

H TECHNICAL PROCEDURE

COMFORT AIR® 190/210/230 Single Axle Rear Air Suspension for Hino Vehicles

SUBJECT: Service Instructions LIT NO: 17730-245 DATE: November 2013 REVISION: B

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SECTION 1 Introduction

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

NOTE

Use only Hendrickson Genuine Parts for servicing this suspension system.

It is important to read and understand the entire Technical Procedure publication prior to performing any maintenance, service, repair, or rebuild of this product. The information in this publication contains parts lists, safety information, product specifications, features, proper maintenance, service, repair and rebuild instructions for 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 e-mail: techservices@hendrickson-intl.com.

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

SECTION 2 Product Description

FIGURE 2-1



The COMFORT AIR rear air suspension system for Hino vehicles – based on Hendrickson's technology, proven in over two million suspensions, helps increase driver comfort and provides superior cargo protection. A Hendrickson air suspension also helps to protect the vehicle from stress. The suspension mounting brackets use common frame hole locations with the mechanical suspension allowing relatively easy conversion to air ride. The system combines superior comfort, outstanding ride, improved handling and reduced maintenance.

- 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.
- Height Control Valve Maintains precise ride height control through changing road surfaces, load, and driving conditions.
- Main Support Member Extended-length generates lower spring rate for optimized roll stiffness, providing a more comfortable and compliant ride.
- **QUIK-ALIGN®** Fast and easy alignment without shims.
- Shock Absorbers Tuned for optimum damping characteristics to provide driving comfort. Protects air springs during rebound.
- ULTRA ROD[®] / ULTRA ROD[®] PLUS[™] Torque Rods Provides greater durability over conventional torque rods and enhances handling during cornering by controlling lateral forces to maintain axle position.

COMFORT AIR SPECIFICATIONS

	COMFORT AIR 190	COMFORT AIR 210	COMFORT AIR 230
Suspension Capacity:	19,000 lb	21,000 lb	23,000 lb
Suspension Weight ¹ :	460.50 lb (208.8 kg)	461 lb (209 kg)	530 lb (240 kg)
Main Support Member:	Single	Single	Double
Ride Height:	8.5"	8.5"	8.5"

1. 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.

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.

A DANGER	INDICATES AN IMMINENTLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, WILL RESULT IN SERIOUS INJURY OR DEATH.
A WARNING	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 spe- cific purposes. These special tools can be found in the Special Tools Section of this publication.



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

SAFETY PRECAUTIONS

🚯 WARNING

FASTENERS

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

LOOSE OR OVER TORQUED FASTENERS CAN CAUSE COMPONENT DAMAGE, LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE, OR SEVERE PERSONAL INJURY. MAINTAIN CORRECT TORQUE VALUE AT ALL TIMES. CHECK TORQUE VALUES ON A REGULAR BASIS AS SPECIFIED, USING A REGULARLY CALIBRATED 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 HINO VEHICLES ARE H-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 H-COATED FASTENERS TO SUSTAIN PROPER CLAMP FORCE. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE OR PERSONAL INJURY.

WARNING LOAD CAPACITY

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

MODIFYING COMPONENTS

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

🛕 WARNING

TORCH/WELDING

DO NOT USE A CUTTING TORCH TO REMOVE ANY FASTENERS. THE USE OF HEAT ON SUSPENSION COMPONENTS WILL ADVERSELY AFFECT THE STRENGTH OF THESE PARTS. A COMPONENT DAMAGED IN THIS MANNER CAN RESULT IN THE LOSS OF VEHICLE CONTROL AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE. EXERCISE EXTREME CARE WHEN HANDLING OR PERFORMING MAINTENANCE IN THE AREA OF THE SUPPORT BEAM. DO NOT CONNECT ARC WELDING GROUND LINE TO THE SUPPORT BEAM. DO NOT STRIKE AN ARC WITH THE ELECTRODE ON THE SUPPORT BEAM. DO NOT USE HEAT NEAR THE SUPPORT BEAM ASSEMBLY. DO NOT NICK OR GOUGE THE SUPPORT BEAM. SUCH IMPROPER ACTIONS CAN DAMAGE THE SUPPORT BEAM ASSEMBLY AND CAUSE LOSS OF VEHICLE CONTROL AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

PROCEDURES AND TOOLS

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

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

PERSONAL PROTECTIVE EQUIPMENT

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

🗥 WARNING

AIR SPRINGS

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.

INFLATION: DO NOT INFLATE AIR SPRING ASSEMBLY WHEN IT IS UNRESTRICTED. ASSEMBLY MUST BE RESTRICTED BY THE SUSPENSION OR OTHER ADEQUATE STRUCTURE. DO NOT INFLATE BEYOND PRESSURES OF 100 PSI AT DESIGN RIDE HEIGHT OF 8.5 INCHES (215 MM) OR 40 PSI AT 16.7 INCHES (424 MM) AIR SPRING HEIGHT. CONTACT HENDRICKSON TECH SERVICES FOR DETAILS. IMPROPER USE OR OVER INFLATION MAY CAUSE ASSEMBLY TO BURST CAUSING PROPERTY OR COMPONENT DAMAGE AND/OR SEVERE PERSONAL INJURY.

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.

DEFLATION: AIR SPRINGS MUST BE DEFLATED PRIOR TO LOOSENING ANY CLAMP GROUP HARDWARE. UNCONSTRAINED AIR SPRINGS WILL VIOLENTLY SHIFT WHICH CAN CAUSE PROPERTY DAMAGE OR SEVERE PERSONAL INJURY.

AIR SPRING LOWER MOUNTING STUDS

BEFORE REMOVING AIR SPRINGS, IT IS MANDATORY TO LUBRICATE THE LOWER AIR SPRING FASTENERS WITH PENETRATING OIL. REMOVE AIR SPRINGS 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

PARTS CLEANING

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

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

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

WARNING

QUIK-ALIGN FASTENERS

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

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

WARNING TRANSVERSE RODS

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

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, LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE, OR SEVERE PERSONAL INJURY. MAINTAIN CORRECT TORQUE VALUES AT ALL TIMES. CHECK TORQUE VALUES ON A REGULAR BASIS AS SPECIFIED.

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

WARNING

CROSS CHANNEL

IMPROPER JACKING METHODS CAN CAUSE STRUCTURAL DAMAGE WHICH CAN CAUSE LOSS OF VEHICLE CONTROL, 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

SECTION 4 Parts Lists

COMFORT AIR 190 / 210



COMFORT AIR® 190/210 for Hino Vehicles

KEY NO). Part no.	DESCRIPTION	NO.REQ.	KEY NO). PART NO.	DESCRIPTION	<u>10.REQ.</u>
1		Spring Hanger			65121-001	HCV Upper Frame Fastener Service Kit,	
	65081-001	Left Hand	1			Includes Key Nos. 34-36	
	65081-002	Right Hand	1	34	58573-004	M10 x 1.5 30 mm Bolt	2
		QUIK-ALIGN [®] Service Kit		35	58246-008	M10 Hardened Washer	4
	65119-001	LH, Includes Key Nos. 2-6		36	58581-000	M10 x 1.5 Locknut	2
	65119-002	RH, Includes Key Nos. 3-6			58994-032	Linkage Rod Assembly,	1
2	60662-000	QUIK-ALIGN Eccentric Collar	1			Includes Key Nos. 37-43	
3	60661-000	QUIK-ALIGN Concentric Collar	3	37		*Linkage Rod	1
4	58705-005	⁷ / ₈ "-9 UNC x 8" Long H-Coated Hex Bolt	2	38		*Valve Arm Joint	1
5	22962-034	%" H-Coated Hardened Washer	4	39		*Valve Arm Clamp	1
6	60266-000	%"-9 UNC H-Coated Locknut	2	40		*5/18 UNC Stud	2
	65106-001	Main Support Member Assembly,	2	41		*‱"-18 UNC Jam Nut	2
		Includes Key Nos. 7-11		42		*5% " Washer	2
7		*Main Support Member	1	43		*5/18 UNC Locknut	2
8		*Flexi-wrap	1	44	65090-000	HCV Lower Linkage Bracket	1
	34013-109	Main Support Member Bushing Service	Kit,	45	65091-001	M6 x 1-6G 30 mm Bolt	2
		One Side, Includes Key Nos. 4-6, 9-11		46	58246-016	M6 Hardened Washer	4
9	59770-000	Isolator Pad	1	47	65092-000	M6 x 1-6H Locknut	2
10		*Main Support Member Bushing	1	48	57317-007	Cross Channel	1
11	60392-000	Spring Eye Clip	1		57499-003	Cross Channel Fastener Service Kit, Axle	Set,
12	65071-000	Top Pad	2			Includes Key Nos. 49-51	
13	56501-005P	Spring Seat - 4°	2	49	58258-001	M20 x 2.5-6G 80 mm Bolt	4
14	50216-000	Axle Bottom Cap	2	50	58246-007	M20 Hardened Washer	8
	58818-011	U-bolt Bracket Fastener Kit, One Side		51	58259-000	M20 x 2.5-6H Locknut	4
		Includes Key Nos. 15-18		52	65086-002	Air Spring Assembly	2
15	58184-001	M22 x 1.5 U-bolt - 380 mm	4		58820-005	Air Spring Fastener Service Kit, One Side	,
16	48574-001	Spherical Washer	8			Includes Key Nos. 53-57	
17	58246-005	M22 Hardened Washer	8	<u>53</u>	58258-004	M20 x 2.5-6G 50 mm Bolt	4
18	58253-000	M22 x 1.5 High Nut	8	54	58246-007	M20 Hardened Washer	8
19	60670-013	Shock Absorber	2	55	58259-000	M20 x 2.5-6H Locknut	4
20	58516-002P	Upper Shock Bracket	2	56	58246-001	M12 Hardened Washer	2
	65118-002	Upper Shock Bracket Service Kit, One S	ide,	57	66224-000	M12 x 1.25 Locknut, Replaces 65089-000	1 2
		Includes Key Nos. 21-25		58	62000-595	**Transverse Torque Rod Assembly, 595 mi	n, 1
21	58244-002	M16 x 2 50 mm Bolt	4			Includes Key No. 59	
22	58246-003	M16 Hardened Washer	8	59	47691-000H	Torque Rod Bar pin Bushing	1
23	58245-000	M16 x 2 Locknut	4	60	65137-000	Outer Reinforcement Plate	1
24	58246-001	M12 Hardened Washer	2	61		***Inner Reinforcement Plate	1
25	58248-000	M12 x 1.75 Locknut	2		58819-004	Transverse Torque Rod Fastener Service	Kit,
26	65098-000	Lower Shock Bracket	2			Axle Set, Includes Key Nos. 62-67	
27	58258-005	M20 x 2.5 140 mm Bolt	2	62	49689-000	Shim (1.5 mm)	As Req.
28	58246-007	M20 Hardened Washer	4	<u>63</u>		***M16 x 2-6G 50 mm Bolt	4
29	58259-000	M20 x 2.5 Locknut	2	64	58246-003	M16 Hardened Washer	8
	65115-000	Height Control Valve Assembly	1	65	58245-000	M16 x 2-6H Locknut	4
		Includes Key Nos. 30-33		66	58244-005	M16 x 2-6G 130 mm Bolt	2
30	60501-000	Height Control Valve	1	67	58244-009	M16 x 2-6G 110 mm Bolt	2
31	22962-028	¼" HCV Washer (Not Shown)	2	68	22186-000	Transverse Torque Rod Frame Bracket	1
32	49983-000	1/4" HCV Hex Nut (Not Shown)	2	69		Transverse Torque Rod Axle Bracket	1
33	65097-000	HCV Mounting Bracket	1			Supplied by Vehicle Manufacturer	
				Not Shown	70867-001	****P-80 Lubricant - 10 ml	As Req.
				1			

NOTES: Quantities of service kit components may vary from amount shown in lists.

Torque Requirements Decal (Part No. 60298-003) is available upon request.

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

** Hendrickson two piece torque rods can be used to create the desired torque rod length, see Torque Rod Selection Guide Lit. No. 45745-148 for more information.

*** Inner reinforcement plate (part no. 65095-000) is no longer available, see torque rod configuration for vehicles built after July 2009.

**** Use as lubricant to install torque rod bushing and main support member pivot bushing.

Hendrickson COMFORT AIR ride height gauge for Hino vehicles can be obtained on-line at www.hendrickson-intl.com/litform/litform-new.asp

• Literature number 45745-242

COMFORT AIR 230



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COMFORT AIR® 230 for Hino Vehicles

KEY NO	. Part no.	DESCRIPTION	NO.REG	2.	KEY NO.	Part No.	DESCRIPTION	NO.REQ
1		Spring Hanger			34	58573-004	M10 x 1.5 30 mm Bolt	2
	65081-001	Left Hand	1	1	35	58246-008	M10 Hardened Washer	4
	65081-002	Right Hand		1	36	58581-000	M10 x 1.5 Locknut	2
		QUIK-ALIGN [®] Service Kit				58994-032	Linkage Rod Assembly,	1
	60632-029	LH, 23K, Includes Key Nos. 2-6					Includes Key Nos. 37-43	
	60632-030	RH, 23K, Includes Key Nos. 3-6		_	37		*Linkage Rod	1
2	64632-000	QUIK-ALIGN Eccentric Collar	1	1	38		*Valve Arm Joint	1
3	64633-000	QUIK-ALIGN Concentric Collar	3	3	39		*Valve Arm Clamp	1
4	68217-001	1"-14 UNF x 8" Long H-Coated Hex Bolt		2	40		*‰"-18 UNC Stud	2
5	68232-000	1" H-Coated Hardened Washer	4	4	41		*5/16"-18 UNC Jam Nut	2
6	68218-000	1"-14 UNF H-Coated Locknut	2	2	42		*5/16" Washer	2
	53443-000	Main Support Member Assembly,		2	43		*5/16"-18 UNC Locknut	2
		Includes Key Nos. 7-11		_	44	65090-000	HCV Lower Linkage Bracket	1
7		*Main Support Member		1	45	65091-003	M6 x 1-6G 35 mm Bolt	2
	34013-189	Main Support Member Bushing Service	e Kit,		46	58246-016	M6 Hardened Washer	4
		One Side, Includes Key Nos. 4-6, 8-9		_	47	65092-000	M6 x 1-6H Locknut	2
8		*Main Support Member Bushing	1	1	48	57317-007	Cross Channel	1
9	60392-001	Spring Eye Clip		1		57499-014	Cross Channel Fastener Service Kit, Axle	e Set,
10		*Nylon Caristrap®		_			Includes Key Nos. 49-51	
<u>11</u>		*Galvanized Liner	ć	3	49	58258-023	M20 x 2.5-6G 90 mm Bolt	4
12	65071-000	Top Pad		2	50	58246-007	M20 Hardened Washer	8
13	56501-007P	Spring Seat - 5°	2	2	51	58259-000	M20 x 2.5-6H Locknut	4
14	50216-000	Axle Bottom Cap	2	2	52	76942-002	Air Spring Assembly	2
	69124-008	U-bolt Bracket Fastener Kit, One Side				49177-035	Air Spring Fastener Service Kit, One Side	e,
15	58184-005	M22 x 1 5 II-bolt - 100 mm			53	58258-004	M20 x 2 5-6G 50 mm Bolt	/
16	48574-001	Spherical Washer		8	54	58246-007	M20 Hardened Washer	
17	58246-005	M22 Hardened Washer	5		55	58259-000	M20 x 2 5-6H Locknut	4
18	58253-000	M22 x 1 5 High Nut	5		56	58246-001	M12 Hardened Washer	
19	60670-018	Shock Absorber		$\frac{1}{2}$	57	66224-000	M12 x 1 25 Locknut with Nylon Insert	2
20	58516-002P	Upper Shock Bracket		$\frac{1}{2}$	58	72000-5955	**UITRA ROD® PLUS™ Transverse Torque R	od 1
20	65118-002	Upper Shock Bracket Service Kit. One S	ide.	-	00	/2000 0/00	Assembly 595 mm Includes Key No. 59)
	00110002	Includes Key Nos. 21-25	,		59	64400-002	Torque Rod Bar pin Bushing	1
21	58244-002	M16 x 2 50 mm Bolt	4	4	60	65137-000	Outer Reinforcement Plate	1
22	58246-003	M16 Hardened Washer	8	8		69124-007	Transverse Torque Rod Fastener Service	Kit.
23	58245-000	M16 x 2 Locknut	4	4			Axle Set. Includes Key Nos. 61-64	,
24	58246-001	M12 Hardened Washer	2	$\frac{1}{2}$	61	49689-000	Shim (1.5 mm)	As Rea.
25	58248-000	M12 x 1.75 Locknut		2	62	58244-005	M16 x 2-6G 130 mm Bolt	4
26	49324-002	Lower Shock Bracket		2	63	58246-005	M16 Hardened Washer	8
27	58258-005	M20 x 2.5 140 mm Bolt		2	64	58245-000	M16 x 2-6H Locknut	4
28	58246-007	M20 Hardened Washer	4	4	65	22186-000	Transverse Torque Rod Frame Bracket	1
29	58259-000	M20 x 2.5 Locknut	2	2	66		Transverse Torque Rod Axle Bracket	1
	69031-000	Height Control Valve Assembly	1	1			Supplied by Vehicle Manufacturer	
		Includes Key Nos. 30-33			67		***Inner Reinforcement Plate	1
30	60501-000	Height Control Valve		1	68		***M16 x 2-6G 50 mm Bolt	4
31	22962-028	¼" HCV Washer (Not Shown)	2	2	69		***M16 Hardened Washer	8
32	49983-000	¼" HCV Hex Nut (Not Shown)	2	2	70		***M16 x 2-6H Locknut	4
33	65097-000	HCV Mounting Bracket	1	1	Not Shown	70867-001	****P-80 Lubricant - 10 ml	As Req.
	65121-001	HCV Upper Frame Fastener Service Kit,		_				
		Includes Key Nos. 34-36						

NOTES: Quantities of service kit components may vary from amount shown in lists.

- * Item included in assembly / kit only, part not sold separately.
- ** Hendrickson two piece torque rods can be used to create the desired torque rod length, see Torque Rod Selection Guide Lit. No. 45745-148 for more information.
- *** Not supplied by Hendrickson. Used for reference only. Hendrickson is not responsible for components supplied by vehicle manufacturer. For assistance with maintenance and rebuild instructions on these components refer to vehicle manufacturer.

**** Use as lubricant to install torque rod bushing and main support member pivot bushing.

Hendrickson COMFORT AIR ride height gauge for Hino vehicles can be obtained on-line at www.hendrickson-intl.com/litform/litform-new.asp

• Literature number 45745-242

Special Tools

These shop made tools are designed for servicing bushings. Bushing tools are to be made from cold rolled steel or equivalent. The drawings are for reference only, Hendrickson does not supply these tool.

PIVOT BUSHING TOOLS





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QUIK-ALIGN SOCKET TOOL

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



SECTION 6 Preventive Maintenance

COMPONENT INSPECTION

A visual inspection of the suspension should be performed at time of delivery and every 25,000 miles (40,000 km) or every six months thereafter, whichever comes first, to help ensure all components function to their highest efficiency.

- 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.
- Cross Channel 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 Bracket 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. Replace all worn or damaged parts.
- 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 Flexi-wrap isolator pads (if equipped) for wear or damage. Inspect Flexi-wrap (if equipped) for signs of looseness or damage. Check torque on QUIK-ALIGN fasteners, cross channel fasteners, and U-bolts. Correct the torque if necessary. Replace all worn or damaged parts.
- Shock Absorbers Look 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 for proper torque. If there is metal-to-metal contact in the bushing joint, this is a sign of excessive bushing wear and the bushing needs to be replaced. Replace all worn or damaged parts.
- 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.

MAIN SUPPORT MEMBER BUSHINGS

Bushings should function satisfactorily during normal vehicle operation. However, if the suspension is not maintained properly premature bushing wear can occur and will require replacement. The main support member bushing should be replaced if it exhibits excessive fore-aft movement or the vehicle is experiencing excessive tire wear on the rear axle. For instructions on bushing replacement, see the Component Replacement Section of this publication.

U-BOLT LOCKNUTS

NOTE

Current Hendrickson Truck Suspension Systems U-bolt locknuts for the COMFORT AIR suspension are H-Coated M22 x 1.5 - class 10 high nuts.

FIGURE 6-1



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.
- 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.
- 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 mile (30,000 km) inspection and re-torque interval.

FIGURE 6-2

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 375-425 foot pounds (508-576 Nm) torque.



TRANSVERSE TORQUE RODS

THE COMFORT AIR SUSPENSION INCORPORATES TRANSVERSE RODS FOR VEHICLE STABILITY. IF WARNING THESE COMPONENTS ARE DISCONNECTED OR ARE NON-FUNCTIONAL THE VEHICLE SHOULD NOT BE OPERATED. FAILURE TO DO SO CAN RESULT IN ADVERSE VEHICLE HANDLING AND POSSIBLE TIRE CONTACT WITH THE FRAME. OPERATING A VEHICLE WITH NON-FUNCTIONAL TRANSVERSE TORQUE RODS CAN RESULT IN LOSS OF VEHICLE CONTROL. SEVERE PERSONAL INJURY, AND PREMATURE COMPONENT DAMAGE. NOTE Hendrickson recommends the use of H-Coated, Class 10.9 bolts and Class 10 locknuts for all straddle mount torque rod attachments. Visually inspect torque rod bushings for torn or shredded rubber, inspect for bent, cracked, or broken torque rods, and for end hubs with an elongated "oval" shape. Any of these conditions will require component replacement. Torque rod looseness inspection is necessary. With the vehicle shut down, a lever check can be made with a long pry bar placed under each rod end and pressure applied. Torque rod length 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 6-3. Refer to Lateral Alignment in the Alignment & Adjustments Section of this publication.



If lateral alignment is out of specification by ¼" (6 mm), remove or install a 1/8" (3 mm) shim as needed

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 6-3.

The torque rod may be renewed by pressing out the worn bushings and installing new replacement bushings, see torque rod removal and bushing replacement in 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.

AIR FITTING INSPECTION

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

Air lines and fittings may be inspected for leaks using a soapy water solution. The height control valve, however, cannot be inspected using this method. All height control valves have an allowable leakage rate. The only acceptable method for inspection of the height control valves is the height control valve test found in this section.

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

SHOCK ABSORBER

Inspection of the shock absorber can be performed by doing a heat test, and a visual inspection. If the shock is damaged install new shock absorber as detailed in the Component Replacement Section of this publication. Hendrickson recommends that the shock absorbers be replaced with identical IP Hendrickson Genuine parts for servicing. It is not necessary to replace shock absorbers in pairs if one shock absorber requires replacement.

HEAT TEST

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

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

- 2. Lightly touch the shock body carefully below the dust cover, see Figure 6-4.
- 3. Touch the frame to get an ambient reference. A warm shock absorber is acceptable, a cold shock absorber should be replaced.

NOTE

🛝 WARNING

To inspect for an internal failure, remove and shake the 4 suspected shock. Listen for the sound of metal parts rattling inside. Rattling of metal parts can indicate that the shock has an internal failure.

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

VISUAL INSPECTION

Look for these potential problems when doing a visual inspection, see Figure 6-5. Inspect the shock absorbers fully extended. Replace as necessary.





Damaged upper or lower mount





Damaged upper or lower bushing

Damaged dust cover and / or shock body

Bent or dented shock





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

LEAKING VS. MISTING SHOCK VISUAL INSPECTION

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

A shock that is leaking and needs to be replaced will show signs of fluid leaking in streams from the



upper seal. These streams can easily be seen when the shock is fully extended, underneath the main body (dust cover) of the shock, see Figure 6-6. Look for these potential problems when doing a visual inspection. Inspect the shock absorbers fully extended. Replace as necessary.

NOTE

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

FIGURE 6-5

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SECTION 7 Alignment & Adjustments

RIDE HEIGHT ADJUSTMENT

The Comfort Air suspension for Hino 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.

- 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 the air system is at full operating pressure.
- 5. See Air Spring Warnings and Instructions in the Important Safety Notice Section of this publication prior to deflating or inflating the air system.
 - FIGURE 7-1
- Cycle the air system. Disconnect the height control valve arm from the rubber grommet. Lower the height control valve arm to exhaust the air in the air springs and deflate the suspension. Reconnect the height control valve arm to the rubber grommet to inflate the suspension, see Figures 7-1 and 7-4.
- A ride height gauge (Hendrickson literature no. 45745-242) for the COMFORT AIR for Hino Vehicles is available from Hendrickson to simplify establishing the 4.5" ± 1/8" ride height dimension as shown in Figure 7-1.

a. Hold the ride height gauge (Hendrickson literature no. 45745-242) vertically against the side of the frame rail and in contact with the bottom of the frame rail, see Figure 7-1. The bottom of the main support member must line up with the pointer of the ride height gauge (± ½").

b. If a height gauge is not available, the alternate method is to use a tape measure to check the referenced vertical ride height from the bottom of the frame rail to the centerline of the axle. Referenced vertical ride height is $8.5" \pm \frac{1}{2}$, see Figure 7-2.







FIGURE 7-3



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

- 9. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to deflating or inflating the air system.
- 10. 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.
- 11. Refill the suspension by raising the height control valve arm by hand, so that the suspension is above the proper ride height.
- 12. Lower the height control valve arm to exhaust the air system until the suspension is at proper ride height.
- 13. 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.

To set neutral position align hole with hole on height control valve cover

- 14. 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.
- 15. Reconnect the height control valve arm to the rubber grommet.
- Tighten the clamp on the adjustable valve arm joint with a screwdriver until securely fastened, see Figure 7-4.
- **FIGURE 7-4** M10 x 1.5 6H Locknut Tightening torque 20-30 ft. lbs. (27-40 Nm) M 5/16"-18 UNC-2B Linkage Rod Locknut 0 Tightening torque 10-12 ft. lbs. (13-16 Nm) **Height Control Valve** Height Control Valve Arm Air Spring Linkage Rod Valve Arm Clamp Valve Arm Joint
- 17. Remove the dowel from the height control valve.
- 18. 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 number 4 through 6 above.
- 19. Recheck the ride height.

exhaust noise.

20. Repeat Steps 3 through 18 until the ride height is within specification.

SERVICE HINTIt is very important that the leveling valve be cycled completely before and after any ride height
adjustments. The cycling of the leveling valve will help make the adjustment more accurate. Be
sure to maintain full system air pressure while setting or inspecting ride height.NOTEDuring cycle operation of the height control valve it is normal to experience a limited amount of

WARNING



- 1. Use a work bay with a level surface.
- 2. Relax the suspension by slowly moving the vehicle back and forth several times in a straight line without using the brakes. This will slacken or loosen the suspension as the vehicle is positioned. End with all wheels positioned straight ahead.
- 3. **DO NOT** set the parking brake. Chock the front wheels of the vehicle.
- 4. Verify and maintain the air system at full operating pressure.
- 5. Verify the vehicle is at the correct ride height. Correct as necessary. Refer to Ride Height Adjustment in this section.
- 6. Verify all suspension components are in good condition. Repair or replace any worn or damaged suspension components before proceeding with the alignment process.
- 7. Ensure all drive axle tires are the same size and properly inflated.
- 8. Measure from the outside of the frame rail to the rim flange of the inner tire. Record the measurement.
- 9. Measure the same distance on the opposite side of the same axle. Record the measurement.
- 10. Subtract the two measurements to get a difference between the two. If the difference is greater than ¹/₈" (3 mm), it will be necessary to correct the lateral alignment. Adding or removing shims as shown in Figure 7-5 accomplishes this.





If lateral alignment is out of specification by ¼" (6 mm), remove or install a 1/8" (3 mm) shim as needed

- A general rule of thumb is to use a shim with a thickness that is half of the difference between the two measurements.
- Shims can be installed either between the transverse torque rod and the transverse torque rod frame bracket or between the transverse torque rod and axle tower bracket.

If the lateral alignment is out of specification by ¼" (6 mm), remove or install a ½" (3 mm) shim between the transverse torque rod and frame rail as needed, see Figure 7-5. Refer to Longitudinal and Transverse Torque Rod Section in Preventive Maintenance Section of this publication.

It is important to check the transverse torque rod fasteners for proper torque during preventive maintenance service intervals. Refer to Torque Specifications Section of this publication.

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.

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.

EXAMPLE

- 2. Verify vehicle is at the proper ride height, see Ride Height Adjustment in this section.
- 3. Install a digital protractor on the drive axle housing as shown in Figure 7-6.

FIGURE 7-6

4. Verify the pinion angle is correct per the vehicle manufacturer's specifications. If an adjustment is needed please contact the vehicle manufacturer.

DRIVE AXLE ALIGNMENT INSPECTION PROCEDURE

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



NOTE

NOTE

It is important to have the QUIK-ALIGN locknut pre-torqued to **1**00 foot pounds (135 Nm) on the left side of vehicle only. All other suspension fasteners must be tightened to their specified torque values. The total range of rear axle alignment adjustment is 1.0" (25.4 mm).

Use a new QUIK-ALIGN kit for any axle alignment or disassembly of the QUIK-ALIGN connection. This ensures proper clamping force is applied to the connection.

- 1. Use a work bay with a level surface.
- Relax the suspension by slowly moving the vehicle back and forth several times in a straight line without using the brakes. This will slacken or loosen the suspension as the vehicle is positioned. End with all wheels positioned straight ahead.
- 3. **DO NOT** set the parking brake. Chock the front wheels of the vehicle.
- 4. Verify and maintain the air system at full operating pressure.
- 5. Verify the vehicle is at the correct ride height. Correct as necessary. Refer to Ride Height Adjustment in this section.



- 6. Verify all suspension components are in good condition. Repair or replace any worn or damaged suspension components before proceeding with the alignment process.
- 7. Ensure all drive axle tires are the same size.
- 8. If axle alignment equipment is not available, using "C" clamps, securely clamp a six-foot piece of STRAIGHT bar stock or angle iron across the lower frame flange as shown in Figure 7-7. Select a location for the angle iron as far forward of the drive axle as possible where components will not interfere.
- 9. Accurately square the straight edge to the frame using a carpenter's square.
- 10. Using a measuring tape, measure from the straight edge to the forward face of the front drive axle arms at the centerline on both sides of the vehicle as shown in Figure 7-7, **A** and **B**.
- 11. Calculate the difference between measurements A and B.



- b. If alignment of the front drive axle **IS NOT** within the vehicle manufacturer's specifications, then the alignment of this axle **MUST** be corrected. Proceed to Steps 12 to 16.
- 12. 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.
- 13. Tighten the QUIK-ALIGN locknut to 100 foot pounds (135 Nm). This will hold the eccentric flanged washer (see Figure 7-8) in place against the hanger face and within the adjustment guide, but loose enough to permit the eccentric flanged washer to rotate freely.
- 14. 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 H-COATED FASTENERS TO SUSTAIN PROPER CLAMP FORCE. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE OR PERSONAL INJURY AND VOID WARRANTY. ENSURE THAT THE QUIK-ALIGN FASTENER'S TORQUE VALUES ARE SUSTAINED AS RECOMMENDED IN THE TORQUE SPECIFICATIONS SECTION OF THIS PUBLICATION. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL RESULTING IN PERSONAL INJURY OR PROPERTY DAMAGE.

 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 S50-600 foot pounds (745-810 Nm) torque, see Figure 7-8.

FIGURE 7-8



SECTION 8 Component Replacement

FASTENERS

Hendrickson recommends when servicing the vehicle, replace 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

valve.

bracket.

Figure 8-1.

- 1. Chock the wheels of the vehicle.
- 2. 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.

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 of this publication prior to deflating or inflating the air system.
- 4. Lower the height control valve arm to exhaust the air in the air springs and deflate the rear suspension.
- 5. Remove the air lines from the height control valve.



ASSEMBLY 1. Re-install the air fittinas into the height control valve. Ensure

> the Teflon® thread sealing ring is seated around the base of the fitting's hex shoulder. Tighten to S 3-15 foot pounds (4-20 Nm) torque.

- 2. Install the height control valve to the frame mounting bracket by attaching the ¼" fasteners. Tighten to S 20-30 foot pounds (27-40 Nm) torque.
- 3. Install the air lines to the height control valve. Refer to the Plumbing Diagram Section of this publication.
- 4. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to deflating or inflating the air system.



- 6. Remove the frame supports.
- Remove the wheel chocks.
- Verify the vehicle's ride height is within specifications, adjust as necessary, see Ride Height Adjustment in Alignment & Adjustments Section of this publication.

AIR SPRING

DISASSEMBLY

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

WARNING

WARNING

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

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

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.

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

SERVICE HINT If the air spring is being removed for an alternate repair and will be reused it will be necessary to lubricate the lower mounting stud with penetrating oil prior to removal of the locknut. This will help prevent the air spring mounting stud from breaking during the removal process.

FIGURE 8-2

M20 x 2.5-6H

160-180 ft. lbs.

(217-245 Nm)

M12 x 1.25-6H

Cross Channel

Tightening Torque

Lower Air Spring Locknut

20-30 ft. lbs. (27-40 Nm)

Air Spring

0)

CHENDRICKSON

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0

Tightening Torque

Upper Air Spring Locknut

- 7. Using hand tools only, remove the M12 lower air spring mounting locknut, see Figure 8-2. This will help prevent the air spring mounting stud from breaking during the removal process.
- 8. Remove the two M20 fasteners from the upper air spring mounting bracket and the frame, see Figure 8-2.

9. Remove the air spring.

INSPECTION

- 1. Inspect the mounting surfaces and lower air spring mount for any damage. Replace as necessarv.
- 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 8-2.

20-30 ft. lbs. (27-40 Nm)

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.

FIGURE 8-3

- M20 Washer 2. Hold the air spring M20 x 50 mm tight against the bot-6 Upper Air Spring Bolt Ø tom frame flange and tighten the two an in T M20 Upper M20 upper air spring Air Spring Air Spring Locknut mounting fasteners Tightening Torque to 🖪 160-180 foot 160-180 ft. lbs. pounds (217-245 Nm) (217-245 Nm) Cross Channel torque, see Figure 8-3. M12 Lower Air Spring Locknut 3. Install the air spring M12 Washer Tightening Torque
- lower mounting stud through the cross-

channel hole. Attach the M12 fasteners to the lower mounting stud of the air spring. **USING HAND TOOLS ONLY**, tighten the locknut to **1** 20-30 foot pounds (27-40 Nm) torque, see Figure 8-3.

- 4. Connect the air line to the air spring.
- 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. Inflate the suspension by connecting the height control valve linkage to the height control valve arm. Verify the air springs inflate uniformly without binding.
- 7. Remove the frame supports.
- 8. Remove the wheel chocks.
- 9. Verify the vehicle's ride height is within specifications. Adjust as necessary, see Ride Height Adjustment in Alignment & Adjustments Section of this publication.

SHOCK ABSORBER

DISASSEMBLY

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

🛕 WARNING

WARNING

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

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

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 M20 through bolt from the lower shock absorber mount, see Figure 8-4.
- 7. Slide the shock absorber out of the lower mounting bracket.
- 8. Remove the M12 locknut from the upper shock absorber mounting stud.

9.

10. Inspect the shock absorber mounting brackets and hardware for damage or wear, and replace as necessary, see the Preventive Maintenance Section of this publication.



ASSEMBLY

- 1. Install the shock absorber onto the upper mounting stud.
- 2. Install the M12 fasteners on the upper shock absorber mounting stud.
- 3. Install the M20 fasteners through the lower shock mount and lower shock bracket. Tighten the locknut to **1** 160-180 foot pounds (217-245 Nm) torque, see Figures 8-5 and 8-6.
- 4. Tighten the M12 upper shock absorber locknut to S 50-70 foot pounds (68-95 Nm) torque, see Figures 8-5 and 8-6.

SHOCK ABSORBER LOWER MOUNTING BRACKET

DISASSEMBLY

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

WARNING

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







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 lines from the air springs.
- 7. Remove the M20 through bolt from the lower shock absorber mount see Figures 8-5 and 8-6.
- 8. Slide the shock absorber out of the lower mounting bracket.
- 9. Remove the four M20 bolts from the cross channel.
- 10. Using a floor jack under the center of the cross channel, raise the cross channel slightly and remove the lower mounting bracket off the main support member.

INSPECTION

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

ASSEMBLY

- 1. Install the lower shock absorber mounting bracket over the end of the main support member.
- 2. Lower the cross channel on top of the main support member and the lower shock absorber mounting bracket.
- 3. Loosely install the two M20 bolt and washer through the cross channel holes, lower shock bracket and main support member on each end of the cross channel, see Figures 8-5 and 8-6.
- 4. Install M20 fasteners on the cross channel bolts. Tighten the cross channel fasteners to 260-320 foot pounds (355-435 Nm) torque.



- 7. Reconnect the air lines to the air springs.
- 8. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of 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. Adjust as necessary, see Ride Height Adjustment in Alignment & Adjustments Section of this publication.

CROSS CHANNEL

DISASSEMBLY

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

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

- 3. Remove the air springs as detailed in the "Air Spring Disassembly" in this section.
- 4. Remove the two M6 height control valve lower bracket fasteners to cross channel. Remove the bracket.
- 5. Remove the four M20 bolts from the cross channel to main support member, see Figure 8-7.
- 6. Remove the cross channel.



WARNING

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 M20 bolts through the cross channel holes, lower shock bracket and main support member on each end of the cross channel, see Figure 8-7.
- 3. Tighten the cross channel fasteners to 🗈 260-320 foot pounds (355-435 Nm) torque, see Figure 8-7.
- 5. 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.

- 6. Hold the air spring tight against the bottom frame flange and tighten the two M20 upper air spring mounting fasteners to 🗈 160-180 foot pounds (217-245 Nm) torque.
- Install the air spring lower mounting stud through the cross-channel hole. Attach the M12 fasteners to the lower mounting stud of the air spring. USING HAND TOOLS ONLY, tighten the locknut to
 20-30 foot pounds (27-40 Nm) torque.
- 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, adjust as necessary, see Ride Height Adjustment in Alignment & Adjustments Section of this publication.

TRANSVERSE TORQUE ROD

WARNING

THE COMFORT AIR SUSPENSION INCORPORATES TRANSVERSE RODS FOR VEHICLE STABILITY. IF THESE COMPONENTS ARE DISCONNECTED OR ARE NON-FUNCTIONAL THE VEHICLE SHOULD NOT BE OPERATED. FAILURE TO DO SO CAN RESULT IN ADVERSE VEHICLE HANDLING AND POSSIBLE TIRE CONTACT WITH THE FRAME. OPERATING A VEHICLE WITH NON-FUNCTIONAL TRANSVERSE RODS CAN RESULT IN LOSS OF VEHICLE CONTROL, SEVERE PERSONAL INJURY, AND PREMATURE COMPONENT DAMAGE.

DISASSEMBLY

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

🛕 WARNING

- THE VEHICLE MUST BE FIRMLY SUPPORTED WITH JACK STANDS PRIOR TO SERVICING. FAILURE TO DO SO CAN RESULT IN PERSONAL INJURY OR PROPERTY DAMAGE.
- 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.
Service Hint	Note the quantity and location of shims removed during disassembly. The same quantity MUST be reinstalled in the same location in order to maintain the lateral alignment of the axle prior to disassembly. The lateral alignment procedure will need to be performed after assembly, see Alignment & Adjustments Section of this publication.
	 Remove the two M16 x 130 mm torque rod-to-axle bracket mounting fasteners, see Figures 8-8 and 8-9.
	7. Remove the two M16 x 110 mm torque rod-to-frame mounting fasteners, see Figures 8-8 and 8-9.
	8. Remove the transverse torque rod.
	FIGURE 8-8
	COMFORT AIR 190 / 210 Vehicles built after July 2009
	Outer Reinforcement Plate — M16 Locknut —
	Note: All Locknuts shown are M16 x 2-6H Tightening Torque 150-205 ft. lbs. (203-280 Nm) Shim
	M16 x 2 x 110 mm Bolt Transverse Rod Frame Bracket Transverse Torque Rod
	Transverse Rod Axle Bracket - M16 x 2 x 130 mm Bolt
	FIGURE 8-9
	COMFORT AIR 230 Outer Reinforcement Plate
	Note: All Locknuts shown are M16 x 2-6H Tightening Torque 150-205 ft. lbs. (203-280 Nm)
	Transverse Rod Axle Bracket Shim Shim Shim Shim Shim Shim Shim Shim
	M16 x 2 x 110 mm Bolt — M16 x 2 x 130 mm Bolt
	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.

- 1. Install the torque rod.
- 2. Install the two M16 x 130 mm bolts and washers through the torque rod bar pin, any shims that were removed, transverse torque rod frame bracket, inner reinforcement plate (if equipped), frame, and outer reinforcement plate, see Figures 8-8 and 8-9.
- 3. Loosely install the two M16 washers and locknuts.
- 4. Install the two M16 x 110 mm bolts and washers through the torque rod bar pin and axle bracket. Re-install any shims that were removed.
- 5. Loosely install the two M16 washers and locknuts.

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

- 6. Prior to tightening torque rod fasteners ensure the vehicle is at the proper ride height.
- Tighten the two M16 x 110 mm torque rod-to-axle bracket mounting fasteners and the two M16 x 130 mm torque rod-to-frame mounting fasteners to
 150-205 foot pounds (203-280 Nm) torque, see Figures 8-8 and 8-9.
- 8. Check the lateral alignment and verify it is within specifications, see the Alignment & Adjustments Section of this publication.
- 9. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to deflating or inflating the suspension 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, adjust as necessary, see Ride Height Adjustment in Alignment & Adjustments Section of this publication.

INNER REINFORCEMENT PLATE

Vehicles built with the COMFORT AIR 230 are equipped with an Inner Reinforcement Plate. The COMFORT AIR 190/210 capacity vehicles **built prior to July 2009** were also built with the Inner Reinforcement Plate (no longer necessary after July 2009). If it is damaged and needs replacement, use the configuration shown in Figure 8-10.

DISASSEMBLY

- 1. Remove transverse torque rod per as detailed in this section.
- Remove and discard the four M16 x 50 mm fasteners from the frame rails, see Figure 8-10.

ASSEMBLY

- 1. Install the new fasteners through the inner reinforcement plate and frame rail.
- 2. Tighten to the vehicle manufacturer's torque specifications.
- 3. Install transverse torque rod as detailed in this section.



NOTE

NOTE



TORQUE ROD BUSHING

DISASSEMBLY

You will need:

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

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

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

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

2. When replacing a straddle mount bar pin type bushing assembly, mark the clocking position of the bushing assembly's bar pin flats with a paint stick on the torque rod end hub prior to disassembly, see Figure 8-11.

FIGURE 8-11



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

ASSEMBLY

NOTE SERVICE HINT	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.					
	 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 8-12. 					
	 Support the torque rod end hub on the receiving tool with the end hub of the torque rod centered on the receiving tool. 					
	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.					
	Press directly on the inner metal of the bushing assembly.					

FIGURE 8-12

H

FIGURE 8-13

FIGURE 8-14







- 5. When pressing in the new bushings overshoot the desired final position by approximately $3/16^{"}$, see Figure 8-13.
- 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 8-14.
- 7. Wipe off excess lubricant. Allow the lubricant four (4) hours to dissipate before operating vehicle.

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.

CLAMP GROUP

■ TOP PAD ■ SPRING SEAT ■ BOTTOM CAP

WARNING THE PROCEDURE TO DISASSEMBLE THE 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 THE OTHER MAIN SUPPORT MEMBER ISN'T PROPERLY CONNECTED TO THE FRAME HANGER AND AXLE IT WILL BE NECESSARY TO SUPPORT THE AXLE PINION TO KEEP THE AXLE FROM SHIFTING.

DISASSEMBLY

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

WARNING

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

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 U-bolt locknuts and washers and discard them, see Figure 8-15.						
	7. Remove the axle bottom cap and top pad. Main Support H						
	8. Remove fasteners from cross channel on the opposite side from the side being serviced.						
SERVICE HINT	Removing the cross channel bolts from the opposite side allows accessibility to the clamp group being serviced without removing the main support member and the air spring.						
	 9. Place a floor jack under the cross channel near the main support member being serviced. Raise the cross channel and main support member enough to remove the spring seat from under the main support member. Axle Bottom Cap Spherical Washer M22 x 1.5 High Nut Tightening Torque 375-425 ft. lbs. (508-576 Nm) 						
	INSPECTION						
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 LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE OR SEVERE PERSONAL INJURY.						
	1. Inspect the main support member assembly for damage. Replace as necessary.						
	2. Inspect the top pad, spring seat and axle bottom cap for excessive wear and cracks or fret- ting. Replace as necessary.						
	3. Inspect the axle housing for any cracks or wear. Repair or replace as necessary.						
	ASSEMBLY						
	 Install the spring seat on the axle housing making sure to engage the alignment dowel on the axle housing with the hole in the bottom of the spring seat, see Figure 8-15. Verify the thicker end of the spring seat is to the rear of the vehicle. 						
	 Lower the main support member assembly on the spring seat making sure the dowel pin on the bottom of the main support member engages both the Flexi-wrap (if equipped) and spring seat dowel pin holes. 						
	 Install top pad on the top of the main support member assembly making sure the dowel on the bottom of the top pad engages the Flexi-wrap (if equipped) and main support dowel pin holes. 						
A 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, LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE, OR SEVERE PERSONAL INJURY. MAINTAIN CORRECT TORQUE VALUE AT ALL TIMES. CHECK TORQUE VALUES ON A REGULAR BASIS AS SPECIFIED.						
	4. Install NEW U-bolts, spherical washers, flat washers, and locknuts.						
NOTE	Current Hendrickson U-bolts for the COMFORT AIR for Hino suspensions are H-Coated M22 x 1.5 and locknuts are H-Coated M22 x 1.5 class 10.						

FIGURE 8-15

5. Verify that the top pad and bottom cap are installed correctly.

NOTE

The arrow on these parts should be facing towards the front of the vehicle.

- Lower the cross-channel onto the opposite side lower shock bracket and main support member. Install the two M20 x 80 mm bolt and washers through the cross-channel, lower shock bracket and main support member. Loosely install the M20 locknuts and washers. DO NOT tighten at this time.
- 7. Verify that the U-bolts are seated properly in the channels of the top pad.
- 8. Verify the Flexi-wrap (if equipped) and main support member are centered in the frame hanger.
- 9. Snug U-bolts prior to tightening, applying a crisscross pattern, (approximately 🗈 100 foot pounds (136 Nm) tightening torque), see Figure 8-16.
- 10. Tighten the cross-channel fasteners to 🕄 260-320 foot pounds (355-435 Nm) torque.

FIGURE 8-16

 Tighten the U-bolt locknuts evenly to 375-425 foot pounds (508-576 Nm) torque and in the proper sequence, see Figure 8-17.



12. Rap the top of the U-bolts with a dead blow mallet, and retighten to 375-425 foot pounds (508-576 Nm) torque. **DO NOT EXCEED SPECIFIED TORQUE ON U-BOLT LOCKNUTS,** see Figure 8-17.

FIGURE 8-17



- 13. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to deflating or inflating the air system.
- 14. Inflate the suspension by connecting the height control valve linkage to the height control valve arm. Verify the air springs inflate uniformly without binding.
- 15. Remove the frame supports.
- 16. Remove the wheel chocks.
- 17. Verify the vehicle's ride height is within specifications. Adjust as necessary, see Ride Height Adjustment in Alignment & Adjustments Section of this publication.
- 18. Align the vehicle. Alignment is necessary anytime the main support member is removed to complete the repair, see Alignment & Adjustments Section of this publication.



The frame hanger should function satisfactorily during normal vehicle operation. Replacement is required when the frame hanger has been damaged or worn.

DISASSEMBLY

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

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

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

🛕 WARNING

SERVICE HINT

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.

FIGURE 8-18

6. Mark the position of the QUIK-ALIGN collar relative to the frame hanger, see Figure 8-18.

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

 COMFORT AIR 190 / 210 – Remove the %" x 9 QUIK-ALIGN locknut and bolt, see Figure 8-19.
 COMFORT AIR 230 – Remove the 1" x 9 QUIK-ALIGN locknut and bolt, see Figure 8-20.

Index Mark

- 8. Remove the QUIK-ALIGN collars that connect the main support member to the frame hanger.
- 9. Remove the six M16 Huck bolt fasteners that attach the frame hanger to the vehicle per the vehicle manufacturer's instructions.
- 10. Remove the frame hanger.

INSPECTION

- 1. Inspect mounting surface of hanger and frame 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.

ASSEMBLY

- 1. Slide the frame hanger over the main support member's bushing. Make sure the arrow on the frame hanger points towards the front of the vehicle, see Figures 8-19 and 8-20.
- 2. Install new hanger to frame rail fasteners as detailed by the vehicle manufacturer.





- 8. Verify the vehicle's ride height is within specifications. Adjust as necessary, see Ride Height Adjustment in Alignment & Adjustments Section of this publication.
- 9. Verify that the axle is in proper alignment, see Alignment & Adjustments Section of this publication.
- 10. After the correct alignment of the axle is verified tighten the QUIK-ALIGN fasteners to 550-600 foot pounds (745-810 Nm) torque.
- 11. Remove the wheel chocks.

MAIN SUPPORT MEMBER

The main support member assembly should function satisfactorily during normal vehicle operation. Replacement is only required when the main support member assembly is damaged or worn.

CAUTION THIS PROCEDURE TO REPLACE A MAIN SUPPORT MEMBER 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 ARE TO BE REMOVED IT WILL BE NECESSARY TO SUPPORT THE AXLE PINION TO KEEP THE AXLE FROM SHIFTING.

DISASSEMBLY

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

🛝 WARNING 👘

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

- Disconnect the height control linkage assembly from the height control valve arm by sliding the rubber grommet from the stud.
- 4. Remove the air springs and cross channel as detailed in the Air Spring and Cross Channel Disassembly instructions in this section.
- 5. Lift and rotate the shock absorber and lower mounting bracket away from the main support assembly.

FIGURE 8-21

6. Mark the position of the QUIK-ALIGN collar relative to the frame hanger, see Figure 8-21.

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

7. On the side being serviced, remove and discard the U-bolts locknuts and washers.



- Remove the axle bottom cap 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.
- Support the main support member by placing a hydraulic jack under the main support member bushing. Remove the pivot bolt, nut and QUIK-ALIGN collars that connect the main support member assembly to the frame hanger.

SERVICE HINT

THE USE OF LEATHER GLOVES IS RECOMMENDED FOR REMOVING THE MAIN SUPPORT MEMBER ASSEMBLY. THIS WILL REDUCE THE POSSIBILITY OF PERSONAL INJURY FROM THE METAL EDGE OF THE FLEXI-WRAP (IF EQUIPPED).

10. Slide the main support member bushing down and out of the frame hanger. Remove the main support assembly.

INSPECTION

A 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, LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE, OR SEVERE PERSONAL INJURY. MAINTAIN CORRECT TORQUE VALUE AT ALL TIMES. CHECK TORQUE VALUES ON A REGULAR BASIS AS SPECIFIED.

- 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. Inspect the main support member for damage. Replace as necessary.
- 3. Inspect the Flexi-wrap (if equipped) for excessive wear or damage. 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.
- 6. Inspect the cross-channel for straightness, excessive wear and cracks. Replace as necessary.
- 7. Inspect the air spring for damage. Inspect the lower piston and the upper air spring mount for cracks.
- 8. Inspect the shock absorber for leaks and the mounts for excessive wear, cracks, and proper frame hanger fastener torque. Replace as necessary.

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

COMFORT AIR 190 / 210 – WHEN SERVICING THE MAIN SUPPORT MEMBER DO NOT DETACH THE FLEXI-WRAP FROM THE MAIN SUPPORT MEMBER. REPLACE COMPONENT WITH ONLY A NEW MAIN SUPPORT MEMBER ASSEMBLY, THAT INCLUDES THE FLEXI-WRAP. A MAIN SUPPORT MEMBER MAY FAIL WHEN REPLACED IMPROPERLY, CAUSING POSSIBLE LOSS OF VEHICLE CONTROL, PERSONAL INJURY, AND/OR PROPERTY DAMAGE.

- COMFORT AIR 190 / 210 Ensure the Flexi-wrap is installed and centered on the main support member assembly. A strip of fiber tape for and aft of the alignment dowel pin will assist in keeping the assembly intact during installation. Verify the two rubber isolator pads are installed in the Flexi-wrap, see Figure 8-22.
- COMFORT AIR 230 Ensure the secondary leaf is centered on the main support member assembly. A nylon Caristrap[®] is used for packaging to hold the assembly together and to ease in installation, this can be removed after installation, see Figure 8-23.
- 11. Lay the main support member assembly on top of the axle and support the front with a hydraulic jack.
- 12. Align the bushing of the main support member assembly under the opening of the frame hanger and jack into place.
- 13. Install NEW QUIK-ALIGN collars and fasteners and tighten to 🕄 100 foot pounds of torque.

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 Figures 8-22 and 8-23.

14. Raise the rear of the main support member assembly and install the spring seat on the axle, engaging the dowel pin. Make sure thicker end of the spring seat is to the rear of the vehicle.

15. Lower the main support member assembly onto the spring seat making sure the dowel pin engages the dowel pin hole in the spring seat.

FIGURE 8-22



SERVICE HINT	It may be necessary to rotate the QUIK-ALIGN eccentric collar to move the main support member assembly forward or rearward in order to engage the dowel pin hole.	Main Support U-bolts Member
NOTE	The arrow on the top pad and bottom cap must be facing towards the front of the vehicle.	
	16. Install the top pad, bottom axle cap, U-bolts, washers, and locknuts ensuring all dowel pins stay engaged. Verify that the top pad and bottom cap are installed correctly.	Spring Seat
	17 Verify that the IL-holts are seated prop-	Axle Bottom Cap
	erly in the channels of the top pad, see Figure 8-24.	Spherical Washer
	 COMFORT AIR 190 / 210 – Before tight- ening the U-bolts, verify the Flexi-wrap is centered on the main support member and centered in the frame hanger. 	Tightening Torque 375-425 ft. lbs. (508-576 Nm)
	COMFORT AIR 230 – Proceed to Step 19.	

- 19. Using a crisscross pattern, tighten U-bolts evenly to approximately 🗈 100 foot pounds (136 Nm) of torque.
- 20. Install the shock absorber and the lower shock mount onto the rear of the main support member assembly, see Figures 8-25 and 8-26.
- 21. Install the cross-channel onto the rear of the main support member assemblies. Loosely install the cross-channel retaining fasteners, see Figures 8-25 and 8-26.





SERVICE HINT

It may be necessary to loosen the U-bolts in order to align the cross-channel holes with the main support member assemblies. **DO NOT** STRIKE SUSPENSION COMPONENTS WITH A HAMMER. **NOTE** Prior to tightening the QUIK-ALIGN fasteners, U-bolts, or cross-channel fasteners to specifications, it is mandatory that the vehicle be positioned at the proper ride height.

22. Tighten the U-bolt locknuts evenly and in the proper sequence as shown in Figure 8-27. Tighten the M22 x 1.5 locknuts to **3**75-425 foot pounds (508-576 Nm) torque.

FIGURE 8-27

 Rap the top of the U-bolts with a dead blow mallet, and retighten to 375-425 foot pounds (508-576 Nm) torque. DO NOT EXCEED SPECIFIED TORQUE ON U-bolt LOCKNUTS.



- 24. Tighten the four M20 x 2.5 cross-channel fasteners to 🕄 260-320 foot pounds (355-435 Nm) torque, see Figures 8-25 and 8-26.
- 25. Hold the air spring tight against the bottom frame flange and tighten the upper air spring mounting fasteners to 🗈 160-180 foot pounds (217-245 Nm) torque, see Figure 8-28.



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.

- 26. Install the air spring lower mounting stud through the cross-channel hole. Attach the M12 washer and M12 x 1.25 locknut to the lower mounting stud of the air spring. **USING HAND TOOLS ONLY**, tighten the locknut to **1** 20-30 foot pounds (27-40 Nm), see Figure 8-28.
- 27. See additional Air Spring Cautions and Warnings in the Important Safety Notice Section of this publication prior to deflating or inflating the air system.
- 28. Inflate the suspension by connecting the height control valve linkage to the height control valve arm. Verify the air springs inflate uniformly without binding.
- 29. Remove the frame supports.
- 30. Remove the wheel chocks.
- 31. Verify the vehicle's ride height is within specifications. Adjust as necessary, see Ride Height Adjustment in Alignment & Adjustments Section of this publication.
- 32. Verify that the axle is in proper alignment, see the Alignment & Adjustments Section of this publication.
- 33. After the correct alignment of the axle is achieved tighten the QUIK-ALIGN fasteners to 550-600 foot pounds (745-810 Nm) torque.
- 34. Remove the wheel chocks.

MAIN SUPPORT MEMBER BUSHING

DISASSEMBLY

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.
- 1. Cut the splicing tape that holds the Flexi-wrap (if equipped) to the center of the main support member assembly.
- 2. Slide the Flexi-wrap (if equipped) off of the main support member.
- 3. Install the main support member in the press. Support the main support member on the receiving tool with the end hub centered on the tool. Be sure the main support member is squarely supported on the press bed, see Figure 8-29.



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 8-30 and 8-31. If 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 8-32.



- 4. 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).
- 5. Clean and inspect the inner diameter of the main support member eye.

ASSEMBLY

- Insert the spring eye clip (if equipped) 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.
- 2. Feed the tape into the spring eye, adhesive side facing gap in the eye. Center the tape equally around each end.
- 3. 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 8-32.

- 4. Lubricate inner diameter of steel spring bore and the new rubber bushing with P-80 Lubricant (refer to Parts List Section of this publication) or light Naphthenic Base Oil, such as 60 SUS at 100°F. **DO NOT** use petroleum or soap base lubricant, it can cause an adverse reaction with the bushing material, such as deterioration.
- 5. 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.





6. 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 %16" and press again from opposite side to center the bushing within the main support member assembly, see Figure 8-33.



- 7. Trim all protruding tape from the underside of the eye. Wipe off excess lubricant. Allow the lubricant four hours to dissipate before operating vehicle.
- COMFORT AIR 190/210 Replace the two isolator pads inside the Flexi-wrap eye.
 COMFORT AIR 230 Proceed to Step 11.
- 9. Slide Flexi-wrap around main support member eye and rotate into position.
- 10. Tape the assembly together using two 1" x 12" long strips of splicing tape.

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

11. Re-install main support member assembly per instructions in this section.

CAUTION

SECTION 9 Plumbing Diagram



SECTION 10 Torque Specifications

COMFORT AIR 190 /210

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



	HENDRICKSON RECOMMENDED TORQUE SPECIFICATIONS						
NO	COMPONENT	Quantity	CIZE	*TORQUE VALUE			
NU.	COMPONENT	Quanny	SIZE	Foot Pounds	Nm		
1.	QUIK-ALIGN (See Warning below) H-Coated Bolt (Grade 8 with a minimum tensile strength of 160,000 psi) H-Coated Locknut (Grade C)	2	7%"-9 UNC	550-600	745-810		
2.	U-bolts	4	**M22	375-425	508-576		
3.	Air Spring to Frame	4	M20	160-180	217-245		
4.	Air Spring to Cross Channel	2	M12	20-30	27-40		
5.	Cross Channel to Main Support Member	4	M20	260-320	355-435		
6.	Upper Shock Bracket to Frame	4	M16	150-205	203-280		
7.	Shock Absorber to Upper Shock Bracket	2	M12	50-70	68-95		
8.	Shock Absorber to Lower Shock Bracket	2	M20	160-180	217-245		
9.	Transverse Torque Rod to Axle Bracket	2	M16	150-205	203-280		
10.	Inner Reinforcement Plate to Frame (Vehicles built prior to July 2009 only)	4	M16	150-205	203-280		
11.	Transverse Torque Rod to Frame Bracket	2	M16	150-205	203-280		
12.	Linkage Rod Bracket to Cross Channel	2	M6	10-12	13-16		
13.	Lower Linkage Rod to Bracket H-Coated Locknut (Grade C)	1	5⁄16"	10-12	13-16		
14.	Height Control Valve Bracket to Frame	2	M10	20-30	27-40		
15.	Linkage Rod to Height Control Valve Arm H-Coated Locknut (Grade C)	1	5⁄16"	10-12	13-16		

COMFORT AIR 190 / 210 FOR HINO VEHICLES

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.

** Torque clamp group fasteners uniformly.

A WARNING FASTENERS

ALL COMFORT AIR FASTENERS FOR HINO VEHICLES ARE H-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 H-COATED FASTENERS TO SUSTAIN PROPER CLAMP FORCE. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE OR PERSONAL INJURY.

WARNING QUIK-ALIGN FASTENERS

ENSURE THAT QUIK-ALIGN FASTENER TORQUE VALUES ARE SUSTAINED AS RECOMMENDED. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL RESULTING IN PERSONAL INJURY OR PROPERTY DAMAGE.

COMFORT AIR 230

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

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HENDRICKSON RECOMMENDED TORQUE SPECIFICATIONS						
NO	COMPONENT	OUANTITY	SIZE	*TORQUE VALUE		
NO.	COMPONENT	QUANTIT		Foot Pounds	Nm	
1.	QUIK-ALIGN (See Warning below) H-Coated Bolt (Grade 8 with a minimum tensile strength of 160,000 psi) H-Coated Locknut (Grade C)	2	1"-14 UNF	550-600	745-810	
2.	U-bolts	4	**M22	375-425	508-576	
3.	Air Spring to Frame	4	M20	160-180	217-245	
4.	Air Spring to Cross Channel	2	M12	20-30	27-40	
5.	Cross Channel to Main Support Member	4	M20	260-320	355-435	
6.	Upper Shock Bracket to Frame	4	M16	150-205	203-280	
7.	Shock Absorber to Upper Shock Bracket	2	M12	50-70	68-95	
8.	Shock Absorber to Lower Shock Bracket	2	M20	160-180	217-245	
9.	Transverse Torque Rod to Axle Bracket	2	M16	150-205	203-280	
10.	Transverse Torque Rod to Frame Bracket	2	M16	150-205	203-280	
11.	Linkage Rod Bracket to Cross Channel	2	M6	10-12	13-16	
12.	Lower Linkage Rod to Bracket H-Coated Locknut (Grade C)	1	5⁄16"	10-12	13-16	
13.	Height Control Valve Bracket to Frame	2	M10	20-30	27-40	
14.	Linkage Rod to Height Control Valve Arm H-Coated Locknut (Grade C)	1	5⁄16"	10-12	13-16	

COMFORT AIR 230 FOR HINO VEHICLES

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.

** Torque clamp group fasteners uniformly.

A WARNING FASTENERS

ALL COMFORT AIR FASTENERS FOR HINO VEHICLES ARE H-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 H-COATED FASTENERS TO SUSTAIN PROPER CLAMP FORCE. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE OR PERSONAL INJURY.

WARNING QUIK-ALIGN FASTENERS

ENSURE THAT QUIK-ALIGN FASTENER TORQUE VALUES ARE SUSTAINED AS RECOMMENDED. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL RESULTING IN PERSONAL INJURY OR PROPERTY DAMAGE.

SECTION 11 Troubleshooting Guide

COMFORT AIR FOR HINO TROUBLESHOOTING GUIDE						
CONDITION	POSSIBLE CAUSE	CORRECTION				
	Leaking shock absorber	Replace shock absorber.				
	Damaged shock absorber	Replace shock absorber.				
Vehicle bouncing excessively	Air spring(s) not inflated	Check air supply to air spring, repair as necessary.				
	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.				
Suspension has harsh or	Damaged height control valve	Replace height control valve.				
bumpy ride	Incorrect ride height	Adjust ride height to proper setting. See Ride Height Adjustment in the Alignment & Adjustments Section of this publication.				
	Incorrect ride height	Adjust ride height to proper setting. See Ride Height Adjustment in the Alignment & Adjustments Section of this publication.				
Excessive driveline vibration	Broken main support member assembly	Replace main support member assembly				
	Air spring(s) not inflated	Check air supply to air spring, repair as necessary.				
	Broken main support member assembly	Replace main support member assembly.				
Vehicle leans	Axle connection not torqued correctly	Perform U-bolt retorque procedure. See Torque Specification Section of this publication.				
	Worn main support member bushing	Replace main support member bushing.				
	Air spring(s) not inflated	Check air supply to air spring, repair as necessary.				
	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.				
Suspension is noisy	Loose U-bolts	Perform U-bolt re-torque procedure. See Torque Specification Section of this publication.				
	Worn main support member isolator pads (if equipped)	Replace worn isolator pads (if equipped).				
	Worn main support member bushing	Replace main support member bushing.				
Irregular tire wear	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 main support assembly and all mating parts.				
QUIK-ALIGN or frame hanger worn	Loose fasteners and/or the re-use of old fasteners	Replace all worn parts and replace fasteners with new H-Coated fasteners.				

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