

TABLE OF CONTENTS

Section 1	Introduction
Section 2	Product Description
Section 3	Important Safety Notice4
Section 4	Special Tools
Section 5	Parts Lists10
Section 6	Preventive Maintenance Hendrickson Recommended Inspection Intervals
	Clamp Group locknuts
Section 7	Alignment & AdjustmentsHeight Control Valve18Drive Axle Alignment Inspection18Axle Pinion Angle19Axle Lateral Alignment19Alignment Adjustment Instructions19Drive Axle Pinion Angle21

H TECHNICAL PROCEDURE

PRIMAAX® EX Rear Air Suspension for **GILLIG** Buses

SUBJECT: Service Instructions LIT NO: 17730-323 DATE: July 2023

REVISION: B

Section 8	Component Replacement
	Fasteners
	Height Control Valve & Shock Absorbers $\ .22$
	Air Spring
	3-piece Transverse Torque Rod
	3-piece Longitudinal Torque Rod $\dots 25$
	3-piece Torque Rod XTRB Bushings $\ldots .27$
	U-beam Assembly
	D-pin Bushing
	QUIK-ALIGN Pivot Bushing
	Bottom Cap
	Axle Stops
	Frame Hanger
Section 9	Torque Specifications
Section 10	Troubleshooting Guide



SECTION 1 Introduction

This publication is intended to acquaint and assist maintenance personnel in the preventive maintenance, service, repair, and rebuild of PRIMAAX® EX rear air suspension system for applicable GILLIG buses.

NOTE

Use only Hendrickson Genuine parts for servicing this suspension system.

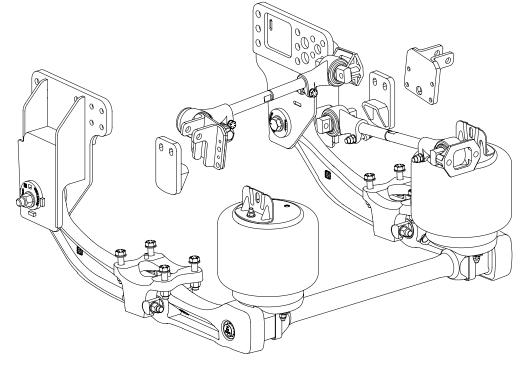
It is important to read and understand this entire Technical Procedure publication prior to performing any maintenance, service, repair, or rebuild of this product. The information in this publication contains parts lists, safety information, product specifications, features, proper maintenance, service,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

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

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

SECTION 2 Product Description

FIGURE 2-1



PRIMAAX EX

The PRIMAAX[®] EX heavy-duty rear air suspension provides a package of benefits tailored for bus applications. The system features a robust structural design with optimized suspension geometry for exceptional stability, handling and ride. Suspension windup and corresponding frame rise are significantly reduced with PRIMAAX EX compared to competitive trailing-arm air suspensions for enhanced driver and passenger comfort. PRIMAAX EX adjusts to variations in load and road conditions for optimal ride and performance. This low-maintenance design delivers greater stability for improved control.

- Unique suspension geometry Optimized configuration significantly controls suspension windup and corresponding frame rise, while increasing roll stiffness and reducing roll steer.
- Easy axle alignment Hendrickson's proven QUIK-ALIGN[®] axle alignment system helps save time and money and offers a fast method to ensure proper alignment for improved tire life.
- D-pin axle connection and clamp group Reduces stress input to the axle housing by transferring the torsional loads to the integrated stabilizer system, which helps extend axle and joint service life.
- Large volume air springs Reduce vibration and harshness to chassis and body for reduced total vehicle maintenance.
- **Frame hanger** Robust design to meet a variety of applications.
- Structural beam end joint Maintenance-free connection with cross brace helps reduce downtime for improved productivity.
- **Cast structural beams** Utilize premium materials for ultimate durability.
- Torque rods Two-rod configuration reduces axle stress, welding and complexity. Optimized configuration helps improve handling and roll stiffness for expanded applications. Premium retained rubber bushings for increased service life and resistance to walkout. Designed for optimum clearance and articulation.

PRIMAAX EX SPECIFICATIONS

	PRIMAAX EX 23.5K
Rating	23,500 lbs (10,659 Kilogram)
Installed Weight ¹	564 lbs (256 Kilogram)
Axle Configuration	Single
GVWR ²	See Vehicle Manufacturer
Axle Travel ³	6.4" (162.5 mm)
Ride Heights	9.0" (229 mm)

- 1. Installed weight includes complete suspension, torque rods, axle and frame brackets and all hardware. Published weight is based on a standard PRIMAAX EX suspension. Other configurations may vary.
- 2. Contact Hendrickson for applications that may exceed GVW approval ratings.
- 3. Suspension articulation may exceed vehicle's capability and may be limited by vehicle manufacturer; vehicle manufacturer installed axle stop may restrict suspensions articulation.

SECTION 3 Important Safety Notice

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

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

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

EXPLANATION OF SIGNAL WORDS

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



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

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

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

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



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

DANGER

WARNING

SAFETY PRECAUTIONS

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.

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 IN THIS PUBLICATION. FAILURE TO FOLLOW THE ABOVE ITEMS CAN CAUSE ADVERSE VEHICLE HANDLING RESULTING IN PERSONAL INJURY OR PROPERTY DAMAGE AND WILL VOID ANY APPLICABLE WARRANTIES. FOLLOW VEHICLE MANUFACTURER'S FASTENER ORIENTATION WHEN PERFORMING ANY MAINTENANCE, SERVICE, OR REPAIR.



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.



SUPPORT THE VEHICLE PRIOR TO SERVICING

CAN RESULT IN PERSONAL INJURY OR PROPERTY DAMAGE.

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.

WHEN LIFTING THE VEHICLE TO PERFORM ANY VEHICLE SERVICE, ENSURE THE PRIMAAX EX 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.

WARNING

PROCEDURES AND TOOLS

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

THE VEHICLE MUST BE FIRMLY SUPPORTED WITH SAFETY STANDS PRIOR TO SERVICING. FAILURE TO DO SO

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.

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.

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 U-BEAM ASSEMBLY AND CAUSE ADVERSE VEHICLE HANDLING, POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

WARNING

TRANSVERSE AND LONGITUDINAL TORQUE RODS

PRIMAAX EX SUSPENSIONS INCORPORATE 3-PIECE ADJUSTABLE TRANSVERSE AND LONGITUDINAL TORQUE RODS FOR VEHICLE STABILITY. IF THESE COMPONENTS ARE DISCONNECTED OR ARE NON-FUNCTIONAL THE VEHICLE SHOULD NOT BE OPERATED. FAILURE TO DO SO CAN RESULT IN ADVERSE VEHICLE HANDLING AND POSSIBLE TIRE CONTACT WITH THE FRAME OR SUSPENSION, SEVERE PERSONAL INJURY, OR PREMATURE COMPONENT DAMAGE.

A WARNING

A WARNING

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.

AIR SPRING PRESSURE RETENTION

BUS APPLICATION WITH A KNEELING FEATURE MAY RETAIN SOME AIR PRESSURE IN THE AIR SPRINGS AT ALL TIMES. PRIOR TO PERFORMING ANY MAINTENANCE, SERVICE, OR REPAIR OF THE SUSPENSION, VERIFY EACH AIR SPRING IS COMPLETELY DEFLATED. FAILURE TO DO SO COULD RESULT SERIOUS PROPERTY DAMAGE AND/OR SEVERE PERSONAL INJURY.

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.

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.

ACAUTION

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.

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

HPRIMAAX"EX" De EX clefforn is	A 14/4 5011010	00 90402-012C	8998 887 888.1 moo.hni-roesioinbner/www
Heevy-cuty Air Suspension a next-generation	A WARNING	Befet to vehicle manufacturer for proper jacking point.	HENDBICKSON Inck Commercial
	UNAUTHORIZED WELDING OR MODIFICATIONS con couse	. Ices of vehicle control, severe personal injury or death.	
	structural damage and result in loss of vehicle control, severe personal injury or	IMPROPER JACKING METHOD can cause structural damage and result in	elitation postod of tww.hordiorapo.int com/policing
	death. Do not bend, weld or modify cross tube without authorization from Hendrickson Truck Commercial Vehicle Systems.	Hendrickson Truck Commercial Vehicle Systems.	This chricle is covered by of least one or more of the U.S. and/or foreign potentia and/or ponding U.S. and/or foreign pation?
and the set of the set	IMPROPER JACKING METHOD can cause structural damage and result in	structural damage and result in loss of vehicle control, severe personal injury or death. Do not bend, weld or modify cross tube without authorization from	ucisuedsing Jiry Auto-Autoen
	loss of vehicle control, severe personal injury or death.	UNAUTHORIZED WELDING OR MODIFICATIONS can cause	HFTREMAAX CX "WIGH ON HIRINAX
HENDRICKSON Truck Commercial Vehicle Systems	 Do not use suspension cross tube as a jacking point. Refer to vehicle manufacturer for proper jacking instructions. 	DNINAAW	rollanansg-train p nolenegeu? i/A Yub-YybaH
www.hendrickson-infl.com 1.666.755.5968	NO. 40905-015C		e molinie x3 ofT X3"XAAMIAGE

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

FIGURE 3-2



FIGURE 3-3



WARNING

PARTS CLEANING

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

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

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

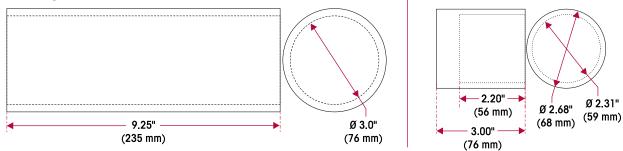
SECTION 4 Special Tools

TORQUE ROD BUSHING SERVICE TOOLS

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

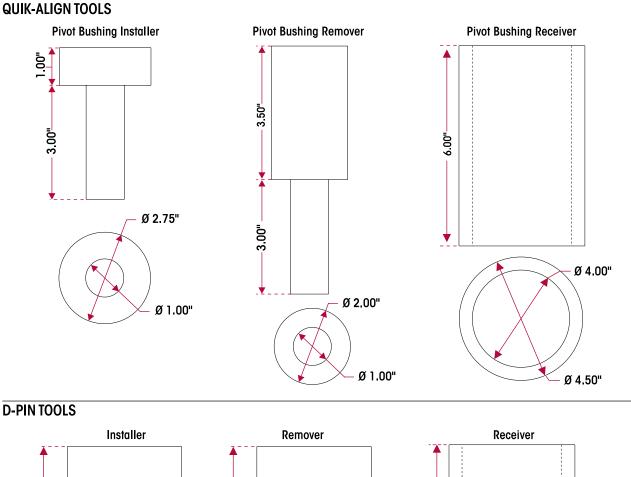


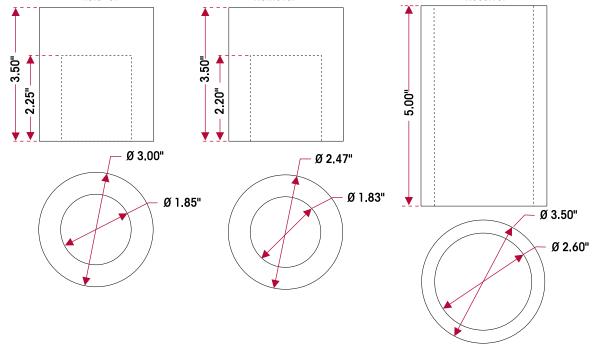
D-PIN / QUIK-ALIGN PIVOT BUSHING SERVICE TOOLS



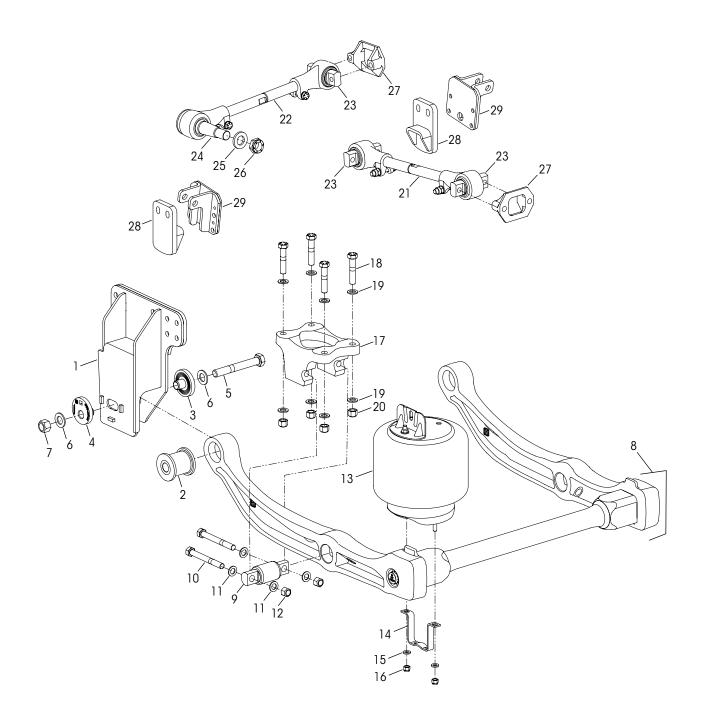
D-PIN / QUIK-ALIGN PIVOT BUSHING SHOP MADE SERVICE TOOLS

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.





SECTION 5 Parts Lists



PRIMAAX® EX Rear Air Suspension for GILLIG Buses

KEY N	O. PART NO.	DESCRIPTION	VEHICLE QTY.
1		Frame Hanger	
	79724-001	Left Hand	1
	79724-002	Right Hand	1
	60632-050	QUIK-ALIGN Pivot Bushing & Collar Ser	vice Kit,
		Axle Set, Includes Key Nos. 2-7, 30	•
	60632-013	QUIK-ALIGN Collar Service Kit,	
		Axle Set, Includes Key Nos. 3-7	
	60632-018	QUIK-ALIGN Fastener Service Kit,	
		One Wheel End, Includes Key Nos. 5-7	
2		*QUIK-ALIGN Severe Pivot Bushing	2
$ \frac{2}{3} \\ \frac{4}{5} \\ \frac{6}{7} $		*QUIK-ALIGN Concentric Collar	$ \begin{array}{r} 2 \\ 3 \\ \hline 1 \\ \hline 2 \\ \hline 4 \\ \hline 2 \\ \hline 1 \\ \end{array} $
4		*QUIK-ALIGN Eccentric Collar	1
5		*1"-14 UNF x 71/2" Hex Bolt	2
6		*1" Flat Washer	4
		*1"-14 UNF Locknut	2
8	93540-533	U-beam Assembly, 40½" Frame Width,	1
		Includes Key Nos. 2, 9	
	34013-471	Single D-pin Bushing Service Kit,	
		Includes Key Nos. 9-12	
9		*D-pin Bushing	2
	56659-028	D-pin Fastener Service Kit, Axle Set,	
		Includes Key Nos. 10-12	
10		*3/4"-16 UNF x 61/2" Bolt	4
11		*¾" Hardened Washer	4 8
12		*3/4"-16 UNF Locknut	4

KEY I	NO. PART NO.	VEHIC VEHIC VEHIC	CLE QTY.
13	67043-002L	Air Spring Assembly with Upper Frame Bracket	2
	49177-063	Air Spring Lower Mounting Service Kit, Axle Serv	
14	60911-002	Air Spring Lower Mounting Bracket	2
15		*½" Flat Washer	4
16		*1/2"-13 UNC Locknut	4 4 2
17	80501-000	Bottom Cap / Axle Seat	2
	64609-111	Clamp Group Fastener Service Kit, Axle Set,	
		Includes Key Nos. 18-20	
18	91801-010	34"-16 UNF x 31/4" Hex Bolt	8
19	91861-008	¾" Flat Washer	16
20	30191-000	34"-16 UNF Locknut	8
21	80803-002	**Longitudinal Adjustable Torque Rod Assembly, Straddle/Straddle, Includes Key No. 23	1
22	80804-001	**Transverse Adjustable Torque Rod Assembly, Straddle/Taper, Includes Key Nos. 23-26	1
23	66649-007	XTRB [™] Straddle Bushing	3
24	66649-004	XTRB Taper Bushing	1
25	30574-000	1¼"Washer	1
26	29749-000	11/4"-12 UNF Locknut	1
27	22186-000	Torque Rod Frame Bracket	2 2 2
28	79736-000P	Axle Stop, Frame Mounted	2
29	79782-000	Upper Shock Frame Bracket	2
30	70867-001	P-80 Lubricant - 10 ml (Not Shown) Per Bushin	ıg 1

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

** Torque rods are mandatory for PRIMAAX EX suspensions regardless of axle spacing. See Hendrickson Literature Nos. 59310-004 and 59310-058 for more information.

SECTION 6 Preventive Maintenance

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

NOTE

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

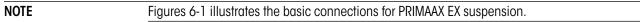
AREAS OF INSPECTION

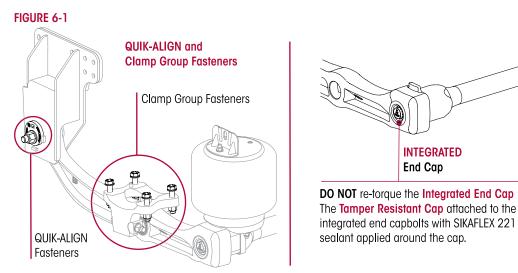
- Air springs
- Air supply and fittings
- All fasteners
- D-pin and Pivot Bushings
- Clamp group: Top pad, hex Shock absorbers bolts and locknuts
- Frame hanger bracket
- Height control valve
- Longitudinal torque rods
- QUIK-ALIGN connections

- Tire wear Transverse torque rods
- U-beam assembly:
 - Cross tube / Support beam/ End cap
- 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: 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: • U-beam assembly • Air springs and air lines • Torque rods	Within the First 100	Within the first 1,000 miles	Every 20,000 Miles (32,000 Km) or 6 Months
 Inspect fasteners for proper torque using a calibrated torque wrench as recommended in the Torque Specifications section in this publication: QUIK-ALIGN fasteners Clamp group hex bolt fasteners, see Figure 6-1 DO NOT re-torque Integrated End Cap, see Figure 6-1 Transverse torque rod fasteners, see vehicle manufacturer's torque specifications 	- Miles (500 Km)	(1,600 km) or 100 hours	whichever comes first
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 of 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 hex bolt locknuts have the proper torque values maintained, see Clamp Group 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.
- Fasteners Visually inspect for any loose or damaged fasteners on the entire suspension. Ensure all fasteners are tightened to the specified torque range. See 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 of 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.
- Shock absorbers Visually inspect for any signs of dents or leakage, refer to vehicle manufacturer for more information.

- Tire wear Visually inspect the tires for wear patterns that may indicate suspension damage or misalignment.
- Torque rods (longitudinal and transverse) Inspect all torque rods 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 beams for dents, dings, or other damage on the outer edges of the beam flanges. Visually inspect the D-pin bushings for tearing or extreme bulging. Check for any metal-to-metal contact in the bushed joints.
- Wear and damage Visually inspect all parts of the suspension for wear and damage. Look for bent or cracked parts.

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

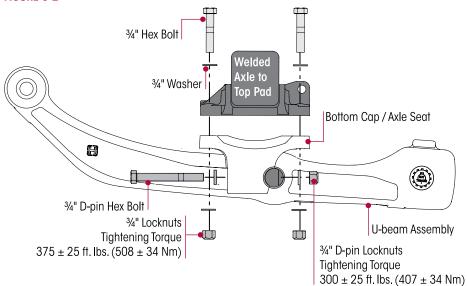
CLAMP GROUP LOCKNUTS

Clamp group hardware for the PRIMAAX EX suspensions for GILLIG buses are 3/4"-16 UNF Grade C locknuts, the 3/4"-16 UNF Grade 8 hex bolts are phosphate and oil coated.

- 1. Clamp group locknuts must be torqued to specification at preparation for delivery.
- 2. Clamp group locknuts must be re-torqued at 1,000 miles.
- 3. Thereafter, follow the 6 months / 20,000 miles (32,000 km) inspection and re-torque interval.

SERVICE HINT Due to certain pinion angle configurations, the removal of the D-pin bolts may be necessary to access the hex bolt locknuts, see Figure 6-2.

FIGURE 6-2





NOTE

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

ION IED. MP 0 TO URE ING, 4 2

FIGURE 6-3

4. Tighten the hex 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 6-3.

QUIK-ALIGN PIVOT BUSHING AND D-PIN BUSHING

FIGURE 6-4

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

There are two types of pivot bushing inspections for the PRIMAAX EX 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 6-4 and 6-5, 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 6-6, this could be a result of axle misalignment. If this condition is evident, pivot bushing replacement is required.





FIGURE 6-5

Disconnected Rubber Flange

FIGURE 6-6



Missing Rubber Flange

FIGURE 6-7 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.
- 3. No replacement is needed if the bushing exhibits a tight joint, see Figure 6-7. An

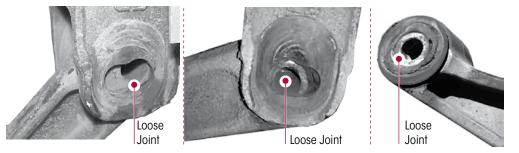


imprinted two-line wear pattern on the bushing inner metal indicates the pivot bushing is securely clamped in the frame hanger.

- 4. Inspect pivot bushing, replacement is necessary if any indications of the following are apparent, see Figure 6-8:
 - Signs of rust, distorted, separated or torn rubber, elongated or damaged bore. This could be a
 result of axle misalignment or loose fasteners.

FIGURE 6-8

PHYSICAL INSPECTION – Indications of a Loose Joint



- 5. Inspect the inside of the frame hanger legs and the QUIK-ALIGN collars. If any of the following are present, the pivot bushing and one (1) or more of the mating components may require replacement:
 - Evidence of wear marks on the inside of the frame hanger legs indicating metal to metal contact or movement
 - The snout of the QUIK-ALIGN concentric or eccentric collar is elongated or damaged
- 6. Check the suspension alignment and adjust if necessary. Refer to 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 6-9.







D-pin bushing replacement IS REQUIRED when:

- Metal to metal contact wear marks on the D-pin outer metal are evident, see Figure 6-10
- D-pin outer metal is distorted, see Figure 6-10

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

HEIGHT CONTROL VALVE & SHOCK ABSORBERS

The height control valve and shock absorbers equipped on PRIMAAX EX suspensions for GILLIG buses are not supplied by Hendrickson, although are required components. Hendrickson is not responsible for components supplied by the vehicle manufacturer. For assistance with inspection, maintenance and rebuild instructions on these components, consult the vehicle service manual for instructions.

LONGITUDINAL AND TRANSVERSE TORQUE RODS

WARNING PRIMAAX EX SUSPENSIONS INCORPORATE 3-PIECE ADJUSTABLE TRANSVERSE AND LONGITUDINAL TORQUE RODS FOR VEHICLE STABILITY. IF THESE COMPONENTS ARE DISCONNECTED OR ARE NON-FUNCTIONAL THE VEHICLE SHOULD NOT BE OPERATED. FAILURE TO DO SO CAN RESULT IN ADVERSE VEHICLE HANDLING AND POSSIBLE TIRE CONTACT WITH THE FRAME OR SUSPENSION, SEVERE PERSONAL INJURY, OR PREMATURE COMPONENT DAMAGE.

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

VISUAL INSPECTION

All 3-piece adjustable transverse and longitudinal torque rods need to be inspected during preventive maintenance and service for looseness.

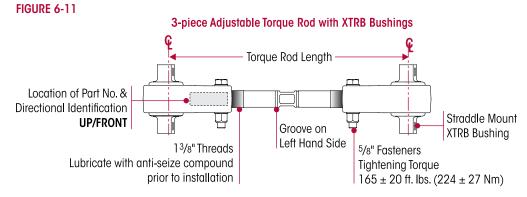
Visually inspect (1) torque rod bushings for any torn or shredded rubber material interfaces or elongated oval shapes and (2) torque rods for any metal to metal contact, bent, cracked or broken components. The torque rod and / or the torque rod bushings will require replacement if any of these conditions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

Torque rod looseness inspection is necessary. With the vehicle shut down, a lever check can be made with a long pry bar (36") placed under each torque rod end and pressure applied.

Torque rod length is determined by the original vehicle manufacturer (see Figure 6-11). The mounting bracket 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,

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.

The **3-piece adjustable** torque rods have right hand and left hand threads. Ensure the correct thread is at the correct end of the rod, see part number and directional location in Figure 6-11.



AIR FITTINGS

INSPECTION

1. If an air leak is suspected, begin by building up the air system to normal operating pressure.

2. Spray all nylon tube air fittings with a soapy water solution to detect the leak location.

Air lines and fittings may be inspected for leaks using a soapy water solution.

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

NOTE

SECTION 7 Alignment & Adjustments

HEIGHT CONTROL VALVE

The height control valve for the PRIMAAX EX suspension for GILLIG buses is not supplied by Hendrickson, although it is a required component. Hendrickson is not responsible for components supplied by the vehicle manufacturer. For assistance with inspection, maintenance and rebuild instructions on these components, consult the vehicle service manual for instructions.

DRIVE AXLE ALIGNMENT INSPECTION

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

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

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.

- 9. 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 10).
 - 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. Correct the alignment of this axle by following the Alignment Adjustment Instructions as shown in this section.
- 10. After the drive axle is aligned, check the pinion angle with a digital protractor, see Figure 7-1. Refer to the vehicle manufacturer specifications for the required pinion angles.
 - a. If the pinion angle is within the vehicle manufacturer's specifications then proceed to Step 11.
 - 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.
- 11. Recheck measurements to confirm adjustments until the correct alignment and pinion angles are achieved.
- 12. When the drive axle alignment and pinion angle is within the vehicle manufacturer's specifications then the alignment procedure is complete.

AXLE PINION ANGLE

Drive axle pinion angles are established by the vehicle manufacturer. The suspension bottom cap / axle seats (see the Parts Lists section of this publication) are machined to specific angles to meet the vehicle manufacturer's specified requirements.

To check the pinion angle:

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

AXLE LATERAL ALIGNMENT

- Use a work bay with a level floor. Drive the vehicle slowly, straight ahead. Try to slacken or loosen the suspension as the vehicle is positioned. End with all wheels positioned straight ahead. Try to roll to a stop without the brakes being used. **DO NOT** set the parking brake. Chock the front wheels of the vehicle.
- 2. Measure from the outside of the frame rail to the rim flange of the inner tire. Record the measurement **A** and **B**, see Figure 7-2.
- 3. Verify the axle lateral alignment is within the vehicle manufacturer's specifications.

EXAMPLE If the axle lateral alignment is out of specification by ¼" (6 mm), adjust the transverse torque rod length by ½" as needed. Refer to Longitudinal & Transverse Torque Rod in Preventive Maintenance section in this publication.

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

ALIGNMENT ADJUSTMENT INSTRUCTIONS

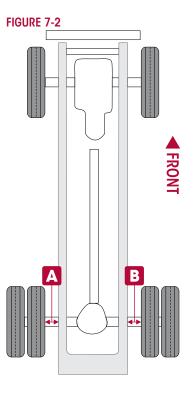
SERVICE HINT The eccentric collars (with the square drive feature) are located on the outboard side of the frame hangers with the concentric collars on the inboard side, see Figure 7-3. The total range of fore/aft axle adjustment is $1.0" \pm \frac{1}{2}"$.

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

ed by the

FIGURE 7-1





WARNING	DO NOT ASSEMBLE QUIK-ALIGN JOINT WITHOUT THE PROPER FASTENERS. USE ONLY HENDRICKSON COATED GENUINE FASTENERS TO SUSTAIN PROPER CLAMP FORCE. ENSURE THAT THE QUIK-ALIGN FASTENER'S TORQUE VALUES ARE SUSTAINED AS RECOMMENDED IN THE TORQUE SPECIFICATIONS SECTION IN THIS PUBLICATION. FAILURE TO FOLLOW THE ABOVE ITEMS CAN CAUSE ADVERSE VEHICLE HANDLING RESULTING IN PERSONAL INJURY OR PROPERTY DAMAGE AND WILL VOID ANY APPLICABLE WARRANTIES. FOLLOW VEHICLE MANUFACTURER'S FASTENER ORIENTATION WHEN PERFORMING ANY MAINTENANCE, SERVICE, OR REPAIR. FIGURE 7-3
	1. Support the frame at ride height.
WARNING	PRIOR TO AND DURING DEFLATION AND INFLATION OF THE AIR SUSPENSION SYSTEM, ENSURE THAT ALL PERSONNEL AND EQUIPMENT ARE CLEAR FROM UNDER THE VEHICLE AND AROUND THE SERVICE AREA, FAILURE TO DO SO CAN CAUSE SERIOUS PERSONAL INJURY, DEATH, OR PROPERTY DAMAGE.
	 2. See additional Air Spring Warnings and Instructions in the Important Safety Notice section in this publication prior to deflating or inflating the suspension system. 1" Washer 1" Uasher 1" Uasher 1" Locknut Tightening Torque 550 ± 25 ft. Ibs. (745 ± 34 Nm)
	Disconnect the height control linkage assembly from the height control valve arm. Lower the height control valve arm to exhaust the air in the air springs and deflate the rear suspension.
WARNING	BUS APPLICATION WITH A KNEELING FEATURE MAY RETAIN SOME AIR PRESSURE IN THE AIR SPRINGS AT ALL TIMES. PRIOR TO PERFORMING ANY MAINTENANCE, SERVICE, OR REPAIR OF THE SUSPENSION, VERIFY EACH AIR SPRING IS COMPLETELY DEFLATED. FAILURE TO DO SO COULD RESULT SERIOUS PROPERTY DAMAGE AND/OR SEVERE PERSONAL INJURY. 4. Using the measurements from the Drive Axle Alignment Inspection procedure, in this section,
	determine which QUIK-ALIGN collar requires an adjustment to correct the axle alignment.
SERVICE HINT	If the axle can be adjusted on both sides, begin the adjustment on the side that is furthest out of specification.
NOTE	Use a new QUIK-ALIGN Fastener Service kit (see the Parts List section in this publication) for any axle alignment or disassembly of the QUIK-ALIGN connection. This will help ensure that the proper clamp load is applied to the connection and help prevent the joint to slip in service.
	5. On the side being adjusted, remove the old QUIK-ALIGN fastener and replace it with a new QUIK-ALIGN fastener. Snug the new QUIK-ALIGN fastener to 50-100 foot pounds. This will hold the eccentric flanged collar in place against the frame hanger face, and within the adjustment guide, but loose enough to permit the QUIK-ALIGN eccentric flanged collar to rotate freely.
	See additional Air Spring Warnings and Instructions in the Important Safety Notice section in this publication prior to deflating or inflating the suspension system.
	 Inflate the suspension by connecting the height control valve linkage to the height control valve arm. Verify the air springs inflate uniformly without binding.
	8. Verify correct ride height, refer to vehicle manufacturer's specifications.
NOTE	When adjusting the alignment of an axle, the fasteners connecting the longitudinal torque rod to the cross tube must be loose at the cross tube. 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.
	Prior to the axle is adjusted, loosen the fasteners connecting the longitudinal torque rod to the cross tube. Remove any existing shims from this connection. Leave the connection loose at this time.

- 10. Use a QUIK-ALIGN socket tool, see Figure 7-4 (refer to the Tool section in this publication) and an impact gun, see Figure 7-5, or a 1/2" square drive breaker bar to rotate the QUIK-ALIGN eccentric collar to align the axle.
 - a. Once the correct axle alignment is achieved, use a calibrated torque wrench to tighten the 1" QUIK-ALIGN locknuts to 3 550 ± 25 foot pounds torque.
 - b. Fill any gap between the cross tube and longitudinal torque rod with shims.
 - c. Tighten the longitudinal torque rod fasteners to the proper specification, see Torque Specifications section in this publication.
 - Verify the ride height is within the vehicle manufacturer's specifications, refer to vehicle manufacturer's specifications. Then proceed to the Drive Axle Alignment Inspection procedure in this section.
 FIGURE 7-4



DRIVE AXLE PINION ANGLE

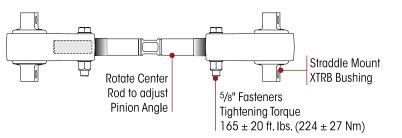
Drive axle pinion angles are established by the vehicle manufacturer. Proper length of the 3-piece adjustable torque rods must be established to maintain the proper pinion angle. Check and record the pinion angle as originally set by the vehicle manufacturer for future reference.

3-PIECE TORQUE ROD LENGTH ADJUSTMENT

SERVICE HINT A general rule of thumb is, ¹/₈" change in torque rod length will increase or decrease the pinion angle by ¹/₂ degree.

- 1. Chock the wheels of the vehicle.
- 2. Use a ¹⁵/₁₆" wrench and socket to loosen the tie-rod clamp bolts, see Figure 7-6.
- 3. Turn the center rod to increase or decrease torque rod length.
- 4. Re-check the pinion angle and verify it is within the vehicle manufacturer's specifications.
- 5. Tighten the longitudinal torque rod fasteners to the proper specification, 🗈 165 ± 20 foot pounds torque.
- 6. Remove wheel chocks.

FIGURE 7-6



SECTION 8 Component Replacement

FASTENERS

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

HEIGHT CONTROL VALVE & SHOCK ABSORBERS

The height control valve and shock absorbers equipped on PRIMAAX EX suspensions for GILLIG buses are not supplied by Hendrickson, although are required components. Hendrickson is not responsible for components supplied by the vehicle manufacturer. For assistance with inspection, maintenance and rebuild instructions on these components, consult the vehicle service manual for instructions.

AIR SPRING

DISASSEMBLY

- 1. Chock the wheels.
- 2. Support the frame with safety stands.
- 3. Disconnect the height control valve linkage assembly from the height control valve arm(s) as per the vehicle manufacturer's instructions.

WARNING

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

- 4. See additional Air Spring Cautions and Warnings in the Important Safety Notice section in this publication prior to deflating or inflating the air system.
- 5. Exhaust the air from the system per the vehicle manufacturer's guidelines.

WARNING

BUS APPLICATION WITH A KNEELING FEATURE MAY RETAIN SOME AIR PRESSURE IN THE AIR SPRINGS AT ALL TIMES. PRIOR TO PERFORMING ANY MAINTENANCE, SERVICE, OR REPAIR OF THE SUSPENSION, VERIFY EACH AIR SPRING IS COMPLETELY DEFLATED. FAILURE TO DO SO COULD RESULT SERIOUS PROPERTY DAMAGE AND/OR SEVERE PERSONAL INJURY.

6. Remove the air line from the air spring.

ACAUTION

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

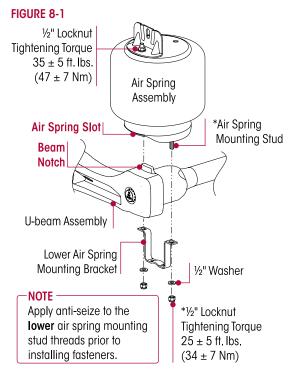
- 7. If the air spring is being removed for an alternate repair it will be necessary to clean and lubricate the lower mounting fasteners with penetrating oil. This will help prevent the air spring mounting studs from breaking during the removal process. Remove the lower mounting fasteners from the air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

ASSEMBLY

 Press the upper air spring bracket assembly firmly against the underside of the frame and tighten frame fasteners to the proper torque per the original equipment manufacturer's specifications.

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.

- Attach the air spring to the upper air spring bracket and tighten locknut to 35 ± 5 foot pounds torque.
- 3. Ensure the **air spring slot** in the bottom of the air spring engages the **beam notch** on the top of the beam, see Figure 8-1.
- 4. Install the lower air spring mounting bracket around the cross tube engaging the mounting air spring studs.



- 5. Apply anti-seize to the lower mounting studs threads.
- 6. Using **HAND TOOLS** only, install the lower mounting locknuts and tighten to 25 ± 5 foot pounds torque, see Figure 8-1.
- 7. Install the air line fitting to the air spring using Teflon (or equivalent) thread seal.
- 8. Connect the air line to the air spring.

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.

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

3-PIECE TRANSVERSE TORQUE ROD

WARNING

PRIMAAX EX SUSPENSIONS INCORPORATE 3-PIECE ADJUSTABLE TRANSVERSE AND LONGITUDINAL TORQUE RODS FOR VEHICLE STABILITY. IF THESE COMPONENTS ARE DISCONNECTED OR ARE NON-FUNCTIONAL THE VEHICLE SHOULD NOT BE OPERATED. FAILURE TO DO SO CAN RESULT IN ADVERSE VEHICLE HANDLING AND POSSIBLE TIRE CONTACT WITH THE FRAME OR SUSPENSION, SEVERE PERSONAL INJURY, OR PREMATURE COMPONENT DAMAGE.

DISASSEMBLY

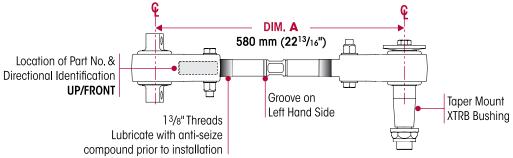
```
WARNING
```

WHEN LIFTING THE VEHICLE TO PERFORM ANY VEHICLE SERVICE, ENSURE THE PRIMAAX EX 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.

THE VEHICLE MUST BE FIRMLY SUPPORTED WITH SAFETY STANDS PRIOR TO SERVICING. FAILURE TO DO SO CAN RESULT IN PERSONAL INJURY OR PROPERTY DAMAGE.

- 1. Chock the wheels of the vehicle.
- 2. Support the vehicle frame with safety stands.
- 3. Prior to loosening the 3-piece adjustable transverse torque rod connection mark the orientation of the bar pin flats and fasteners.
- 4. Remove and discard the 3-piece torque rod fasteners from the axle housing and the chassis bracket per the vehicle manufacturer's instructions.
- 5. Remove one 3-piece transverse torque rod
- 6. After removal, measure the length of the 3-piece transverse torque rod, see Figure 8-2. This will facilitate the setting of the lateral alignment during assembly (measurement will be transferred to the new 3-piece torque rod)
- 7. Inspect the mounting surfaces for any wear or damage. Repair or replace as necessary.

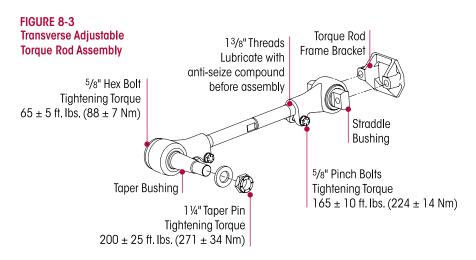




ASSEMBLY

- Prior to installation of the 3-piece transverse torque rod, measure from the centerline of the straddle bushing bar pins with an equal amount of threads shown on both sides of the torque rod center tube. **Dimension A** needs to equal 580 mm (22¹³/₁₆ inches) from centerline to centerline of the bushing, see Figures 8-2.
- 2. Prior to installation ensure the torque rod length is set to the length measured prior to removal and verify the pinch bolts are tightened to $\boxed{165 \pm 10}$ foot pounds torque, see Figure 8-3.
- 3. If an adjustment is necessary, lubricate the torque rod center tube threads with anti-seize, see Figure 8-3.
- 4. Install the transverse torque rod with the torque rod pinch bolts facing downward, see Figure 8-3.

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



- 5. Install the 3-piece torque rod with the bar pins and fasteners in the same orientation as prior to removal.
- 6. Prior to tightening, ensure that the vehicle is at the proper ride height, refer to the vehicle manufacturer's specifications.
- 7. Tighten all fasteners to the required torque specification. Refer to the original equipment manufacturer for specifications.
- 8. Remove the safety stands from the vehicle frame.
- 9. 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 in this publication.
- 10. Remove the wheel chocks.

3-PIECE LONGITUDINAL TORQUE ROD

WARNING

PRIMAAX EX SUSPENSIONS INCORPORATE 3-PIECE ADJUSTABLE TRANSVERSE AND LONGITUDINAL TORQUE RODS FOR VEHICLE STABILITY. IF THESE COMPONENTS ARE DISCONNECTED OR ARE NON-FUNCTIONAL THE VEHICLE SHOULD NOT BE OPERATED. FAILURE TO DO SO CAN RESULT IN ADVERSE VEHICLE HANDLING AND POSSIBLE TIRE CONTACT WITH THE FRAME OR SUSPENSION, SEVERE PERSONAL INJURY, OR PREMATURE COMPONENT DAMAGE.

DISASSEMBLY

WHEN LIFTING THE VEHICLE TO PERFORM ANY VEHICLE SERVICE, ENSURE THE PRIMAAX EX 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.

WARNING

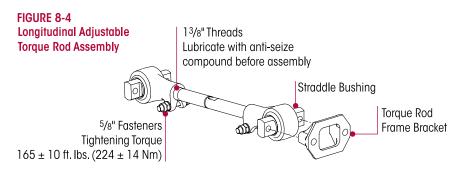
THE VEHICLE MUST BE FIRMLY SUPPORTED WITH SAFETY STANDS PRIOR TO SERVICING. FAILURE TO DO SO CAN RESULT IN PERSONAL INJURY OR PROPERTY DAMAGE.

- 1. Chock the wheels of the vehicle.
- 2. Support the vehicle frame with safety stands.

ACAUTION

IF THE LONGITUDINAL TORQUE ROD IS BEING SERVICED, SUPPORT THE PINION TO MAINTAIN PINON ANGLE AFTER COMPONENT REPLACEMENT.

- 3. Place a floor jack under axle pinion to maintain the pinion angle.
- 4. Prior to replacement of the **longitudinal torque rod**, support the front end of the differential to prevent movement.
- 5. Prior to loosening the 3-piece adjustable torque rod connection mark the orientation of the bar pin flats and fasteners.

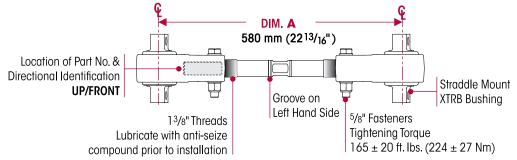


- 6. Remove and discard the 3-piece longitudinal torque rod fasteners from the axle housing and the chassis bracket per the vehicle manufacturer's instructions.
- 7. Remove the 3-piece longitudinal torque rod.
- 8. After removal, measure the length of the 3-piece longitudinal torque rod. This will facilitate the setting of the axle pinion angle during assembly (measurement will be transferred to the new 3-piece torque rod).
- 9. Inspect the mounting surfaces for any wear or damage. Repair or replace as necessary.

ASSEMBLY

 Prior to installation of the longitudinal torque rod, measure from the centerline of the straddle bushing bar pins with an equal amount of threads shown on both sides of the torque rod center tube. Dimension A needs to equal 580 mm (22¹% inches), see Figures 8-5.

FIGURE 8-5



- 2. Prior to installation ensure the torque rod length is set to the length measured prior to removal and verify the pinch bolts are tightened to 3165 ± 10 foot pounds torque, see Figure 8-5.
- 3. If an adjustment is necessary, lubricate the torque rod center tube threads with anti-seize, see Figure 8-5.
- 4. Install the 3-piece torque rod with the bar pins and fasteners in the same orientation as prior to removal, see Figure 8-6.

SERVICE HINT If the angles of the torque rod bar pins do not match, turn the torque rod 180 degrees and check again.

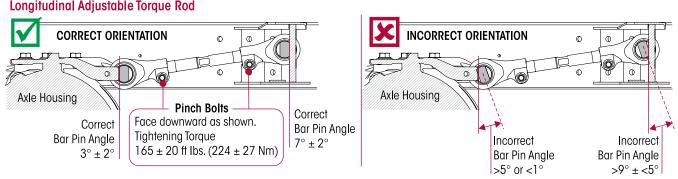
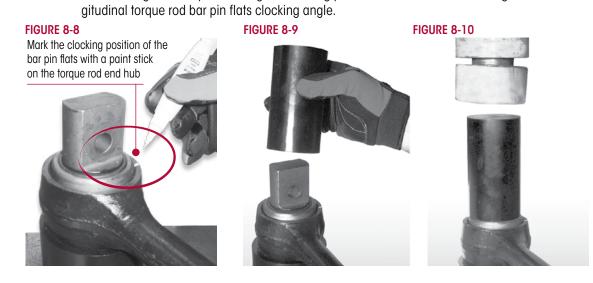


FIGURE 8-6 Longitudinal Adjustable Torque Rod

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 fasteners
	5. Tighten all fasteners to the required torque specification. Refer to the original equipment manufac- turer for specifications.
	6. Remove the jack stands from the axle pinion.
	7. Remove the safety stands from the vehicle frame.
	 When the assembly is complete, check the drive axle pinion angles, see the Alignment & Adjustments section in this publication.
	 After assembly is complete, verify the drive axle pinion angles are within the vehicle manufacturer's specifications, see the Alignment & Adjustments section in this publication.
	10. After alignment remove the wheel chocks.
	3-PIECE TORQUE ROD XTRB BUSHINGS
	YOU WILL NEED
	A vertical press with a capacity of at least 10 tons
	Shop made receiving tool and installation / removal tool, see the Special Tools section of this publication for more information
	DISASSEMBLY
	 Remove the torque rod(s) as detailed in 3-piece Torque Rod Disassembly instructions in this section.
WARNING	DO NOT USE HEAT OR USE A CUTTING TORCH TO REMOVE THE BUSHINGS FROM THE TORQUE ROD. THE USE OF HEAT WILL ADVERSELY AFFECT THE STRENGTH OF THE TORQUE ROD, HEAT CAN CHANGE THE MATERIAL PROPERTIES. A COMPONENT DAMAGED IN THIS MANNER CAN RESULT IN ADVERSE VEHICLE HANDLING AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.
	2. When servicing a straddle mount bar pin bushing assembly on a longitudinal torque rod, mark the clocking position of the straddle mount bar pin flats with a paint stick on the torque rod end hub prior to disassembly, see Figure 8-8. This marking will serve as a guide when installing the new bushing assembly so the original clocking position can be retained, see Figure 8-6 for lon-



- 3. Support the torque rod end hub centered on the receiving tool. Be sure the torque rod is squarely supported on the press bed for safety.
- 4. Push directly on the straddle mount bar pin, until the top of the bar pin is level with the top of torque rod end hub, see Figure 8-9.
- 5. Place the shop made removal tool on the bar pin and press until the bushing clears the torque rod hub, see Figure 8-10.
- 6. Support the torque rod hub on the receiving tool with the torque rod squarely supported on the press bed for safety.

ASSEMBLY

1. Clean and inspect the inner diameter of the torque rod end hubs, see Figure 8-11.

FIGURE 8-12

SERVICE HINT DO NOT use a paraffinic oil, or soap base lubricant. Such lubricants can cause adverse reactions with the bushing, causing premature failure.

FIGURE 8-11

Inspect and clean the inner diameter of torque rod end hubs Apply NLGI #2-EP (Extreme Pressure) Iubricant to the inner diameter of torque rod end hub and bushings



- Lubricate the inner diameter of the torque rod end hubs and the new bushings with NLGI#2 EP (Extreme Pressure) lithium base grease, see Figure 8-12.
- 3. Support the torque rod end hub centered on the receiving tool. Be sure the torque rod is squarely supported on the press bed for safety.
- 4. Realign the bar pin bushings to the mark made prior to removal as shown in Figure 8-8.
- 5. Using the shop made tool, place the installer tool on the bushing and press in. The bushing must be centered within the hub of the torque rod.
- 6. Wipe off the excess lubricant.
- 7. Install the torque rod as detailed in the Torque Rod Assembly assembly instructions in this section.

U-BEAM ASSEMBLY

DISASSEMBLY

- 1. Chock the wheels.
- 2. Support the frame with safety stands.
- 3. Disconnect the height control valve linkage assembly from the height control valve arm(s) as per the vehicle manufacturer's instructions.

WARNING

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

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

	5. Exhaust the air from the system per the vehicle manufacturer's guidelines.
WARNING	BUS APPLICATION WITH A KNEELING FEATURE MAY RETAIN SOME AIR PRESSURE IN THE AIR SPRINGS AT ALL TIMES. PRIOR TO PERFORMING ANY MAINTENANCE, SERVICE, OR REPAIR OF THE SUSPENSION, VERIFY EACH AIR SPRING IS COMPLETELY DEFLATED. FAILURE TO DO SO COULD RESULT SERIOUS PROPERTY DAMAGE AND/OR SEVERE PERSONAL INJURY.
A CAUTION	IF THE AIR SPRING IS BEING REMOVED FOR AN ALTERNATE REPAIR, IT IS MANDATORY TO LUBRICATE THE LOWER AIR SPRING FASTENERS WITH PENETRATING OIL AND REMOVE WITH HAND TOOLS TO PREVENT DAMAGE TO THE LOWER AIR SPRING MOUNTING STUD. FAILURE TO DO SO CAN CAUSE COMPONENT DAMAGE AND VOID WARRANTY
	6. 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.
	7. Remove and discard the lower mounting fasteners from the air springs using HAND TOOLS only.
	8. Remove both lower air spring mounting brackets to disconnect air springs from the cross tube, refer to Air Spring in this section.
WARNING	USE ONLY A FLOOR JACK EQUIPPED WITH A FOUR INCH CONTACT PLATE TO SUPPORT THE U-BEAM ASSEMBLY AT THE CROSS TUBE TO FACILITATE SAFE LOWERING AND RAISING OF THE U-BEAM ASSEMBLY. DO NOT USE A BOTTLE JACK, WHICH DOES NOT HAVE ENOUGH CONTACT AREA AND CAN BE UNSTABLE. FAILURE TO DO SO CAN CAUSE COMPONENT DAMAGE OR RESULT IN PERSONAL INJURY.
	9. Install a floor jack with a 4" contact plate to support the U-beam assembly at the cross tube.
SERVICE HINT	Each frame hanger will have a pair of QUIK-ALIGN collars. Note which type (eccentric or concentric) of QUIK-ALIGN collar is removed from which frame hanger location to facilitate the assembly process. Any eccentric (with the square drive feature) QUIK-ALIGN collar should be mounted on the outboard side of the frame hanger. Axle thrust angles can only be corrected on frame hangers equipped with eccentric QUIK-ALIGN collars, see Figure 8-13.
	FIGURE 8-13
	10. 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 pro- cess after the repair is complete, see Figure 8-13.
	11. Loosen both the QUIK-ALIGN fasten- ers, DO NOT remove at this time.
	12. Remove and discard D-pin fasteners on both sides of the suspension. 1" Locknut Tightening Torque Pivot Bushing
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 cap / axle seats.
SERVICE HINT	It may be necessary to raise the front of the differential to allow the D-pins to disengage the bottom cap / axle seats.
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. 13. Lower the floor jack and pivot the U-beam assembly down. 14. Remove and discard the QUIK-ALIGN fasteners. 15. Remove QUIK-ALIGN ecceptric and concentric collars.

15. Remove QUIK-ALIGN eccentric and concentric collars.

H

NOTE	It may be necessary to use a pry bar to push the U-beam assembly out of the frame hangers.				
	16. Remove the U-beam assembly from the hangers.				
	17. Remove the U-beam assembly from the vehicle.				
	18. Inspect the U-beam assembly for any damage or wear and replace as necessary.				
	ASSEMBLY				
	 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. 				
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.				
	2. Install the U-beam assembly into the frame hangers.				
WARNING	DISCARD USED QUIK-ALIGN FASTENERS. ALWAYS USE NEW QUIK-ALIGN FASTENERS TO COMPLET REPAIR. FAILURE TO DO SO COULD RESULT IN FAILURE OF THE PART, OR MATING COMPONENTS, ADVEI 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 IN THIS PUBLICATION. FAILURE TO FOLLOW THE ABOVE ITEMS CAN CAUSE ADVERSE VEHICLE HANDLING RESULTING IN PERSONAL INJURY OR PROPERTY DAMAGE AND WILL VOID ANY APPLICABLE WARRANTIES. FOLLOW VEHICLE MANUFACTURER'S FASTENER ORIENTATION WHEN PERFORMING ANY MAINTENANCE, SERVICE, OR REPAIR.				
NOTE	Use a new QUIK-ALIGN pivot bolt kit (see the Parts List section of this publication) for any axle align- ment 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.				
	 Verify the correct QUIK-ALIGN collar (eccentric/concentric) is in the correct location as noted in the disassembly procedure. 				
	 Install the QUIK-ALIGN fasteners and snug to about Society 50-100 foot pounds torque, DO NOT tighten at this time. The final torque must be done after the alignment is complete. 				
	5. Position the U-beam assembly on a floor jack.				
	6. Raise the U-beam assembly until the D-pins engage in the bottom cap / axle seat.				
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 cap / axle seats.				
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 / axle seat. Use a drift pin if necessary to align the D-pins with the bottom cap / axle seat.				
	7. Install the D-pin fasteners from front to back, see Figure 8-14.				
	8. Remove the floor jack supporting the U-beam assembly.				
	 Tighten D-pin fasteners to 300 ± 25 foot pounds torque, see Figure 8-14. FIGURE 8-14 				
	U-beam Assembly JT D-pin Locknuts Tightening Torque				
	Top Pad / Axle Seat $(407 \pm 34 \text{ Nm})$				
	3/4" D-pin Hex Bolt				

NOTE

- 10. Install both **lower** air spring mounting brackets onto the cross tube, refer to the Air Spring in this section.
- 11. Install the lower air spring mounting fasteners and tighten to \bigcirc 25 ± 5 foot pounds.
- 12. Install the wheels and remove axle support.
- 13. See additional Air Spring Cautions and Warnings in the Important Safety Notice section in this publication prior to deflating or inflating the air system.
- 14. Connect the linkage to the height control valve arm(s) to inflate the suspension, see the vehicle manufacturer's instructions.
- 15. Remove safety stand(s).
- 16. Remove the wheel chocks.

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

- 17. Check the alignment and adjust if necessary. See Alignment & Adjustments section in this publication.
- 18. Once the correct axle alignment is achieved, use a calibrated torque wrench to tighten the 1" QUIK-ALIGN locknuts to 350 ± 25 foot pounds torque.

D-PIN BUSHING

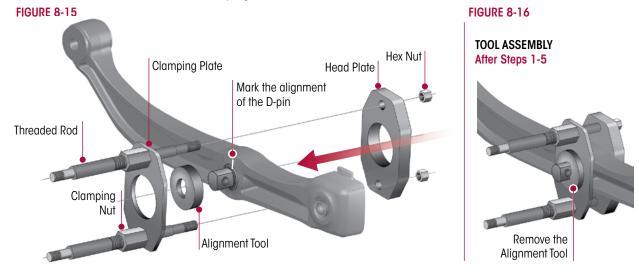
YOU WILL NEED:

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



DISASSEMBLY

- 1. Mark the support beam of the U-beam assembly to show the alignment of the existing D-pin. Install the alignment tool over the D-pin, and place the clamping plate over the alignment tool, see Figure 8-15.
- 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 8-15.
- 6. Ensure the clamping plate and head plate are parallel to each other.
- 7. Remove the alignment tool.

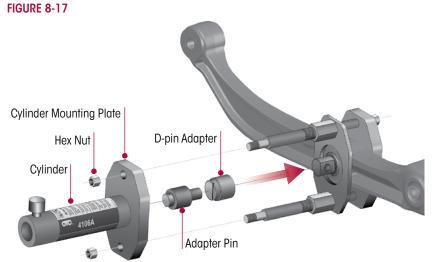
WARNING

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

- 8. Thread the cylinder into the cylinder mounting plate, see Figure 8-17.
- 9. Install the cylinder mounting plate onto the end of the threaded rods. Adjust the clamping nuts as needed to fit the threaded rods through the holes in the cylinder mounting plate. Assemble the hex nuts on the threaded rods. Tighten the hex nuts on both ends of the threaded rods.
- 10. Place the D-pin adapter over the D-pin.
- 11. Insert the adapter pin into the head of the cylinder.

WARNING

- TO HELP PREVENT PERSONAL INJURY, THE HYDRAULIC PUMP RATING MUST NOT EXCEED 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.





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

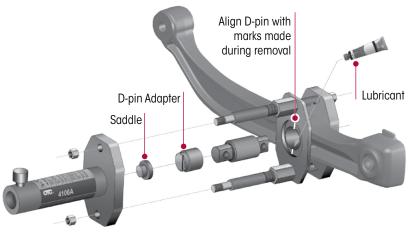
- 1. Clean and thoroughly lubricate the entire surface of the inside diameter of the support beam of the U-beam assembly, see Figure 8-18.
- 2. Insert the saddle into the head of the cylinder.
- 3. Assemble the new D-pin and the D-pin adapter as shown. Align the line in the D-pin adapter with the alignment marks made during the removal procedure.
- 4. Operate the pump to extend the cylinder piston and apply enough pressure to hold the tool and components. Check the alignment of the D-pin. The centerline of the D-pin must be aligned with the centerline of the inside diameter of the support beam of the U-beam assembly.

WARNING

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

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

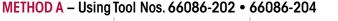
FIGURE 8-18



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





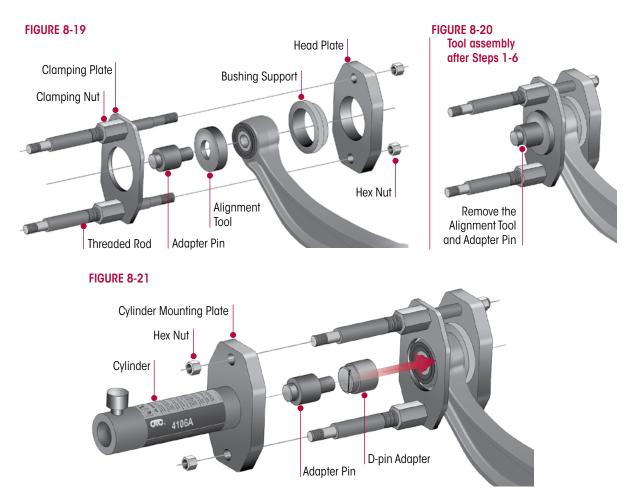
DISASSEMBLY

- 1. Insert the adapter pin through the alignment tool and into the pivot bushing hole as shown in Figure 8-19.
- 2. Insert the bushing support over the pivot bushing.
- 3. Assemble the clamping nuts to the threaded rods.
- 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 8-20.
- 7. Remove the alignment tool and adapter pin.

WARNING

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

8. Thread the cylinder into the cylinder mounting plate, see Figure 8-21.



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

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

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



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

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

ASSEMBLY

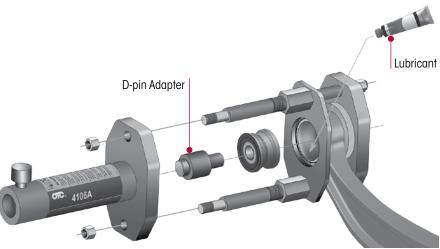
- 1. Clean and thoroughly lubricate the entire surface of the inside diameter of the support beam of the U-beam assembly, see Figure 8-22.
- 2. Insert the adapter pin into the head of the cylinder.
- 3. Place the pivot bushing on the end of the adapter pin as shown.
- 4. Operate the pump to extend the 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.

FIGURE 8-22



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 8-23.



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

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

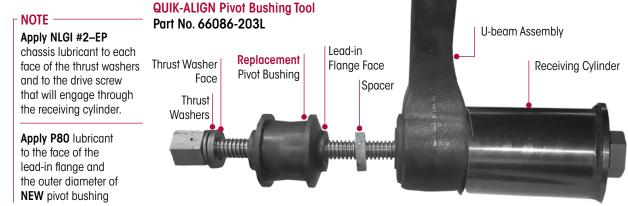
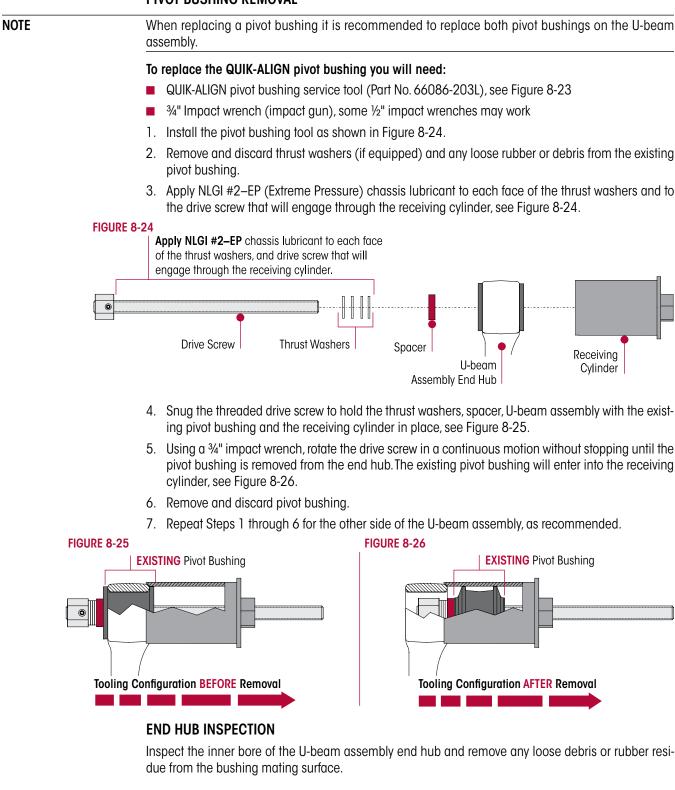


FIGURE 8-23

PIVOT BUSHING REMOVAL



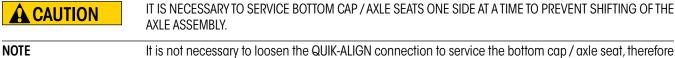
PIVOT BUSHING INSTALLATION

- 1. Clean the inner diameter of the U-beam assembly end hub with brake cleaner.
- 2. Apply NLGI #2–EP (Extreme Pressure) chassis lubricant to each face of the thrust washers and to the drive screw that will engage through the receiving cylinder, see Figure 8-27.

NOTE DO NOT use petroleum or soap based lubricant, it can cause an adverse reaction with the bushing material, such as deterioration. P-80 lubricant is supplied in the QUIK-ALIGN Pivot Bushing Kits. 3. Apply P-80 lubricant to the face of the lead-in flange, the outer diameter of the replacement pivot bushing, and the inner diameter of the U-beam assembly end hub, see Figure 8-27. 4. Snug the threaded drive screw to hold the thrust washers, spacer, pivot bushing, and the U-beam assembly with the receiving cylinder in place, see Figure 8-28. 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 Figure 8-29. **FIGURE 8-27** Apply P-80 lubricant to the face of the lead-in flange, Apply NLGI #2-EP chassis lubricant to each face outer diameter of the **REPLACEMENT** Pivot Bushing, of the thrust washers, and drive screw that will and the inner bore of the U-beam Assembly End Hub. engage through the receiving cylinder. 0 Drive Screw **Thrust Washers** Spacer Receiving REPLACEMENT U-beam Cylinder **Pivot Bushing** Assembly End Hub FIGURE 8-30 **FIGURE 8-28 FIGURE 8-29** REPLACEMENT Press from opposite side to Overshoot bushing **Pivot Bushing** Bump Back bushing to center past the hub ۲ **Tooling Configuration BEFORE Installation Tooling Configuration AFTER Overshoot** Tooling Configuration AFTER "Bump Back"

- 6. Remove and reverse the installation tool, then from the opposite side of the hub press the pivot bushing again to center the bushing within the beam end hub, see Figure 8-30. Center the pivot bushing to help prevent bulging and bushing preload. This is known as the "Bump Back" procedure.
- 7. Repeat Steps 1 through 6 for the other side of the U-beam assembly
- 8. Allow the lubricant four (4) hours to dissipate before fully operating the vehicle.
- 9. Install the U-beam assembly, follow the installation procedure as detailed in this section.

BOTTOM CAP



It is not necessary to loosen the QUIK-ALIGN connection to service the bottom cap / axle seat, 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. Raise the frame of the suspension to remove the load and support with safety stands.

	3. Raise and support the axle with safety stands.
	4. Remove the tires per the vehicle manufacturer's instructions.
	 Disconnect the height control valve linkage assembly from the height control valve arm(s) as per the vehicle manufacturer's instructions.
WARNING	PRIOR TO AND DURING DEFLATION AND INFLATION OF THE AIR SUSPENSION SYSTEM, ENSURE THAT ALL PERSONNEL AND EQUIPMENT ARE CLEAR FROM UNDER THE VEHICLE AND AROUND THE SERVICE AREA, FAILURE TO DO SO CAN CAUSE SERIOUS PERSONAL INJURY, DEATH, OR PROPERTY DAMAGE.
	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. Exhaust the air from the system per the vehicle manufacturer's guidelines.
WARNING	BUS APPLICATION WITH A KNEELING FEATURE MAY RETAIN SOME AIR PRESSURE IN THE AIR SPRINGS AT ALL TIMES. PRIOR TO PERFORMING ANY MAINTENANCE, SERVICE, OR REPAIR OF THE SUSPENSION, VERIFY EACH AIR SPRING IS COMPLETELY DEFLATED. FAILURE TO DO SO COULD RESULT SERIOUS PROPERTY DAMAGE AND/OR SEVERE PERSONAL INJURY.
WARNING	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.
	8. Support the U-beam assembly at the cross tube with a floor jack that is equipped with a four inch (4") contact plate.
	9. Remove and discard the four (4) ³ / ₄ " fasteners that secure the axle housing to the bottom cap / axle seat.
SERVICE HINT	It may need to loosen the opposing side bottom cap / axle being serviced fasteners to create a slight gap to facilitate removal of the bottom cap. If this is necessary, also replace the bottom cap fasteners
	gup to reclamate removal of the bolion cap. It mis is necessary, also replace the bolion cap fasteriers.
	 10. Raise and support the axle on the side being serviced with a floor jack until there a gap between the axle housing mount and the bottom cap / axle seat.
	10. Raise and support the axle on the side being serviced with a floor jack until there a gap between
	 Raise and support the axle on the side being serviced with a floor jack until there a gap between the axle housing mount and the bottom cap / axle seat.
	 10. Raise and support the axle on the side being serviced with a floor jack until there a gap between the axle housing mount and the bottom cap / axle seat. 11. Remove and discard the ³/₄" bottom cap / axle seat fasteners from the D-pins.
	 10. Raise and support the axle on the side being serviced with a floor jack until there a gap between the axle housing mount and the bottom cap / axle seat. 11. Remove and discard the ³/₄" bottom cap / axle seat fasteners from the D-pins. 12. Slide the bottom cap / axle seat forward and remove.
	 10. Raise and support the axle on the side being serviced with a floor jack until there a gap between the axle housing mount and the bottom cap / axle seat. 11. Remove and discard the ³/₄" bottom cap / axle seat fasteners from the D-pins. 12. Slide the bottom cap / axle seat forward and remove. FIGURE 8-31
	 10. Raise and support the axle on the side being serviced with a floor jack until there a gap between the axle housing mount and the bottom cap / axle seat. 11. Remove and discard the ¾" bottom cap / axle seat fasteners from the D-pins. 12. Slide the bottom cap / axle seat forward and remove. FIGURE 8-31 ¾" Hex Bolt ¾" Welded ¾" Washer Welded ¾" Washer Bottom Cap / Axle Seat
	 10. Raise and support the axle on the side being serviced with a floor jack until there a gap between the axle housing mount and the bottom cap / axle seat. 11. Remove and discard the ¾" bottom cap / axle seat fasteners from the D-pins. 12. Slide the bottom cap / axle seat forward and remove. FIGURE 8-31 ¾" Hex Bolt ¾" Welded ¾" Washer ¥" Bolt ¥" Bolt ¥" Bolt
	 10. Raise and support the axle on the side being serviced with a floor jack until there a gap between the axle housing mount and the bottom cap / axle seat. 11. Remove and discard the ³/₄" bottom cap / axle seat fasteners from the D-pins. 12. Slide the bottom cap / axle seat forward and remove. FIGURE 8-31
	 10. Raise and support the axle on the side being serviced with a floor jack until there a gap between the axle housing mount and the bottom cap / axle seat. 11. Remove and discard the ³/₄" bottom cap / axle seat fasteners from the D-pins. 12. Slide the bottom cap / axle seat forward and remove. FIGURE 8-31 Welded ³/₄" Hex Bolt ³/₄" Washer ³/₄" Washer ³/₄" bottom Cap / Axle Seat
	 10. Raise and support the axle on the side being serviced with a floor jack until there a gap between the axle housing mount and the bottom cap / axle seat. 11. Remove and discard the ³/₄" bottom cap / axle seat fasteners from the D-pins. 12. Slide the bottom cap / axle seat forward and remove. FIGURE 8-31 Welded ³/₄" Washer ³/₄" Washer ³/₄" Washer ³/₄" bottom Cap / Axle Seat

Tightening Torque 300 ± 25 ft. lbs. (407 ± 34 Nm) NOTE

ASSEMBLY

- 1. Install the bottom cap / axle seat onto the D-pin in the proper direction.
- NOTE Current Hendrickson Truck Commercial Vehicle Systems hex bolt locknuts for the PRIMAAX EX suspension are ³/₄" -16 Grade C and are phosphate and oil coated.
 - 2. Install the D-pin fasteners with the bolt heads on the forward side of the bottom cap/axle seat and loosely install the D-pin fasteners. **DO NOT** tighten to torque at this time.

3. Use a jack to lower the axle onto the bottom cap / axle seat and ensure it is seated properly. **FIGURE 8-32** Hendrickson Truck Commercial Vehicle Systems locknuts for the PRIMAAX EX sus-(1)pensions are ³/₄"-16 Grade C and are phosphate and oil coated. 4. Install the bottom cap / axle seat hex bolts and fasteners and tighten fasteners evenly in 50 foot pound increments in the proper pattern to achieve uniform bolt tension, see Figure 8-32. Tighten to 375 ± 25 foot pounds torque. (4) 5. Tighten the D-pin fasteners to 300 ± 25 foot pounds torque. 6. Install the tires per the vehicle manufacturer's instructions. 7. Raise the U-beam assembly and remove the jack stands... 8. Connect the linkage assembly to the height control valve arm(s) and inflate the suspension per the vehicle manufacturer's instructions. See additional Air Spring Cautions and Warnings in the Important Safety Notice section 9. Remove the axle safety stands 10. Remove the wheel chocks. **AXLE STOPS** DISASSEMBLY 1. Chock the wheels. 2. Remove the fasteners connecting the axle stop to the frame. 3. Remove the axle stop. 4. Inspect the frame rail mounting surfaces for any cracks or damage. ASSEMBLY 1. Install the axle stop on the frame. 2. Install new mounting fasteners. 3. Tighten axle stop fasteners to the vehicle manufacturer's torque specifications.

- 4. Install any items removed
- 5. Remove the wheel chocks.

FRAME HANGER

THIS PROCEDURE TO REPLACE A FRAME HANGER MUST BE CONDUCTED WITH THE REMAINING FRAME A WARNING 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.

H

DISASSEMBLY

- 1. Chock the wheels of the axle.
- 2. Raise the frame of the vehicle to remove the load from the suspension. Support the frame with safety stands.
- 3. Raise and support the axle being serviced. Remove the tires.
- 4. Disconnect the height control valve linkage assembly from the height control valve arm(s) as per the vehicle manufacturer's instructions.

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

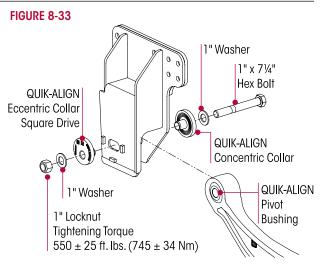
5. See additional Air Spring Cautions and Warnings in the Important Safety Notice section of this publication prior to deflating or inflating the air system.

WARNING BUS APPLICATION WITH A KNEELING FEATURE MAY RETAIN SOME AIR PRESSURE IN THE AIR SPRINGS AT ALL TIMES. PRIOR TO PERFORMING ANY MAINTENANCE, SERVICE, OR REPAIR OF THE SUSPENSION, VERIFY EACH AIR SPRING IS COMPLETELY DEFLATED. FAILURE TO DO SO COULD RESULT SERIOUS PROPERTY DAMAGE AND/OR SEVERE PERSONAL INJURY.

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

SERVICE HINT Mark the position of the QUIK-ALIGN square drive in 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.

- 6. Remove and discard the QUIK-ALIGN fasteners and collars, and note the orientation of the fasteners, see Figure 8-33.
- 7. Remove the fasteners that attach the frame hanger to the vehicle per the vehicle manufacturer's specifications.
- 8. Remove the frame hanger.
- 9. Inspect the mounting surface for any damage or wear.
- 10. Inspect the QUIK-ALIGN pivot bushing and torque rod bushings for wear or damage, replace as neces-



sary. Refer to Pivot Bushing in the Preventive Maintenance section in this publication.

ASSEMBLY

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

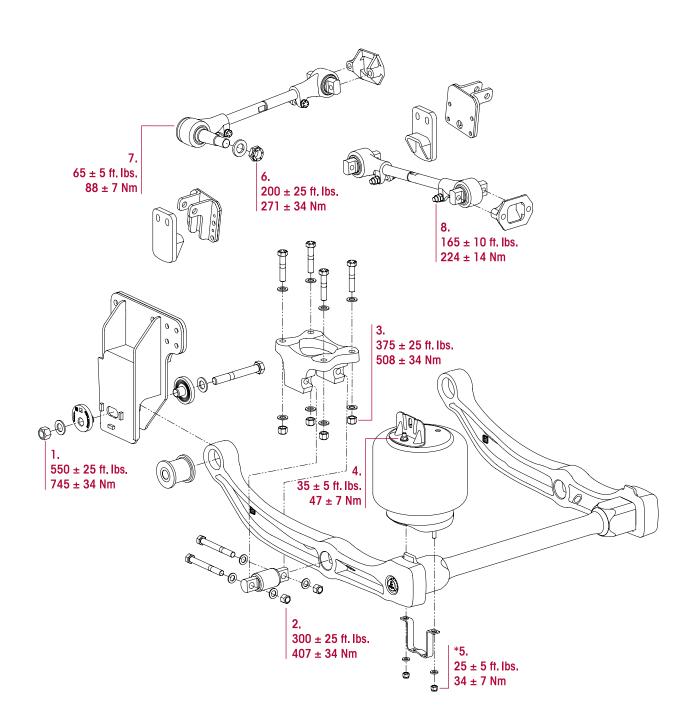


A WARNING

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 HENDRICKSO COATED GENUINE FASTENERS TO SUSTAIN PROPER CLAMP FORCE. ENSURE THAT THE QUIK-ALIG FASTENER'S TORQUE VALUES ARE SUSTAINED AS RECOMMENDED IN THE TORQUE SPECIFICATION SECTION IN THIS PUBLICATION. FAILURE TO FOLLOW THE ABOVE ITEMS CAN CAUSE ADVERSE VEHIC HANDLING RESULTING IN PERSONAL INJURY OR PROPERTY DAMAGE AND WILL VOID ANY APPLICAB WARRANTIES. FOLLOW VEHICLE MANUFACTURER'S FASTENER ORIENTATION WHEN PERFORMING AN MAINTENANCE, SERVICE, OR REPAIR.			
NOTE	Use a new QUIK-ALIGN service kit (see the Parts List section in this publication) for any axle alignment or disassembly of the QUIK-ALIGN connection. This will help ensure that the proper clamp load is applied to the connection and help prevent the joint to slip in service.			
	3. Install the new QUIK-ALIGN collars and mounting hardware that attach the U-beam assembly to the frame hanger, see Figure 8-33. 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.			
	 See additional Air Spring Cautions and Warnings in the Important Safety Notice section in this publication prior to deflating or inflating the air system. 			
	5. Inflate the suspension as per vehicle manufacturer's specifications.			
	6. Remove safety stand(s).			
	7. Verify that the axle is in proper alignment, see Alignment & Adjustments section in this publication.			
NOTE	It is mandatory to have the vehicle at proper ride height prior to tightening the 1.0" QUIK-ALIGN lock- nuts to torque specifications. Refer to vehicle manufacturer's instructions and specifications.			
	8. After the correct alignment of the axle is verified tighten the 1.0" QUIK-ALIGN locknuts to $\textcircled{3}$ 550 ± 25 foot pounds torque.			
NOTE	Ensure the QUIK-ALIGN fasteners are re-torqued at the recommended intervals after installation.			
	 Verify the correct pinion angle on the axle per the original equipment manufacturer's specifica- tions. Adjust as necessary per the Alignment & Adjustments section in this publication. 			
	10. Remove the chocks from the front wheels.			

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



HENDRICKSON RECOMMENDED TORQUE SPECIFICATIONS						
NO.	COMPONENT	QUANTITY	SIZE	TORQUE VALUE		
	COMPONENT			(In foot pounds)	(In Nm)	
	Frame fasteners furnished and installed per the vehicle manufacturer. Torque values listed below apply only if Hendrickson supplied fasteners are used. If non-Hendrickson fasteners are used, refer to the vehicle manufacturer's torque specifications					
1	U-beam Assembly to QUIK-ALIGN Bushing	2	1"-14 UNF	550 ± 25	745 ± 34	
2	U-beam Assembly to D-pin Bushing	2	34"-16 UNF	300 ± 25	407 ± 34	
3	Clamp Group Locknuts	8	34"-16 UNF	375 ± 25	508 ± 34	
4	Upper Air Spring Assembly to Air Spring Bracket	2	1⁄2"-13 UNC	35 ± 5	47 ± 7	
5	Lower Air Spring Assembly To Cross Tube	4	1⁄2"-13 UNC	*25 ± 5	*34 ± 7	
6	Transverse Torque Rod Taper Pin	2	1¼"-12 UNF	200 ± 25	271 ± 34	
7	Transverse Torque Rod Hex Head Bolt	2	₅⁄8"-11 UNC	65 ± 5	88 ± 7	
8	Adjustable Torque Rod	2	₅⁄8"-18 UNF	165 ± 10	224 ± 14	
NOTE	FE * Apply anti-seize to lower air spring mounting stud threads prior to installing the fasteners.					

PRIMAAX EX SUSPENSION FOR GILLIG BUSES

SECTION 10 Troubleshooting Guide

PRIMAAX EX Suspension for GILLIG Buses

	TROUBLESHOOTING GUIDE					
CONDITION	POSSIBLE CAUSE	CORRECTION				
Suspension has harsh or bumpy ride	Air spring is not inflated to specification or damaged	Repair air system and check ride height as per vehicle manufacturer's specifications.				
	Ride height set incorrectly	Adjust ride height as per vehicle manufacturer's specifications				
	Suspension is overloaded	Redistribute the load to correct weight.				
	Broken support beam	Replace the broken U-beam assembly.				
	Incorrect tire inflation pressure	Correct tire pressure per vehicle manufacturer and tire manufacturer specifications.				
	Incorrect alignment	Correct the alignment. Refer to the Alignment & Adjustments section.				
Irregular tire	Worn QUIK-ALIGN bushing	Replace the QUIK-ALIGN bushing.				
wear	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 as per vehicle manufacturer's specifications.				
	Broken support beam	Replace the U-beam assembly.				
Suspension is noisy	Loose QUIK-ALIGN attachment	Replace QUIK-ALIGN connection, and check vehicle alignment. Adjust if necessary. Check frame hanger for wear around QUIK-ALIGN plates and replace if necessary.				
	Loose hex bolts	Tighten the hex bolts to specifications, see Torque Specifications section.				
	Worn bushings	Replace the bushings as necessary.				
Vehicle is bouncing excessively	Damaged or leaking shock absorber	Replace the shock absorber per vehicle manufacturer's instructions.				
	Ride height set incorrectly	Adjust the ride height as per vehicle manufacturer' specifications.				

PRIMAAX EX Suspension for GILLIG Buses

TROUBLESHOOTING GUIDE (CONTINUED)					
CONDITION	POSSIBLE CAUSE	CORRECTION			
Vehicle leaning	Air spring not inflated to specification or damaged	Repair the air system and check ride height as per vehicle manufacturer's specifications.			
	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's guidelines and align the vehicle.			
	Loose hex bolts	Tighten the hex bolts to specification, see Torque Specifications section in this publication.			
	Front suspension	Inspect and repair the front suspension.			
	Suspension is overloaded	Redistribute load to correct weight.			
Suspension will not reach ride height	Air spring leaking or damaged	Replace the air spring.			
	Leak in the air system	Inspect air fittings, see Air Fittings in the Preventive Maintenance section of this publication. Repair the air system as necessary and check the ride height as per vehicle manufacturer's specifications.			
	Air line obstructed or improperly connected	Repair the air system and check the ride height as per vehicle manufacturer's specifications.			
	HCV dump port activated	Check the HCV dump port for proper connection per the vehicle manufacturer's instructions.			
Air springs deflate when parked	Leak in the air system	Inspect air fittings, see Air Fittings in the Preventive Maintenance section of this publication. Repair the air system as necessary and check the ride height as per vehicle manufacturer's specifications.			
	Malfunctioning height control valve	Refer to vehicle manufacturer for test procedure and replacement as necessary.			
Excessive frame	Ride height set incorrectly	Adjust the ride height per vehicle manufacturer's specifications.			
slope	Suspension is overloaded	Redistribute the load to correct weight.			

H

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.

800 South Frontage Road Woodridge, IL 60517-4904 USA 1.866.755.5968 (Toll-free U.S. and Canada)

Fax 1.630.910.2899

TRUCK COMMERCIAL VEHICLE SYSTEMS

1.630.910.2800 (Outside U.S. and Canada)

Hendrickson

www.hendrickson-intl.com

17730-323 Rev B 07-23

© 2022-2023 Hendrickson USA, LL.C. All Rights Reserved. All trademarks shown are owned by Hendrickson USA, LL.C., or one of the affiliates, in one or more countries. Information contained in this literature was accurate at the time of publication. Product changes may have been made after the copyright date that are not reflected.