



H TECHNICAL PROCEDURE

COMFORT AIR® Single Axle Rear Air Suspension for Blue Bird Buses

SUBJECT: Service Instructions

LIT NO: 17730-246

DATE: February 2022

REVISION: D

TABLE OF CONTENTS

Section 1	Introduction	2	Section 8	Component Replacement	
Section 2	Product Description	2	Fasteners	25	
Section 3	Important Safety Notice	4	Height Control Valve	25	
Section 4	Parts Lists	8	Air Spring	27	
Section 5	Special Tools	12	Shock Absorber	29	
Section 6	Preventive Maintenance		Lower Shock Absorber Bracket	29	
	Hendrickson Recommended		Cross Channel (if equipped)	31	
	Inspection Intervals	14	Transverse Torque Rods	33	
	Component Inspection	14	Torque Rod Bushings	34	
	Air Fittings	15	Main Support Member & Clamp Group	35	
	U-bolt Locknuts	15	Frame Hanger	39	
	QUIK-ALIGN Pivot Bushing	16	QUIK-ALIGN Pivot Bushing	41	
	Transverse Torque Rods	17	Section 9	Torque Specifications	46
	Shock Absorber	18	Section 10	Plumbing Diagram	50
Section 7	Alignment & Adjustments		Section 11	Troubleshooting Guide	51
	Ride Height Adjustment	20			
	Drive Axle Alignment Inspection	22			
	Axle Pinion Angle	23			
	Axle Lateral Alignment	23			
	Alignment Adjustment	24			

SECTION 1

Introduction

This publication is intended to acquaint and assist maintenance personnel in the preventive maintenance, service, repair, and rebuild for the COMFORT AIR® single axle air suspension system as installed on applicable Blue Bird Buses.

NOTE

Use only Hendrickson Genuine Parts for servicing this suspension system.

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

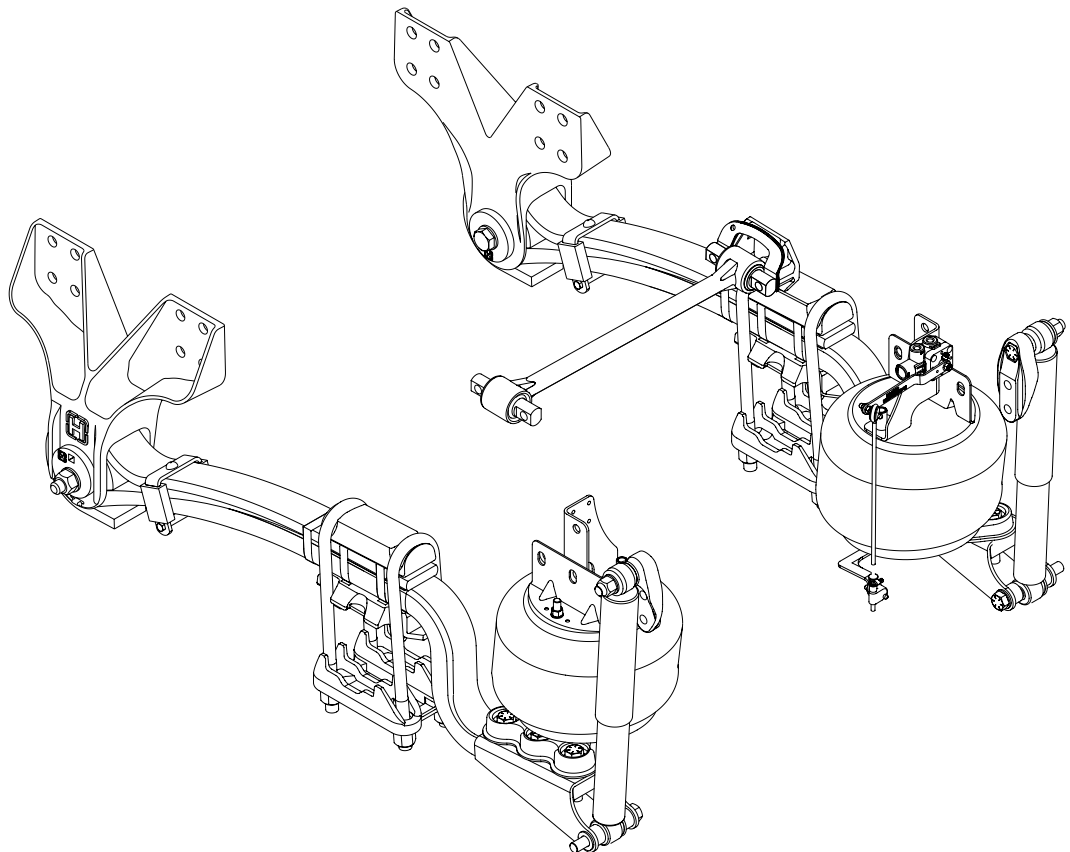
Hendrickson reserves the right to make changes and improvements to its products and publications at any time. Contact Hendrickson Tech Services for information on the latest version of this manual at 1-866-755-5968 (toll-free U.S. and Canada), 1-630-910-2800 (outside U.S. and Canada) or email: techservices@hendrickson-intl.com.

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

SECTION 2

Product Description

FIGURE 2-1





The COMFORT AIR rear air suspension system – Designed specifically for buses, COMFORT AIR rear air suspension delivers outstanding passenger and driver comfort along with exceptional handling characteristics. Using advanced spring technology from Hendrickson, COMFORT AIR’s main support member has an elongated design for optimized roll stiffness. This provides a softer ride and greater protection from the effects of road shock on your chassis, equipment, drivers and passengers.

- **Air springs** – Adjusts to changing load conditions to deliver superior ride quality.
- **Axle connection** – No welding required for reduced maintenance.
- **Frame hanger** – Wide footprint distributes load over a larger area for reduced frame stress and help increase the life of the vehicle.
- **Height control valve** – Maintains precise ride height control through changing road surfaces, load, and driving conditions.
- **Main support member** – Provides neutral roll steer for better handling
- **QUIK-ALIGN® Axle Alignment System** – Reduces maintenance time by offering a fast and easy method to adjust and set alignment without shims
- **Shock absorbers** – Tuned for optimum damping characteristics to provide driving comfort.
- **Torque rods** – Provide greater durability over conventional torque rods and enhance handling during cornering by controlling lateral forces to maintain axle position.

COMFORT AIR SPECIFICATIONS

	21K	23K
Suspension Capacity¹	21,000 Pound (9,525 kg)	23,000 Pound (10,433 kg)
Suspension Weight²	462 Pound (210 kg)	521 Pound (236 kg)
GVW	40,000 Pound (18,144 kg)	
Ride Height	8.0", 8.5", 10.5", 11.5" (with straight frames)	

All applications must comply with applicable Hendrickson specifications and must be approved by Blue Bird with the vehicle in its original, as-built configuration.

All marks are trademarks of their respective owners.

COMFORT AIR is approved for a variety of bus, ambulance and motorhome applications.

1. COMFORT AIR is approved for up to 10 percent off-highway use.
2. The suspension weight includes the frame hanger brackets, main support member assembly, axle clamp group, air springs, shock absorbers, cross channel, upper and lower shock brackets, transverse torque rod and frame bracket, height control system, and fasteners. Weight may vary slightly based upon application specific configuration.

SECTION 3

Important Safety Notice

Proper maintenance, service, and repair is important for 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.

All information 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 it unsafe in operation, or void manufacturer's warranty.

Failure to follow the safety precautions in this manual can result in personal injury and/or property damage. Carefully read and understand all safety related information within this publication, on all decals and 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, COULD RESULT IN SERIOUS INJURY OR DEATH.



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

NOTE

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

SERVICE HINT

A helpful suggestion that will make the servicing being performed a little easier and/or faster.

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



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



■ SAFETY PRECAUTIONS



WARNING

FASTENERS

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

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

ALL COMFORT AIR FASTENERS FOR BLUE BIRD BUSES ARE HENDRICKSON COATED. METRIC FASTENERS ARE CLASS 10.9 BOLTS AND CLASS 10 LOCKNUTS AND NON-METRIC FASTENERS ARE GRADE 8 BOLTS AND GRADE C LOCKNUTS. DO NOT ASSEMBLE WITHOUT THE PROPER FASTENERS. USE ONLY HENDRICKSON COATED FASTENERS TO SUSTAIN PROPER CLAMP FORCE. FAILURE TO DO SO CAN CAUSE ADVERSE VEHICLE HANDLING, PROPERTY DAMAGE OR PERSONAL INJURY.



WARNING

QUIK-ALIGN FASTENERS

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

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



WARNING

LOAD CAPACITY

ADHERE TO THE PUBLISHED CAPACITY RATINGS FOR THE SUSPENSIONS. ADD-ON AXLE ATTACHMENTS (I.E. SLIDING FIFTH WHEELS) AND OTHER LOAD TRANSFERRING DEVICES CAN INCREASE THE SUSPENSION LOAD ABOVE THE RATED AND APPROVED CAPACITIES WHICH COULD RESULT IN FAILURE AND ADVERSE VEHICLE HANDLING, POSSIBLY CAUSING PERSONAL INJURY OR PROPERTY DAMAGE.



WARNING

MODIFYING COMPONENTS

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



WARNING

TORCH/WELDING

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

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

CAUTION**PROCEDURES AND TOOLS**

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

WARNING**PERSONNEL PROTECTIVE EQUIPMENT**

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

WARNING**SUPPORT THE VEHICLE PRIOR TO SERVICING**

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

WARNING**AIR SPRING INFLATION AND DEFLATION**

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

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

CAUTION**AIR SPRING INFLATION**

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

CAUTION**AIR SPRING LOWER MOUNTING STUDS**

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

WARNING**AIR SPRING PRESSURE RETENTION**

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

WARNING

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

WARNING**SHOCK ABSORBERS**

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



WARNING

U-BOLT FASTENERS

U-BOLTS THAT ARE FOUND TO BE LOOSE REQUIRE THAT MATING COMPONENTS BE INSPECTED FOR SIGNS OF WEAR. ANY WORN COMPONENTS MUST BE REPLACED. FAILURE TO DO SO CAN CAUSE PREMATURE CLAMP GROUP FAILURE, COMPONENT DAMAGE, ADVERSE VEHICLE HANDLING, PROPERTY DAMAGE, OR SEVERE PERSONAL INJURY. MAINTAIN CORRECT TORQUE VALUES AT ALL TIMES. CHECK TORQUE VALUES ON A REGULAR BASIS AS SPECIFIED.

WARNING

TORQUE RODS

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

WARNING

MAIN SUPPORT MEMBER

FAILURE OF THE MAIN SUPPORT MEMBER BETWEEN THE U-BOLTS WILL REQUIRE THE REPLACEMENT OF THE MAIN SUPPORT MEMBER AND ALL CLAMP GROUP COMPONENTS. FAILURE TO DO SO CAN RESULT IN CLAMP GROUP FAILURE AND FURTHER FAILURE TO THE MAIN SUPPORT MEMBER, WHICH CAN CAUSE ADVERSE VEHICLE HANDLING, PROPERTY DAMAGE OR SEVERE PERSONAL INJURY.

WARNING

CROSS CHANNEL (IF EQUIPPED)

IMPROPER JACKING METHODS CAN CAUSE STRUCTURAL DAMAGE WHICH CAN CAUSE ADVERSE VEHICLE HANDLING, PROPERTY DAMAGE OR SEVERE PERSONAL INJURY AND WILL VOID HENDRICKSON'S WARRANTY.

- DO NOT USE THE SUSPENSION CROSS CHANNEL AS A JACKING POINT
- REFER TO VEHICLE MANUFACTURER FOR PROPER JACKING INSTRUCTIONS

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:

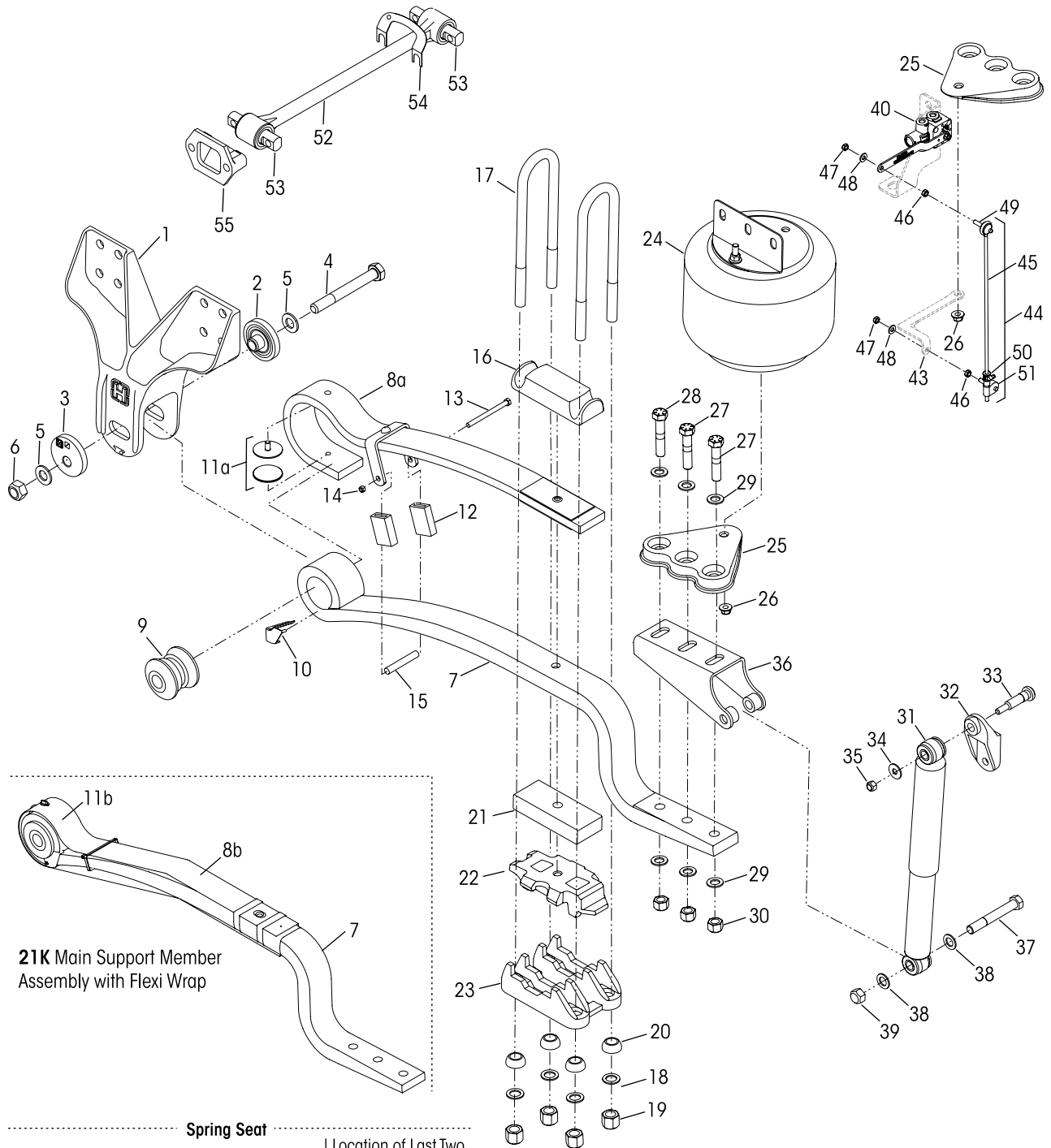
1. WEAR PROPER EYE PROTECTION.
2. WEAR CLOTHING THAT PROTECTS YOUR SKIN.
3. WORK IN A WELL VENTILATED AREA.
4. DO NOT USE GASOLINE, OR SOLVENTS THAT CONTAIN GASOLINE. GASOLINE CAN EXPLODE.
5. HOT SOLUTION TANKS OR ALKALINE SOLUTIONS MUST BE USED CORRECTLY. FOLLOW THE MANUFACTURER'S RECOMMENDED INSTRUCTIONS 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 ANY APPLICABLE WARRANTY.

SECTION 4 Parts Lists

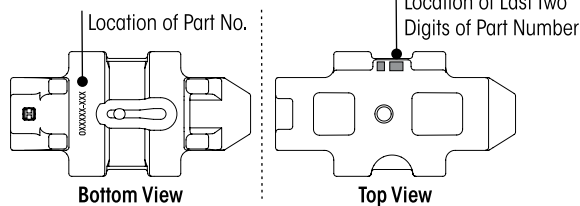
21K • 23K Capacity

Vehicles built after January 2021



21K Main Support Member Assembly with Flexi Wrap

Spring Seat





KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.
1	60784-000	Frame Hanger	2
		QUIK-ALIGN® Pivot Bushing & Collar Service Kits	
	60632-038	Axle Set , Includes Key Nos. 2-6, 9, 11a, 56	
	60632-044	Axle Set , Includes Key Nos. 2-6, 9, 56	
		QUIK-ALIGN Pivot Bushing Service Kit, One Side	
	34013-103	Includes Key Nos. 4-6, 9, 11a, 56	
	34013-322	Includes Key Nos. 4-6, 9, 56	
	60632-013	QUIK-ALIGN Collar Service Kit, Axle Set , Includes Key Nos. 2-6	
2		*QUIK-ALIGN Concentric Collar	3
3		*QUIK-ALIGN Eccentric Collar	1
	60632-018	QUIK-ALIGN Fastener Service Kit, One Side , Includes Key Nos. 4-6	
4		*1"-14 UNF x 7½" Bolt	2
5		*1" Hardened Washer	4
6		*1"-14 UNF Locknut	2
		Main Support Assembly, 3 Holes	2
	82633-000	23K, Includes Key Nos. 7, 8a, 9-10, 11a, 12-15	
	82632-000	21K, Includes Key Nos. 7, 8b, 9-10, 11b	
7		*Main Support Member	2
8 a		*23K, Secondary Leaf	2
b		*21K, Flexi Wrap, Includes Key No. 11b	2
9	58648-000L	QUIK-ALIGN Pivot Bushing	2
10	60392-000	Spring Eye Clip	2
	49175-026	Spring Eye Clip Fastener Service Kit, One Side , Includes Key Nos. 11a, 12-15	
11 a	64817-000	23K, Plastic Isolator Puck	4
b	59770-000	21K, Rubber Isolator Pad	4
12	64272-000	Spring Eye Clip Sleeve	4
13	37042-006	⅞"-14 UNC Bolt	2
14	37587-000	⅞"-14 UNC Locknut	2
15		*Clip Bolt Spacer, 23K	2
16	56805-000	Top Pad	2
	91430-013	U-bolt Service Kit, One Wheel End , Includes Key No. 17 and Kit No. 48417-157	
17		*⅞"-14 UNF x 15" U-bolt	4
	48718-157	U-bolt Fasteners Service Kit, One Wheel End , Includes Key Nos. 18-20	
18		*⅞" Hardened Flat Washer	8
19		*⅞" 14 UNF U-bolt Locknut	8
20		*Spherical Washer	8
21		Spacer	As Req.
	48531-019	1½" Thickness, -4.5° 10½" Ride Height	
	76863-001	2½" Thickness, 2°, 4.5° 11½" Ride Height	
22		**Spring Seat	2
	56501-031	4.5°, -4.5° Pinion Angle, ID No. D31	
	56501-035	2° Pinion Angle, ID No. D35	
23	93302-000	Axle Bottom Cap, <i>Replaces 50216-000</i>	2

KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.
24		Air Spring Assembly	2
a	91349-000	Standard Bumper 2°, 4.5° - 8½" Ride Height	
b	91350-000	Tall Bumper 2°, 4.5° - 11½" Ride Height -4.5° - 8½" & 10½" Ride Height	
25	80502-000	Lower Air Spring Bracket	2
		Air Spring Fastener Service Kit, One Side	
	49177-056	Includes Key No. 26	
	49177-058	Includes Key Nos. 27-30	
26	79626-001	½" -13 UNC Flange Nut	2
27		*¾"-10 UNC x 3½" Bolt	4
28		*¾"-10 UNC x 3¾" Bolt	2
29		*¾" Hardened Washer	12
30		*¾"-10 UNC Locknut	6
31	60998-003L	Shock Absorber	2
32	67463-002	Upper Shock Bracket	2
33	50764-010	¾"-10 UNC Serrated Shank Bolt	2
34	22962-001	¾" Hardened Washer	2
35	49842-000	¾"-10 UNC Locknut	2
36	91551-000	Lower Shock Bracket, 3 Slots	2
37	50764-002	¾"-10 UNC x 5½" Bolt	2
38	22962-001	¾" Hardened Washer	4
39	49842-000	¾"-10 UNC Locknut	2
	59013-000	Single Height Control Valve Service Kit , Includes Key Nos. 40-42	
40		*Height Control Valve	1
41		*¼" Hardened Washer (Not Shown)	2
42		*¼"-20 UNC Locknut (Not Shown)	2
43		***HCV Linkage Bracket	1
44	58994-004	HCV Linkage Assembly, Specify Length	1
		Includes Key Nos. 45-51	
45		*HCV Linkage Rod	1
46		*⅝"-18 UNC Jam Nut	2
47		*⅝"-18 UNC Locknut	2
48		*⅝" Hardened Washer	2
49		*⅝"-18 UNC Stud	2
50		*Valve Arm Clamp	1
51		*Adjustable Valve Arm Joint	1
52		Transverse Torque Rod Assembly	1
	62000-560	2°, 4.5°, -4.5° 8½" Ride Height	
	62000-595	2°, 4.5° 11½" Ride Height -4.5° 10½" Ride Height	
53	47691-000L	Torque Rod Bushing	2
54	49689-000L	Torque Rod Shim	As Req.
55	22186-000	Transverse Torque Rod Frame Bracket	1
56	70867-001	P-80 Lubricant - 10 ml (Not Shown)	As Req.

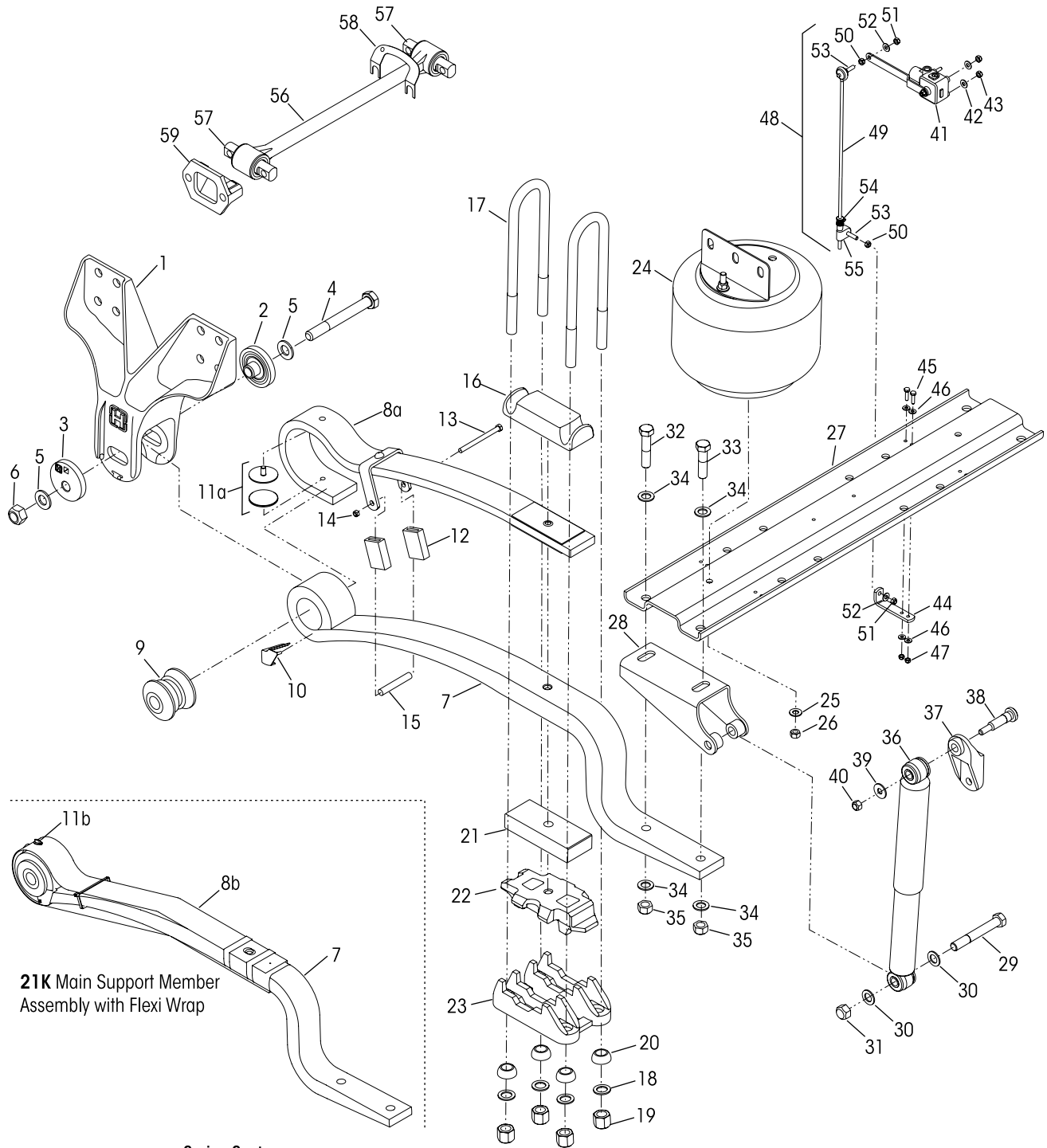
NOTE: * Item included in kit/assembly only, part not sold separately.

** Refer to Page 8 for the ID number location.

*** Not supplied by Hendrickson, used for reference only. Hendrickson is not responsible for components supplied by the vehicle manufacturer. For assistance with maintenance and rebuild instructions on these components, see vehicle manufacturer.

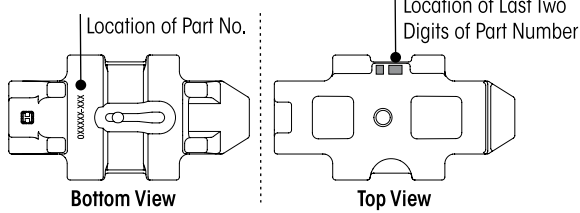
21K • 23K Capacity

Vehicles built prior to January 2021



21K Main Support Member Assembly with Flexi Wrap

Spring Seat





KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.
1	60784-000	Frame Hanger	2
	60632-038	QUIK-ALIGN® Pivot Bushing & Collar Service Kits	
	60632-044	Axle Set , Includes Key Nos. 2-6, 9, 11a, 60	
		Axle Set , Includes Key Nos. 2-6, 9, 60	
		QUIK-ALIGN Pivot Bushing Service Kit, One Side	
	34013-103	Includes Key Nos. 4-6, 9, 11a, 60	
	34013-322	Includes Key Nos. 4-6, 9, 60	
	60632-013	QUIK-ALIGN Collar Service Kit, Axle Set , Includes Key Nos. 2-6, <i>Replaces 60632-001</i>	
2		*QUIK-ALIGN Concentric Collar	3
3		*QUIK-ALIGN Eccentric Collar	1
	60632-018	QUIK-ALIGN Fastener Service Kit, One Side , Includes Key Nos. 4-6	
4		*1"-14 UNF x 7½" Bolt, <i>Replaces 64107-000</i>	2
5		*1" Hardened Washer, <i>Replaces 22962-035</i>	4
6		*1"-14 UNF Locknut, <i>Replaces 64108-000</i>	2
		Main Support Assembly	2
	82433-000	23K, Includes Key Nos. 7, 8a, 9-10, 11a, 12-15 <i>Replaces 60779-000</i>	
	82432-000	21K, Includes Key Nos. 7, 8b, 9, 11b, 12	
7		*Main Support Member	2
8 a		*23K, Secondary Leaf	2
b		*21K, Flexi Wrap, Includes Key No. 11b	2
9	58648-000L	QUIK-ALIGN Pivot Bushing	2
10	60392-000	Spring Eye Clip	2
	49175-026	Spring Eye Clip Fastener Service Kit, One Side , Includes Key Nos. 11a, 12-15	
11 a	64817-000	23K, Plastic Isolator Puck	4
b	59770-000	21K, Rubber Isolator Pad	4
12	64272-000	Spring Eye Clip Sleeve	4
13	37042-006	¾"-14 UNC Bolt, <i>Replaces 37042-002</i>	2
14	37587-000	¾"-14 UNC Locknut	2
15		*Clip Bolt Spacer	2
16	56805-000	Top Pad	2
		U-bolt Service Kit, One Wheel End	
	91430-013	Includes Key No. 17a and Kit No. 48417-157	
	91430-001	Includes Key No. 17b and Kit No. 48417-157	
	91430-005	Includes Key No. 17c and Kit No. 48417-157	
	91430-019	Includes Key No. 17d and Kit No. 48417-157	
17		*¾"-14 UNF U-bolt	4
a		15"	
b		16¼"	
c		17¼"	
d		18"	
	48718-157	U-bolt Fasteners Service Kit, One Wheel End , Includes Key Nos. 18-20	
18		*¾" Hardened Flat Washer	8
19		*¾" 14 UNF U-bolt Locknut	8
20		*Spherical Washer	8
21		Spacer	As Req.
	48531-014	1½"	
	76863-001	2½"	
22		**Spring Seat	2
	57022-010	•Meritor RS15-120 - 4½° Pinion Angle LH / RH	
		•Meritor RS21-145, RS23-160	
	56501-001	2° Pinion Angle LH/RH, 8.5" Ride Ht., ID No. D01	
	56501-002	2.5° Pinion Angle LH/RH, ID No. D02	
	56501-006	4.5° Pinion Angle LH/RH, 8.5" Ride Ht., ID No. D06	
	56501-009	6° Pinion Angle LH/RH, ID No. D09	
	56501-020	4.5° Pinion Angle LH/RH, 10.5" Ride Ht., ID No. D20	
	56501-021	0° Pinion Angle LH/RH, ID No. D21	
	56501-022	2° Pinion Angle LH/RH, 10.5" Ride Ht., ID No. D22	
		•Meritor RC23-160	
	56501-020	Negative 4.5° Pinion Angle LH/RH, ID No. D20	

KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.
23	93302-000	Axle Bottom Cap, <i>Replaces 50216-000</i> Meritor RS21-145 - 0-9½° Pinion Angle LH/RH, Meritor RC23-160 - Negative 0-9½° Angle LH/RH	2
24		Air Spring Assembly, Includes Upper Bracket and Fasteners	2
	60925-002	21K • 23K	
	60929-002	Front Engine, 21K • 23K	
	49177-006	Lower Air Spring Fastener Service Kit, Axle Set Includes Key Nos. 25-26	
25		*½" Flat Washer	2
26		*½"-13 UNC Nylocknut	2
27		Cross Channel - 40° Axle Dowel Pin Centers	1
	57317-001	Standard	
	64399-001	For Differential Relief	
	67156-001	Square Tube for Rear Engine, Propane	
	57356-000	Lower Shock Bracket Assembly, Includes Key Nos. 28-31	2
28	57355-000	Lower Shock Bracket	2
29	50764-002	¾"-10 UNC x 5½" Bolt	2
30	22962-001	¾" Hardened Washer	4
31	49842-000	¾"-10 UNC Locknut	2
	50763-004	Cross Channel Fastener Service Kit, Axle Set , Includes Key Nos. 32-35	
32		*¾"-10 UNC x 3½" Bolt	2
33		*¾"-10 UNC x 3" Bolt	2
34		*¾" Hardened Washer	8
35		*¾"-10 UNC Locknut	4
36	60998-003L	Shock Absorber, <i>Replaces 60998-001</i>	2
37	67463-002	Upper Shock Bracket	2
38	50764-010	¾"-10 UNC Serrated Shank Bolt	2
39	22962-001	¾" Hardened Washer	2
40	49842-000	¾"-10 UNC Locknut	2
	59013-000	Single Height Control Valve Service Kit , Includes Key Nos. 41-43	
41		*Height Control Valve	1
42		*¼" Hardened Washer	2
43		*¼"-20 UNC Locknut	2
		HCV Linkage Lower Bracket Service Kit	
	57430-000	All Except Rear Engine, Includes Key Nos. 44a-47	
	57430-003	Rear Engine Only, Includes Key Nos. 44b-47	
44		HCV Linkage Bracket	1
a	56789-000	All Except Rear Engine	
b	58367-000	Rear Engine	
45	56935-001	¼"-20 UNC x 1¼" Bolt	2
46	22962-028	¼" Hardened Washer	4
47	49983-000	¼"-20 UNC Locknut	2
48	58994-XXX	HCV Linkage Assembly, Specify Length Includes Key Nos. 49-55	1
49		*HCV Linkage Rod	1
50		*⅝"-18 UNC Jam Nut	2
51		*⅝"-18 UNC Locknut	2
52		*⅝" Hardened Washer	2
53		*⅝"-18 UNC Stud	2
54		*Valve Arm Clamp	1
55		*Adjustable Valve Arm Joint	1
56	62000-XXX	Transverse Torque Rod Assembly, Specify Length	1
57	47691-000L	Torque Rod Bushing	2
58	49689-000L	Torque Rod Shim	As Req.
59	22186-000	Transverse Torque Rod Frame Bracket	1
60	70867-001	P-80 Lubricant - 10 ml (Not Shown)	As Req.

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

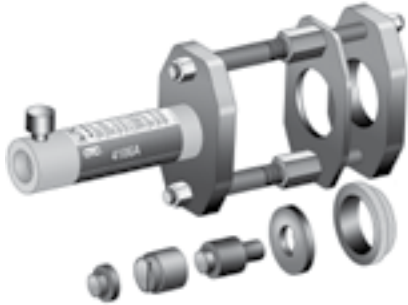
** Refer to Page 10 for the ID number location.

SECTION 5 Special Tools

QUIK-ALIGN PIVOT BUSHING SERVICE TOOLS

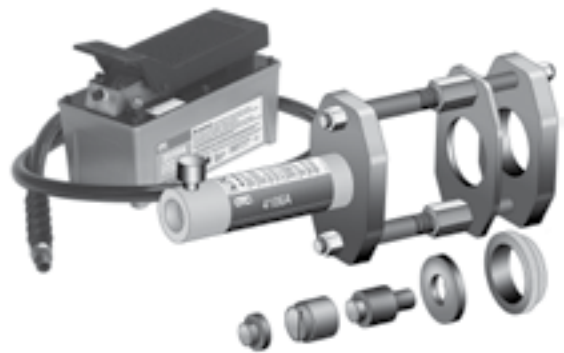
HENDRICKSON PART NO. 66086-202

OTC Part No. 4246 Visit otctools.com



HENDRICKSON PART NO. 66086-204

OTC Part No. 4247 Visit otctools.com



QUIK-ALIGN PIVOT BUSHING SERVICE TOOL

Hendrickson Part No. 66086-203L

Reference Hendrickson Literature No. 59310-061



QUIK-ALIGN SOCKET TOOL

Hendrickson Part No. 66086-200

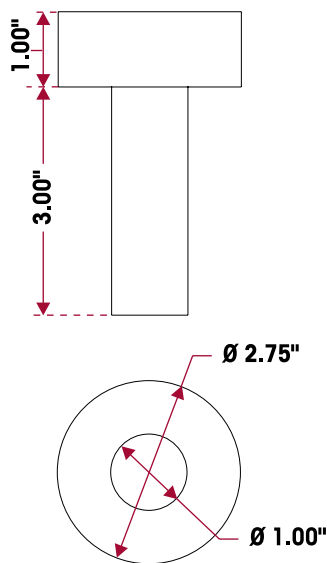
OTC Part No. 1767

Visit otctools.com

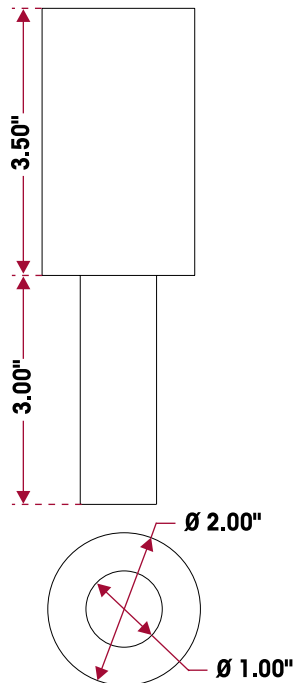


These shop made tools are designed to service QUIK-ALIGN. These tools are made from cold rolled steel or equivalent. Drawings are for reference only. Hendrickson does not supply these tools.

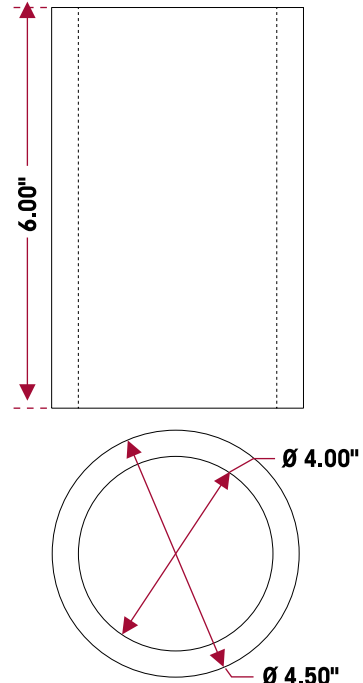
Pivot Bushing Installer



Pivot Bushing Remover



Pivot Bushing Receiver





TORQUE ROD BUSHING TOOLS

FUNNEL

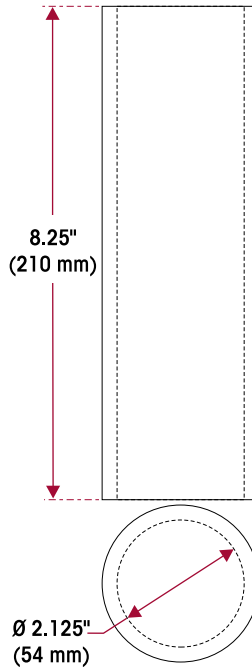
Hendrickson Part No. 66086-001L

ULTRA ROD®

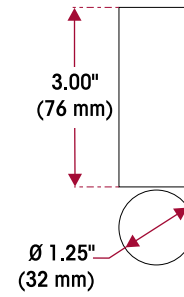


These shop made tools are designed to install and remove torque rod bushings. Bushing tools are made from cold rolled steel or equivalent. Drawings are for reference only. Hendrickson does not supply these tools.

Receiving Tool



Installation / Removal Tool



SECTION 6

Preventive Maintenance

Following appropriate inspection procedures is important to help ensure the proper maintenance and operation of the COMFORT AIR suspension system and component parts function to their highest efficiency. Look for bent or cracked parts. Replace all worn or damaged parts.

HENDRICKSON RECOMMENDED INSPECTION INTERVALS	PRE-DELIVERY INSPECTION	FIRST IN-SERVICE INSPECTION	PREVENTIVE MAINTENANCE
Visual inspection for proper assembly and function. Check for all of the following and replace components as necessary: <ul style="list-style-type: none"> • Signs of unusual movement, loose or missing components • Signs of abrasive or adverse contact with other components • Damaged, or cracked parts • Improper suspension function or alignment 	Within the First 100 Miles (500 Km)	Within the First 1,000 Miles (1,600 Km) or 100 Hours	On-Highway 20,000 Miles (32,000 Km) or Every 6 Months Whichever comes First
Visually inspect the overall condition, tighten fasteners to torque and look for any signs of damage to: <ul style="list-style-type: none"> • Main Support Member • Spring Seat • Clamp group • Transverse torque rod 			
Inspect all fasteners for proper torque using a calibrated torque wrench			

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

COMPONENT INSPECTION

- **Air spring** – Look for chafing or any signs of spring or 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. Replace all worn or damaged parts.
- **Clamp group** – Visually inspect for any loose or damaged fasteners. Verify the U-bolt locknuts have the proper torque values maintained. See the U-bolt Locknuts in this section.
- **Cross channel (if equipped)** – Vehicles built prior to January 2021, check for cracks, damage, metal shavings, or looseness at the main support member connection. Replace all worn or damaged parts.
- **Fasteners** – Look for any loose or damaged fasteners on the entire suspension. Make sure all fasteners are tightened to a torque value within the specified torque range. See Torque 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. Correct the torque if necessary. Replace any worn or damaged fasteners with genuine specified fasteners.
- **Frame hanger** – Check for any signs of loosening or damage at the QUIK-ALIGN connections. Check for cracks, damage, or any signs of looseness at the mounting fasteners. Replace all worn or damaged parts.



- **Height control valve and air lines** – Check the suspension air system for air leaks. Check all air lines for proper routing. Check for chafing or pinched air lines. Check the height control valve linkage for damage or interference with peripheral components. Refer to Air Lines inspection in this section.
- **Main support member assembly** – Look for signs of looseness, cracks, or other damage. Inspect QUIK-ALIGN bushings for looseness, torn or shredded rubber. Inspect the cross channel connection for looseness or damage. Inspect isolator puck for wear or damage. Inspect secondary leaf for signs of looseness or damage. Check torque on QUIK-ALIGN fasteners, cross channel fasteners (if applicable), and U-bolts. Correct the torque if necessary. Replace all worn or damaged parts.
- **QUIK-ALIGN connection** — Visually inspect the connection for signs of looseness or movement. Visually inspect the bushing for wear. Verify the connections have the proper torque values maintained. See the Torque Specifications section in this publication for recommended torque requirements.

Refer to the QUIK-ALIGN Fastener Warning in the Important Safety Notice section in this publication prior to installing the QUIK-ALIGN connection
- **Shock absorbers** – Visually inspect for any signs of dents or leakage. Misting is not considered a leak, see Shock Absorber Inspection in this section.
- **Tire wear** – Inspect the tires for wear patterns that may indicate suspension damage or misalignment. Replace all worn or damaged parts.
- **Torque rods** – All torque rods must be inspected for looseness, torn or shredded rubber, and proper fastener torque. If there is metal-to-metal contact in the bushing joint, this is a sign of excessive bushing wear and the torque rod needs to be serviced, see Longitudinal and Transverse Torque Rod inspection in this section.
- **Wear and damage** – Inspect all parts of the suspension for wear and damage. Look for bent or cracked parts. Replace all worn or damaged parts.

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

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.

NOTE

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

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

U-BOLT LOCKNUTS

NOTE

Hendrickson Truck Suspension Systems U-bolt clamp group hardware for the COMFORT AIR suspension are phosphate and oil coated 7/8"-1.4 UNF Grade C high locknuts and 7/8"-1.4 UNF Grade 8 U-bolts.

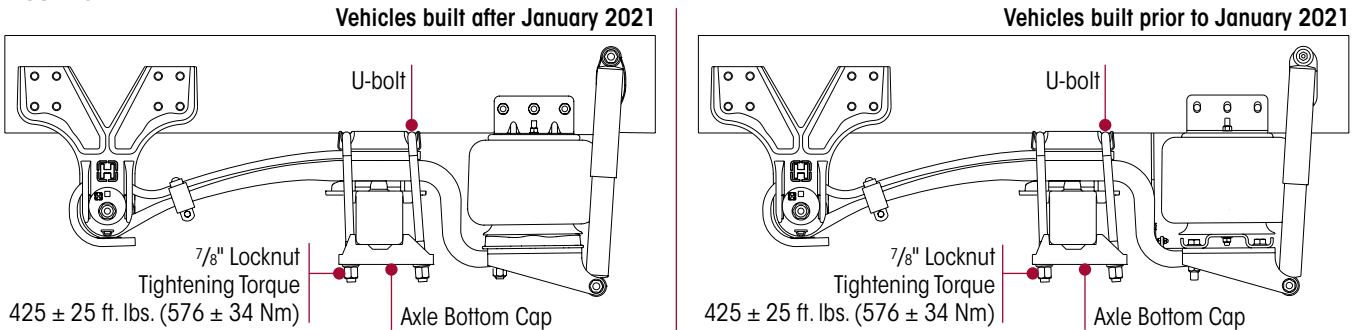


IT IS IMPORTANT THAT THE U-BOLT CLAMP GROUP CONNECTION BE PROPERLY ALIGNED AND HAVE THE PROPER TIGHTENING TORQUE VALUES MAINTAINED. METAL SURFACES CAN WORK AND WEAR AGAINST OTHER RELATED CLAMP GROUP COMPONENTS IF NOT PROPERLY ALIGNED OR PROPERLY TIGHTENED TO MAINTAIN THE PROPER CLAMP FORCE. FAILURE TO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

Maintaining the correct U-bolt torque value is important to help ensure proper suspension component performance.

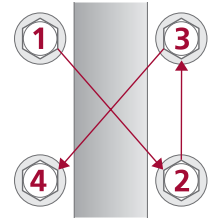
1. Inspect the U-bolts for proper seating of components, i.e. no gaps, etc.
2. U-bolt locknuts must be torqued to specification, refer to Torque Specification section of this publication. **DO NOT** exceed specified torque on U-bolt locknuts.

FIGURE 6-1



3. U-bolt locknuts must be re-torqued at the following intervals:
 - At preparation for delivery.
 - At 1,000 miles (1,600 km) of service on a new vehicle or vehicle with serviced axle attachment assembly.
 - Thereafter follow the 1-year / 20,000 miles (32,000 km) inspection and re-torque interval.
4. Tighten the U-bolt locknuts in the proper sequence, shown in Figure 6-2, evenly in 50 foot pounds increments to achieve uniform bolt tension to 425 ± 25 foot pounds torque.

FIGURE 6-2



QUIK-ALIGN PIVOT BUSHING

WARNING

THE PIVOT BUSHINGS ARE CRITICAL COMPONENTS OF THE COMFORT AIR SUSPENSIONS. IF THESE COMPONENTS APPEAR DAMAGED OR WORN THE COMPONENT MUST BE REPLACED. FAILURE TO REPLACE SUCH WORN OR DAMAGED COMPONENTS CAN RESULT IN THE DEFORMATION OF PARTS, LOSS OF CLAMP FORCE, BOLT FAILURE, LOSS OF THE AXLE'S ALIGNMENT, ADVERSE VEHICLE HANDLING, PROPERTY DAMAGE, OR PERSONAL INJURY.

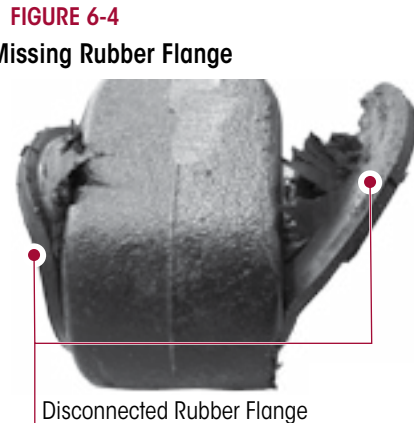
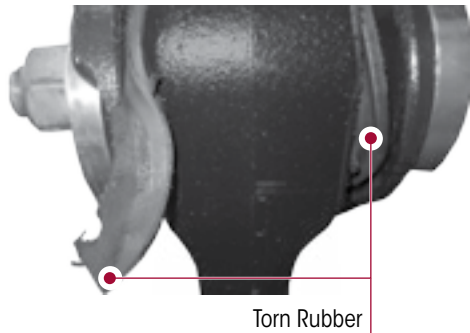
There are two types of pivot bushing inspections. The pivot bushing can be visually inspected by looking at the outer rubber flange(s) of the bushing. If the visual inspection warrants, a physical inspection can be conducted in which disassembly is required.

VISUAL INSPECTION

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

- The main support member is designed with the pivot bushing centered in the end hub. If the pivot bushing is not centered in the end hub, it is an indication that the pivot bushing could be worn and a pivot bushing physical inspection is required.
- If the pivot bushing shows signs of torn, separated or disconnected rubber, see Figures 6-3 and 6-4, this could be a result of axle misalignment. If this condition is evident, a pivot bushing physical inspection is required.
- If the outer rubber flange(s) is missing, or there are shards of rubber visible, see Figure 6-5, this could be a result of axle misalignment. If this condition is evident, pivot bushing replacement is required.

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



PHYSICAL INSPECTION

1. Remove the main support assembly, refer to Main Support Member in the Component Replacement of this publication.
2. Inspect the pivot bushing connection, examine the pivot bushing inner metal area.
 - **No replacement is needed** if the bushing exhibits a tight joint, see Figure 6-6. An imprinted two-line wear pattern on the bushing inner metal indicates the pivot bushing is securely clamped in the frame hanger.
 - **Replacement is necessary** if any indications of the following are apparent, see Figure 6-7: Signs of rust, distorted, separated or torn rubber, elongated or damaged bore. This could be a result of axle misalignment or loose fasteners.
3. Inspect the inside of the frame hanger legs and the QUIK-ALIGN collars. If any of the following are present, the pivot bushing and one or more of the mating components may require replacement:
 - Evidence of wear marks on the inside of the frame hanger legs indicating metal to metal contact or movement.
 - The snout of the QUIK-ALIGN concentric or eccentric collar is elongated or damaged.
4. Check the suspension alignment and adjust if necessary. Refer to Alignment & Adjustments section of this publication.

FIGURE 6-6
PHYSICAL INSPECTION

GOOD JOINT – No Replacement Needed

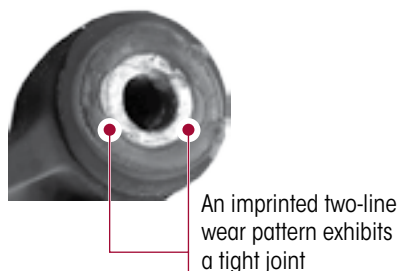
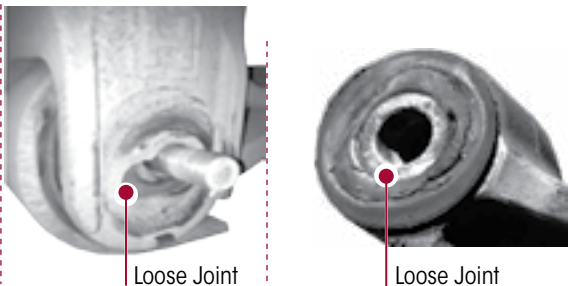


FIGURE 6-7

INDICATIONS OF A LOOSE JOINT – Replacement Needed



TRANSVERSE TORQUE RODS



WARNING

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

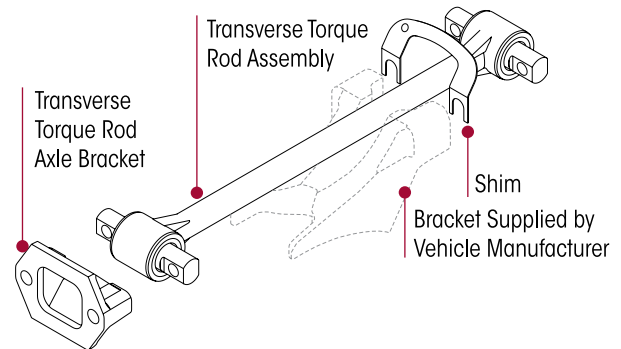
NOTE

Hendrickson recommends the use of Hendrickson coated, Class 10.9 bolts and Class 10 locknuts for all straddle mount torque rod attachments.

FIGURE 6-8

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

Physical inspection for torque rod looseness. With the vehicle shut down, a lever check can be made with a long pry bar placed under each torque rod end and pressure applied.



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

- If the lateral alignment of the axles is incorrect, it may be necessary to shim the transverse torque rod at the straddle mount end, see Figure 6-8. Refer to Axle Lateral Alignment in the Alignment & Adjustments section of this publication.
- The transverse torque rods also control axle walk-out during cornering. The mounting brackets at the axle housing end of the torque rods are furnished and welded into position on the axle housings by the axle or vehicle manufacturer, see Figure 6-8.

Torque rod straddle bushings may be replaced by pressing out the worn bushings and installing new replacement bushings, see Torque Rod Bushing in the Component Replacement section of this publication. A two-piece rod is also available to cut and weld to the desired length, see Hendrickson Literature No. 45745-148.

Torque rod end attaching fasteners are furnished by the vehicle manufacturer. It is important that the tightening torque of the locknuts be checked during preventive maintenance service. Follow the vehicle manufacturer's specifications for torque values. It is important to check the **tightening torque** of the locknuts during preventive maintenance and service. Follow the tightening torque specifications and all applicable preventive maintenance, service and safety instructions issued by the respective vehicle manufacturers.

SHOCK ABSORBER

NOTE

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

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

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

FIGURE 6-9

HEAT TEST AND PHYSICAL INSPECTION

1. **Heat Test:** Drive the vehicle with the lift axle down at moderate speeds on a rough road for a minimum of fifteen minutes.



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

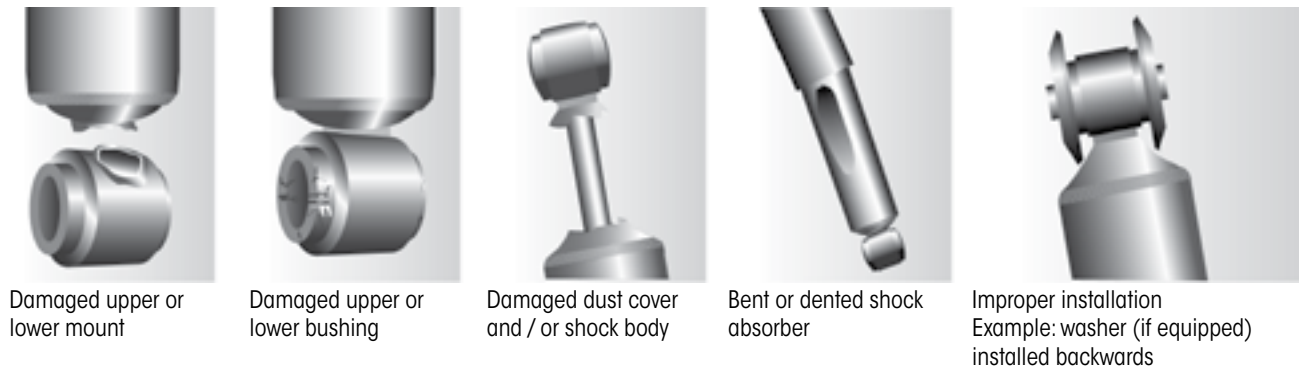
- a. Perform a heat test by carefully touching or placing a hand near the shock absorber body below the dust cover. Touch the frame to get an ambient reference, see Figure 6-9. A shock absorber that is warm to the touch is acceptable, a cold shock absorber should be replaced.
2. **Physical Inspection:** To inspect for an internal failure, remove and shake the suspected shock absorber. Listen for the sound of metal parts rattling inside. The rattling of metal parts can indicate that the shock absorber has an internal failure and the shock absorber should be replaced.

VISUAL INSPECTION

Look for these potential problems when doing a visual inspection, see Figure 6-10. Inspect the shock absorbers fully extended. Replace as necessary.

FIGURE 6-10

SHOCK ABSORBER VISUAL INSPECTION – UNACCEPTABLE CONDITIONS



LEAKING VS. MISTING SHOCK ABSORBER

INSPECTION

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

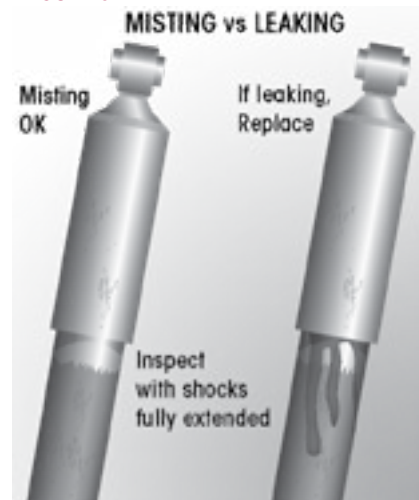
Many shock absorbers are often misdiagnosed as failures. Misting is the process whereby very small amounts of shock absorber fluid evaporate at a high operating temperature through the upper seal of the shock absorber. When the “mist” reaches the cooler outside air, it condenses and forms a film on the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

NOTE

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

Inspect the shock absorber fully extended. **A shock absorber that is truly leaking** will show signs of fluid **leaking in streams from the upper seal**, see Figure 6-11. These streams can easily be seen, underneath the main body (dust cover) of the shock absorber. Replace as necessary.

FIGURE 6-11



SECTION 7

Alignment & Adjustments

RIDE HEIGHT

The Comfort Air suspension for Blue Bird vehicles is equipped with a height control valve located above the left air spring on the inside of the left frame rail. Refer to the Plumbing Diagram section of this publication.

INSPECTION

1. Drive the vehicle onto a level surface.
2. Free and center all suspension joints by slowly moving vehicle back and forth several times without using the brakes. It is **IMPORTANT** when coming to a complete stop to verify the brakes are released.
3. Chock front wheels. **DO NOT** set parking brake.
4. Verify that the air system is at full operating pressure.

SERVICE HINT

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



WARNING

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

5. See Air Spring Safety Notice in the Important Safety Notice section of this publication prior to deflating or inflating the suspension system.
6. Cycle the air system.
7. Deflate the suspension. Detach the upper rubber grommet of the height control valve linkage from the upper stud and exhaust the suspension system air by lowering the height control valve linkage arms, see Figure 7-1.
8. Inflate the suspension. Raise the height control valve arms and attach the upper rubber grommets of the height control valve linkage to the height control valve arms. Allow the suspension system to inflate.
9. Re-attach the upper grommet of the height control valve linkages onto the upper studs to fill the suspension system with air. Wait until the airflow to the front air springs has stopped.
10. Measure the ride height using one of the method shown below.
 - **Method A** – The **actual ride height** is measured at the bottom of the frame rail to the bottom of the main support member assembly as shown in Figure 7-2. The actual ride height is $4\frac{7}{8} \pm \frac{1}{4}$ " as shown in the Table 7-2, **Dimension A**.
 - **Method B** – The **referenced ride height** is measured at the normal running length of the shock absorber. Measure from center of upper shock eye to center of lower shock eye, see **Dimension B**, in Figure 7-2. The specific running length of the shock absorber varies per specific OEM applications as shown in the matrix.
11. If the ride height **IS** correct then height control valve adjustment is not required.
12. If the ride height is **NOT** correct, then height control valve adjustment is required. Refer to the Adjustment Procedure in this section.

FIGURE 7-1

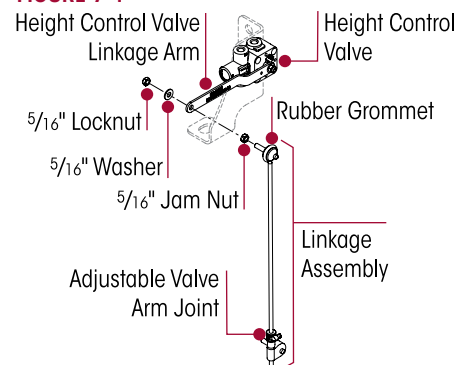
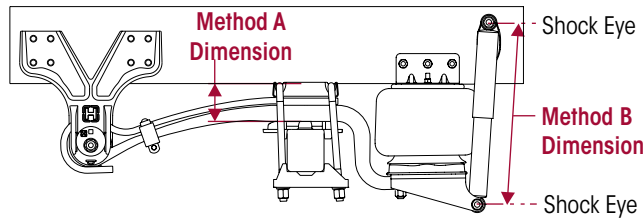




FIGURE 7-2
Vehicles built after January 2021



Vehicles built prior to January 2021

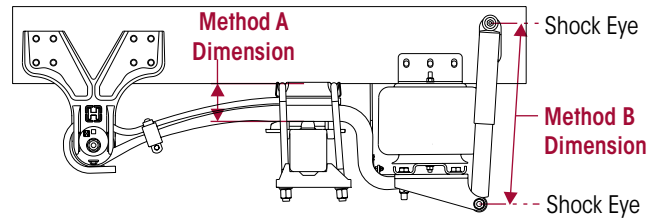


TABLE 7-2

OEM AND MODEL	METHOD A	METHOD B
	ACTUAL RIDE HEIGHT Bottom of the frame rail to the bottom of the main support member	REFERENCED RIDE HEIGHT Shock absorber length with a tolerance of ¼"
BLUE BIRD - A3FE/A3RE/BBCV	4 7/8" ± ¼" (124 mm ± 6 mm)	22.68" ± ¼" (576 mm ± 6 mm)
BLUE BIRD - RE/QBRE		22.75" ± ¼" (578 mm ± 6 mm)
BLUE BIRD - TCFE/CSFE		
BLUE BIRD - TCFE FLAT FLOOR		
BLUE BIRD - C4RE		23.00" ± ¼" (584 mm ± 6 mm)
BLUE BIRD - TSFE/CIFE		

ADJUSTMENT PROCEDURE

1. Drive the vehicle onto a level surface.
2. Free and center all suspension joints by slowly moving vehicle back and forth several times without using the brakes. It is **IMPORTANT** after coming to a complete stop to verify the brakes are released.
3. Chock front wheels. **DO NOT** set parking brake.
4. When checking or adjusting ride height, verify and maintain the vehicle's air system is at full operating pressure.

SERVICE HINT

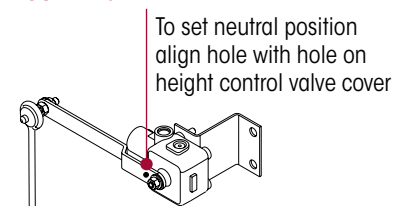
It is important that the height control valve is cycled completely before and after any ride height adjustments. The cycling of the height control valve will help to make the adjustment more accurate.



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.
6. Disconnect the height control valve arm from the rubber grommet. Lower the height control valve arm to exhaust the air from the air springs and deflate the rear suspension.
7. Refill the suspension by raising the height control valve arm by hand, so that the suspension is above the proper ride height.
8. Lower the height control valve arm to exhaust the air system until the suspension is at proper ride height.
9. Use a 1/8" wooden dowel rod (golf tee) to set the neutral position for the height control valve by aligning the hole in the height control valve arm with the hole in the height control valve cover, as shown in Figure 7-3. **DO NOT** use a metal rod or nail as this may cause damage to the height control valve.

FIGURE 7-3





10. Adjust the extension rod assembly so the rubber grommet can be reconnected to the height control valve arm at the proper height. Check the rubber components for any tearing or damage, replace as necessary.
11. Reconnect the height control valve arm to the rubber grommet.
12. Tighten the clamp on the adjustable valve arm joint with a screwdriver until securely fastened.
13. Remove the dowel from the height control valve.
14. If equipped with a suspension dump system in the cab, cycle the suspension air system by using the cab dump valve control. If not equipped with a dump valve, cycle the height control valve arm as stated in Steps numbers 4 through 6 above.
15. Recheck the ride height.
16. Repeat Steps 6 through 15 until the ride height is within specification.

NOTE

During cycle operation of the height control valve it is normal to experience a limited amount of exhaust noise.

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's ride height is within specifications and adjust as necessary, see Ride Height in the Alignment & Adjustments section of this publication.
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.

NOTE

Depending on your alignment equipment, enter the vehicle year, make, model and design into the system's computer to determine the OEM'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 all drive axles are aligned, check the pinion angle of each drive axle with a digital protractor, see Figure 7-4. Refer to the vehicle manufacturer specifications for the required pinion angles.
 - a. If all pinion angles are within the vehicle manufacturer's specifications then proceed to Step 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 all drive axle alignments and pinion angles are within the vehicle manufacturer's specifications then the alignment procedure is complete.

AXLE PINION ANGLE

The vehicle manufacturer establishes drive axle pinion angles. If it is necessary to fine-tune the pinion angle it will be necessary to contact the vehicle manufacturer.

FIGURE 7-4



TO CHECK THE PINION ANGLE

1. 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.
2. **DO NOT** set the parking brake. Chock the **FRONT** wheels of the vehicle.
3. Verify vehicle is at the proper ride height, see Ride Height Adjustment in this section.
4. Install a digital protractor on the drive axle housing as shown in Figure 7-4.
5. Verify the pinion angle is correct per the vehicle manufacturer's specifications. If an adjustment is needed please contact the vehicle manufacturer.

AXLE LATERAL ALIGNMENT

1. 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 7-5.
3. Verify the axle lateral alignment is within the vehicle manufacturer's specifications. Adding or removing shims that are located between the transverse torque rod and the frame rail will normally correct the axle lateral alignment.
 - A general rule of thumb is to use a torque rod shim with a thickness that is half of the difference between the two measurements.

EXAMPLE

If the axle lateral alignment is out of specification by $\frac{1}{4}$ " (6 mm), remove or install a $\frac{1}{8}$ " (3 mm) torque rod shim between the transverse torque rod and frame rail as needed, see Figure 7-6.

NOTE

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

FIGURE 7-5

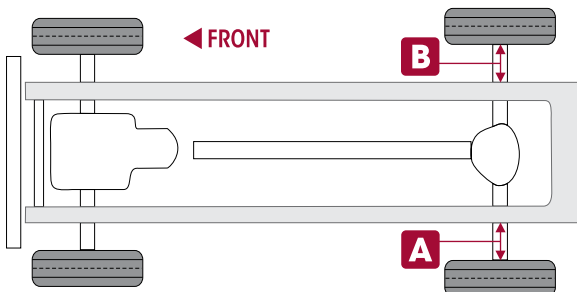
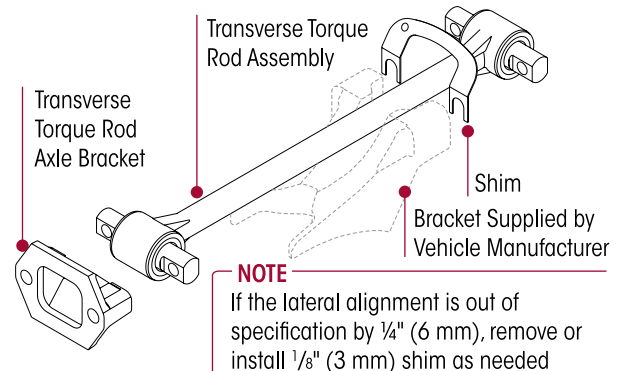


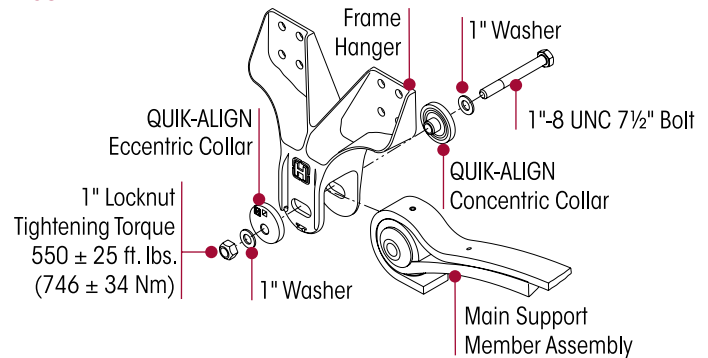
FIGURE 7-6



ALIGNMENT ADJUSTMENT

FIGURE 7-7

1. Remove the existing left side QUIK-ALIGN hardware and replace with a new left side QUIK-ALIGN service kit, see Parts List section of this publication.
2. Tighten the QUIK-ALIGN locknut to 100 foot pounds. This will hold the eccentric flanged washer (see Figure 7-7) in place against the hanger face and within the adjustment guide, but loose enough to permit the eccentric flanged washer to rotate freely.
3. Using an alignment tool or ½" (13 mm) square drive breaker bar, rotate the left eccentric alignment collar to align axle (Clockwise rotation moves axle forward, counter clockwise rotation moves axle rearward). A 90° rotation of the QUIK-ALIGN collar will move axle fore and aft ± ½" (13 mm) from center.



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.

4. Measure from the straight edge to the forward face of the axle arm to verify both sides of axle are equal and tighten the QUIK-ALIGN locknuts to 550 ± 25 foot pounds torque, see Figure 7-7.

NOTE

The Eccentric collar (1 per suspension) is located on the outside of the left frame hanger. The concentric collars (3 per suspension) are located on the inside of the left frame hanger and both outside and inside of the right frame hanger.

NOTE

Axle adjustment is applied to the LEFT side of the vehicle only. If adjustment to the right side of the vehicle is necessary, it will require replacement of the outside concentric collar with an eccentric collar and repeat Steps 6 to 10 on the right side of the vehicle.

5. Following alignment of axle, move vehicle back and forth several times prior to removing straight edge from frame, and recheck measurements to confirm adjustments.
6. Repeat Steps 1 to 5 until alignment is achieved.
7. After the drive axle is aligned, check the pinion angle of drive axle with a digital protractor, see Figure 7-4. Refer to the vehicle manufacturer specifications for the required pinion angles.
 - a. If the pinion angles are within the vehicle manufacturer's specifications then proceed to Step 8.
 - b. If any pinion angle is out of the vehicle manufacturer's specifications it must be corrected. Contact vehicle manufacturer.
8. When all drive axle alignments and pinion angles are within the vehicle manufacturer's specifications then the alignment procedure is complete.

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

DISASSEMBLY

1. Chock the wheels of the vehicle.
2. Raise frame of vehicle to remove load from suspension.
3. Remove the height control valve's linkage assembly from the height control valve arm and lower mounting bracket by sliding the rubber grommets off their studs.

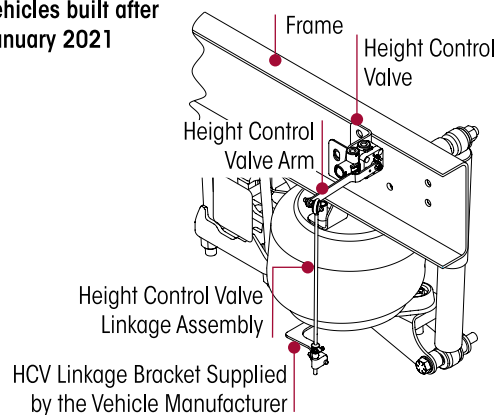


PRIOR TO AND DURING DEFLATION AND INFLATION OF THE AIR SUSPENSION SYSTEM, ENSURE THAT ALL PERSONNEL AND EQUIPMENT ARE CLEAR FROM UNDER THE VEHICLE AND AROUND THE SERVICE AREA, FAILURE TO DO SO CAN CAUSE SERIOUS PERSONAL INJURY, DEATH, OR PROPERTY DAMAGE.

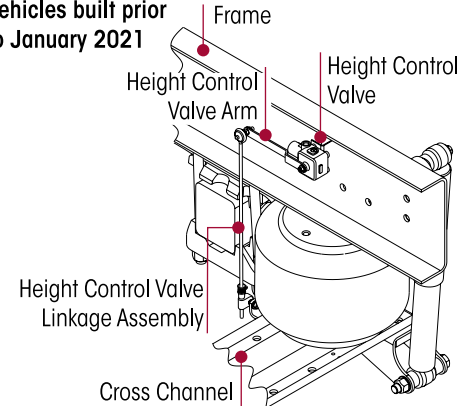
4. See additional Air Spring Cautions and Warnings in the Important Safety Notice section of this publication prior to deflating or inflating the air system.
5. Lower the height control valve arm (see Figure 8-1) to exhaust the air in the air springs and deflate the rear suspension.

FIGURE 8-1

Vehicles built after January 2021



Vehicles built prior to January 2021



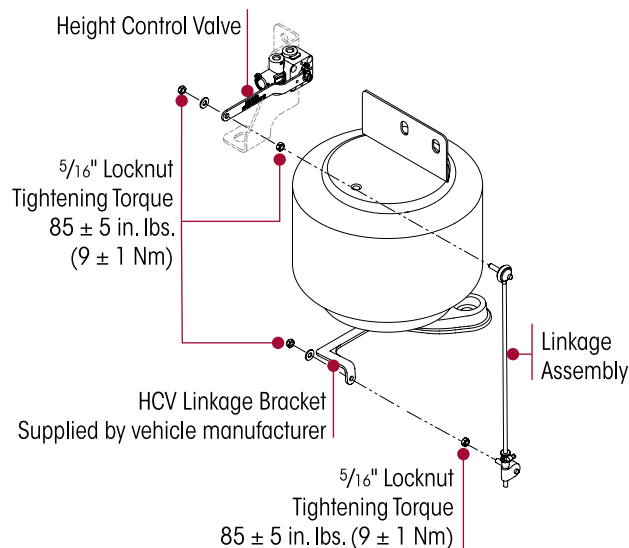
6. Remove and discard the $\frac{5}{16}$ " fasteners that attach the linkage rod to the height control valve arm.
7. Remove the air lines and air fittings from the height control valve.
8. Remove and discard the $\frac{1}{4}$ " height control valve fasteners to the frame mounting bracket.
9. Remove the height control valve, see Figure 8-1.

ASSEMBLY

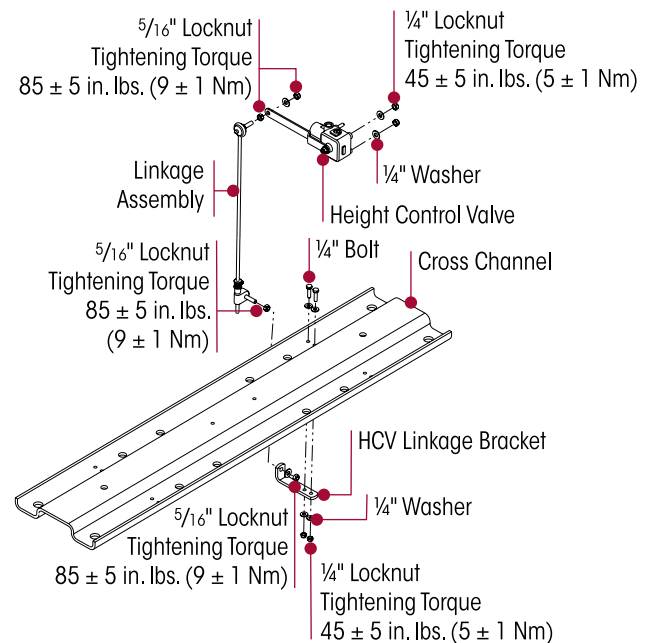
1. Install the height control valve to the frame mounting bracket by attaching the $\frac{5}{16}$ " washers and locknuts. Tighten to \mathbb{R} 85 \pm 5 inch pounds torque, see Figure 8-2.
2. Re-install the air fittings into the height control valve. Ensure the Teflon® thread sealing ring is seated around the base of the fitting's hex shoulder. Tighten to \mathbb{R} 9 \pm 6 foot pounds torque.
3. Install the height control valve link assembly to the height control valve arm by attaching the $\frac{5}{16}$ " washer and locknut. Tighten to \mathbb{R} 85 \pm 5 inch pounds torque, see Figure 8-2.
4. Install the height control valve linkage bracket:
 - **Vehicles built after January 2021** – Attach the $\frac{5}{16}$ " fasteners to the linkage bracket. Tighten to \mathbb{R} 85 \pm 5 inch pounds torque, see Figure 8-2.
 - **Vehicles built prior to January 2021** – Attach the $\frac{1}{4}$ " fasteners to the cross channel. Tighten to \mathbb{R} 45 \pm 5 inch pounds torque, see Figure 8-2.

FIGURE 8-2

Vehicles built after January 2021



Vehicles built prior to January 2021



5. Install the air lines to the height control valve. Refer to the Plumbing Diagram section of this publication.
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. 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. Remove the frame supports.
9. Remove the wheel chocks.
10. Verify the vehicle's ride height is within specifications and adjust as necessary, see Ride Height in the Alignment & Adjustments section of this publication.

AIR SPRING

DISASSEMBLY

1. Chock the front wheels.
2. Raise and support the frame of the vehicle at ride height.

WARNING

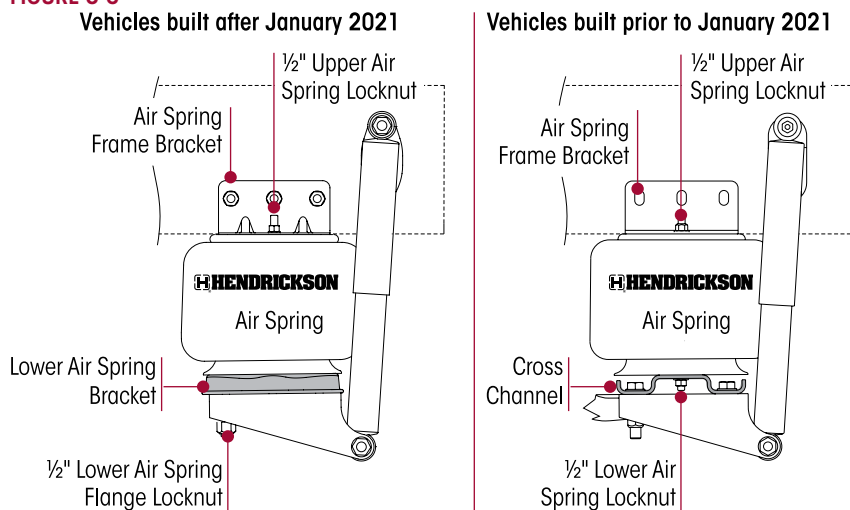
DO NOT WORK AROUND OR UNDER A RAISED VEHICLE SUPPORTED BY ONLY A FLOOR JACK OR OTHER LIFTING DEVICE. ALWAYS SUPPORT A RAISED VEHICLE WITH RIGID JACK STANDS. FAILURE TO DO SO CAN CAUSE SERIOUS PERSONAL INJURY OR DAMAGE TO EQUIPMENT.

3. Disconnect the height control linkage assembly from the height control valve arm by sliding the rubber grommet from the stud.

WARNING

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

FIGURE 8-3



4. See additional Air Spring Cautions and Warnings in the Important Safety Notice section of this publication prior to deflating or inflating the air system.
5. Lower the height control valve arm to exhaust the air in the air springs and deflate the rear suspension.
6. Remove the air line from the air spring.
7. Remove air fittings from air spring.
8. **Vehicles built after January 2021** – Remove the 1/2" lower air spring flange nut that connect air spring to lower air spring bracket.

Vehicles built prior to January 2021 – Remove the 1/2" lower air spring fasteners that connect air spring to the cross channel, see Figure 8-3.

9. Remove the 1/2" fasteners that connect air spring to the upper air spring hanger.
10. Remove the air spring.

INSPECTION

1. Inspect the mounting surfaces and lower air spring mount for any damage. Replace as necessary.
2. Inspect upper air spring bracket for cracks. Replace as necessary.

ASSEMBLY

1. Install the air spring between the frame and cross channel, see Figure 8-3.

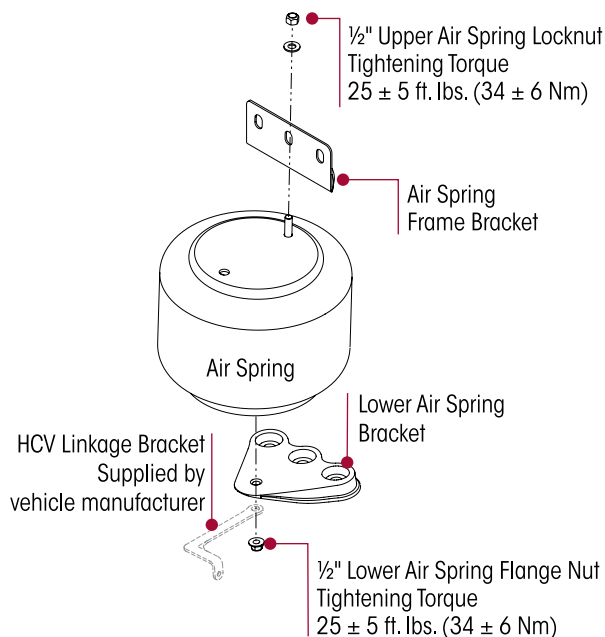
CAUTION

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

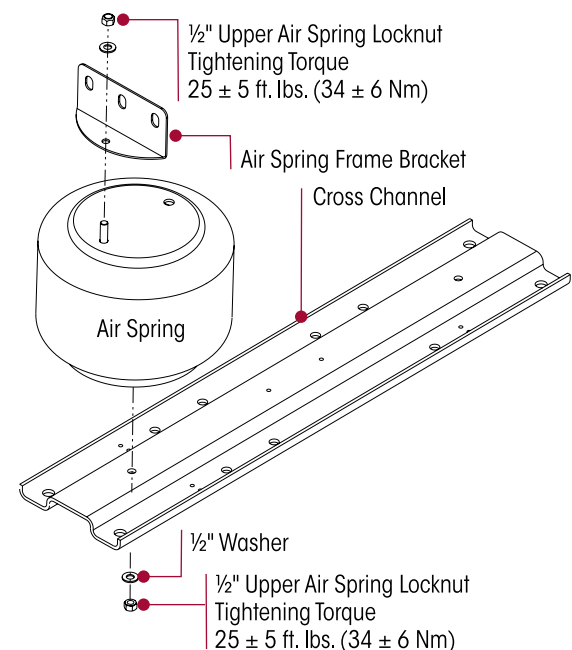
2. **Vehicles built after January 2021** – Install the air spring lower mounting stud through the lower air spring bracket hole. Attach the ½" fasteners to the lower mounting stud of the air spring.
Vehicles built prior to January 2021 – Install the air spring lower mounting stud through the cross channel hole. Attach the ½" fasteners to the lower mounting stud of the air spring.
3. **USING HAND TOOLS ONLY**, tighten the locknut to $\boxed{25} \pm 5$ foot pounds torque, see Figure 8-4.
4. Install the air spring to the air spring frame bracket. Tighten the locknut to $\boxed{25} \pm 5$ foot pounds torque, see Figure 8-4.
5. Install the air fittings using Teflon® (or equivalent) thread seal. Tighten to $\boxed{9} \pm 6$ foot pounds torque.
6. Connect the air line to the air spring.
7. See additional Air Spring Cautions and Warnings in the Important Safety Notice section of this publication prior to deflating or inflating the air system.
8. Inflate the suspension by connecting the height control valve linkage to the height control valve arm. Verify the air springs inflate uniformly without binding.
9. Remove the frame supports.
10. Remove the wheel chocks.
11. Verify the vehicle's ride height is within specifications and adjust as necessary, see Ride Height in the Alignment & Adjustments section of this publication.

FIGURE 8-4

Vehicles built after January 2021



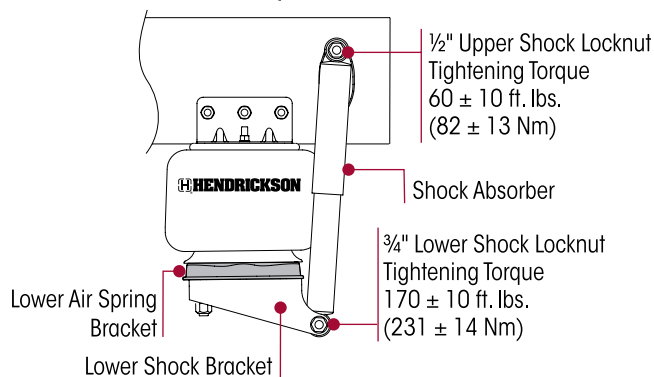
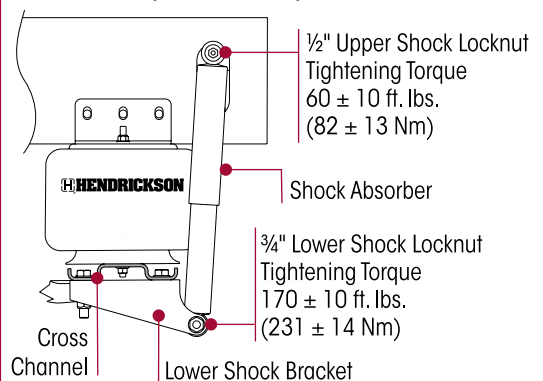
Vehicles built prior to January 2021



SHOCK ABSORBER

DISASSEMBLY

1. Chock the wheels of the vehicle.
2. Remove and discard the upper shock absorber ½" fasteners, see Figure 8-5.
3. Remove and discard the lower shock absorber ¾" fasteners from the lower shock bracket, see Figure 8-5.
4. Slide the shock absorber out of the lower mounting bracket.
5. Remove the shock absorber from the upper mounting stud.
6. Inspect the shock absorber mounting brackets and hardware for damage or wear, and replace as necessary, see the Preventive Maintenance section in this publication.

FIGURE 8-5
Vehicles built after January 2021

Vehicles built prior to January 2021


ASSEMBLY

1. Install the upper shock absorber to the frame bracket stud. Attach the upper ½" fasteners and tighten to 60 ± 10 foot pounds torque.
2. Install the lower shock absorber to lower shock bracket. Attach the ¾" fasteners and tighten to 170 ± 10 foot pounds torque, see Figure 8-5.
3. Remove the frame supports.
4. Remove the wheel chocks.
5. Verify the vehicle's ride height is within specifications and adjust as necessary, see Ride Height in the Alignment & Adjustments section of this publication.

LOWER SHOCK ABSORBER BRACKET

DISASSEMBLY

1. Chock the front wheels.
2. Raise and support the frame of the vehicle at ride height.


WARNING

DO NOT WORK AROUND OR UNDER A RAISED VEHICLE SUPPORTED BY ONLY A FLOOR JACK OR OTHER LIFTING DEVICE. ALWAYS SUPPORT A RAISED VEHICLE WITH RIGID JACK STANDS. FAILURE TO DO SO CAN CAUSE SERIOUS PERSONAL INJURY OR DAMAGE TO EQUIPMENT.

3. Disconnect the height control linkage assembly from the height control valve arm by sliding the rubber grommet from the stud.


WARNING

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

4. See additional Air Spring Cautions and Warnings in the Important Safety Notice section of this publication prior to deflating or inflating the air system.
5. Lower the height control valve arm to exhaust the air in the air springs and deflate the rear suspension.
6. On the side being serviced, remove the lower air spring fasteners.
7. Remove the lower shock absorber $\frac{3}{4}$ " fasteners that connect to the lower shock bracket, see Figure 8-6.
8. Remove the air lines from the air springs and compress to facilitate removal of the lower shock bracket.
9. Slide the shock absorber out of the lower shock bracket.
10. **Vehicles built prior to January 2021** – Use a floor jack under the center of the cross channel and raise the cross channel slightly to facilitate removal of the lower shock bracket.
11. Remove and discard the $\frac{3}{4}$ " fasteners that connect the lower air spring bracket / cross channel and lower shock bracket to the main support member assembly on the side being serviced.
12. **Vehicles built prior to January 2021** – Loosen, **DO NOT** remove the $\frac{3}{4}$ " fasteners on the opposite side.
13. Remove the lower shock bracket.

INSPECTION

1. Inspect the shock absorber mounting brackets for damage or wear, and replace as necessary, see the Preventive Maintenance section in this publication.

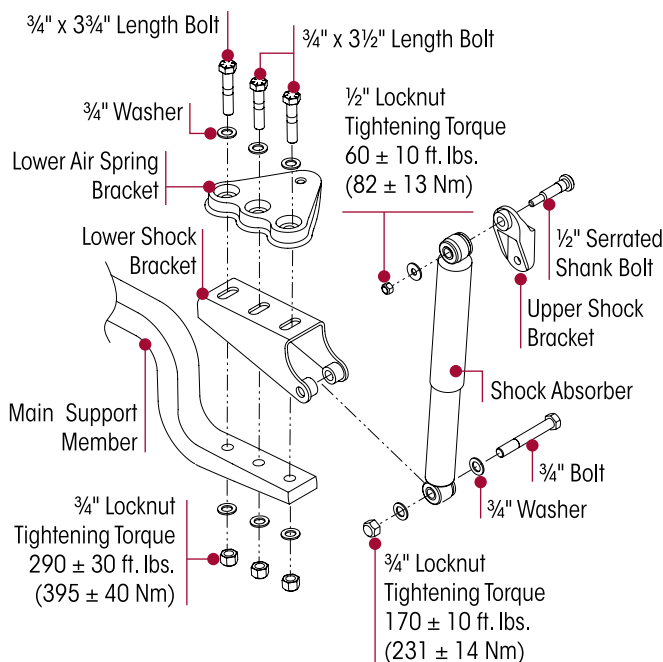
ASSEMBLY

1. Install the lower shock absorber mounting bracket over the end of the main support member.
2. Lower the lower air spring bracket / cross channel on top of the main support member.
3. **Vehicles built after January 2021** Loosely install the three (3) $\frac{3}{4}$ " bolt and washer through the lower air spring bracket holes, lower shock bracket and main support member on each side, see Figure 8-6.

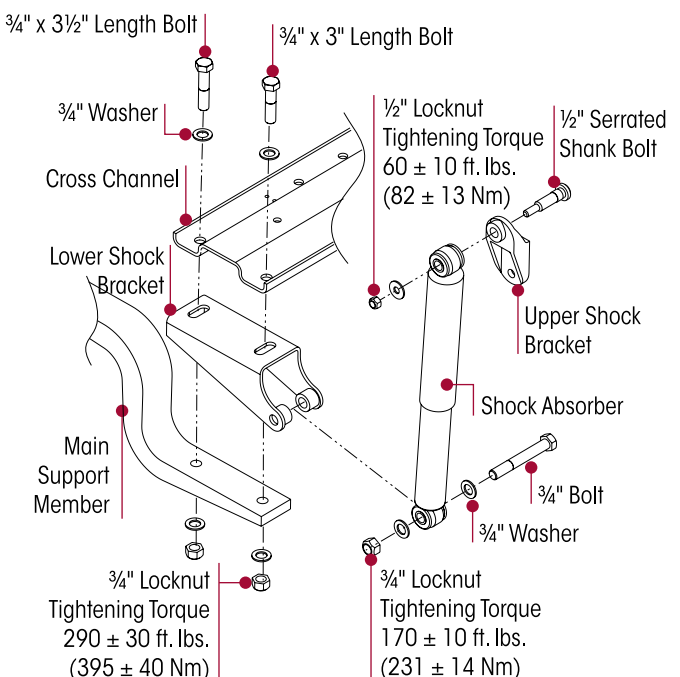
Vehicles built prior to January 2021 Loosely install the two (2) $\frac{3}{4}$ " bolt and washer through the cross channel holes, lower shock bracket and main support member on each side, see Figure 8-6.

FIGURE 8-6

Vehicles built after January 2021



Vehicles built prior to January 2021



4. Install 3/4" bolts and tighten the fasteners to \mathbb{R} 290 \pm 30 foot pounds torque, see Figure 8-6.
5. Slide the shock absorber lower mount into the lower shock absorber mounting bracket.
6. Install the 3/4" fasteners through the lower shock absorber mount and lower shock bracket. Tighten the fasteners to \mathbb{R} 170 \pm 10 foot pounds torque, see Figure 8-6.
7. Reconnect the air lines to the air springs.
8. See additional Air Spring Cautions and Warnings in the Important Safety Notice section in this publication prior to deflating or inflating the air system.
9. Inflate the suspension by connecting the height control valve linkage to the height control valve arm. Verify the air springs inflate uniformly without binding.
10. Remove the frame supports.
11. Remove the wheel chocks.
12. Verify the vehicle's ride height is within specifications and adjust as necessary, see Ride Height in the Alignment & Adjustments section of this publication.

CROSS CHANNEL (if equipped)

■ Vehicles built prior to January 2021

DISASSEMBLY

1. Chock the front wheels.
2. Support the frame of the vehicle at ride height.



DO NOT WORK AROUND OR UNDER A RAISED VEHICLE SUPPORTED BY ONLY A FLOOR JACK OR OTHER LIFTING DEVICE. ALWAYS SUPPORT A RAISED VEHICLE WITH RIGID JACK STANDS. FAILURE TO DO SO CAN CAUSE SERIOUS PERSONAL INJURY OR DAMAGE TO EQUIPMENT.

3. Remove the air springs as detailed, refer to Air Spring in this section.
4. Remove the 1/4" height control valve linkage bracket fasteners to cross channel. Remove the bracket.
5. Remove and discard lower shock fasteners.
6. Remove and discard the 3/4" bolts from the cross channel to main support member, see Figure 8-7.
7. Remove the cross channel.

INSPECTION

1. Inspect the mounting surfaces and lower air spring mount for any damage. Replace as necessary.
2. Inspect the upper air spring bracket for cracks. Replace as necessary.
3. Inspect the cross channel for straightness, excessive wear and cracks. Replace as necessary.

ASSEMBLY

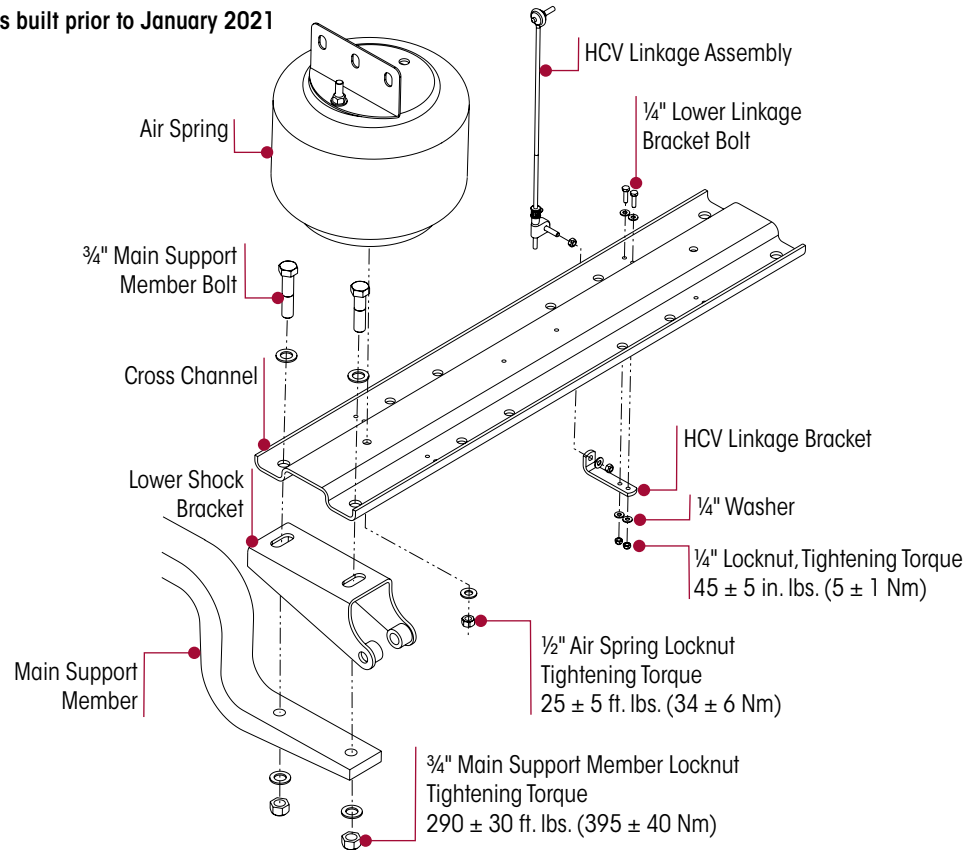
1. Place cross channel on top of the lower shock bracket and main support member.
2. Loosely install the two 3/4" bolt and washer through the cross channel holes, lower shock bracket and main support member on each end of the cross channel, see Figure 8-7.
3. Install lower shock absorber into the lower shock bracket. Install the lower shock fasteners and tighten fasteners to \mathbb{R} 170 \pm 10 foot pounds torque, see Figure 8-6
4. Tighten the cross channel fasteners to \mathbb{R} 290 \pm 30 foot pounds torque, see Figure 8-7.
5. Install the height control valve lower bracket to the cross channel using two 1/4" fasteners. Tighten the fasteners to \mathbb{R} 45 \pm 5 inch pounds torque.
6. Install the air spring between the frame and cross channel.

WARNING

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

7. Install the air spring lower mounting stud through the cross channel hole. Attach the ½" fasteners to the lower mounting stud of the air spring. **USING HAND TOOLS ONLY**, tighten the locknut to 25 ± 5 foot pounds torque.

FIGURE 8-7
Vehicles built prior to January 2021



8. Connect the air line to the air spring.
9. See additional Air Spring Cautions and Warnings in the Important Safety Notice section of this publication prior to deflating or inflating the air system.
10. Inflate the suspension by connecting the height control valve linkage to the height control valve arm. Verify the air springs inflate uniformly without binding.
11. Remove the frame supports.
12. Remove the wheel chocks.
13. Verify the vehicle's ride height is within specifications and adjust as necessary, see Ride Height in the Alignment & Adjustments section of this publication.

TRANSVERSE TORQUE RODS

WARNING

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

DISASSEMBLY

1. Chock the wheels of the vehicle.

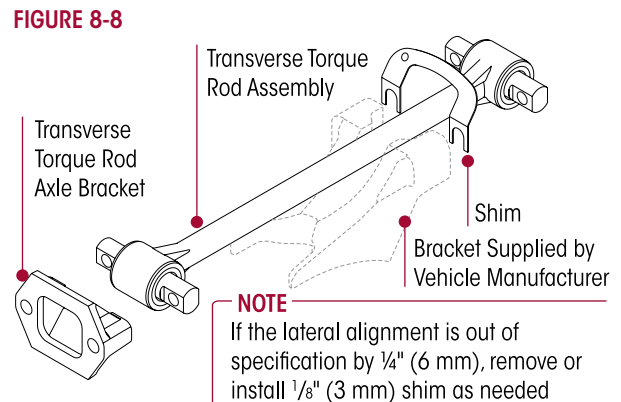
SERVICE HINT

Note the quantity and location of shims prior to disassembly. The same quantity **MUST** be reinstalled in the same location in order to maintain the lateral alignment. The lateral alignment procedure will need to be performed after assembly.

2. Remove the $\frac{5}{8}$ " fasteners that connect the transverse torque rod to the frame bracket and axle.
3. Remove the transverse torque rod.

INSPECTION

1. Inspect the torque rod mating surfaces for any wear or damage. Repair as necessary.
2. Inspect the rubber bushings for wear or damage, replace as necessary.
3. Inspect the torque rod for straightness, wear, or cracks, replace as necessary.
4. Inspect the inner (if equipped) and outer reinforcement plates for wear or damage, replace as necessary.
5. Inspect the frame rail for wear or damage, repair as necessary.



ASSEMBLY

NOTE

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

1. Install the transverse torque rod and shims as noted prior to disassembly.
2. Attach the $\frac{5}{8}$ " fasteners to the frame bracket and axle. Refer to the vehicle manufacturer for torque specifications.
3. Perform the lateral alignment procedure, refer to the Alignment and Adjustment section in this publication.
4. Remove the wheel chocks.

TORQUE ROD BUSHINGS

DISASSEMBLY

You will need:

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



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

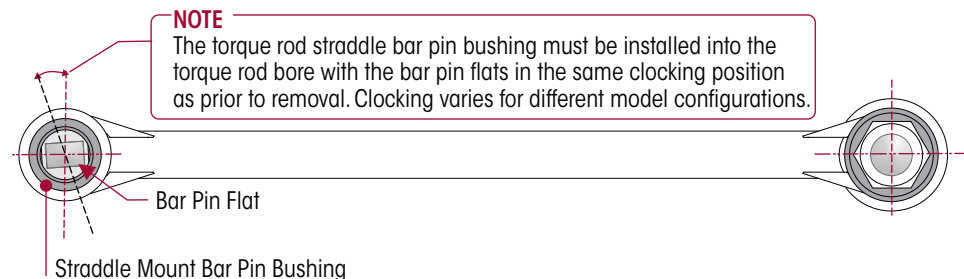
1. Remove the torque rod as detailed in this section.

SERVICE HINT

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

2. When replacing a straddle mount bar pin type bushing assembly, mark the clocking position of the bushing assembly's bar pin flats with a paint stick on the torque rod end hub prior to disassembly, see Figure 8-9.
3. Install the torque rod in the press. Support the torque rod end on the receiving tool with the end of the torque rod centered on the tool. Be sure the torque rod is squarely supported on the press bed.
4. Push directly on the inner metal of the bushing assembly until the bushing assembly clears the torque rod end tube.
5. Clean and inspect the inner diameter of the torque rod ends.

FIGURE 8-9



ASSEMBLY

NOTE

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

1. Lubricate the inner diameter of the torque rod end hub and the new rubber bushing with P-80 Lubricant (refer to the Parts List section of this publication) or light Naphthenic Base Oil, such as 60 SUS at 100°F, see Figure 8-10.
2. Support the torque rod end hub on the receiving tool with the end hub of the torque rod centered on the receiving tool.

SERVICE HINT

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

3. Verify the bar pin flats are clocked correctly.

FIGURE 8-10

FIGURE 8-11

FIGURE 8-12


4. Press directly on the inner metal of the bushing assembly.
5. When pressing in the new bushings overshoot the desired final position by approximately $\frac{3}{16}$ " , see Figure 8-11.
6. Press the inner metal of the bushing assembly again from opposite side to center the bushing and inner metal within the torque rod end hub, see Figure 8-12.
7. Wipe off excess lubricant. Allow the lubricant four (4) hours to dissipate before operating vehicle.

CAUTION

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

8. Install the torque rod assembly as detailed in this section.

MAIN SUPPORT MEMBER & CLAMP GROUP

NOTE

The main support member assemblies come fully assembled with the pivot bushing, secondary leaf/Flexi-wrap, liners, and spring eye clip, refer to the Part List section of this publication.

WARNING

FAILURE OF THE MAIN SUPPORT MEMBER BETWEEN THE U-BOLTS WILL REQUIRE THE REPLACEMENT OF THE MAIN SUPPORT MEMBER AND ALL CLAMP GROUP COMPONENTS. FAILURE TO DO SO CAN RESULT IN CLAMP GROUP FAILURE AND FURTHER FAILURE TO THE MAIN SUPPORT MEMBER, WHICH CAN CAUSE ADVERSE VEHICLE HANDLING, PROPERTY DAMAGE OR SEVERE PERSONAL INJURY.

DISASSEMBLY

CAUTION

THE PROCEDURE TO DISASSEMBLE THE MAIN SUPPORT MEMBER AND CLAMP GROUP IS DONE WITH THE OTHER MAIN SUPPORT MEMBER PROPERLY CONNECTED TO THE FRAME HANGER AND AXLE. FAILURE TO HAVE THE OTHER MAIN SUPPORT MEMBER CONNECTED PROPERLY COULD ALLOW THE AXLE TO SHIFT RESULTING IN POSSIBLE DAMAGE TO COMPONENTS AND/OR PERSONAL INJURY. IF BOTH MAIN SUPPORT MEMBERS REQUIRE REPLACEMENT, IT WILL BE NECESSARY TO SUPPORT THE AXLE PINION TO PREVENT THE AXLE FROM SHIFTING.

1. Chock the front wheels.
2. Support the frame of the vehicle at ride height.

WARNING

DO NOT WORK AROUND OR UNDER A RAISED VEHICLE SUPPORTED BY ONLY A FLOOR JACK OR OTHER LIFTING DEVICE. ALWAYS SUPPORT A RAISED VEHICLE WITH RIGID JACK STANDS. FAILURE TO DO SO CAN CAUSE SERIOUS PERSONAL INJURY OR DAMAGE TO EQUIPMENT.

3. Disconnect the height control linkage assembly from the height control valve arm by sliding the rubber grommet from the stud.

WARNING

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

4. See additional Air Spring Cautions and Warnings in the Important Safety Notice section of this publication prior to deflating or inflating the air system.
5. Lower the height control valve arm to exhaust the air in the air springs and deflate the rear suspension.
6. Remove the air spring as detailed in the Air Spring instructions in this section.
7. Remove the shock absorber as detailed in the Shock Absorber instructions in this section.
8. If equipped, remove the cross channel as detailed in Cross Channel instructions in this section.

SERVICE HINT

Marking the position of the QUIK-ALIGN collar will create a starting point for the alignment procedure following reassembly.

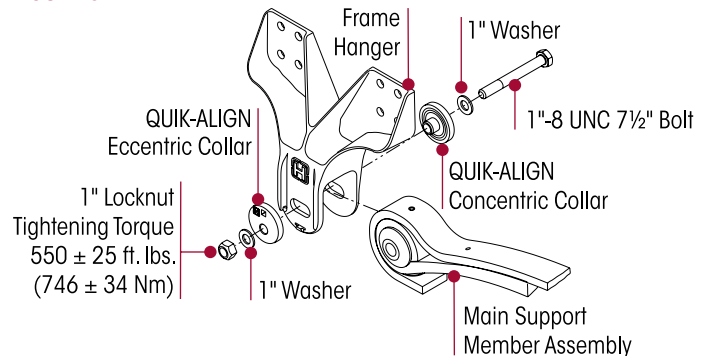
9. On the side being serviced, mark the position of the QUIK-ALIGN collar relative to the frame hanger, see Figure 8-13.
10. On the side being serviced, remove and discard the U-bolts and fasteners.
11. Remove the axle bottom cap, spacer and top pad. Lift the back of the main support member assembly and remove the axle seat from under main support member. Lower the main support member onto the axle housing.
12. Support the main support member by placing a hydraulic jack under the pivot bushing.
13. Remove and discard the pivot bolt and fasteners.

FIGURE 8-13



14. Remove the QUICK ALIGN collars that connect the main support member assembly to the frame hanger, see Figure 8-14.
15. Slide the pivot bushing down and out of the frame hanger.
16. Remove the main support assembly.

FIGURE 8-14



INSPECTION

WARNING

U-BOLTS THAT ARE FOUND TO BE LOOSE REQUIRE THAT MATING COMPONENTS BE INSPECTED FOR SIGNS OF WEAR OR FRETTING. ANY COMPONENTS WORN MUST BE REPLACED. FAILURE TO DO SO CAN CAUSE PREMATURE CLAMP GROUP FAILURE, COMPONENT DAMAGE, ADVERSE VEHICLE HANDLING, PROPERTY DAMAGE, OR SEVERE PERSONAL INJURY. MAINTAIN CORRECT TORQUE VALUE AT ALL TIMES. CHECK TORQUE VALUES ON A REGULAR BASIS AS SPECIFIED.

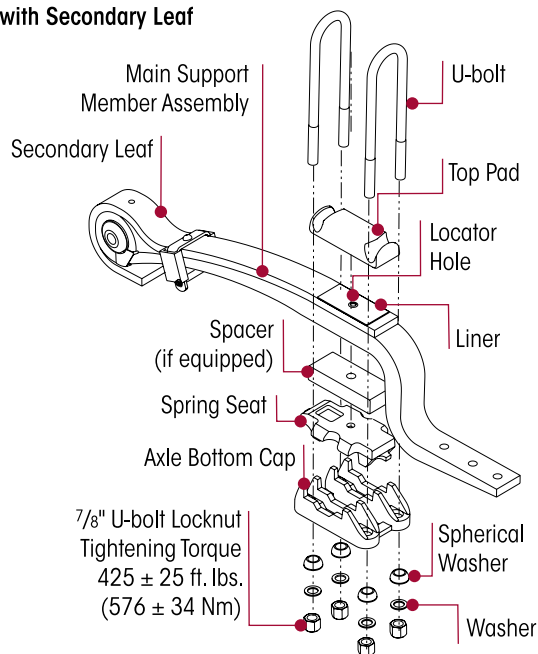
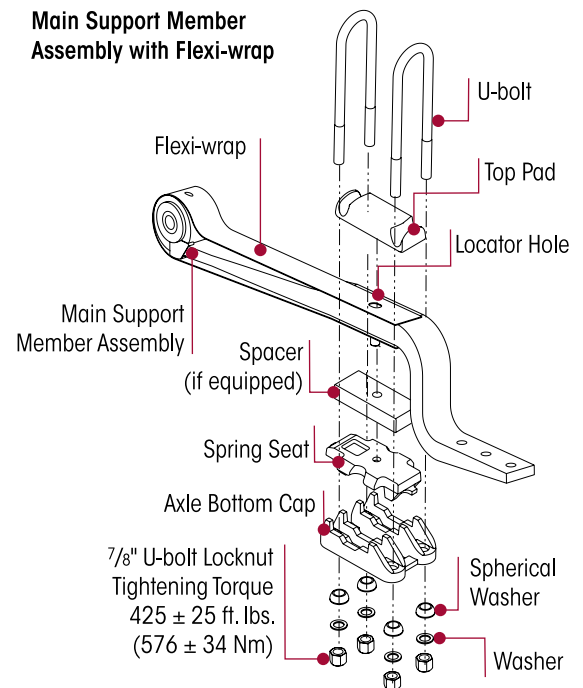
1. Clean any dirt and debris from the QUIK-ALIGN slots in the hangers. Inspect the frame hanger for excessive wear, cracks and proper frame hanger fastener torque. Replace as necessary.
2. **Vehicles built prior to January 2021** – Inspect the cross channel for straightness, excessive wear and cracks. Replace as necessary.
3. Inspect the air spring for damage. Inspect the lower piston, upper and lower air spring mount for cracks. Inspect the shock absorber, refer to the Preventive Maintenance section in this publication. Replace as necessary.
4. Inspect the top pad, spring seat and axle bottom cap for excessive wear and cracks or fretting. Replace as necessary.
5. Inspect the axle housing for any cracks or wear. Repair or replace as necessary per the axle manufacturer and/or the vehicle manufacturer.

ASSEMBLY

WARNING

DO NOT STRIKE SUSPENSION COMPONENTS WITH A HAMMER. DO NOT NICK OR GOUGE THE MAIN SUPPORT MEMBER. SUCH IMPROPER ACTIONS CAN CAUSE DAMAGE; THE MAIN SUPPORT MEMBER ASSEMBLY COULD FAIL AND CAUSE ADVERSE VEHICLE HANDLING AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

1. Install the spring seat and spacer on top of the axle housing. Verify the thicker end of the spring seat is to the rear of the vehicle.
2. Lower the main support member assembly on the spacer and spring seat.
3. Ensure the main support member assembly engages both the secondary leaf and spring seat locator holes.
4. Position the main support member assembly with the center locator piloting into hole in spring seat and spacer.
5. Ensure to engage the alignment locator on the axle housing with the hole in the bottom of the spring seat.
6. Install the top pad on the top of the secondary leaf / Flexi-wrap of the main support member, see Figure 8-15.
7. Ensure the locator hole on the bottom of the top pad engages the secondary leaf and main support locator holes. Verify the galvanized steel liner is positioned on the top of the main support member assembly.
8. Align the pivot bushing of the main support member assembly under the opening of the frame hanger and jack into place.

FIGURE 8-15
Main Support Member Assembly with Secondary Leaf

Main Support Member Assembly with Flexi-wrap

WARNING

DO NOT ASSEMBLE THE QUIK-ALIGN JOINT WITHOUT THE PROPER FASTENERS. USE ONLY HENDRICKSON COATED GENUINE FASTENERS TO SUSTAIN PROPER CLAMP FORCE. ENSURE THAT THE QUIK-ALIGN FASTENER'S TORQUE VALUES ARE SUSTAINED AS RECOMMENDED IN THE TORQUE SPECIFICATIONS SECTION IN THIS PUBLICATION. FAILURE TO FOLLOW THE ABOVE ITEMS CAN CAUSE ADVERSE VEHICLE HANDLING 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

Ensure that QUIK-ALIGN eccentric collar is on the outboard side of the frame hanger. Verify that the nose of each QUIK-ALIGN collar is installed correctly into bushing sleeve, and the flanged side is flat against the frame hanger face within the alignment guides, see Figure 8-14.

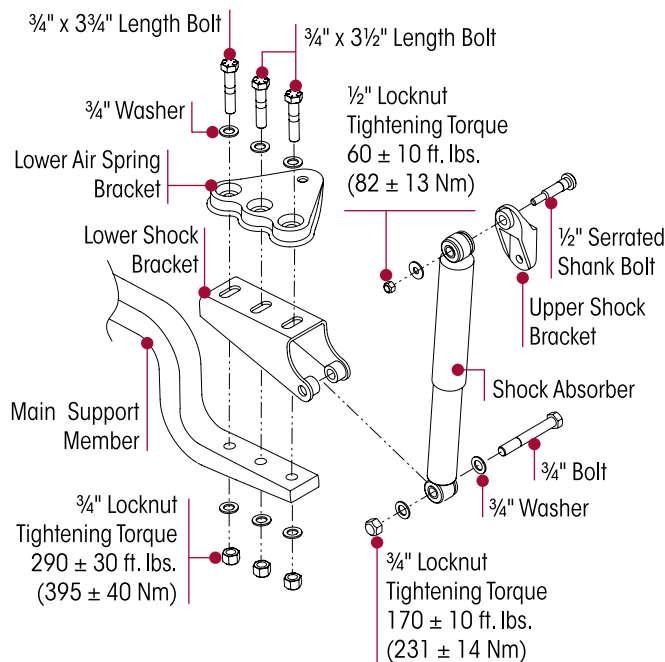
9. Install the QUIK-ALIGN collars and fasteners and tighten to 100 foot pounds of torque.
10. Install the **NEW** U-bolts and fasteners.
11. Verify that the top pad and bottom cap are aligned and installed properly.
12. Install the lower air spring bracket (if equipped), see Figure 8-16.
13. Install the shock absorber as detailed in the Shock Absorber instructions in this section.
14. **Vehicles built prior to January 2021** – Install the cross channel as detailed in the Cross Channel instructions in this section.
15. Loosely install the $\frac{3}{4}$ " locknuts and washers. **DO NOT** tighten at this time.
16. Verify that the U-bolts are seated properly in the channels of the top pad, see Figure 8-15.
17. Verify the secondary leaf and main support member are centered in the frame hanger.
18. Snug the U-bolts prior to tightening using a crisscross pattern, (approximately 100 foot pounds tightening torque), see Figure 8-14.
19. Tighten the lower air spring bracket/cross channel fasteners to 290 \pm 30 foot pounds torque.

WARNING

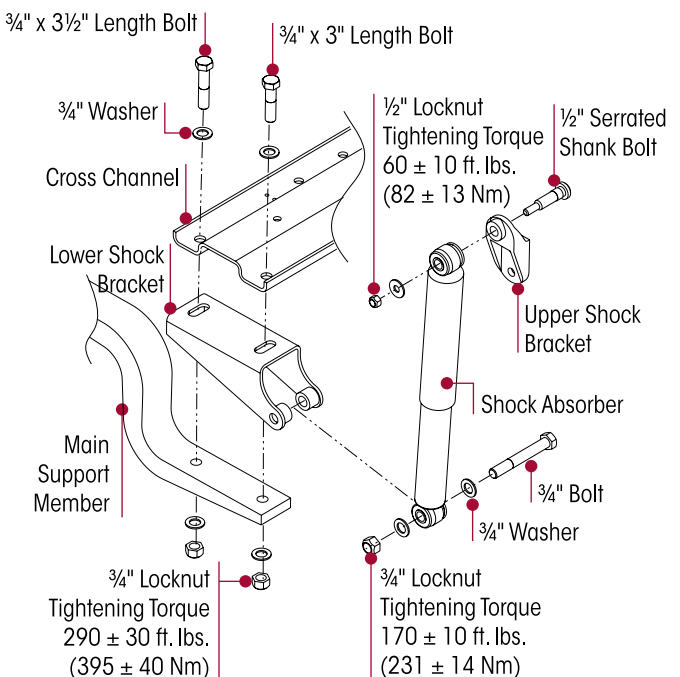
IT IS IMPORTANT THAT THE U-BOLT CLAMP GROUP CONNECTION BE PROPERLY ALIGNED AND HAVE THE PROPER TIGHTENING TORQUE VALUES MAINTAINED. METAL SURFACES CAN WORK AND WEAR AGAINST OTHER RELATED CLAMP GROUP COMPONENTS IF NOT PROPERLY ALIGNED OR PROPERLY TIGHTENED TO MAINTAIN THE PROPER CLAMP FORCE. FAILURE TO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

FIGURE 8-16

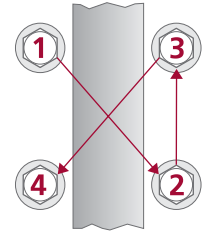
Vehicles built after January 2021



Vehicles built prior to January 2021



20. Tighten the U-bolt locknuts evenly in 100 pound increments to \mathbb{R} 425 \pm 25 foot pounds torque in the crisscross pattern to achieve uniform bolt tension, see Figure 8-17. Rap the top of the U-bolts with a dead blow mallet, and retighten to specified torque. **DO NOT** exceed specified torque on U-bolt locknuts.
21. See additional Air Spring Cautions and Warnings in the Important Safety Notice section of this publication prior to deflating or inflating the air system.
22. Inflate the suspension by connecting the height control valve linkage to the height control valve arm. Verify the air springs inflate uniformly without binding.
23. Remove the frame supports.
24. Verify the vehicle's ride height is within specifications and adjust as necessary, see Ride Height in the Alignment & Adjustments section of this publication.
25. Align the vehicle. Alignment is necessary anytime the main support member is removed to complete the repair, see Alignment & Adjustments section in this publication.

FIGURE 8-17

NOTE

Prior to tightening the QUIK-ALIGN fasteners, U-bolts, or lower shock bracket fasteners to specifications, it is mandatory that the vehicle be positioned at the proper ride height.

26. After the correct alignment of the axle is verified, tighten the QUIK-ALIGN fasteners to \mathbb{R} 550 \pm 25 foot pounds torque.
27. Remove the wheel chocks.

FRAME HANGER

DISASSEMBLY

1. Chock the front wheels.

WARNING

DO NOT WORK AROUND OR UNDER A RAISED VEHICLE SUPPORTED BY ONLY A FLOOR JACK OR OTHER LIFTING DEVICE. ALWAYS SUPPORT A RAISED VEHICLE WITH RIGID JACK STANDS. FAILURE TO DO SO CAN CAUSE SERIOUS PERSONAL INJURY OR DAMAGE TO EQUIPMENT.

2. Raise and support the frame of the vehicle 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.

3. See additional Air Spring Cautions and Warnings in the Important Safety Notice section in this publication prior to deflating or inflating the air system.
4. Disconnect the linkage assembly from the height control valve arm by sliding the rubber grommet from the stud.
5. Lower the height control valve arm to exhaust the air in the air springs and deflate the rear suspension.

SERVICE HINT

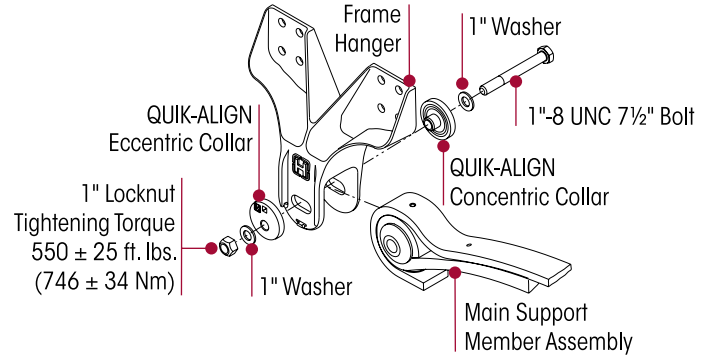
Marking the position of the QUIK-ALIGN collar will create a starting point for the alignment procedure following reassembly.

6. Mark the position of the QUIK-ALIGN collar relative to the frame hanger, see Figure 8-18.
7. Remove and discard the 1" QUIK-ALIGN fasteners, see Figure 8-19.
8. Remove the QUIK-ALIGN collars that connect the main support member to the frame hanger.
9. Remove the fasteners that attach the frame hanger to the frame rail per the vehicle manufacturer's instructions.
10. Remove the frame hanger.

FIGURE 8-18



FIGURE 8-19



INSPECTION

1. Inspect mounting surface of the frame rail for any damage or wear. Repair or replace as necessary.
2. Inspect the main support member assembly and bushing for wear or damage. Replace as necessary per instructions in this section.

ASSEMBLY

1. Slide the frame hanger over the main support member pivot bushing.
2. Install the frame hanger to the frame rail and fasten as detailed by the vehicle manufacturer.

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 Kit (see the Parts Lists section in this publication) for any axle alignment or disassembly of the QUIK-ALIGN connection. This ensures that the proper clamp load is applied to the connections, so that the joints will not slip in service.

3. Install the QUIK-ALIGN collars and fasteners.

NOTE

Ensure that QUIK-ALIGN eccentric collar is located on the outboard side of the LEFT frame hanger. Verify that the nose of each QUIK-ALIGN collar is properly installed into the sleeve of the pivot bushing with the flanged side flat against the frame hanger face within the alignment guides.

4. Align the QUIK-ALIGN collar with the marks made on the frame hanger prior to disassembly.
5. Snug the pivot bolt locknut to approximately 100 foot pounds of torque. **DO NOT** tighten to specified torque at this time.
6. See additional Air Spring Cautions and Warnings in the Important Safety Notice section in this publication prior to deflating or inflating the air system.
7. Inflate the suspension by connecting the height control valve linkage to the height control valve arm. Verify the air springs inflate uniformly without binding.
8. Remove the frame supports.
9. Verify the vehicle's ride height is within specifications and adjust as necessary, see Ride Height in the Alignment & Adjustments section of this publication..
10. Verify that the axle is in proper alignment, see the Alignment & Adjustments section in this publication.

NOTE

Prior to tightening the QUIK-ALIGN locknuts to final torque specifications, it is mandatory that the vehicle be positioned at the proper ride height and alignment.

11. After alignment of the axle is verified, tighten the QUIK-ALIGN fasteners to $\boxed{550 \pm 25}$ foot pounds torque, see Figure 8-19.
12. Remove the wheel chocks.

QUIK-ALIGN PIVOT BUSHING

NOTE

There are two methods to replace the QUIK-ALIGN bushing.

METHOD A – Using a Shop Press

You will need:

- A vertical shop press with a capacity of at least 10 tons.
- A receiving tool and push out tool, see the Special Tools section of this publication.

DISASSEMBLY

1. Remove the main support member from the vehicle, see Main Support Member & Clamp Group in this section.
2. Note the main support components location and orientation prior to disassembly. Disassemble the secondary leaf / Flexi-wrap from the main support member assembly. Inspect the main support member attaching components for wear and replace as necessary (clip bolt spacer, spring clip sleeve, spring eye clip, isolator pad, see Figure 8-25). Refer to the Part List section for replacement components.
3. Place the main support member in the shop press.
4. Squarely support the main support member on the receiving tool with the end hub centered on the tool, see Figure 8-20.

NOTE

At the time of manufacture, a spring eye clip was used to insert the bushing into the spring eye of the main support member, see Figures 8-21 and 8-22. If the spring eye clip is equipped on the main support member you have the option to carefully press out the bushing from the **opposite** side of the spring eye (where the spring eye clip is **NOT** visible). If the spring eye clip is not damaged, it can be used again to facilitate the pressing in of the bushing into the spring eye. If clip is damaged and a replacement (part number 60392-000) is not available the alternative method is to use the tape option as shown in Figure 8-23.

5. Center the push out tool on inner sleeve and press out the old bushing. (These bushings are not cartridge type bushings. They do not have outer metals).
6. Clean and inspect the inner diameter of the main support member eye.

FIGURE 8-20



FIGURE 8-21

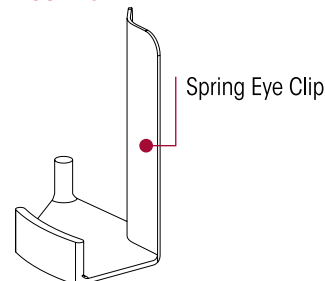
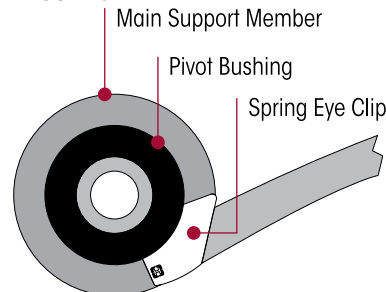


FIGURE 8-22



ASSEMBLY

1. Assemble the main support member assembly secondary leaf/ Flexi-wrap and components as prior to disassembly.
2. Insert the spring eye clip into the gap of the main support member eye, (see note above). If spring eye clip is damaged and a replacement (Part No. 60392-000) is not available the alternative method is to cut a strip of 3M Scotch #890T black fiber tape, or heavy bodied duct tape 1" x 6" long.
3. Feed the tape into the spring eye, adhesive side facing gap in the eye. Center the tape equally around each end.
4. Pull the tape tight, and wrap it around the outside of the eye. Additional tape may be required depending on gap size. Ensure that the gap is completely covered, see Figure 8-23.

FIGURE 8-23

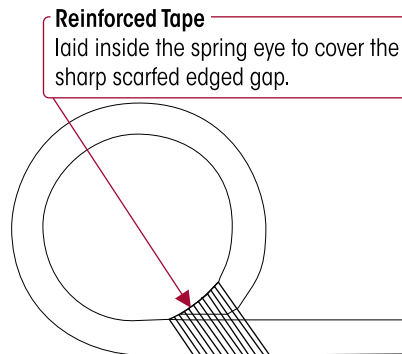


FIGURE 8-24



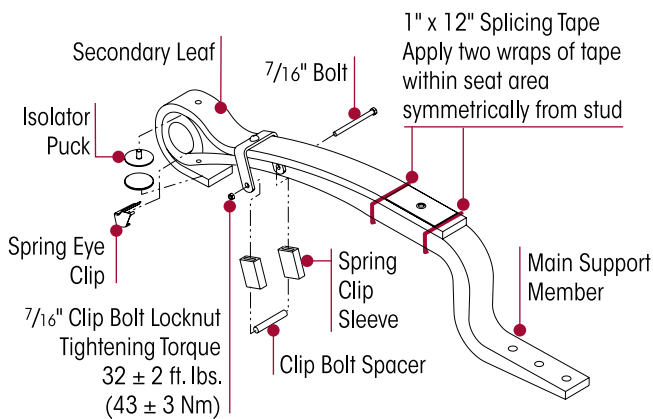
5. Use P-80 Lubricant or light Naphthenic Base Oil, such as 60 SUS at 100°F to lubricate the inner diameter of leaf spring bore and the new rubber bushing (refer to Parts List section of this publication). **DO NOT** use petroleum or soap base lubricant, it can cause an adverse reaction with the bushing material, such as deterioration.
6. Install the main support member in the press. Place the main support member on the receiving tool with the end hub centered on the receiving tool. Be sure the main support member is squarely supported on the press bed.
7. Locate the machined pilot of the push out tool on inner sleeve, and press in the new bushing. Bushings must be centered within the spring eye. When pressing in the new bushings, over-shoot desired final position by $\frac{3}{16}$ " and press again from opposite side to center the bushing within the main support member assembly, see Figure 8-24.
8. Trim all protruding tape from the underside of the spring eye. Wipe off the excess lubricant. Allow the lubricant four (4) hours to dissipate before operating the vehicle.
9. Install the two (2) new isolator pads inside the secondary leaf / Flexi-wrap-eye, see Figure 8-25.
10. Slide the secondary leaf/ Flexi-wrap around the main support member and rotate into position, see Figure 8-25.
11. If equipped with a secondary leaf, install the spring eye clip sleeve, clip bolt spacer. Install clip bolt spacer fasteners and tighten to \mathbb{N} 32 ± 2 foot pounds torque, see Figure 8-25.



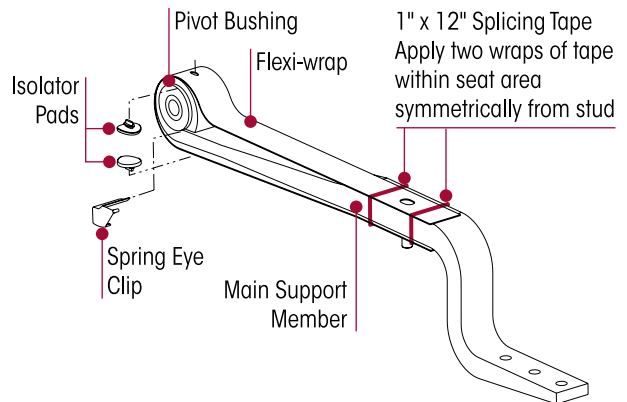
DO NOT WRAP TAPE AROUND THE MAIN SUPPORT MEMBER ASSEMBLY MORE THAN TWICE, AS THIS WOULD CREATE HIGH SPOTS IN THE CLAMP GROUP. FAILURE TO DO SO CAN CAUSE PREMATURE WEAR OR DAMAGE TO THE MAIN SUPPORT MEMBER ASSEMBLY.

12. Use two (2) 1" x 12" long strips of splicing tape to keep main support member components together, see Figure 8-25.
13. Install the main support member assembly as detailed in this section.

FIGURE 8-25
Main Support Member Assembly with Secondary Leaf



Main Support Member Assembly with Flexi-wrap



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 main support member assembly into the receiving cylinder. Then follow a similar procedure to push in the replacement pivot bushing, see Figure 8-26.

WARNING

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

MAIN SUPPORT MEMBER ASSEMBLY REMOVAL

1. Remove the main support member assembly from the vehicle per the Main Support Member & Clamp Group procedure in this section.
2. After removal, place the main support member assembly on the floor or suitable work area.

PIVOT BUSHING

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

- QUIK-ALIGN pivot bushing service tool (Part No. 66086-203L), see Figure 8-26
- ¾" Impact wrench (impact gun), some ½" impact wrenches may work

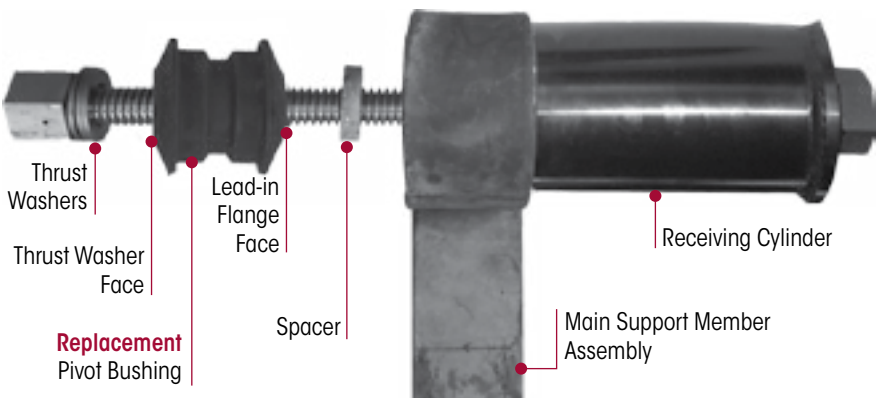
FIGURE 8-26

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

NOTE

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

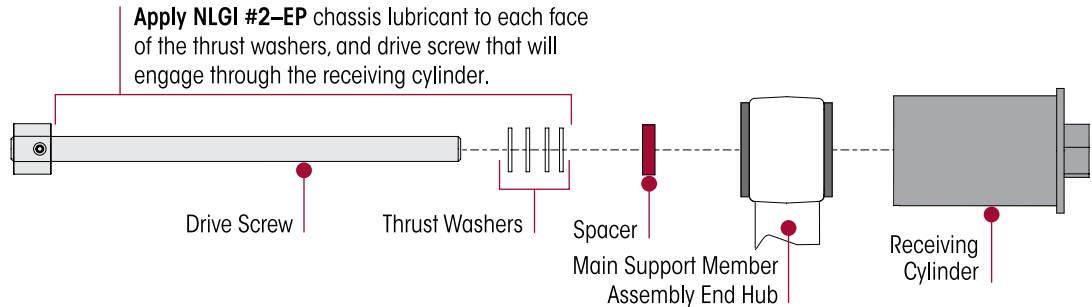
Apply P80 lubricant to the face of the lead-in flange and the outer diameter of NEW pivot bushing



REMOVAL

1. Install the pivot bushing tool as shown in Figure 8-27.
2. Remove and discard thrust washers (if equipped) and any loose rubber or debris from the existing pivot bushing.
3. Apply NLGI #2-EP (Extreme Pressure) chassis lubricant to each face of the thrust washers and to the drive screw that will engage through the receiving cylinder, see Figure 8-27.

FIGURE 8-27



4. Snug the threaded drive screw to hold the thrust washers, spacer, main support member assembly with the existing pivot bushing and the receiving cylinder in place, see Figure 8-28.
5. Using a $\frac{3}{4}$ " impact wrench, rotate the drive screw in a continuous motion without stopping until the pivot bushing is removed from the end hub. The existing pivot bushing will enter into the receiving cylinder, see Figure 8-29.
6. Remove and discard pivot bushing.
7. Repeat steps 1 through 6 for other side of the main support member assembly, as recommended.

FIGURE 8-28

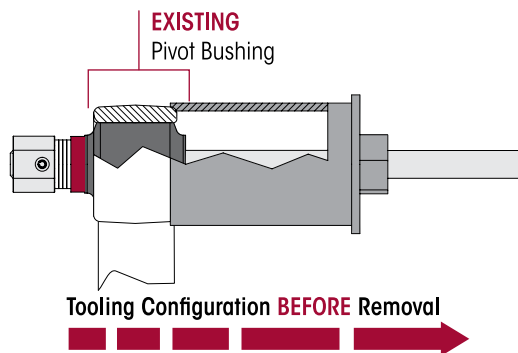
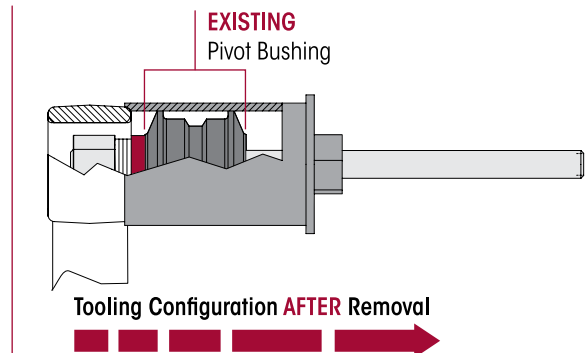


FIGURE 8-29



END HUB INSPECTION

1. Inspect the inner bore of the main support member assembly end hub and remove any loose debris or rubber residue from the bushing mating surface.

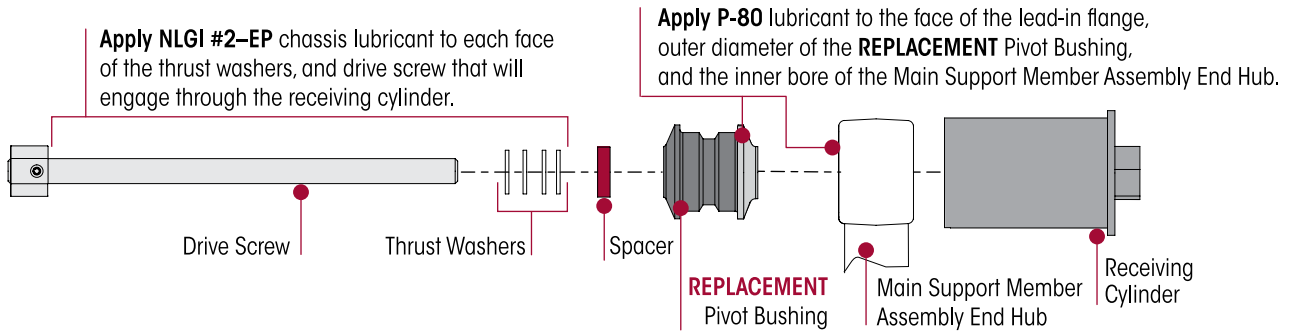
INSTALLATION

1. Clean the inner diameter of the main support member 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 8-30.

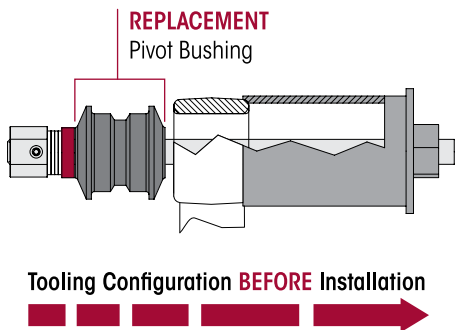
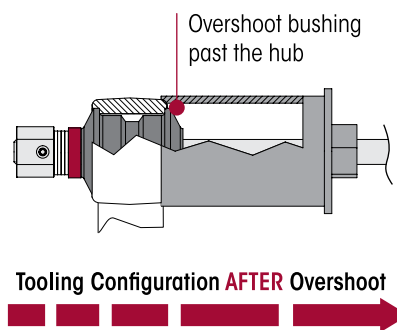
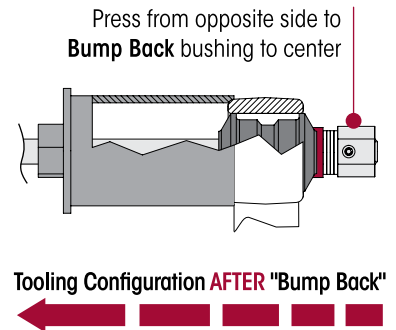
NOTE

DO NOT use petroleum or soap base 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, to the outer diameter of the replacement pivot bushing and to the inner diameter of the main support member assembly end hub, see Figure 8-30.

FIGURE 8-30


4. Snug the threaded drive screw to hold the thrust washers, spacer, pivot bushing, and main support member assembly with the receiving cylinder in place, see Figure 8-31.
5. Using a $\frac{3}{4}$ " 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 8-32.
6. Remove and reverse the installation tool, then from opposite side of the hub press the pivot bushing again to center the bushing within the beam end hub, see Figure 8-33. Center the pivot bushing to help prevent bulging and bushing preload. This is known as the "Bump Back" procedure.

FIGURE 8-31

FIGURE 8-32

FIGURE 8-33


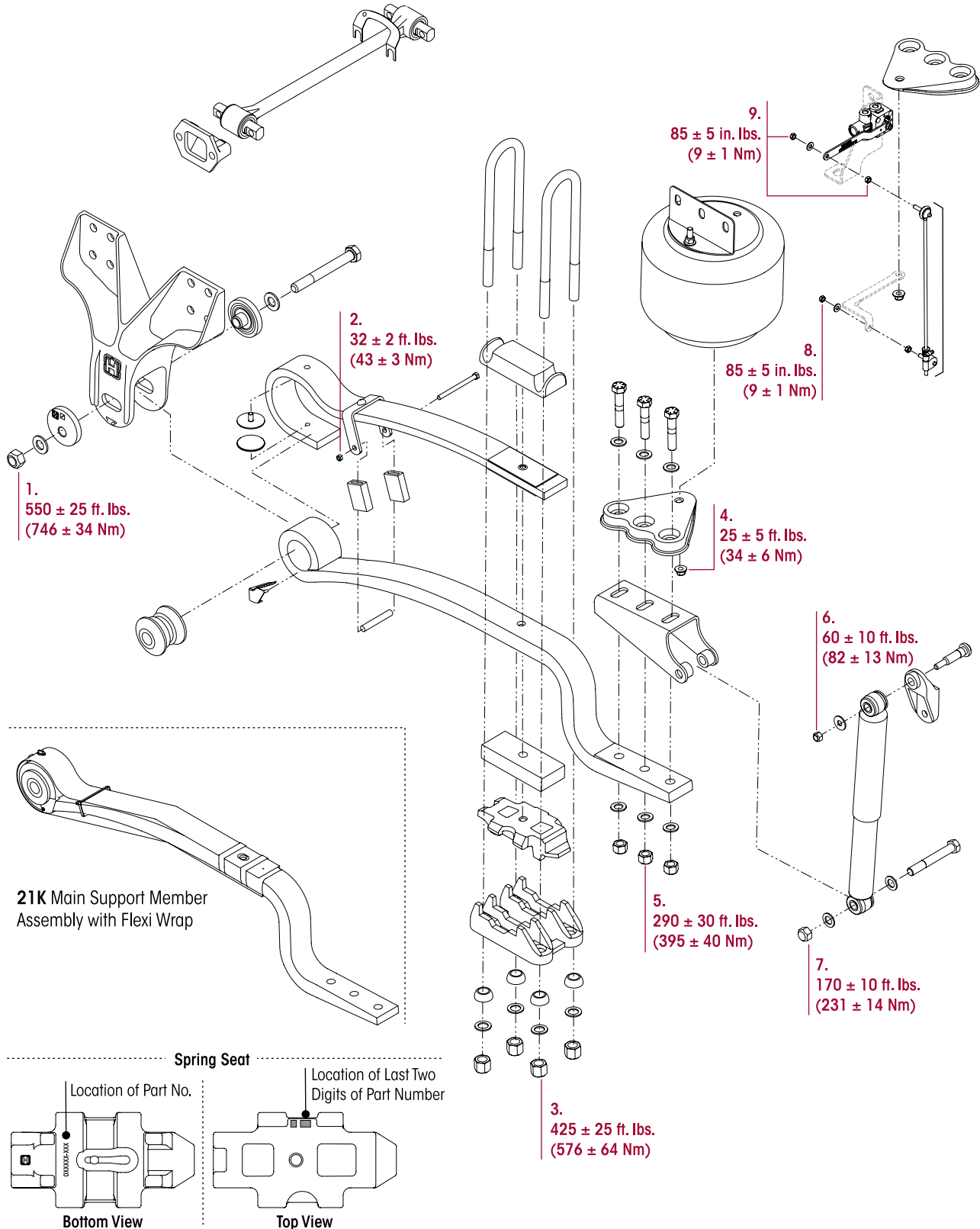
7. Repeat for the other main support member assembly.
8. Allow the lubricant four (4) hours to dissipate before fully operating the vehicle.
9. Install the main support member assembly, follow the procedure as detailed in this section.



SECTION 11 Torque Specifications

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


Vehicles built after January 2021






COMFORT AIR for Blue Bird Buses

HENDRICKSON RECOMMENDED TORQUE SPECIFICATIONS

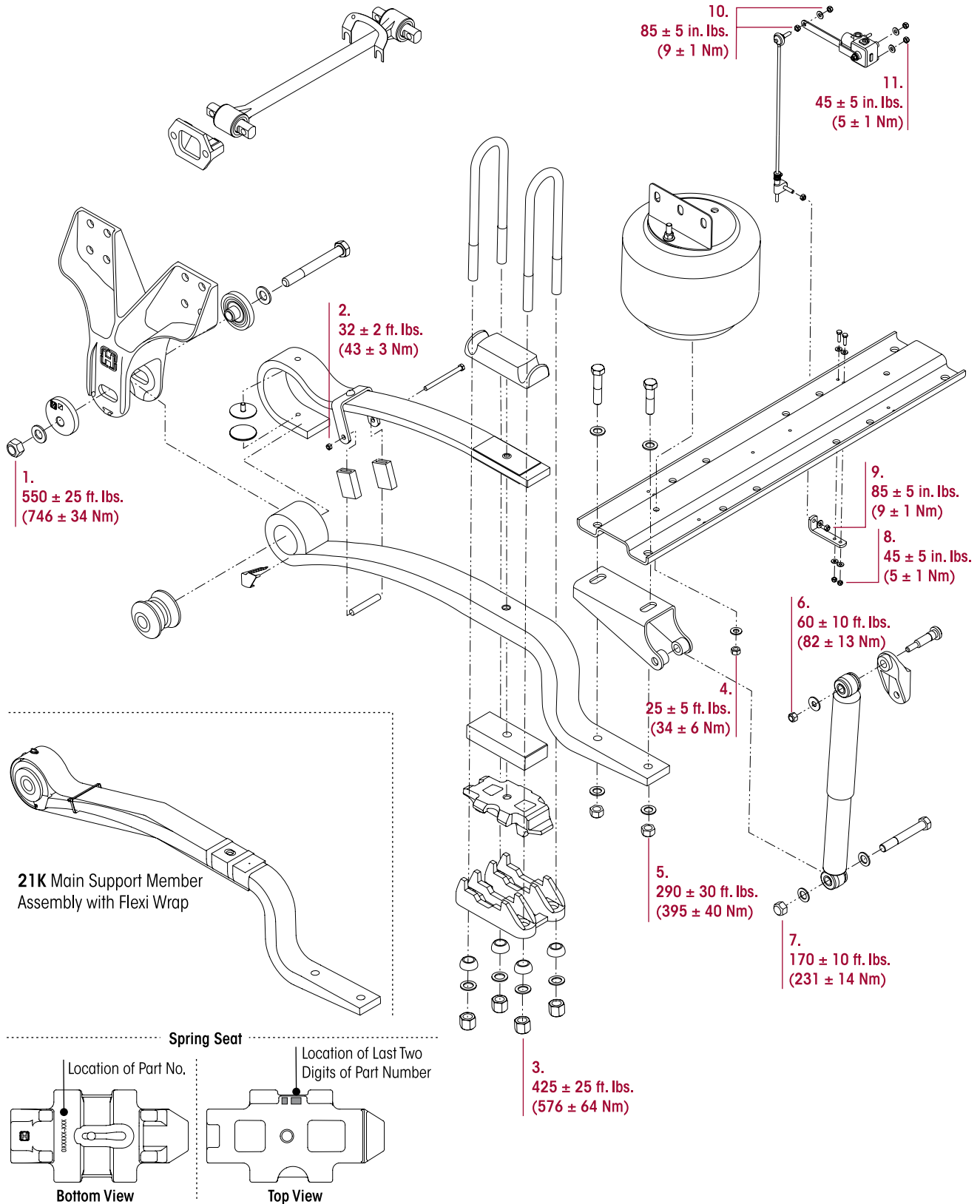
NO.	COMPONENT	QUANTITY	SIZE	*TORQUE VALUE	
				FOOT POUNDS	NM
1.	QUIK-ALIGN Fasteners	2	1"-8 UNC	550 ± 25	746 ± 34
	 WARNING ENSURE THAT QUIK-ALIGN FASTENER TORQUE VALUES ARE SUSTAINED AS RECOMMENDED. FAILURE TO DO SO CAN CAUSE ADVERSE VEHICLE HANDLING RESULTING IN PERSONAL INJURY OR PROPERTY DAMAGE.				
2.	Main Support Member Spring Clip	2	7/16"-14 UNC	32 ± 2	43 ± 3
3.	U-bolts	4	7/8"-14 UNF	425 ± 25	576 ± 64
4.	Air Spring to Air Spring Bracket	2	1/2"-13 UNC	25 ± 5	34 ± 6
5.	Lower Air Spring Bracket to Main Support Member	6	3/4"-10 UNC	290 ± 30	395 ± 40
6.	Shock Absorber to Upper Shock Bracket	2	1/2"-13 UNC	60 ± 10	82 ± 13
7.	Shock Absorber to Lower Shock Bracket	2	3/4"-10 UNC	170 ± 10	231 ± 14
8.	HCV Linkage Bracket to HCV Linkage	2	5/16"-18 UNC	85 ± 5 in. lbs.	9 ± 1
9.	HCV Linkage to Height Control Valve	2	5/16"-18 UNC	85 ± 5 in. lbs.	9 ± 1
10.	Height Control Valve to Frame (Not Shown)	2	1/4"-20 UNC	45 ± 5 in. lbs.	5 ± 1

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

 **WARNING** ALL COMFORT AIR FASTENERS FOR BLUE BIRD VEHICLES ARE HENDRICKSON COATED. METRIC BOLTS ARE CLASS 10.9 AND USE CLASS 10.0 LOCKNUTS. NON-METRIC FASTENERS ARE DETAILED AS SPECIFIED ABOVE. DO NOT ASSEMBLE WITHOUT THE PROPER FASTENERS. USE ONLY HENDRICKSON COATED FASTENERS TO SUSTAIN PROPER CLAMP FORCE. FAILURE TO DO SO CAN CAUSE ADVERSE VEHICLE HANDLING, PROPERTY DAMAGE OR PERSONAL INJURY.

Vehicles built prior to January 2021



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





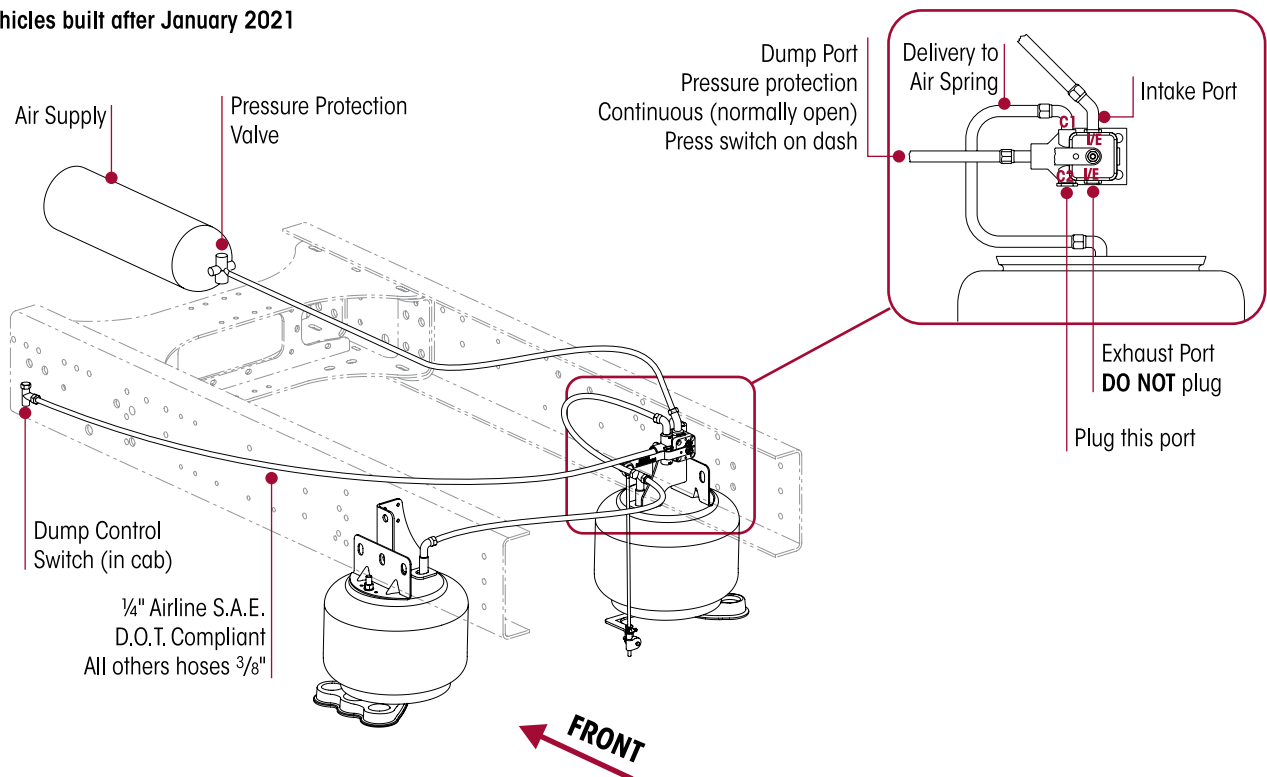
COMFORT AIR for Blue Bird Buses

HENDRICKSON RECOMMENDED TORQUE SPECIFICATIONS

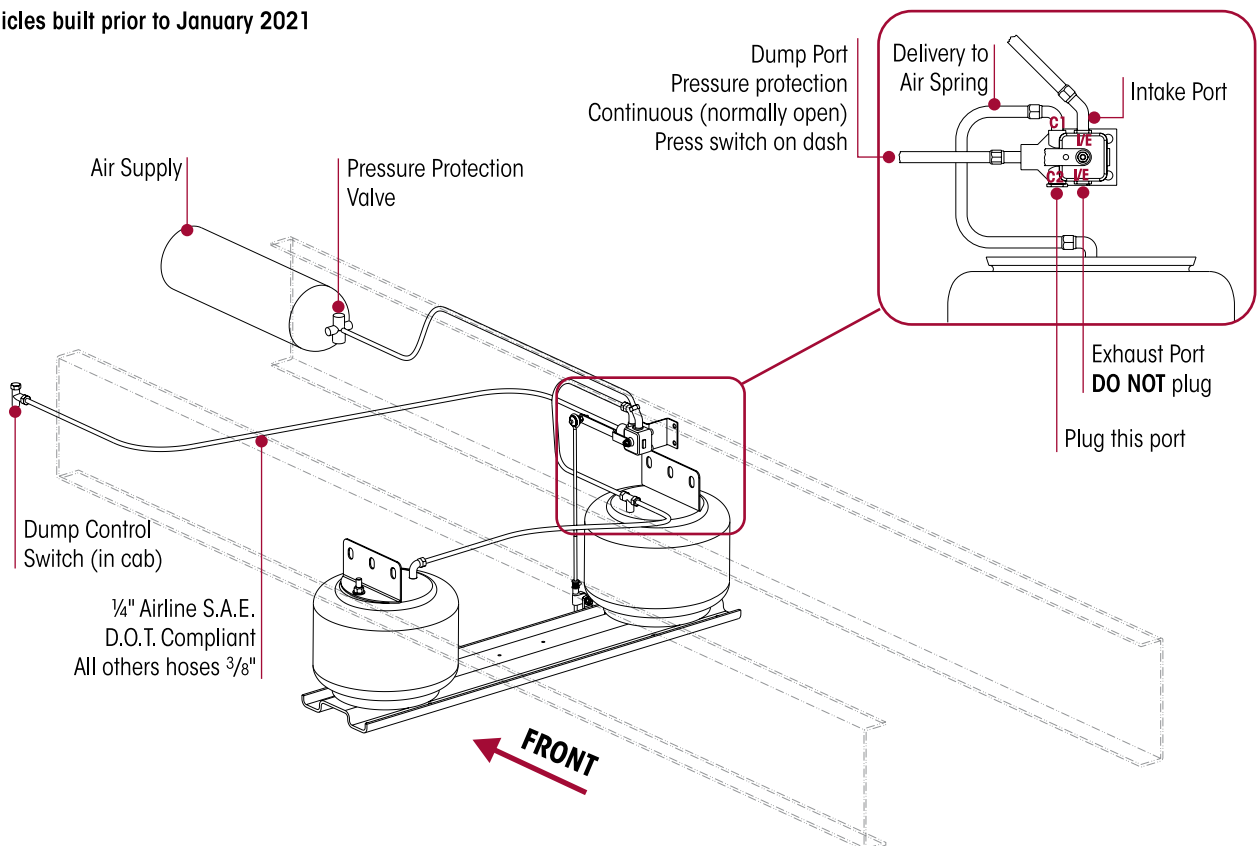
NO.	COMPONENT	QUANTITY	SIZE	*TORQUE VALUE	
				FOOT POUNDS	NM
1.	QUIK-ALIGN Fasteners	2	1"-8 UNC	550 ± 25	746 ± 34
	 WARNING ENSURE THAT QUIK-ALIGN FASTENER TORQUE VALUES ARE SUSTAINED AS RECOMMENDED. FAILURE TO DO SO CAN CAUSE ADVERSE VEHICLE HANDLING RESULTING IN PERSONAL INJURY OR PROPERTY DAMAGE.				
2.	Main Support Member Spring Clip	2	7/16"-14 UNC	32 ± 2	43 ± 3
3.	U-bolts	4	7/8"-14 UNF	425 ± 25	576 ± 64
4.	Air Spring to Cross Channel	2	1/2"-13 UNC	25 ± 5	34 ± 6
5.	Cross Channel to Main Support Member	6	3/4"-10 UNC	290 ± 30	395 ± 40
6.	Shock Absorber to Upper Shock Bracket	2	1/2"-13 UNC	60 ± 10	82 ± 13
7.	Shock Absorber to Lower Shock Bracket	2	3/4"-10 UNC	170 ± 10	231 ± 14
8.	Cross Channel to HCV Linkage Bracket	2	1/4"-20 UNC	45 ± 5 in. lbs.	5 ± 1
9.	HCV Linkage Bracket to HCV Linkage	2	5/16"-18 UNC	85 ± 5 in. lbs.	9 ± 1
10.	HCV Linkage to Height Control Valve	2	5/16"-18 UNC	85 ± 5 in. lbs.	9 ± 1
11.	Height Control Valve to Frame	2	1/4"-20 UNC	45 ± 5 in. lbs.	5 ± 1
NOTE: * Torque values listed above apply only if Hendrickson supplied fasteners are used. If non-Hendrickson fasteners are used, follow torque specification listed in vehicle manufacturer's service manual.					
 WARNING ALL COMFORT AIR FASTENERS FOR BLUE BIRD VEHICLES ARE HENDRICKSON COATED. METRIC BOLTS ARE CLASS 10.9 AND USE CLASS 10.0 LOCKNUTS. NON-METRIC FASTENERS ARE DETAILED AS SPECIFIED ABOVE. DO NOT ASSEMBLE WITHOUT THE PROPER FASTENERS. USE ONLY HENDRICKSON COATED FASTENERS TO SUSTAIN PROPER CLAMP FORCE. FAILURE TO DO SO CAN CAUSE ADVERSE VEHICLE HANDLING, PROPERTY DAMAGE OR PERSONAL INJURY.					

SECTION 9 Plumbing Diagram

Vehicles built after January 2021



Vehicles built prior to January 2021





SECTION 10

Troubleshooting Guide

COMFORT AIR for Blue Bird Buses

TROUBLESHOOTING GUIDE		
CONDITION	POSSIBLE CAUSE	CORRECTION
Vehicle bouncing excessively	Leaking shock absorber	Replace shock absorber.
	Damaged shock absorber	Replace shock absorber.
	Air spring(s) not inflated	Check air supply to air springs, repair as necessary.
	Incorrect ride height	Adjust ride height to proper setting. See Ride Height Adjustment in the Alignment & Adjustments section of this publication.
Suspension has harsh or bumpy ride	Broken main support member assembly	Replace main support member assembly.
	Damaged height control valve	Replace height control valve.
	Incorrect ride height	Adjust ride height to proper setting. See Ride Height Adjustment in the Alignment & Adjustments section of this publication.
Excessive driveline vibration	Incorrect ride height	Adjust ride height to proper setting. See Ride Height Adjustment in the Alignment & Adjustments section of this publication.
	Broken main support member assembly	Replace main support member assembly
	Air spring(s) not inflated	Check air supply to air springs, repair as necessary.
Vehicle leans	Broken main support member assembly	Replace main support member assembly.
	Axle connection not torqued correctly	Perform a U-bolt re-torque procedure. See Torque Specification section of this publication.
	Worn pivot bushing	Replace pivot bushing.
	Air spring(s) not inflated	Check air supply to air springs, repair as necessary.
Suspension is noisy	Loose QUIK-ALIGN attachment	Replace QUIK-ALIGN connection and check suspension alignment. Check frame hanger for wear around QUIK-ALIGN assembly and fasteners and replace as necessary.
	Loose U-bolts	Perform U-bolt re-torque procedure, see Preventive Maintenance section in this publication.
	Worn main support member isolator pads (if equipped)	Replace worn isolator pads (if equipped).
Irregular tire wear	Worn pivot bushing	Replace pivot bushing.
	Loose QUIK-ALIGN attachment	Replace QUIK-ALIGN connection and check suspension alignment. Check frame hanger for wear around QUIK-ALIGN assembly and fasteners and replace as necessary.
Main support member broken between U-bolts	Loose U-bolts	Replace the main support member assembly and all mating components.
QUIK-ALIGN or frame hanger worn	Loose fasteners and/or the reuse of old fasteners	Replace all worn parts and replace fasteners with new Hendrickson coated fasteners.

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.*



www.hendrickson-intl.com

TRUCK COMMERCIAL VEHICLE SYSTEMS
800 South Frontage Road
Woodridge, IL 60517-4904 USA
1.866.755.5968 (Toll-free U.S. and Canada)
1.630.910.2800 (Outside U.S. and Canada)
Fax 1.630.910.2899

17730-246 Rev D 02-22

© 2004 – 2022 Hendrickson USA, L.L.C. All Rights Reserved. All trademarks shown are owned by Hendrickson USA, L.L.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.

Printed in United States of America