

H TECHNICAL PROCEDURE

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

SUBJECT: Service Instructions

LIT NO: 17730-238

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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® suspension systems.

Refer to Hendrickson website for other vehicle manufacturer specific PRIMAAX EX • PRIMAAX suspension Parts Lists.

NOTE

Use only Hendrickson Genuine parts for servicing this suspension system.

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

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

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

SECTION 2

Product Description

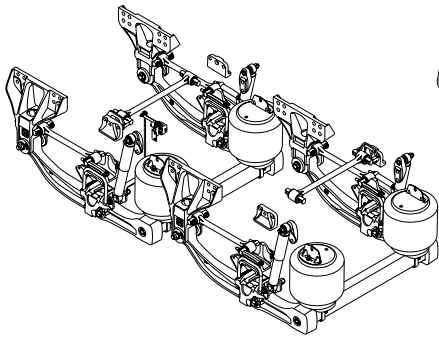
PRIMAAX EX Severe-duty Vocational Air Suspension System — With its rugged, weight efficient design, PRIMAAX EX is a severe-duty vocational air suspension that delivers advanced suspension technology for the rigorous demands of vocational, severe-service, and heavy-haul applications. The system features a robust structural design with optimized suspension geometry for exceptional stability, handling and ride. Suspension-induced driveline vibration is significantly reduced with PRIMAAX EX compared to competitive trailing-arm air suspensions, resulting in higher driver comfort and less premature wear on expensive truck and body equipment.

- **Air springs** — Large volume, low frequency design for improved ride. Advanced design air springs lift and support the load with less air pressure.
- **Cast structural beams** — Integrated end caps for increased reliability. Utilize premium materials to improve durability. Robust rubber bushings help improve service life and eliminate lubrication requirements. Designed for increased disc brake clearance and compatibility.
- **D-pin axle connection and clamp group** — Decreases torsional axle stress for reduced maintenance and increased joint integrity. Integrated axle stop contact pads reduce axle stress. Newly designed torque rod bar-pin connection for increased reliability and reduced maintenance time.
- **Frame hangers** — Robust frame hangers enhance system durability to meet a variety of grueling vocational and severe-duty applications.
- **Heavy-duty shock absorbers** — Positioned and tuned for optimum damping characteristics and protect air springs from over-extension.
- **QUIK-ALIGN®** — Allows for easy axle alignment without shims. Reduces maintenance time and helps extend tire life.

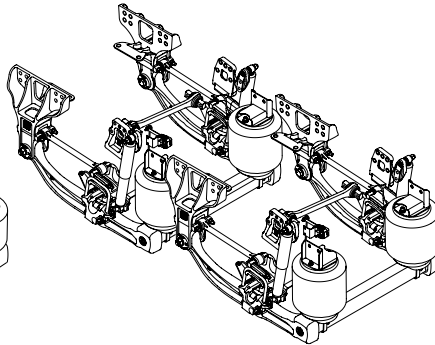


- **Torque Rods** — Optimized configuration helps improve handling and roll stiffness for expanded applications. Premium retained rubber bushings for increased service life and resistance to walk-out. Designed for optimum clearance and articulation. Alternative torque rods available for disc brake use.

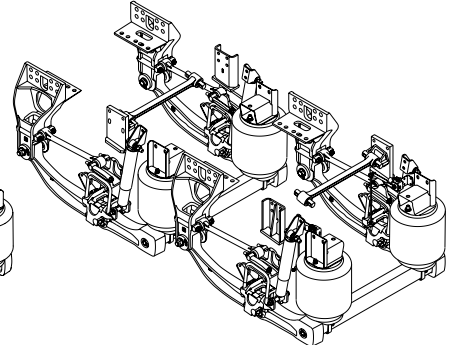
FIGURE 2-1 Current Production Shown



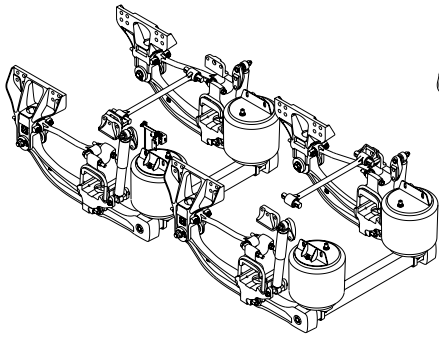
23K•46K•69K | 26K S•52K S•78K S
8½" to 10½" Ride Height



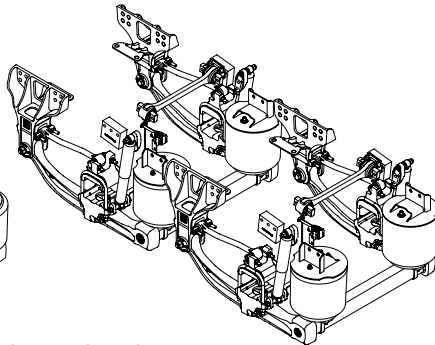
23K•46K•69K | 26K S•52K S•78K S
12" Ride Height



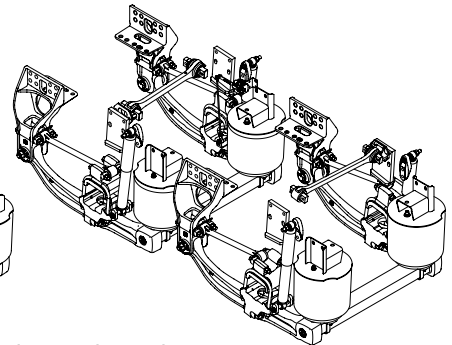
23K T•46K T•69K T | 26K ST•52K ST•78K ST
12½" to 15½" Ride Height



26K • 52K • 78K
8½" to 10½" Ride Height



26K • 52K•78K
12" Ride Height



26K T•52K T•78K T
12½" to 15½" Ride Height

S – designates **Small Clamp Group** | **T** – designates **Tall Ride Height** 12½" to 15½"

Top pad / Longitudinal connection may vary with different models. Refer to the specific parts list for PRIMAAX EX suspension equipped on your vehicle available online at www.hendrickson-intl.com/products/primaax.



***PRIMAAX EX SPECIFICATIONS**

S – designates Small Clamp Group | **T** – designates Tall Ride Height 12½", 13", 14¾", 15½"

	Single Axle Configuration						Tandem Axle Configuration					
	23K	23K T	26K	26K T	26K S	26K ST	46K	46K T	52K	52K T	52K S	52K ST
Suspension Capacity Rating	23,000 lbs		26,000 lbs				46,000 lbs		52,000 lbs			
Job-Site Travel Rating¹	30,000 lbs		33,000 lbs		33,000 lbs		60,000 lbs		66,000 lbs		66,000 lbs	
Ride Height²	8½" to 10½", 12"	12½" to 15½"	8½" to 10½", 12"	12½" to 15½"	8½" to 10½", 12"	12½" to 15½"	8½" to 10½", 12"	12½" to 15½"	8½" to 10½", 12"	12½" to 15½"	8½" to 10½", 12"	12½" to 15½"
Gross Combination Weight Approval³	Contact Vehicle Manufacturer						Contact Vehicle Manufacturer					
Axle Travel⁴	8"						8"					
Lift Axles	Approved						Approved					
Axle Spacing	N/A						52" to 72½"		54" to 72½"			

	Tridem Axle Configuration					
	69K	69K T	78K	78K T	78KS	78K ST
Suspension Rating	69,000 lbs		78,000 lbs			
Job-Site Travel Rating¹	90,000 lbs		99,000 lbs		99,000 lbs	
Ride Height²	8½" to 10½", 12"	12½" to 15½"	8½" to 10½", 12"	12½" to 15½"	8½" to 10½", 12"	12½" to 15½"
Gross Combination Weight Approval³	Contact Vehicle Manufacturer					
Axle Travel⁴	8"					
Lift Axles	Approved					
Axle Spacing	52" to 60"		54" to 60"			

*Current production specifications shown. PRIMAAX EX is approved for vocational and heavy-haul vehicle applications including, but not limited to: truck, tractor, dump, front and rear discharge mixers, logging, crane mounted, platform, fire / rescue, specialty and vehicles equipped with outriggers. Shock absorbers are required in tractor and logging applications. Ride and traction may be improved in other applications with shock absorbers. Ride performance can be subjective and may be dependent on many factors beyond the suspension design, such as cab suspension, road conditions, body / auxiliary equipment, frame specifications, etc.

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

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



SECTION 3

Important Safety Notice

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

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

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

■ EXPLANATION OF SIGNAL WORDS

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



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

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



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, ADVERSE VEHICLE HANDLING, POSSIBLE PERSONAL INJURY, OR PROPERTY DAMAGE.

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

WARNING

QUIK-ALIGN FASTENERS

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

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

WARNING

LOAD CAPACITY

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

WARNING

SUPPORT THE VEHICLE PRIOR TO SERVICING

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

WARNING

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

CAUTION

PROCEDURES AND TOOLS

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

WARNING

MODIFYING COMPONENTS

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



WARNING

PERSONAL PROTECTIVE EQUIPMENT

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



WARNING

TORCH/WELDING

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

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



WARNING

WORK SITE DUMPING



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



CAUTION

AIR SPRING LOWER MOUNTING STUDS

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



WARNING

AIR SPRING PRESSURE RETENTION

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



WARNING

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



WARNING

AIR SPRING INFLATION AND DEFLATION

PRIOR TO DISASSEMBLY OF THE SUSPENSION, AIR SPRING ASSEMBLIES MUST BE DEFLATED. UNRESTRICTED AIR SPRING ASSEMBLIES CAN VIOLENTLY SHIFT. DO NOT INFLATE AIR SPRING ASSEMBLIES WHEN THEY ARE UNRESTRICTED. AIR SPRING ASSEMBLIES MUST BE RESTRICTED BY SUSPENSION OR OTHER ADEQUATE STRUCTURE. DO NOT INFLATE BEYOND PRESSURES RECOMMENDED BY AIR SPRING MANUFACTURER, CONTACT HENDRICKSON TECHNICAL SERVICES FOR DETAILS. IMPROPER USE OR OVER INFLATION MAY CAUSE AIR SPRING ASSEMBLIES TO BURST, CAUSING PROPERTY DAMAGE AND/OR SEVERE PERSONAL INJURY.

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



CAUTION

AIR SPRING INFLATION

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



TORQUE RODS

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



SHOCK ABSORBERS

THE SHOCK ABSORBERS ARE THE REBOUND TRAVEL STOPS FOR THE SUSPENSION. THE SHOCK ABSORBERS MUST REMAIN CONNECTED ANYTIME THE AXLE IS SUSPENDED OTHERWISE ALLOWED TO HANG ABOVE THE GROUND. 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.

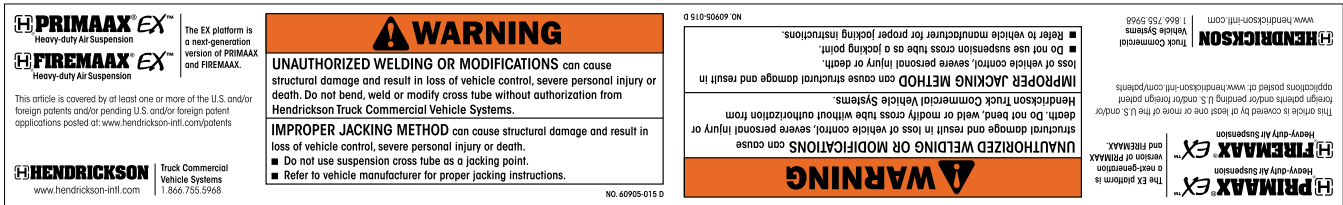


CROSS TUBE

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

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

FIGURE 3-1 Safety Decal Number 60905-015



- DO NOT USE THE SUSPENSION CROSS TUBE AS A JACKING POINT TO RAISE THE VEHICLE, SEE FIGURE 3-2
- REFER TO THE VEHICLE MANUFACTURER FOR PROPER JACKING INSTRUCTIONS, SEE FIGURE 3-3

FIGURE 3-2



FIGURE 3-3



PARTS CLEANING

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

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

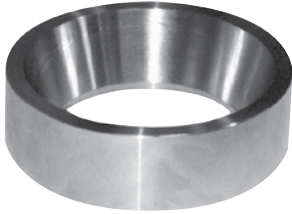
DO NOT USE HOT SOLUTION TANKS OR WATER AND ALKALINE SOLUTIONS TO CLEAN GROUND OR POLISHED PARTS. DOING SO WILL CAUSE DAMAGE TO THE PARTS AND VOID WARRANTY.



SECTION 4 Special Tools

TORQUE ROD BUSHING SERVICE TOOLS

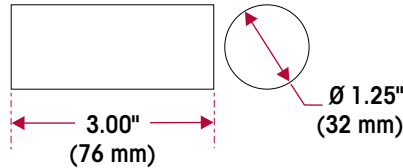
Hendrickson Part No. 66086-001L



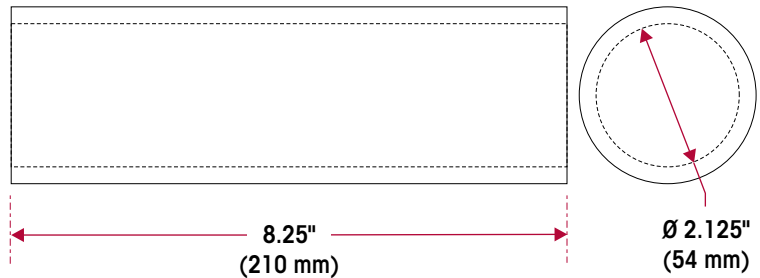
NOTE: TRAAX ROD and some ULTRA ROD torque rod assemblies equipped on the PRIMAAX EX • PRIMAAX suspensions are not rebushable. The entire torque rod assembly must be replaced. This feature provides superior bushing retention in the torque rod end hub. These torque rods can be identified by the part number: 67428-XXX • 67219-XXX • 65302-XXX or the suffix N after any part number (i.e. 62000-615N).

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

INSTALLATION / REMOVAL TOOL



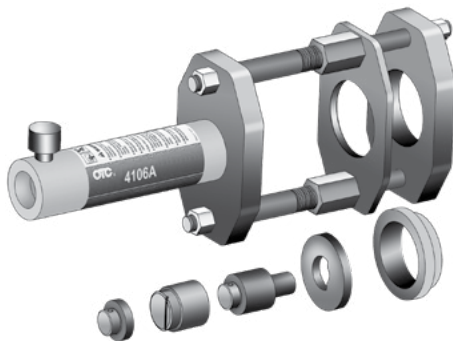
RECEIVING TOOL



D-PIN / QUIK-ALIGN PIVOT BUSHING SERVICE TOOLS

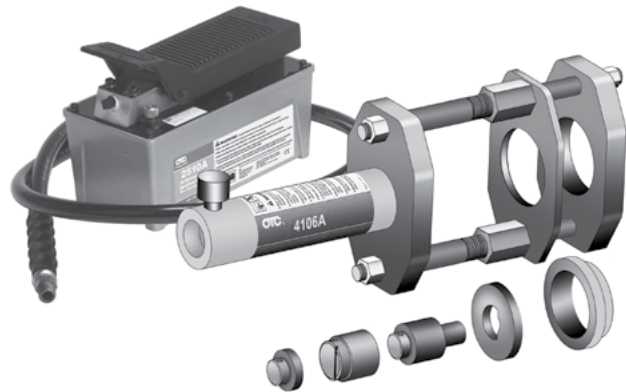
Hendrickson Part No. 66086-202

OTC Part No. 4246 Visit otctools.com



Hendrickson Part No. 66086-204

OTC Part No. 4247 Visit otctools.com



QUIK-ALIGN SOCKET TOOL

Hendrickson Part No. 66086-200

OTC Part No. 1767

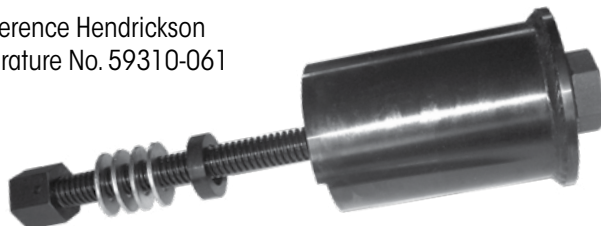
Visit otctools.com



QUIK-ALIGN PIVOT BUSHING SERVICE TOOL

Hendrickson Part No. 66086-203L

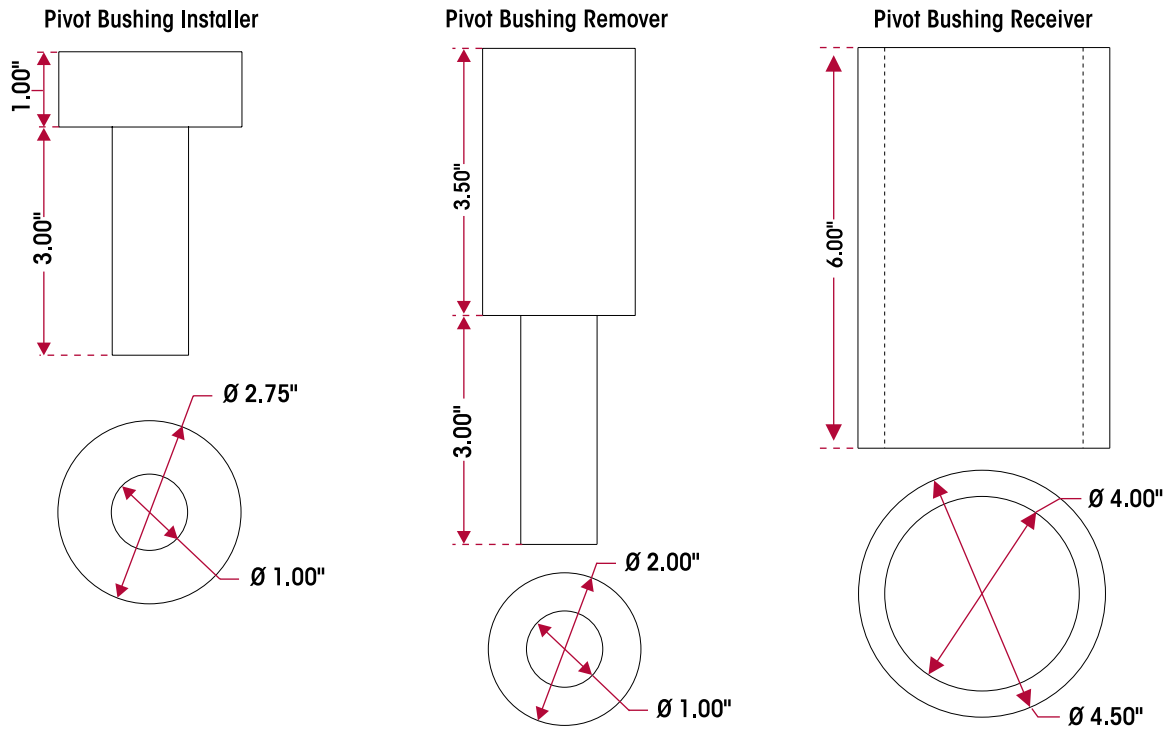
Reference Hendrickson Literature No. 59310-061



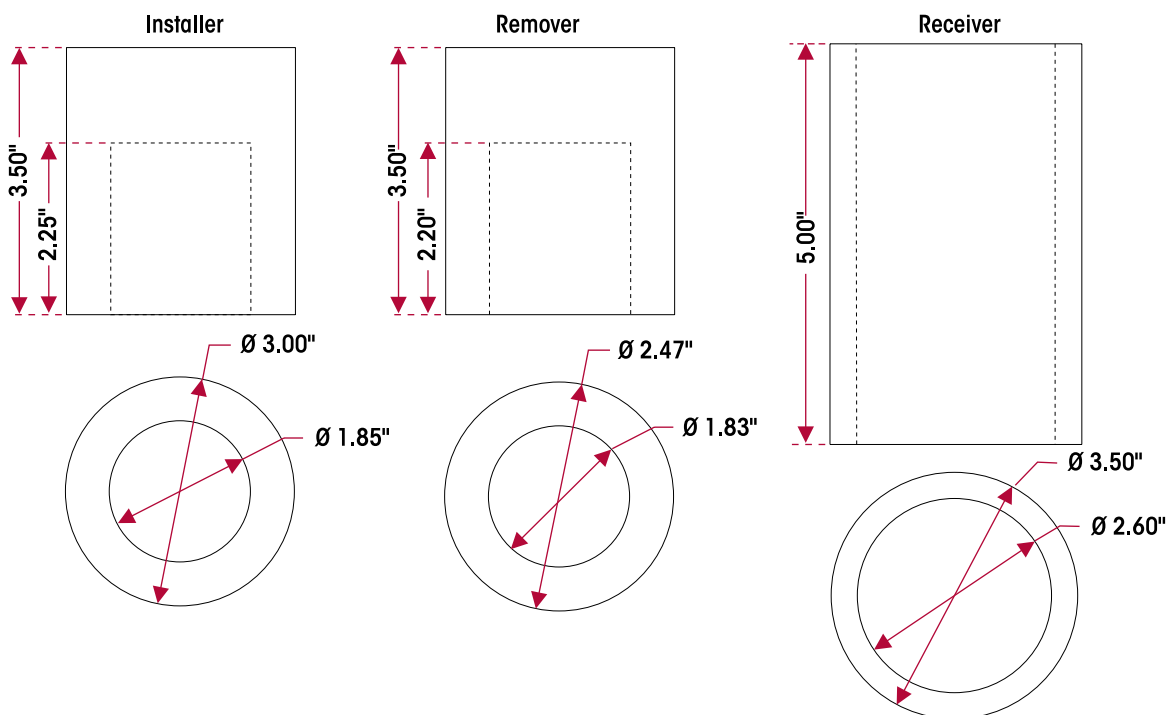
D-PIN / QUIK-ALIGN PIVOT BUSHING SHOP MADE SERVICE TOOLS

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

QUIK-ALIGN TOOLS



D-PIN TOOLS





SECTION 5 Parts Lists

Refer to the specific parts list for PRIMAAX EX suspension equipped on your vehicle available online at www.hendrickson-intl.com/products/primaax.

FIGURE 5-1

HENDRICKSON
The World Rides On Us

Ride Solutions ▾ Parts & Service Literature Contact Work For Us ▾ Company ▾ Compliance Suppliers **Where To Buy**

FIND YOUR SUSPENSION Choose Position ▾ Vehicle Type ▾ or Choose Vocation ▾ **Search**

PRIMAAX® EX
Severe-Duty Vocational Air Suspension System

With its rugged, weight efficient design, PRIMAAX® EX is a severe-duty vocational air suspension that delivers advanced suspension technology for the rigorous demands of vocational, severe-service, and heavy-haul applications. The system features a robust structural design with optimized suspension geometry for exceptional stability, handling and ride. Suspension-induced driveline vibration is significantly reduced with PRIMAAX EX compared to competitive trailing-arm air suspensions, resulting in higher driver comfort and less premature wear on expensive truck and body equipment.

Parts Lists

45745-148 Torque Rod Selection Guide	F	3/14/2022	2.19 MB
SP-164 PRIMAAX EX and PRIMAAX Parts List (Replaces SP-225)	N	10/17/2022	6.13 MB
SP-226 PRIMAAX EX / PRIMAAX Parts List for Volvo	F	1/16/2021	1.42 MB
SP-230 PRIMAAX EX Parts List for Freightliner and Western Star	C	11/22/2022	1.71 MB
SP-231 PRIMAAX EX / PRIMAAX Parts List for Mack	F	1/16/2021	1.42 MB
SP-233 PRIMAAX EX / PRIMAAX Parts List for International Truck	C	12/19/2017	2.78 MB
SP-234 PRIMAAX EX Parts List for Caterpillar	C	9/20/2017	1.9 MB
SP-329 PRIMAAX EX Rear Suspension Parts List for Mack Heavy Dump Truck (HDT) Vehicles	A	6/16/2020	1.69 MB



SECTION 6 Preventive Maintenance

Following the appropriate inspection procedures are important to help ensure the suspension system and components. Hendrickson recommends the PRIMAAX EX • PRIMAAX suspension be inspected at pre-delivery, the first 1,000 miles of service, and regular preventive maintenance intervals. Off-highway and severe service operating conditions require more frequent inspections than on-highway service operations.

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

- Air springs
 - Air supply and fittings
 - All fasteners
 - D-pin and Pivot Bushings
 - Clamp group: Top pad, U-bolts and locknuts
 - Frame hanger bracket
 - Height control valve
 - Longitudinal torque rods
 - QUIK-ALIGN connections
 - S-cam support tube bracket (if equipped)
 - Shock absorbers
 - Tire wear
 - Transverse torque rods
 - U-beam assembly: Cross tube/Support beam/End cap (enhanced or detachable)
- Signifies performance critical components group

HENDRICKSON RECOMMENDED INSPECTION INTERVALS

	PRE-DELIVERY INSPECTION	FIRST IN-SERVICE INSPECTION	PREVENTIVE MAINTENANCE
Visually inspect for proper assembly and function. Check for all of the following and replace components as necessary:			<p>OFF-HIGHWAY every 6 months / 1,200 hours or 25,000 miles / 40,000 km, whichever comes first</p> <p>ON-HIGHWAY every 12 months or 50,000 miles, whichever comes first</p>
<ul style="list-style-type: none"> • Signs of unusual movement, loose or missing components • Signs of abrasive or adverse contact with other components • Damaged, or cracked parts • Improper suspension function or alignment 			
Visually inspect the overall condition of and for any signs of damage to:			<p>Every 12 months / 2400 hours</p>
<ul style="list-style-type: none"> • U-beam assembly • Air springs and air lines • Torque rods 	Within the first 500 miles (800 km)	Within the first 1,000 miles (1,600 km) or 100 hours	
Inspect fasteners for proper torque as recommended in the Torque Specifications section of this publication:			
<ul style="list-style-type: none"> • QUIK-ALIGN fasteners and torque rod to the top pad fasteners • Clamp group U-bolt fasteners, see Figure 6-1 • DO NOT re-torque integrated end cap • Transverse torque rod fasteners, see vehicle manufacturer’s torque specifications 			
Verify the lateral alignment of the drive axles are within the vehicle manufacturer’s tolerances			
Verify ride height. Refer to the vehicle manufacturer for proper specifications and procedure.			

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



COMPONENT INSPECTION

IMPORTANT NOTE

Replace all worn or damaged parts.

- **Air springs** — Visually inspect the outer surface of the air spring for chafing, uneven wear, cracks, or any signs of component damage. Ensure that the upper bead plate is tight against the underside of the frame. Check for any lateral slippage at the lower air spring bracket. A 1/8" of slippage in either direction is acceptable. Verify all mounting hardware have the proper torque values maintained. Refer to the Torque Specifications section in this publication.
- **Air supply (Pneumatic components)** — The air supply to the system plays a large role in the air springs' performance. Inspect, clean and replace as necessary any support products to the air springs, valves, regulators and air lines. See Air Fittings in this section if an air leak is suspected.
- **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 support beam connection on the U-beam assembly.
- **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 in this publication for recommended torque requirements.
- **Fasteners** — Visually inspect for any loose or damaged fasteners on the entire suspension. Ensure all fasteners are tightened to the specified torque range. See the Torque Specifications section of this publication for recommended torque requirements. Use a calibrated torque wrench to check torque in a tightening direction. As soon as the fastener starts to move, record the torque and correct the torque if necessary.
- **Frame hanger** — 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. Refer to the vehicle manufacturer for maintenance and specifications.
- **QUIK-ALIGN connection** — Visually inspect the connection for signs of looseness or movement. Visually inspect the bushing for wear. Verify the connections have the proper torque values maintained. See the Torque Specifications section in this publication for recommended torque requirements. Refer to the QUIK-ALIGN Fastener Warning in the Important Safety Notice section of this publication prior to installing the QUIK-ALIGN connection.
- **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. Verify the top pad/longitudinal torque rod connections have the proper torque values maintained. See the Torque Specifications section in this publication for recommended torque requirements.
- **Torque rods (longitudinal and transverse)** — All torque rods must be inspected for looseness, torn or shredded rubber, and proper fastener torque. See Longitudinal and Transverse Torque Rod inspection in this section.



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

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

U-BOLT LOCKNUTS

NOTE

U-bolt clamp group hardware for the PRIMAAX EX • PRIMAAX suspensions are 3/4"-16 UNF Grade C locknuts and 3/4"-16 UNF Grade 8 U-bolts which are phosphate and oil coated.

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

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

SERVICE HINT

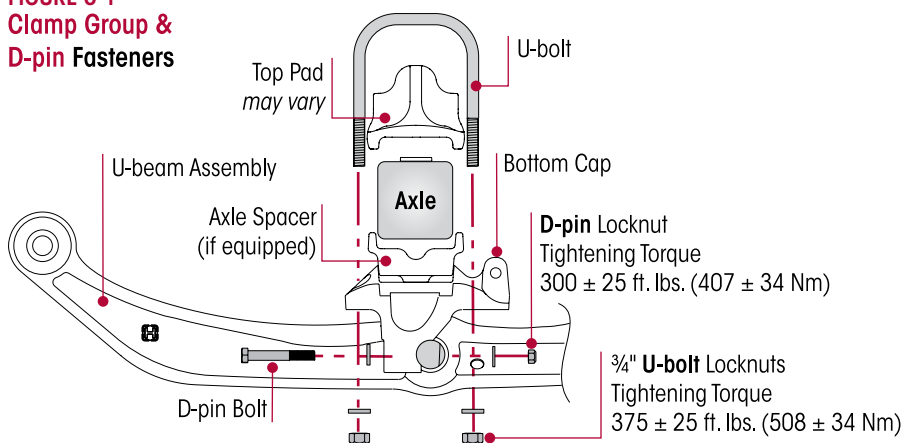
Due to certain pinion angle configurations, the removal of the D-pin bolts may be necessary to access the U-bolt locknuts, see Figure 6-1.



WARNING

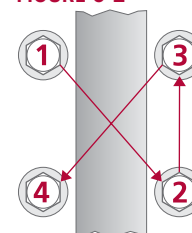
THE U-BOLT CLAMP GROUP CONNECTION MUST BE PROPERLY ALIGNED AND HAVE THE PROPER TORQUE VALUES MAINTAINED. METAL SURFACES CAN WORK AND WEAR AGAINST OTHER RELATED CLAMP GROUP COMPONENTS IF NOT PROPERLY ALIGNED OR PROPERLY TIGHTENED TO MAINTAIN THE PROPER CLAMP FORCE. FAILURE TO DO SO CAN CAUSE PREMATURE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

FIGURE 6-1
Clamp Group & D-pin Fasteners



4. Tighten the U-bolt locknuts evenly in 50 foot pounds increments to 375 ± 25 foot pounds torque in the proper pattern to achieve uniform bolt tension, see Figures 6-2.

FIGURE 6-2



WARNING
QUIK-ALIGN Pivot Bushing & D-pin Bushing

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

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

■ QUIK-ALIGN PIVOT BUSHING
VISUAL INSPECTION

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

- The support beam is designed with the pivot bushing centered in the support beam end hub of the U-beam assembly. If the pivot bushing is not centered in the end hub, it is an indication that the pivot bushing could be worn and a pivot bushing physical inspection is required.
- If the pivot bushing shows signs of torn, separated, or disconnected rubber, see Figures 6-3 and 6-4, 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 6-5, this could be a result of axle misalignment. If this condition is evident, pivot bushing replacement is required.

FIGURE 6-3
VISUAL INSPECTION – Torn, Disconnected or Missing Rubber Flange

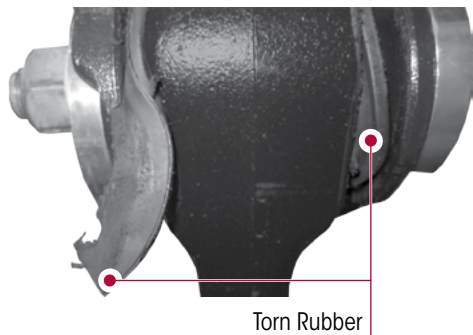


FIGURE 6-4

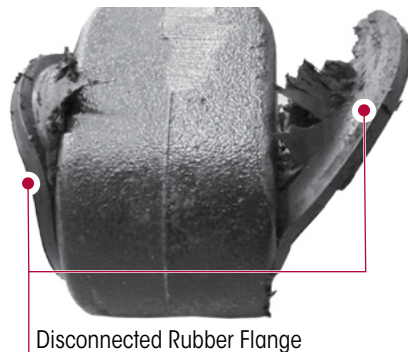


FIGURE 6-5

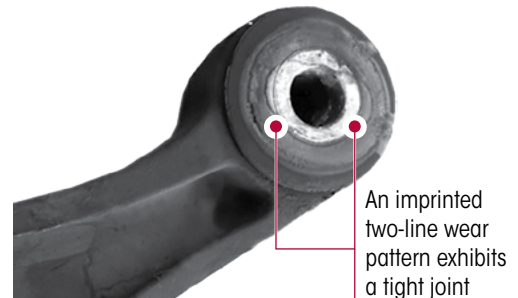


FIGURE 6-6
GOOD JOINT – No Replacement Needed

PHYSICAL INSPECTION

1. Remove the U-beam assembly as detailed in the Component Replacement section of this publication.
2. After removal, inspect the pivot bushing connection, examine the pivot bushing inner metal area.

- **No replacement is needed** if the bushing exhibits a tight joint, see Figure 6-8. An imprinted two-line wear pattern on the bushing inner metal indicates the pivot bushing is securely clamped in the frame hanger.

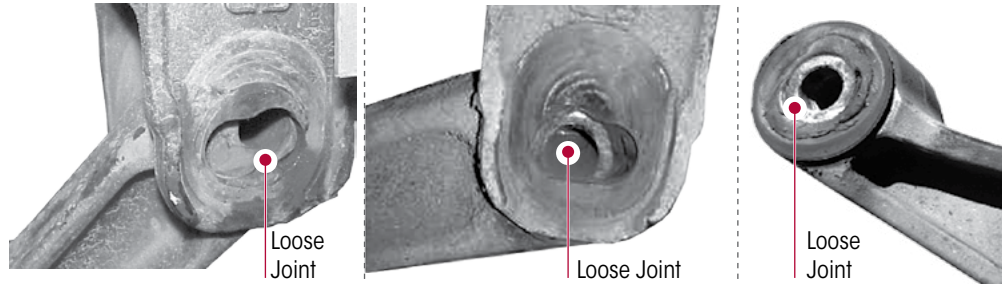




- **Replacement is necessary** if any indications of the following are apparent, see Figure 6-7: Signs of rust, distorted, separated or torn rubber, elongated or damaged bore. This could be a result of axle misalignment or loose fasteners.

FIGURE 6-7

PHYSICAL INSPECTION – Indications of a Loose Joint



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

■ **D-PIN BUSHING**

VISUAL INSPECTION

It is not necessary to disassemble the D-pin connection to perform a D-pin visual inspection. The D-pin bushing is designed with a layer of rubber in the bushing, it is acceptable to see a bead of rubber protruding from the bushing, see Figure 6-8.

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

- Metal to metal contact wear marks on the D-pin outer metal are evident, see Figure 6-9
- D-pin outer metal is distorted, see Figure 6-9

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

FIGURE 6-8

ACCEPTABLE D-PIN

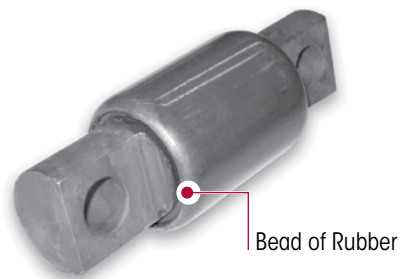
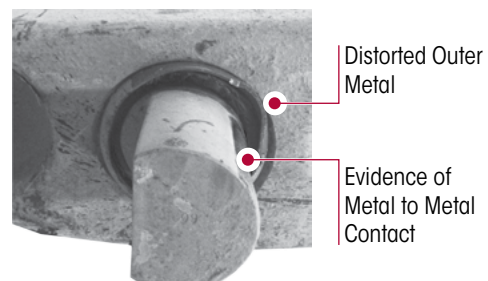


FIGURE 6-9

UNACCEPTABLE D-PIN



WARNING
LONGITUDINAL & TRANSVERSE TORQUE RODS

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

VISUAL INSPECTION

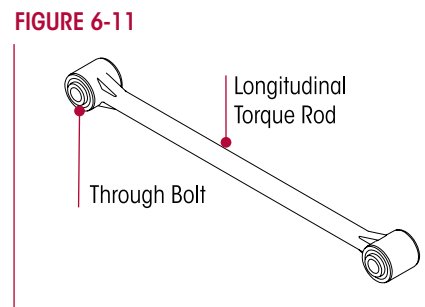
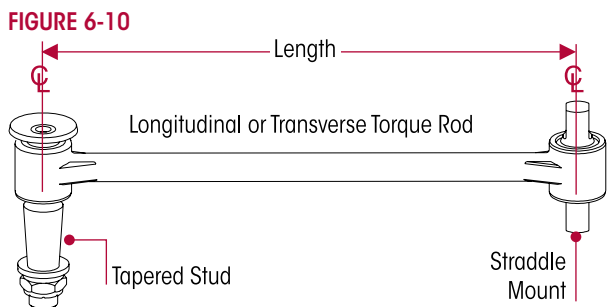
All torque rods equipped on the PRIMAAX EX • PRIMAAX suspensions need to be inspected during preventive maintenance and service for looseness by one of the following methods.

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

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

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

- **Longitudinal ULTRA ROD torque rod length** is determined by the original vehicle manufacturer for optimum driveline angle(s). The longitudinal torque rods along with the bottom caps maintain these angles and control acceleration and brake forces. Refer to the specific parts list for PRIMAAX EX suspension equipped on your vehicle available online.
 - **Some ULTRA ROD** Longitudinal torque rod assemblies are designed with non-rebushable bushings. These torque rods can be identified by the part number: 67428-XXX • 67219-XXX • 65302-XXX or the **Suffix N** after any part number (i.e. 62000-615N).
 - **For rebushable** longitudinal torque rod bushings equipped with a **straddle, taper stud, or hollow mount**, see Figures 6-10 and 6-11, they can be replaced by pressing out the worn components and installing new Hendrickson bushings.



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



- **TRAAX ROD torque rods are non-rebushable.** The entire torque rod assembly must be replaced. This feature provides superior bushing retention in the torque rod end hub.

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

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

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

AIR FITTINGS

INSPECTION

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

NOTE Air lines and fittings may be inspected for leaks using a soapy water solution. The height control valve, however, cannot be inspected using this method. All height control valves have an allowable leakage rate.

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.

SHOCK ABSORBER

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

Hendrickson uses a long service life, premium shock absorber on all PRIMAAX EX • PRIMAAX suspensions. When the shock absorber replacement is necessary, Hendrickson recommends that the shock absorbers be replaced with identical Hendrickson Genuine parts for servicing. Failure to do so will affect the suspension performance, durability, and will void any applicable warranty. See vehicle manufacturer's applicable publications for other shock absorber inspection requirements.

Inspection of the shock absorber can be performed by doing a heat test, and a visual inspection. Replace as necessary, refer to the Component Replacement section of this publication.

FIGURE 6-12



HEAT TEST AND PHYSICAL INSPECTION

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

1. **Heat Test:** Drive the vehicle with the lift axle down at moderate speeds on a rough road for a minimum of fifteen minutes.
 - a. Perform a heat test by carefully touching or placing a hand near the shock absorber body below the dust cover. Touch the frame to get an ambient reference, see Figure 6-12. A shock absorber that is warm to the touch is acceptable, a cold shock absorber should be replaced.
2. **Physical Inspection:** To inspect for an internal failure, remove and shake the suspected shock absorber. Listen for the sound of metal parts rattling inside. The rattling of metal parts can indicate that the shock absorber has an internal failure and the shock absorber should be replaced.



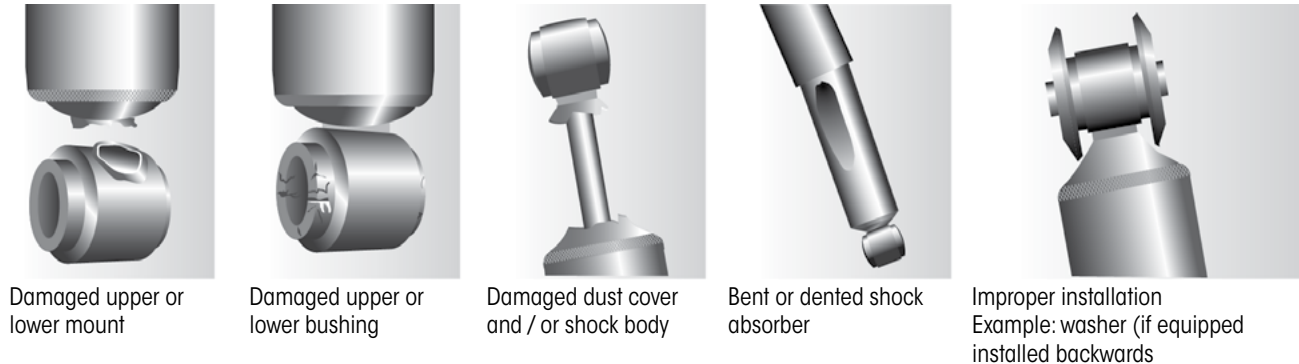
WARNING

VISUAL INSPECTION

Look for these potential problems when doing a visual inspection, see Figure 6-13. Inspect the shock absorbers fully extended. Replace as necessary.

FIGURE 6-13

SHOCK ABSORBER VISUAL INSPECTION – UNACCEPTABLE CONDITIONS



LEAKING VS. MISTING SHOCK ABSORBER

INSPECTION

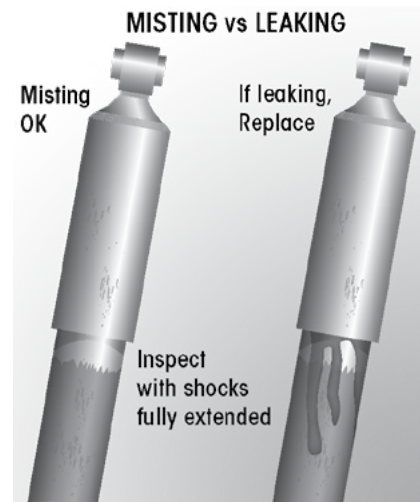
The inspection must not be conducted after driving in wet weather or a vehicle wash. The shock absorber needs to be free from water.

Many shock absorbers are often misdiagnosed as failures. Misting is the process whereby very small amounts of shock absorber fluid evaporate at a high operating temperature through the upper seal of the shock absorber. When the “mist” reaches the cooler outside air, it condenses and forms a film on the outside of the shock absorber body. Misting is perfectly normal and a necessary function of the shock absorber. The fluid which evaporates through the seal area helps to lubricate and prolong the life of the seal.

NOTE

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

FIGURE 6-14



Inspect the shock absorber fully extended. **A shock absorber that is truly leaking** will show signs of fluid **leaking in streams from the upper seal**, see Figure 6-14. These streams can easily be seen, underneath the main body (dust cover) of the shock absorber. Replace as necessary.

SECTION 7

Alignment & Adjustments

RIDE HEIGHT

Hendrickson recommends a single height control valve for most tandem and single axle suspensions. However, some applications require dual height control valves. Hendrickson has approved dual height control valves for use on the following applications:

- All front discharge mixer vehicles equipped with PRIMAAX EX • PRIMAAX 14³/₈" , 15¹/₂" ride height
- Contact Hendrickson and the vehicle manufacturer for other applications that may be approved

FIGURE 7-1



NOTE

Some vehicles may be equipped with non-Hendrickson supplied height control valves. When servicing a suspension with non-Hendrickson height control valves, refer to the vehicle manufacturer's instructions for ride height inspection and adjustment.

HEIGHT CONTROL VALVE

SERVICE HINT

When inspecting or setting ride height on a lightly loaded vehicle, such as a bobtail tractor equipped with dual height control valves, it is necessary to have a load on the vehicle. Loading the vehicle to its normal operating condition, such as a tractor with a loaded trailer, increases ride height setting accuracy.

INSPECTION

1. Drive the vehicle onto a level surface.
2. Relax the suspension by slowly moving the vehicle back and forth several times in a straight line without using the brakes. This will slacken or loosen the suspension as the vehicle is positioned. End with all wheels positioned straight ahead.
3. **DO NOT** set the parking brake.
4. Chock front wheels of the vehicle.
5. When checking or adjusting ride height, verify and maintain the vehicle's air system is at full operating pressure.

SERVICE HINT

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

WARNING

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

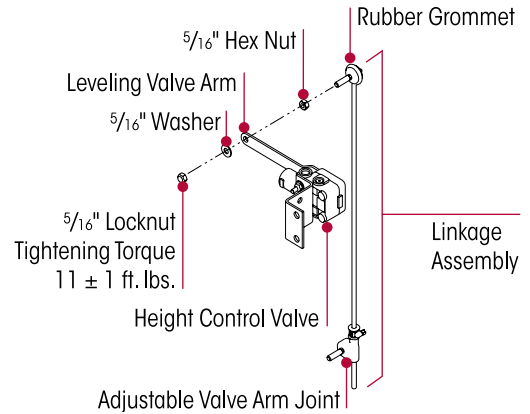
6. See additional Air Spring Cautions and Warnings in the Important Safety Notice section of this publication prior to deflating or inflating the air system.

WARNING

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

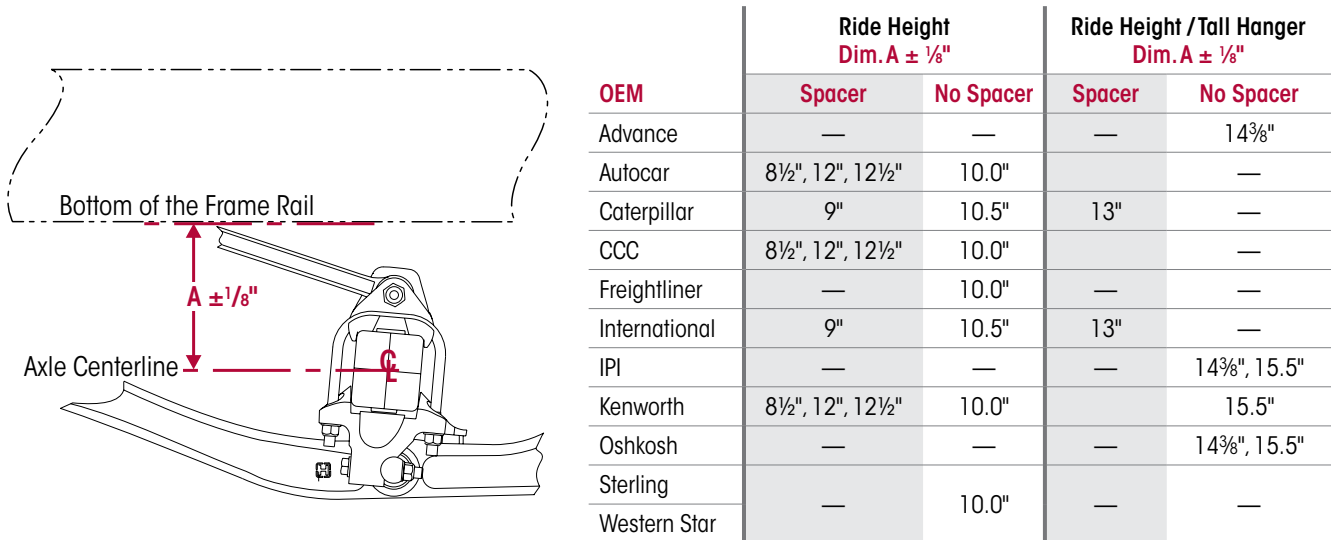
7. Deflate the suspension by using one of the following appropriate methods:
 - a. If the vehicle is equipped with a suspension dump system in the cab, deflate the suspension air system by using the cab dump valve control.

- b. If not equipped with a suspension dump system, detach the upper rubber grommet of the height control valve linkage from the height control valve arm and exhaust the suspension system air by lowering the height control valve arm, see Figure 7-2.
8. Inflate the suspension by using one of the following methods:
 - a. If the vehicle is equipped with a suspension dump system in the cab, inflate the suspension air system by using the cab dump valve control. Allow the suspension system to inflate.
 - b. If the vehicle is not equipped with a suspension dump system, raise the height control valve arm and attach the upper rubber grommet of the height control valve linkage to the height control valve arm. Allow the suspension system to inflate.
9. Measure the suspension ride height. Measure the distance from the bottom of the frame rail to the axle centerline on the wheel ends where the height control valve is located.

FIGURE 7-2


NOTE A vehicle equipped with dual height control valves must measure the ride height at each height control valve location.

NOTE All ride heights are measured on the axle attached to the height control valve(s). Ride height is measured from the bottom of the frame to the axle centerline, see Figure 7-3.

FIGURE 7-3


- NOTE:**
- All ride heights are taken on the axle with the height control valve(s) attached.
 - Ride height is measured from the bottom of the frame rail to the axle centerline ± 1/8", (average of the weld bead measurements on front and rear of the axle at the clamp group).
 - If the vehicle is equipped with dual height control valves, the ride height must be checked at each height control valve location.

10. Compare the measured ride height dimensions to the specified dimension for your suspension in Figure 7-3.
 - a. If the ride height **IS** correct then height control valve adjustment is not required.
 - b. If the ride height is **NOT** correct, then height control valve adjustment is required. Refer to the Adjustment Procedure in this section.

ADJUSTMENT PROCEDURE

SERVICE HINT

When inspecting or setting ride height on a lightly loaded vehicle, such as a bobtail tractor equipped with dual height control valves, it is necessary to have a load on the vehicle. Loading the vehicle to its normal operating condition, such as a tractor with a loaded trailer, increases ride height setting accuracy.

1. Drive the vehicle onto 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. Try to roll to a stop without the brakes being used.
3. **DO NOT** set the parking brake.
4. Chock the front wheels of the vehicle.

NOTE

If equipped with **DUAL** height control valves – An adjustment to one (1) height control valve may affect the ride height setting on the other height control valve. Verify the ride height is correct at both height control valves locations whenever an adjustment is made.

5. When checking or adjusting ride height, verify and maintain the vehicle's air system at full operating pressure.

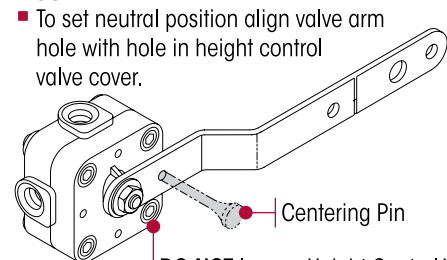
SERVICE HINT

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

6. See Air Spring Cautions and Warnings in the Important Safety Notice section of this publication prior to deflating or inflating the air system.
7. Detach the upper rubber grommet of the linkage assembly from the upper stud and exhaust the suspension system air by lowering the height control valve arm.
8. Raise the height control valve arm by hand to refill the suspension air and to ensure the air springs are above the proper ride height.
9. Lower the height control valve arm to exhaust the suspension air system until the suspension reaches the proper ride height.

10. Use a 1/8" wooden dowel rod (golf tee) to set the neutral position for the height control valve by aligning the hole in the leveling arm with the hole in the height control valve cover, as shown in Figure 7-4. **DO NOT** use a metal rod or nail as this may cause damage to the height control valve.

FIGURE 7-4



DO NOT loosen Height Control Valve housing socket head cap screws to adjust ride height.

NOTE

Hendrickson recommends the following be performed during any type of ride height adjustment to help prevent socket head cap screws from loosening from the height control valve housing, potentially causing subsequent air leaks from the height control valve, see Figure 7-4.

11. If equipped with **DUAL** height control valves – Steps 7 to 9 might need to be repeated using one (1) height control valve at a time.
12. Adjust the linkage assembly so the rubber grommet can be reconnected to the height control valve arm at the proper height. Check the rubber components for any tearing or damage, replace as necessary.
13. Reconnect the rubber grommet to the height control valve arm.
14. Tighten the clamp on the adjustable valve arm joint with a screwdriver until securely fastened, see Figure 7-2.



15. Remove the dowel from the height control valve.
16. Remove the wheel chocks.

DRIVE AXLE ALIGNMENT INSPECTION

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

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

NOTE

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

10. If the measurements are within the vehicle manufacturer's specifications, then the rear drive axle alignment is acceptable. Proceed to check the pinion angles of the drive axles (Step 11).
 - a. If the alignment of the rear drive axle **IS NOT** within the vehicle manufacturer's specifications, then the alignment of this axle **MUST** be corrected **BEFORE** checking the drive axle pinion angles.
 - b. Correct the alignment of this axle by following the Alignment Adjustment instructions as shown in this section.
11. After all drive axles are aligned, check the pinion angle of each drive axle with a digital protractor, see Figure 7-5. Refer to the vehicle manufacturer specifications for the required pinion angles.
 - a. If all pinion angles are within the vehicle manufacturer's specifications then proceed to Step 12.
 - b. If any pinion angle is out of the vehicle manufacturer's specifications it must be corrected. Follow the Pinion Angle Adjustment procedure in this section.
12. Recheck measurements to confirm adjustments until the correct alignment and pinion angles are achieved.
13. When all drive axle alignments and pinion angles are within the vehicle manufacturer's specifications then the alignment procedure is complete.
14. Remove the wheel chocks.



AXLE PINION ANGLE

Drive axle pinion angles are established by the vehicle manufacturer. Bottom caps are machined to specific angles to meet the vehicle manufacturer's specified requirements. For the suspension bottom caps pinion angles, refer to the specific parts list for PRIMAAX EX suspension equipped on your vehicle available online.

To check the pinion angle:

1. Verify the suspension is at the proper ride height (see the Ride Height Adjustment in this section).
2. Place a digital protractor on the axle housing as shown in Figure 7-5.
3. Verify the pinion angle is within the range specified by the vehicle manufacturer.
4. Follow the Pinion Angle Adjustment in this section if necessary to fine-tune the pinion angle.

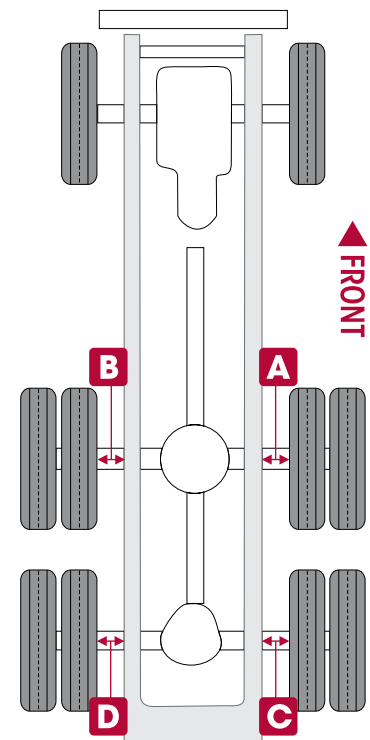
FIGURE 7-5



AXLE 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. Try to roll to a stop without the brakes being used.
3. **DO NOT** set the parking brake.
4. Chock the front wheels of the vehicle.
5. Measure from the outside of the frame rail to the rim flange of the inner tire. Record the measurement **A** and **B**, see Figure 7-6.
6. Measure the same distance on the opposite side of the same axle. Record the measurement of **C** and **D**, see Figure 7-6.
7. Verify the axle lateral alignment is within the vehicle manufacturer's specifications. Adding or removing shims that are located between the transverse torque rod and the frame rail will normally correct the axle lateral alignment.
 - A general rule of thumb is to use a torque rod shim with a thickness that is half of the difference between the two measurements.

FIGURE 7-6



EXAMPLE

If the axle lateral alignment is out of specification by $\frac{1}{4}$ " (6 mm), remove or install a $\frac{1}{8}$ " (3 mm) torque rod 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. Washers are not necessary when flanged fasteners are used.



AXLE ALIGNMENT

ADJUSTMENT INSTRUCTIONS

SERVICE HINT

The eccentric collars (with the square drive feature) are located on the outboard side of the frame hangers with the concentric collars on the inboard side, see Figures 7-7 and 7-8. 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 7-7

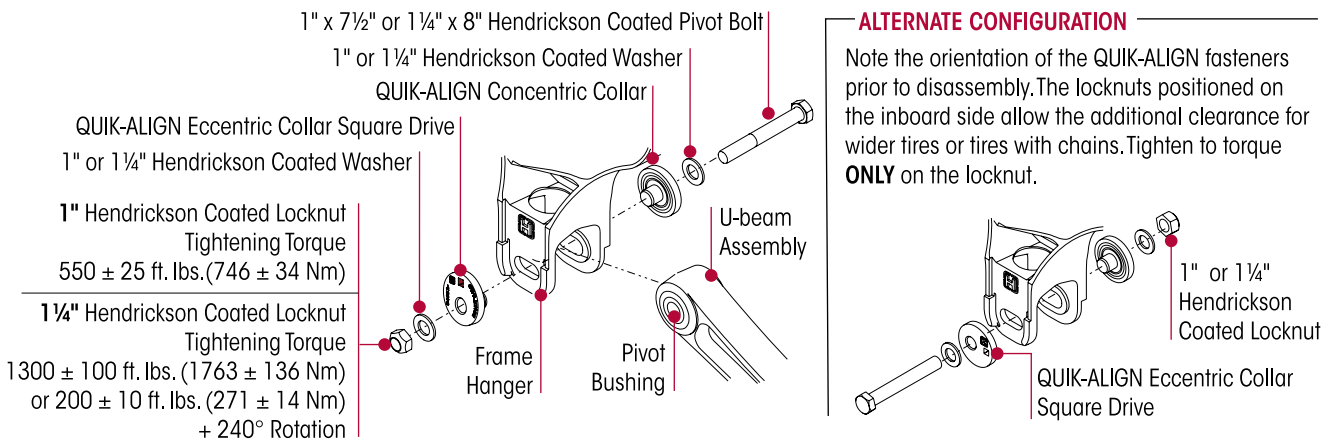
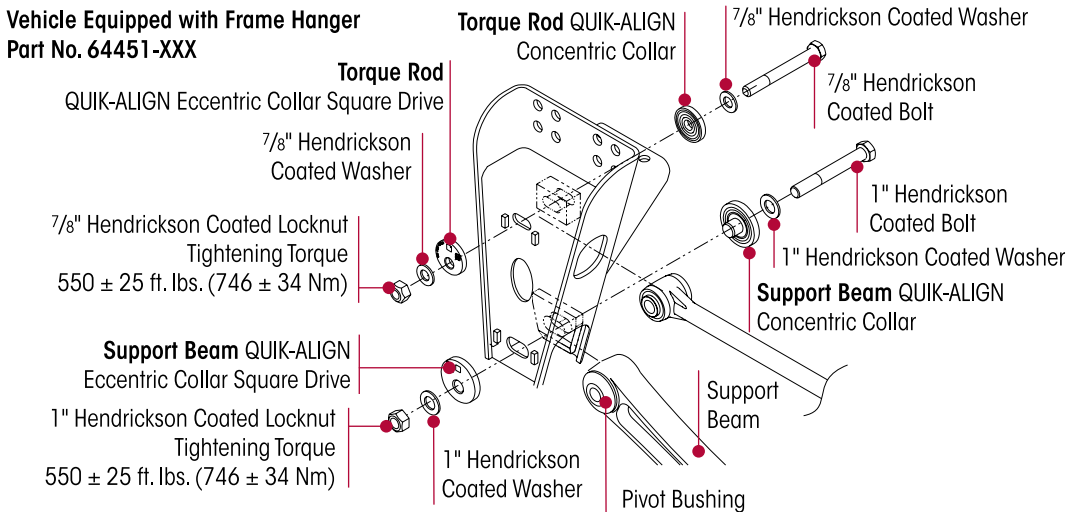


FIGURE 7-8

Vehicle Equipped with Frame Hanger
Part No. 64451-XXX



WARNING

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



WARNING

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

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 linkage assembly from the height control valve arm. Lower the height control valve arm to exhaust the air in the air springs and deflate the rear suspension.

WARNING

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

4. Using the measurements from the **Drive Axle Alignment Inspection** procedure, in this section, determine which QUIK-ALIGN collar requires an adjustment to correct the axle alignment.

SERVICE HINT

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

NOTE

Use a new QUIK-ALIGN pivot bolt kit (Refer to the specific parts list for PRIMAAX EX suspension equipped on your vehicle available online) for any axle alignment or disassembly of the QUIK-ALIGN connection. This will help ensure that the proper clamp load is applied to the connection and help prevent the joint to slip in service.

5. On the side being adjusted, remove the QUIK-ALIGN fastener and replace it with a QUIK-ALIGN fastener. Snug the QUIK-ALIGN fastener to 50-100 foot pounds. This will hold the eccentric flanged collar in place against the frame hanger face, and within the adjustment guide, but loose enough to permit the QUIK-ALIGN eccentric flanged collar to rotate freely.
6. See additional Air Spring Warnings in the Important Safety Notice section of this publication prior to deflating or inflating the suspension system.
7. Connect the linkage assembly to the height control valve arm to inflate the suspension. Verify the air springs inflate uniformly without binding.
8. Verify the vehicle is at the correct ride height.

NOTE

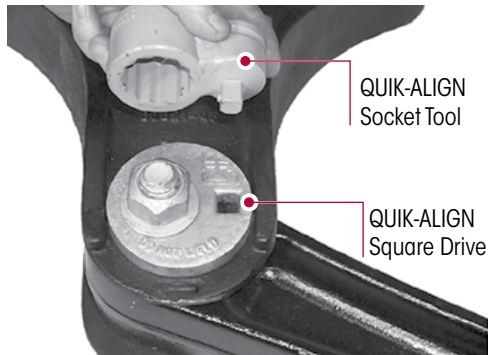
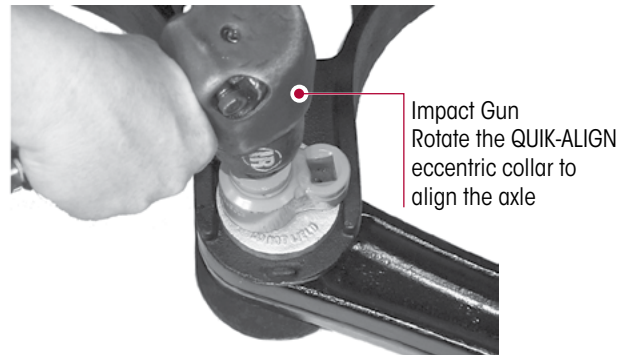
When adjusting the alignment of an axle, the fasteners connecting the longitudinal torque rod to the frame hanger, above the QUIK-ALIGN collar being adjusted, must be loose at the frame hanger. This will allow the longitudinal torque rod to move freely with the axle while the alignment is adjusted. Failure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

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

■ **All models except equipped with Frame Hanger 64451-XXX, see Figures 7-9 and 7-10**

10. Use a QUIK-ALIGN socket tool, see Figure 7-9 (refer to Special Tool section of this publication) and an impact gun, see Figure 7-10, or a ½" square drive breaker bar to rotate the QUIK-ALIGN eccentric collar to align the axle.
 - a. Once the correct axle alignment is achieved, use a calibrated torque wrench to tighten:
 - 1" QUIK-ALIGN locknut to $\boxed{550 \pm 25}$ foot pounds torque.
 - 1¼" QUIK-ALIGN locknut to $\boxed{1300 \pm 100}$ foot pounds torque **or** pre-torque the locknut to $\boxed{200 \pm 10}$ foot pounds. After the pre-torque has been applied, tighten the locknut an additional ⅔ turn (240° rotation).
 - b. Fill any gap between the frame hanger and longitudinal torque rod with shims.
 - c. Tighten the longitudinal torque rod fasteners to the proper specification, see Torque Specifications section of this publication.

- d. Verify the ride height is within the vehicle manufacturer's specifications, refer to the Ride Height procedure in this section. Then proceed to the Drive Axle Alignment Inspection procedure in this section.

FIGURE 7-9

FIGURE 7-10


- All models equipped with Frame Hanger 64451-XXX, see Figures 7-11 to 7-13

SERVICE HINT

The square drive of both the torque rod and support beam eccentric collars will rotate to move in the same direction fore and aft, see Figure 7-11.

1. Use a QUIK-ALIGN socket tool (refer to the Special Tools section) and impact gun, see Figure 7-12, or a ½" square drive breaker bar to rotate the support beam QUIK-ALIGN eccentric collar to align the axle.
 - a. The square drive on the QUIK-ALIGN collar will rotate fore and aft above the centerline of the bolt. From the center position, see Figure 7-13, a 90° rotation of the support beam QUIK-ALIGN eccentric collar will move the axle fore or aft up to a maximum of ½".
 - b. Once the correct axle alignment is achieved, use a calibrated torque wrench to tighten the support beam QUIK-ALIGN locknuts to $\boxed{550 \pm 25}$ foot pounds torque.

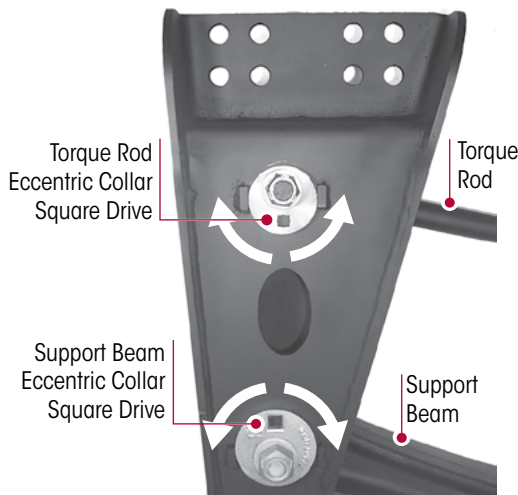
FIGURE 7-11

FIGURE 7-12

FIGURE 7-13


NOTE: The square drive of both the torque rod and support beam eccentric collars will rotate to move in the same direction fore and aft.

- c. Verify the longitudinal QUIK-ALIGN eccentric collar is seated properly against the frame hanger face and between the alignment guides. Rotate the longitudinal QUIK-ALIGN eccentric collar, clockwise or counter-clockwise as needed, until the longitudinal torque rod is neither being pushed or pulled on.
- d. Tighten the longitudinal torque rod QUIK-ALIGN fastener to $\boxed{550 \pm 25}$ foot pounds torque.
2. Verify the ride height is within the vehicle manufacturer's specifications, refer to the Ride Height procedure in this section. Then proceed to the Drive Axle Alignment Inspection procedure in this section.



PINION ANGLE ADJUSTMENT

- **Adjustment of 1.5 Degrees or less** – All models **EXCEPT** equipped with Frame Hanger 64451-XXX, see Figure 7-14

NOTE

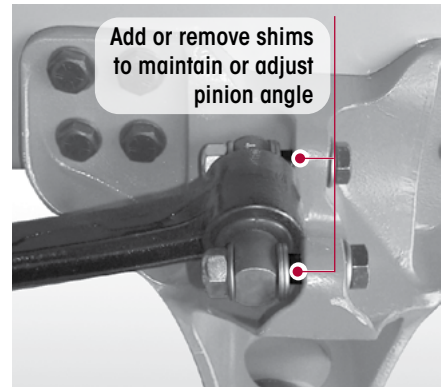
When correcting the pinion angle of an axle, the correction must be in equal amounts on both sides of the axle. However, the total number of shims per side may differ due to axle alignment.

SERVICE HINT

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

1. Loosen the longitudinal torque rod fasteners from 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 7-14. Therefore, to increase the pinion angle install shims, to decrease the pinion angle remove shims.
3. Tighten the longitudinal torque rod fasteners to the proper specification, see Torque Specification section of this publication per model designation.
4. Verify the pinion angle is within the vehicle manufacturer's specifications.

FIGURE 7-14



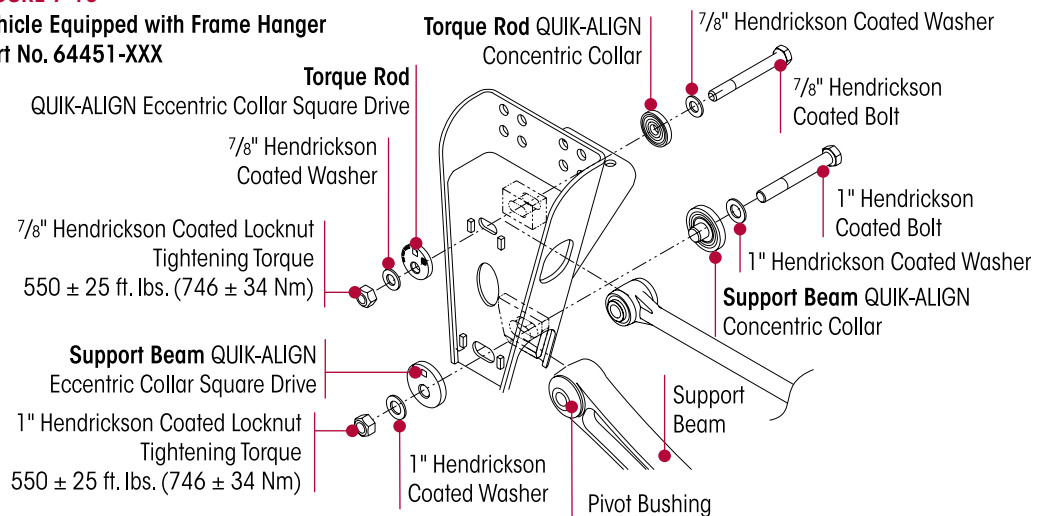
- **Adjustment of more than 1.5 Degrees** – All models **EXCEPT** equipped with Frame Hanger 64451-XXX, see Figure 7-14

If an adjustment of **more** than 1.5 degrees is required, it will be necessary to replace both bottom caps on the axle with bottom caps that will achieve the desired pinion angle, refer to the Pinion Angle Chart in to the specific parts list for PRIMAAX EX suspension equipped on your vehicle available online. After replacement of both bottom caps, perform the drive axle alignment procedure.

- **Adjustment of 1.5 Degrees or less** – Models equipped with **Frame Hanger 64451-XXX**, see Figure 7-15

FIGURE 7-15

Vehicle Equipped with Frame Hanger Part No. 64451-XXX



NOTE

When correcting the axle pinion angle, the torque rod QUICK-ALIGN collars must be installed so they **DO NOT** preload either torque rod bushing.

1. Check the front wheels of the vehicle.



2. Verify proper ride height adjustment, see Ride Height Adjustment in the Preventive Maintenance section of this publication.
3. Install a floor jack under the pinion so the axle housing will not rotate when the **longitudinal QUIK-ALIGN** fasteners are loose.
4. Remove the **longitudinal QUIK-ALIGN** fasteners and discard.
5. From the inboard side of the frame hanger, install new **longitudinal QUIK-ALIGN** fasteners, flat washer, and **longitudinal QUIK-ALIGN concentric** collar through the frame hanger and torque rod bushing. **DO NOT** attach the **longitudinal QUIK-ALIGN eccentric** collar, flat washer, and locknut at this time, see Figure 7-15.
6. Raise or lower the floor jack to achieve the proper pinion angle. Refer to the vehicle manufacturer for the specified angle.



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



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

7. When the correct pinion angle is achieved, install the **longitudinal QUIK-ALIGN eccentric** collar, flat washer, and locknut. Verify the **longitudinal QUIK-ALIGN eccentric** collar is seated properly against the frame hanger face and is between the alignment guides, see Figure 7-15. The adjusting square should be at or below the centerline of the QUIK-ALIGN fastener. Rotate the **longitudinal QUIK-ALIGN eccentric** collar, clockwise or counter-clockwise as needed, until the longitudinal torque rod is neither being pushed or pulled on.
8. **Tighten** both **longitudinal QUIK-ALIGN** fasteners to $\boxed{275 \pm 25}$ foot pounds torque.
9. Remove the floor jack from under the pinion.
10. Verify the pinion angle is correct. Refer to the Pinion Angle Chart in to the specific parts list for PRIMAAX EX suspension equipped on your vehicle available online.
11. If the pinion angle is not correct, repeat Steps 1 through 8 until the correct pinion angle is achieved. **DO NOT** use the **longitudinal QUIK-ALIGN eccentric** collar to force the pinion to the proper angle. This will result in a preload on the torque rod and can reduce component life.

NOTE

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

12. Once the proper pinion angle is achieved, apply the final torque of $\boxed{550 \pm 25}$ foot pounds.
13. Remove the wheel chocks from the front wheels.

■ **Adjustment of more than 1.5 Degrees** – Models equipped with **Frame Hanger Part No. 64451-XXX**, see Figure 7-15

If an adjustment of **more** than 1.5 degrees is required, it will be necessary to replace both bottom caps on the axle with bottom caps that will achieve the desired pinion angle, refer to the Pinion Angle Chart in to the specific parts list for PRIMAAX EX suspension equipped on your vehicle available online. After replacement of both bottom caps, perform the drive axle alignment procedure.

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.

AIR SPRING • UPPER AIR SPRING BRACKET

DISASSEMBLY

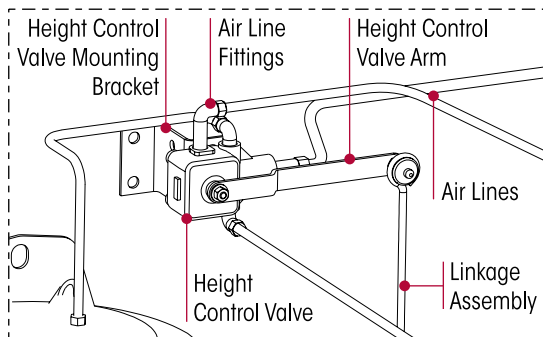
1. Chock the wheels.
2. Support the frame with safety stands.
3. Disconnect the height control valve arm(s) from the linkage assembly.

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, see Figure 8-1.

FIGURE 8-1



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

6. Remove the air line from the air spring.

WARNING

CAUTION

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

7. If the air spring is being removed for an alternate repair it will be necessary to clean and lubricate the lower mounting fasteners with penetrating oil to prevent damage to the lower mounting stud.
8. Remove and discard the lower air spring mounting fasteners using **HAND TOOLS** only.
9. Remove the lower air spring mounting bracket from the cross tube.
10. Remove and discard the upper air spring mounting bracket fasteners from the frame per the vehicle manufacturer's instructions.
11. Remove the air spring.
12. Remove and discard the upper air spring bracket and air spring support bracket (if equipped) fasteners from the frame rail per the vehicle manufacturer's instructions.
13. Remove the upper air spring bracket and air spring support bracket (if equipped).

14. Inspect the upper air spring bracket assembly, air spring support bracket (if equipped), mounting surfaces, and the lower air spring mounting bracket for any damage. Replace as necessary.

ASSEMBLY

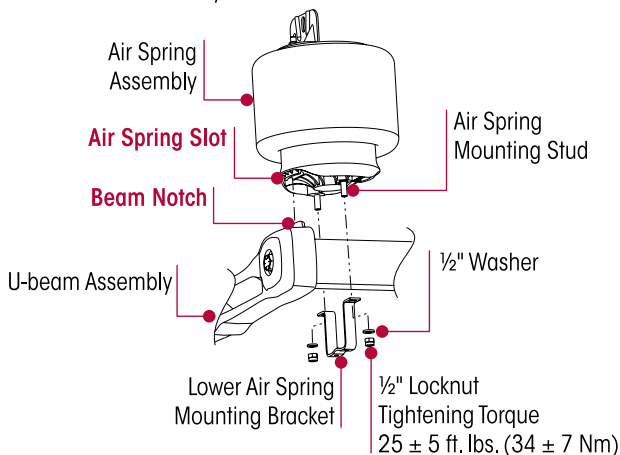
1. Loosely attach the air spring support bracket (if equipped) to the upper air spring bracket assembly and the frame fastener, see Figure 8-3.

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.

2. Press the upper air spring bracket assembly firmly against the underside of the frame and tighten frame fasteners to the proper torque per the vehicle manufacturer's specifications.
3. If equipped with air spring support bracket, tighten the fastener to the upper air spring bracket assembly. Tighten the fastener per the Torque Specifications section of this publication.
4. Attach the air spring to the upper air spring bracket assembly and tighten the fasteners to the proper torque per the Torque Specifications section of this publication.
5. Install the air spring between the frame and the cross tube. Refer to the specific parts list for PRIMAAX EX suspension equipped on your vehicle available online for replacement part numbers.
 - **PRIMAAX EX:** Ensure the **air spring slot** in the bottom of the air spring engages the **beam notch** on the top of the beam, see Figure 8-2.
 - **PRIMAAX:** Ensure the **V-notch** in the end cap engages the air spring **locator tab** on the air spring, see Figure 8-3.
6. Install the lower air spring mounting bracket around the cross tube, engaging the mounting air spring studs, see Figures 8-2 and 8-3.
7. Use **HAND TOOLS** only to install the lower mounting locknuts and tighten to 25 ± 5 foot pounds torque, see Figures 8-2 and 8-3.
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. Reconnect the linkage assembly to height control valve arm to inflate the suspension.

FIGURE 8-2
8½"-10½" Ride Height
PRIMAAX EX equipped with Integrated End Cap
 Vehicles built after May 2010



PRIMAAX equipped with Detachable End Cap
 Out of production May 2010

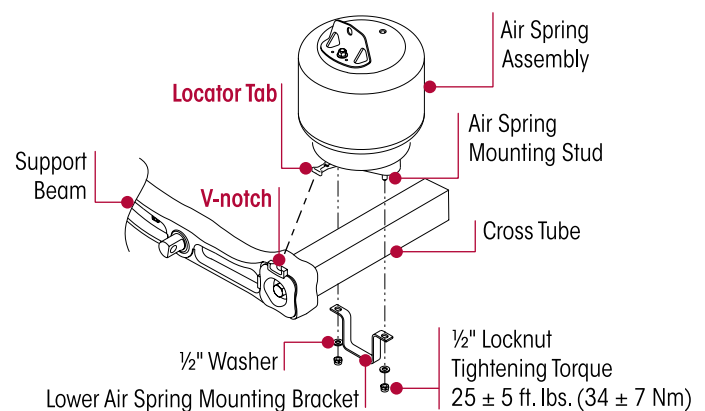
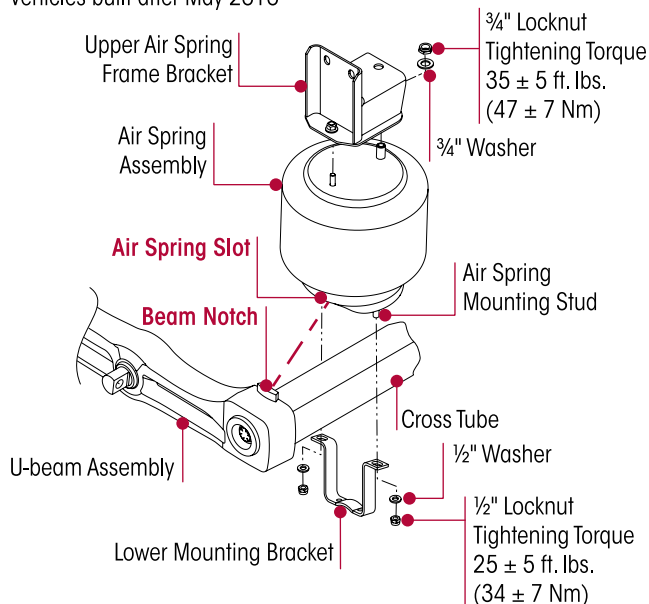
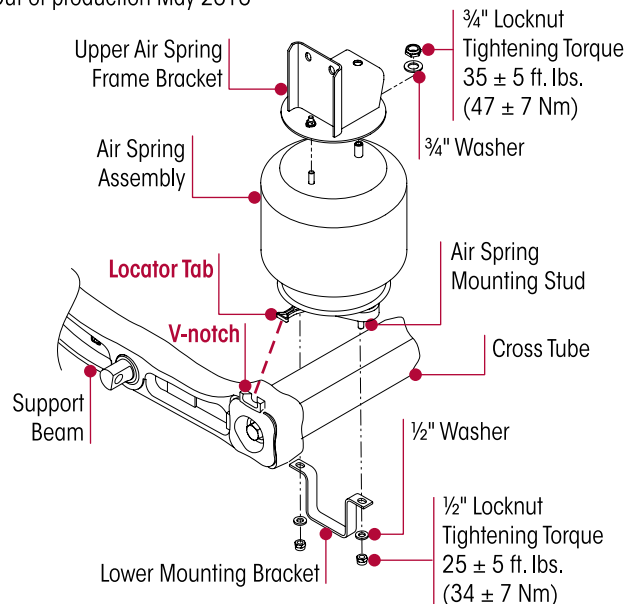




FIGURE 8-3
12"-15½" Ride Height Ride Height
PRIMAAX EX equipped with Integrated End Cap
 Vehicles built after May 2010



PRIMAAX equipped with Detachable End Cap
 Out of production May 2010



12. Inflate the suspension slowly and verify that the air spring bladder inflates uniformly without binding.
13. Remove the frame safety stands.
14. Verify proper ride height. Refer to the Alignment & Adjustments section of this publication.
15. Remove the wheel chocks.

HEIGHT CONTROL VALVE

NOTE

This procedure is for servicing a height control valve supplied by Hendrickson. Contact the vehicle manufacturer for instructions when servicing a non-Hendrickson height control valve.

DISASSEMBLY

1. Chock the wheels.
2. Support the frame with safety stands.
3. Disconnect the linkage assembly from the height control valve arm.

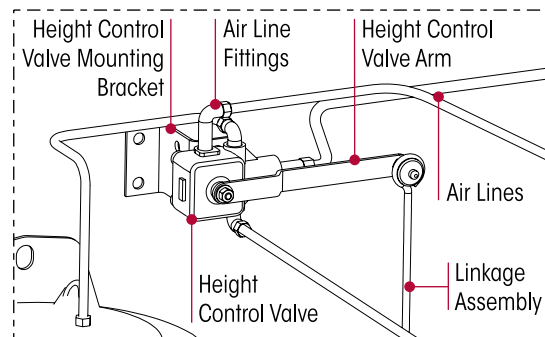


WARNING

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, see Figure 8-4.

FIGURE 8-4



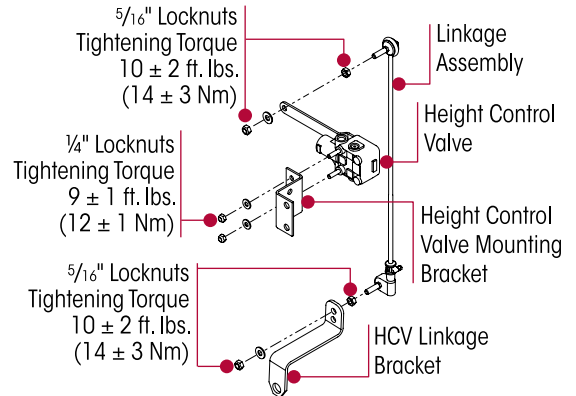
WARNING

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

6. Remove the air lines from the height control valve.
7. Remove and discard the locknut mounting bracket fasteners that attach to the height control valve.
8. Remove the height control valve, see Figure 8-4.

ASSEMBLY

1. Install the height control valve to the frame mounting bracket by attaching the 1/4" fasteners. Tighten to 9 ± 1 foot pounds torque, see Figure 8-5.
2. Install the upper linkage assembly to the height control valve. Install the lower linkage assembly to lower linkage bracket. Install fasteners and tighten to 10 ± 2 foot pounds torque, see Figure 8-5.
3. Install the air lines to the height control valve. Refer to the Plumbing Diagrams section in this publication.
4. See additional Air Spring Cautions and Warnings in the Important Safety Notice section of this publication prior to deflating or inflating the air system.
5. Inflate the suspension by connecting the linkage assembly to the height control valve arm. Verify the air springs inflate uniformly without binding.
6. Remove the frame safety stands.
7. Verify proper ride height. Refer to the Alignment & Adjustments section of this publication.
8. Remove the wheel chocks.

FIGURE 8-5

SHOCK ABSORBER
NOTE

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

WARNING

THE SHOCK ABSORBERS ARE THE REBOUND TRAVEL STOPS FOR THE SUSPENSION. THE SHOCK ABSORBERS MUST REMAIN CONNECTED ANYTIME THE AXLE IS SUSPENDED OTHERWISE ALLOWED TO HANG ABOVE THE GROUND. 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.

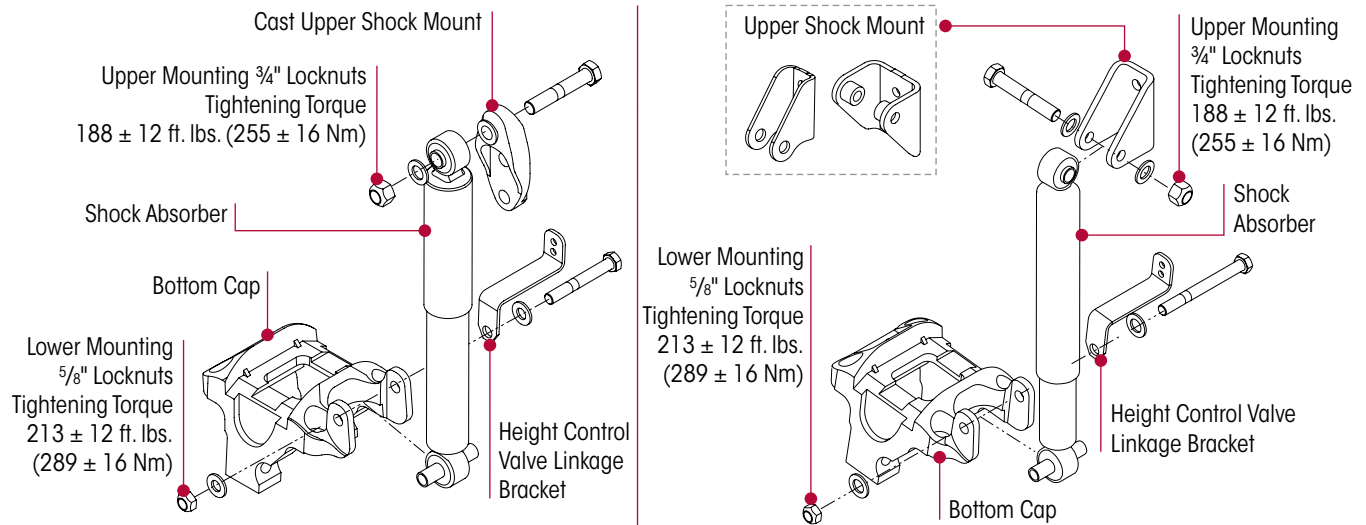
DISASSEMBLY
NOTE

If may be necessary to remove the height control valve linkage bracket for shock absorber replacement, if so, mark the position of the linkage bracket to facilitate reinstallation.

1. Chock the wheels of the vehicle.
2. Remove and discard the **lower** shock absorber mounting fasteners and, if necessary, the height control valve linkage bracket, see Figure 8-6.
3. Remove and discard the **upper** shock absorber mounting fasteners.
4. Slide the shock absorber out of the **upper** mounting bracket.

5. Inspect the shock absorber mounting brackets and hardware for damage or wear, replace as necessary. Refer to Preventive Maintenance section of this publication.

FIGURE 8-6



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

IF THE SUSPENSION IS EQUIPPED WITH THE CAST UPPER SHOCK FRAME BRACKET (PART NO. 67463-002) THE UPPER SHOCK BOLT MUST BE INDEXED INTO THE RECESSED HEX BORE OF THE UPPER SHOCK FRAME BRACKET FOR PROPER FASTENER INSTALLATION. FAILURE TO DO SO CAN CAUSE THE SHOCK FASTENERS TO BECOME LOOSE AND CAUSE PREMATURE COMPONENT DAMAGE.

4. Slide the lower shock absorber mount into the bottom cap.
5. Install the lower shock absorber mounting fasteners and height control valve linkage bracket (if removed).
6. Tighten the upper shock absorber mounting locknut to $\boxed{188 \pm 12}$ foot pounds torque, see Figure 8-6.
7. Tighten the lower shock absorber mounting locknut to $\boxed{213 \pm 12}$ foot pounds torque, see Figure 8-6.
8. Install the linkage bracket per the marked position if removed.
9. Verify proper ride height. Refer to the Alignment & Adjustments section of this publication.
10. Remove the wheel chocks.

TRAAX ROD – TRANSVERSE TORQUE ROD

WARNING

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

NOTE

TRAAX ROD torque rod assemblies equipped on the PRIMAAX EX • PRIMAAX suspension are non-bushable. The entire torque rod assembly must be replaced. This feature provides superior bushing retention in the torque rod end hub.

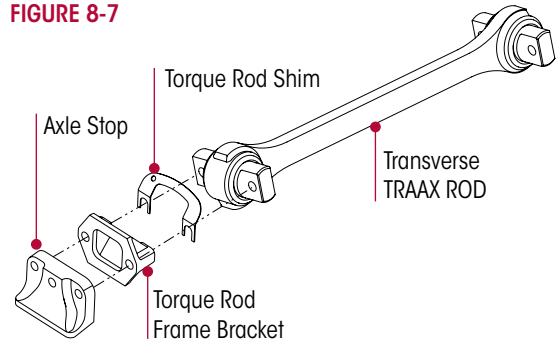
DISASSEMBLY

1. Chock the wheels of the vehicle.

SERVICE HINT

Note the quantity and location of shims (see Figure 8-7), removed to maintain the lateral alignment of the axle during assembly. See Alignment & Adjustments section of this publication.

2. Remove and discard the torque rod mounting fasteners and shims (if equipped) as per the vehicle manufacturer's instructions.
3. Remove the transverse torque rod.
4. Inspect the mounting surfaces for any wear or damage. Repair or replace as necessary.

FIGURE 8-7

ASSEMBLY

1. Install the transverse torque rod.
2. Install the mounting fasteners and any shims with the same quantity and location as prior to removal to maintain lateral alignment.

NOTE

Hendrickson recommends 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.
4. Tighten all fasteners to the required torque specification. Refer to the original equipment manufacturer for specifications.
5. Check the lateral alignment. If not within the vehicle manufacturer's specified range, a lateral alignment is necessary. See Lateral Alignment in the Alignment & Adjustments section of this publication.
6. Remove the wheel chocks.

ULTRA ROD – LONGITUDINAL TORQUE ROD
NOTE

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

- Equipped on all models **EXCEPT** those equipped with Frame Hanger 64451-XXX, see Figure 8-8

DISASSEMBLY

1. Chock the wheels of the vehicle.

SERVICE HINT

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

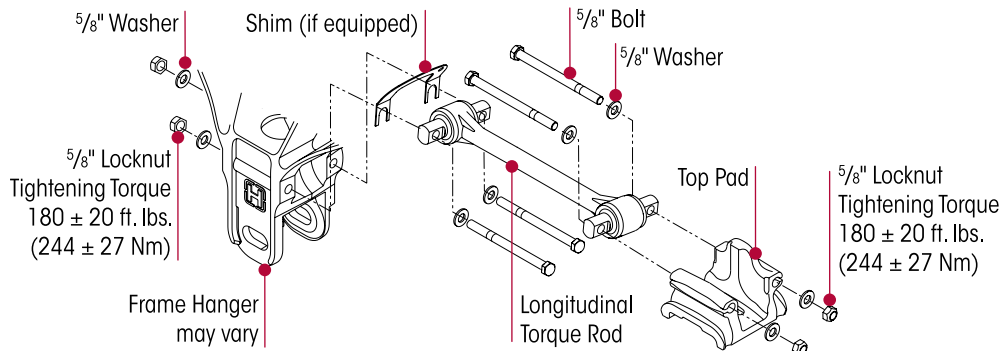
2. Remove and discard the longitudinal torque rod fasteners and shims (if equipped) that connect to the frame hanger, see Figure 8-8.
3. Remove and discard the longitudinal torque rod fasteners that connect to the top pad, see Figure 8-8.
4. Remove the longitudinal torque rod.
5. Inspect the mounting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

ASSEMBLY

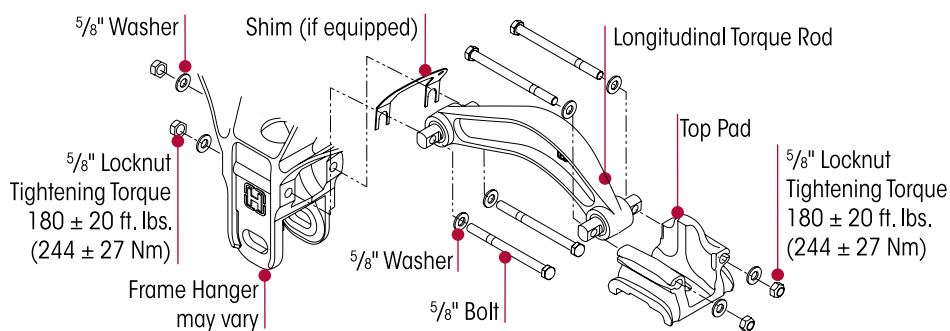
1. Install the longitudinal torque rod.
2. Install the mounting fasteners. Install any shims as prior to disassembly, see Figure 8-8.



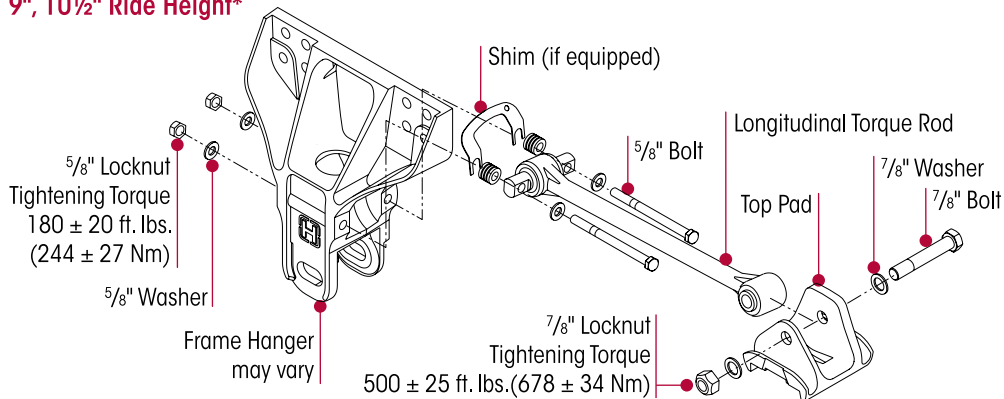
FIGURE 8-8
8½", 10", 13" Ride Height*



8½", 10", 13" Ride Height*



9", 10½" Ride Height*



***NOTE**

The frame hanger • top pad • longitudinal torque rod connection may vary for different models. Refer to the specific Parts List for the PRIMAAX EX suspension equipped on your vehicle available online at: www.hendrickson-intl.com/products/primaax

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 longitudinal torque rod locknuts to torque specifications. Refer to Ride Height Inspection in the Alignment & Adjustments section of this publication.

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

■ For models equipped with **Frame Hanger 64451-XXX**, see Figure 8-9

SERVICE HINT

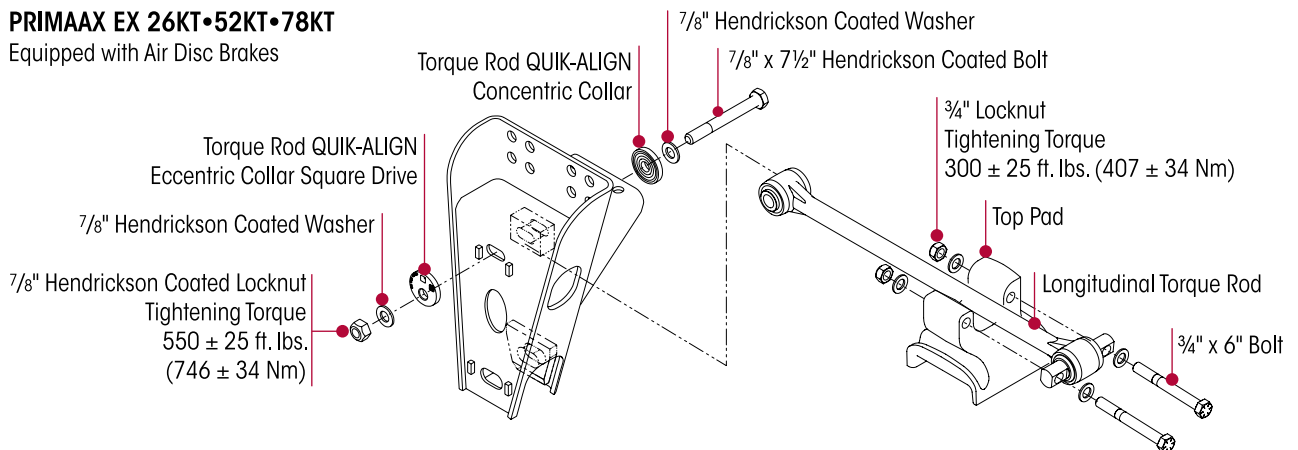
Mark the position of the torque rod's QUIK-ALIGN eccentric collar square drive (see Figure 8-9) in relation to the frame hanger prior to loosening the connection. This will facilitate the setting of the axle pinion angle during assembly.

DISASSEMBLY

1. Chock the wheels of the vehicle.
2. Remove and discard the QUIK-ALIGN fasteners.
3. Remove the QUIK-ALIGN collars that connect the longitudinal torque rod to the frame hanger, see Figure 8-9.
4. Remove and discard the longitudinal torque rod fasteners that connect to the top pad, see Figure 8-9.
5. Remove the longitudinal torque rod.
6. Inspect the mounting surfaces for any wear or damage, replace if necessary.

FIGURE 8-9
PRIMAAX EX 26KT•52KT•78KT

Equipped with Air Disc Brakes


ASSEMBLY

1. Install the longitudinal torque rod.
2. Install new mounting fasteners, ensure the bolt head and the QUIK-ALIGN concentric collar are on the inboard side of the frame hanger, see Figure 8-9.


WARNING

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


WARNING

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

NOTE

It is mandatory to have the vehicle at proper ride height prior to tightening the torque rod mounting fasteners, see the Alignment & Adjustments section of this publication.

3. Tighten all fasteners to the required specification, see Figure 8-9.
4. After assembly is complete, verify the drive axle pinion angles are within the vehicle manufacturer's specifications, see the Alignment & Adjustments section of this publication.
5. Remove the wheel chocks.

ULTRA ROD TORQUE ROD BUSHINGS

NOTE

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

You will need:

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

DISASSEMBLY



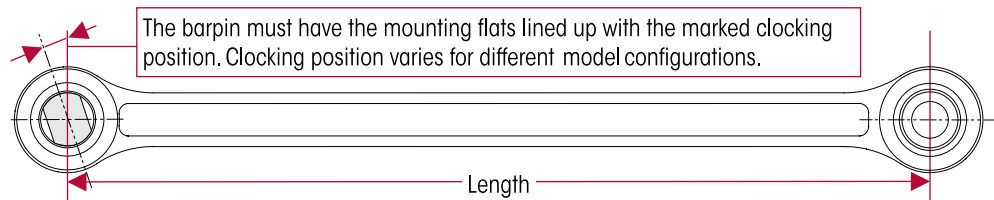
DO NOT USE HEAT OR USE A CUTTING TORCH TO REMOVE THE BUSHINGS FROM THE TORQUE ROD. THE USE OF HEAT WILL ADVERSELY AFFECT THE STRENGTH OF THE TORQUE ROD; HEAT CAN CHANGE THE MATERIAL PROPERTIES. A COMPONENT DAMAGED IN THIS MANNER CAN RESULT IN THE ADVERSE VEHICLE HANDLING, POSSIBLE PERSONAL INJURY OR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

SERVICE HINT

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

1. Remove the torque rod as detailed in this section.
2. When replacing a straddle mount bar pin type bushing assembly, mark the clocking position of the bushing assembly's bar pin flats with a paint stick on the torque rod end hub prior to disassembly. Clocking varies for different model configurations, see Figure 8-10.
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.

FIGURE 8-10



ASSEMBLY

NOTE

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

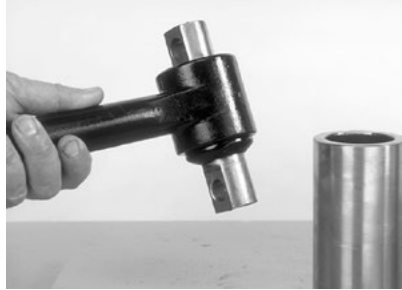
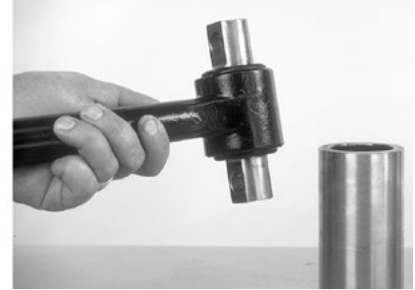
1. Lubricate the inner diameter of the torque rod end hub and the new rubber bushing with light Naphthenic Base Oil, such as 60 SUS at 100°F, see Figure 8-11.
2. Support the torque rod end tube on the receiving tool with the end tube of the torque rod centered on the receiving tool.

NOTE

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

3. Center the new bushing assembly on the torque rod end hub. When installing a straddle mount type bushing assembly, verify the bushing assembly's bar pin flats are clocked correctly.

FIGURE 8-11

FIGURE 8-12

FIGURE 8-13


4. Press directly on the inner metal of the bushing assembly. The rubber bushings of the bar pin must be centered within the torque rod end tubes.
5. When pressing in the new bushings overshoot the desired final position by approximately $\frac{3}{16}$ " , see Figure 8-12.
6. Press the inner metal of the bushing assembly again from the opposite side to center the bushing and inner metal within the torque rod end tube, see Figure 8-13.

CAUTION

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

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

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. See Hendrickson publication SEU-0229 for PRIMAAX support beam/cross tube assembly conversion to the new U-beam assembly enhancement or refer to the specific parts list for PRIMAAX EX suspension equipped on your vehicle available online.

DISASSEMBLY

1. Chock the front wheels.
2. Support the frame at ride height with safety stands.
3. Raise and support the axle being serviced with safety stands.
4. Remove the wheel assembly per the vehicle manufacturer's instructions.
5. Disconnect the linkage assemblies from the height control valve arms.

WARNING

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

WARNING

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

6. See additional Air Spring Cautions and Warnings in the Important Safety Notice section of this publication prior to deflating or inflating the air system.
7. Lower the height control valve arm(s) to exhaust the air in the air springs and deflate the rear suspension.
8. 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.

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

WARNING

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

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

SERVICE HINT

Each frame hanger will have a pair of QUIK-ALIGN collars. Note the type of QUIK-ALIGN collar removed from which frame hanger location to facilitate the assembly process. The QUIK-ALIGN eccentric collar (with square drive feature, see Figure 8-14) 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.

13. Mark the position of the QUIK-ALIGN **square drive** in relation to the frame hanger and note the **orientation of the fasteners** prior to loosening the QUIK-ALIGN connection. This will facilitate the axle alignment process after the repair is complete, see Figure 8-14.
14. Loosen both the QUIK-ALIGN fasteners, **DO NOT** remove at this time.
15. Remove and discard D-pin fasteners on both sides of the suspension.

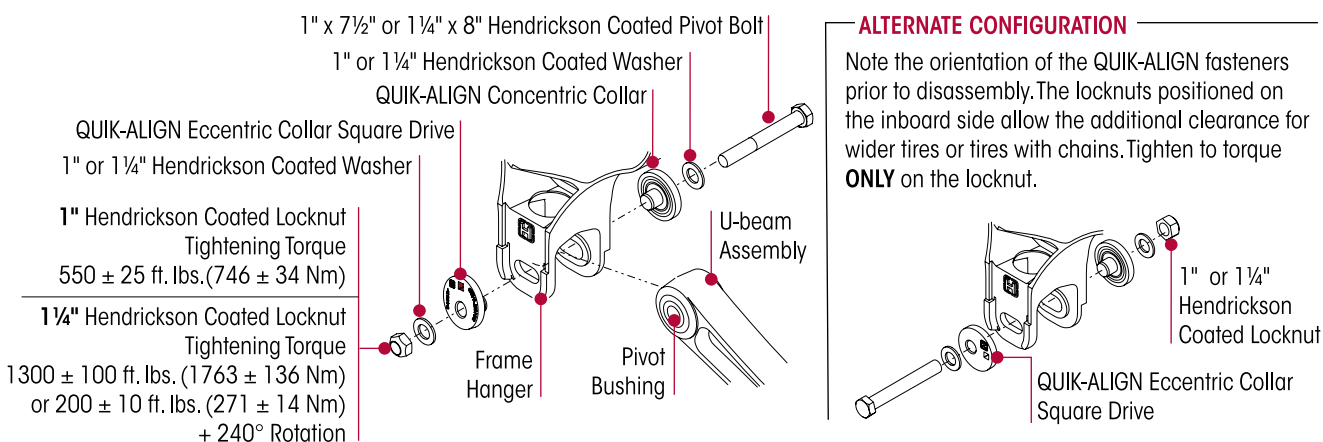
SERVICE HINT

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.

FIGURE 8-14



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.

16. Lower the floor jack and pivot the U-beam assembly down.
17. Remove and discard the QUIK-ALIGN fasteners.
18. 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.

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

ASSEMBLY

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



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.



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



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

NOTE

Use a new QUIK-ALIGN pivot bolt kit (Refer to the specific parts list for PRIMAAX EX suspension equipped on your vehicle available online) for any axle alignment or disassembly of the QUIK-ALIGN connection. This will help ensure that the proper clamp load is applied to the connection and help prevent the joint to slip in service.

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.

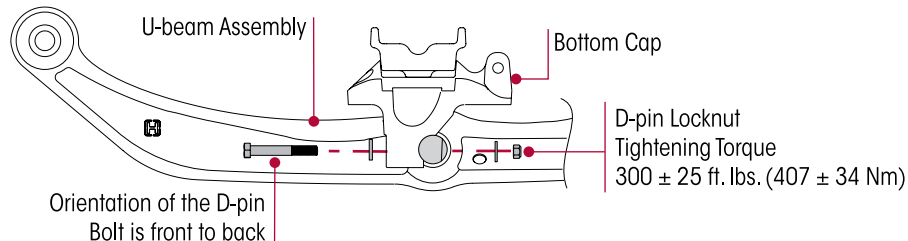
SERVICE HINT

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 8-15.

FIGURE 8-15


9. Remove the floor jack supporting the U-beam assembly.
10. Tighten D-pin fasteners to 300 ± 25 foot pounds torque.



11. Install the air spring between the frame and cross tube, refer to Air Spring in this section.
12. Install the wheel assemblies per the vehicle manufacturer’s instructions.
13. Remove the axle safety stands.
14. See additional Air Spring Cautions and Warnings in the Important Safety Notice section of this publication prior to deflating or inflating the air system.
15. Connect the linkage assemblies to the height control valve arms to inflate the suspension.
16. Remove frame safety stands.
17. Remove the wheel chocks.

NOTE



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

18. Check the alignment and adjust if necessary. See Alignment & Adjustments section of this publication.
19. Once the correct axle alignment is achieved, use a calibrated torque wrench to tighten:
 - 1" QUIK-ALIGN locknut to 550 ± 25 foot pounds torque.
 - 1 ¼" QUIK-ALIGN locknut to 1300 ± 100 foot pounds torque **or** pre-torque the locknut to 200 ± 10 foot pounds. After the pre-torque has been applied, tighten the locknut an additional ⅔ turn (240° rotation).

D-PIN BUSHING

You will need:

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

REMOVAL	✓	✓	✓	✓
INSTALLATION	✓		✓	✓
D-PIN BUSHING	 <p>575164 Saddle</p>	 <p>575163 Adapter Pin</p>	 <p>576421 D-pin Adapter</p>	 <p>575167 Alignment Tool</p>

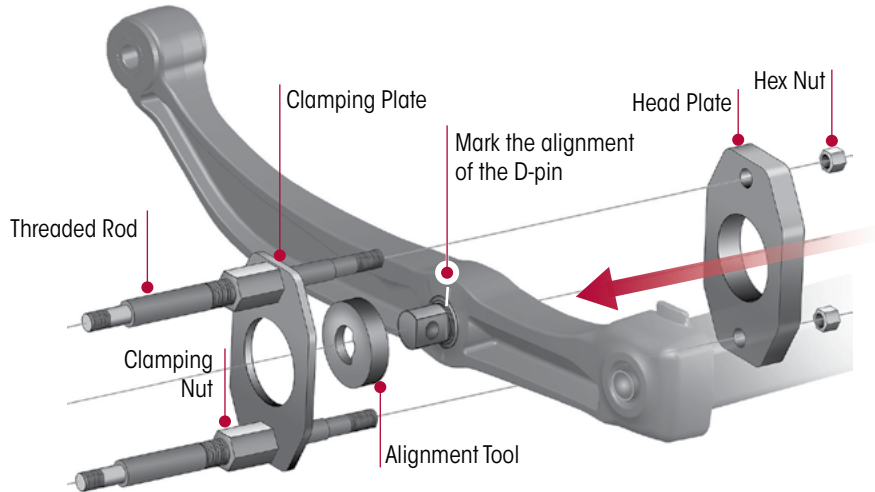
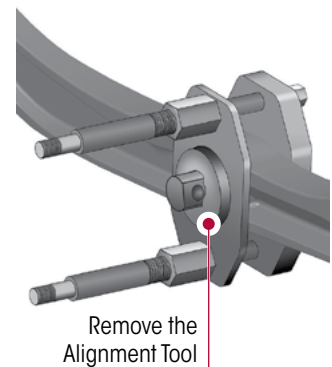
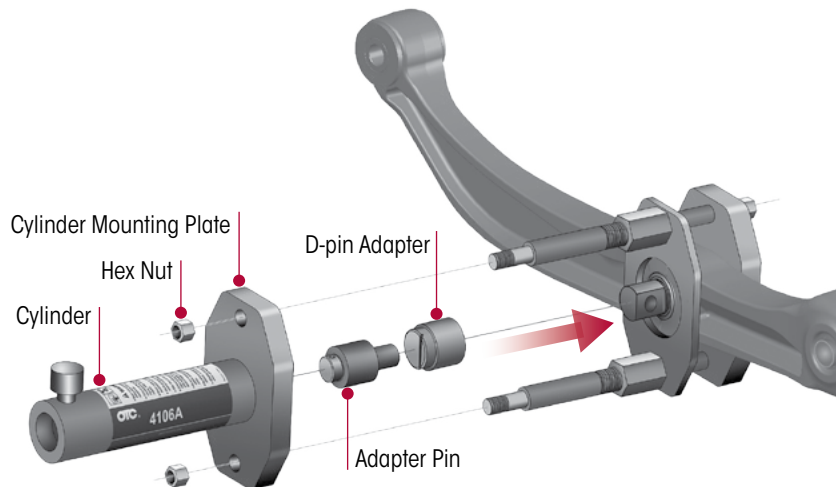
DISASSEMBLY

1. Mark the spring to show the alignment of the existing D-pin. Install the alignment tool over the D-pin, and place the clamping plate over the alignment tool, see Figure 8-16.
2. Assemble the clamping nuts to the threaded rods.
3. Insert a threaded rod through the **upper** holes in the clamping plate and the head plate. Install a hex nut on the threaded rod, but **DO NOT** tighten at this time.
4. Insert a threaded rod through the **lower** holes in the clamping plate and the head plate. Install a hex nut on the threaded rod, but **DO NOT** tighten at this time.
5. Tighten the clamping nuts to the clamping plate, see Figure 8-17.
6. Ensure the clamping plate and head plate are parallel to each other.
7. Remove the alignment tool.



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

8. Thread the cylinder into the cylinder mounting plate, see Figure 8-18.
9. Install the cylinder mounting plate onto the end of the threaded rods. Adjust the clamping nuts as needed to fit the threaded rods through the holes in the cylinder mounting plate. Assemble the hex nuts on the threaded rods. Tighten the hex nuts on both ends of the threaded rods.

FIGURE 8-16

FIGURE 8-17
TOOL ASSEMBLY
After Steps 1-5

FIGURE 8-18


10. Place the D-pin adapter over the D-pin.
11. Insert the adapter pin into the head of the cylinder.

WARNING

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

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

WARNING

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

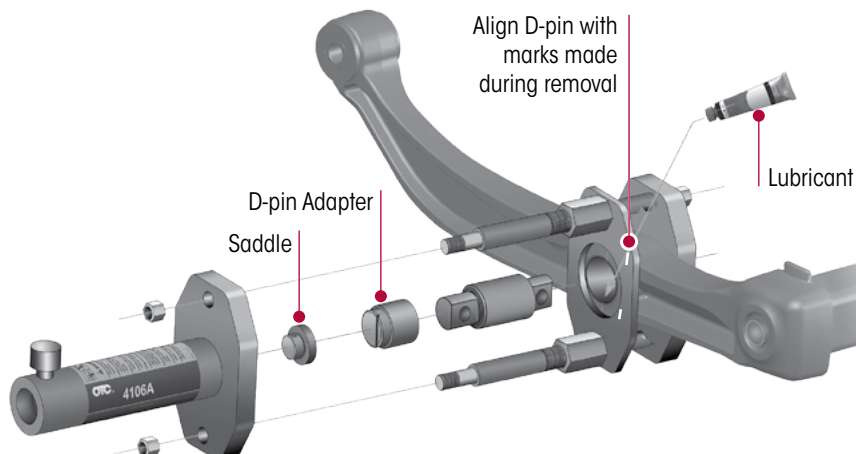
13. Connect the hydraulic hose from the hydraulic pump to the cylinder.
14. Operate the pump to extend the cylinder piston and apply pressure to push the D-pin out of the support beam of the U-beam assembly.

ASSEMBLY

1. Clean and thoroughly lubricate the entire surface of the inside diameter of the spring, see Figure 8-19.
2. Insert the saddle tool into the head of the cylinder.
3. Assemble the D-pin and the D-pin adapter as shown. Align the D-pin adapter with the alignment marks made during the removal procedure.



FIGURE 8-19



4. Operate the pump to extend the cylinder piston and apply enough pressure to hold the tool and components. Check the alignment of the D-pin. The centerline of the D-pin must be aligned with the centerline of the inside diameter of the spring.



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





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

QUIK-ALIGN PIVOT BUSHING

You will need:

- **Method A:** Hendrickson Tool Part Nos. 66086-202 • 66086-204 (OTC Nos. 4246 • 4247) and **Method B:** 66086-203L, refer to the Special Tools section in this publication

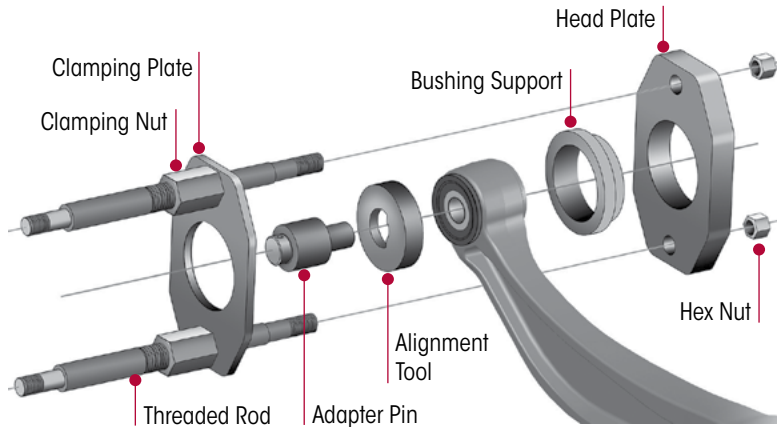
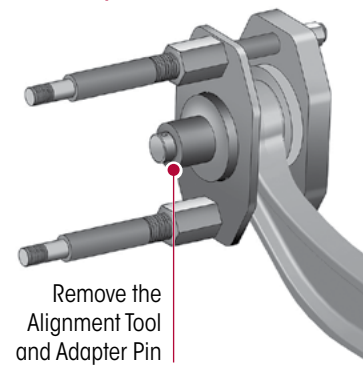
METHOD A – Using Tool Nos. 66086-202 • 66086-204

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

DISASSEMBLY

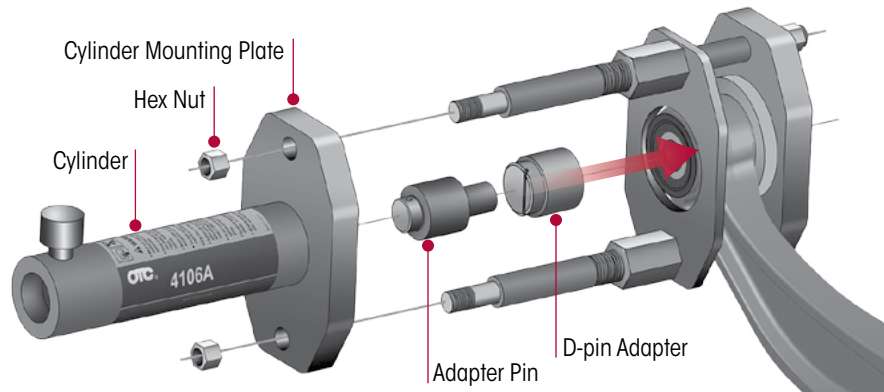
1. Insert the adapter pin through the alignment tool and into the pivot bushing hole as shown in Figure 8-20.
2. Insert the bushing support over the pivot bushing.
3. Assemble the clamping nuts to the threaded rods.
4. Insert a threaded rod through the upper holes in the clamping plate and the head plate while positioning the head plate over the bushing support. Install a hex nut on the threaded rod, but **DO NOT** tighten at this time.
5. Insert a threaded rod through the lower holes in the clamping plate and the head plate. Install a hex nut on the threaded rod, but **DO NOT** tighten at this time.
6. Tighten the clamping nuts to the clamping plate, see Figure 8-21.

- Remove the alignment tool and adapter pin.

FIGURE 8-20

FIGURE 8-21
Tool assembly after Steps 1-6

WARNING

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

- Thread the cylinder into the cylinder mounting plate, see Figure 8-22.

FIGURE 8-22


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

WARNING

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

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

WARNING

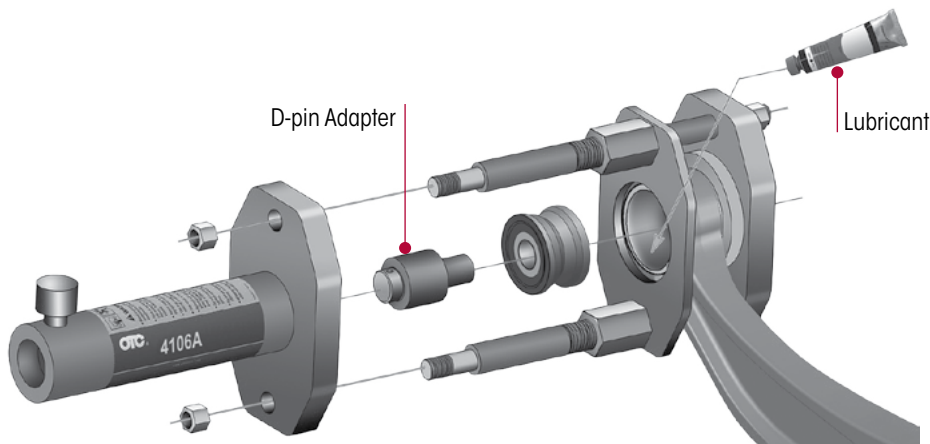
TO HELP PREVENT PERSONAL INJURY STAY CLEAR OF THE HYDRAULIC PUMP, ADJACENT TOOLS, AND THE DIRECTION OF THE HYDRAULIC FORCE WHILE THE D-PIN IS BEING EXTRACTED.

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

ASSEMBLY

- Clean and thoroughly lubricate the entire surface of the inside diameter of the support beam of the U-beam assembly, see Figure 8-23.
- Insert the adapter pin into the head of the cylinder.
- Place the pivot bushing on the end of the adapter pin as shown.

FIGURE 8-23



4. Operate the pump to extend the cylinder piston and apply enough pressure to hold the tool and components. Check the alignment of the pivot bushing.

WARNING

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

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

METHOD B – Using Tool No. 66086-203L

SERVICE HINT

Use the QUIK-ALIGN Pivot Bushing Tool No. 66086-203L to help with the installation and removal of QUIK-ALIGN pivot bushings. The tool allows the existing pivot bushing to be pushed out from the U-beam assembly into the receiving cylinder. Then follow a similar procedure to push in the replacement pivot bushing, see Figure 8-24.

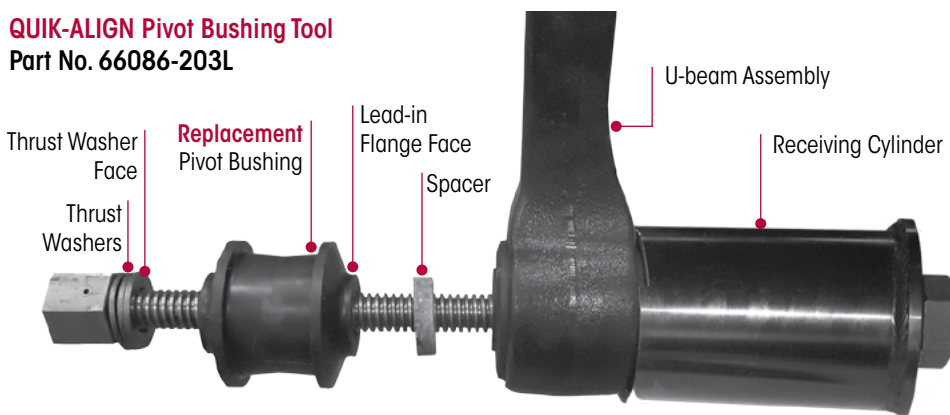
FIGURE 8-24

NOTE

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

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

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



WARNING

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

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

PIVOT BUSHING REMOVAL

NOTE

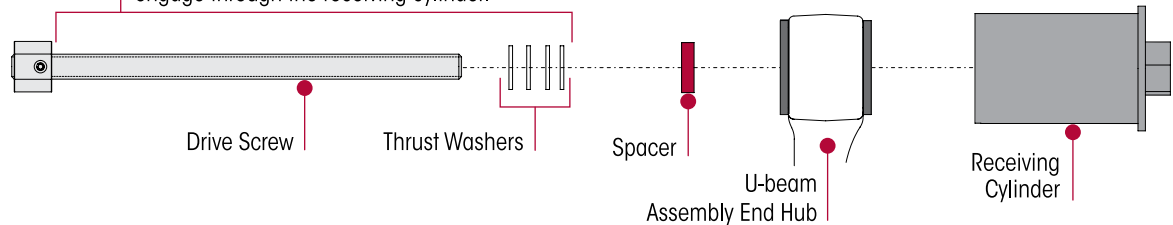
When replacing a pivot bushing it is recommended to replace both pivot bushings on the U-beam assembly.

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

- QUIK-ALIGN pivot bushing service tool (Part No. 66086-203L), see Figure 8-24.
 - $\frac{3}{4}$ " Impact wrench (impact gun), some $\frac{1}{2}$ " impact wrenches may work.
1. Install the pivot bushing tool as shown in Figure 8-25.
 2. Remove and discard thrust washers (if equipped) and any loose rubber or debris from the existing pivot bushing.
 3. Apply NLGI #2-EP (Extreme Pressure) chassis lubricant to each face of the thrust washers and to the drive screw that will engage through the receiving cylinder, see Figure 8-25.

FIGURE 8-25

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



4. Snug the threaded drive screw to hold the thrust washers, spacer, U-beam assembly with the existing pivot bushing and the receiving cylinder in place, see Figure 8-26.
5. Using a $\frac{3}{4}$ " impact wrench, rotate the drive screw in a continuous motion without stopping until the pivot bushing is removed from the end hub. The existing pivot bushing will enter into the receiving cylinder, see Figure 8-27.

FIGURE 8-26

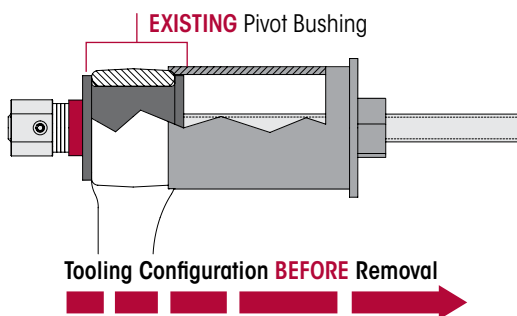
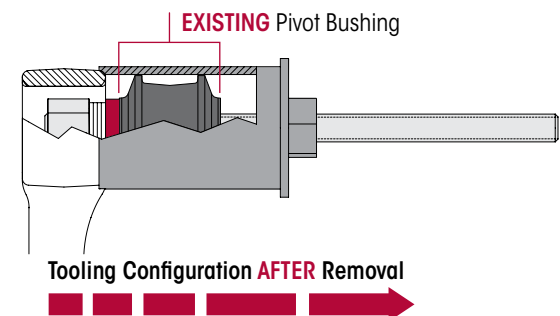


FIGURE 8-27



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

END HUB INSPECTION

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

PIVOT BUSHING INSTALLATION

1. Clean the inner diameter of the U-beam assembly end hub with brake cleaner.
2. Apply NLGI #2-EP (Extreme Pressure) chassis lubricant to each face of the thrust washers and to the drive screw that will engage through the receiving cylinder, see Figures 8-28 and 8-29.

NOTE

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

3. Apply P-80 lubricant to the:

- **Heavy-duty Pivot Bushing** – to the face of the lead-in flange, the outer diameter of the replacement pivot bushing, and the inner diameter of the U-beam assembly end hub, see Figure 8-28.
- **Severe-duty Pivot Bushing** – the face of the lead-in flange and to the outer diameter of the severe-duty pivot bushing, see Figure 8-29. **DO NOT** apply to the U-beam end hub.

FIGURE 8-28
Heavy-duty Pivot Bushing

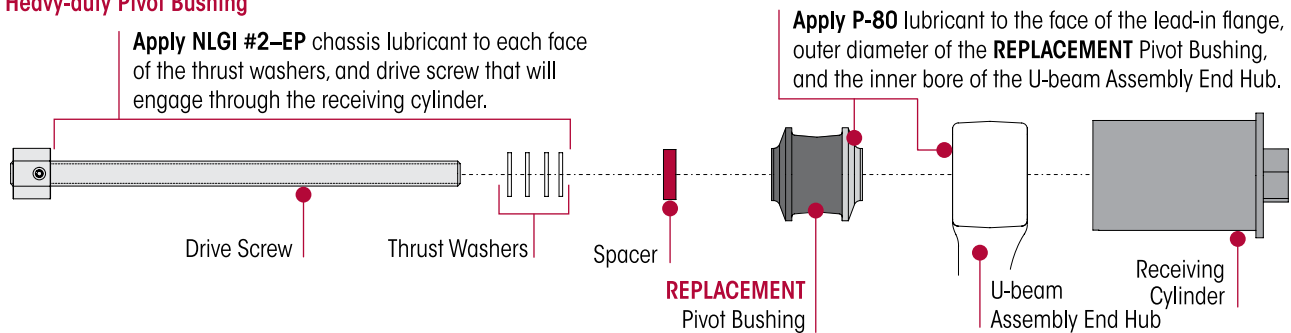
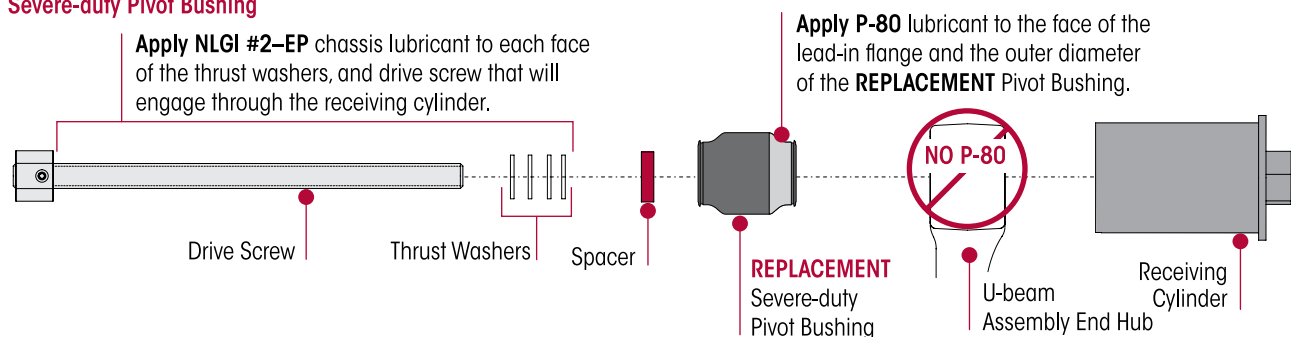


FIGURE 8-29
Severe-duty Pivot Bushing



4. Snug the threaded drive screw to hold the thrust washers, spacer, pivot bushing, and the U-beam assembly with the receiving cylinder in place, see Figures 8-30 and 8-31.

FIGURE 8-30
Heavy-duty Pivot Bushing

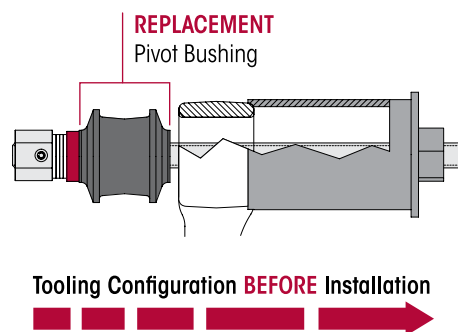
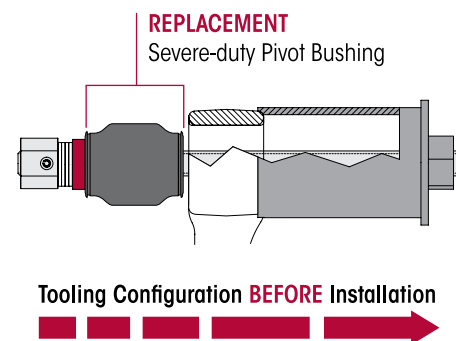


FIGURE 8-31
Severe-duty Pivot Bushing



5. Using a 3/4" impact wrench, rotate the drive screw in a continuous motion without stopping until the pivot bushing is seated in the hub and slightly overshoots the opposite end of the hub. It is necessary to overshoot the desired final position, see Figures 8-32 and 8-33.
6. Remove and reverse the installation tool, then from the opposite side of the hub press the pivot bushing again to center the bushing within the beam end hub, see Figures 8-34 and 8-35. Center the pivot bushing to help prevent bulging and bushing preload. This is known as the "Bump Back" procedure.

FIGURE 8-32
Heavy-duty Pivot Bushing

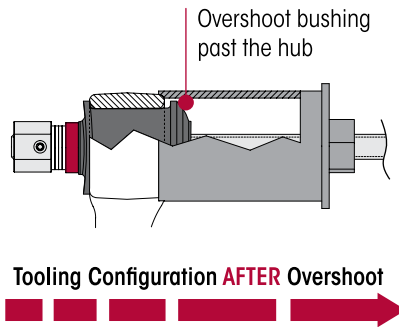


FIGURE 8-33
Severe-duty Pivot Bushing

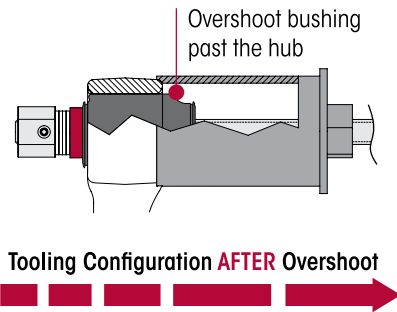


FIGURE 8-34
Heavy-duty Pivot Bushing

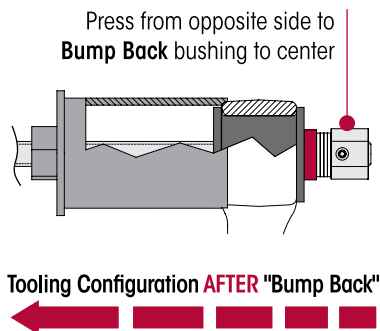
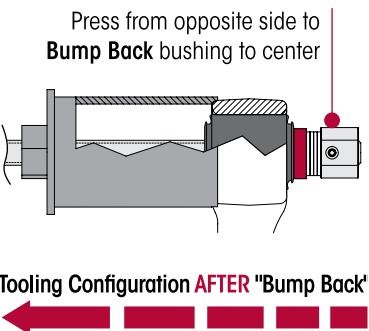


FIGURE 8-35
Severe-duty Pivot Bushing



SERVICE HINT

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

- Severe-duty Pivot Bushings** – Snap the thrust washers onto the bushing, (see Figure 8-36) and ensure there is free play on both washers, see Figure 8-37. If one washer does not seat properly or is very snug use a dead blow hammer to center the bushing. If a dead blow hammer is not sufficient, the installation tool must be used to perform a secondary "Bump Back" procedure to center the bushing, refer to Step 6 and see Figures 8-34 and 8-35.

FIGURE 8-36
Severe-duty Pivot Bushing

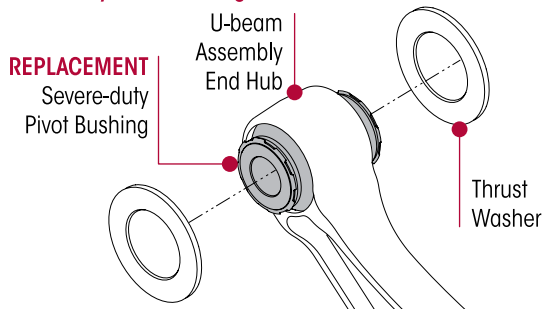
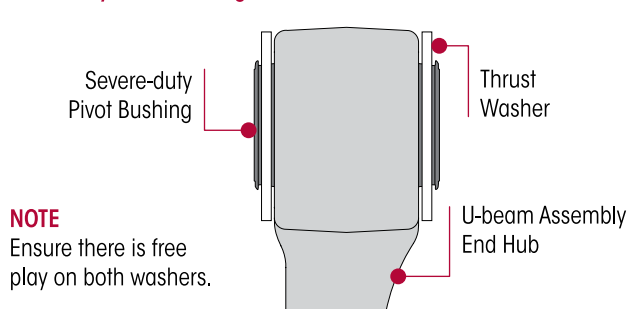


FIGURE 8-37
Severe-duty Pivot Bushing



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



TOP PAD

NOTE Replace the top pad one side at a time and ensure the opposite top remains connected when servicing. This preserves the pinion angle and facilitates installation.

DISASSEMBLY

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

WARNING

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

WARNING

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

6. See additional Air Spring Cautions and Warnings in the Important Safety Notice section of this publication prior to deflating or inflating the air system.
7. 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. Refer to the Alignment & Adjustments section of this publication.

8. Remove and discard the fasteners from the longitudinal torque rod to the top pad joint. Remove the shims (if equipped), see Figure 8-38.

NOTE

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

WARNING

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

WARNING

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

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

ASSEMBLY

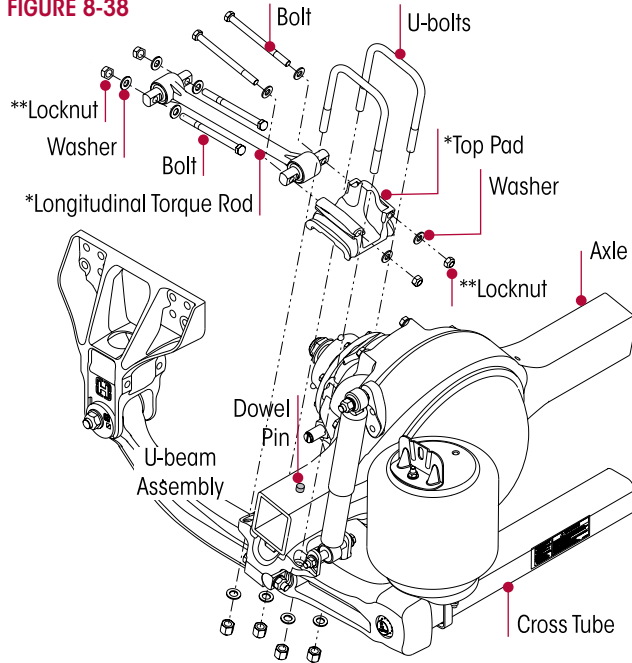
SERVICE NOTE

The following models: PRIMAAX EX 26K•52K•78K and PRIMAAX 260•520•780 may be equipped with top pads, axle spacers, and bottom caps that are contoured to fit the axle housing on the axle's short arm side. Ensure the correct parts are installed at each location, refer to the Bottom Cap Selection Guides in the specific parts list for PRIMAAX EX suspension equipped on your vehicle available online.

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 8-39.



FIGURE 8-38



NOTES

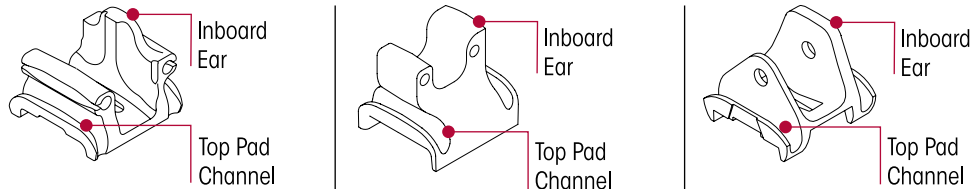
- * PRIMAAX EX 23K•46K•69K Top Pad & Torque Rod shown
For additional configurations, refer to the specific parts list for the PRIMAAX EX suspension equipped on your vehicle, available online at: www.hendrickson-intl.com/products/primaax
- ** Refer to the Torque Specifications section of this publication for the proper torque specifications.

NOTE

Hendrickson Truck Commercial Vehicle Systems U-bolt locknuts for the PRIMAAX EX • PRIMAAX suspensions are 3/4"-16 Grade C and are phosphate and oil coated.

2. Install the new U-bolts and fasteners.
3. Verify that the U-bolts are seated properly in the top pad channels, see Figure 8-39.

FIGURE 8-39



NOTE: Top pads may vary with different models, refer to the specific Parts List for the PRIMAAX EX suspension equipped on your vehicle available online at: www.hendrickson-intl.com/products/primaax

4. Tighten the U-bolt locknuts evenly in 50 foot pound increments in the proper pattern to achieve uniform bolt tension, see Figure 8-40.
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 the U-bolt locknuts. Tighten the 3/4" locknuts to $\boxed{375 \pm 25}$ foot pounds torque.
6. Tighten the D-pin fasteners to $\boxed{300 \pm 25}$ foot pounds torque if loosened or removed during disassembly, see Figure 8-41.

FIGURE 8-40

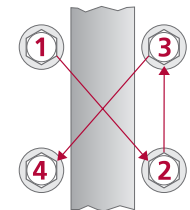
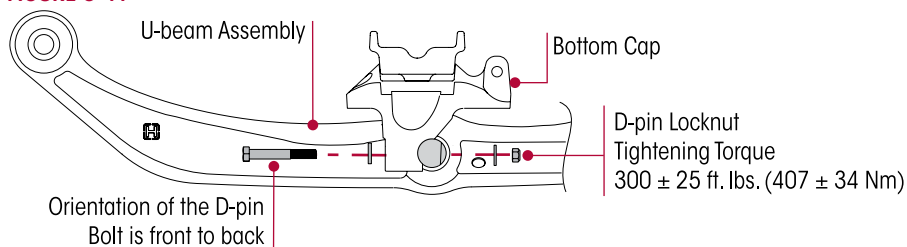


FIGURE 8-41





7. Remove the safety stand from 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 linkage assembly to the height control valve arm(s) to inflate the suspension.
11. Remove the frame safety stands.

NOTE

It is mandatory to have the vehicle at proper ride height prior to tightening the longitudinal torque rod fasteners to torque specifications.

12. Tighten the longitudinal torque rod fasteners to the required specification, see the Torque Specifications section of this publication.
13. Install wheel assemblies per the vehicle manufacturer's instructions.
14. Remove axle safety stands and lower the axle.
15. 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 front wheels.
2. Support the frame at ride height with safety stands.
3. Raise and support the axle being serviced.
4. Remove the wheel assembly per the vehicle manufacturer's instructions.
5. Disconnect the linkage assembly from the height control valve arm(s).

WARNING

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

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

WARNING

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

7. Lower the height control valve arm(s) to exhaust the air in the air springs and deflate the rear suspension.
8. 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.
9. Remove the lower mounting fasteners from both air springs using **HAND TOOLS** only, refer to Air Spring in this section.

WARNING

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

WARNING

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

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

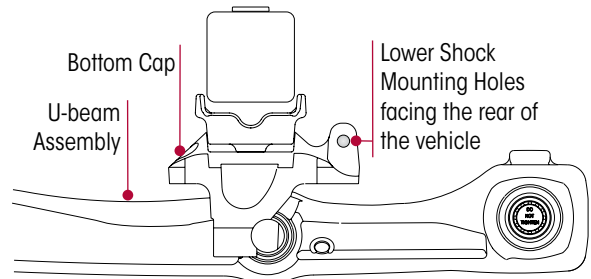
ASSEMBLY

NOTE

The following models PRIMAAX EX 26K • 52K • 78K, and PRIMAAX 260 • 520 • 780 may be equipped with top pads, axle spacers, and bottom caps that are contoured to fit the axle housing on the axle's short arm side. Ensure the correct parts are installed at each location, refer to the Bottom Cap selection guides in the specific parts list for PRIMAAX EX suspension equipped on your vehicle available online.

FIGURE 8-42

1. Install the top pad (if removed) on the top of the axle engaging the dowel pin. See Top Pad in this section.
2. Install the bottom cap and axle spacer (if equipped) on the axle in the proper direction, with the lower shock mounting holes facing the rear of the vehicle, see Figure 8-42.



NOTE

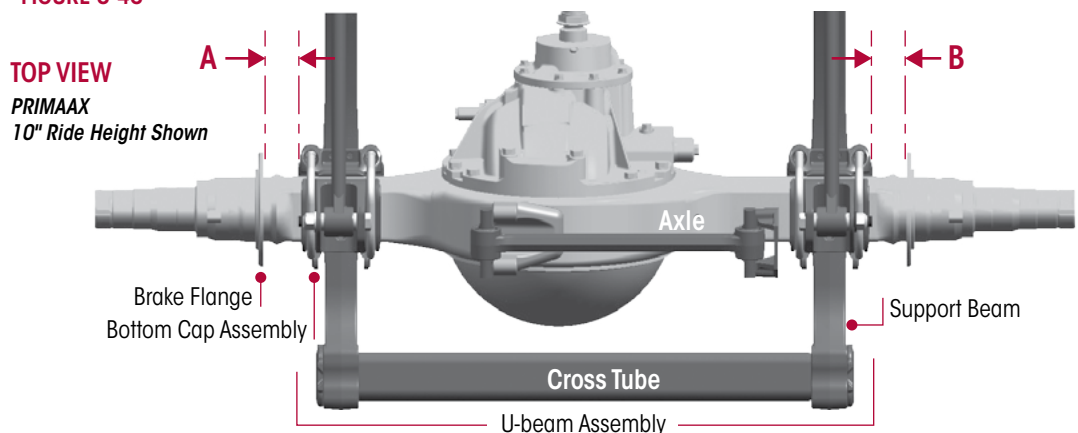
Hendrickson Commercial Vehicle Systems U-bolt locknuts for the PRIMAAX EX • PRIMAAX suspension are ¾" -16 Grade C and are phosphate and oil coated.

3. Install the new U-bolts. Verify that the U-bolts are seated properly in the top pad channels and through the bottom cap.
4. Install the new U-bolt fasteners and hand tighten, **DO NOT** tighten to torque at this time.



PRIOR TO TIGHTENING THE U-BOLTS TO THE FINAL TORQUE, ENSURE THE U-BEAM ASSEMBLY AND THE BOTTOM CAP ASSEMBLY ARE CENTERED ON THE AXLE ($A = B \pm 1/8"$), SEE FIGURE 8-43. FAILURE TO DO SO COULD CAUSE PREMATURE COMPONENT WEAR OR CAUSE UNEVEN LOAD DISTRIBUTION.

FIGURE 8-43





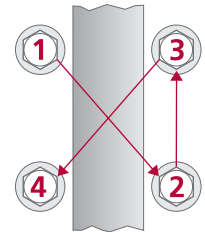
- Center the U-beam assembly, and the bottom cap assembly on the axle ($A = B \pm 1/8"$), see Figure 8-43.

SERVICE HINT

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

- Raise the U-beam assembly until the D-pins engage in the bottom cap.
- Install the D-pin fasteners with the bolt heads on the forward side of the bottom cap.
- Lower the front differential to allow the full engagement of the D-pins into the bottom caps.
- Prior to tightening the D-pin fasteners, verify the bottom cap is centered over the support beam.

- Tighten the D-pin fasteners to $\boxed{300 \pm 25}$ foot pounds torque.
- Tighten the U-bolt locknuts evenly in 50 foot pound increments in the proper pattern to achieve uniform bolt tension, see Figure 8-44.
- 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 $3/4"$ locknuts to $\boxed{375 \pm 25}$ foot pounds torque.
- Pivot the shock back into the lower shock mount and install the lower shock absorber mounting fasteners. Tighten the $5/8"$ locknuts to $\boxed{213 \pm 12}$ foot pounds torque.
- Install the S-cam support bracket and fasteners (if equipped). Tighten the $3/8"$ locknuts to $\boxed{35 \pm 5}$ foot pounds torque. Tighten the $5/16"$ locknuts to $\boxed{25 \pm 5}$ foot pounds torque.
- Install the air spring between the frame and the cross tube, refer to Air Spring in this section.
- Install the wheel assembly per the vehicle manufacturer's instructions.
- Remove the safety stands and lower the frame of the vehicle.
- See additional Air Spring Cautions and Warnings in the Important Safety Notice section of this publication prior to deflating or inflating the air system.
- Connect the linkage assembly to the height control valve arm(s) to inflate the suspension.
- Remove the wheel chocks.

FIGURE 8-44**FRAME HANGER****WARNING**

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

SERVICE HINT

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

DISASSEMBLY

- Chock the front wheels.
- Support the frame at ride height with safety stands.
- Raise and support the axle being serviced.
- Remove the wheel assembly per the vehicle manufacturer's instructions.
- Disconnect the linkage assembly from the height control valve arm(s).

**WARNING**

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

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

WARNING

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

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

SERVICE HINT

Each frame hanger will have a pair of QUIK-ALIGN collars. Any eccentric (with the square drive feature, see Figures 8-45 and 8-46) 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.

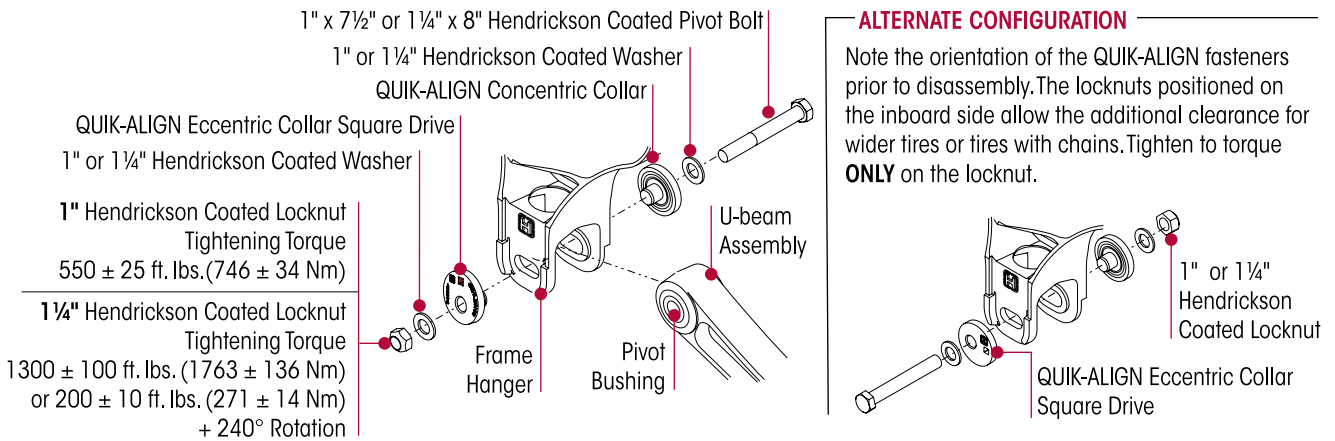
8. Mark the position of the QUIK-ALIGN square drive in relation to the frame hanger with a paint stick prior to loosening the QUIK-ALIGN connection. This will facilitate the axle alignment process after the repair is complete.
9. Remove fasteners per below:
 - All models **EXCEPT** if equipped with Frame Hanger 64451-XXX, see Figure 8-45
 - a. Remove and discard QUIK-ALIGN fasteners. Remove and note the QUIK-ALIGN collar and fastener orientation, see Figure 8-45. The collars may be reused if they are not damaged.

SERVICE HINT

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

- b. Remove and discard the longitudinal torque rod fasteners. Remove shim (if equipped) that attach the to the frame hanger.
- c. Proceed to Step 10.

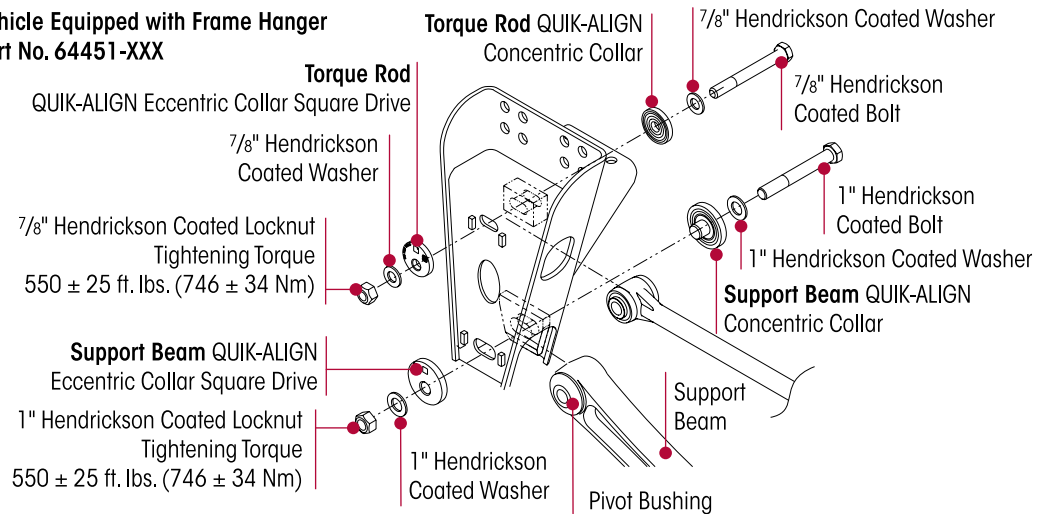
FIGURE 8-45



- Models equipped with **Frame Hanger 64451-XXX**, see Figure 8-46
 - a. Remove the **support beam** QUIK-ALIGN fasteners and collars see Figure 8-46.

FIGURE 8-46

Vehicle Equipped with Frame Hanger
Part No. 64451-XXX



10. Remove the frame hanger fasteners from the vehicle frame rail per the vehicle manufacturer's specifications.
11. Remove the frame hanger.
12. Inspect the mounting surface for any damage or wear.
13. Inspect the QUIK-ALIGN pivot bushing and torque rod bushings for wear or damage, replace as necessary. Refer to Pivot Bushing in the Preventive Maintenance section of this publication.

ASSEMBLY

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

WARNING

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

WARNING

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

NOTE

Use a new QUIK-ALIGN pivot bolt kit (Refer to the specific parts list for PRIMAAX EX suspension equipped on your vehicle available online) for any axle alignment or disassembly of the QUIK-ALIGN connection. This will help ensure that the proper clamp load is applied to the connection and help prevent the joint to slip in service.

- All vehicles **EXCEPT** those equipped with **Frame Hanger 64451-XXX**
 - a. Install the new QUIK-ALIGN collars and fasteners that attach to the frame hanger with the eccentric collar on the outboard side of the vehicle, see Figure 8-45. Verify that the nose of each QUIK-ALIGN collar is installed correctly into the pivot bushing sleeve, and the flanged side is flat against the frame hanger face within the alignment guides. Snug QUIK-ALIGN locknuts to 50-100 foot pounds torque, **DO NOT** tighten at this time.

- b. Install the longitudinal torque rod mounting fasteners and install any shims that were removed during disassembly. Tighten the fasteners to the proper specification, see Torque Specification section of this publication per model designation.
- c. Proceed to Step 3.

■ **Vehicles equipped with Frame Hanger 64451-XXX**

- a. Attach the longitudinal torque rod QUIK-ALIGN eccentric collar on the outboard side of the frame hanger and the concentric collars on the inboard side of the frame hanger.
 - b. Install the support beam QUIK-ALIGN collars and fasteners to the frame hanger, see Figure 8-46. Verify that the nose of each QUIK-ALIGN collar is installed correctly into the pivot bushing sleeve, and the flanged side is flat against the frame hanger face within the alignment guides. Snug QUIK-ALIGN locknuts to 100 foot pounds torque, **DO NOT** tighten to torque at this time.
 - c. Verify that the longitudinal torque rod QUIK-ALIGN collars are flat against the hanger face and within the alignment guides. The longitudinal torque rod QUIK-ALIGN collars are flat.
3. See additional Air Spring Cautions and Warnings in the Important Safety Notice section of this publication prior to deflating or inflating the air system.
 4. Connect the linkage assembly to the height control valve arm(s) to inflate the suspension properly.
 5. Remove frame safety stands.
 6. Verify that the axle is in proper alignment, see Alignment & Adjustments section of this publication.

NOTE

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

7. Once the correct axle alignment is achieved, use a calibrated torque wrench to tighten:
 - 1" QUIK-ALIGN locknut to 550 ± 25 foot pounds torque.
 - 1¼" QUIK-ALIGN locknut to 1300 ± 100 foot pounds torque or pre-torque the locknut to 200 ± 10 foot pounds. After the pre-torque has been applied, tighten the locknut an additional ⅔ turn (240° rotation).
8. Verify the correct pinion angle on the axle per the original equipment manufacturer's specifications. Adjust as necessary per the Alignment & Adjustments section of this publication.
9. Remove the wheel chocks.

AXLE STOPS

DISASSEMBLY

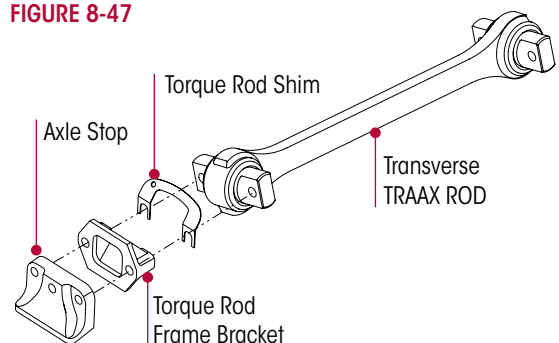
1. Chock the wheels.

SERVICE HINT

The axle stop fasteners secure the transverse torque rod to the inside of the frame rail. It may be necessary to remove and replace one fastener at a time to facilitate axle stop replacement and help prevent the torque rod from shifting.

2. Remove the fasteners connecting the axle stop to the frame per the vehicle manufacturer's instructions.
3. Remove the axle stop, see Figure 8-47.
4. Inspect the frame rail mounting surfaces for any cracks or damage and replace or repair as necessary per the vehicle manufacturer's instructions.

FIGURE 8-47



ASSEMBLY

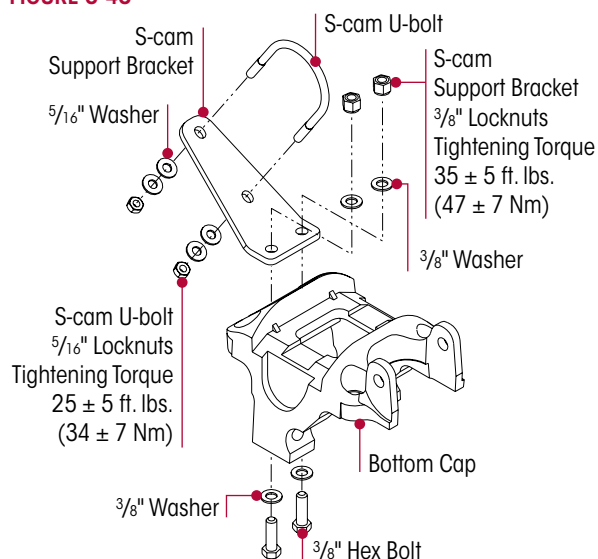
1. Install the axle stop on the outboard side of the frame rail with the torque rod frame bracket on the inboard side.
2. Install and tighten the new mounting fasteners per the vehicle manufacturer's installation and torque specifications.
3. Remove the wheel chocks.

S-CAM SUPPORT BRACKET (if equipped)

FIGURE 8-48

DISASSEMBLY

1. Chock the wheels.
2. Remove the S-cam U-bolt fasteners, see Figure 8-48.
3. Remove the S-cam U-bolt from the bracket and the S-cam housing.
4. Remove S-cam support bracket fasteners connecting 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.

IMPORTANT NOTE

S-cam $\frac{3}{8}$ " bolts S-cam support bracket **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.

2. Install the S-cam $\frac{3}{8}$ " fasteners with the bolt heads on the underside of the bottom cap and tighten fasteners to \mathbb{T} 35 \pm 5 foot pounds torque, see Figure 8-48.
3. Install the U-bolt around the S-cam housing and through the S-cam support bracket.
4. Install the $\frac{5}{16}$ " fasteners and tighten the to \mathbb{T} 25 \pm 5 foot pounds torque.
5. Remove the wheel chocks.

AFTERMARKET DUAL HEIGHT CONTROL VALVES

Although the PRIMAAX EX • PRIMAAX single and tandem suspensions do not require dual height control valves, Hendrickson understands there may be demand for this dual height control valve configuration in certain applications.

Hendrickson strongly recommends you review your vehicle application and contact the vehicle manufacturer and Hendrickson to obtain authorization to equip the vehicle with dual height control valves prior to installing dual height control valves on your vehicle, **failure to do so will void component warranty**.

Upon authorization from both the vehicle manufacturer and Hendrickson, dual height control valve service kits 58525-XXX (Refer to the specific parts list for PRIMAAX EX suspension equipped on your vehicle available online) are available to add a second height control valve on vehicles equipped with only one (1) height control valve.

To install a second height control valve proceed with the following installation instructions.

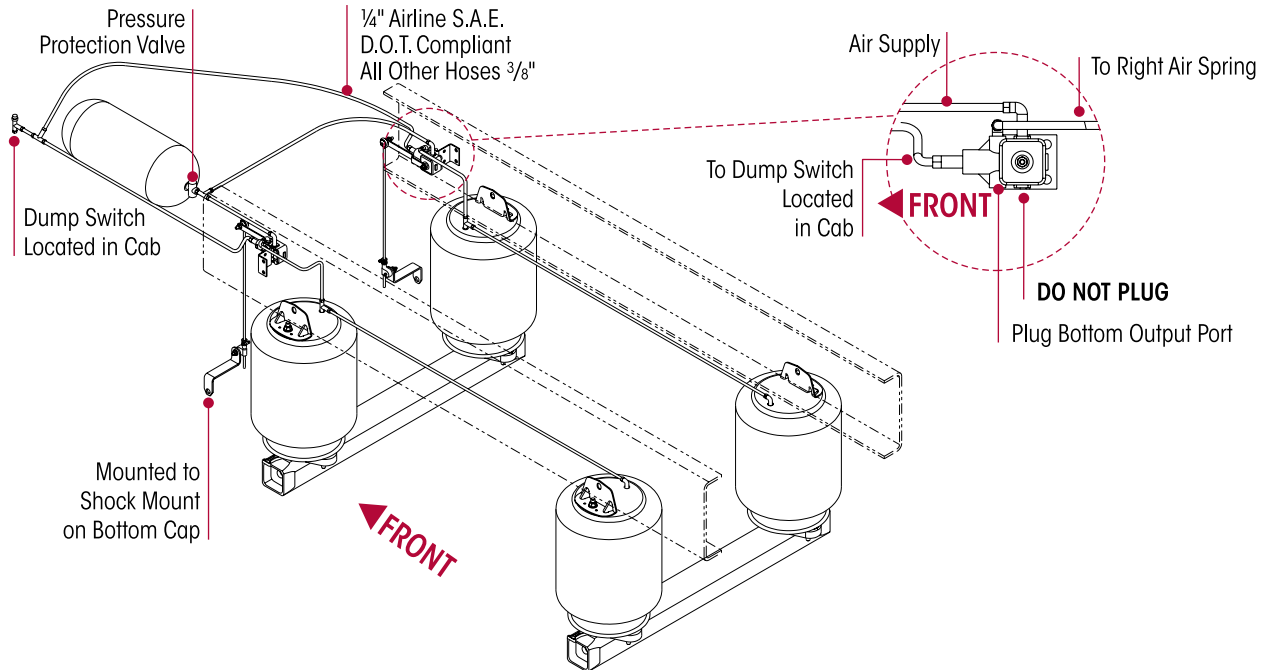
DUAL HEIGHT CONTROL VALVE INSTALLATION

1. Chock the wheels of the vehicle.

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.

2. See additional Air Spring Cautions and Warnings in the Important Safety Notice section of this publication prior to deflating or inflating the air system.
3. Deflate the suspension by disconnecting the height control valve linkage and lowering the height control valve arm.

FIGURE 8-49

WARNING

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

4. Measure the location on the frame of the existing height control valve mounting bracket and install the new frame bracket on the opposite side of the same axle. It will be necessary to drill the two (2) frame mounting holes for the new bracket.
5. Install the height control valve mounting bracket onto the frame, see Figure 8-49.

NOTE

Refer to the Plumbing Diagrams section in this publication to facilitate installation for the preceding Steps.

6. Install the height control valve on the height control valve mounting bracket with the dump port and the height control valve arm facing the front of the vehicle.
7. Install a **T** fitting (not provided) in the air supply line to the original height control valve.
8. Install and route a new air supply line from the **T** fitting to the new height control valve intake port marked **E/I**.
9. Remove the opposite side air spring supply line from the original height control valve.
10. Plug the port on the original height control valve that the air spring supply line was removed from.
11. Route and install the air spring supply line into the port marked **C1/C2** on the new height control valve.

12. Plug the opposite port marked **C2/C1** on the new height control valve.
13. If the vehicle is equipped with a cab dump valve, install a **T** fitting into the dump switch supply line.
14. Install and route a new dump switch supply line from the **T** fitting to the new height control valve dump port.
15. Remove the lower shock mounting bolt on the side the new height control valve was installed.
16. Install the height control valve linkage bracket on the lower shock mounting bolt.
17. Install the lower shock mounting fasteners and tighten to $\boxed{213} \pm 12$ foot pounds torque.
18. Connect the height control valve linkage to the height control valve arm.
19. Connect the adjustable valve arm joint to the height control valve linkage bracket and tighten fasteners to $\boxed{11} \pm 1$ foot pounds torque.
20. Follow the ride height adjusting procedure for dual height control valves as shown in the Alignment & Adjustments section of this publication.

DISCONTINUED – SUPPORT BEAM ASSEMBLY AND CROSS TUBE

NOTE

Effective May 2010, the support beam assembly part numbers 66435-00X or 60831-00X (Forging part numbers 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 8-51.

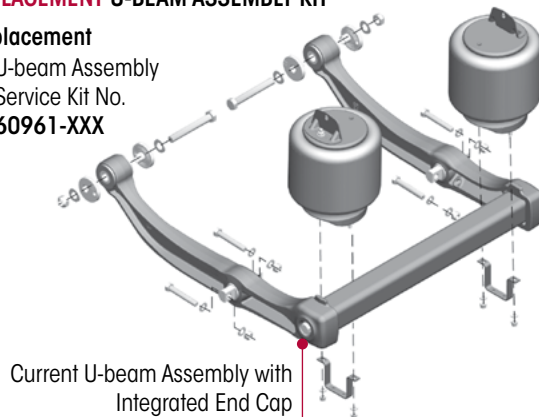
The U-beam assembly with integrated end caps, see Figure 8-50, is now a required replacement for any PRIMAAX support beam or cross tube component. Refer to the Support Beam and Cross Tube Replacement Guide Table in the specific parts list for PRIMAAX EX suspension equipped on your vehicle available online.

FIGURE 8-50

REPLACEMENT U-BEAM ASSEMBLY KIT

Replacement

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



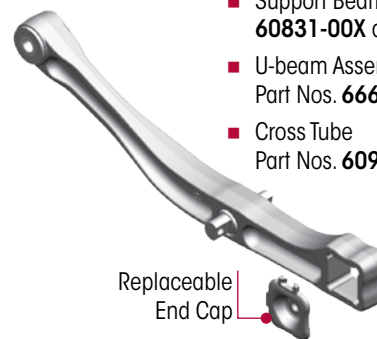
Current U-beam Assembly with Integrated End Cap

FIGURE 8-51

FORMER SUPPORT BEAM ASSEMBLY

Discontinued May 2010

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

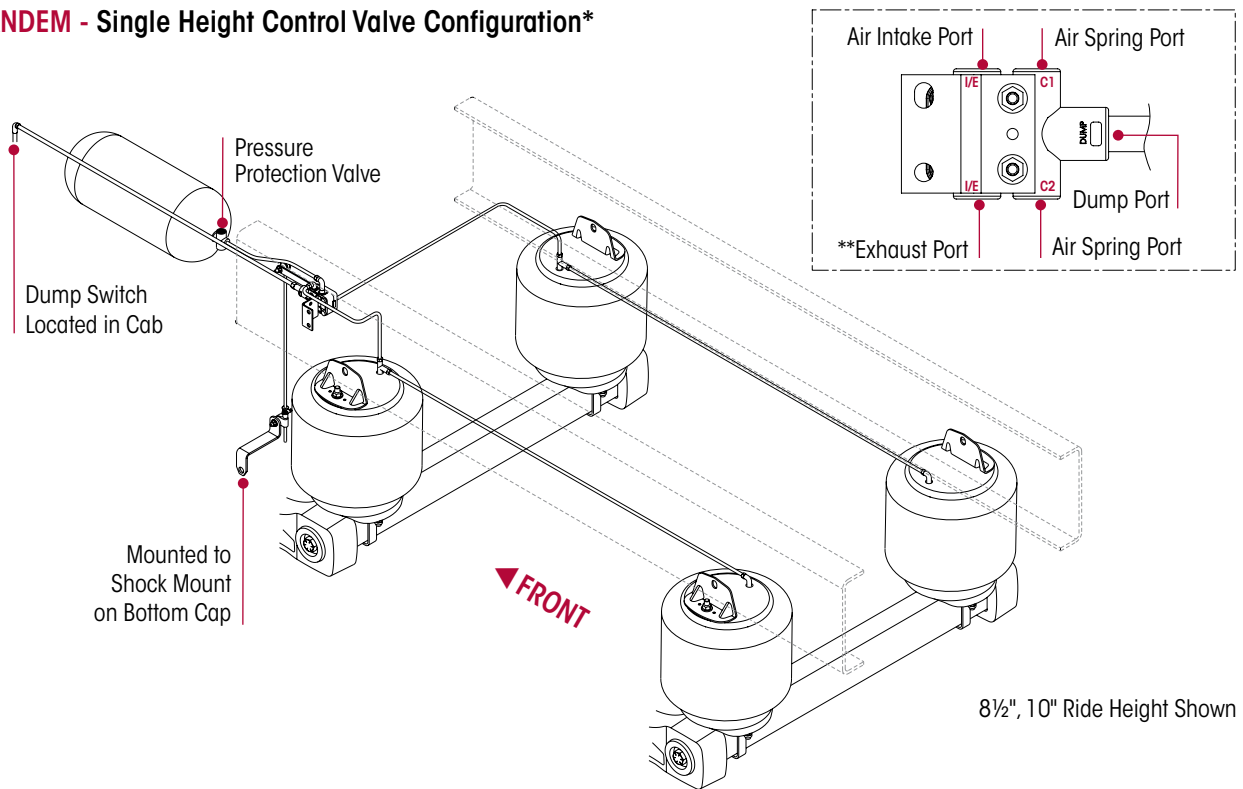


Replaceable End Cap

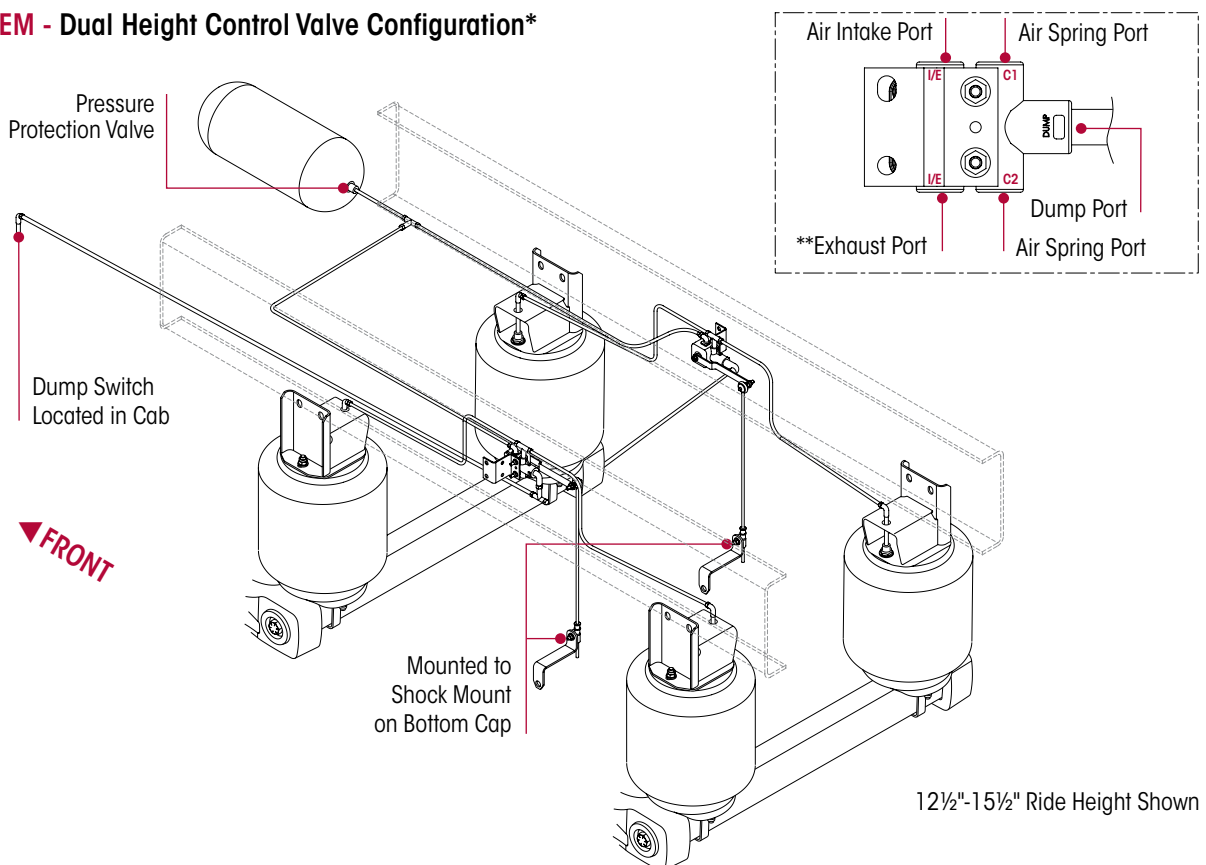


SECTION 9 Plumbing Diagrams

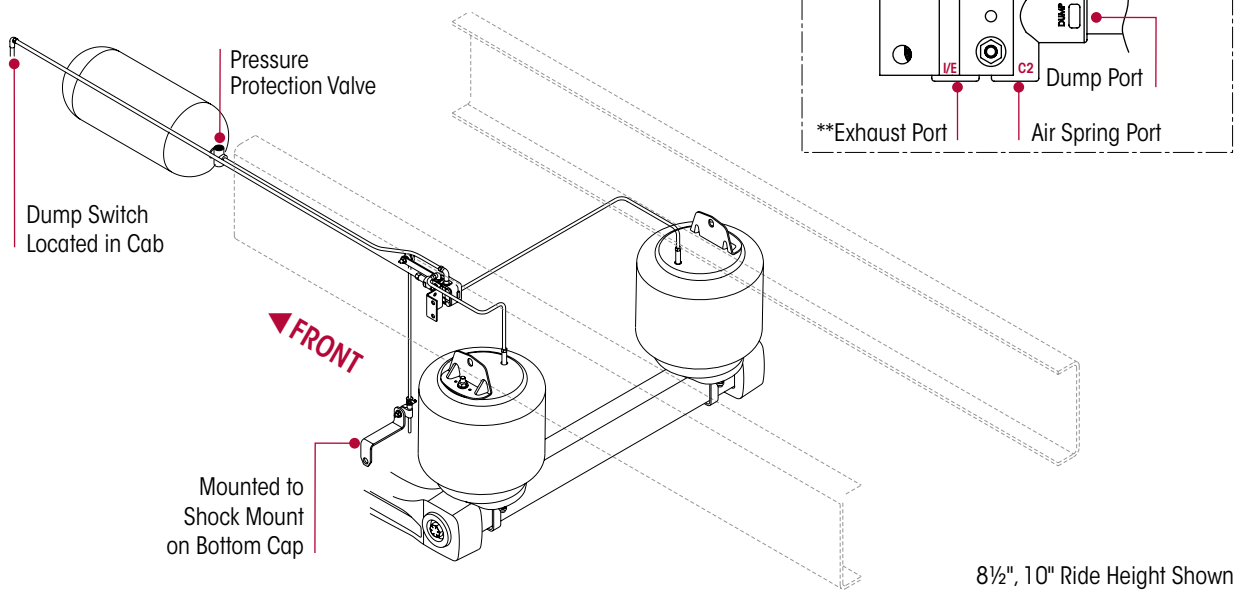
TANDEM - Single Height Control Valve Configuration*



TANDEM - Dual Height Control Valve Configuration*



SINGLE - Height Control Valve Configuration*



NOTES: * Common example configuration. Contact vehicle manufacturer for specific plumbing specifications.

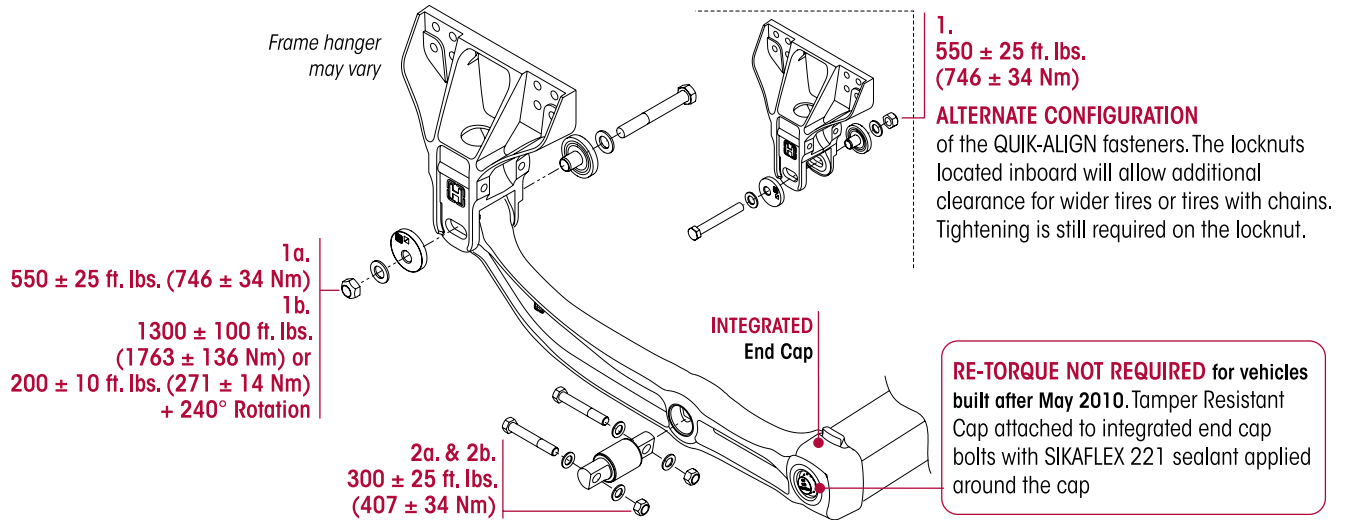
** Exhaust Port may use muffler screen to keep dirt / debris out.



SECTION 10 Torque Specifications

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

QUIK-ALIGN • D-PIN CONNECTION

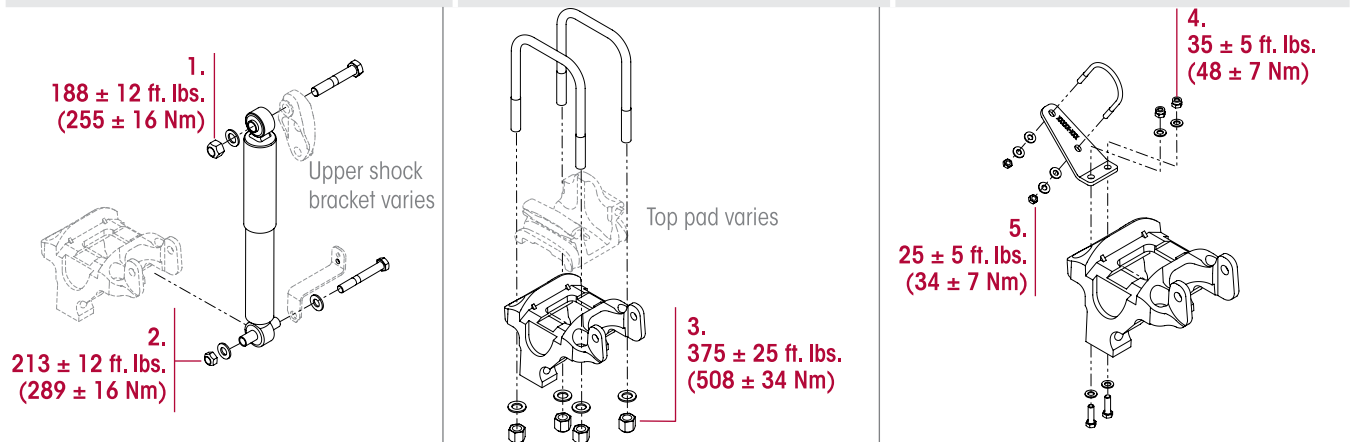


NO.	COMPONENT	*FASTENER		**TORQUE VALUE	
		***Quantity	Size	Foot Pounds	Newton Meters
1a	QUIK-ALIGN Bushing Locknut	2	1"-14 UNF	550 ± 25	746 ± 34
1b		2	1¼"-12 UNF	1300 ± 100 or 200 ± 10 + 240° Rotation	1763 ± 136 271 ± 14 + 240° Rotation
2a	D-Pin Bushing Locknut	4	¾"-16 UNF	300 ± 25	407 ± 34
2b		4	7/8"-14 UNF		

SHOCK ABSORBER

U-BOLTS

S-CAM

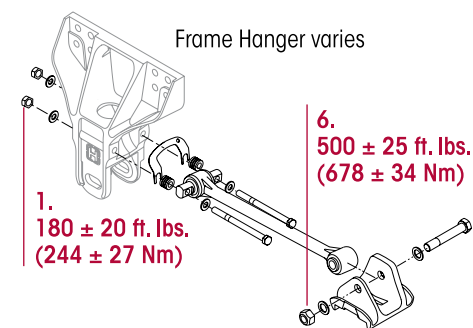
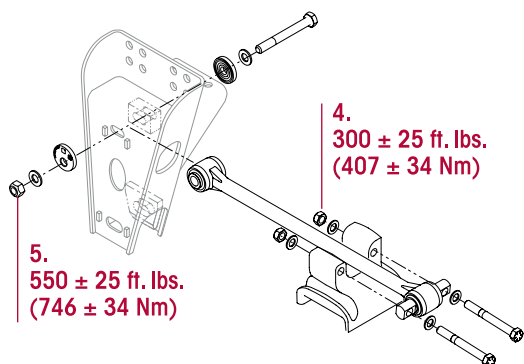
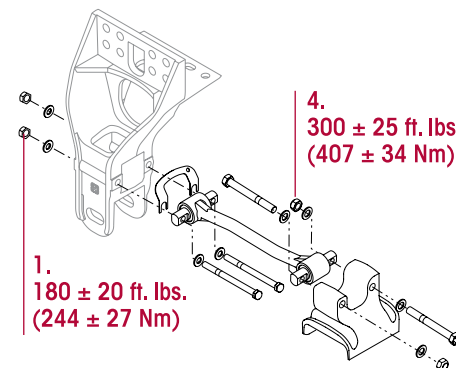
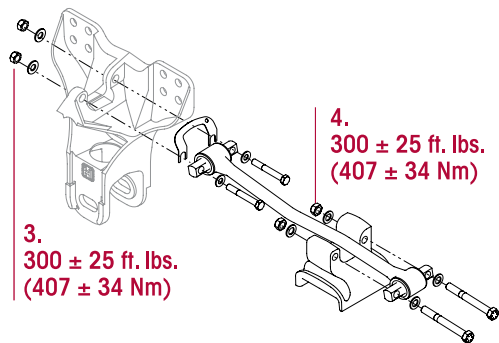
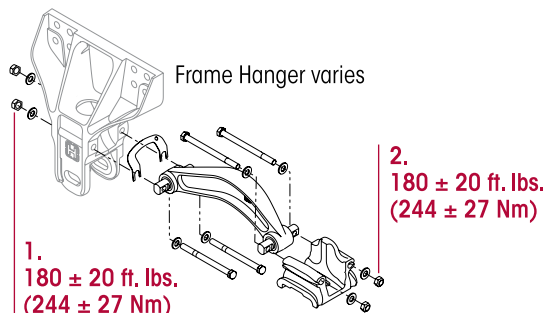
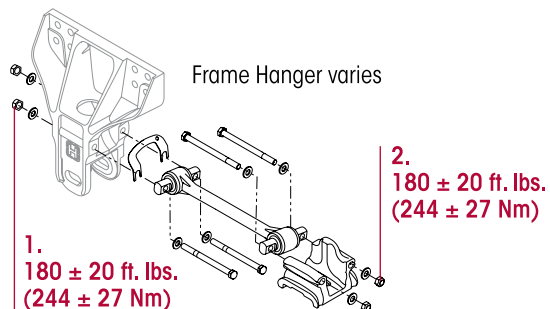


NO.	COMPONENT	*FASTENER		**TORQUE VALUE	
		***Quantity	Size	Foot Pounds	Newton Meters
1	Upper Shock Absorber Locknuts	2	¾"-10 UNC	188 ± 12	255 ± 16
2	Lower Shock Absorber Locknuts	2	5/8"-11 UNC	213 ± 12	289 ± 16
3	U-bolt Locknuts	8	¾"-16 UNF	375 ± 25	508 ± 34
4	S-cam Support Bracket To Bottom Cap Mount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



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

◆LONGITUDINAL TORQUE RODS



NO.	COMPONENT	*FASTENER		**TORQUE VALUE	
		***QUANTITY	SIZE	FOOT POUNDS	NM
1	◆Frame Hanger	4	5/8"-11 UNC	180 ± 20	244 ± 27
2	Top Pad	4	5/8"-11 UNC	180 ± 20	244 ± 27
3	◆Longitudinal Torque Rod to	4	3/4"-16 UNF	300 ± 25	407 ± 34
4	Top Pad	2	3/4"-16 UNF	300 ± 25	407 ± 34
5	◆Frame Hanger / QUIK-ALIGN	2	7/8"-9 UNC	550 ± 25	746 ± 34
6	Top Pad	2	7/8"-14 UNF	500 ± 25	678 ± 34

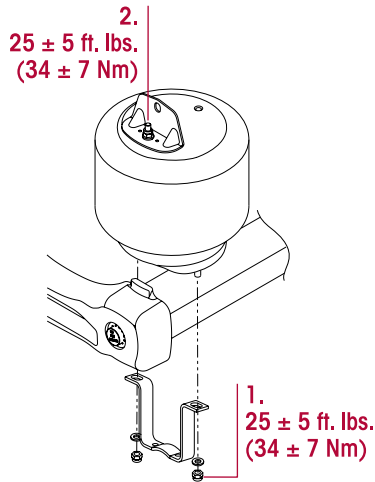
◆ Frame hanger • top pad • longitudinal connection may vary as per capacity and ride height. Refer to the specific Parts List for the PRIMAAX EX suspension equipped on your vehicle available online at www.hendrickson-intl.com/products/primaax



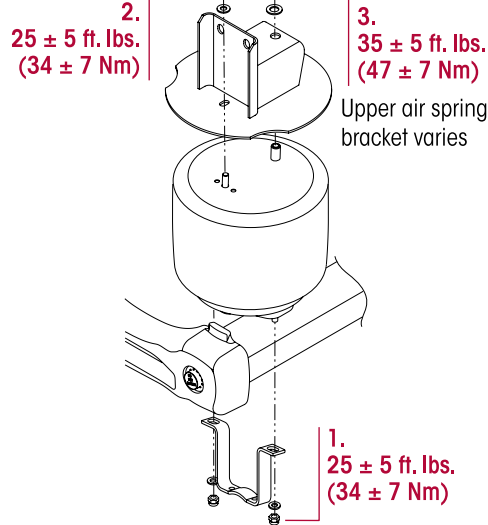
Hendrickson recommended torque values provided in Foot Pounds and in Newton Meters

AIR SPRINGS

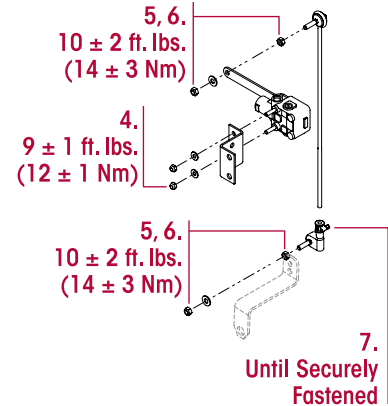
8½" to 10" Ride Height



12½" to 15½" Ride Height



HEIGHT CONTROL VALVE

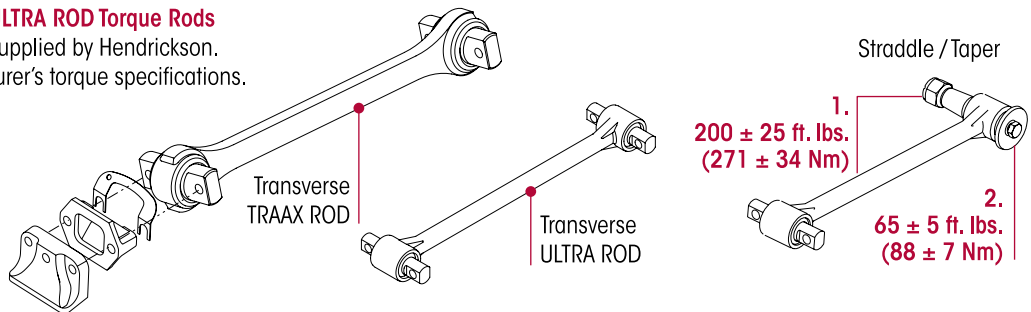


NO.	COMPONENT	*FASTENER		**TORQUE VALUE		
		***Quantity	Size	Foot Pounds	Newton Meters	
1	Lower Air Spring Bracket to Cross Tube	4	½"-13 UNC	25 ± 5	34 ± 7	
2	Upper Air Spring Assembly	2	½"-13 UNC	25 ± 5	34 ± 7	
3	Upper Air Spring Assembly to Air Spring Bracket	2	¾"-16 UNF	25 ± 5	34 ± 7	
4	HCV Frame Bracket	2	¼"-20 UNC	9 ± 1	12 ± 1	
5	Height Control Valve to	Linkage Jam Nut	2	5/16"-18 UNC	10 ± 2	14 ± 3
6		Linkage Assembly / Linkage Bracket	2	5/16"-18 UNC	10 ± 2	14 ± 3
7	Linkage Clamp	1		Until Securely Fastened		

TRANSVERSE TORQUE ROD

Transverse TRAAX ROD and ULTRA ROD Torque Rods

Torque rod fasteners are not supplied by Hendrickson. Refer to the vehicle manufacturer's torque specifications.



For all (*) see Notes on Page 67



SECTION 11

Troubleshooting Guide

PRIMAAX EX • PRIMAAX

TROUBLESHOOTING GUIDE

CONDITION	POSSIBLE CAUSE	CORRECTION
Suspension has harsh or bumpy ride	Air spring is not inflated to specification or damaged	Repair the air system and check the ride height. See Ride Height in the Alignment & Adjustments section of this publication.
	Ride height set incorrectly	Adjust the ride height to the proper setting. See Ride Height Adjustment in the Alignment & Adjustments section of this publication.
	Suspension is overloaded	Redistribute the load to correct weight.
	Broken support beam	Replace the broken U-beam assembly.
Irregular tire wear	Incorrect tire inflation pressure	Correct the tire pressure per the vehicle manufacturer and tire manufacturer specifications.
	Incorrect alignment	Correct the alignment. Refer to the Alignment & Adjustments section of this publication.
	Worn QUIK-ALIGN bushing	Replace the QUIK-ALIGN bushing.
	Loose QUIK-ALIGN attachment	Replace the QUIK-ALIGN connection, and check vehicle alignment. Adjust if necessary. Check frame hanger for wear around QUIK-ALIGN plates and replace if necessary.
	Worn torque rod bushings	Replace the torque rod bushings as necessary.
Excessive driveline vibration	Incorrect pinion angle(s)	Adjust the pinion angle(s), refer to the vehicle manufacturer for specifications.
	Loose QUIK-ALIGN attachment	Replace the QUIK-ALIGN connection, and check the vehicle alignment. Adjust if necessary. Check the frame hanger for wear around the QUIK-ALIGN collars and replace if necessary.
	Ride height is set incorrectly	Adjust the ride height to proper setting. See Ride Height in the Alignment & Adjustments section of this publication.
	Broken support beam	Replace the U-beam assembly.
Suspension is noisy	Loose QUIK-ALIGN attachment	Replace the QUIK-ALIGN connection, and check the vehicle alignment. Adjust if necessary. Check the frame hanger for wear around the QUIK-ALIGN plates and replace if necessary.
	Loose U-bolts	Tighten the U-bolts to specifications, see Torque Specifications section of this publication.
	Worn bushings	Replace the bushings as necessary.
Vehicle is bouncing excessively	Damaged or leaking shock absorber	Replace the shock absorber.
	Ride height set incorrectly	Adjust the ride height to proper setting. See Ride Height in the Alignment & Adjustments section of this publication.



PRIMAAX EX • PRIMAAX

TROUBLESHOOTING GUIDE (continued)

CONDITION	POSSIBLE CAUSE	CORRECTION
Vehicle leaning	Air spring not inflated to specification or damaged	Repair the air system and check the ride height. See Ride Height in the Alignment & Adjustments section of this publication.
	Load not centered	Redistribute the load.
	Frame twisted	Straighten the frame per vehicle manufacturer's guidelines.
	Broken support beam	Replace the broken U-beam assembly.
	Axle housing bent or broken	Replace the axle housing per vehicle manufacturer guidelines and align the vehicle.
	Loose U-bolts	Tighten the U-bolts to specification, see Torque Specifications section of this publication.
	Front suspension	Inspect and repair the front suspension.
Suspension will not reach ride height	Suspension is overloaded	Redistribute the load to correct weight.
	Air Spring leaking or damaged	Replace the air spring.
	Leak in the air system	Inspect the air fittings, see Air Fitting in the Preventive Maintenance section of this publication. If necessary, repair air system and check the ride height. See Ride Height in the Alignment & Adjustments section of this publication.
	Air line obstructed or improperly connected	Repair the air system and check the ride height. See Ride Height in the Alignment & Adjustments section of this publication.
	HCV dump port activated	Check the HCV dump port for proper connection and function.
Air springs deflate when parked	Leak in the air system	Inspect the air fittings, see Air Fittings in the Preventive Maintenance section of this publication. If necessary, repair the air system and check the ride height. See Ride Height in the Alignment & Adjustments section of this publication.
	Malfunctioning height control valve	See the test procedure in the Preventive Maintenance section of this publication, replace height control valve as necessary.
Excessive frame slope	Ride height set incorrectly	Adjust the ride height to proper setting. See Ride Height in the Alignment & Adjustments section of this publication. Contact Hendrickson Tech Services.
	Suspension is overloaded	Redistribute the load to correct weight.

NOTES: * Frame fasteners, in most cases Huck style fasteners, are furnished and installed by the vehicle manufacturer.

** Torque values listed apply only if Hendrickson supplied fasteners are used. If non-Hendrickson fasteners are used, refer to the vehicle manufacturer's torque specifications.

*** Quantity shown are per axle. Double for tandem, triple for tridem.

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

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



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