Upper Shock Bolt	4
a	21867-036	Length 5.0"		44	22962-001	3/4" Flat Washer	4
b	21867-026	Length 5.5"		45	49842-000	3/4"-10 UNC Locknut	4
c	21867-043	Length 4.75"		46	32043-017	5/8"-11 UNC 6.0" Lower Shock Bolt	4
17	22962-001	3/4" Flat Washer	16	47	22962-004	5/8" Flat Washer	8
18	30191-000	3/4"-16 UNF Locknut	8	48	47764-000	5/8"-11 UNC-2B Locknut	4
19		***Support Beam Assembly (66435-xxx, see replacement guide below)		49	60921-000	Height Control Valve Linkage Bracket	1
20		***Cross Tube (60912-xxx, see replacement guide below)		50	64508-XXX	S-cam Support Bracket See Part No. on component	4
	46772-001	End Cap and Fastener Kit, Axle Set , Includes Key Nos. 21-23		51	58035-004	3/8"-16 UNC 1.25" Hex Bolt	8
				52	22962-015	3/8" Hardened Washer	16
				53	17700-006	3/8"-16 UNC Locknut	8
				54	64202-000	5/16" S-Cam U-bolt	4
				55	22962-029	5/16" Hardened Washer	16
				56	59016-000	5/16"-18 UNC Locknut	8

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

** Transverse Rods are mandatory for the PRIMAAX EX • PRIMAAX suspensions regardless of axle spacing, see Literature No. 59310-004 for more information.

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

Key No. 19,20		SUPPORT BEAM AND CROSS TUBE REPLACEMENT GUIDE					
Frame Width*	Discontinued				New		
	Support Beam Assembly Part Number				Cross Tube Part Number	U-beam Assembly Service Kit Number	
	60831-00X • 66435-00X				60912-XXX	60961-XXX	
	LEFT HAND		RIGHT HAND				
	Forward	Rear	Forward	Rear			
34.3"					-003	-261 (Forward), -262 (Rear)	
34.5"	-003	-001	-004	-002	-002	-263 (Forward), -264 (Rear)	
34.8"					-009	-243 (Forward), -244 (Rear)	

* Contact vehicle manufacturer to verify frame width.

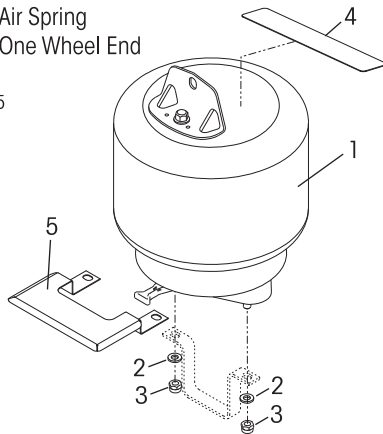


■ Severe Service Kits

PRIMAAX EX • PRIMAAX SERIES

Severe Service Kit | Air Spring
No. 60961-169 | One Wheel End

Reference Lit. No. 59310-035

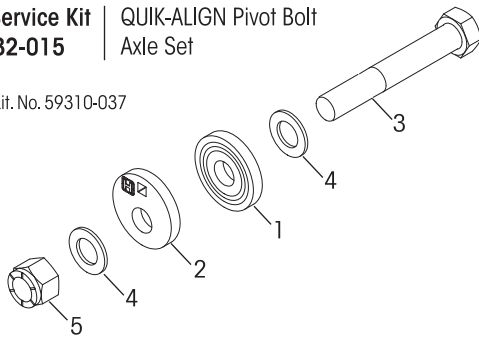


PRIMAAX 230/460/690
9", 10½" Ride Height

KEY NO.	PART NO.	DESCRIPTION	QTY.
	60961-169	Air Spring Severe Service Kit, One Wheel End, Includes Key Nos. 1-5 (Does not include lower air spring mounting bracket)	
1	60271-002	Air Spring Assembly	1
2	22962-014	½" Flat Washer	2
3	17700-010	½"-13 UNC Locknut	2
4	67269-000	Upper Air Spring Shield	1
5	66975-000	Lower Air Spring Shield	1

Severe Service Kit | QUIK-ALIGN Pivot Bolt
No. 60632-015 | Axle Set

Reference Lit. No. 59310-037

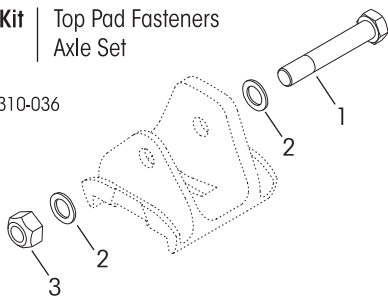


PRIMAAX EX, PRIMAAX
9", 10½", 13" Ride Height

KEY NO.	KIT NO.	DESCRIPTION	QTY.
	60632-015	QUIK-ALIGN Pivot Bolt Severe Service Kit Axle Set, Includes Key Nos. 1-5	
1		*PAX QUIK-ALIGN Concentric Collar	2
2		*PAX QUIK-ALIGN Eccentric Collar	2
3		*1¼"-12 UNF Bolt - 8.0"	2
4		*1¼" Hardened Washer	4
5		*1¼"-12 UNF Nylocknut	2

Severe Service Kit | Top Pad Fasteners
No. 58821-026 | Axle Set

Reference Lit. No. 59310-036



PRIMAAX 230/460/690
9", 10½", 13" Ride Height

KEY NO.	KIT NO.	DESCRIPTION	QTY.
	58821-026	Top Pad Bolt Severe Service Kit, Axle Set, Includes Key Nos. 1-3 (Does not include Top Pad)	
1		*M24 x 3.0-6G H-coat Hex Bolt	2
2		*M24 Hardened Washer	4
3		*M24 x 3.0-6H Locknuts	2

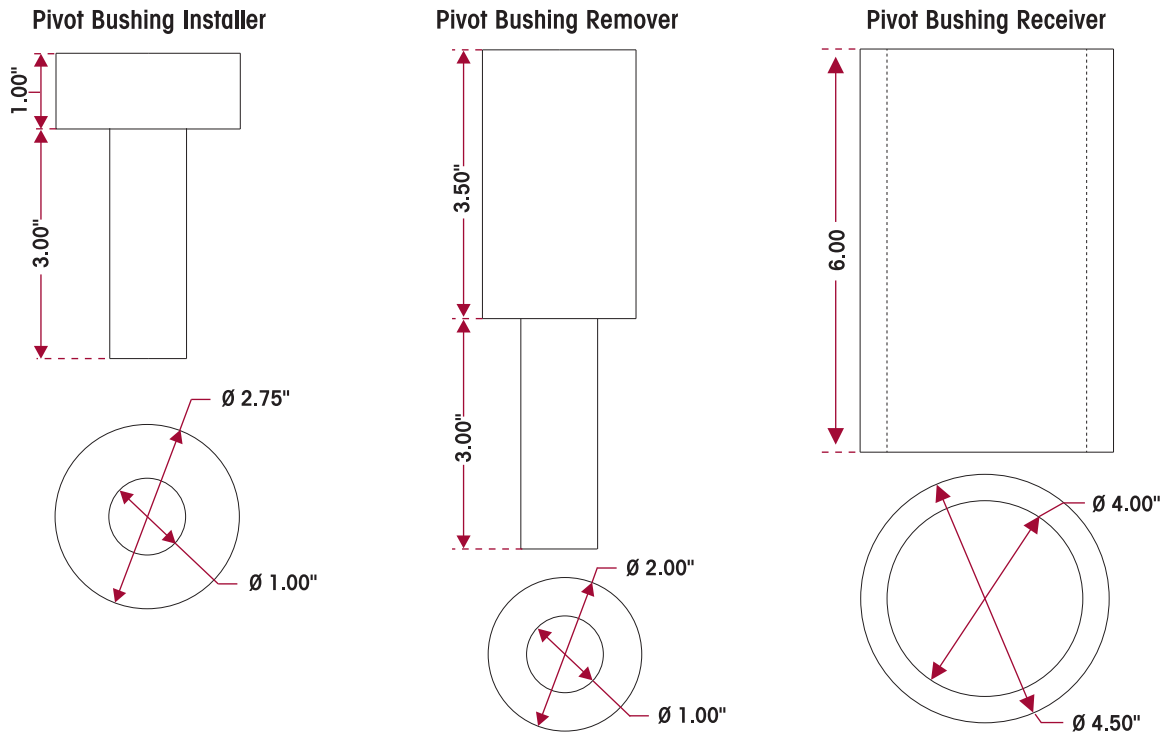
NOTE: * Item included in assembly / kit only, part not sold separately.



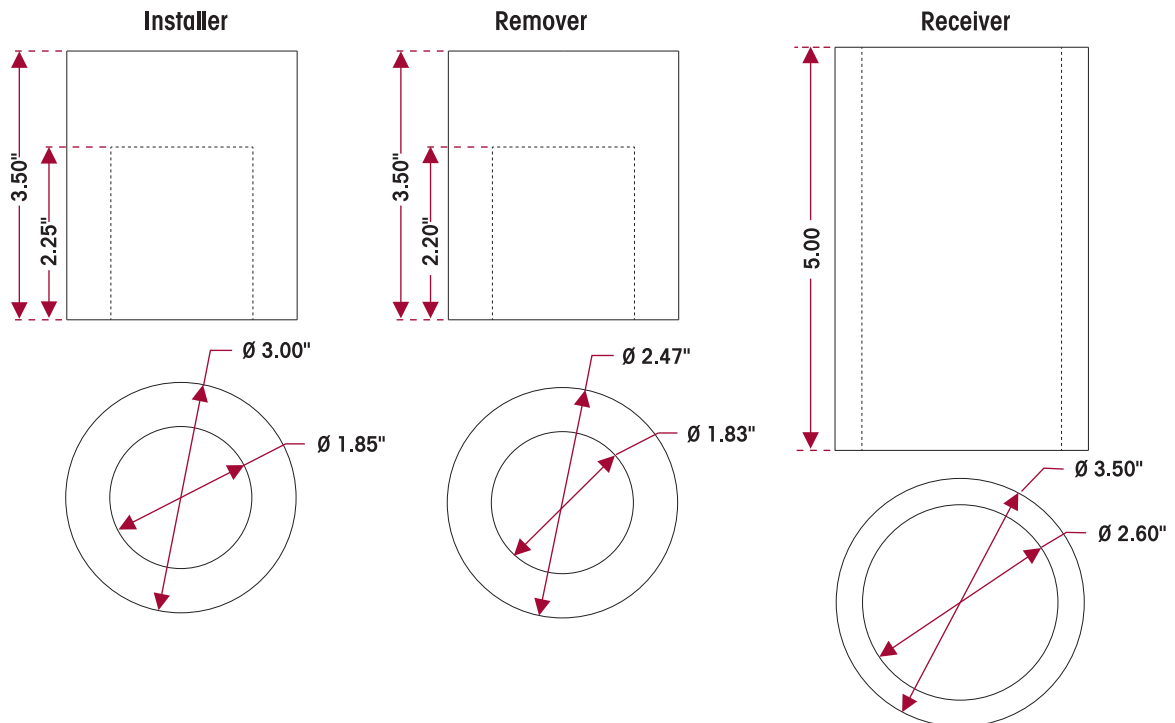
SECTION 5 Special Tools

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



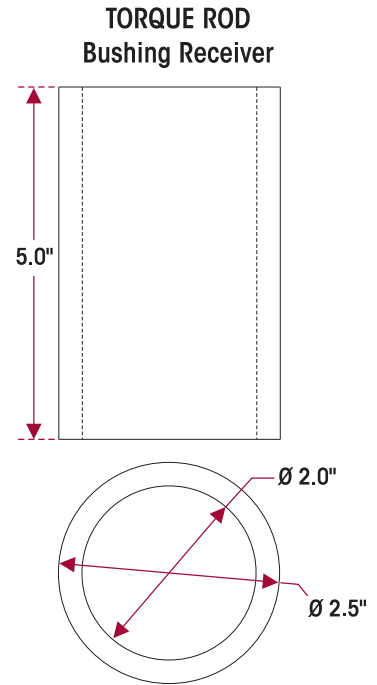


TORQUE ROD BUSHING

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.

NOTE Some torque rods assemblies equipped on PRIMAAX EX / PRIMAAX suspensions 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.

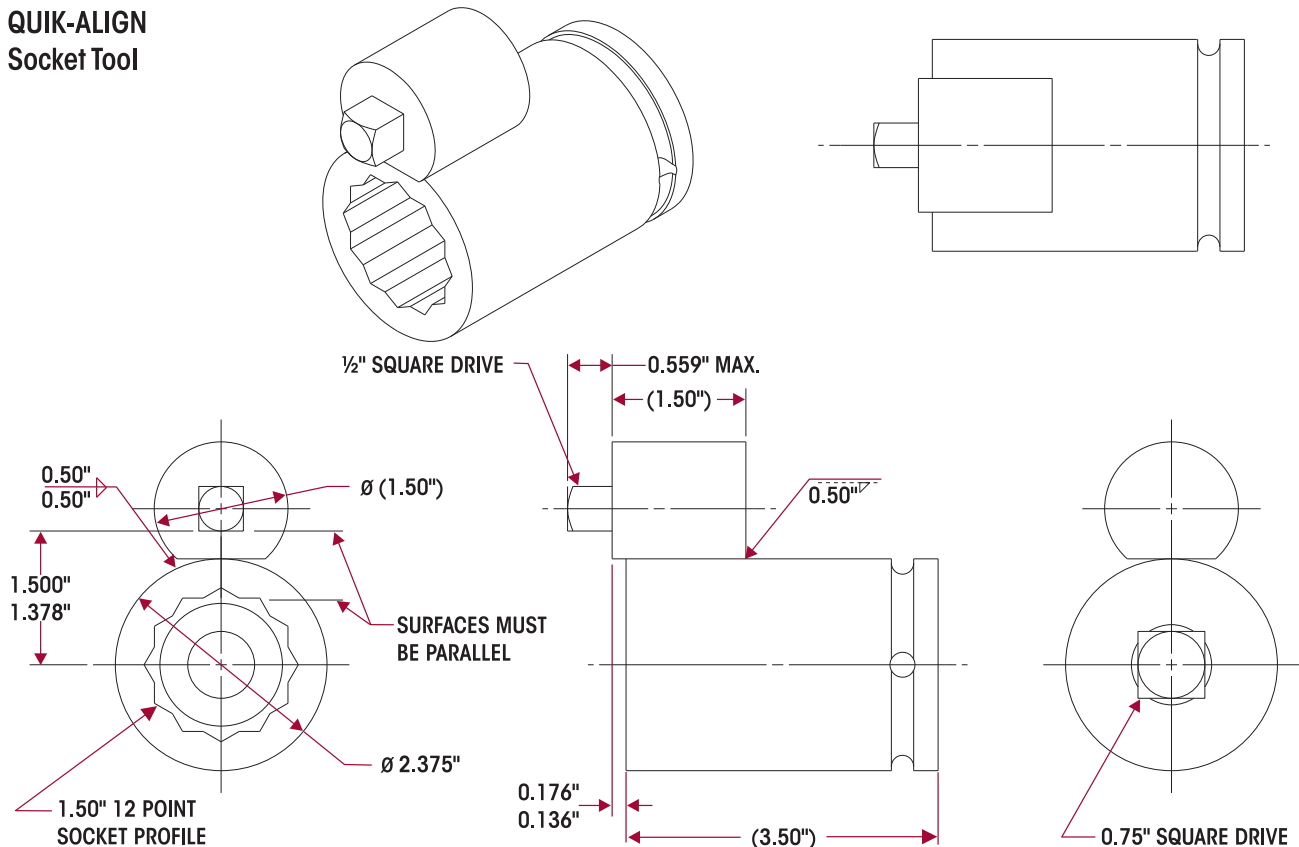
- These torque rods can be identified by the part number 67428-XXX or the suffix N after any part number (i.e. 62000-615N).



QUIK-ALIGN SOCKET TOOL

Hendrickson PRIMAAX EX / PRIMAAX QUIK-ALIGN Socket Tool is available from the Owatonna Tool Corporation (Owatonna Part 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





PRIMAAX QUICK WRENCH

FIGURE 5-1

Owatonna Tool Company (OTC) manufactures a Hendrickson approved tool (OTC Part Number 1768) for use on **PRIMAAX** suspensions (not for use on PRIMAAX EX suspensions). Contact OTC for more information at 800-533-6127.



- Used to tighten to torque the cross tube end cap bolts and longitudinal torque rod top pad bolts.
- 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 Quick Wrench tool with Hendrickson PRIMAAX suspensions detachable end cap (see Figure 5-2) and on the longitudinal torque rod to top pad configuration illustrated in Figure 5-3.

Any questions regarding the Quick Wrench tooling applications contact Tech Services

E-mail: techservices@hendrickson-intl.com

Telephone: 630-910-2800

FIGURE 5-2
Support Beam with Detachable End Cap

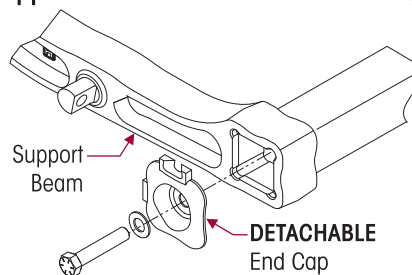
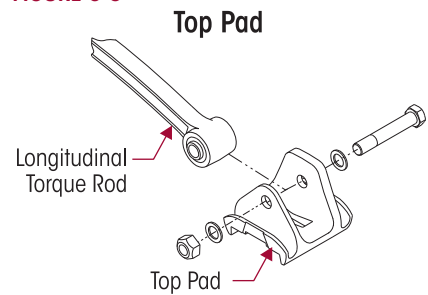


FIGURE 5-3





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 function to their highest efficiency. Hendrickson recommends PRIMAAX EX / PRIMAAX heavy-duty rear suspensions be inspected at pre-delivery, the first 1,000 miles of service and at the regular preventive maintenance intervals. Off-highway and severe service operating conditions require more frequent inspections than on-highway service operation.

NOTE

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

AREAS OF INSPECTION

The inspection must include the following components:

- | | | |
|--|--|---|
| <ul style="list-style-type: none"> ➤ Air springs <ul style="list-style-type: none"> • Air supply and fittings • All fasteners ➤ Clamp group <ul style="list-style-type: none"> ➤ Top pad ➤ U-bolt locknuts | <ul style="list-style-type: none"> • Frame hanger bracket ➤ QUIK-ALIGN connections • S-cam support tube bracket • Shock absorbers • Suspension wear and damage • Tire wear | <ul style="list-style-type: none"> • Torque rods <ul style="list-style-type: none"> – Transverse – Longitudinal ➤ U-beam assembly <ul style="list-style-type: none"> • Cross tube • Support beam • End cap (if equipped) |
|--|--|---|

➤ Signifies performance critical components.

HENDRICKSON RECOMMENDED PREVENTIVE MAINTENANCE INTERVALS**PRE-DELIVERY INSPECTION – PRIMAAX EX**

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** March 2009), 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
Enhanced U-beam Assembly
with Integrated End Cap

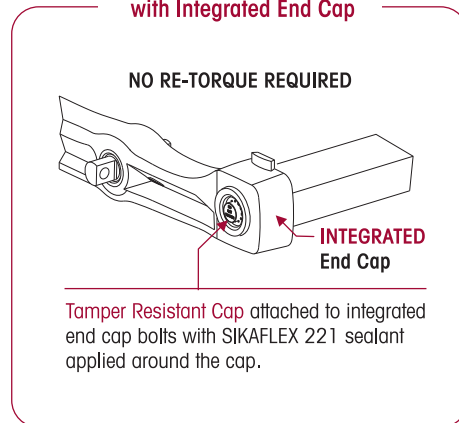
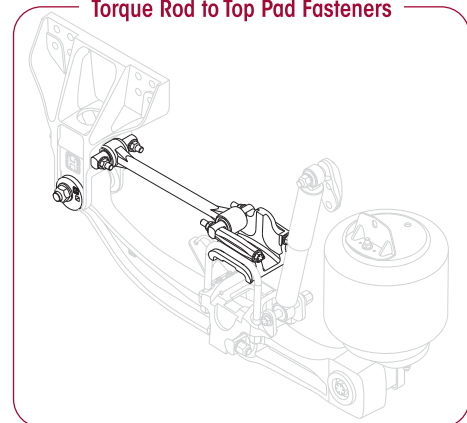


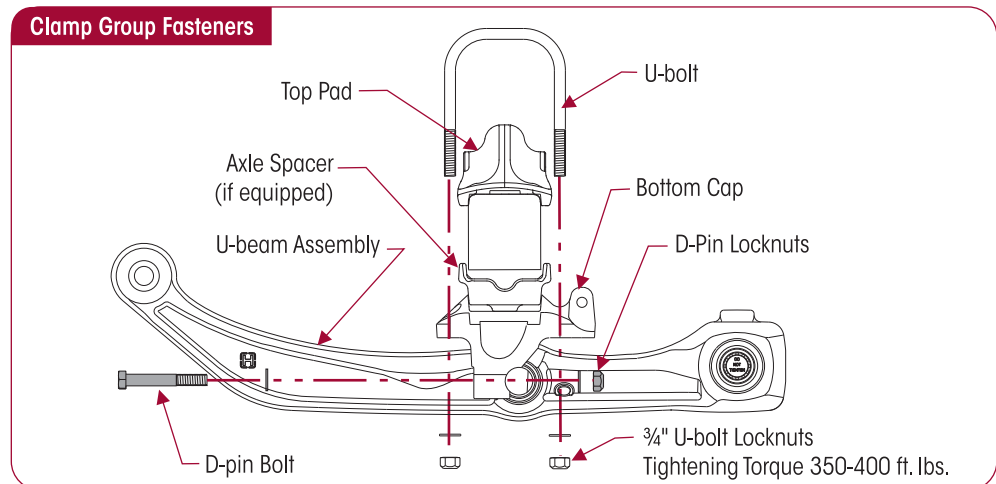
FIGURE 6-2
QUIK-ALIGN Fasteners and
Torque Rod to Top Pad Fasteners



INSPECTION AT 1,000 MILES – PRIMAAX EX

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.

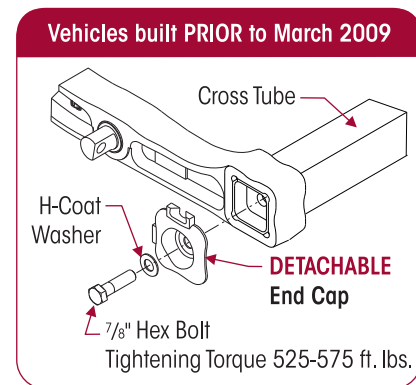
FIGURE 6-3
Clamp Group Fasteners



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. **PRIMAAX EX vehicles built AFTER March 2009** — **DO NOT RE-TORQUE** the integrated end cap, see Figure 6-1.
PRIMAAX vehicles built PRIOR TO March 2009 — Check for proper torque values on the detachable end cap connection fasteners, see Figure 6-4.

FIGURE 6-4



- 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.
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.

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 the 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 U-bolt Locknuts in this section.
- **Cross tube** — Visually inspect for cracks, damage, metal shavings, or looseness at the beam connection.
- **End cap (if equipped)** — Visually inspect the end cap connection for signs of movement or damage. Verify the support beam / cross tube connection bolts have the proper torque values maintained. See the Torque 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 in this publication for recommended torque requirements. Use a calibrated torque wrench to check torque in a tightening direction. As soon as the fastener starts to move, record the torque and correct the torque if necessary.
- **Frame hanger bracket** — Visually inspect for any signs of loose fasteners, movement, or damage. Verify the frame attaching fasteners have the proper torque values maintained. See the vehicle manufacturer for proper torque specifications.
- **Height control valve and Air lines** — Check the suspension air system for air leaks. Check all air lines for proper routing. Check for chafing or pinched air lines. Check the height control valve linkage for damage or interference with peripheral components.
- **QUIK-ALIGN connection** — Visually inspect the connection for signs of looseness or movement. Visually inspect the bushing for wear. Verify the connections have the proper torque values maintained. See the Torque Specification Section of this publication for recommended torque requirements.
- **S-Cam support tube bracket** (If equipped) — Visually inspect the bracket for damage and check for any loose or damaged fasteners.
- **Shock absorbers** — Visually inspect for any signs of dents or leakage. Misting is not considered a leak, see Shock 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 the 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, 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 and Transverse Torque Rod inspection in this section.

NOTE

Some torque rods assemblies equipped on PRIMAAX EX / PRIMAAX suspensions 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).
- **U-beam assembly** — Visually inspect the overall condition of the support beam for dents, dings, or other damage on the outer edges of the beam flanges. Visually inspect the D-pin bushings for tearing or extreme bulging. Check for any metal-to-metal contact in the bushed joints.
- **Wear and damage** — Visually inspect all parts of the suspension for wear and damage. Look for bent or cracked parts.

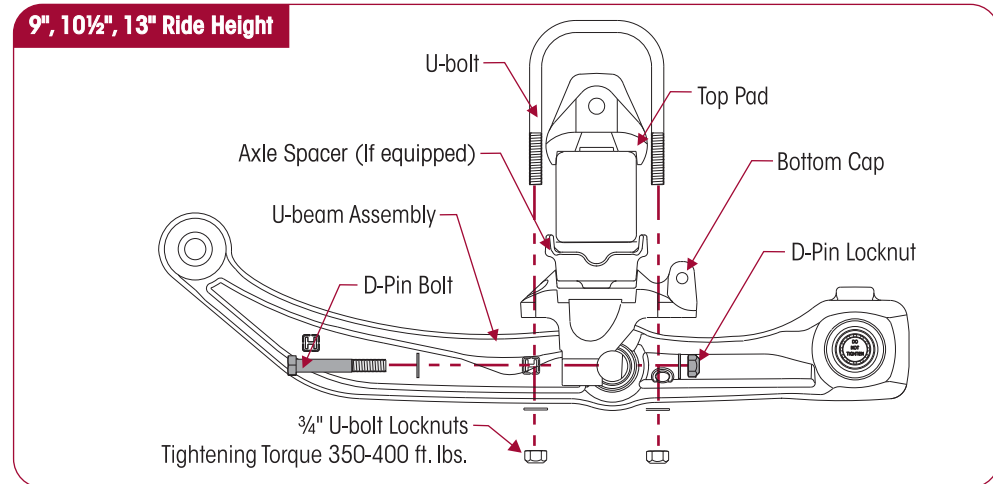
See vehicle manufacturer's applicable publications for other preventive maintenance requirements.

U-BOLT LOCKNUTS

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.

FIGURE 6-5



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

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

NOTE

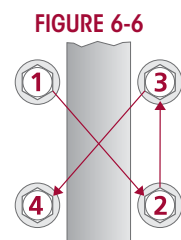
U-bolt clamp group hardware for PRIMAAX EX / PRIMAAX suspensions are ¾"-16 UNF Grade C locknuts and ¾"-16 UNF Grade 8 U-bolts which are phosphate and oil coated.



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 Figures 6-6.



**WARNING****PIVOT BUSHING AND D-PIN BUSHING INSPECTION**

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

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

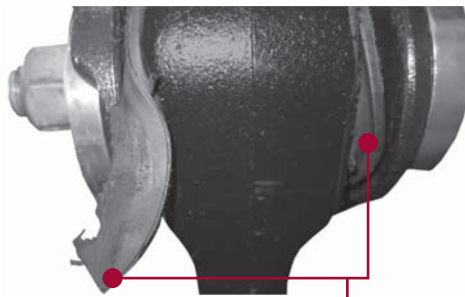
PIVOT BUSHING VISUAL INSPECTION

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

- The support beam is designed with the pivot bushing centered in the support beam end hub. If the pivot bushing is not centered in the end hub, it is an indication that the pivot bushing could be worn and a pivot bushing physical inspection is required.
- If the pivot bushing shows signs of torn, separated or disconnected rubber, see Figures 6-7 and 6-8, this could be a result of axle misalignment. If this condition is evident, a pivot bushing physical inspection is required.
- If the outer rubber flange(s) is missing, or there are shards of rubber visible, see Figure 6-9, this could be a result of axle misalignment. If this condition is evident, pivot bushing replacement is required.

INSPECT FOR TORN, DISCONNECTED OR MISSING RUBBER FLANGE

FIGURE 6-7



Torn Rubber

FIGURE 6-8



Disconnected Rubber Flange

FIGURE 6-9

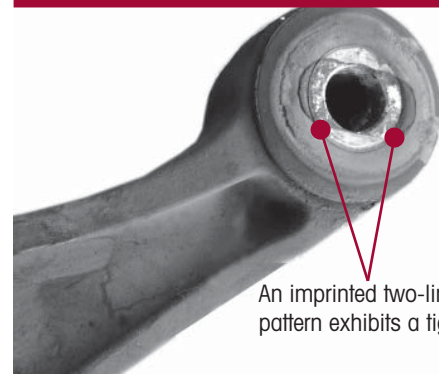


Missing Rubber Flange

PIVOT BUSHING PHYSICAL INSPECTION

1. Remove the U-beam assembly, refer to U-beam Assembly in the Component Replacement of this publication.
2. After removal, inspect the pivot bushing connection, examine the pivot bushing inner metal area.
3. No replacement is needed if the bushing exhibits a tight joint, see Figure 6-10. An imprinted two-line wear pattern on the bushing inner metal indicates the pivot bushing is securely clamped in the frame hanger.

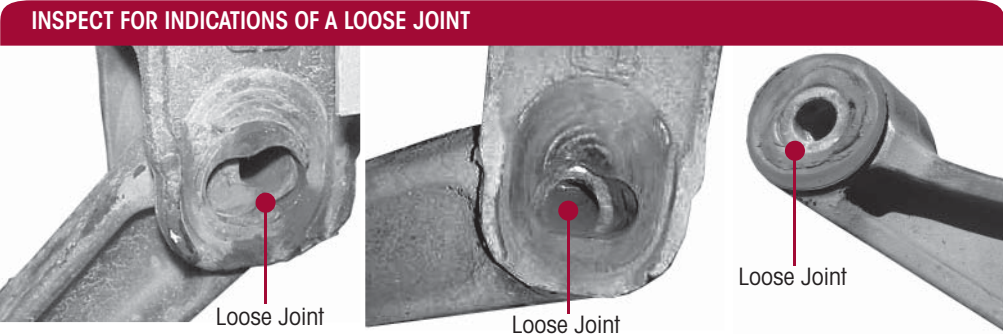
FIGURE 6-10

GOOD JOINT - NO REPLACEMENT NEEDED

An imprinted two-line wear pattern exhibits a tight joint

4. Inspect pivot bushing, replacement is necessary if any indications of the following are apparent, see Figure 6-11:
 - Signs of rust, distorted, separated or torn rubber, elongated or damaged bore. This could be a result of axle misalignment or loose fasteners.

FIGURE 6-11



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

D-PIN BUSHING VISUAL INSPECTION

It is not necessary to disassemble the D-Pin connection to perform a D-Pin visual inspection.

The D-Pin bushing is designed with a layer of rubber in the bushing, it is acceptable to see a bead of rubber protruding from the bushing, see Figure 6-12.

D-Pin bushing replacement is required only when:

- Metal to metal contact wear marks on the D-pin outer metal are evident, see Figure 6-13.
- D-pin outer metal is distorted, see Figure 6-13.

FIGURE 6-12

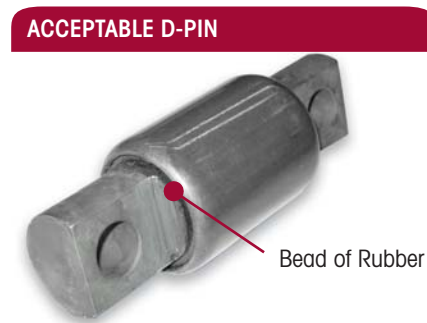
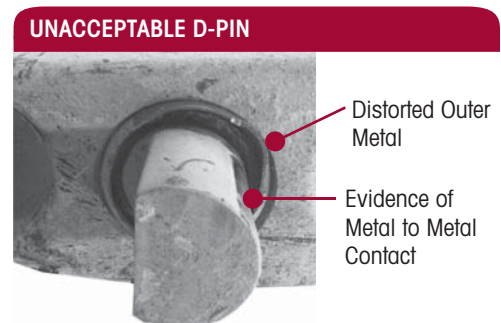


FIGURE 6-13





LONGITUDINAL AND TRANSVERSE TORQUE RODS

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 AND POSSIBLE TIRE CONTACT WITH THE FRAME. OPERATING A VEHICLE WITH NON-FUNCTIONAL TRANSVERSE TORQUE RODS CAN RESULT IN LOSS OF VEHICLE CONTROL, SEVERE PERSONAL INJURY, AND PREMATURE COMPONENT DAMAGE.

NOTE

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

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.

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

- **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.

TORQUE ROD LENGTH

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 Table in the Parts Lists Section of this publication.

Transverse rod length is also determined by the vehicle manufacturer to center the axles under the frame.

- If the lateral alignment of the axles is incorrect, it may be necessary to shim the transverse torque rod at the straddle mount end. Shims can be installed between the transverse torque rod and the transverse torque rod frame bracket or between the transverse torque rod and axle tower bracket. Refer to vehicle manufacturer for proper shim location; also see Lateral Alignment in the Alignment & Adjustments Section of this publication.
- The transverse torque rods also control axle walk-out during cornering. The mounting brackets at the axle housing end of the torque rods are furnished and welded into position on the axle housings by the axle or vehicle manufacturer.

Transverse and longitudinal torque rods have attaching ends designated as "straddle mount," "tapered stud," or "through bolt" as shown in Figures 6-14 and 6-15. Most can be replaced by pressing out the worn torque rod bushing and installing a replacement bushing, others require complete torque rod assembly replacement.

FIGURE 6-14

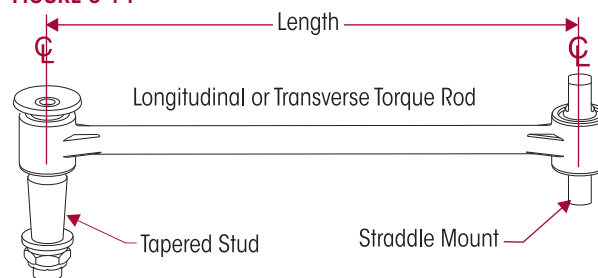
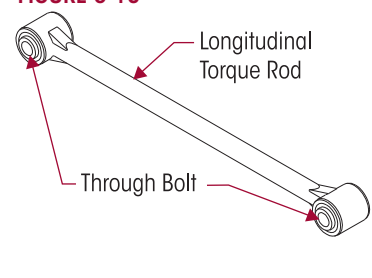


FIGURE 6-15




NOTE

Some torque rods assemblies equipped on PRIMAAX EX / PRIMAAX suspensions 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).

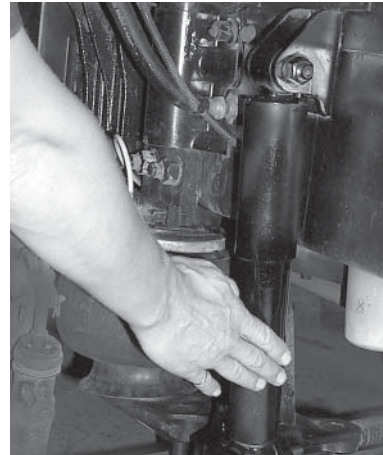
A two-piece **transverse torque rod** is available to cut and weld to the desired length, see Hendrickson Literature No. 45745-148.

SHOCK ABSORBER INSPECTION

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 original  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, also inspect the shock absorber mounting brackets and hardware for damage or wear, replace as necessary. See instructions on shock absorber replacement in the Component Replacement Section of this publication. It is not necessary to replace shock absorbers in pairs if one shock absorber requires replacement.

FIGURE 6-16



HEAT TEST

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

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

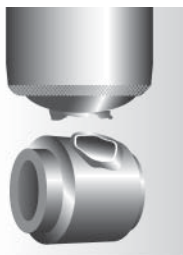
2. Lightly touch the shock body carefully below the dust cover, see Figure 6-16.
3. Measure the shock absorber temperature using an Infrared Temp Gun or touch the frame to get an ambient reference. A warm shock absorber is acceptable; a cold shock absorber should be replaced.
4. To inspect for an internal 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.

WARNING

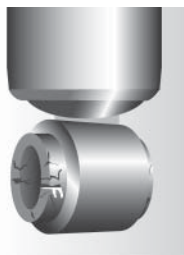
VISUAL INSPECTION

Look for these potential problems when doing a visual inspection as shown in Figure 6-17. Inspect the shock absorbers fully extended. Replace as necessary.

FIGURE 6-17



Damaged upper or lower mount



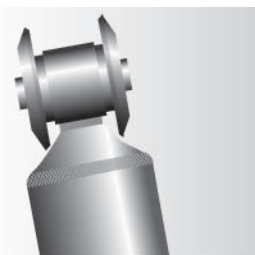
Damaged upper or lower bushing



Damaged dust cover and / or shock body



Bent or dented shock



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

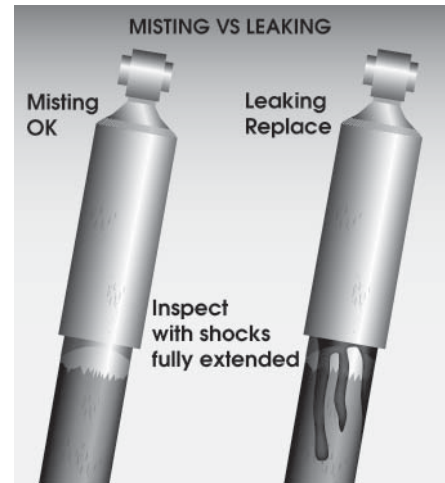


LEAKING VS. MISTING SHOCK VISUAL INSPECTION

The inspection must not be conducted after driving in wet weather or a vehicle wash. Shocks need to be free from water. Many shocks are often mis-diagnosed 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 6-18



NOTE

PRIMAAX EX / PRIMAAX suspensions are 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 the 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**NOTE**

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

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 vehicle manufacturer for proper ride height adjustment.
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 $\frac{1}{8}$ " (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 $\frac{1}{8}$ " (3mm) shim between the transverse torque rod and frame rail as needed. Refer to Longitudinal and Transverse Torque Rod Section in Preventive Maintenance Section of this publication.

NOTE

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

DRIVE AXLE ALIGNMENT INSPECTION PROCEDURE

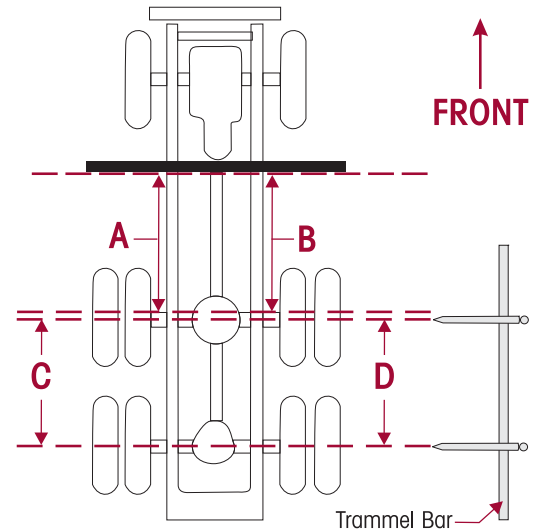
Proper alignment is essential for maximum ride quality, performance, and tire service life, the recommended alignment procedure is described below. This procedure should be performed if excessive or irregular tire wear is observed, or any time the QUIK-ALIGN connection is loosened or removed.

1. Use a work bay with a level surface.
2. Relax the suspension by slowly moving the vehicle back and forth several times in a straight line without using the brakes. This will slacken or loosen the suspension as the vehicle is positioned. End with all wheels positioned straight ahead.
3. **DO NOT** set the parking brake. Chock the front wheels of the vehicle.



4. Verify and maintain the air system at full operating pressure.
5. Verify the vehicle is at the correct ride height. Correct as necessary. Refer to vehicle manufacturer for proper ride height adjustment.
6. Verify all suspension components are in good condition. Repair or replace any worn or damaged suspension components before proceeding with the alignment process.

FIGURE 7-1



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

12. Using a trammel bar, measure the distance from the spindle center of the front drive axle to the spindle center of the rear drive axle on both sides of the vehicle, see Figure 7-1, **C** and **D**.
13. Calculate the difference between measurements **C** and **D**.
 - a. If the measurements are within the vehicle manufacturer's specifications, then the rear drive axle alignment is acceptable. Proceed to check the pinion angles of the drive axles (Step 15).
 - b. If alignment of the rear drive axle **IS NOT** within the vehicle manufacturer's specifications, then the alignment of this axle **MUST** be corrected **BEFORE** checking the drive axle pinion angles. Correct the alignment of this axle by following the proper alignment instructions for 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 7-5.

- 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 procedure in this section.
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

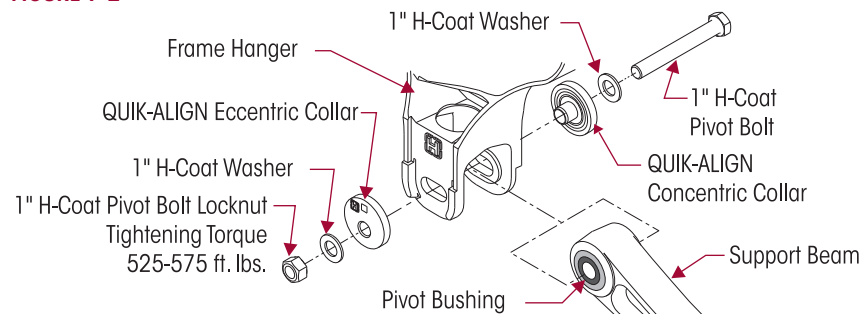
SERVICE HINT

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" ± ½".

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.

FIGURE 7-2



WARNING

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

DO NOT ASSEMBLE QUIK-ALIGN JOINT WITHOUT THE PROPER FASTENERS. USE ONLY HENDRICKSON GENUINE FASTENERS WITH SPECIAL COATING (H-COAT) 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.

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.



- 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 the Parts List Section of this publication) for any axle alignment or disassembly of the QUIK-ALIGN connection. This will help ensure that the proper clamp load is applied to the connection and help prevent the joint to slip in service.


- 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.
- See additional Air Spring Warnings and Instructions in the Important Safety Notice Section of this publication prior to deflating or inflating the suspension system.
- Inflate the suspension by connecting the height control valve linkage to the height control valve arm. Verify the air springs inflate uniformly without binding.
- Verify the ride height is within specification, refer to vehicle manufacturer for proper ride height adjustment.

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.

- 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.
- Use a QUIK-ALIGN socket tool, Figure 7-3 (also see Tool Section of this publication) and impact gun, see Figure 7-4, or a ½" square drive breaker bar to rotate the QUIK-ALIGN eccentric collar to align the axle.

FIGURE 7-3**FIGURE 7-4**

- 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.
- Fill any gap between the frame hanger and longitudinal torque rod with shims.
- Tighten the longitudinal torque rod fasteners to the proper specification, see Torque Specification Section of this publication per model designation.
- 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.
- Return to the Drive Axle Alignment Inspection Procedure, Step 12, for the remaining drive axles.

AXLE PINION ANGLE

Drive axle pinion angles are established by the vehicle manufacturer. The suspension bottom cap called out in the Parts Lists Section of this publication, are machined to specific angles to meet the vehicle manufacturer specified requirements.

FIGURE 7-5



To check the pinion angle:

1. Verify the suspension is at the proper ride height. Refer to the vehicle manufacturer for proper ride height adjustment procedure.
2. Install a digital protractor (or equivalent) on the axle housing as shown in Figure 7-1.
3. Check the pinion angle is within the range as specified by the vehicle manufacturer.
4. If pinion angle is within the acceptable range, then no pinion angle adjustment is necessary.
5. If out of range, an adjustment is necessary, see Axle Pinion Angle Adjustment in this section.

AXLE 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.

FIGURE 7-6



Add or remove shims to maintain or adjust pinion angle

SERVICE HINT

A general rule of thumb is, 1/8" change in the shim pack thickness will increase or decrease the pinion angle by 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 may be necessary to replace the bottom cap with a bottom cap that will achieve the desired pinion angle. Contact the vehicle manufacturer for acceptable bottom cap replacement to achieve the required pinion angle and refer to the Parts List Section of this publication.

NOTE

After bottom cap replacement, a drive axle alignment is required.



SECTION 8

Component Replacement

FASTENERS

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

HEIGHT CONTROL VALVE

The height control valve 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 vehicle manufacturer's instructions.

AIR SPRING

■ 9", 10½" Ride Height

DISASSEMBLY

1. Chock the wheels.
2. Support the frame.
3. Disconnect the height control valve arm(s) from the rubber grommet, refer to vehicle manufacturer's instructions.



WARNING

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

4. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section 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 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.

6. Remove the air line from the air spring.



CAUTION

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

7. If the air spring is being removed for an alternate repair it will be necessary to lubricate the lower mounting fasteners with penetrating oil. This will help prevent the air spring mounting studs from breaking during the removal process.
8. Remove and discard the lower mounting fasteners from the air springs using **HAND TOOLS** only.
9. Remove the lower air spring mounting bracket from the cross tube.
10. Remove and discard the fasteners from the upper air spring mounting bracket.
11. Remove the air spring.

ASSEMBLY

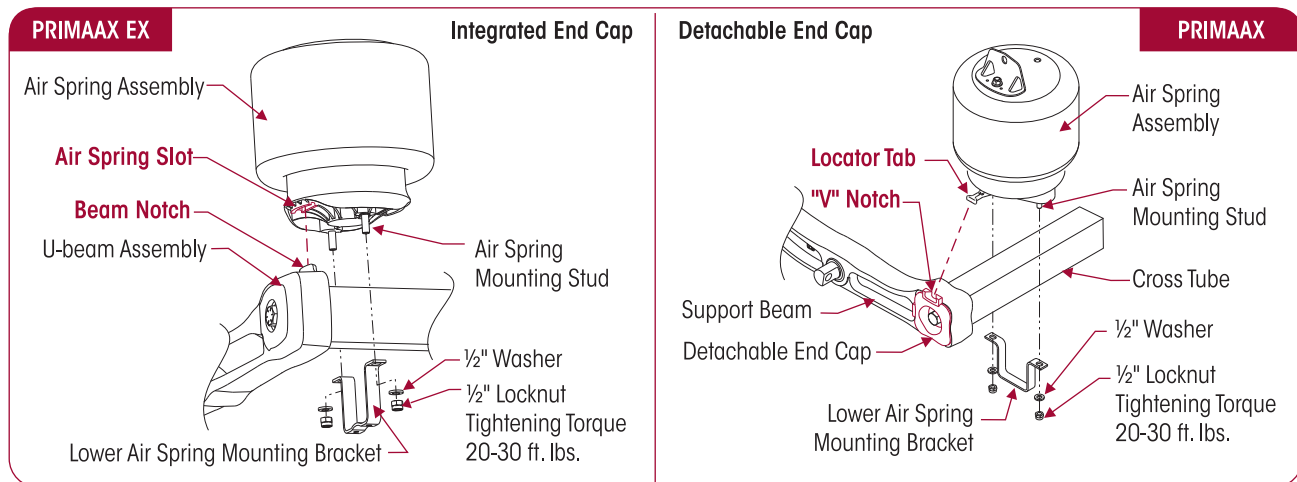
1. Inspect the mounting surfaces and lower air spring mounting bracket for any damage, replace if necessary.

WARNING

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

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

FIGURE 8-1



4. Install the lower air spring mounting bracket around the cross tube, engaging the mounting air spring studs, see Figure 8-1.
5. Using **HAND TOOLS** install the lower mounting fasteners and tighten to 20-30 foot pounds torque.
6. Reconnect 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. Inflate the suspension slowly and verify that the air spring bladder inflates uniformly without binding.
9. Connect the height control valve linkage(s) to the height control valve arm(s) to inflate the suspension.
10. Remove the frame supports.
11. Verify the ride height is within specification, refer to vehicle manufacturer for proper ride height adjustment.
12. Remove the wheel chocks.



AIR SPRING / UPPER AIR SPRING BRACKET

■ 13" Ride Height

DISASSEMBLY

1. Chock the wheels.
2. Support the frame.
3. Disconnect the height control valve arm(s) from the rubber grommet, refer to vehicle manufacturer's instructions.



WARNING

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

4. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section 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 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.

6. Remove the air line from the air spring.



CAUTION

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

7. If the air spring is being removed for an alternate repair it will be necessary to lubricate the lower mounting fasteners with penetrating oil. This will help prevent the air spring mounting studs from breaking during the removal process.
8. Remove and discard the lower mounting fasteners from the air springs using **HAND TOOLS** only.
9. Remove the lower air spring mounting bracket from the cross tube.
10. Remove and discard the fasteners from the upper air spring mounting bracket.
11. Remove the air spring.
12. Remove and discard the fasteners securing the upper air spring bracket assembly to the frame rail.
13. Inspect the upper air spring bracket assembly, air spring support bracket (if equipped), mounting surfaces and lower air spring mounting bracket for any damage. Replace as necessary.

ASSEMBLY

1. Inspect the mounting surfaces and lower air spring mounting bracket for any damage, replace if necessary.
2. Loosely attach the upper air spring bracket assembly to the frame rail.



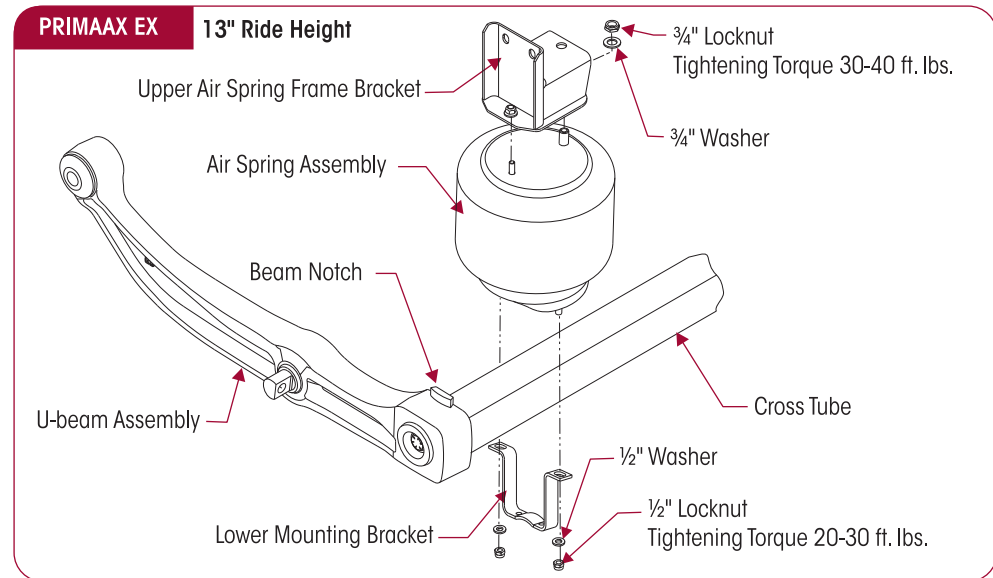
WARNING

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

3. Press the upper air spring bracket assembly against the underside of the frame and tighten the frame fasteners to the proper torque per the vehicle manufacturer's specifications.
4. Attach the air spring to the upper air spring bracket assembly and tighten the locknuts to proper torque specifications, see Torque Specification Section in this publication.

5. Install the air spring between the frame and cross tube, see Figure 8-2.
 - a. **PRIMAAX EX** — Ensure the “air spring slot” located in the bottom of the air spring engages the “beam notch” on the top of the support beam.

FIGURE 8-2



6. Install the lower air spring mounting bracket around the cross tube, engaging the mounting air spring studs, see Figure 8-2.
7. Using **HAND TOOLS** install the lower mounting fasteners and tighten to 20-30 foot pounds torque.
8. Install the air line fitting to the air spring using Teflon or equivalent thread seal.
9. Reconnect the air line to the air spring.
10. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to deflating or inflating the air system.
11. Inflate the suspension slowly and verify that the air spring bladder inflates uniformly without binding.
12. Connect the height control valve linkage(s) to the height control valve arm(s) to inflate the suspension.
13. Remove the frame supports.
14. Verify the ride height is within specification, refer to vehicle manufacturer for proper ride height adjustment.
15. 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.

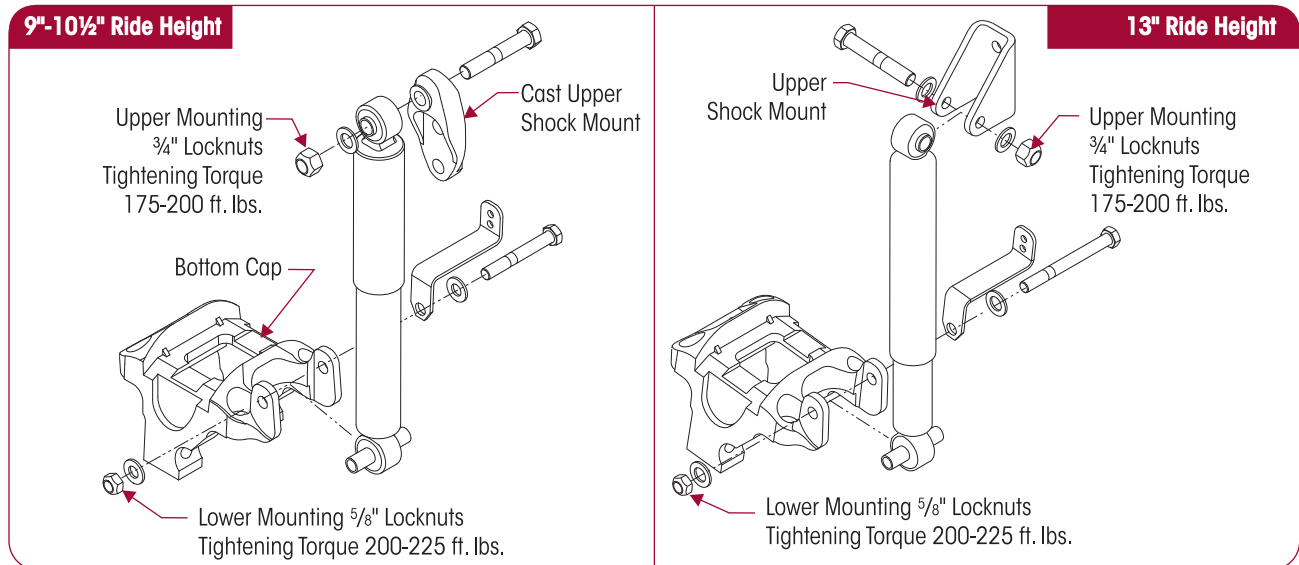
NOTE

If removal of the height control valve linkage bracket is necessary for shock absorber replacement, mark the position of the linkage bracket to facilitate reinstallation.



2. Remove and discard the lower shock absorber mounting fasteners and, if necessary, the height control valve linkage bracket, see Figure 8-3.
3. Remove and discard 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. Remove and replace as necessary.

FIGURE 8-3





ASSEMBLY

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

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.

4. Slide the lower shock absorber mount into the bottom cap.
5. Install the lower shock absorber mounting fasteners and height control valve linkage bracket (if removed).
6. Tighten the upper shock absorber mounting locknut to  175-200 foot pounds torque, see Figure 8-3.
7. Tighten the lower shock absorber mounting locknut to  200-225 foot pounds torque, see Figure 8-3.
8. If the height control valve linkage bracket was removed, verify the ride height is within specification, refer to vehicle manufacturer for proper ride height adjustment.
9. Remove the wheel chocks.



TRANSVERSE TORQUE ROD

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 AND POSSIBLE TIRE CONTACT WITH THE FRAME. OPERATING A VEHICLE WITH NON-FUNCTIONAL TRANSVERSE TORQUE RODS CAN RESULT IN LOSS OF VEHICLE CONTROL, SEVERE PERSONAL INJURY, AND PREMATURE COMPONENT DAMAGE.

NOTE

Some torque rods assemblies equipped PRIMAAX EX / PRIMAAX suspensions 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 and location of shims removed to maintain the lateral alignment of the axle during assembly. See Alignment & Adjustments Section of this publication.

2. Remove and discard the transverse torque rod mounting fasteners.
3. Remove the transverse torque rod.
4. Inspect the mounting surfaces for any wear or damage. Repair or replace as necessary.

ASSEMBLY

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

NOTE

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

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

LONGITUDINAL TORQUE ROD

NOTE

Some torque rods assemblies equipped on PRIMAAX EX / PRIMAAX suspensions 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 correct pinion angle of the axle at assembly. See Alignment & Adjustments Section of this publication.



2. Remove shims (if equipped) and remove and discard the torque rod mounting fasteners, see Figures 8-4 and 8-5.
3. Remove the longitudinal torque rod.
4. Inspect the mounting surfaces for any wear or damage, replace if necessary.

FIGURE 8-4

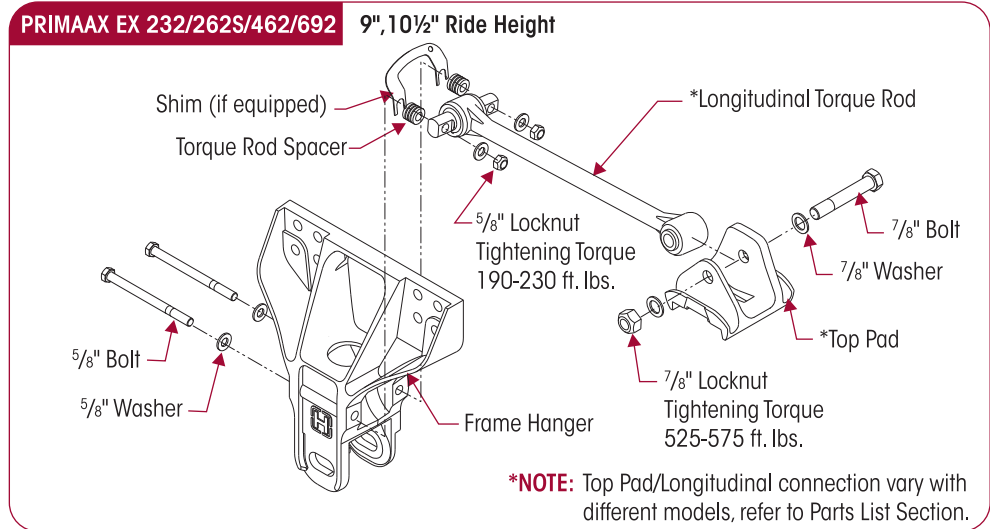
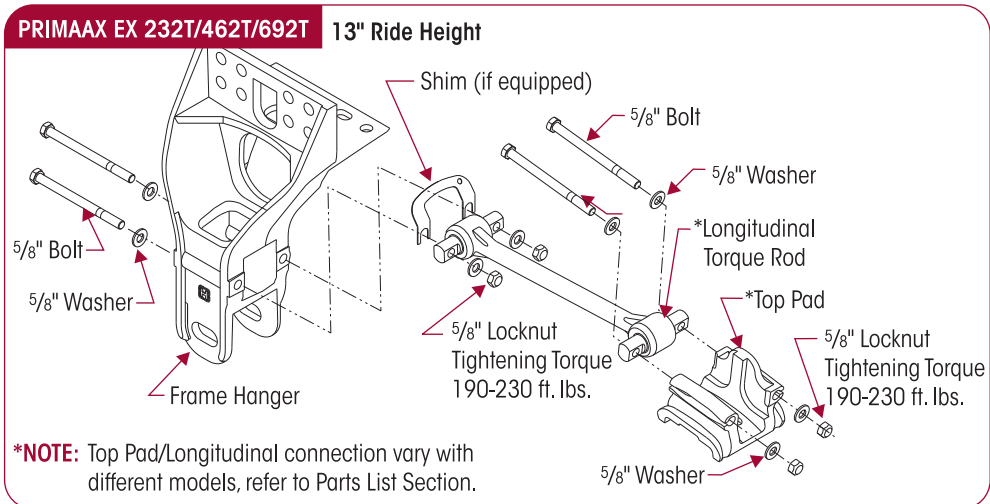


FIGURE 8-5



ASSEMBLY

1. Install the longitudinal torque rod.
2. Install the mounting fasteners and any shims that were removed, see Figures 8-4 and 8-5.

NOTE

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

NOTE

It is mandatory to have the vehicle at proper ride height prior to tightening the ¾" straddle bushing and the 7/8" top pad through bolt locknuts to torque specifications.

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

TORQUE ROD BUSHING

NOTE

Some torque rods assemblies equipped on PRIMAAX EX / PRIMAAX suspensions 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, see the Special Tools Section of this publication for shop made tool specifications.

CAUTION

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

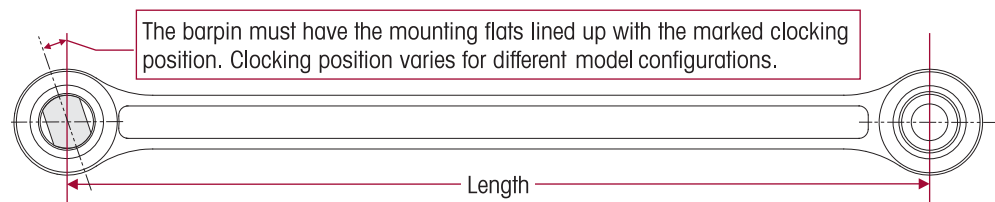
1. Remove the torque rod as detailed in this section.

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 8-6.

FIGURE 8-6



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

ASSEMBLY

NOTE

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

1. Lubricate the inner diameter of the torque rod end hub and the new rubber bushing with light Naphthenic Base Oil, such as 60 SUS at 100°F, see Figure 8-7.
2. Support the torque rod end tube on the receiving tool with the end tube 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 3/16", see Figure 8-8.
5. Press the straddle mount bar pin again from opposite side to center the bar pin within the torque rod end hub, see Figure 8-9.

FIGURE 8-7



FIGURE 8-8

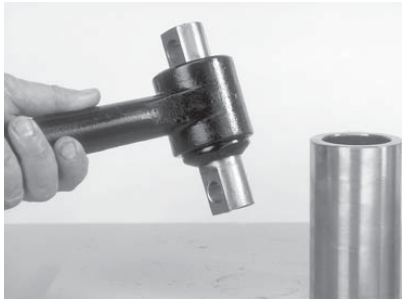
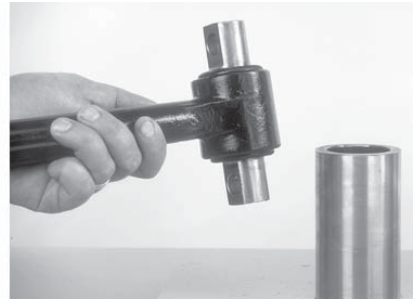


FIGURE 8-9



6. Wipe off excess lubricant. Allow the lubricant four (4) 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 MAY SLIDE FROM THE TORQUE ROD END HUB. IF THIS OCCURS, THE BUSHING MAY BE DAMAGED AND WILL 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

FIGURE 8-10

FORMER SUPPORT BEAM ASSEMBLY

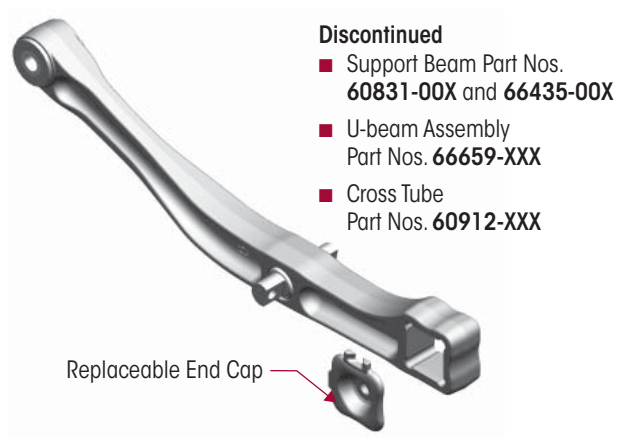
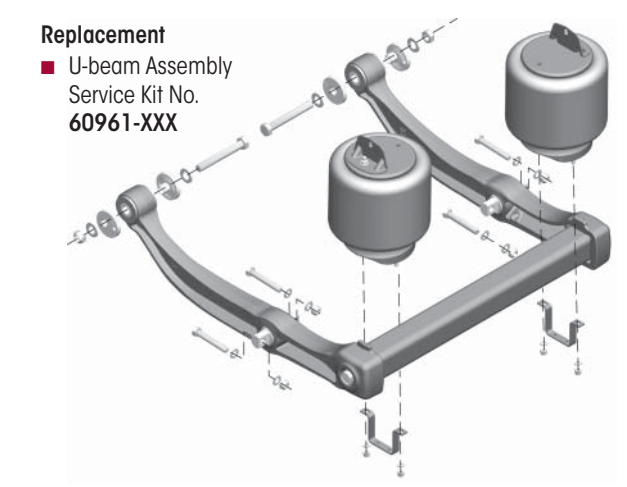


FIGURE 8-11

REPLACEMENT U-BEAM ASSEMBLY KIT



NOTE

Effective May 2010, the support beam assembly part numbers 66435-00X or 60831-00X (Forging Part Nos. 59363-001, 65082-000, 65284-000), cross tube, and previous U-beam Assembly Part Numbers with the prefix 66659-XXX, for PRIMAAX suspension systems were discontinued, see Figure 8-10.

The U-beam Assembly with integrated end caps, see Figure 8-11, is now a required replacement for any PRIMAAX support beam or cross tube component. Refer to the Support Beam and Cross Tube Replacement Guide table in the Parts List Section of this publication.

U-BEAM ASSEMBLY

IMPORTANT NOTICE

As of September 2010, Hendrickson introduced the new enhanced U-beam assembly design for PRIMAAX EX suspensions equipped on new production vehicles and for the Aftermarket. The new U-beam assembly results in a maintenance-free integrated end cap connection. Refer to Figure 6-1 in the Preventive Maintenance 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 manufacturer's instructions.

WARNING

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

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

WARNING

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

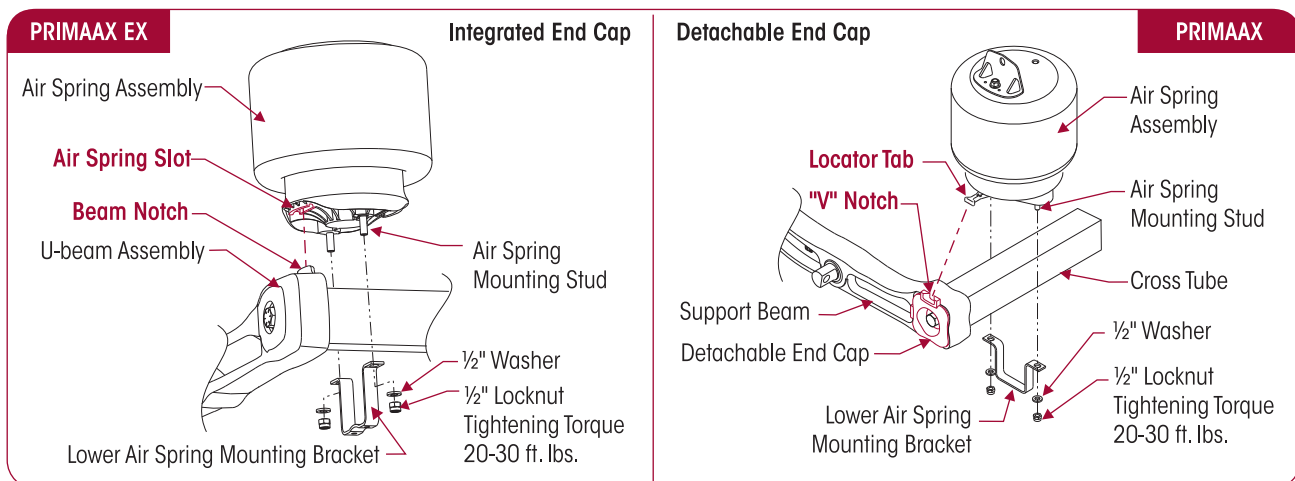
6. Lower the linkage arm(s) to exhaust the air in the air springs and deflate the rear suspension.

CAUTION

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

7. Lubricate the lower mounting fasteners of the air springs with penetrating oil. This will help prevent the air spring mounting studs from breaking during the removal process.
8. Remove and discard 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 8-12.

FIGURE 8-12





WARNING

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

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

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 and discard D-pin fasteners on both sides of the suspension.

SERVICE HINT

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

SERVICE HINT

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

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 and discard the QUIK-ALIGN fasteners.

16. Remove QUIK-ALIGN eccentric and concentric collars.

NOTE

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

17. Remove the U-beam assembly from the 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 frame hangers.



WARNING

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

DO NOT ASSEMBLE QUIK-ALIGN JOINT WITHOUT THE PROPER FASTENERS. USE ONLY HENDRICKSON GENUINE FASTENERS WITH SPECIAL COATING (H-COAT) 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.

NOTE

Use a new QUIK-ALIGN pivot bolt kit (see the Parts List Section of this publication) for any axle alignment or disassembly of the QUIK-ALIGN connection. This will help ensure that the proper clamp load is applied to the connection and help prevent the joint to slip in service.

4. Verify the correct QUIK-ALIGN collar (eccentric/concentric) is in the correct location as noted in the disassembly procedure.
5. Install QUIK-ALIGN connection with new Hendrickson fasteners and snug to about 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.

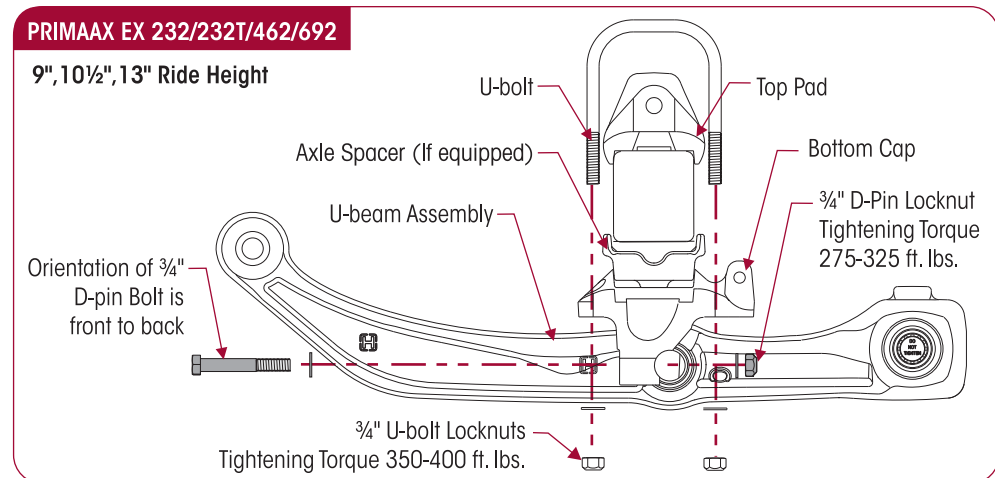
SERVICE HINT

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 8-13.
9. Remove floor jack supporting the U-beam assembly.
10. Tighten D-Pin locknuts to 275-325 foot pounds torque.

FIGURE 8-13

11. Install the air spring between the frame and cross tube, see Figure 8-12.
 - a. **PRIMAAX EX** — Ensure the "air spring slot" located in the bottom of the air spring engages the "beam notch" on the top of the support beam.
 - b. **PRIMAAX** — Ensure the "V" notch in the end cap engages the "locator tab" on the air spring.
12. Install the lower air spring mounting bracket around the cross tube, engaging the mounting studs on the air spring, see 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 height control valve linkage(s) 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 as to not damage the U-beam assembly.

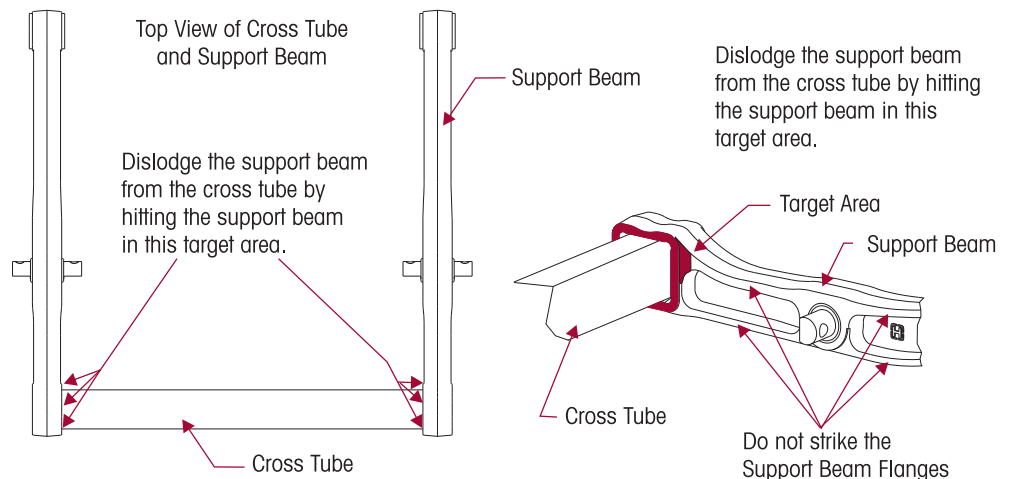
2. Remove the support beam/cross tube connection bolt from the end of the beam.
3. Remove the end cap (if equipped).

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, SEE FIGURE 8-14. FAILURE TO STRIKE THE SUPPORT BEAM SQUARELY MAY RESULT IN COMPONENT DAMAGE, PREMATURE FAILURE AND VOID WARRANTY.

4. Place a piece of plywood or cardboard around the cross tube prior to applying blunt force to the support beam.
5. 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 8-14. Continue striking the support beam until it is completely dislodged from the cross tube.

FIGURE 8-14



6. Inspect all components for any damage or wear and replace as necessary.
7. Clean any loose debris or foreign material, and if applied remove all old sealant for inspection and reassembly.
8. 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.
9. Mark the clocking position of the D-pin bushing on the support beam with a paint stick, see Figure 8-15.
10. Install the D-Pin Removal Tool centered on the D-Pin bushing, see Figure 8-16.

FIGURE 8-15

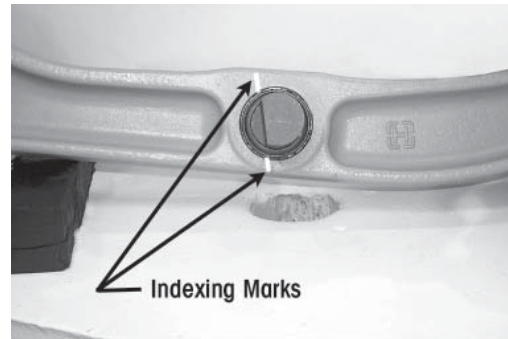
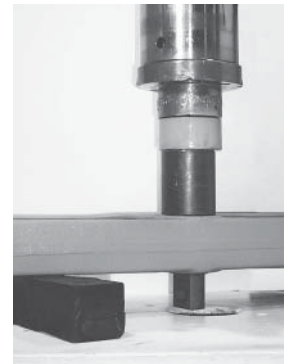


FIGURE 8-16



11. Push directly on the D-pin Removal Tool until the D-Pin bushing is pressed out of the support beam bore.
12. 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 8-17.
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 8-18.
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 U-beam assembly, see Figures 8-19 and 8-20.

NOTE

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

FIGURE 8-17



FIGURE 8-18

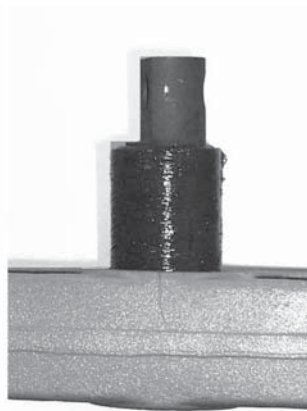


FIGURE 8-19



FIGURE 8-20





5. Install the support beams into the frame 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 frame 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**

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 HENDRICKSON GENUINE FASTENERS WITH SPECIAL COATING (H-COAT) 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.

NOTE

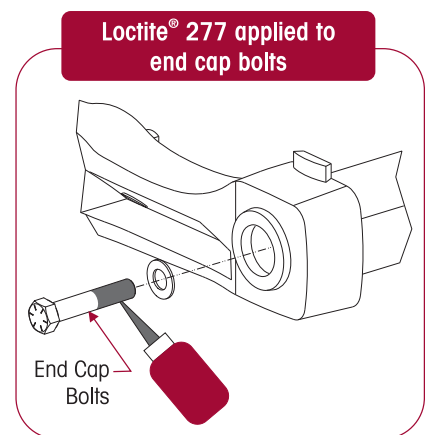
Use a new QUIK-ALIGN pivot bolt kit (see the Parts List Section of this publication) for any axle alignment or disassembly of the QUIK-ALIGN connection. This will help ensure that the proper clamp load is applied to the connection and help prevent the joint to slip in service.

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.

11. Apply Loctite 277 to the 3/8" fastener and install in end hub. **DO NOT** tighten at this time, see Figure 8-21.

FIGURE 8-21**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.

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

SERVICE HINT

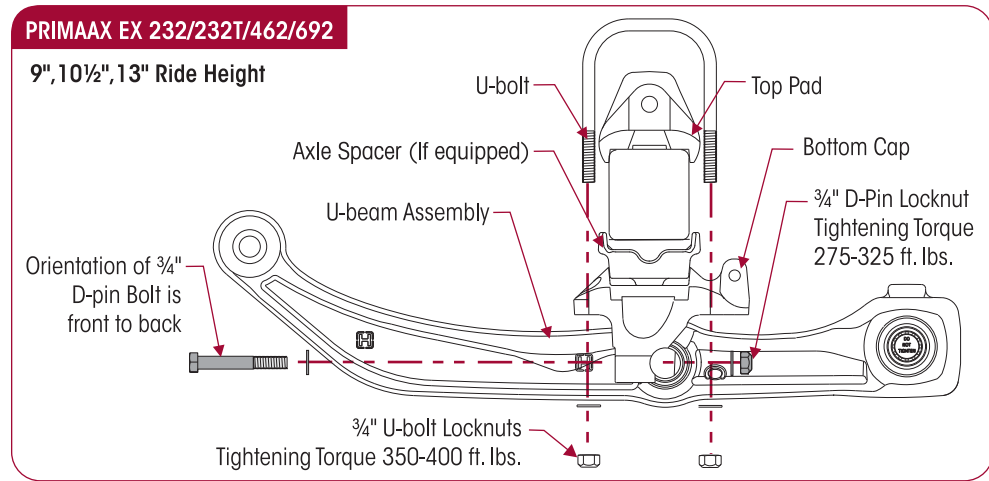
It may be necessary to rotate the QUIK-ALIGN eccentric collars to pull the axle forward to allow the full engagement of the D-Pins into the bottom caps.

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 8-22.

FIGURE 8-22



15. Tighten the $\frac{7}{8}$ " 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

Apply Sikaflex 221 polyurethane sealant at room temperature, refer to sealant manufacturer's specifications.

FIGURE 8-23

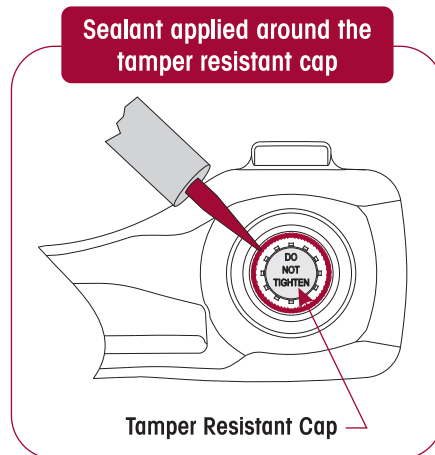
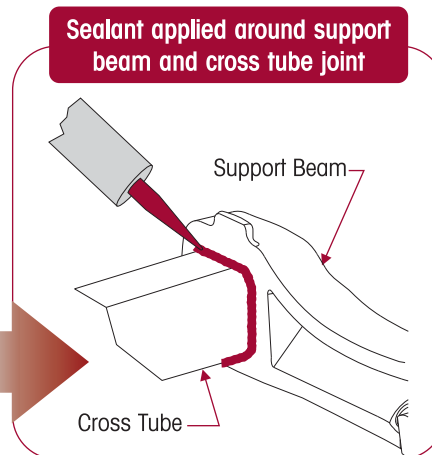


FIGURE 8-24





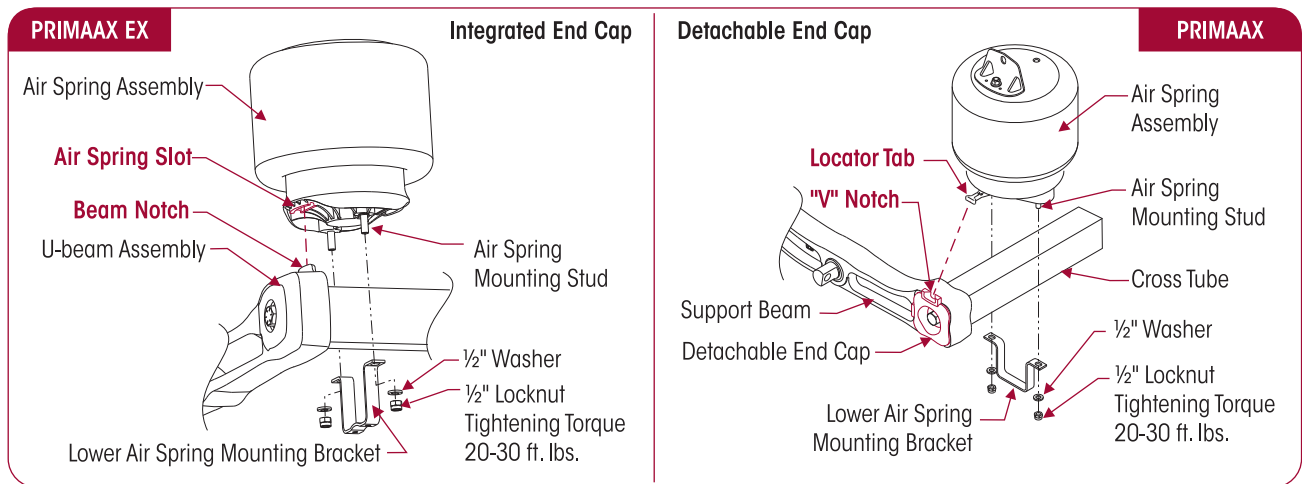
20. Use gloves when applying sealant; apply Sikaflex 221 polyurethane sealant 360 degrees over tamper resistant cap edges, ensure there are no voids or gaps in sealant after application, see Figure 8-23.
21. Use gloves when applying sealant; apply Sikaflex 221 polyurethane sealant 360 degrees around cross tube/support beam connection, ensure there are no voids or gaps in sealant after application, see Figure 8-24.

NOTE

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

22. Install the air spring between the frame and cross tube, see Figure 8-25.
 - a. **PRIMAAX EX** — Ensure the “air spring slot” located in the bottom of the air spring engages the “beam notch” on the top of the support beam.
 - b. **PRIMAAX** — Ensure the “V” notch in the end cap engages the “locator tab” on the air spring.
23. Install the lower air spring mounting bracket around the cross tube, engaging the mounting air spring studs, see Figure 8-25.

FIGURE 8-25



24. Using **HAND TOOLS** only, install the lower mounting fasteners and tighten to 20-30 foot pounds torque.
25. Install the wheels and remove the axle support(s).
26. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to deflating or inflating the air system.
27. Connect the height control valve linkage assembly to the height control valve arm(s) to inflate the suspension.
28. Remove the frame support.
29. Remove the wheel chocks.
30. Verify the ride height is within specification, refer to vehicle manufacturer for proper ride height adjustment.

NOTE

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

31. Check the alignment and adjust if necessary. See Alignment & Adjustments Section of this publication.
32. 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:

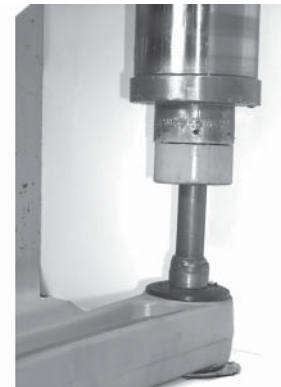
- A vertical shop press with a capacity of at least 10 tons.
- A QUIK-ALIGN pivot bushing installer, remover and receiver tool. See Special Tools Section of this publication.

1. Remove the support beam assembly. Follow the D-pin Bushing Disassembly Step 1 through 8 in this section.
2. Center the push out 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 Figure 8-26 and 8-27.
3. Clean and inspect the I.D. of the support beam eye.

FIGURE 8-26



FIGURE 8-27



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 8-28.
2. Position the support beam on the receiving tool with the beam eye centered on the tool. Be sure the support beam is squarely supported on the press bed.
3. Place the QUIK-ALIGN bushing installer tool (see Special Tools Section of this publication) on the QUIK-ALIGN bushing, see Figure 8-29.
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 8-30.
5. Install the support beam assembly. Follow D-pin Bushing Assembly Instructions, Steps 5 through 32 in this section.

FIGURE 8-28



FIGURE 8-29



FIGURE 8-30





TOP PAD

DISASSEMBLY

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

WARNING

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

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

WARNING

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

5. Lower the height control valve arm(s) to exhaust the air in the air springs and deflate the rear suspension.

SERVICE HINT

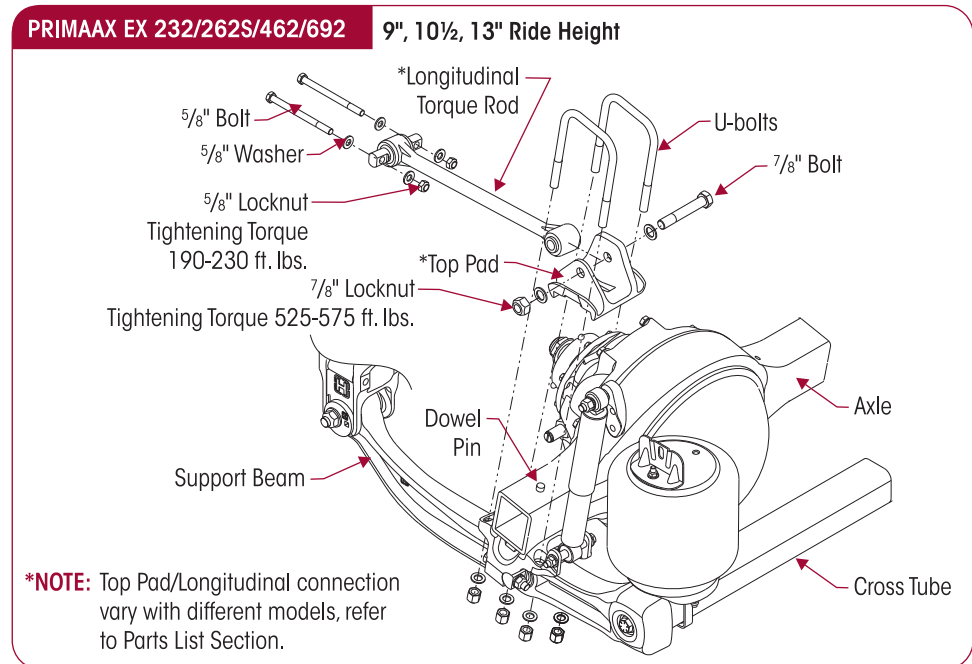
Note the quantity of shims removed to maintain the correct pinion angle of the axle at assembly. See Alignment & Adjustments Section of this publication.

6. Remove the fasteners from the longitudinal torque rod to top pad joint and shims (if equipped), see Figure 8-31.

NOTE

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

FIGURE 8-31



WARNING

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



WARNING

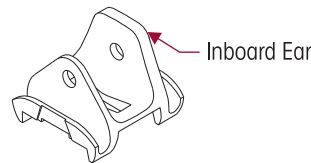
THE WEIGHT OF THE U-BEAM ASSEMBLY IS APPROXIMATELY 225 POUNDS. CARE SHOULD BE TAKEN AT REMOVAL AND INSTALLATION TO PREVENT PERSONAL INJURY OR DAMAGE TO COMPONENTS.

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

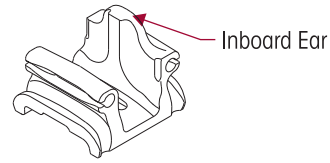
ASSEMBLY

1. Install the top pad on the top of the axle engaging the dowel pin. Care should be taken to ensure the taller ear of the top pad is mounted to the inboard side of the suspension. The top pad varies with different models and may appear different, see Figure 8-32.

FIGURE 8-32



PRIMAAX EX 232/462/692 - 9", 10½" Ride Height
 PRIMAAX 230/460/690 - 9" Ride Height
 PRIMAAX EX 232T/462T/692T - 13" Ride Height



PRIMAAX EX 232T/462T/692T - 13" Ride Height
 PRIMAAX EX 262S - 9" Ride Height

2. Install the new U-bolts. Verify that the U-bolts are seated properly in the channels of the top pad, see Figure 8-31.
3. Install the new U-bolt fasteners.

NOTE

U-bolt clamp group hardware for 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.

4. Tighten the U-bolt locknuts evenly in 50 foot pounds increments in the proper pattern to achieve uniform bolt tension, see Figure 8-33.
5. Rap the top of the U-bolts with a dead blow mallet, and retighten to the proper torque. **DO NOT** exceed specified torque on U-bolt locknuts. Tighten the ¾" locknuts to 350-400 foot pounds torque.
6. Tighten the ¾" D-Pin bolts to 275-325 foot pounds torque if loosened or removed during disassembly, see Figure 8-34.

FIGURE 8-33

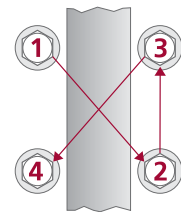
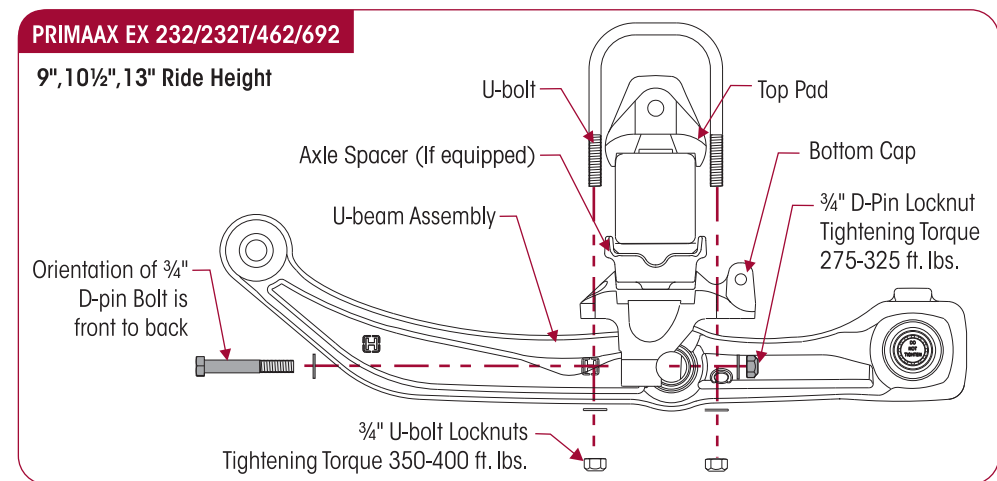


FIGURE 8-34





7. Remove the support from the U-beam assembly.
8. Install the fasteners on the longitudinal torque rod, **DO NOT** tighten at this time.
9. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to deflating or inflating the air system.
10. Connect the height control valve linkage(s) to the height control valve arm(s) to inflate the suspension.
11. Remove the frame stands.

NOTE

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

12. Ensure the vehicle is at proper ride height.
13. Tighten the longitudinal torque rod fasteners to the required specification, see Torque Specifications Section of this publication.
14. Remove the wheel chocks.

BOTTOM CAP AND AXLE SPACER (If equipped)

NOTE

It is not necessary to loosen the QUIK-ALIGN connection to service the bottom cap 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 tires.
4. Disconnect the height control linkage assembly from the height control valve arm by sliding the rubber grommet off the height control valve arm's stud.



WARNING

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

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



WARNING

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

6. Lower the height control valve linkage arm(s) to exhaust the air in the air springs and deflate the rear suspension.



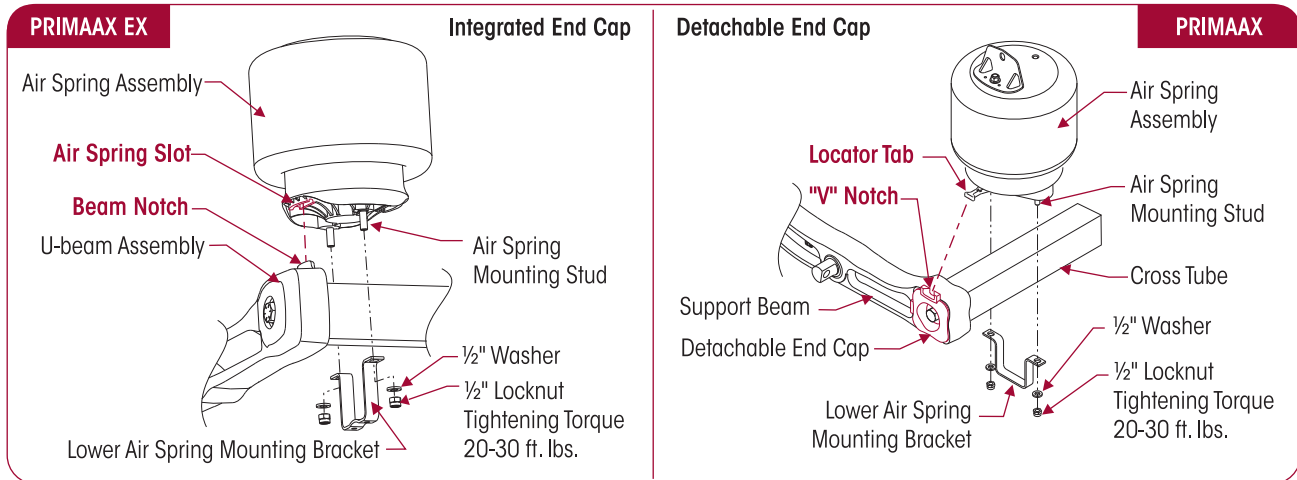
CAUTION

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

7. Clean and 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 and discard the lower mounting fasteners from the air springs using **HAND TOOLS** only, see Figure 8-35.



FIGURE 8-35



WARNING

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

WARNING

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

9. Support the U-beam assembly at the cross tube with a floor jack or jackstand that is equipped with a 4" contact plate.
10. Remove and discard the D-Pin $\frac{3}{4}$ fasteners from both sides of the support beam.
11. Raise the front of the differential to facilitate removal of the D-Pins from the bottom caps.
12. Lower the floor jack to pivot the U-beam assembly down from the bottom caps.
13. Remove and discard the lower shock absorber mounting fasteners.

14. Pivot the lower shock mount out of the bottom cap.
15. Remove and discard the S-cam support bracket fasteners and support bracket (if equipped), see Figure 8-36.
16. Remove and discard the U-bolt fasteners from the clamp group.
17. Remove the bottom cap and inspect for damage or wear. Replace as necessary.

ASSEMBLY

1. Install the top pad (if removed) on the top of the axle engaging the dowel pin. Care should be taken to ensure the taller ear of the top pad is mounted to the inboard side of the suspension, see Figure 8-37.
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.

FIGURE 8-36

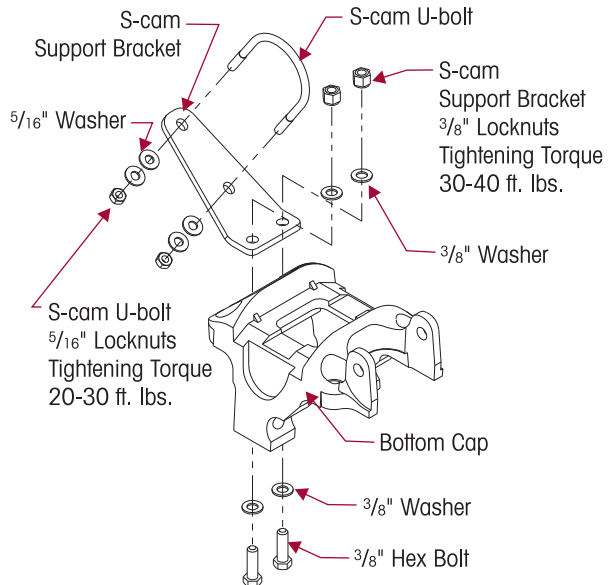
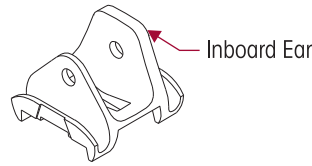
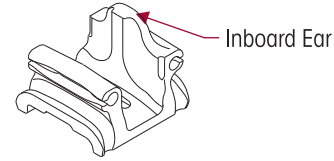




FIGURE 8-37



PRIMAAX EX 232/462/692 - 9", 10 1/2" Ride Height
 PRIMAAX 230/460/690 - 9" Ride Height
 PRIMAAX EX 232T/462T/692T - 13" Ride Height



PRIMAAX EX 232T/462T/692T - 13" Ride Height
 PRIMAAX EX 262S - 9" Ride Height

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 top pad channels and through the bottom cap, see Figure 8-34.

NOTE

U-bolt clamp group hardware for PRIMAAX EX / PRIMAAX suspensions are 3/4"-1.6 UNF Grade C locknuts and 3/4"-1.6 UNF Grade 8 U-bolts which are phosphate and oil coated.

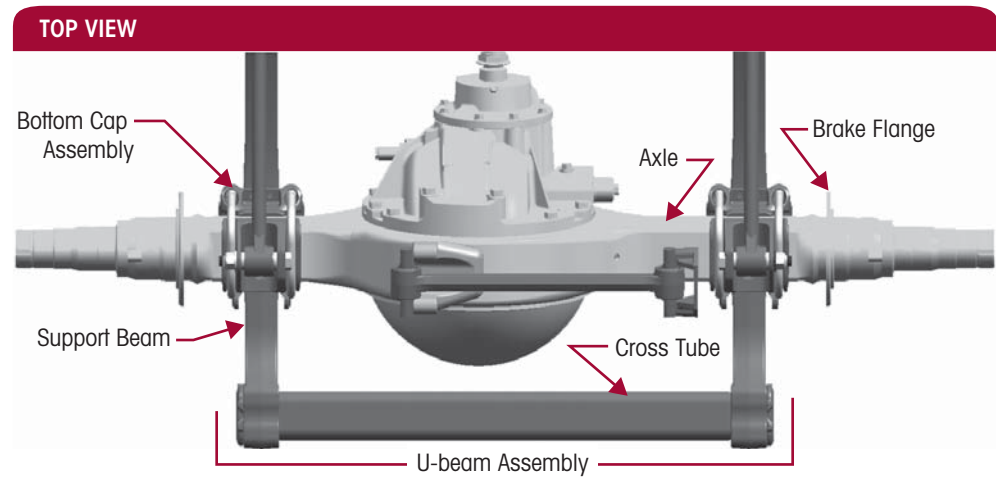
4. Install the U-bolt 3/4" fasteners and hand tighten, **DO NOT** tighten to torque at this time.

CAUTION

PRIOR TO TIGHTENING THE U-BOLTS TO THE FINAL TORQUE, ENSURE THE U-BEAM AND THE BOTTOM CAP ASSEMBLY ARE CENTERED ON THE AXLE ($A = B \pm 1/8"$), SEE FIGURE 8-38. FAILURE TO DO SO COULD CAUSE PREMATURE COMPONENT WEAR OR CAUSE UNEVEN LOAD DISTRIBUTION.

5. Center the U-beam assembly and the bottom cap on the axle ($A = B \pm 1/8"$), see Figure 8-38.

FIGURE 8-38

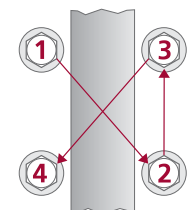


SERVICE HINT

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

6. Raise the U-beam assembly until the D-Pins engage in the bottom cap.
7. Install the D-Pin fasteners with the bolt heads on the forward side of the bottom cap, see Figure 8-34.
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.
11. Tighten the U-bolt locknuts evenly in 50 foot pounds increments in the proper pattern to achieve uniform bolt tension, see Figure 8-39.

FIGURE 8-39



12. Rap the top of the U-bolts with a dead blow mallet, and retighten to the proper torque. **DO NOT** exceed the specified tightening torque specified on the U-bolt locknuts. Tighten the $\frac{3}{4}$ " locknuts to 350-400 foot pounds torque, see Figure 8-34.
13. Pivot the shock back into the lower shock mount and install the lower shock absorber mounting fasteners. Tighten the $\frac{5}{8}$ " locknuts to 200-225 foot pounds torque.
14. Install the S-cam support bracket and fasteners (if equipped). Tighten the $\frac{3}{8}$ " locknuts to 30-40 foot pounds torque. Tighten the $\frac{5}{16}$ " locknuts to 20-30 foot pounds torque.
15. Install the air spring between the frame and the cross tube, see Figure 8-35.
 - a. **PRIMAAX EX** — Ensure the "air spring slot" located in the bottom of the air spring engages the "beam notch" on the top of the support beam.
 - b. **PRIMAAX** — Ensure the "V" notch in the end cap engages the "locator tab" on the air spring.
16. Install the lower air spring mounting bracket around the cross tube, engaging the mounting air spring studs, see Figure 8-35.
17. Using **HAND TOOLS** install the lower mounting fasteners and tighten to 20-30 foot pounds torque.
18. Install the wheels and remove axle support.
19. Remove the jack stands and lower the frame of vehicle.
20. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to deflating or inflating the air system.
21. Connect the height control valve linkage(s) to the height control valve arm(s) to inflate the suspension.
22. Alignment is necessary anytime the U-beam assembly is removed to complete the repair. See Alignment & Adjustments Section of this publication.
23. Remove the wheel chocks.

S-CAM SUPPORT BRACKET (If equipped)

DISASSEMBLY

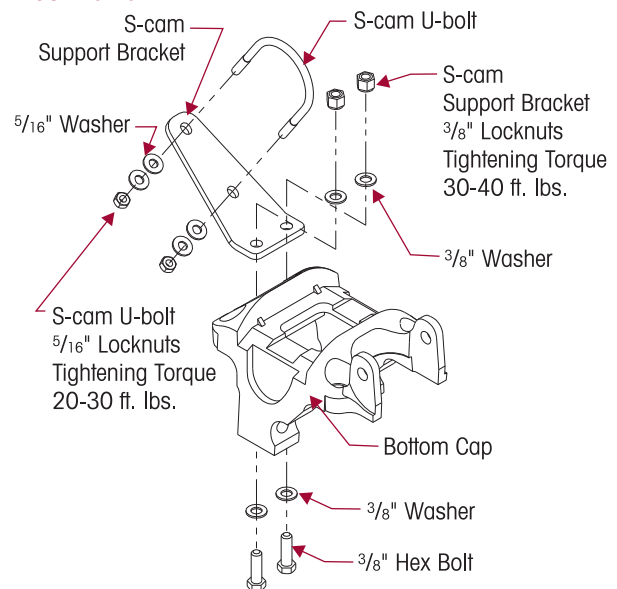
1. Chock the wheels.
2. Remove and discard the S-cam U-bolt fasteners, see Figure 8-40.

3. Remove and discard the S-cam U-bolt from the bracket and the S-cam housing.
4. Remove and discard the fasteners connecting the S-cam support bracket from the bottom cap.
5. Remove the bracket and inspect components for wear or damage. Replace as necessary.


ASSEMBLY

1. Install the bracket on top of the bottom cap.

FIGURE 8-40






2. Install the S-cam $\frac{3}{8}$ " bolts, washers, and locknuts must be installed with the bolt heads on the underside of the bottom cap, see Figure 8-40. Tighten the locknuts to  30-40 foot pounds.

SERVICE HINT

S-cam $\frac{3}{8}$ " bolts must be installed with the bolt heads on the underside of the bottom cap to prevent interference between the support beam and the bolt fasteners during articulation.

3. Install the U-bolt around the S-cam housing and through the S-cam support bracket.
4. Install the $\frac{5}{16}$ " washers and locknuts. Tighten the locknuts to  20-30 foot pounds.
5. Remove the wheel chocks.

AXLE STOPS

DISASSEMBLY

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

ASSEMBLY

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

FRAME HANGER

WARNING

THIS PROCEDURE TO REPLACE A FRAME HANGER, IS DONE WITH THE 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 REMAINING FRAME HANGERS. FAILURE TO DO SO COULD CAUSE THE AXLE TO SHIFT RESULTING IN POSSIBLE DAMAGE TO COMPONENTS OR PERSONAL INJURY.

SERVICE HINT

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

DISASSEMBLY

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

WARNING

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

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

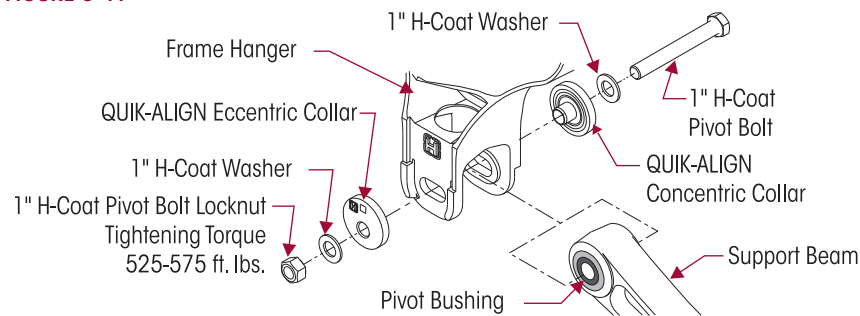
SERVICE HINT

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

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.

- Remove and discard the QUIK-ALIGN fasteners and collars, see Figure 8-41. The collars may be reused if they are not damaged.

FIGURE 8-41**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.

- Remove the fasteners and shim (if equipped) that attach the longitudinal torque rod to the frame hanger.
- Remove the fasteners that attach the frame hanger to the vehicle per vehicle manufacturer's specifications.
- Remove the frame hanger.
- Inspect mounting surface for any damage or wear, replace as necessary.
- Inspect the QUIK-ALIGN pivot bushing and torque rod bushings for wear or damage, replace as necessary.

ASSEMBLY

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

WARNING


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

DO NOT ASSEMBLE QUIK-ALIGN JOINT WITHOUT THE PROPER FASTENERS. USE ONLY HENDRICKSON GENUINE FASTENERS WITH SPECIAL COATING (H-COAT) 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.

NOTE


Use a new support beam QUIK-ALIGN 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 connections, so that the joints will not slip in service.



3. Install the QUIK-ALIGN collars and the new mounting hardware that attach the support beam to the frame hanger, see Figure 8-41. 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  50 to 100 foot pounds torque, **DO NOT** tighten at this time.
4. Install the torque rod mounting fasteners and reinstall any shims that were removed during disassembly. Tighten the fasteners to the proper specification, see Torque Specification Section of this publication per model designation.
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 height control valve linkage(s) to the height control valve arm(s) to inflate the suspension.
7. Remove frame support(s).
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.

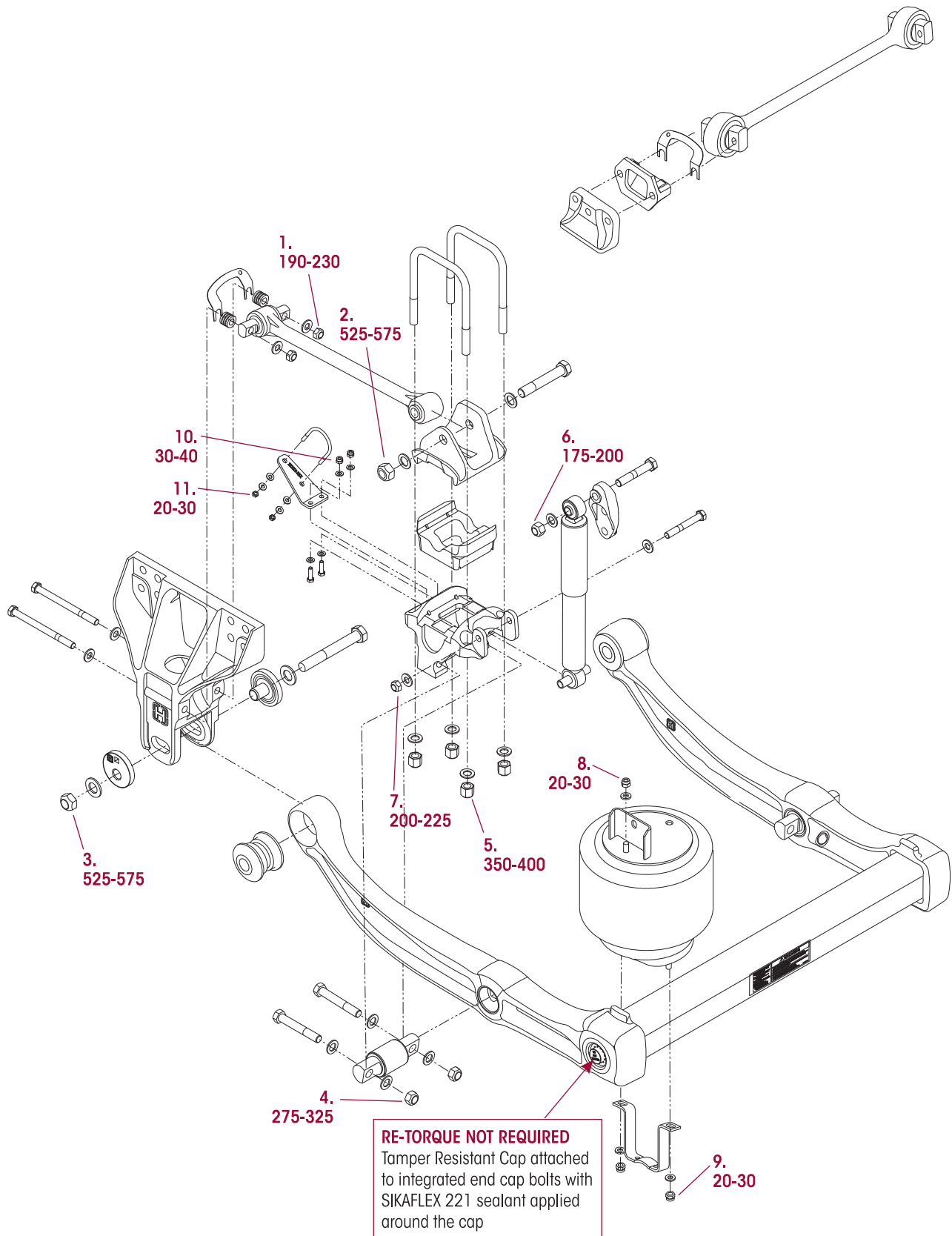
9. After the correct alignment of the axle is verified tighten the 1.0" QUIK-ALIGN locknuts to  525-575 foot pounds torque.
10. Verify the correct pinion angle on the axle per vehicle manufacturer's specifications. Adjust as necessary per the Alignment & Adjustments Section of this publication.
11. Remove the wheel chocks.

SECTION 9

Torque Specifications

- PRIMAAX EX 232/462/692
9", 10½" Ride Height

HENDRICKSON RECOMMENDED TORQUE VALUES
PROVIDED IN FOOT POUNDS





PRIMAAX EX 232/462/692

9", 10½" Ride Height

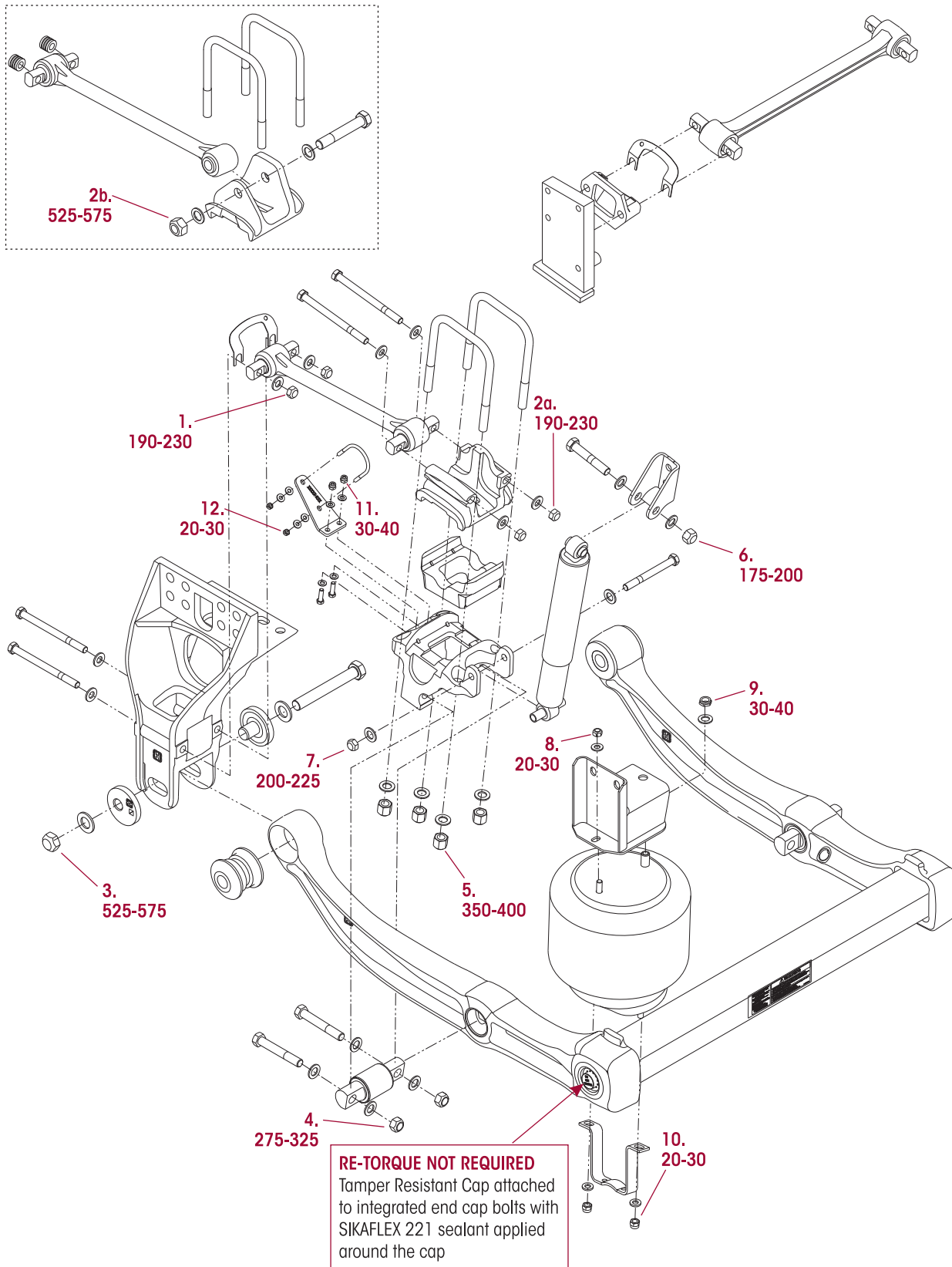
HENDRICKSON RECOMMENDED TORQUE SPECIFICATIONS

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.			
1	Longitudinal Torque Rod to Frame Hanger	4	5/8"-11 UNC	190-230
2	Longitudinal Torque Rod to Top Pad	2	7/8"-14 UNF	525-575
3	U-beam Assembly to QUIK-ALIGN Bushing	2	1"-14 UNF	525-575
4	U-beam Assembly to Center D-Pin Bushing	4	3/4"-16 UNF	275-325
5	U-bolt Locknuts	8	3/4"-16 UNF	350-400
6	Upper Shock Absorber to Shock Bracket	2	3/4"-10 UNC	175-200
7	Lower Shock Absorber to Bottom Cap	2	5/8"-11 UNC	200-225
8	Air Spring Assembly to Upper Air Spring Bracket	2	1/2"-13 UNC	20-30
9	Air Spring Assembly to Lower Air Spring Mounting Bracket	4	1/2"-13 UNC	20-30
10	S-cam Support Bracket to Bottom Cap Mount	4	3/8"-16 UNC	30-40
11	S-cam Support Bracket U-bolt Locknuts	4	5/16"-18 UNC	20-30
NOTE: * Quantities shown are per axle. Double for Tandem, Triple for Tridem. ** Torque values listed above apply only if Hendrickson supplied fasteners are used. If non Hendrickson fasteners are used, follow torque specification listed in vehicle manufacturer's service manual.				



■ PRIMAAX EX 232/462/692
13" Ride Height

HENDRICKSON RECOMMENDED TORQUE VALUES
PROVIDED IN FOOT POUNDS





PRIMAAX EX 232/462/692

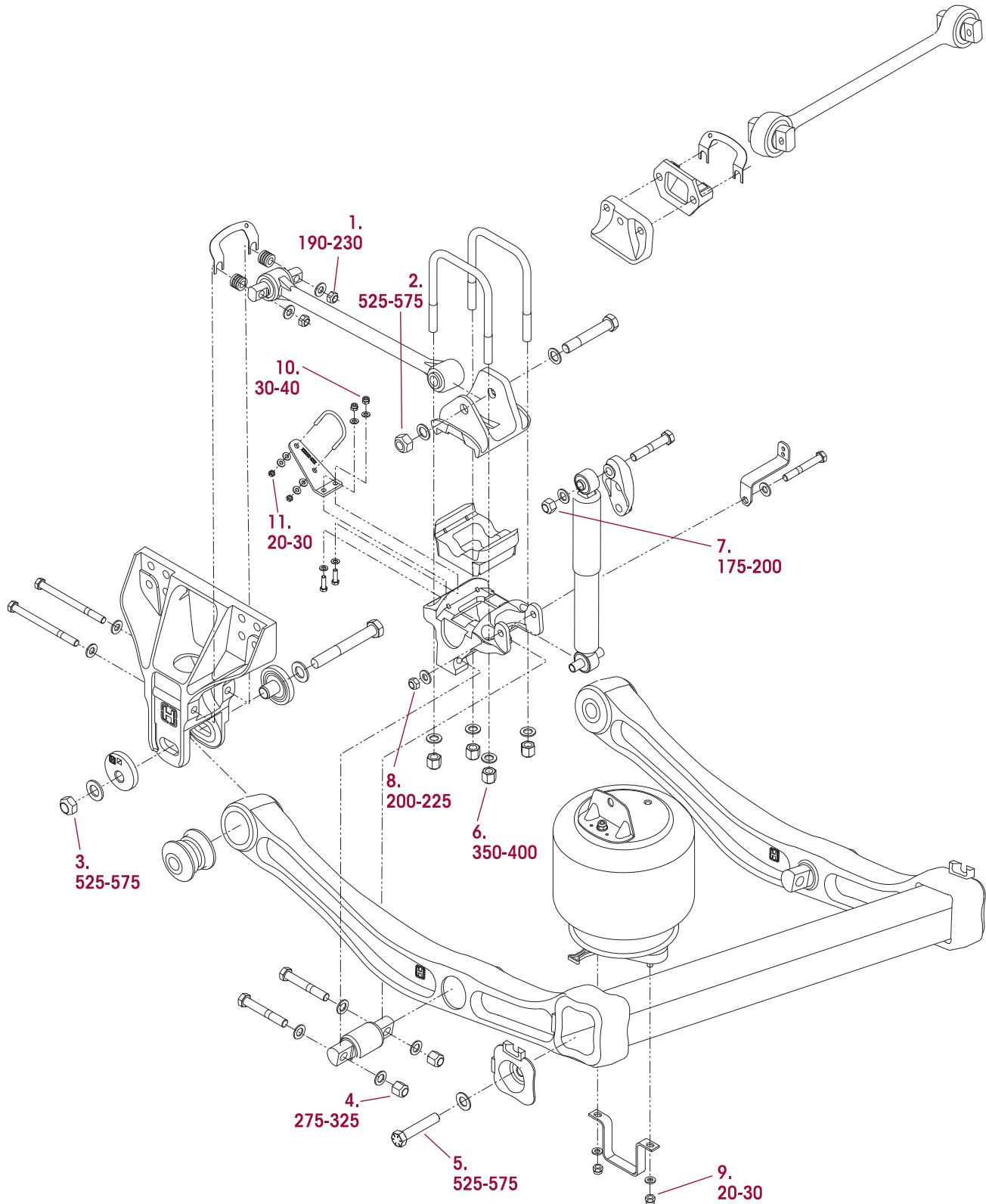
13" Ride Height

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.				
1	Longitudinal Torque Rod to Frame Hanger	4	5/8"-11 UNC	190-230
2a	Longitudinal Torque Rod to Top Pad	4	5/8"-11 UNC	190-230
2b	Longitudinal Torque Rod to Top Pad	2	7/8"-14 UNF	525-575
3	U-beam Assembly to QUIK-ALIGN Bushing	2	1"-14 UNF	525-575
4	U-beam Assembly to Center D-Pin Bushing	4	3/4"-16 UNF	275-325
5	U-bolt Locknuts	8	3/4"-16 UNF	350-400
6	Upper Shock Absorber to Shock Bracket	2	3/4"-10 UNC	175-200
7	Lower Shock Absorber to Bottom Cap	2	5/8"-11 UNC	200-225
8	Upper Air Spring Assembly	2	1/2"-13 UNC	20-30
9	Air Spring Assembly to Upper Frame Bracket	2	3/4"-16 UNF	30-40
10	Air Spring Assembly to Lower Air Spring Mounting Bracket	4	1/2"-13 UNC	20-30
11	S-cam Support Bracket to Bottom Cap Mount	4	3/8"-16 UNC	30-40
12	S-cam Support Bracket U-bolt Locknuts	4	5/16"-18 UNC	20-30
<p>NOTE: * Quantities shown are per axle. Double for Tandem, Triple for Tridem.</p> <p>** Torque values listed above apply only if Hendrickson supplied fasteners are used. If non Hendrickson fasteners are used, follow torque specification listed in vehicle manufacturer's service manual.</p>				



■ PRIMAAX 230/460/690
9" Ride Height

HENDRICKSON RECOMMENDED TORQUE VALUES
PROVIDED IN FOOT POUNDS





PRIMAAX 230/460/690

9" Ride Height

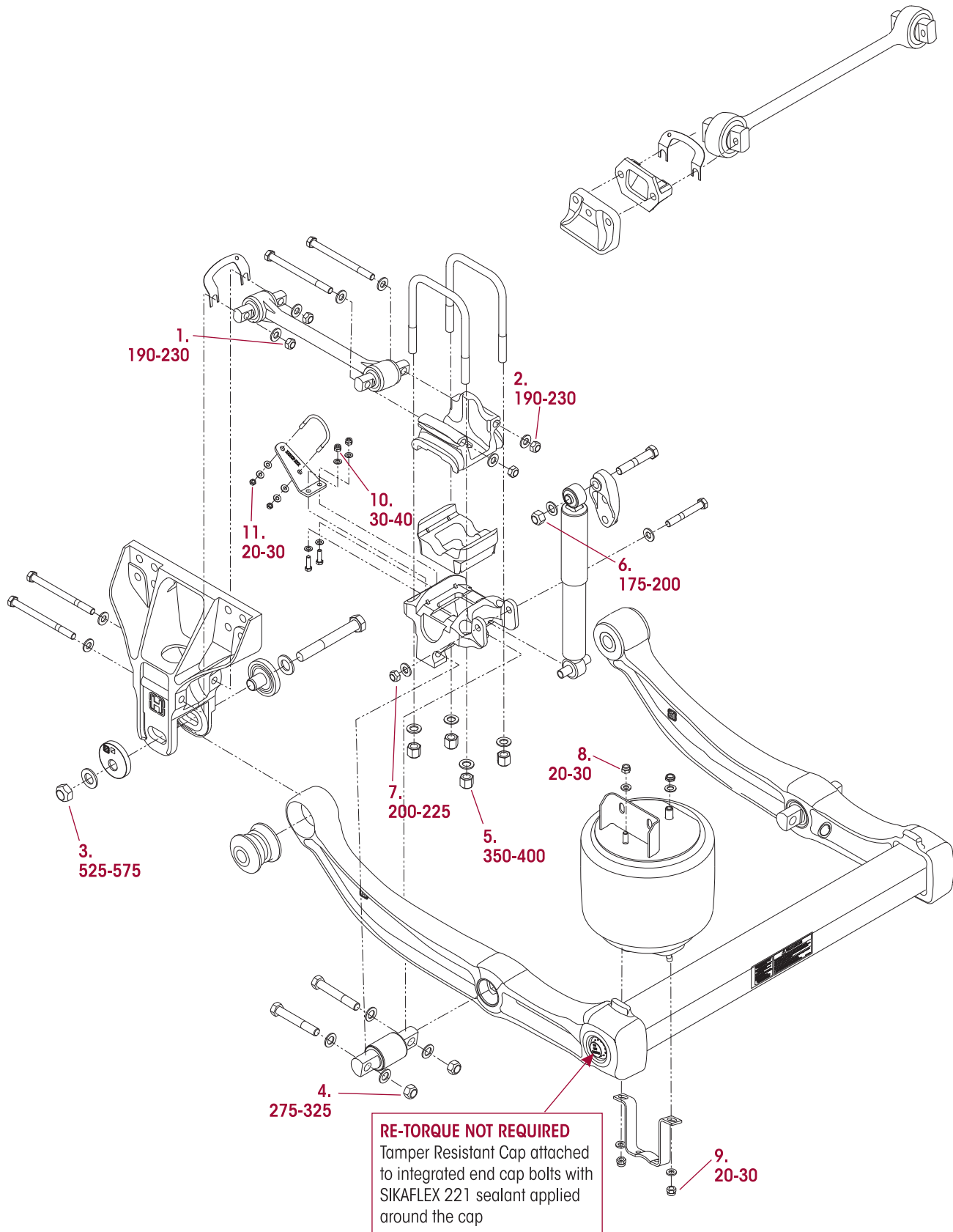
HENDRICKSON RECOMMENDED TORQUE SPECIFICATIONS

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.			
1	Longitudinal Torque Rod to Frame Hanger	4	5/8"-11 UNC	190-230
2	Longitudinal Torque Rod to Top Pad	2	7/8"-14 UNF	525-575
3	U-beam Assembly to QUIK-ALIGN Bushing	2	1"-14 UNF	525-575
4	U-beam Assembly to Center D-Pin Bushing	4	3/4"-16 UNF	275-325
5	U-beam Assembly to End Cap	2	7/8"-9 UNC	525-575
6	U-bolt Locknuts	8	3/4"-16 UNF	350-400
7	Upper Shock Absorber to Shock Bracket	2	3/4"-10 UNC	175-200
8	Lower Shock Absorber to Bottom Cap	2	5/8"-11 UNC	200-225
9	Air Spring Assembly to Lower Air Spring Mounting Bracket	4	1/2"-13 UNC	20-30
10	S-cam Support Bracket to Bottom Cap Mount	4	3/8"-16 UNC	30-40
11	S-cam Support Bracket U-bolt Locknuts	4	5/16"-18 UNC	20-30
<p>NOTE: * Quantities shown are per axle. Double for Tandem, Triple for Tridem.</p> <p>** For torque requirements see the vehicle manufacturer. Torque values listed above apply only if Hendrickson supplied fasteners are used. If non Hendrickson fasteners are used, follow torque specification listed in vehicle manufacturer's service manual.</p>				



■ PRIMAAX EX 262S
9" Ride Height

HENDRICKSON RECOMMENDED TORQUE VALUES
PROVIDED IN FOOT POUNDS





PRIMAAX EX 262S

9" Ride Height

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.			
1	Longitudinal Torque Rod to Frame Hanger	4	5/8"-11 UNC	190-230
2	Longitudinal Torque Rod to Top Pad	4	5/8"-11 UNC	190-230
3	U-beam Assembly to QUIK-ALIGN Bushing	2	1"-14 UNF	525-575
4	U-beam Assembly to Center D-Pin Bushing	4	3/4"-16 UNF	275-325
5	U-bolt Locknuts	8	3/4"-16 UNF	350-400
6	Upper Shock Absorber to Shock Bracket	2	3/4"-10 UNC	175-200
7	Lower Shock Absorber to Bottom Cap	2	5/8"-11 UNC	200-225
8	Air Spring Assembly to Upper Frame Bracket	2	3/4"-16 UNF	30-40
9	Air Spring Assembly to Lower Air Spring Mounting Bracket	4	1/2"-13 UNC	20-30
10	S-cam Support Bracket to Bottom Cap Mount	4	3/8"-16 UNC	30-40
11	S-cam Support Bracket U-bolt Locknuts	4	5/16"-18 UNC	20-30
<p>NOTE: * Quantities shown are per axle. Double for Tandem, Triple for Tridem.</p> <p>** Torque values listed above apply only if Hendrickson supplied fasteners are used. If non Hendrickson fasteners are used, follow torque specification listed in vehicle manufacturer's service manual.</p>				



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.
	Incorrect alignment	Correct the alignment. Refer to the Alignment & Adjustments Section.
	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.
	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.
	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 vehicle alignment. Adjust if necessary. Check frame hanger for wear around QUIK-ALIGN plates and replace if necessary.
	Loose U-bolts	Tighten U-bolts to specifications, see Preventive Maintenance Section.
	Loose end caps (if equipped)	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 bushings	Replace 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.



PRIMAAX EX / PRIMAAX TROUBLESHOOTING GUIDE

CONDITION	POSSIBLE CAUSE	CORRECTION
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 in this publication.
	Load not centered	Redistribute the load.
	Frame twisted	Straighten the frame per vehicle manufacturer's 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.
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 Ride Height Adjustment in the Alignment & Adjustments Section of this publication.
	Air line obstructed or improperly connected	Repair air system and check ride height. See Ride Height Adjustment in the Alignment & Adjustments Section.
	HCV dump port activated	Check HCV 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 Ride Height Adjustment in the Alignment & Adjustments Section of this publication.
	Misfunctioning Height Control Valve	See test procedure in Preventive Maintenance Section, replace height control valve as necessary.
Excessive frame slope	Ride height set incorrectly	Adjust ride height to proper setting. See Ride Height Adjustment in the Alignment & Adjustments Section. Contact Hendrickson Tech Services.
	Suspension is overloaded	Redistribute load to correct weight

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