

H TECHNICAL PROCEDURE

HTS™ Rear Suspension for Autocar

SUBJECT: Service Instructions

LIT NO: 17730-277

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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 of the HTS™ rear suspension system as installed on applicable Autocar Vehicles.

NOTE

Use only Genuine Hendrickson 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 HTS 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), 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

Hendrickson's HTS suspension for Autocar is a mechanical suspension designed to achieve maximum durability with limited maintenance requirements. The system utilizes advanced spring technology to achieve extended service life with excellent ride characteristics.

The HTS for Autocar is approved for the following straight truck applications*: city delivery, tanker, paint striper, sweeper, utility, and small service crane.

Proper suspension selection should be based on the amount of carrying capacity required for the specific vehicle operation.

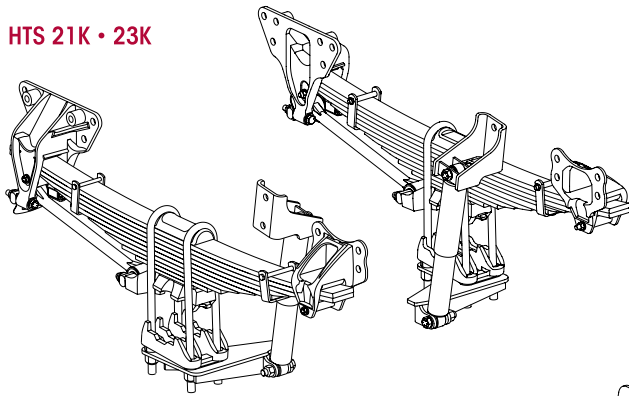
The HTS suspension design features include:

- Leaf springs designed by Hendrickson using advanced spring technology to achieve extended service life with excellent ride characteristics.
- Premium rubber bushings are used for the longitudinal torque rods.
- Drop-in shims used for ease of alignment.

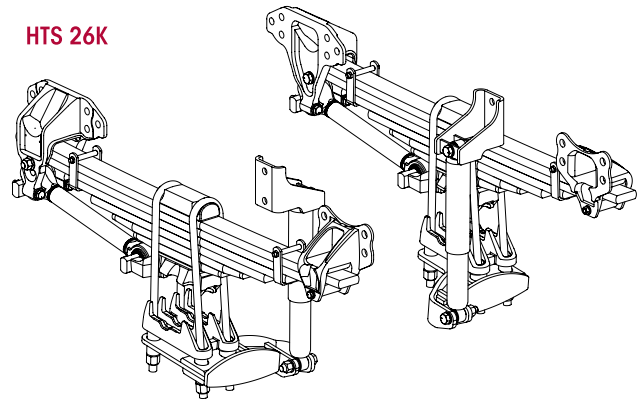


FIGURE 2-1

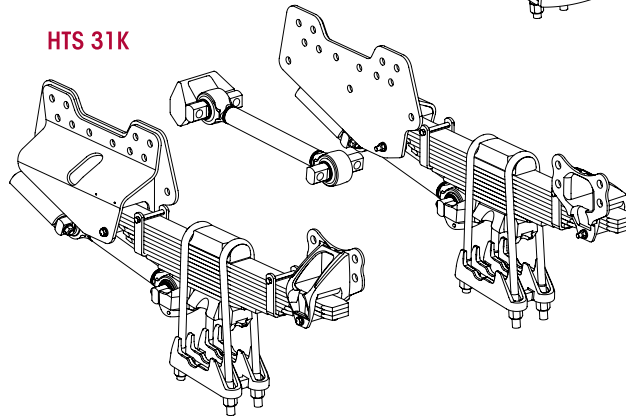
HTS 21K • 23K



HTS 26K



HTS 31K



HTS FOR AUTOCAR SPECIFICATIONS

	21K	23K	26K	31K
Suspension Weight	600 lbs.	615 lbs.	745 lbs.	630 lbs.
Suspension Rating	21,000 lbs.	23,000 lbs.	26,000 lbs.	31,000 lbs.
Gross Vehicle Weight (GVW) Approval	33,000 lbs.	33,000 lbs.	40,600 lbs.	49,000 lbs.
Gross Combination Weight (GCW) Approval	33,000 lbs.	33,000 lbs.	58,000 lbs.	58,000 lbs.
Diagonal Articulation	8 in.			
Lift Axles	Not Approved			
Ride Heights	9.0"			

* All applications require approval from Hendrickson Engineering.

SECTION 3

Important Safety Notice

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

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

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

■ EXPLANATION OF SIGNAL WORDS

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



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

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



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



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



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

NOTE

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

SERVICE HINT

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

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



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

■ SAFETY PRECAUTIONS

WARNING

FASTENERS

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

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

WARNING

LOAD CAPACITY

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

WARNING

MODIFYING COMPONENTS

DO NOT MODIFY OR REWORK PARTS WITHOUT AUTHORIZATION FROM HENDRICKSON. DO NOT USE SUBSTITUTE OR 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, AND 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 OR BUSHINGS. 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 EQUALIZING BEAM. DO NOT CONNECT ARC WELDING GROUND LINE TO THE EQUALIZING BEAM. DO NOT STRIKE AN ARC WITH THE ELECTRODE ON THE EQUALIZING BEAM AND AXLE. DO NOT USE HEAT NEAR THE EQUALIZING BEAM ASSEMBLY. DO NOT NICK OR GOUGE THE EQUALIZING BEAM. SUCH IMPROPER ACTIONS CAN DAMAGE THE EQUALIZING BEAM ASSEMBLY AND CAUSE LOSS OF VEHICLE CONTROL AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

CAUTION

PROCEDURES AND TOOLS

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

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**LEAF SPRING ASSEMBLY**

A LEAF SPRING ASSEMBLY THAT HAS A MISSING, CRACKED OR DAMAGED LEAF OR SPRING CLIP WILL REQUIRE COMPLETE LEAF SPRING ASSEMBLY REPLACEMENT AND A THOROUGH INSPECTION OF THE ENTIRE SUSPENSION. IF ANY SUSPENSION COMPONENT APPEARS DAMAGED, REPLACEMENT IS REQUIRED. FAILURE TO REPLACE ANY DAMAGED COMPONENTS CAN CAUSE LOSS OF VEHICLE CONTROL, POSSIBLE PERSONAL INJURY, DEATH, OR PROPERTY DAMAGE AND WILL VOID ANY APPLICABLE WARRANTIES.

⚠ CAUTION**SHOCK ABSORBERS**

THE SHOCK ABSORBERS ARE THE REBOUND TRAVEL STOPS FOR THE SPRINGS. ANYTIME THE FRONT AXLE ON THE SUSPENSION IS SUSPENDED IT IS MANDATORY THAT THE SHOCK ABSORBERS REMAIN CONNECTED. FAILURE TO DO SO COULD CAUSE THE REVERSE ARCH IN THE STEEL LEAF SPRINGS, POSSIBLY RESULTING IN PREMATURE STEEL LEAF SPRING FAILURE.

⚠ WARNING**SUPPORT THE VEHICLE PRIOR TO SERVICING**

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

⚠ CAUTION**TORQUE ROD SHIMS**

FAILURE TO INSTALL THE HTS LONGITUDINAL TORQUE ROD SHIMS IN THE SAME ORIENTATION AND LOCATION WILL REQUIRE A VEHICLE ALIGNMENT. IMPROPER VEHICLE ALIGNMENT CAN INCREASE TIRE WEAR.

⚠ 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. ACIDIC SOLUTIONS CANNOT BE USED ON ALUMINUM COMPONENTS.
6. HOT SOLUTION TANKS OR ALKALINE SOLUTIONS MUST BE USED CORRECTLY. FOLLOW THE MANUFACTURER'S RECOMMENDED INSTRUCTIONS AND GUIDELINES CAREFULLY TO HELP PREVENT PERSONAL ACCIDENT OR INJURY.

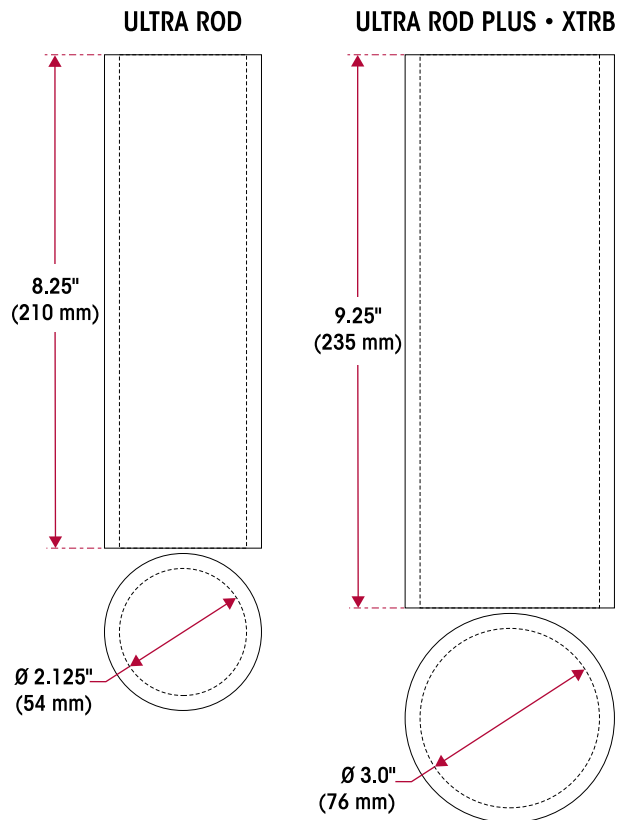
DO NOT USE HOT SOLUTION TANKS OR WATER AND ALKALINE SOLUTIONS TO CLEAN GROUND OR POLISHED PARTS. DOING SO WILL CAUSE DAMAGE TO THE PARTS AND VOID WARRANTY.

SECTION 4 Special Tools

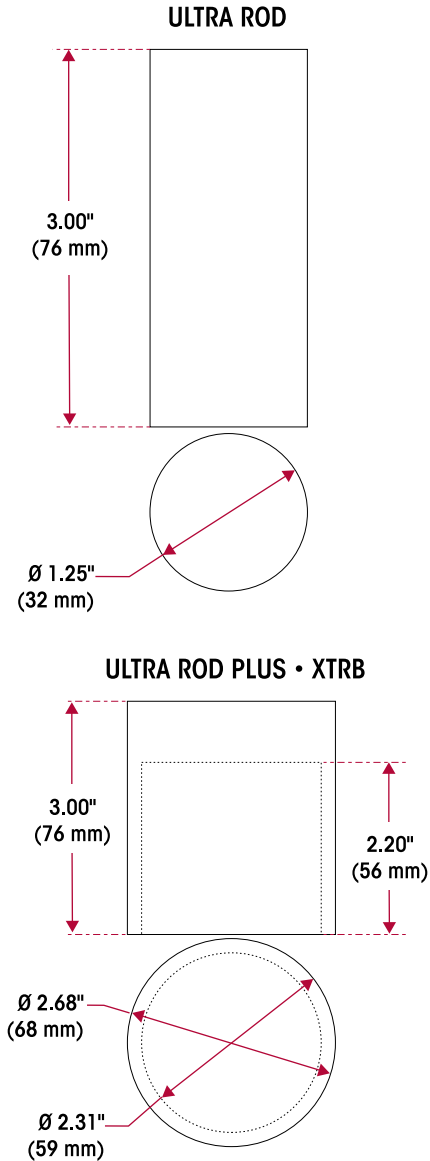
TORQUE ROD BUSHING TOOLS

These shop made tools are designed for the torque rod bushings. Bushing tools are to be made from cold rolled steel or equivalent. Drawing is for reference only. Hendrickson does not supply this tools.

RECEIVING TOOLS



INSTALLATION / REMOVAL TOOLS



ASSEMBLY FUNNEL TOOL



Hendrickson Part No. 66086-001

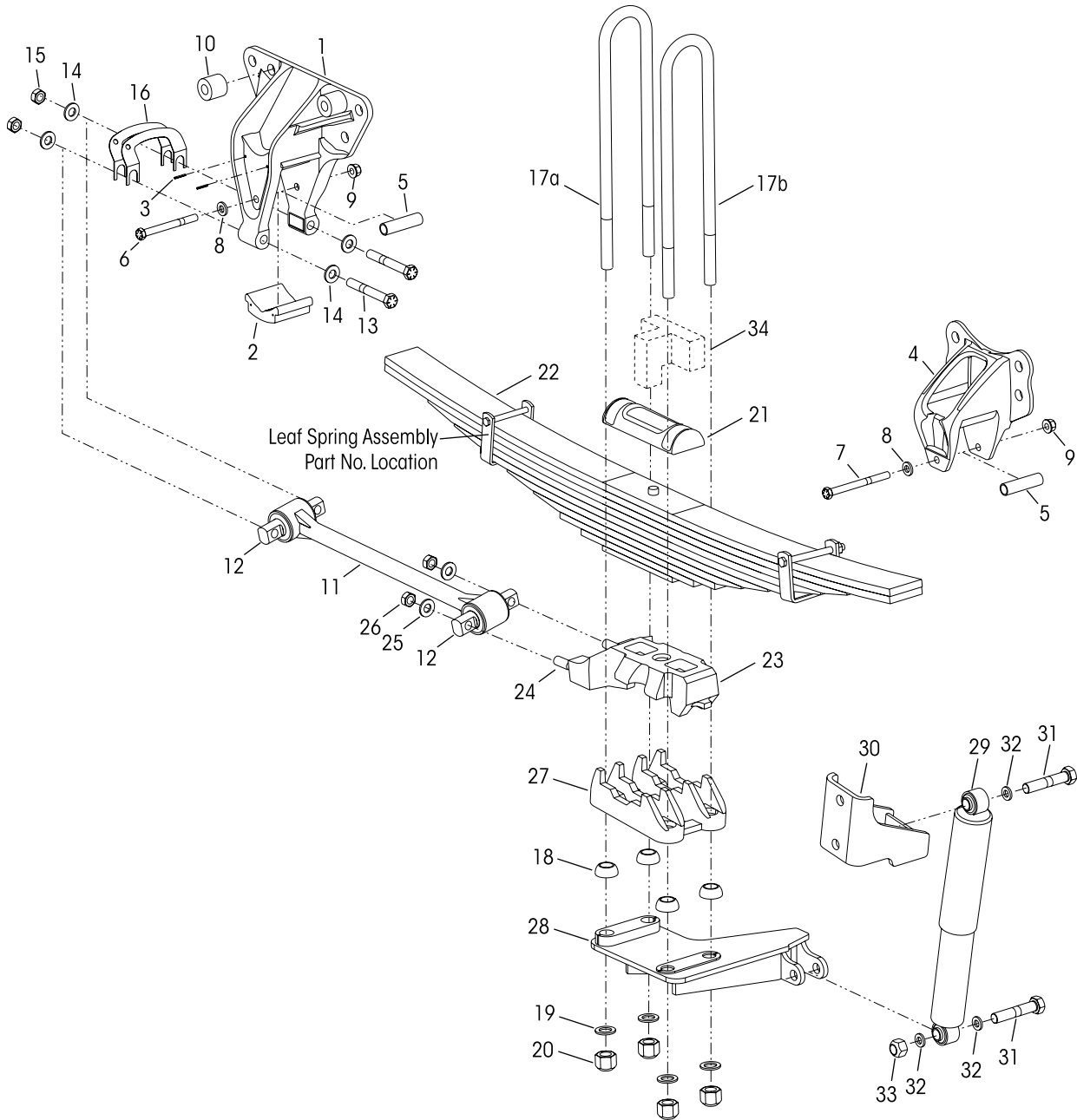
ULTRA ROD

Hendrickson Part No. 66086-000

ULTRA ROD PLUS

SECTION 5 Parts Lists

HTS 21K • 23K



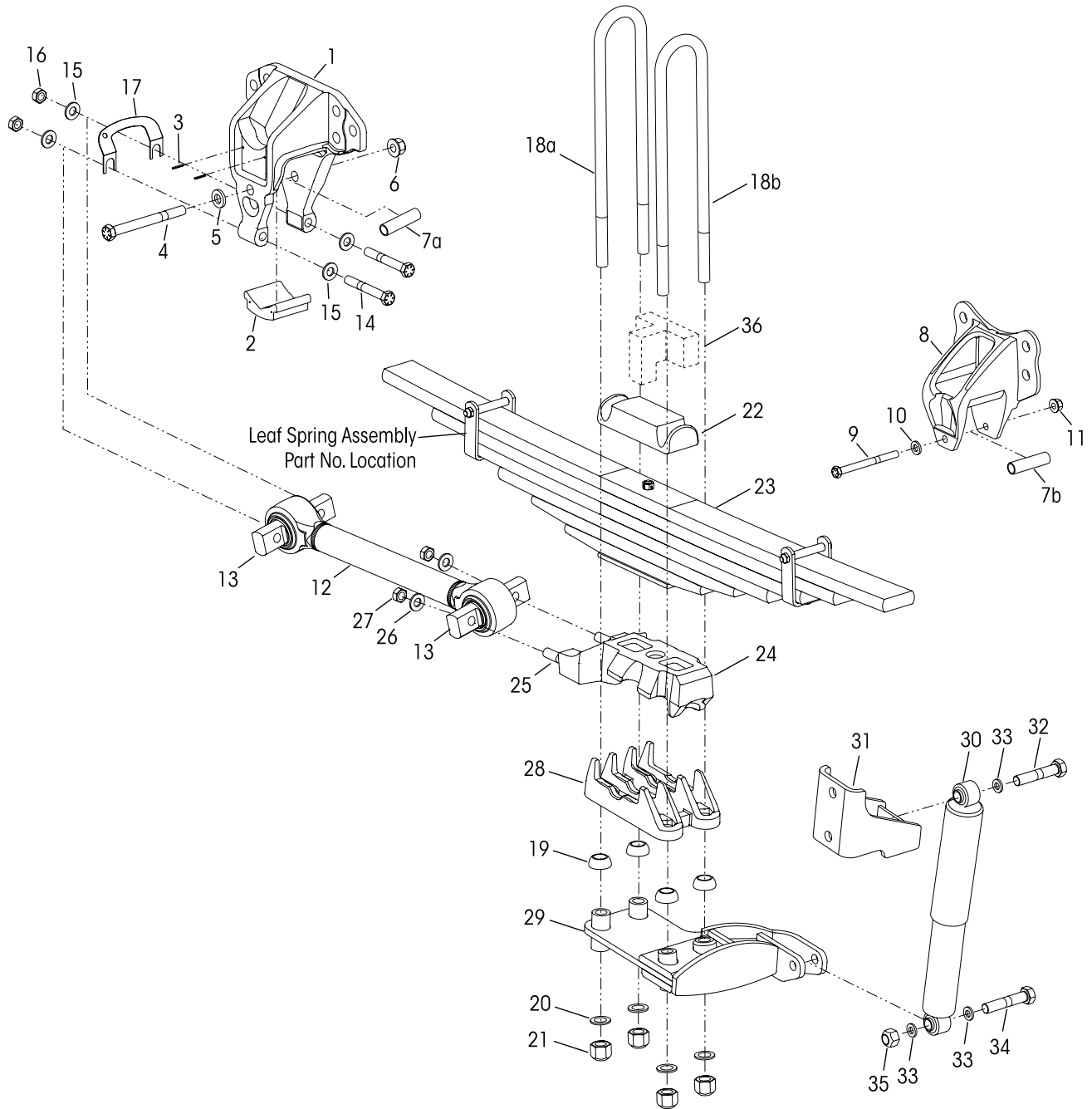


KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.	KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.
1	58425-001	Front Hanger Assembly, Includes Key Nos. 2-3	2		48718-157	U-bolt Fastener Service Kit, Per Side, Includes Key Nos. 18-20	
	56557-005	Slipper Pad Service Kit, One Hanger, Includes Key Nos. 2-3		18	48574-000	7/8" Spherical Washer	8
2	56929-000	Slipper Pad	2	19	22962-002	7/8" Flat Washer	8
3	58287-001	Retainer Lock Pin	4	20	50765-000	7/8"-14 UNF-2B Nut	8
4	50028-001	Rear Hanger	2	21	48797-000	Top Pad	2
	49175-032	Front and Rear Rebound Roller Service Kit, Axle Set, Includes Key Nos. 5-9		22		Leaf Spring Assembly	2
5	58631-000	Rebound Roller	4		53292-000	HTS 21K	
6	24531-015	1/2"-13 UNC-2B x 5 1/2" Hex Bolt	2		53692-000	HTS 23K Sweeper	
7	24531-014	1/2"-13 UNC-2B x 5" Hex Bolt	2		53693-000	HTS 23K Refuse	
8	22962-014	1/2" Flat Washer	4	23	50970-005	Spring Seat Assembly, Includes Key Nos. 24-26	2
9	60819-000	1/2"-13 UNC-2B Flange Nut	4	24	50918-000	5/8"-11 UNC Stud	4
10	59946-001	Spacer	4	25	22962-004	5/8" Flat Washer	12
11	62044-505	ULTRA ROD® Longitudinal Torque Rod Assembly, Includes Key No. 12	2	26	47764-000	5/8"-11 UNC Locknut	8
12	47691-000L	ULTRA ROD Torque Rod Bushing	4	27	50216-000	Axle Bottom Cap	2
	49176-007	Longitudinal Torque Rod Fastener Service Kit, Axle Set, Includes Key Nos. 13-15, 24-26		28		Lower Shock Bracket	
	50754-023	Front Hanger Fastener Service Kit, One Hanger, Includes Key Nos. 13-15			67556-003	HTS 21K Left Hand	1
13	32043-005	5/8"-11 UNC x 4 1/2" Hex Bolt	4		67556-004	HTS 21K Right Hand	1
14	22962-004	5/8" Flat Washer	8		67556-005	HTS 23K Left Hand	1
15	47764-000	5/8"-11 UNC Locknut	4		67556-006	HTS 23K Right Hand	1
16	49689-000	Torque Rod Shim	As Req.	29	60665-025L	Shock Absorber	2
17		7/8"-14 UNF- 2A U-bolt		30	67530-000	Upper Shock Bracket	2
a	47417-010	19" Front	2		69588-004	Upper and Lower Shock Absorber Fastener Service Kit, Axle Set, Includes Key Nos. 31-33	
b	47417-014	22 1/2" Rear	2	31	50764-004	3/4"-10 UNC x 3 3/4" Hex Bolt	4
				32	22962-001	3/4" Washer	6
				33	49842-000	3/4"-10 UNC Locknut	2
				34		*Bump Stop	2

NOTES

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

HTS 26K



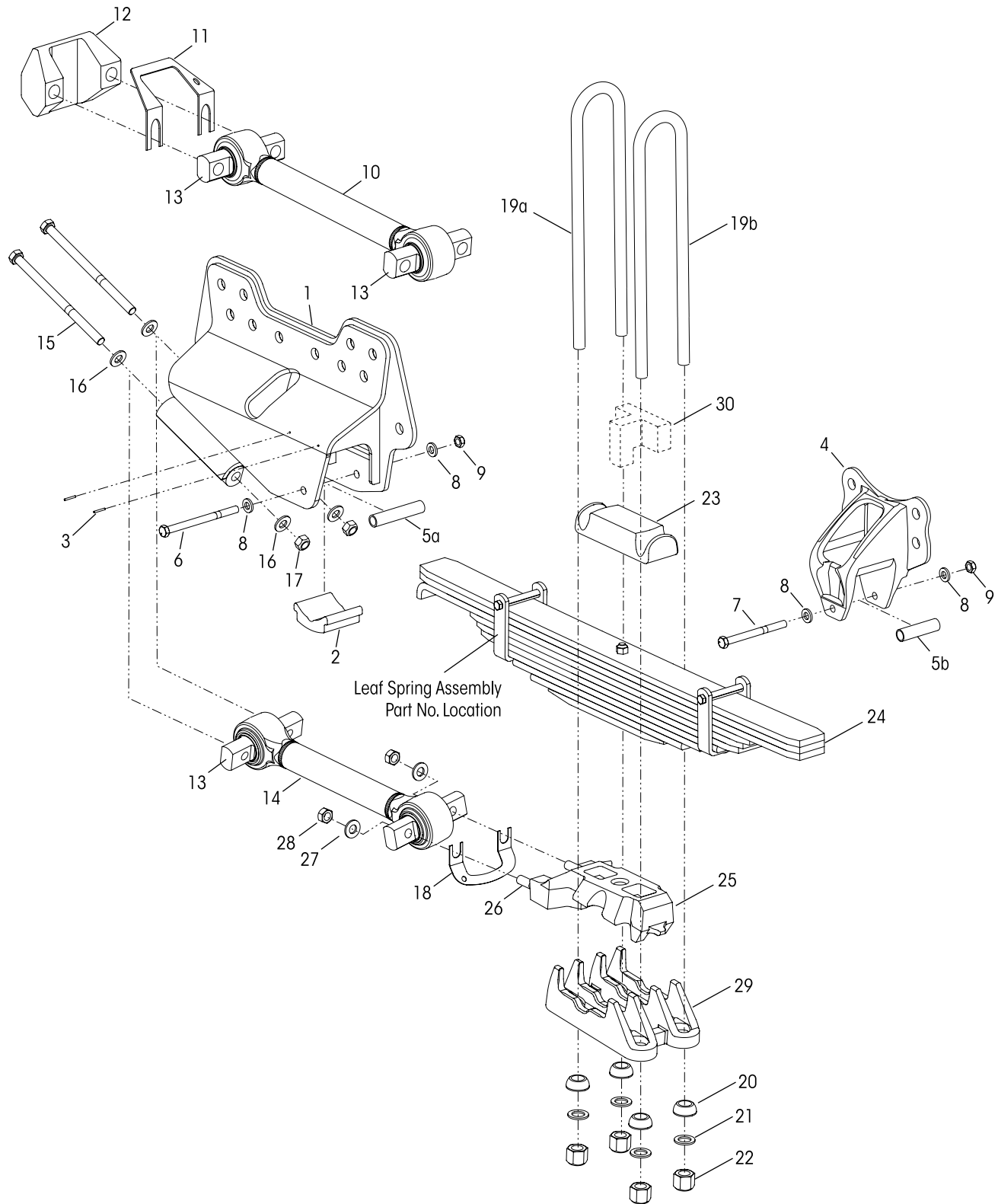


KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.	KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.
1	58425-008	Front Hanger Assembly, Includes Key Nos. 2-3	2		48718-157	U-bolt Fastener Service Kit, Per Side, Includes Key Nos. 19-21	
	56557-005	Slipper Pad Service Kit, One Hanger Includes Key Nos. 2-3		19	48574-000	7/8" Spherical Washer	8
2	56929-000	Slipper Pad	2	20	22962-002	7/8" Flat Washer	8
3	58287-001	Retainer Lock Pin	4	21	50765-000	7/8"-14 UNF-2B Nut	8
		Rebound Roller Service Kits, Axle Set,		22	56805-002	Top Pad	2
a	49175-037	Front Hanger, Includes Key Nos. 4-6, 7a		23	53793-000	Leaf Spring Assembly	2
b	49175-038	Rear Hanger, Includes Key Nos. 7b, 9-11		24		Spring Seat Assembly, Includes Key Nos. 25-27	2
4	58917-008	3/4"-10 UNC x 6" Hex Bolt	2		50988-026	Left Hand 5°	
5	22962-001	3/4" Flat Washer	2		50988-027	Right Hand 5°	
6	66137-000	3/4"-10 UNC Flange Nut	2	25	50918-000	5/8"-11 UNC Stud	4
7		Rebound Roller		26	22962-004	5/8" Flat Washer	12
a	59598-000	Front Hanger	2	27	47764-000	5/8"-11 UNC Locknut	8
b	58631-000	Rear Hanger	2	28		Axle Bottom Cap	2
8	50028-002	Rear Hanger	2		58424-002	Left Hand	
9	24531-014	1/2"-13 UNC-2B x 5" Hex Bolt	2		58424-001	Right Hand	
10	22962-014	1/2" Flat Washer	2	29		Lower Shock Bracket	
11	60819-000	1/2"-13 UNC-2B Flange Nut	2		78018-001	Left Hand	1
12	92407-500	XTRB Longitudinal Torque Rod Assembly, Includes Key No. 13	2		78018-002	Right Hand	1
13	66649-002L	XTRB Torque Rod Bushing	4	30	60665-025L	Shock Absorber	2
14	32043-005	5/8"-11 UNC x 4 1/2" Hex Bolt	4	31	67530-000	Upper Shock Bracket	2
15	22962-004	5/8" Flat Washer	8		65118-005	Shock Absorber Fastener Service Kit, Axle Set Includes Key Nos. 32-35	
16	47764-000	5/8"-11 UNC Locknut	4	32	50764-004	3/4"-10 UNC x 3 3/4" Hex Bolt	2
17	49689-000	Torque Rod Shim	As Req.	33	22962-001	3/4" Washer	6
18		7/8"-14 UNF- 2A U-bolt		34	50764-010	3/4"-10 UNC x 4 1/4" Hex Bolt	2
a	47417-015	22" Front	2	35	49842-000	3/4"-10 UNC Locknut	4
b	47417-014	22 1/2" Rear	2	36		*Bump Stop	2

NOTES

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

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KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.	KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.
1		Front Hanger Assembly, Includes Key Nos. 2-3	2	15	32043-013	5/8"-11 UNC x 10" Hex Bolt	4
	70628-001	Left Hand		16	22962-004	3/8" Flat Washer	8
	70628-002	Right Hand		17	47764-000	5/8"-11 UNC Locknut	4
	56557-005	Slipper Pad Service Kit, One Hanger, Includes Key Nos. 2-3		18	49689-000	Lower Torque Rod Shim	As Req.
2	56929-000	Slipper Pad	2	19		7/8"-14 UNF-2A U-bolt	4
3	58287-001	Retainer Lock Pin	4	a	47417-003	17 1/2" Front	
4	50028-002	Rear Hanger	2	b	47417-010	19" Rear	
		Rebound Roller Service Kits, Axle Set			48718-157	U-bolt Fastener Service Kit, Per Side Includes Key Nos. 20-22	
	49175-035	Front Hanger, Includes Key Nos. 5a, 6, 8-9		20	48574-000	7/8" Spherical Washer	8
	49175-036	Rear Hanger, Includes Key Nos. 5b, 7-9		21	22962-002	7/8" Flat Washer	8
5		Rebound Roller	4	22	50765-000	7/8"-14 UNF-2B Nut	8
a	77852-001	Front Hanger		23	56805-002	Top Pad	2
b	57988-000	Rear Hanger		24	53134-000	Leaf Spring Assembly	2
6	24531-005	1/2"-13 UNC-2B x 6 1/2" Hex Bolt	2	25		Spring Seat Assembly, Includes Key Nos. 26-28	2
7	24531-015	1/2"-13 UNC-2B x 5 1/2" Hex Bolt	2		50988-025	Left Hand	
8	22962-014	1/2" Flat Washer	4		50988-024	Right Hand	
9	49846-000	1/2"-13 UNC-2B Flange Nut	2	26	50918-000	5/8"-11 UNC Stud	4
10	72100-535	Upper Torque Rod Assembly, ULTRA ROD® PLUS™ Includes Key No. 13a	1	27	22962-004	3/8" Flat Washer	8
11	67779-002	Upper Torque Rod Shim	As Req.	28	47764-000	5/8"-11 UNC Locknut	4
12	46015-000	Upper Torque Rod Bracket	1	29		Axle Bottom Cap	2
13		Torque Rod Bushing - Straddle			58424-004	Left Hand	
a	64400-003L	ULTRA ROD PLUS	2		58424-000	Right Hand	
b	66649-002L	XTRB	2	30		*Bump Stop	2
14	92446-430	Lower Torque Rod Assembly, XTRB, Includes Key No. 13b	2				

NOTES

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



SECTION 6 Preventive Maintenance

Following the appropriate inspection procedures is important to help ensure the proper maintenance and operation of the HTS rear suspension system and component parts for Autocar function to their highest efficiency. Hendrickson recommends the HTS rear suspension be inspected at vehicle pre-delivery, the first 1,000 miles, and at the regular preventive maintenance intervals, every 50,000 miles or twelve (12) months, whichever comes first, with the exception of the clamp group fasteners, see U-bolt Locknuts in this Section.

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

HENDRICKSON RECOMMENDED INSPECTION INTERVALS	PRE-DELIVERY INSPECTION	FIRST IN-SERVICE INSPECTION	PREVENTIVE MAINTENANCE
Visually inspect for proper assembly and function. Check for all of the following and replace components as necessary: <ul style="list-style-type: none"> • Signs of unusual movement, loose or missing components • Signs of abrasive or adverse contact with other components • Damaged, or cracked parts • Proper suspension function, alignment • Front frame hanger to longitudinal torque rod • Rear frame hanger to leaf spring assembly 	Within the first 100 Miles / (150 km)	Within the first 1,000 Miles (1,600 km) or 100 Hours	Every 12 Months or 50,000 Miles
Inspect fasteners for proper torque as recommended in the Torque Specification Section of this publication with special attention to the following suspension connection: <ul style="list-style-type: none"> • Clamp group (U-bolts) 			*Not to exceed 25,000 Miles
Verify the lateral alignment of axles are within the vehicle manufacturer’s tolerances. Inspect leaf spring assembly (Missing, cracked or damaged spring leaf(s))			Every 12 Months or 50,000 Miles

* Maintaining correct U-bolt torque is important to help ensure proper suspension component performance after the first 1,000 mile inspection or U-bolt service. A fleet may determine its own torque inspection interval by inspecting U-bolt torque on a more frequent basis (for example at 5,000 miles, or 10,000 miles). If during the torque inspection U-bolt torque is found below torque specifications, correct the U-bolt torque and decrease the interval of the torque inspections. If U-bolt torque is found within torque specifications, inspection intervals may be increased. **DO NOT exceed 25,000 miles between U-bolt torque inspection intervals.**

COMPONENT INSPECTION

Following the appropriate inspection procedures is important to help ensure the proper maintenance and operation of the HTS suspension system and component parts. Look for and replace worn, damaged, bent or cracked parts.

- **Clamp group** — Visually inspect for any loose or damaged fasteners. Verify the U-bolt locknuts have the proper torque values maintained, see the U-bolt Locknuts in this section.
- **Fasteners** — Visually inspect for any loose or damaged fasteners on the entire suspension. Make sure all fasteners are tightened to a torque value within the specified torque range. See Torque Specification Section in this publication for recommended torque requirements. Use a calibrated torque wrench to check torque in a tightening direction. As soon as the fastener starts to move, record the torque and correct the torque if necessary.

- **Frame hanger** — Visually inspect for any signs of loose fasteners, movement, damage or excessive wear on the inside of hanger legs. Verify the frame attaching fasteners have the proper torque values maintained, refer to the vehicle manufacturer for proper torque specifications.
- **Longitudinal torque rods** — All torque rods must be inspected for looseness, torn or shredded rubber, bushing walk-out, and for proper fastener torque. If there is metal-to-metal contact in the bushing joint, this is a sign of excessive bushing wear and the bushing needs to be replaced.
- **Leaf spring assembly** — See Leaf Spring Assembly in this section.
- **Tire wear** — Visually inspect the tires for wear patterns that may indicate suspension damage or misalignment.
- **Wear and damage** — Visually inspect all parts of the suspension for wear and damage. Look for bent or cracked parts. Replace as necessary.

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

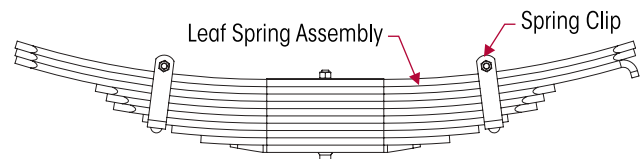
LEAF SPRING ASSEMBLY

VISUAL INSPECTION

WARNING

A LEAF SPRING ASSEMBLY THAT HAS A MISSING, CRACKED OR DAMAGED LEAF OR SPRING CLIP WILL REQUIRE COMPLETE LEAF SPRING ASSEMBLY REPLACEMENT AND A THOROUGH INSPECTION OF THE ENTIRE SUSPENSION MUST BE PERFORMED. IF ANY COMPONENT APPEARS DAMAGED, REPLACEMENT IS REQUIRED. FAILURE TO REPLACE ANY DAMAGED COMPONENTS CAN CAUSE LOSS OF VEHICLE CONTROL, POSSIBLE PERSONAL INJURY, DEATH, OR PROPERTY DAMAGE AND WILL VOID ANY APPLICABLE WARRANTIES.

FIGURE 6-1



The spring assembly part number is stamped on the spring clip. Hendrickson recommends for high mileage springs that both leaf spring assemblies on the suspension be replaced to ensure even spring deflection. All Hendrickson leaf springs are made to rigid specifications and each leaf is shot peened for long life. To assure compatibility and functionality as a suspension system, Hendrickson recommends genuine leaf springs be specified.

- Inspect the entire leaf spring assembly (Figure 6-1), replacement is required if any leaf spring or spring clip is damaged, cracked, or missing.
- In the unloaded condition, replacement is required if more than 50% of the first leaf is worn at the frame hanger contact area, regardless of mileage.

U-BOLT CONNECTION

NOTE

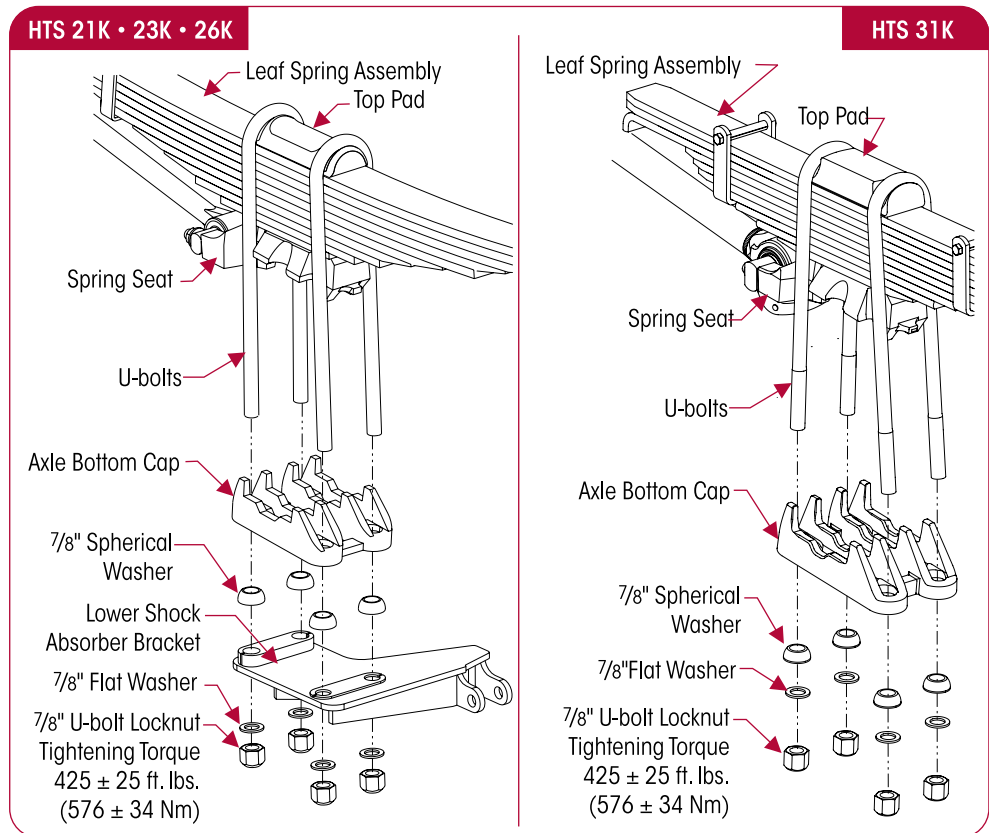
Hendrickson recommends the use of phosphate and oil coated Grade 8 bolts, hardened washers and Grade C locknuts for the U-bolt connection. All threads should be lubricated with SAE 20 oil before assembly to obtain the correct relationship of torque and fastener tension.

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

1. Inspect U-bolts for proper seating of components, i.e. no gaps, etc., see Figure 6-2.

2. **DO NOT** exceed specified torque on U-bolt locknuts, refer to Torque Specification Section of this publication. U-bolt locknuts **MUST** be torqued as specified:
 - At pre-delivery and at any U-bolt service
 - First 1,000 miles, thereafter, follow the inspection and re-torque intervals, every 25,000 miles

FIGURE 6-2



WARNING

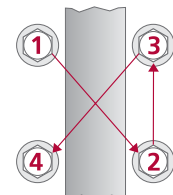
IT IS IMPORTANT THAT THE U-BOLT CONNECTION BE PROPERLY ALIGNED AND HAVE THE PROPER TORQUE VALUES MAINTAINED. METAL SURFACES CAN WORK AND WEAR THE SPRING SEATS, AXLE BOTTOM CAPS AND POSSIBLY OTHER COMPONENTS RELATED IN THE TOTAL ASSEMBLY. PROPERLY TIGHTENED U-BOLT LOCKNUTS WILL ELIMINATE COSTLY REPAIR, DOWNTIME AND POSSIBLE SEPARATION OF COMPONENTS AND LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE OR PERSONAL INJURY.

EXAMPLE

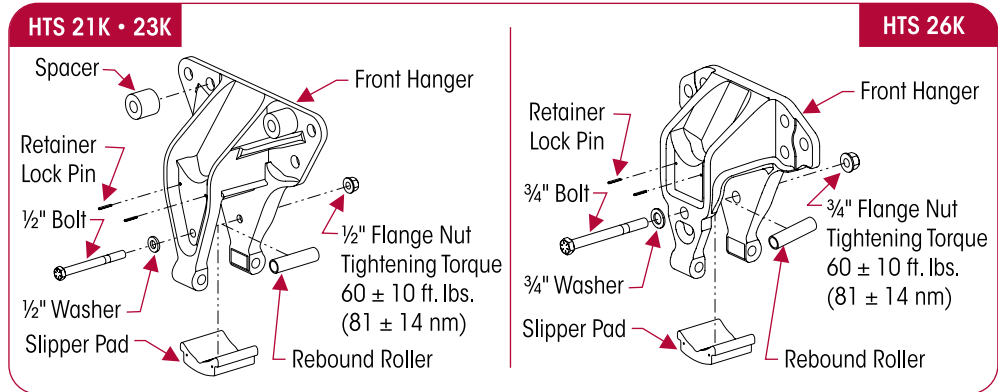
A fleet may determine its own torque inspection interval by inspecting U-bolt torque on a more frequent basis (for example at 5,000 miles, or 10,000 miles). If during the torque inspection U-bolt torque is found below torque specifications, correct the U-bolt torque and decrease the interval of the torque inspections. If U-bolt torque is found within torque specifications, inspection intervals may be increased. **DO NOT exceed 25,000 miles between U-bolt torque inspection intervals.**

3. Tighten the U-bolt locknuts evenly in 50 foot pounds increments to 425 ± 25 foot pounds (576 ± 34 Nm) torque in the proper pattern to achieve uniform bolt tension, see Figure 6-3.

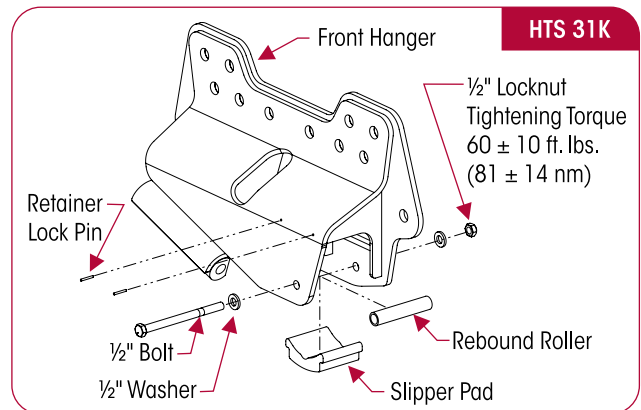
FIGURE 6-3



FRONT HANGER SLIPPER PADS

FIGURE 6-4

FIGURE 6-5

The operation of the HTS suspension will result in some wear between the leaf spring assembly and the front hanger slipper pads, see Figures 6-4 and 6-5. In normal use the slipper pads will function satisfactorily even though they may show some wear. If the slipper pads require replacement, follow instructions in the Component Replacement Section of this publication.



LONGITUDINAL TORQUE RODS

VISUAL INSPECTION

Visually inspect torque rod bushings for any torn or shredded rubber, inspect for bent, cracked, or broken torque rods, and for end hubs with any elongated "oval" shape. Any of these conditions will require component replacement, see Figure 6-6.

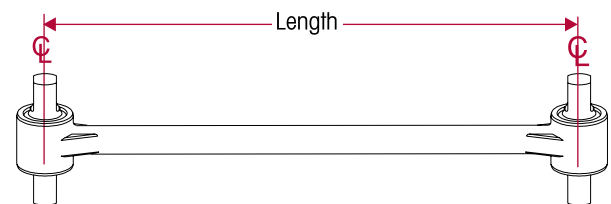
PHYSICAL INSPECTION

Torque rod looseness inspection is necessary per the following method below.

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

The longitudinal torque rods along with the axle seat maintain the control of acceleration and brake forces.

Torque rod bushings can be replaced by pressing out the worn end, and installing a replacement bushing. See Component Replacement Section of this publication.

FIGURE 6-6

NOTE

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

SHOCK ABSORBER INSPECTION

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

Inspection of the shock absorber can be performed by doing a heat test, and a visual inspection. For instructions on shock absorber replacement see the Component Replacement Section of this publication. It is not necessary to replace shock absorbers in pairs if one shock absorber requires replacement.

FIGURE 6-7



HEAT TEST

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

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

2. Use an infrared thermometer to check the temperature of the shock absorber. This can also be performed by carefully touching the shock body below the dust cover. Touch the frame to get an ambient reference, see Figure 6-7. A warm shock absorber is acceptable, a cold shock absorber should be replaced.
3. To inspect for an internal failure, remove and shake the suspected shock. Listen for the sound of metal parts rattling inside. Rattling of metal parts can indicate that the shock has an internal failure.

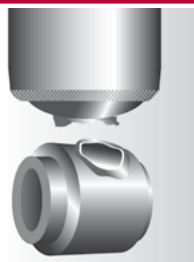
WARNING

VISUAL INSPECTION

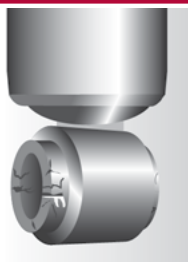
Look for any of the potential problems in Figure 6-8 when doing a visual inspection. Inspect the shock absorbers fully extended. Replace as necessary.

FIGURE 6-8

UNACCEPTABLE CONDITIONS



Damaged upper or lower mount



Damaged upper or lower bushing



Damaged dust cover and / or shock body



Bent or dented shock



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

LEAKING VS. MISTING SHOCK VISUAL INSPECTION

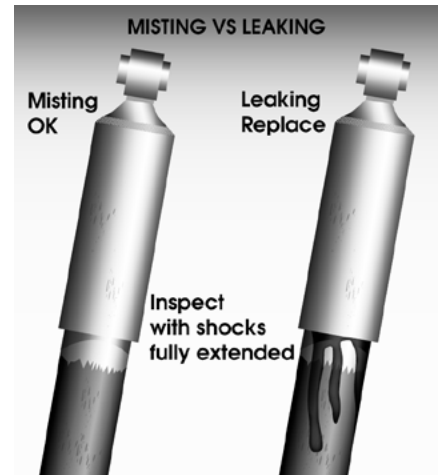
The inspection must not be conducted after driving in wet weather or a vehicle wash. Shocks need to be free from water. Many shocks are often misdiagnosed as failures. Misting is the process whereby very small amounts of shock fluid evaporate at a high operating temperature through the upper seal of 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 truly leaking and needs to be replaced will show signs of fluid leaking in streams from the upper seal. These streams can easily be seen when the shock is fully extended, underneath the main body (dust cover) of the shock. Look for these potential problems when doing a visual inspection. Inspect the shock absorbers fully extended. Replace as necessary.

NOTE

The HTS systems are offered with a premium seal on the shock, however this seal will allow for misting to appear on the shock body (misting is not a leak and is considered acceptable).

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

FIGURE 6-9

SECTION 7

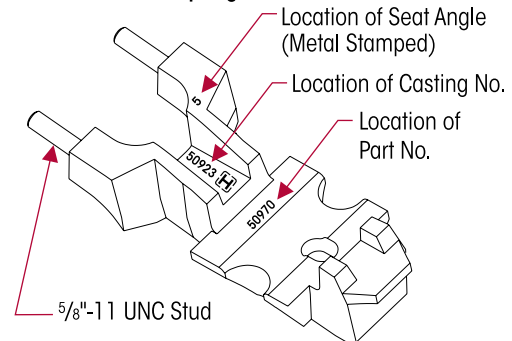
Alignment & Adjustments

AXLE PINION ANGLE

Pinion angle is set by the spring seat assembly. Pinion angle should be checked in the loaded condition, and is set by the vehicle manufacturer. If new spring seats are required, the seat angle as shown in Figure 7-1 must be specified when ordering, see Parts Lists Section of this publication.

FIGURE 7-1

Bottom View of Spring Seat



DRIVE AXLE ALIGNMENT

Proper alignment is essential for maximum ride quality, performance, and tire service life. The following recommended alignment procedure should be performed if excessive or irregular tire wear is observed.

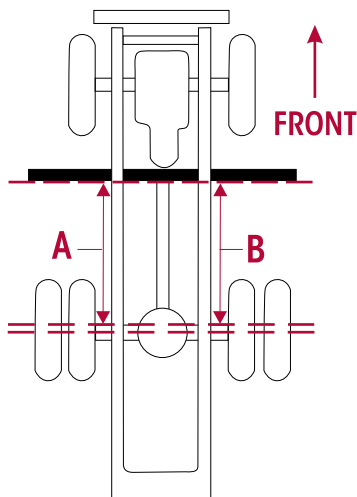
NOTE

Computerized alignment equipment is the preferred method of measuring alignment. Laser alignment equipment may be used, however, to calculate the shim thickness required the target offset must be converted to thrust angle, see alignment equipment manufacturer for procedures.

ALIGNMENT INSPECTION

1. Use a work bay with a level, flat 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 all suspension components are in good condition. Repair or replace any worn or damaged suspension components before proceeding with the alignment process.

FIGURE 7-2



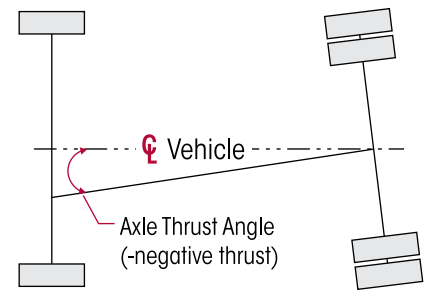
6. Ensure all drive axle tires are the same size, and inflated to the proper PSI.
7. Securely clamp a six-foot piece of STRAIGHT bar stock or angle iron across the lower frame flange as shown in Figure 7-2. Select a location for the bar stock or angle iron as far forward of the drive axle as possible where components will not interfere.
8. Accurately square the bar stock or angle iron to the frame using a carpenter's square.
9. Using a measuring tape, measure from the straight edge to the forward face of the front drive axle arms on both sides of the vehicle as shown in Figure 7-2, **A** and **B**.
10. Calculate the difference between measurements **A** and **B**.
 - a. The drive axle is aligned if within vehicle manufacturer's specifications.
 - b. If alignment of the drive axle **IS NOT** within the vehicle manufacturer's specifications, then the alignment of this axle **MUST** be corrected. Correct the alignment of this axle by following the alignment instructions in this section.

ALIGNMENT ADJUSTMENT

If alignment of the drive axle is required, as determined by the alignment inspection procedure, the following steps will need to be performed.

1. Determine the direction of axle thrust angle. Figure 7-3 illustrates the drive axle with a thrust angle to the left (-negative thrust).
2. To determine where to adjust shim thickness use measurement **A** and **B**, see Figure 7-2.
3. Chock the wheels of the front axles to prevent vehicle movement during service.
4. Raise the frame of the vehicle to remove the load from the suspension. Support the frame at this height.
5. Loosen **DO NOT REMOVE** the longitudinal torque rod fasteners from the front hanger.
6. Adjust shim thickness to move the axle in the desired direction, see Figure 7-4.

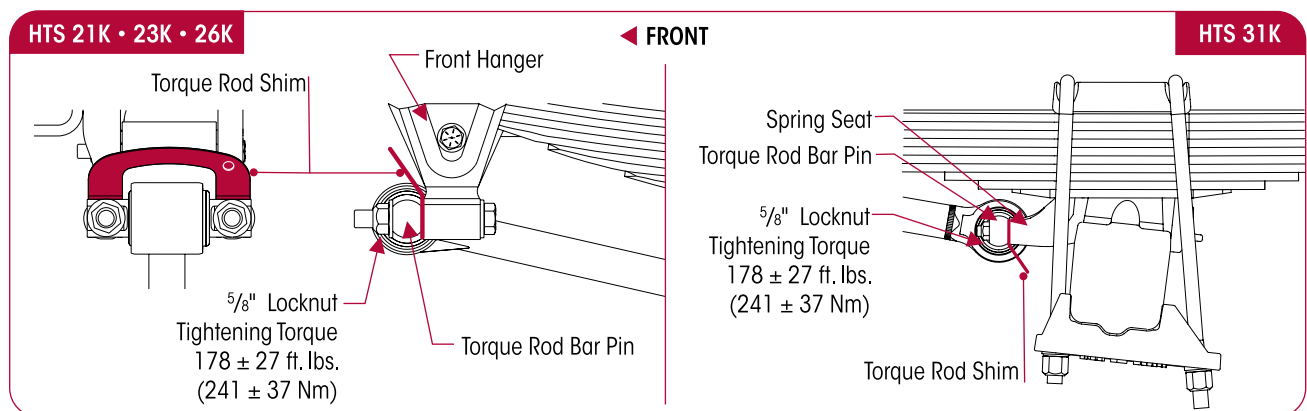
FIGURE 7-3



SERVICE HINT

Axle thrust angle may be adjusted at either wheel end on an axle. If insufficient adjustment is available at one wheel end, the opposing wheel end will also need to be adjusted, but in the opposite direction.

FIGURE 7-4



7. Remove the frame supports and re-measure dimension **A** and **B**, see Figure 7-2.
8. If more adjustment is needed, up to four (4) shims may be installed at the longitudinal torque rod ends.
9. Once the vehicle is aligned, tighten the longitudinal torque rod fasteners to 178 ± 27 foot pounds (241 ± 37 Nm) torque.
10. Remove wheel chocks.

SECTION 8

Component Replacement

FASTENERS

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

SPRING SEATS / SPRING SEAT STUDS

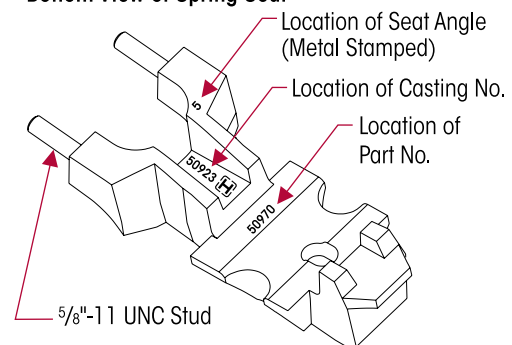
The following instructions apply if the spring seat or mounting bolts for the torque rod attachment require replacement. Figure 8-1 shows a view of the spring seat and the serrated shank studs that are used to connect the torque rod to the spring seat.

NOTE

If a new spring seat is required, the seat angle will be necessary to specify, see Figure 8-1.

FIGURE 8-1

Bottom View of Spring Seat



■ SPRING SEATS

DISASSEMBLY

1. Chock the wheels.
2. Raise the frame to remove the load from the suspension. Support the frame.
3. Raise and support the axle.
4. Remove the tires.
5. Loosen the rebound bolt flange nut in the front hanger.

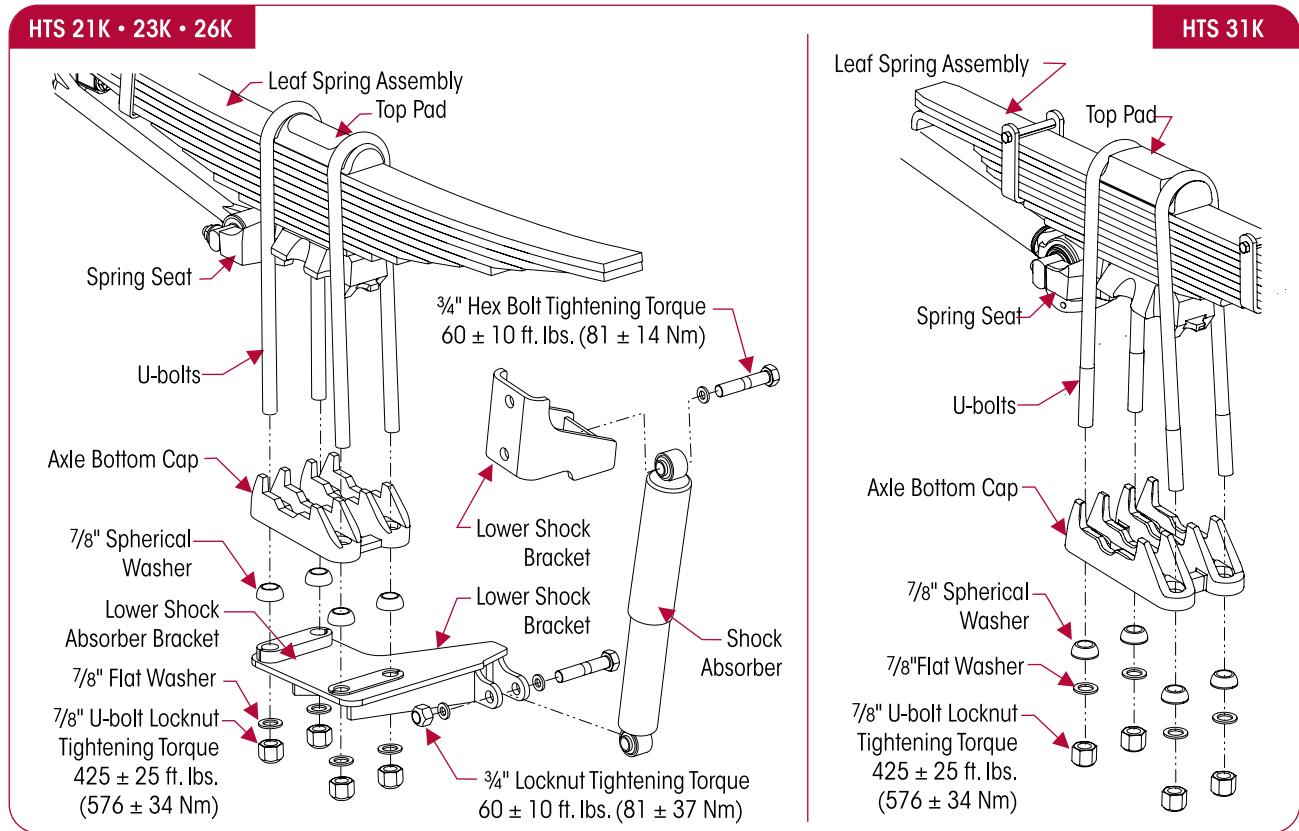
NOTE

It might be necessary to raise or lower the frame in order to remove the torque rod fasteners.

SERVICE HINT

Prior to disassembly of the HTS longitudinal torque rod fasteners, note the location, orientation and quantity of torque rod shim(s). It is required that the longitudinal torque rod shims be installed in the same orientation and location as removed to preserve the existing alignment.

6. Remove the longitudinal torque rod to front hanger fasteners and alignment shim(s).
7. Remove the longitudinal torque rod to spring seat stud fasteners and discard.
8. Remove the longitudinal torque rod, see Figure 8-2.
9. If equipped, remove the lower shock absorber fasteners (if equipped) and discard.
10. Remove the U-bolt fasteners and discard.
11. Remove the bottom cap, spherical washers, and lower shock bracket.
12. Remove and discard U-bolts, see Figure 8-2.
13. Lower the axle enough to allow clearance to remove the spring seat.

FIGURE 8-2


INSPECTION

WARNING

FAILURE OF THE LEAF SPRING ASSEMBLY BETWEEN THE U-BOLTS WILL REQUIRE THE REPLACEMENT OF ALL CLAMP GROUP COMPONENTS. FAILURE TO DO SO CAN RESULT IN PREMATURE LEAF SPRING ASSEMBLY OR CLAMP GROUP FAILURE, WHICH MAY RESULT IN LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE AND/OR PERSONAL INJURY.

1. Inspect the leaf spring assembly for cracks, broken or missing leaves, or damage, see Preventive Maintenance Section of this publication. Replace as necessary.
2. Inspect the spring seat and axle bottom cap for excessive wear and cracks. Replace as necessary.
3. Inspect the axle housing for any cracks or wear. Repair or replace as necessary per vehicle manufacturer's specifications.

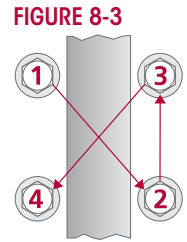
WARNING

U-BOLTS THAT ARE FOUND TO BE LOOSE WILL REQUIRE THAT THE MATING COMPONENTS BE INSPECTED FOR SIGNS OF WEAR. 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.

ASSEMBLY

1. Install the spring seat with the studs mounted forward. Ensure the spring seat is engaged on the axle dowel pin.
2. Raise the axle and center the leaf spring assembly through the legs of the front and rear hangers with the spring center bolt piloting into the hole in the spring seat.
3. Install the U-bolts, top pad, spring seat, axle bottom cap, lower shock absorber bracket (if equipped), washers, and locknuts as shown in Figure 8-2. Do not tighten the U-bolt locknuts at this time.

4. Continue to raise the axle so the front and rear hangers engage the spring.
5. Tighten the U-bolt locknuts evenly in 50 foot pounds increments in the proper pattern, see Figure 8-3, to achieve uniform bolt tension to 425 ± 25 foot pounds (576 ± 34 Nm).
6. Tap the top of the U-bolts with a dead blow mallet, and retighten to 425 ± 25 foot pounds (576 ± 34 Nm). **DO NOT** exceed specified torque on U-bolt locknuts.
7. Install the longitudinal torque rod.



NOTE

U-bolt locknuts must be retightened to 425 ± 25 foot pounds (576 ± 34 Nm) torque after the first 1,000 miles of service and at regular service intervals thereafter as experience dictates, not to exceed 25,000 miles. **DO NOT** exceed specified torque on U-bolt locknuts.

CAUTION

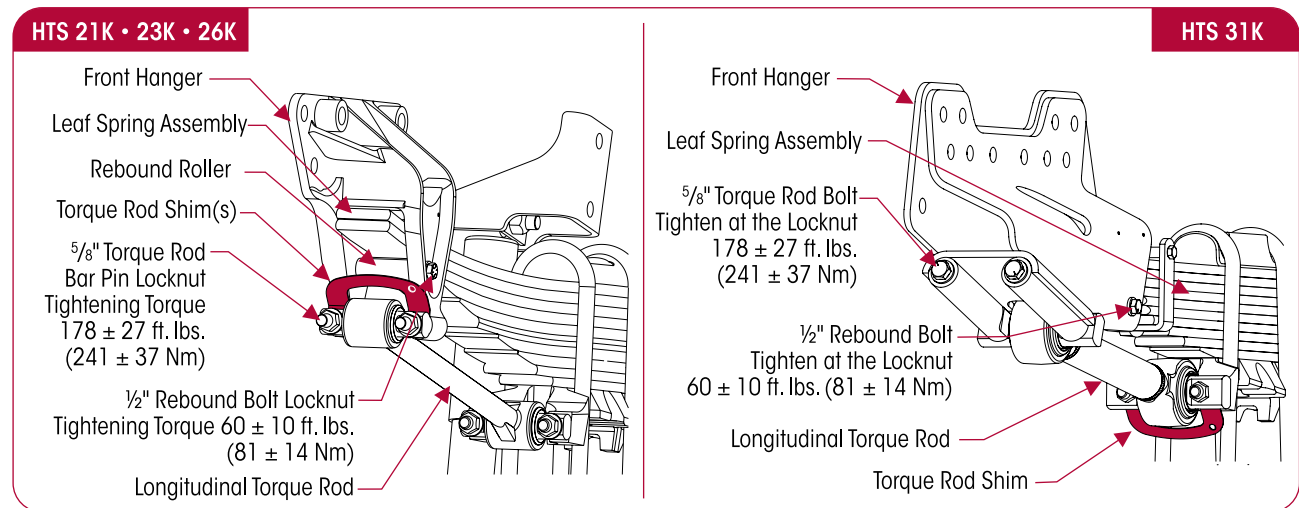
FAILURE TO INSTALL THE HTS LONGITUDINAL TORQUE ROD SHIMS IN THE SAME ORIENTATION AND LOCATION WILL REQUIRE A VEHICLE ALIGNMENT. IMPROPER VEHICLE ALIGNMENT CAN INCREASE TIRE WEAR.

NOTE

Prior to assembly of the HTS longitudinal torque rod fasteners, note the location, orientation and quantity of torque rod shim(s). It is required that the longitudinal torque rod shims be installed in the same orientation and location as removed to preserve the existing alignment.

8. Install the longitudinal torque rod fasteners and any alignment shim(s) that were removed, see Figure 8-4.

FIGURE 8-4



9. Tighten the torque rod fasteners to 178 ± 27 foot pounds (241 ± 37 Nm) torque, see Figure 8-4.
10. If equipped, install the shock absorber into upper and lower shock brackets. Install fasteners and tighten the upper shock bracket at the bolt head and lower fastener locknuts to 60 ± 10 foot pounds (81 ± 14 Nm) torque see Figure 8-2.
11. Tighten rebound roller flange nut to 60 ± 10 foot pounds (81 ± 14 Nm) torque.
12. Install the tires.
13. Remove the frame support.

NOTE

Axle alignment is necessary anytime the leaf spring assembly is serviced, which includes removal of the U-bolts.

14. Verify axle alignment, refer to Alignment & Adjustments Section of this publication.
15. Remove wheel chock.

■ SPRING SEAT STUDS

SERVICE HINT

The clamp group does not have to be disassembled while replacing torque rod mounting stud.

DISASSEMBLY

1. Chock the front wheels of the vehicle.
2. Support the frame rails.
3. Loosen rebound bolt flange nut in the front hanger.

SERVICE HINT

It might be necessary to raise or lower the frame in order to remove the torque rod fasteners.

NOTE

Prior to disassembly of the HTS longitudinal torque rod fasteners, note the location, orientation and quantity of torque rod shim(s). It is required that the longitudinal torque rod shims be installed in the same orientation and location as removed to preserve the existing alignment.

4. Remove the longitudinal torque rod to front hanger fasteners and torque rod shims.
5. Remove the longitudinal torque rod to spring seat stud fasteners and discard.
6. Remove the longitudinal torque rod.
7. Using a stud puller, remove the torque rod mounting stud.

ASSEMBLY

1. Install the dog-point end (tap end) of the new stud into the spring seat until it bottoms out in the spring seat, see Figure 8-5. Using a stud driver, tighten the stud to \mathbb{R} 65 ± 5 foot pounds (88 ± 7 Nm) torque.
2. Install the longitudinal torque rod.

CAUTION

FAILURE TO INSTALL THE HTS LONGITUDINAL TORQUE ROD SHIMS IN THE SAME ORIENTATION AND LOCATION WILL REQUIRE A VEHICLE ALIGNMENT. IMPROPER VEHICLE ALIGNMENT CAN INCREASE TIRE WEAR.

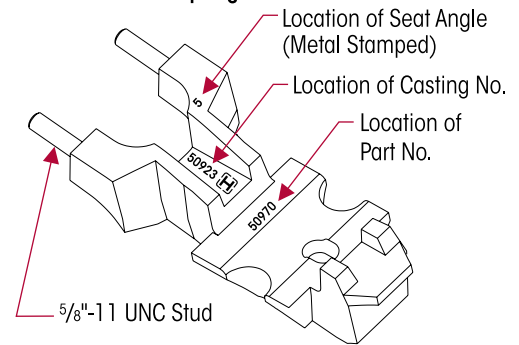
NOTE

It is required that the HTS longitudinal torque rod shim(s) be installed in the same location, orientation and quantity as removed to preserve the existing alignment.

3. Install the mounting fasteners and any torque rod shims that were removed, see Figure 8-4.
4. Tighten the torque rod fasteners to \mathbb{R} 178 ± 27 foot pounds (241 ± 37 Nm) torque, see Figure 8-4.
5. Install and tighten rebound roller fasteners to \mathbb{R} 60 ± 10 foot pounds (81 ± 14 Nm) torque.
6. Remove the frame supports and wheel chocks.

FIGURE 8-5

Bottom View of Spring Seat



LEAF SPRING ASSEMBLY

WARNING

A LEAF SPRING ASSEMBLY THAT HAS A MISSING, CRACKED OR DAMAGED LEAF OR SPRING CLIP WILL REQUIRE COMPLETE LEAF SPRING ASSEMBLY REPLACEMENT AND A THOROUGH INSPECTION OF THE ENTIRE SUSPENSION MUST BE PERFORMED. IF ANY COMPONENT APPEARS DAMAGED, REPLACEMENT IS REQUIRED. FAILURE TO REPLACE ANY DAMAGED COMPONENTS CAN CAUSE LOSS OF VEHICLE CONTROL, POSSIBLE PERSONAL INJURY, DEATH, OR PROPERTY DAMAGE AND WILL VOID ANY APPLICABLE WARRANTIES.

DISASSEMBLY

1. Chock the wheels.
2. Raise the frame to remove the load from the suspension. Support the frame.
3. Raise and support the axle enough to remove the tires.
4. Remove the tires.
5. Remove the rebound bolt fasteners, and roller from both front and rear hangers, see Figure 8-6.

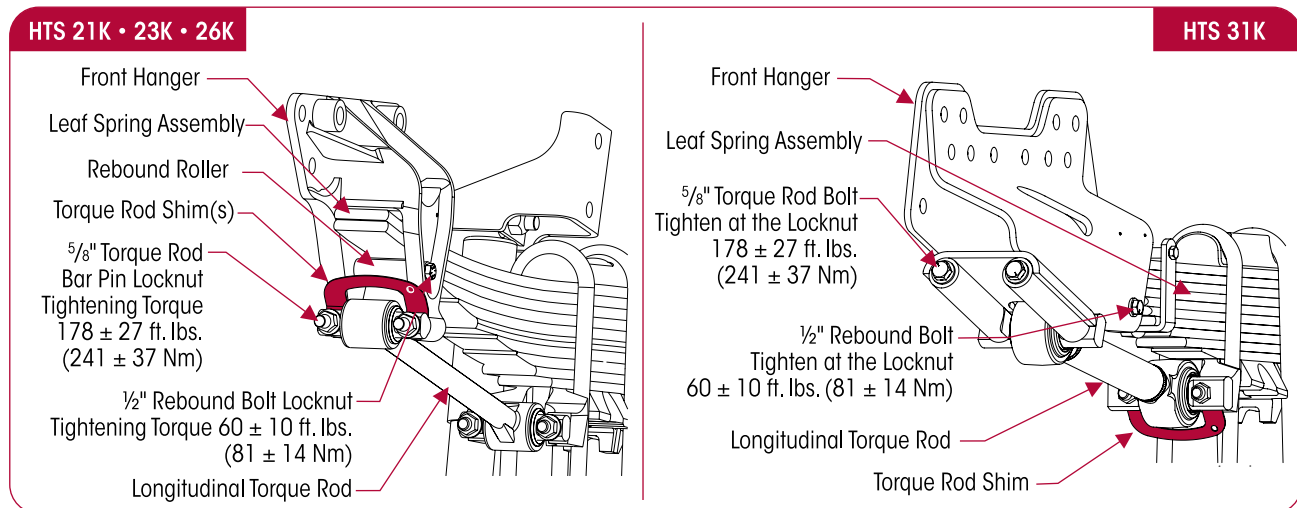
SERVICE HINT

It might be necessary to raise or lower the frame in order to remove the torque rod fasteners.

NOTE

Prior to disassembly of the HTS longitudinal torque rod fasteners, note the location, orientation and quantity of torque rod shim(s). It is required that the longitudinal torque rod shims be installed in the same orientation and location as removed to preserve the existing alignment.

FIGURE 8-6



6. Remove the longitudinal torque rod to front hanger fasteners and torque rod shims.
7. Remove the longitudinal torque rod to spring seat stud fasteners and discard.
8. Remove the longitudinal torque rod.
9. If shock absorber equipped, remove and discard shock fasteners then remove shock absorber.
10. Remove the U-bolt fasteners and discard.
11. Remove the bottom cap, spherical washers, and lower shock bracket.

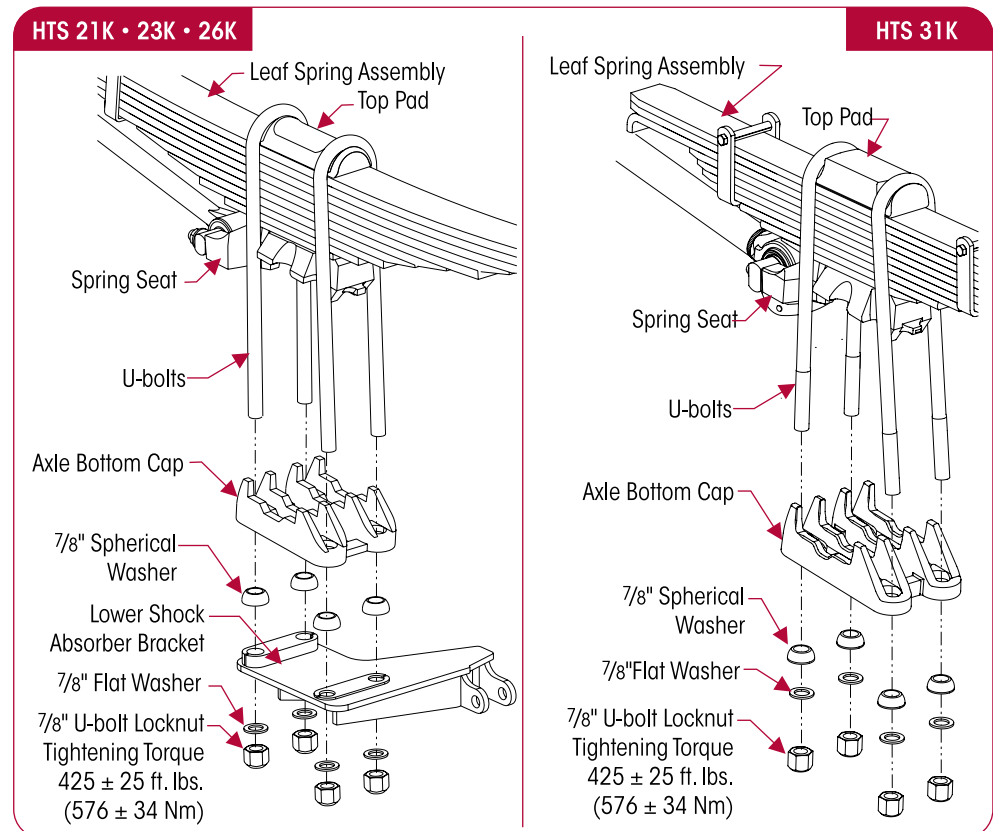
WARNING

U-BOLTS THAT ARE FOUND TO BE LOOSE REQUIRE THAT MATING COMPONENTS BE INSPECTED FOR SIGNS OF WEAR. 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.

12. Remove and discard U-bolts.
13. Lower the axle enough to allow clearance to remove the spring.
14. Remove the leaf spring assembly.

ASSEMBLY

1. Install new leaf spring assembly on the spring seat.
2. Raise the axle and center the spring through the legs of the hangers with the spring center bolt piloting into the hole in the spring seat.
3. Install the U-bolts, top pad, bottom cap, spherical washers, lower shock bracket (if equipped), washers, and locknuts as shown in Figure 8-7. Snug, **DO NOT** tighten the U-bolt locknuts at this time.

FIGURE 8-7


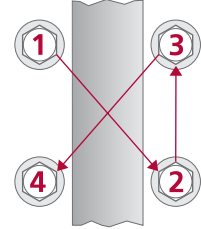
4. Continue to raise the axle so the front and rear hangers engage into the leaf spring assembly.

WARNING

IT IS IMPORTANT THAT THE U-BOLT CONNECTION BE PROPERLY ALIGNED AND HAVE THE PROPER TORQUE VALUES MAINTAINED. METAL SURFACES CAN WORK AND WEAR THE SPRING SEATS, AXLE BOTTOM CAPS AND POSSIBLY OTHER COMPONENTS RELATED IN THE TOTAL ASSEMBLY. PROPERLY TIGHTENED U-BOLT LOCKNUTS WILL ELIMINATE COSTLY REPAIR, DOWNTIME AND POSSIBLE SEPARATION OF COMPONENTS AND LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE OR PERSONAL INJURY.

5. Tighten the U-bolt locknuts evenly in 50 foot pounds increments in the proper pattern, see Figure 8-8, to achieve uniform bolt tension to 425 ± 25 foot pounds (576 ± 34 Nm).
6. Tap the top of the U-bolts with a dead blow mallet, and retighten to 425 ± 25 foot pounds (576 ± 34 Nm). **DO NOT** exceed specified torque on U-bolt locknuts.

FIGURE 8-8



NOTE

U-bolt locknuts must be retightened to 425 ± 25 foot pounds (576 ± 34 Nm) torque after the first 1,000 miles of service and at regular intervals thereafter as experience dictates, not to exceed 25,000 miles. **DO NOT** exceed specified torque on U-bolt locknuts, see Preventive Maintenance section for more information.

7. Install the longitudinal torque rod, see Figure 8-6.

CAUTION

FAILURE TO INSTALL THE HTS LONGITUDINAL TORQUE ROD SHIMS IN THE SAME ORIENTATION AND LOCATION WILL REQUIRE A VEHICLE ALIGNMENT. IMPROPER VEHICLE ALIGNMENT CAN INCREASE TIRE WEAR.

NOTE

It is required that the HTS longitudinal torque rod shim(s) be installed in the same location, orientation and quantity as removed to preserve the existing alignment.

8. Install the longitudinal torque rod fasteners and any torque rod shims that were removed.
9. Tighten the torque rod fasteners to 178 ± 27 foot pounds (241 ± 37 Nm) torque see Figure 8-6.
10. If equipped, install the shock absorber into upper and lower shock brackets. Install fasteners and tighten the upper shock bracket at the bolt head and lower fastener at the locknut to 60 ± 10 foot pounds (81 ± 14 Nm) torque see Figure 8-9.

FIGURE 8-9

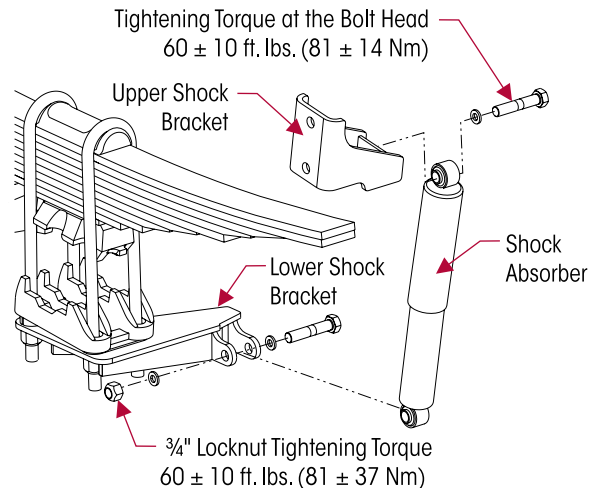
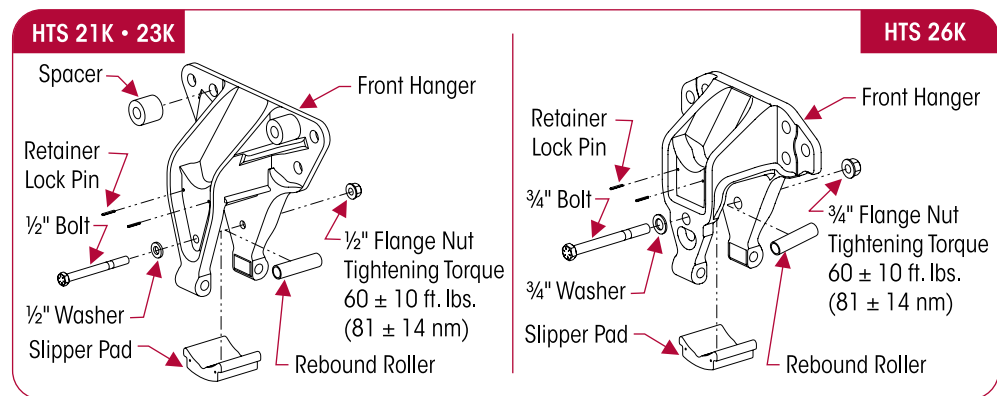


FIGURE 8-10



11. Install the rebound bolt, rebound roller, washer and flange nut on the front hangers shown in Figures 8-10 and 8-11 and tighten to 60 ± 10 foot pounds (81 ± 14 Nm) torque.
12. Install the tires.

NOTE

Alignment is necessary anytime the leaf spring assembly is serviced, which includes removal of the U-bolts.

13. Remove the frame supports. Verify the axle alignment, see Alignment & Adjustments Section of this publication.
14. Remove the wheel chocks.

LONGITUDINAL TORQUE RODS

Hendrickson offers fixed length torque rods and the drop-in torque rod shims for HTS suspension.

DISASSEMBLY

1. Chock wheels of drive axle.
2. Loosen rebound bolt flange nut in the front hanger.

NOTE

It might be necessary to raise or lower the frame in order to remove the torque rod fasteners.

SERVICE HINT

Prior to disassembly of the HTS longitudinal torque rod fasteners, note the location, orientation and quantity of torque rod shim(s). It is required that the longitudinal torque rod shims be installed in the same orientation and location as removed to preserve the existing alignment.

3. Remove the longitudinal torque rod to front hanger fasteners and torque rod shims.
4. Remove the longitudinal torque rod to spring seat stud fasteners and discard.
5. Remove the longitudinal torque rod.
6. Inspect the mounting surfaces for any wear or damage, replace if necessary.
7. To replace bushings, refer to Torque Rod Bushing in this section.

ASSEMBLY

1. Position the new or re-bushed torque rod on the spring seat and install fasteners. Hand tighten locknuts. **DO NOT** tighten at this time.
2. Position the longitudinal torque rod on the forward face of the hanger legs.

CAUTION

FAILURE TO INSTALL THE HTS LONGITUDINAL TORQUE ROD SHIMS IN THE SAME ORIENTATION AND LOCATION WILL REQUIRE A VEHICLE ALIGNMENT. IMPROPER VEHICLE ALIGNMENT CAN INCREASE TIRE WEAR.

NOTE

Prior to assembly of the HTS longitudinal torque rod fasteners, note the location, orientation and quantity of torque rod shim(s). It is required that the longitudinal torque rod shims be installed in the same orientation and location as removed to preserve the existing alignment.

3. Install torque rod to hanger fasteners, and any torque rod shims that were removed.

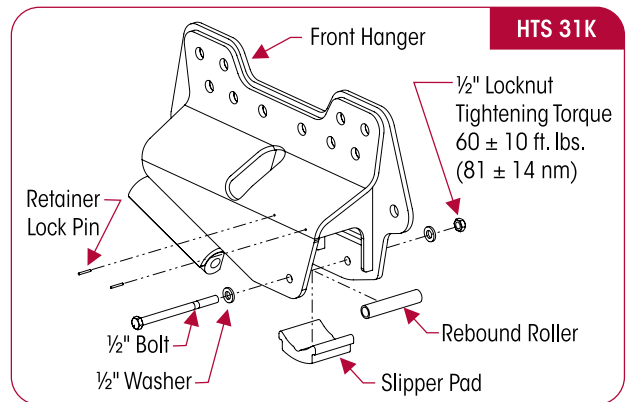
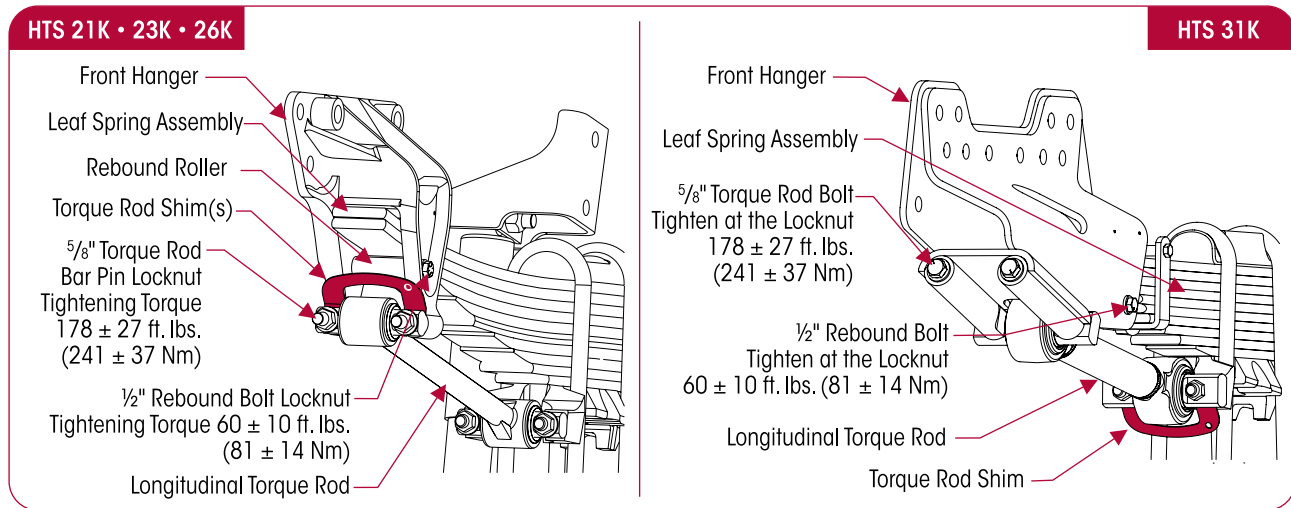
FIGURE 8-11


FIGURE 8-12



4. Tighten torque rod locknuts to \mathbb{N} 178 ± 27 foot pounds (241 ± 37 Nm) torque as shown in Figure 8-12.
5. Tighten the rebound bolt flange nuts to \mathbb{N} 60 ± 10 foot pounds (81 ± 14 Nm) torque as shown in Figure 8-12.
6. Verify the axle alignment, see Alignment & Adjustments Section of this publication.
7. Remove the wheel chocks.

ULTRA ROD•ULTRA ROD PLUS TORQUE ROD BUSHING

You will need

- A vertical press with a minimum capacity of 10 tons
- Shop made receiving tool and installation/removal tool, refer to the Special Tools Section of this publication for more information.
- Funnel Tool Part Nos. 66086-001 (ULTRA ROD) / 66086-000 (ULTRA ROD PLUS)

DISASSEMBLY

1. Remove torque rods as detailed in Torque Rod Disassembly instructions in this section.

FIGURE 8-13



Straddle Pin Bushing

WARNING

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

2. Support the torque rod end tube centered on the receiving tool. Be sure the torque rod is squarely supported on the press bed for safety.
3. Push directly on the straddle bar pin, see Figure 13, until the top of the pin is level with the top of torque rod end tube. Place the push out tool directly on top of the bar pin and press until the bushing clears the torque rod end tube.

BUSHING INSTALLATION

1. Clean and inspect the inner diameter of the torque rod end tubes.

FIGURE 8-14

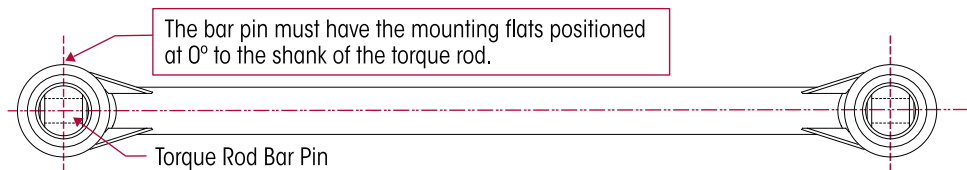


SERVICE HINT

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

2. Lubricate the inner diameter of the torque rod end hub 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, see Figure 8-14.
3. Support the torque rod end tube centered on the receiving tool. Be sure the torque rod is squarely supported on the press bed for safety. The straddle mount bar pin bushings must have the mounting flats positioned at zero degrees to the shank of the torque rod, see Figure 8-15.

FIGURE 8-15



4. Push directly on the straddle mount bar pin, or the tapered stud. The bushing must be centered within the end tubes of the torque rod.
 - When pushing in the new bushings, overshoot the desired final position by approximately $\frac{3}{16}$ ", see Figure 8-16.
 - Push the bushing again from the opposite side to center the bar pin, or tapered stud within the end tube, see Figure 8-17.

FIGURE 8-16

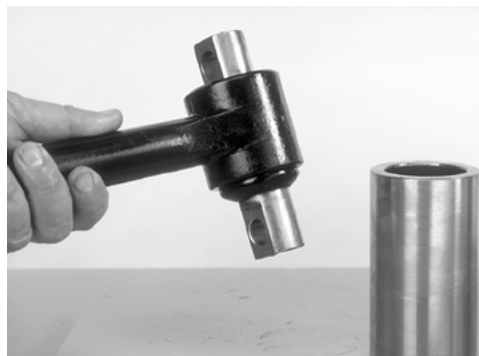
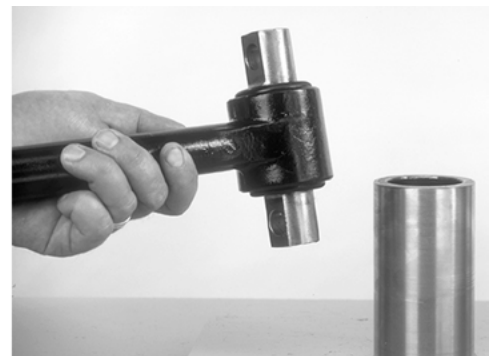


FIGURE 8-17



CAUTION

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

5. Wipe off the excess lubricant. Allow the lubricant four hours to dissipate prior to operating the vehicle.
6. Replace torque rod assembly as detailed in the Transverse Torque Rod Assembly in this section.

XTRB TORQUE ROD BUSHING

DISASSEMBLY

1. Remove longitudinal torque rods as detailed in Longitudinal Torque Rod Disassembly instructions in this section.

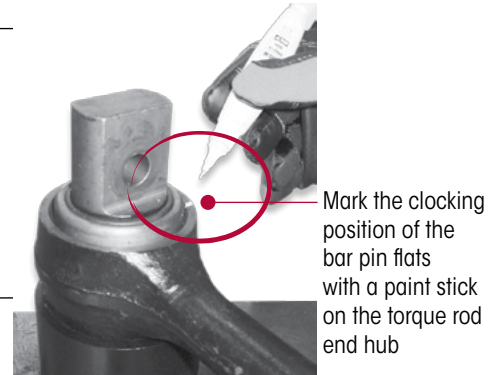
CAUTION

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.

FIGURE 8-18

SERVICE HINT

When servicing a straddle mount bar pin bushing assembly, mark the clocking position of the straddle mount bar pin flats with a paint stick on the torque rod end hub prior to disassembly, see Figure 8-18. This marking will serve as a guide when installing the new bushing assembly so the original clocking position can be retained.



2. Mark the clocking position of the straddle mount bar pin flats with a paint stick on the torque rod end hub prior to disassembly, see Figure 8-18.

FIGURE 8-19

3. Support the torque rod end tube centered on the receiving tool. Be sure the torque rod is squarely supported on the press bed for safety.
4. Push directly on the straddle mount bar pin, until the top of the bar pin is level with the top of torque rod end hub, see Figure 8-19.



FIGURE 8-20

5. Place the shop made removal tool on the bar pin and press until the bushing clears the torque rod hub, see Figure 8-20.



ASSEMBLY

1. Clean and inspect the inner diameter of the torque rod end hubs, see Figure 8-21.

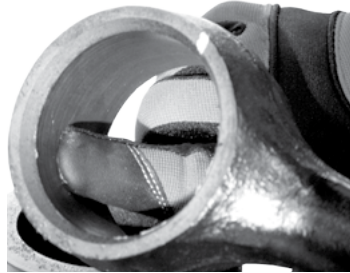
SERVICE HINT

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

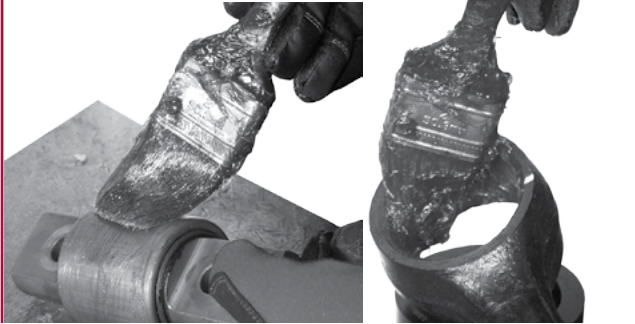
2. Lubricate the inner diameter of the torque rod end hubs and the new bushings with NLGI #2 EP grease, see Figure 8-22.

FIGURE 8-21

Inspect and clean the inner diameter of torque rod end hubs


FIGURE 8-22

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



3. Support the torque rod end hub centered on the receiving tool. Be sure the torque rod is squarely supported on the press bed for safety.
4. Re-align the bar pin bushings to the mark made before removal as shown in Figure 8-18.
5. Using the shop made tool, place the installer tool on the bushing and press in. The bushing must be centered within the hub of the torque rod.
6. Wipe off the excess lubricant.
7. Replace torque rod assembly as detailed in the Longitudinal Torque Rod Assembly section in this publication.

FRONT HANGER

NOTE

Follow the vehicle manufacturer's specifications for front hanger to frame fastener tightening torque values.

DISASSEMBLY

1. Chock the wheels.
2. Remove the rebound fastener, spacer and roller from the front hanger, see Figures 8-23 and 8-24.

NOTE

It might be necessary to raise or lower the frame in order to remove the torque rod fasteners.

SERVICE HINT

Prior to disassembly of the HTS longitudinal torque rod fasteners, note the location, orientation and quantity of torque rod shim(s). It is required that the longitudinal torque rod shims be installed in the same orientation and location as removed to preserve the existing alignment.

3. Remove the longitudinal torque rod to hanger fasteners and torque rod shims.
4. Remove the longitudinal torque rod to spring seat stud fasteners and discard.
5. Remove the longitudinal torque rod.
6. Raise the frame of the vehicle high enough to remove the load from the leaf spring assembly.
7. Remove the front hanger to frame fasteners per vehicle manufacturer's specifications.
8. Remove the front hanger.

CAUTION

FAILURE TO INSTALL THE HTS LONGITUDINAL TORQUE ROD SHIMS IN THE SAME ORIENTATION AND LOCATION WILL REQUIRE A VEHICLE ALIGNMENT. IMPROPER VEHICLE ALIGNMENT CAN INCREASE TIRE WEAR.

NOTE

Prior to assembly of the HTS longitudinal torque rod fasteners, note the location, orientation and quantity of torque rod shim(s). It is required that the longitudinal torque rod shims be installed in the same orientation and location as removed to preserve the existing alignment.

FIGURE 8-23

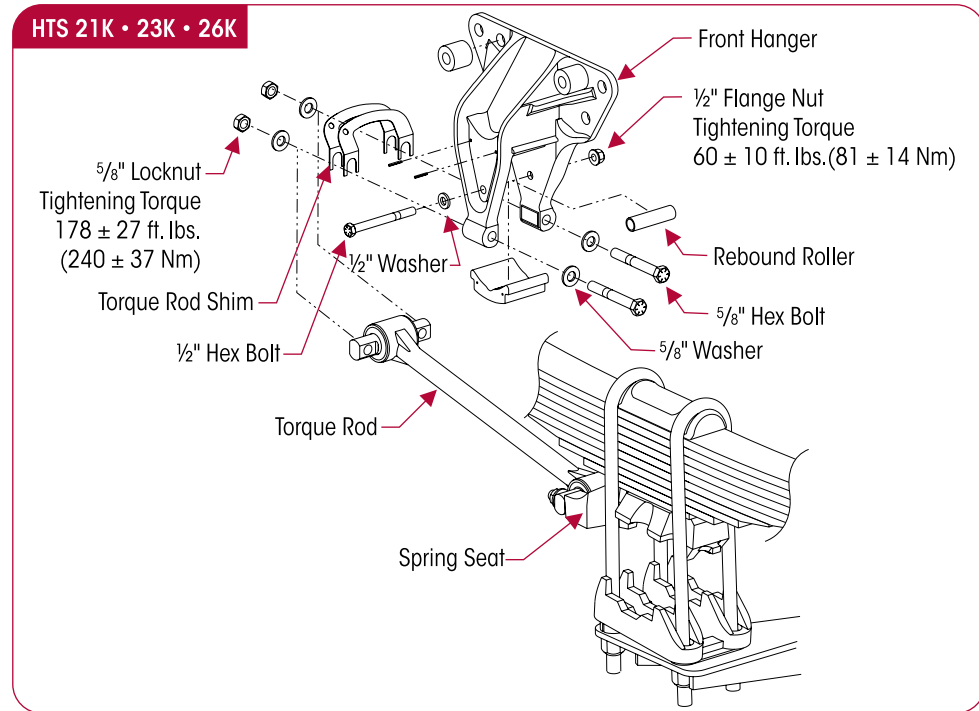
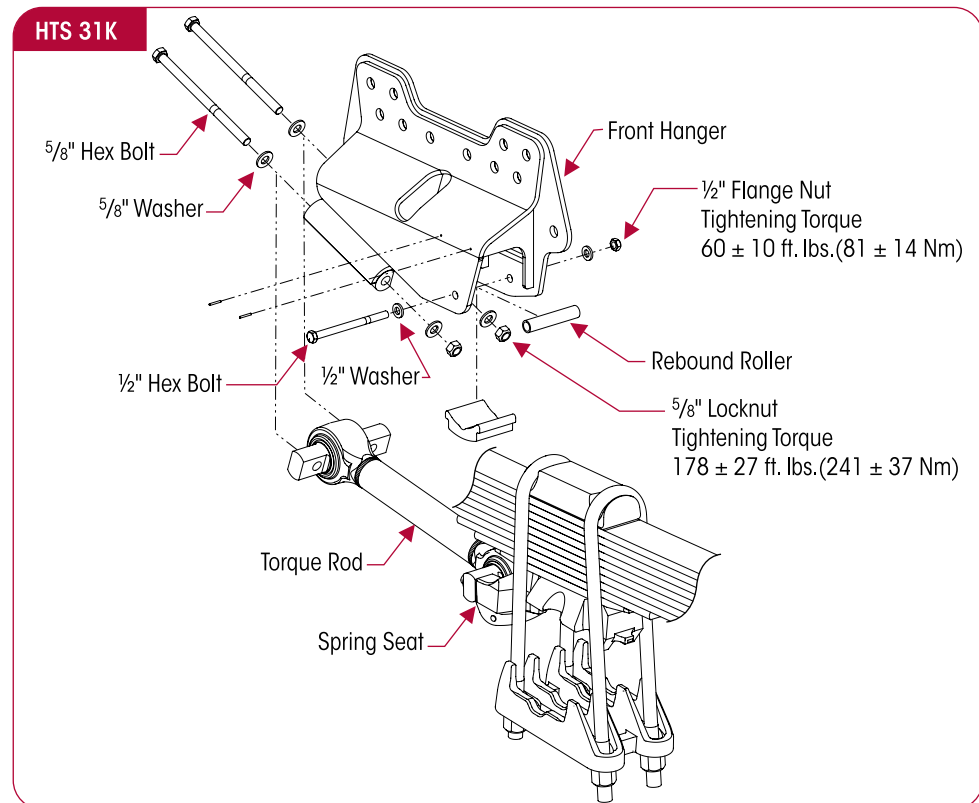


FIGURE 8-24

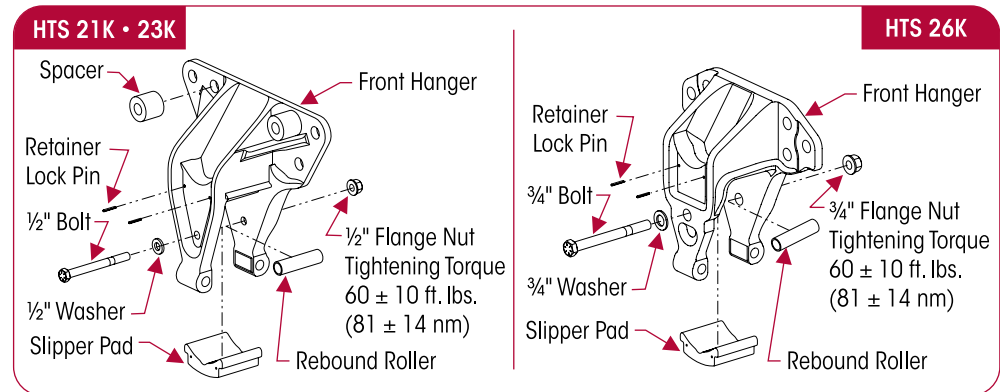


ASSEMBLY

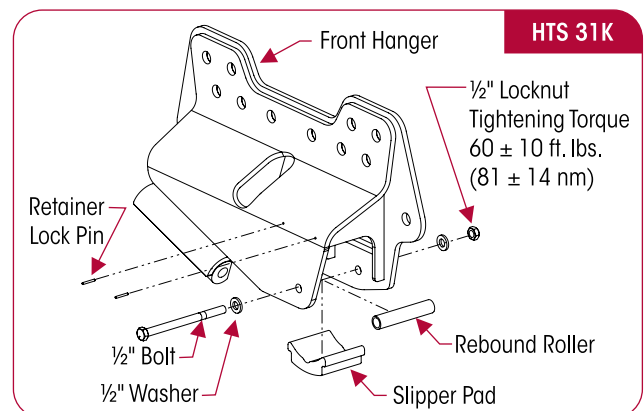
1. Position the front hanger over the leaf spring assembly.
2. Install new frame fasteners in the front hanger and tighten to vehicle manufacturer's specifications.
3. Lower the frame.
4. Install the longitudinal torque rod on the forward face of the front hanger legs.
5. Install the mounting fasteners and any torque rod shims that were removed.
6. Tighten the torque rod fasteners to \mathbb{N} 178 ± 27 foot pounds (241 ± 37 Nm) torque.
7. Install the rebound roller and fasteners in hanger and tighten to \mathbb{N} 60 ± 10 foot pounds (81 ± 14 Nm) torque, see Figures 8-23 and 8-24.
8. Verify axle alignment, see Alignment & Adjustments Section of this publication.
9. Remove wheel chocks.

FRONT HANGER SLIPPER PAD
DISASSEMBLY

1. Chock the wheels.
2. Remove the rebound fastener and roller.
3. With a blunt end $\frac{1}{8}$ " punch drive in current lock pins until it has passed through the front hanger.
4. Raise the frame just high enough to access the slipper pad.
5. Remove slipper pad with a screwdriver.

FIGURE 8-25

FIGURE 8-26
ASSEMBLY

1. Insert new slipper pad.
2. Lower the frame to secure the slipper pad in place against the leaf spring assembly.
3. Drive new retainer lock pins in place with punch until flush with front of hanger, see Figures 8-25 and 8-26.



4. Install rebound fastener and roller and tighten to 60 ± 10 foot pounds (81 ± 14 Nm) torque, see Figures 8-25 and 8-26.
5. Remove wheel chocks.

REAR HANGERS

NOTE

Follow the vehicle manufacturer's specifications for hanger to frame fastener tightening torque values.

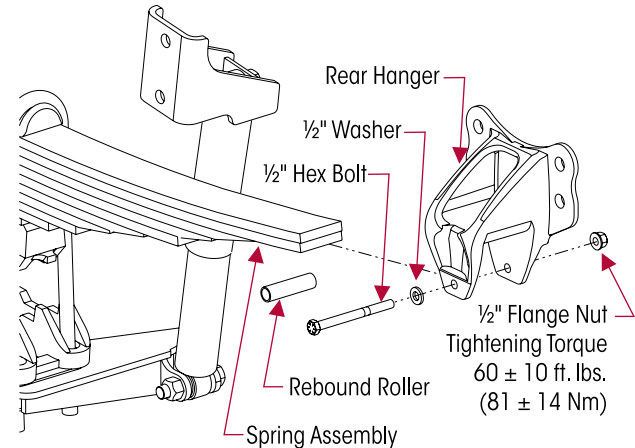
DISASSEMBLY

1. Chock the wheels.
2. Remove the rebound fasteners and roller from the rear hanger, see Figure 8-27.
3. Raise the frame of the vehicle high enough to remove the load from the leaf spring assembly.
4. Remove the rear hanger frame fasteners per vehicle manufacturer's specifications.
5. Remove the rear hanger.

ASSEMBLY

1. Position the rear hanger over the leaf spring assembly, see Figure 8-27.
2. Install new frame fasteners in the hanger and tighten to vehicle manufacturer's specifications.
3. Lower the frame.
4. Install the rebound roller and fasteners in hanger and tighten to 60 ± 10 foot pounds (81 ± 14 Nm) torque, see Figure 8-27.
5. Remove wheel chocks.

FIGURE 8-27

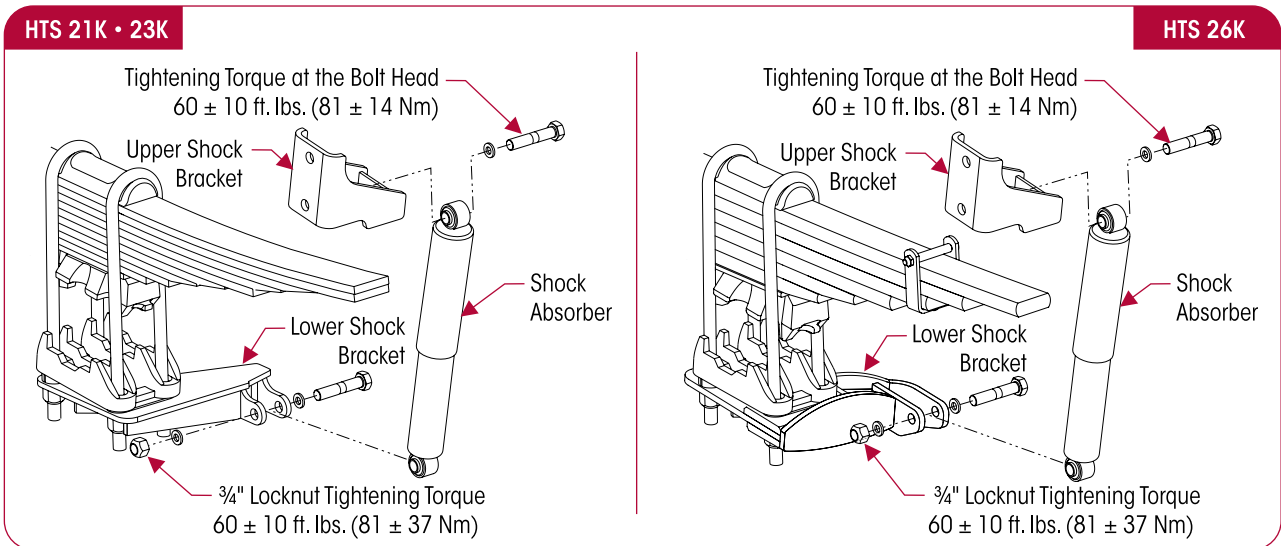


SHOCK ABSORBER (IF EQUIPPED)

DISASSEMBLY

1. Chock the wheels of the vehicle.
2. Remove and discard the lower shock absorber mounting fasteners, see Figure 8-28.
3. Remove and discard the upper shock absorber mounting fasteners see Figure 8-28.
4. Slide the shock absorber out of the mounting brackets.
5. Inspect the shock absorber mounting brackets and hardware for damage or wear. Replace if necessary.

FIGURE 8-28



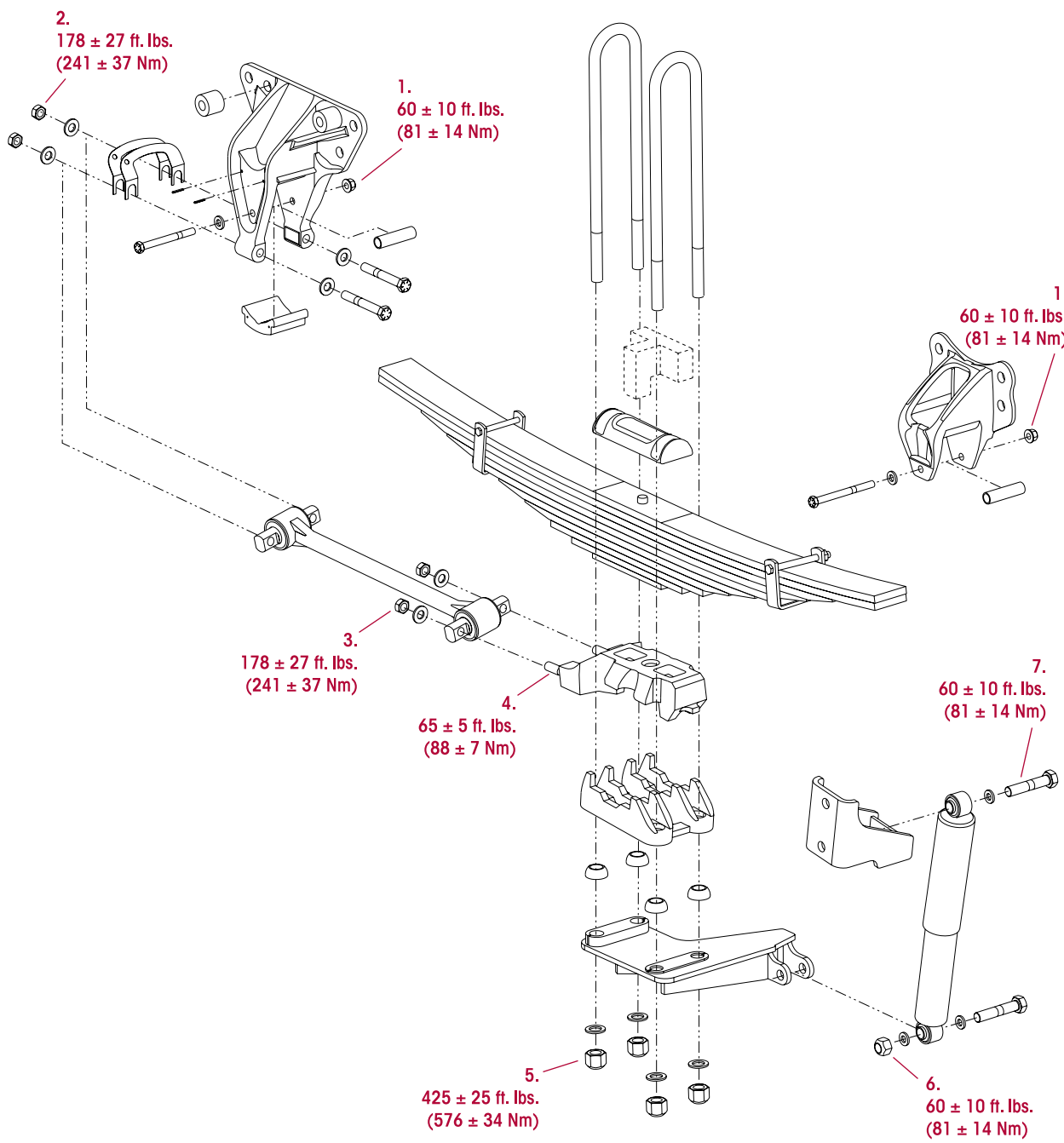
ASSEMBLY

1. Install the upper shock absorber mounting bracket (if removed).
2. Install the shock absorber into the upper mounting bracket and mounting fasteners.
3. Slide the lower shock absorber mount into the lower shock bracket and install lower mounting fasteners.
4. Tighten the upper shock absorber fasteners at the bolt head to 60 ± 10 foot pounds (81 ± 14 Nm) torque, see Figure 8-28.
5. Tighten the lower shock absorber fasteners to 60 ± 10 foot pounds (81 ± 14 Nm) torque, see Figure 8-28.
6. Remove the wheel chocks.

SECTION 9 Torque Specifications

HTS 21K • 23K

HENDRICKSON RECOMMENDED TORQUE VALUES
PROVIDED IN FOOT POUNDS AND IN Nm





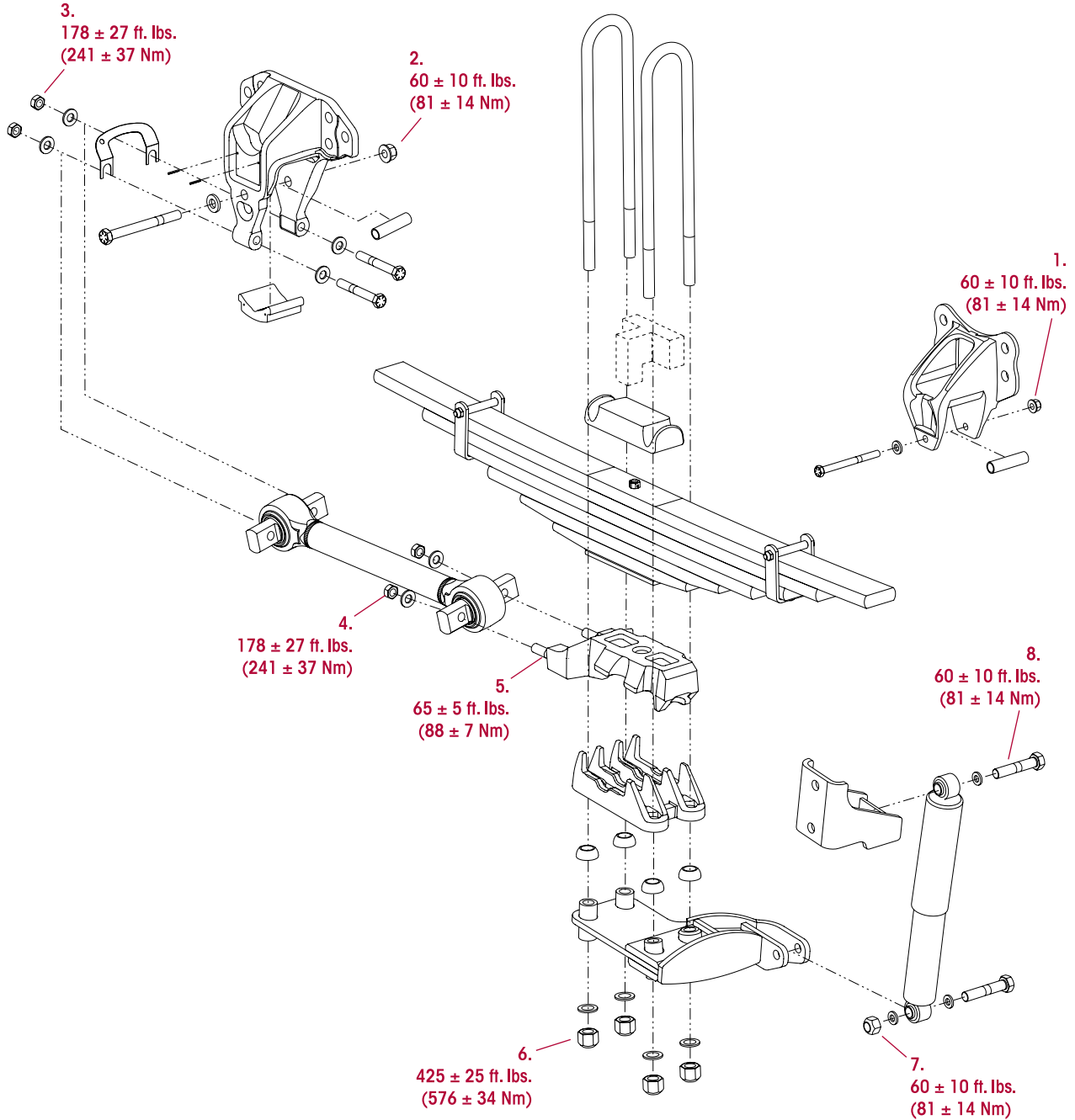
HTS 21K • 23K FOR AUTOCAR

HENDRICKSON RECOMMENDED TORQUE SPECIFICATIONS

NO.	COMPONENT	FASTENER		*TORQUE VALUE	
		QTY.	***SIZE	FOOT POUNDS	Nm
Frame Hanger to Vehicle Frame Fasteners Furnished & Installed by Vehicle Manufacturer					
1	Rebound Roller Fastener	4	½"-11 UNC	60 ± 10	81 ± 14
2	Torque Rod Bar Pin to Frame Hanger	4	⅝"-11 UNC	178 ± 27	241 ± 37
3	Torque Rod Bar Pin to Spring Seat	4	⅝"-11 UNC	178 ± 27	241 ± 37
4	Spring Seat Stud	4	⅝"-11 UNC	65 ± 5	88 ± 7
5	U-bolt Locknut	8	⅞"-14 UNF	**425 ± 25	567 ± 34
6	Shock Absorber to Lower Shock Bracket	2	¾"-10 UNC	60 ± 10	81 ± 14
7	Shock Absorber to Upper Shock Bracket (at bolt head)	2	¾"-10 UNC	60 ± 10	81 ± 14
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.				
	** DO NOT exceed torque on U-bolt locknuts.				
	*** All threads must be clean and lubricated with SAE 20 oil before assembly to obtain the correct relationship of torque and fastener tension.				
NOTE	After initial break-in period (up to 1,000 miles) all bolts and nuts should be checked to ensure recommended torque is being maintained. To obtain maximum service life from the suspension system, mounting fasteners should be checked at least once a year and tightened to specified torque.				

HTS 26K

HENDRICKSON RECOMMENDED TORQUE VALUES
PROVIDED IN FOOT POUNDS AND IN Nm





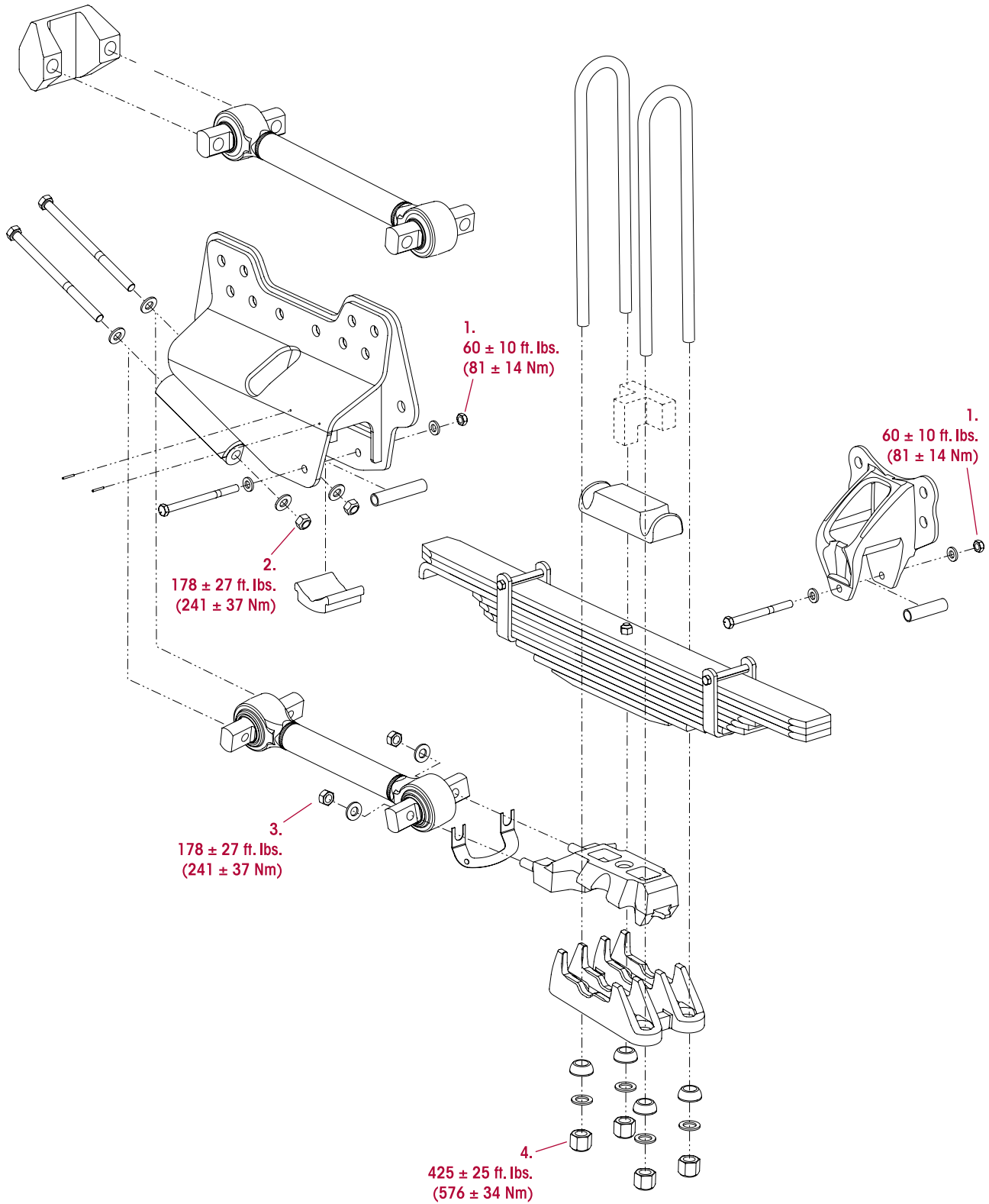
HTS 26K FOR AUTOCAR

HENDRICKSON RECOMMENDED TORQUE SPECIFICATIONS

NO.	COMPONENT	FASTENER		*TORQUE VALUE	
		QTY.	***SIZE	FOOT POUNDS	Nm
Frame Hanger to Vehicle Frame Fasteners Furnished & Installed by Vehicle Manufacturer					
1	Rebound Roller Fastener (Rear)	4	½"-11 UNC	60 ± 10	81 ± 14
2	Rebound Roller Fastener (Front)	4	¾"-10 UNC	60 ± 10	81 ± 14
3	Torque Rod Bar Pin to Frame Hanger	4	⅝"-11 UNC	178 ± 27	241 ± 37
4	Torque Rod Bar Pin to Spring Seat	4	⅝"-11 UNC	178 ± 27	241 ± 37
5	Spring Seat Stud	4	⅝"-11 UNC	65 ± 5	88 ± 7
6	U-bolt Locknut	8	⅞"-14 UNF	**425 ± 25	576 ± 34
7	Shock Absorber to Lower Shock Bracket	2	¾"-10 UNC	60 ± 10	81 ± 14
8	Shock Absorber to Upper Shock Bracket (at bolt head)	2	¾"-10 UNC	60 ± 10	81 ± 14
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.				
	** DO NOT exceed torque on U-bolt locknuts.				
	*** All threads must be clean and lubricated with SAE 20 oil before assembly to obtain the correct relationship of torque and fastener tension.				
NOTE	After initial break-in period (up to 1,000 miles) all bolts and nuts should be checked to ensure recommended torque is being maintained. To obtain maximum service life from the suspension system, mounting fasteners should be checked at least once a year and tightened to specified torque.				

HTS 31K

**HENDRICKSON RECOMMENDED TORQUE VALUES
PROVIDED IN FOOT POUNDS AND IN Nm**





HTS 31K FOR AUTOCAR

HENDRICKSON RECOMMENDED TORQUE SPECIFICATIONS					
NO.	COMPONENT	FASTENER		*TORQUE VALUE	
		QTY.	***SIZE	FOOT POUNDS	Nm
Frame Hanger to Vehicle Frame Fasteners Furnished & Installed by Vehicle Manufacturer					
1	Rebound Roller Fastener	4	½"-13 UNC	60 ± 10	81 ± 14
2	Torque Rod Bar Pin to Frame Hanger	4	⅝"-11 UNC	178 ± 27	241 ± 37
3	Torque Rod Bar Pin to Spring Seat	4	⅝"-11 UNC	178 ± 27	241 ± 37
4	U-bolt Locknut	8	⅞"-14 UNF	**425 ± 25	576 ± 34
NOTE	<p>* Torque values listed above apply only if Hendrickson supplied fasteners are used. If non Hendrickson fasteners are used, follow torque specification listed in vehicle manufacturer's service manual.</p> <p>** DO NOT exceed torque on U-bolt locknuts.</p> <p>*** All threads must be clean and lubricated with SAE 20 oil before assembly to obtain the correct relationship of torque and fastener tension.</p>				
NOTE	<p>After initial break-in period (up to 1,000 miles) all bolts and nuts should be checked to ensure recommended torque is being maintained. To obtain maximum service life from the suspension system, mounting fasteners should be checked at least once a year and tightened to specified torque.</p>				

SECTION 10

Troubleshooting Guide

HTS TROUBLESHOOTING GUIDE		
CONDITION	POSSIBLE CAUSE	CORRECTION
Suspension has harsh or bumpy ride	Suspension is overloaded	Redistribute load to correct weight.
	Damaged or leaking shock absorber	Replace shock absorber.
Irregular tire wear	Incorrect tire inflation pressure	Correct tire pressure per vehicle manufacturer and tire manufacturer specifications.
	Incorrect alignment	Adjust the alignment, see Alignment & Adjustments Section.
	Worn torque rod bushings	Replace torque rod bushings as necessary.
Excessive driveline vibration	Incorrect pinion angle(s)	Adjust pinion angle(s), refer to the vehicle manufacturer for specifications.
Suspension is noisy	Loose U-bolts	Tighten U-bolts to specifications, see Preventive Maintenance Section.
	Worn torque rod bushings	Replace torque rod bushings as necessary.
Vehicle leaning	Load not centered	Redistribute the load.
	Frame twisted	Straighten the frame per vehicle manufacturer's guidelines.
	Axle housing bent or broken	Replace axle housing per vehicle manufacturer's guidelines and align vehicle.
	Loose U-bolts	Tighten U-bolts to specifications, see Preventive Maintenance Section.
	Front suspension	Inspect and repair front suspension.
	Broken leaf in spring assembly	Replace spring assembly.
Vehicle bouncing excessively	Damaged or leaking shock absorbers	Replace shock absorbers.
	Incorrect ride height or broken leaf in spring assembly	Replace leaf spring assembly.
Excessive frame slope	Incorrect ride height or broken leaf in spring assembly	Replace leaf spring assembly.
	Suspension overloaded	Redistribute load / reduce load to correct weight.

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