TECHNICAL PROCEDURE

HTS™ 15.5K Rear Suspension for Workhorse W56 Medium-duty Electric Trucks

SUBJECT: Service Instructions
LIT NO: 17730-355
DATE: September 2024 **REVISION:** B

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HENDRICKSON
The World Rides On Us®

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 Workhorse W56 medium-duty electric trucks.

NOTE Use only Genuine Hendrickson parts for servicing this suspension system.

It is important to read and understand this entire Technical Procedure publication and all work instructions and safety related information provided by the vehicle manufacturer 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 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

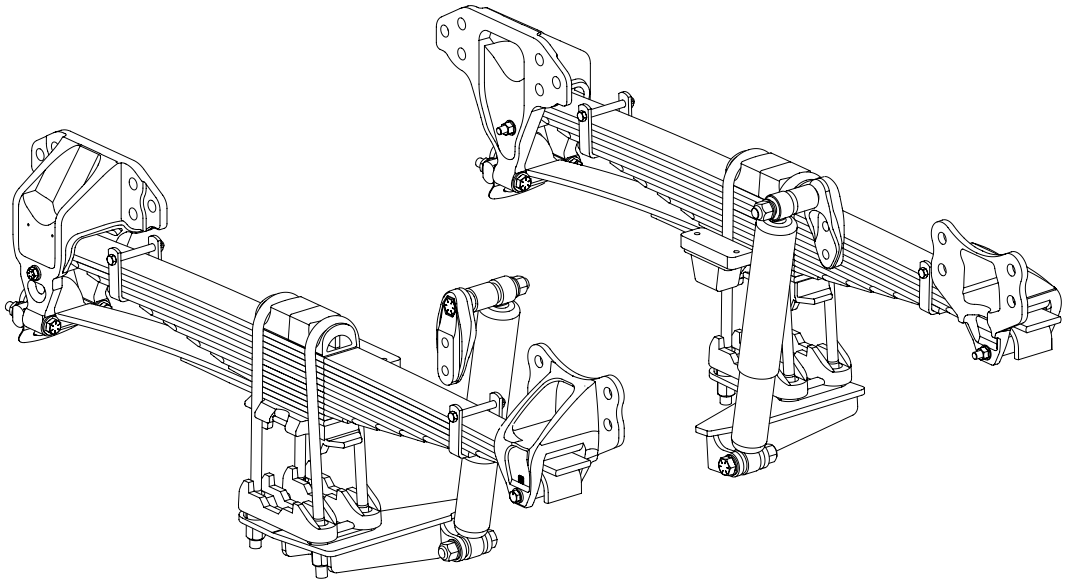
Hendrickson's HTS suspension for Workhorse W56 medium-duty electric trucks is a mechanical suspension designed to achieve maximum durability with limited maintenance requirements. The system utilizes advanced spring technology to achieve extended service life with excellent ride characteristics.

The HTS for Workhorse vehicle 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.

- **Frame Hanger** — Lightweight design with proven durability.
- **Leaf spring assembly** — Hendrickson quality springs are made from high-strength steel. Heat treated and shot peened for exceptional fatigue life.
- **Alignment Shims** — Equipped with drop-in shims at the radial leaf for ease of alignment.
- **Axle Connection** — Wide seats with heavy-duty U-bolts for secure connection.
- **Axle Stop** — Limits spring deflection.
- **Shock Absorbers** — HTS utilizes premium shock absorbers that have been tested and tuned specifically for the suspension system.

FIGURE 2-1



HTS* Specifications for Workhorse W56

Suspension Installed Weight[1]	516 lbs.
Suspension Rating	15,500 lbs.
Gross Vehicle Weight (GVW) Approval	26,000 lbs.
Ride Height (loaded)[2]	158.4 mm

* All applications require approval from Hendrickson Engineering.

1. Installed weight includes complete suspension, axle brackets, shock absorbers, shock absorber brackets, and frame brackets.
2. Suspension ride height measurements are taken from the centerline of the axle to the bottom of the truck frame.

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.

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

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

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

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

WARNING

U-BOLT FASTENERS

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

WARNING

LOAD CAPACITY

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

WARNING

SUPPORT THE VEHICLE PRIOR TO SERVICING

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

WARNING

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

CAUTION

PROCEDURES AND TOOLS

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

WARNING

PERSONNEL PROTECTIVE EQUIPMENT

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

WARNING

MODIFYING COMPONENTS

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

⚠ WARNING

TORCH / WELDING

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

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

⚠ WARNING

CLAMP GROUP

THE PROCEDURE TO DISASSEMBLE THE CLAMP GROUP IS DONE WITH THE OTHER LEAF SPRING ASSEMBLY PROPERLY CONNECTED TO THE FRAME HANGER AND AXLE. FAILURE TO HAVE THE OTHER LEAF SPRING ASSEMBLY CONNECTED PROPERLY COULD ALLOW THE AXLE TO SHIFT RESULTING IN POSSIBLE DAMAGE TO COMPONENTS AND/OR PERSONAL INJURY. IF THE OTHER LEAF SPRING ASSEMBLY 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.

⚠ 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 ADVERSE VEHICLE HANDLING, POSSIBLE PERSONAL INJURY, DEATH, OR PROPERTY DAMAGE AND WILL VOID ANY APPLICABLE WARRANTIES.

⚠ CAUTION

RADIUS LEAF SHIMS

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

⚠ CAUTION

SHOCK ABSORBERS

THE SHOCK ABSORBERS ARE THE REBOUND TRAVEL STOPS FOR THE SUSPENSION. ANYTIME THE AXLE ON HTS SUSPENSION IS SUSPENDED IT IS MANDATORY THAT THE SHOCK ABSORBERS REMAIN CONNECTED. REPLACEMENT OF SHOCK ABSORBERS WITH NON-HENDRICKSON PARTS CAN ALTER THE REBOUND TRAVEL OF THE SUSPENSION.

⚠ 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 PROCEDURE:

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 ANY APPLICABLE WARRANTY.

WARNING

ELECTRIC VEHICLE SAFETY

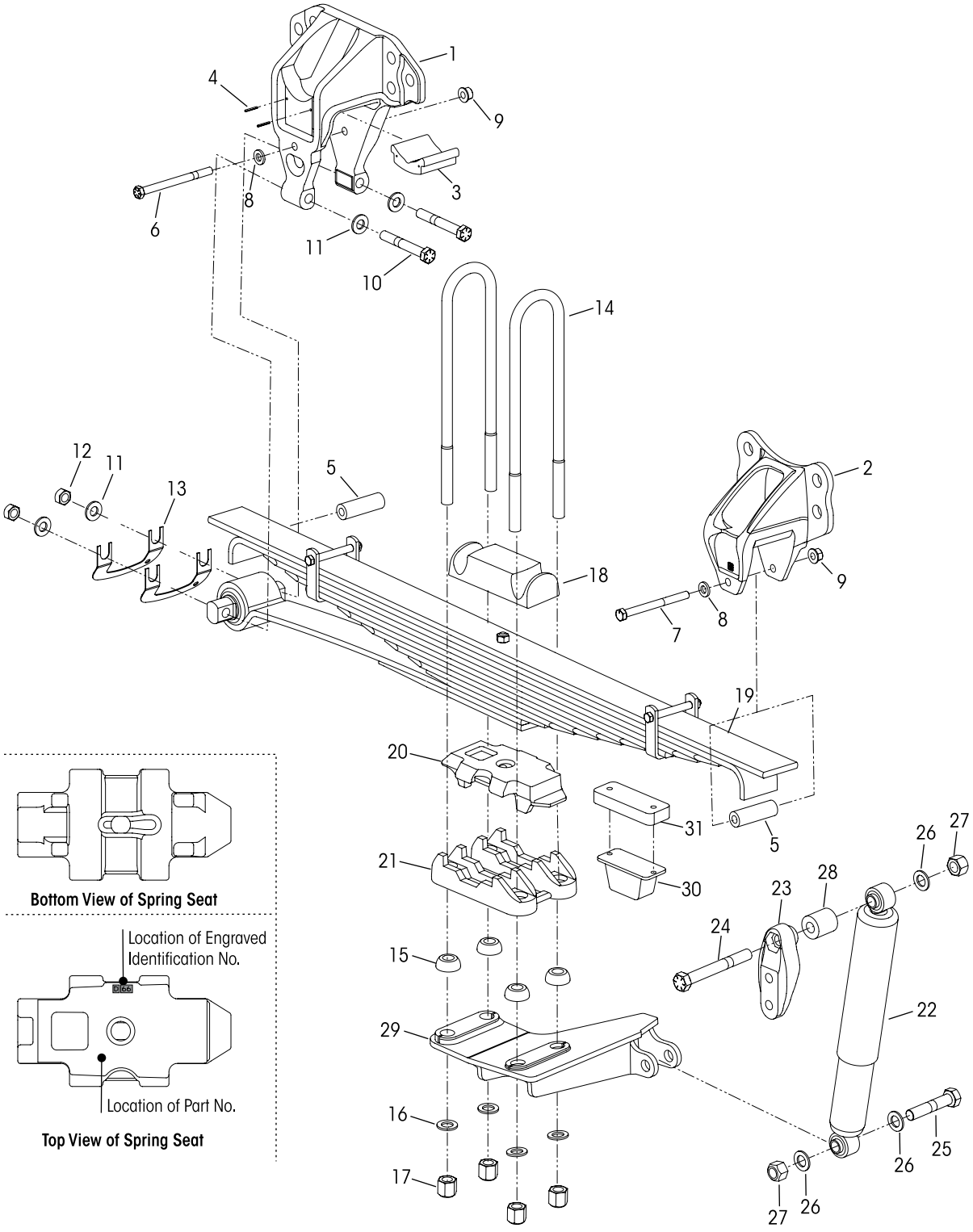
PRIOR TO PERFORMING ANY WORK ON THE VEHICLE, READ ALL WORK INSTRUCTIONS AND SAFETY INFORMATION PROVIDED BY THE VEHICLE MANUFACTURER AND MAKE SURE THAT THE STARTER SWITCH IS IN THE "OFF" POSITION, SET THE PARKING BRAKE, AND CHOCK THE TIRES.

TOOLS USED WHEN WORKING NEAR BATTERIES OR ELECTRICAL CONNECTIONS MUST BE CERTIFIED TO A RATING OF 1000 VDC TO HELP PREVENT INJURIES FROM ELECTRIC SHOCK. SHORT CIRCUITS BETWEEN COMPONENTS OR WIRES MUST BE AVOIDED.

SECTION 4

Parts Lists

HTS 15.5K Capacity



KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.
1	58425-009	Front Spring Hanger Assembly, Includes Key Nos. 3-4	2
2	50028-001	Rear Spring Hanger	2
	34013-439	**Slipper Pad and Rebound Roller Service Kit, Axle Set,** Includes Key Nos. 3-9	
	56557-005	**Slipper Pad Service Kit, One Hanger,** Includes Key Nos. 3-4	
3	56929-000	Slipper Pad	2
4	58287-001	Retainer Lock Pin	4
	49175-039	**Front and Rear Rebound Roller Service Kit, Axle Set,** Includes Key Nos. 5-9	
5	58631-000	Rebound Roller	4
6	24531-022	½"-13 UNC-2B x 6" Hex Bolt	2
7	24531-015	½"-13 UNC-2B x 5½" Hex Bolt	2
8	22962-014	½" Flat Washer	4
9	60819-000	½"-13 UNC-2B Flange Nut	4
	50754-023	**Leaf Spring Mounting Service Kit, One Hanger,** Includes Key Nos. 10-12	
10	32043-005	*⅝"-11 UNC x 4½" Hex Bolt	4
11	22962-025	*⅝" Flat Washer	8
12	47764-000	*⅝"-11 UNC Locknut	4
13	34013-234	**Front Radius Leaf Shim Kit** (4 x 1.5 mm)	As Req
	91430-035	**U-bolt Service Kit, Axle Set,** Includes Key No. 14 and Kit No. 48718-158	

KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.
14	49684-014	*¾"-16 UNF- 2A x 17" U-bolt	4
	48718-158	**U-bolt Fastener Service Kit,** Includes Key Nos. 15-17	
15	49947-000	*¾" Spherical Washer	8
16	22962-001	*¾" Flat Washer	8
17	49685-000	*¾"-16 UNF-2B Locknut	8
18	80946-000	Top Pad	2
19	82538-000	Leaf Spring Assembly	2
20	56501-066	Spring Seat Assembly, ID No. D66	2
21	57198-000	Axle Bottom Cap	2
22	60665-038L	Shock Absorber	2
23	67463-002	Upper Shock Bracket	2
	50754-090	**Single Shock Absorber Fastener Service Kit,** Includes Key Nos. 24-27	
24	50764-021	*¾"-10 UNC x 6" Hex Upper Bolt	2
25	50764-004	*¾"-10 UNC x 3¾" Hex Lower Bolt	2
26	22962-001	*¾" Washer	6
27	49842-000	*¾"-10 UNC Locknut	4
28	59946-014	Shock Spacer	2
29		Lower Shock Bracket	
	67556-013	Left Hand	1
	67556-014	Right Hand	1
30	49395-000	Axle Stop	2
31	94155-000	Axle Stop Spacer	2

NOTE: Quantities specified are for the vehicle. Quantities of service kit components may vary from the amount shown in the list.

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

SECTION 5
Preventive Maintenance

WARNING

ELECTRIC VEHICLE SAFETY

PRIOR TO PERFORMING ANY WORK ON THE VEHICLE, READ ALL WORK INSTRUCTIONS AND SAFETY INFORMATION PROVIDED BY THE VEHICLE MANUFACTURER AND MAKE SURE THAT THE STARTER SWITCH IS IN THE "OFF" POSITION, SET THE PARKING BRAKE, AND CHOCK THE TIRES.

TOOLS USED WHEN WORKING NEAR BATTERIES OR ELECTRICAL CONNECTIONS MUST BE CERTIFIED TO A RATING OF 1000 VDC TO HELP PREVENT INJURIES FROM ELECTRIC SHOCK. SHORT CIRCUITS BETWEEN COMPONENTS OR WIRES MUST BE AVOIDED.

HENDRICKSON RECOMMENDED INSPECTION INTERVALS

Following appropriate inspection procedures are important to help ensure the proper maintenance and operation of the HTS rear suspension and components function to their highest efficiency.

Hendrickson recommends to visually inspect for proper assembly and function, overall condition and any signs of damage. Check for all of the following as per the inspection intervals shown and replace components as necessary:

- Signs of unusual movement, loose or missing components, abrasive or adverse contact with other components, damaged or cracked parts and improper suspension function or alignment

	PRE-DELIVERY	FIRST IN-SERVICE	PREVENTIVE MAINTENANCE	
	Within the first 100 miles (500 km)	1,000 miles (1,600 km), 100 hours or whichever comes first	25,000 miles (40,000 km), every 6 months or whichever comes first	50,000 miles (80,000 km), every 12 months or whichever comes first
Axle Stops	■	■		■
Fasteners	■	■	■	
Front Spring Hangers and Slipper Pads Rear Spring Hangers	■	■		■
Leaf Spring Assembly	■	■		■
Lateral Alignment	■	■		■
Shock Absorber	■		■	
Tire Wear			■	
U-bolt Connection and Clamp Group	■	■	■	
Wear and Damage			■	

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

COMPONENT INSPECTION

- **Axle stop** — Refer to Axle Stops in this section.
- **Fasteners** — Visually inspect for any loose or damaged fasteners on the entire suspension. Make sure all fasteners are tightened to the specified torque. Refer to the Torque Specifications section of this publication. 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.

NOTE

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

- **Front and Rear Spring 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. Refer to Front Spring Hanger Slipper Pads in this section.
- **Leaf spring assembly** — Refer to Leaf Spring Assembly in this section.
- **Shock absorbers** — Visually inspect for any signs of dents or leakage, misting is not considered a leak. See Shock Absorbers in this section.
- **Tire wear** — Visually inspect the tires for any wear patterns that may indicate suspension damage or misalignment, see Visual Tire Inspection in this section.
- **U-bolt connection and 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 Connection in this section. Visually inspect the clamp group components for any damage or excessive wear. Replace as necessary,
- **Wear and damage** — Visually inspect all parts of suspension for wear and damage. Replace all worn or damaged parts.

AXLE STOP

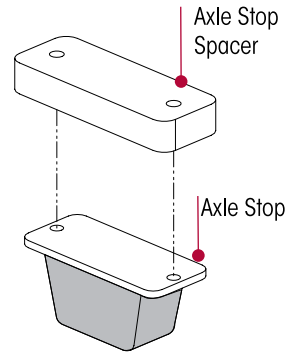
INSPECTION

NOTE

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

In the event one axle stop shows signs of damage or excessive wear, Hendrickson recommends that both axle stops be replaced.

FIGURE 5-1

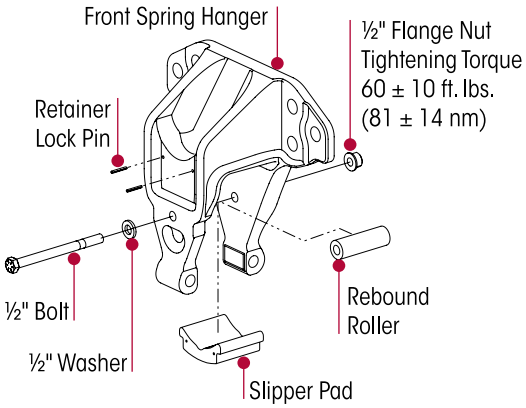


- Check the axle stop to frame fasteners for proper torque per the vehicle manufacturer's specifications.
- Check stop bolt to axle bracket fasteners for proper torque per the vehicle manufacturer's specifications.
- Visually inspect the axle stop and mating components for damage or excessive wear and replace as necessary, see Figure 5-1. Refer to Axle Stop in the Component Replacement section of this publication.

FRONT SPRING HANGER SLIPPER PADS

The operation of the HTS suspension will result in some wear between the leaf spring assembly and the front hanger slipper pads, see Figure 5-2. In normal use the slipper pads will function satisfactorily even though they may show some wear. If the slipper pads require replacement, follow the instructions in the Component Replacement section of this publication.

FIGURE 5-2



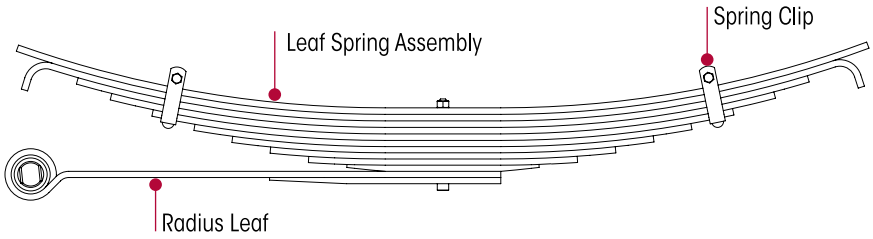
LEAF SPRING ASSEMBLY

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. IF ANY SUSPENSION COMPONENT APPEARS DAMAGED, REPLACEMENT IS REQUIRED. FAILURE TO REPLACE ANY DAMAGED COMPONENTS CAN CAUSE ADVERSE VEHICLE HANDLING, POSSIBLE PERSONAL INJURY, DEATH, OR PROPERTY DAMAGE AND WILL VOID ANY APPLICABLE WARRANTIES.

FIGURE 5-3



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 5-3), 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.

SHOCK ABSORBERS

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

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

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

FIGURE 5-4

HEAT TEST AND PHYSICAL INSPECTION

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

WARNING

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

   a. Perform a heat test by carefully touching or placing a hand near the shock absorber body below the dust cover. Touch the frame to get an ambient reference, see Figure 5-4. A shock absorber that is warm to the touch is acceptable, a cold shock absorber should be replaced.

2. **Physical Inspection:** To inspect for an internal failure, remove and shake the suspected shock absorber. Listen for the sound of metal parts rattling inside. The rattling of metal parts can indicate that the shock absorber has an internal failure and the shock absorber should be replaced.

VISUAL INSPECTION

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

FIGURE 5-5

SHOCK ABSORBER VISUAL INSPECTION – UNACCEPTABLE CONDITIONS

Damaged upper or lower mount

Damaged upper or lower bushing

Damaged dust cover and / or shock body

Bent or dented shock absorber

Improper installation Example: washer (if equipped) installed backwards

FIGURE 5-6

LEAKING VS. MISTING SHOCK ABSORBER INSPECTION

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

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

NOTE

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

Inspect the shock absorber fully extended. **A shock absorber that is truly leaking** will show signs of fluid **leaking in streams from the upper seal**, see Figure 5-6. These streams can easily be seen, underneath the main body (dust cover) of the shock absorber. Replace as necessary.

U-BOLT CONNECTION

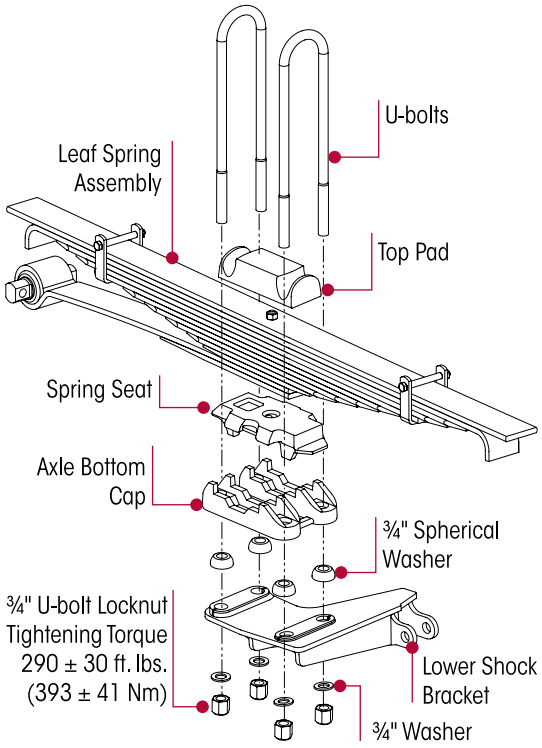
NOTE

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

1. Inspect the U-bolts for proper seating of components, i.e. no gaps, etc., see Figure 5-7.

FIGURE 5-7



2. **DO NOT** exceed the specified torque on U-bolt locknuts, refer to the Torque Specifications 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

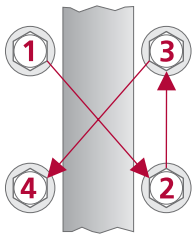
⚠ WARNING

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

EXAMPLE

A fleet may determine its own torque inspection interval by inspecting the U-bolt torque on a more frequent basis (for example at 5,000 miles, or 10,000 miles). If during the torque inspection the U-bolt torque is found to be below torque specifications, correct the U-bolt torque and decrease the interval of the torque inspections. If the 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.**

FIGURE 5-8



3. Tighten the U-bolt locknuts evenly in 50 foot pounds increments to 290 ± 30 foot pounds torque in the proper pattern to achieve uniform bolt tension, see Figure 5-8.

SECTION 6

Alignment & Adjustments

WARNING

ELECTRIC VEHICLE SAFETY

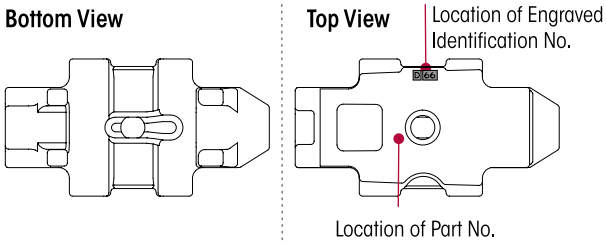
PRIOR TO PERFORMING ANY WORK ON THE VEHICLE, READ ALL WORK INSTRUCTIONS AND SAFETY INFORMATION PROVIDED BY THE VEHICLE MANUFACTURER AND MAKE SURE THAT THE STARTER SWITCH IS IN THE "OFF" POSITION, SET THE PARKING BRAKE, AND CHOCK THE TIRES.

TOOLS USED WHEN WORKING NEAR BATTERIES OR ELECTRICAL CONNECTIONS MUST BE CERTIFIED TO A RATING OF 1000 VDC TO HELP PREVENT INJURIES FROM ELECTRIC SHOCK. SHORT CIRCUITS BETWEEN COMPONENTS OR WIRES MUST BE AVOIDED.

AXLE PINION ANGLE

The axle pinion angle is set by the spring seat assembly. The pinion angle should be checked in the loaded condition and is set by the vehicle manufacturer. The spring seat part number location is shown in Figure 6-1, refer to the Parts Lists section of this publication.

FIGURE 6-1



DRIVE AXLE ALIGNMENT INSPECTION

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.

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 all suspension components are in good condition. Repair or replace any worn or damaged suspension components before proceeding with the alignment process.
5. Ensure all drive axle tires are the same size and inflated to the correct tire pressure.
6. Use an alignment machine to calculate the drive axle readings.

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

7. If the measurements are within the vehicle manufacturer's specifications, then the rear drive axle alignment **is acceptable**. Proceed to check the pinion angles of the drive axles (Step 9).
   a. If the alignment of the rear drive axle **IS NOT** within the vehicle manufacturer's specifications, then the alignment of this axle **MUST** be corrected **BEFORE** checking the drive axle pinion angles. Correct the alignment of this axle by following the Alignment Adjustment Instructions as shown in this section.

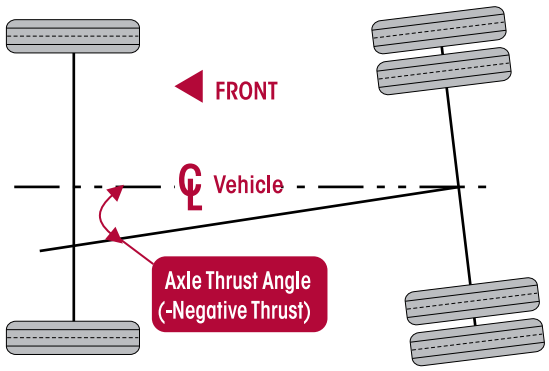
8. After all drive axles are aligned, check the pinion angle of each drive axle with a digital protractor. Refer to the vehicle manufacturer specifications for the required pinion angles.
   a. If all pinion angles are within the vehicle manufacturer's specifications then proceed to Step 10.
   b. If any pinion angle is out of the vehicle manufacturer's specifications it must be corrected. Contact the vehicle manufacturer for instructions.
9. Recheck measurements to confirm adjustments until the correct alignment and pinion angles are achieved.
10. When all drive axle alignments and pinion angles are within the vehicle manufacturer's specifications then the alignment procedure is complete.
11. Remove the wheel chocks.

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 6-2 illustrates the drive axle with a thrust angle to the left (-negative thrust).
2. Chock the wheels of the front axles to prevent vehicle movement during service.
3. Loosen, **DO NOT REMOVE** the front radius leaf fasteners from the front hanger.

FIGURE 6-2

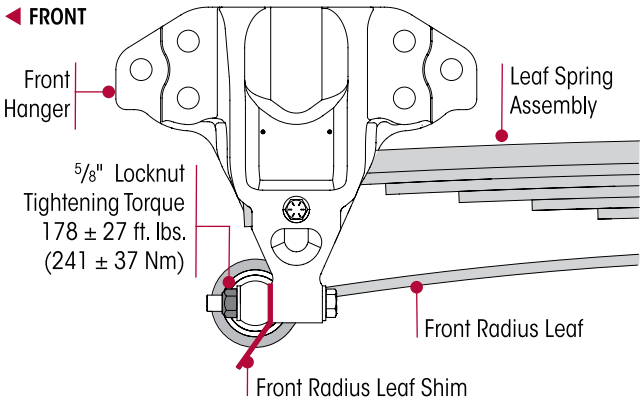


SERVICE HINT Axle thrust angle may be adjusted at either wheel end on an axle. If insufficient adjustment is available at one wheel end, the opposing wheel end will also need to be adjusted, but in the opposite direction.

EXAMPLE: The alignment equipment shows the front drive axle to have a 0.35° thrust angle to the left. This will require a ¼" shim thickness increase to the front side of the left front leaf spring assembly bar pin. If there is less then ¼" of adjustment available at this location then some of the adjustment will have to be made at the right front bar pin. In this case a ⅛" shim thickness increase at the left side bar pin and a ⅛" shim thickness decrease at the right side bar pin will correct the 0.35° thrust angle.

4. Adjust shim thickness at the front radius leaf to move the axle in the desired direction, see Figure 6-3.
5. If more adjustment is needed, up to four (4) shims may be installed at the leaf spring assembly bar pin connection, see Figure 6-3.
6. Once the vehicle is aligned, tighten the leaf spring assembly fasteners to 178 ± 27 foot pounds torque, see Figure 6-3.
7. Remove wheel chocks.

FIGURE 6-3



SECTION 7

Component Replacement

WARNING

ELECTRIC VEHICLE SAFETY

PRIOR TO PERFORMING ANY WORK ON THE VEHICLE, READ ALL WORK INSTRUCTIONS AND SAFETY INFORMATION PROVIDED BY THE VEHICLE MANUFACTURER AND MAKE SURE THAT THE STARTER SWITCH IS IN THE "OFF" POSITION, SET THE PARKING BRAKE, AND CHOCK THE TIRES.

TOOLS USED WHEN WORKING NEAR BATTERIES OR ELECTRICAL CONNECTIONS MUST BE CERTIFIED TO A RATING OF 1000 VDC TO HELP PREVENT INJURIES FROM ELECTRIC SHOCK. SHORT CIRCUITS BETWEEN COMPONENTS OR WIRES MUST BE AVOIDED.

FASTENERS

Hendrickson recommends that when servicing the vehicle replace the 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.

LEAF SPRING ASSEMBLY & CLAMP GROUP

CAUTION

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

You will need: 8 inch C-clamp

DISASSEMBLY

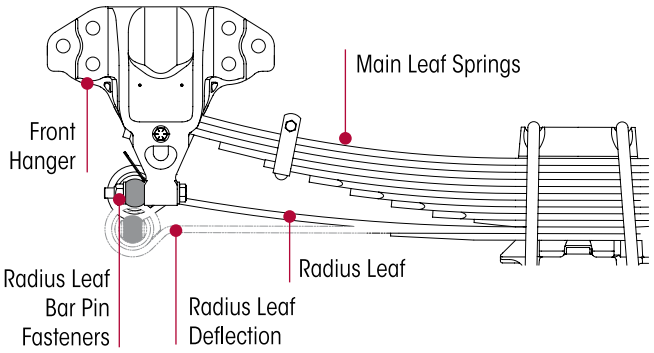
1. Chock the wheels.
2. Raise and support the axle with safety stands.

NOTE

The procedure to replace the leaf spring assembly is done with the opposing leaf spring assembly connected properly.

3. On the side being serviced, remove the tires per the vehicle manufacturer's instructions.
4. Raise the frame to remove the load from the suspension.
5. Support the frame with safety stands.
6. On the side being serviced, remove and discard the front and rear rebound bolt fasteners.

FIGURE 7-1



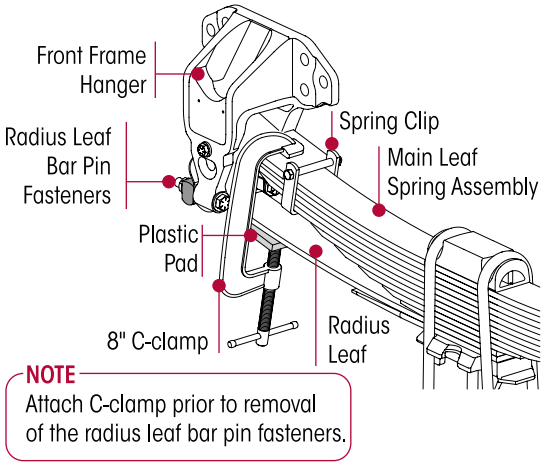
7. Remove the roller from both front and rear hangers.
8. Remove and discard the lower shock absorber fasteners.

WARNING THE LEAF SPRING IS PRE-LOADED WITH A SPRING FORCE OF APPROXIMATELY 300 FOOT POUNDS. INSTALLATION OF THE C-CLAMP ON THE RADIUS LEAF AND MAIN LEAF SPRINGS MUST BE DONE PRIOR TO DISASSEMBLY OF THE RADIUS LEAF BAR PIN FASTENERS. FAILURE TO DO SO CAN CAUSE COMPONENT DAMAGE, PROPERTY DAMAGE, OR SEVERE PERSONAL INJURY, SEE FIGURE 7-2.

CAUTION DO NOT INSTALL THE C-CLAMP ON THE RADIUS LEAF CLOSE TO THE SPRING SEAT, DOING SO COULD RESULT IN DAMAGE TO THE LEAF SPRING ASSEMBLY.

9. Place a plastic pad between the C-clamp and below the radius leaf, then locate the C-clamp between the front hanger and the spring clip, see Figure 7-2. Placing the C-clamp closer to the front hanger will help prevent damage to the leaf spring assembly.

FIGURE 7-2

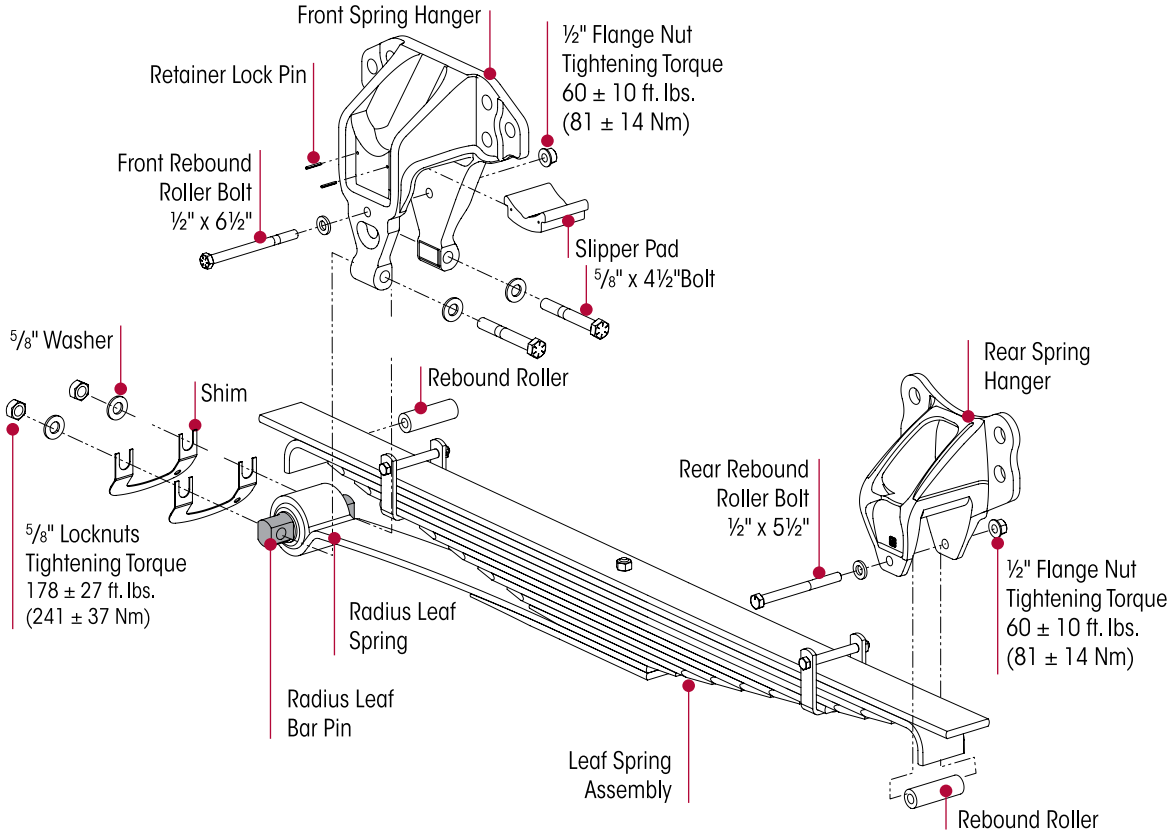


SERVICE HINT It might be necessary to raise or lower the frame in order to remove the leaf spring assembly mounting fasteners.

10. Remove and discard the front hanger rebound and the radius leaf spring bar pin fasteners.
11. Slowly unwind the C-clamp to remove the load from the radius leaf spring assembly.

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

FIGURE 7-3



12. Remove the shim(s) from the front radius leaf connection, see Figure 7-3.

WARNING

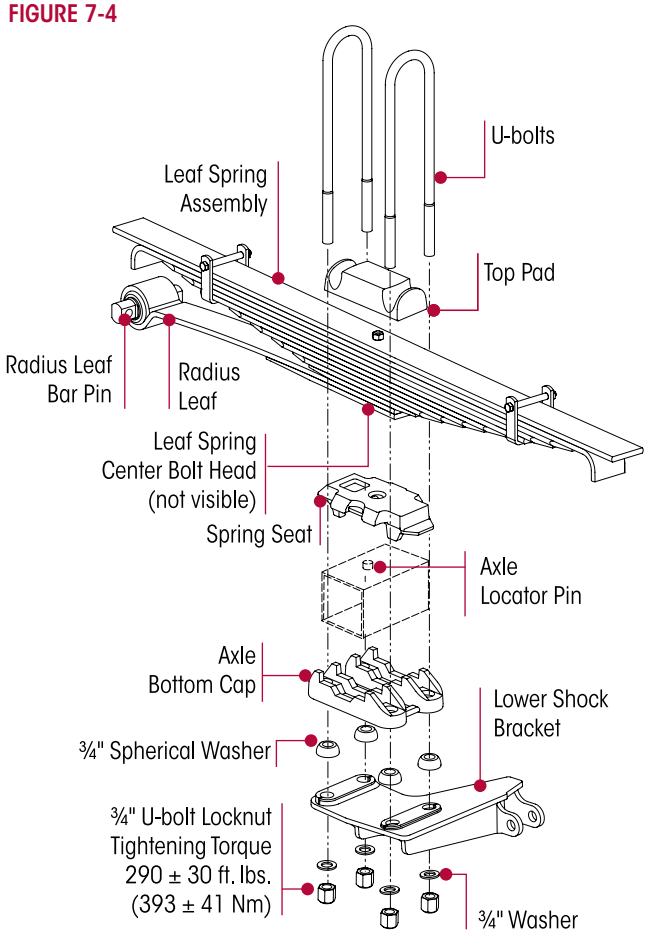
U-BOLTS THAT ARE FOUND TO BE LOOSE REQUIRE THAT MATING COMPONENTS BE INSPECTED FOR SIGNS OF WEAR. ANY WORN COMPONENTS MUST BE REPLACED. FAILURE TO DO SO CAN CAUSE PREMATURE CLAMP GROUP FAILURE, COMPONENT DAMAGE, ADVERSE VEHICLE HANDLING, PROPERTY DAMAGE, OR SEVERE PERSONAL INJURY. MAINTAIN CORRECT TORQUE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

13. Remove and discard the U-bolts and U-bolt fasteners, see Figure 7-3.
14. Remove the bottom cap, spherical washers, and lower shock bracket.
15. Lower the axle enough to allow clearance to remove the spring assembly.
16. Remove the leaf spring assembly.

INSPECTION

1. Inspect the slipper pad and the rebound roller for damage, replace as necessary.
2. Inspect the spring seat and axle bottom cap for excessive wear and damage. Replace as necessary.
3. Inspect the axle housing for any cracks or wear. Repair or replace as necessary per vehicle manufacturer's specifications.

FIGURE 7-4



ASSEMBLY

1. Install the new leaf spring assembly on the spring seat. Ensure the spring seat is engaged on the axle locator pin, see Figure 7-4.
2. Raise the axle or lower the frame to center the leaf spring assembly through the legs of both spring hangers.
3. Pilot the spring center bolt into the hole in the spring seat.
4. Place the U-bolts and top pad on the leaf spring assembly.
5. Install the bottom cap, spherical washers, lower shock bracket, washers, and locknuts as shown in Figure 7-4.
6. Install U-bolt fasteners. Snug **DO NOT** tighten the U-bolt locknuts at this time.
7. Continue to raise the axle so the front and rear hangers engage into the leaf spring assembly.
8. Ensure the leaf spring assembly is in contact with the slipper pads on the front and rear hangers. This will help minimize the amount of radius leaf deflection necessary for assembly, see deflection in Figure 7-3.
9. Note the location the radius leaf bar pin is assembled on the front of the front hanger as shown in Figure 7-5.

CAUTION

DO NOT INSTALL THE C-CLAMP ON THE RADIUS LEAF CLOSE TO THE SPRING SEAT, DOING SO COULD RESULT IN DAMAGE TO THE LEAF SPRING ASSEMBLY.

NOTE The 8-inch C-clamp installation will help to compress the radius leaf upward into the front hanger mounting hole and ease leaf spring assembly installation.

10. Place a plastic pad between the C-clamp and below the radius leaf, then locate the C-clamp between the front hanger and the spring clip, see Figure 7-6. Placing the C-clamp closer to the front hanger will help prevent damage to the leaf spring assembly.

⚠ CAUTION FAILURE TO INSTALL THE HTS 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 shim(s) be installed in the same location, orientation and quantity as removed to preserve the existing alignment.

11. Install the radius leaf bar pin fasteners and any shims that were removed.

FIGURE 7-5
Radius Leaf Deflection

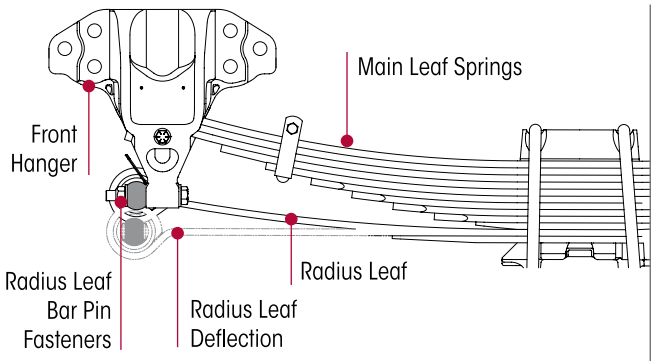
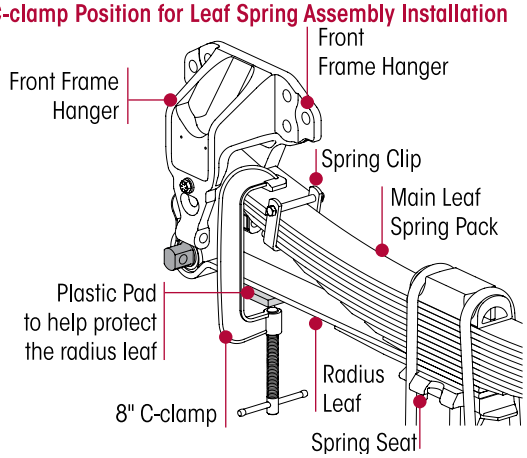


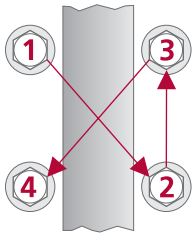
FIGURE 7-6
C-clamp Position for Leaf Spring Assembly Installation



12. Tighten the radius leaf bar pin fasteners to 178 ± 27 foot pounds torque see Figure 7-3.
13. Remove the C-clamp from the spring leaf assembly.

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

FIGURE 7-7



14. Tighten the U-bolt locknuts evenly in 50 foot pounds increments in the proper pattern, see Figure 7-7, to achieve uniform bolt tension to 290 ± 30 foot pounds.
15. Tap the top of the U-bolts with a dead blow mallet, and retighten to 290 ± 30 foot pounds. **DO NOT** exceed specified torque on U-bolt locknuts.

NOTE U-bolt locknuts must be retightened to 290 ± 30 foot pounds 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.

16. Install the lower shock absorber into lower shock bracket and tighten to 188 ± 13 foot pounds torque.
17. Install the rebound roller, install rebound 6½" bolt on the front and the 5½ bolt on the rear hanger. Install front and rebound bolt fasteners and tighten to 60 ± 10 foot pounds torque, see Figure 7-3.
18. Install the tires per the vehicle manufacturer's instructions.

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

19. Remove the frame safety stands.
20. Verify the axle alignment, see Alignment & Adjustments section in this publication.
21. Remove the wheel chocks.

FRONT SPRING HANGER ASSEMBLY

NOTE: The front frame hanger assembly (Part No. 58425-009) comes equipped with the slipper pad and lock pins. Refer to the Parts List section in this publication.

⚠ CAUTION

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

You will need: 8 inch C-clamp

DISASSEMBLY

1. Chock the wheels.
2. Raise and support the axle with safety stands.

NOTE The procedure to replace the front spring hanger assembly is done with the opposing front leaf spring assembly and leaf spring assembly connected properly.

3. On the side being serviced, remove the tires per the vehicle manufacturer`s instructions.
4. Raise the frame to remove the load from the suspension.
5. Support the frame with safety stands.
6. On the side being serviced, remove and discard the front rebound bolt fasteners.

⚠ WARNING

THE LEAF SPRING IS PRE-LOADED WITH A SPRING FORCE OF APPROXIMATELY 300 FOOT POUNDS. INSTALLATION OF THE C-CLAMP ON THE RADIUS LEAF AND MAIN LEAF SPRINGS MUST BE DONE PRIOR TO DISASSEMBLY OF THE RADIUS LEAF BAR PIN FASTENERS. FAILURE TO DO SO CAN CAUSE COMPONENT DAMAGE, PROPERTY DAMAGE, OR SEVERE PERSONAL INJURY,SEE FIGURE 7-8.

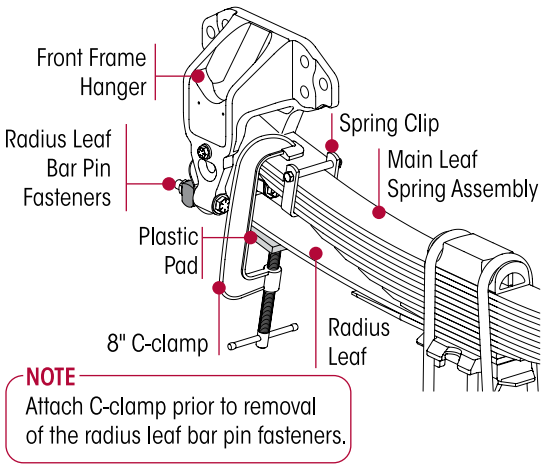
⚠ CAUTION

DO NOT INSTALL THE C-CLAMP ON THE RADIUS LEAF CLOSE TO THE SPRING SEAT, DOING SO COULD RESULT IN DAMAGE TO THE LEAF SPRING ASSEMBLY.

7. Place a plastic pad between the C-clamp and below the radius leaf, then locate the C-clamp between the front hanger and the spring clip, see Figure 7-8. Placing the C-clamp closer to the front hanger will help prevent damage to the leaf spring assembly.
8. Remove the rebound fastener, spacer and roller from the front hanger as shown in Leaf Spring Assembly and Clamp Group in this section.

NOTE It might be necessary to raise or lower the frame in order to remove the leaf spring mounting fasteners.

FIGURE 7-8



9. Remove and discard the radius leaf bar pin fasteners that connect to the leaf spring assembly.
10. Raise the frame of the vehicle high enough to remove the load from the leaf spring assembly.

SERVICE HINT

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

CAUTION

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

11. Remove shim(s).
12. Remove and discard the front hanger frame fasteners per the vehicle manufacturer's instructions.
13. Remove the front spring hanger.

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 radius leaf spring on the forward face of the front hanger legs.
5. Install the mounting fasteners and any shims that were removed.
6. Tighten the radius leaf bar pin fasteners to 178 ± 27 foot pounds torque.
7. Install the rebound roller and fasteners in hanger and tighten to 60 ± 10 foot pounds torque as shown in Leaf Spring Assembly and Clamp Group in this section.
8. Remove the frame support safety stands.
9. Verify axle alignment, see Alignment & Adjustments section of this publication.
10. Remove wheel chocks.

SLIPPER PAD

You will need: ⅛" Punch

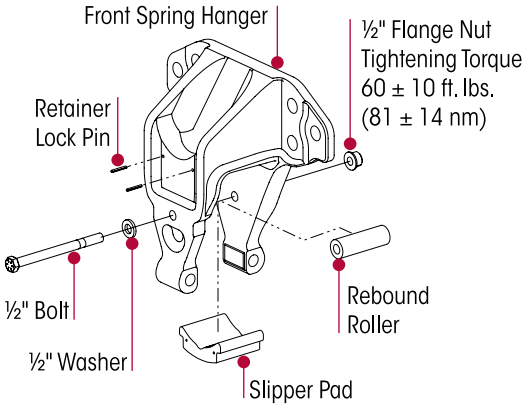
DISASSEMBLY

1. Follow Steps 1 through 12 of Leaf Spring Assembly & Clamp Group Disassembly in this section.
2. Lower the leaf spring enough to add clearance to the slipper pad.
3. With a blunt end ⅛" 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 the slipper pad with a screwdriver.

ASSEMBLY

1. Insert new slipper pad.
2. Lower the frame to secure the slipper pad in place against the leaf spring assembly. Refer to Leaf Spring Assembly and Clamp Group in this section.
3. Drive the new retainer lock pins in place with punch until flush with front of hanger, see Figure 7-9.

FIGURE 7-9



4. Install rebound roller and fasteners. Tighten fastener to 60 ± 10 foot pounds torque, see Figure 7-9.
5. Remove the frame support safety stands.
6. Verify axle alignment, see Alignment & Adjustments section of this publication.
7. Remove wheel chocks.

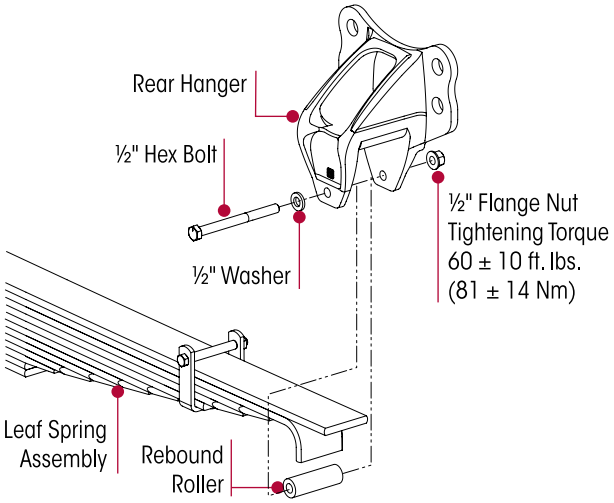
REAR SPRING HANGER

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 7-10.
3. Raise the frame of the vehicle high enough to remove the load from the leaf spring assembly.
4. Support the frame with safety stands.
5. Remove the rear hanger frame fasteners per vehicle manufacturer's specifications.
6. Remove the rear hanger.

FIGURE 7-10



ASSEMBLY

1. Position the rear hanger over the leaf spring assembly, see Figure 7-10.
2. Install new frame fasteners in the hanger and tighten to vehicle manufacturer's specifications.
3. Remove the frame support safety stands.
4. Lower the frame.
5. Install the rebound roller and fasteners in hanger and tighten to 60 ± 10 foot pounds torque, see Figure 7-10.
6. Remove wheel chocks.

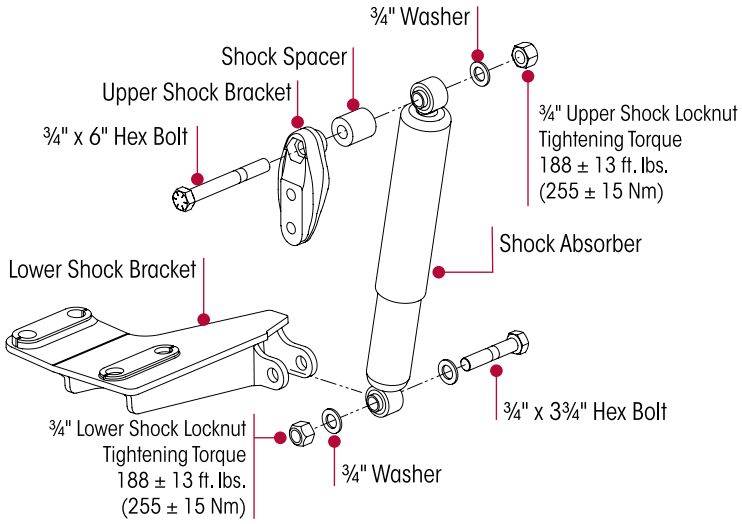
SHOCK ABSORBERS

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

DISASSEMBLY

1. Chock the wheels of the vehicle.
2. Remove and discard the lower shock absorber mounting fasteners, see Figure 7-11.
3. Remove and discard the upper shock absorber mounting fasteners see Figure 7-11.
4. Slide the shock absorber out of the upper and lower mounting brackets.
5. Inspect the shock absorber mounting brackets and fasteners for damage or wear. Replace if necessary.

FIGURE 7-11



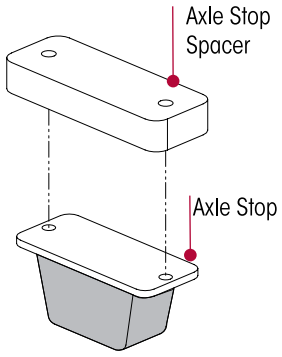
ASSEMBLY

1. Install the upper shock absorber mounting bracket (if removed).
2. Install the shock absorber into the upper shock bracket and fasteners.
3. Slide the lower shock absorber mount into the lower shock bracket and install lower fasteners.
4. Tighten the upper and lower shock absorber fasteners to 188 ± 13 foot pounds torque, see Figure 7-11.
5. Remove the wheel chocks.

AXLE STOP

NOTE Follow the vehicle manufacturer's specifications for axle stop to frame fastener tightening torque values.

FIGURE 7-12



DISASSEMBLY

1. Chock the wheels.
2. Remove and discard the fasteners connecting the axle stop spacer and axle stop to the frame per the vehicle manufacturer's instructions.
3. Remove the axle stop and axle stop spacer, see Figure 7-12.
4. Inspect for any damage or worn surfaces.

ASSEMBLY

1. Install the axle stop spacer and the axle stop to the bottom of the frame.
2. Install the frame fasteners that connect axle spacer and the axle stop.
3. Tighten fasteners to the vehicle manufacturer's torque specifications.
4. Remove the wheel chocks.

SECTION 8
Troubleshooting Guide

HTS for Workhorse W56 Medium-duty Electric Trucks

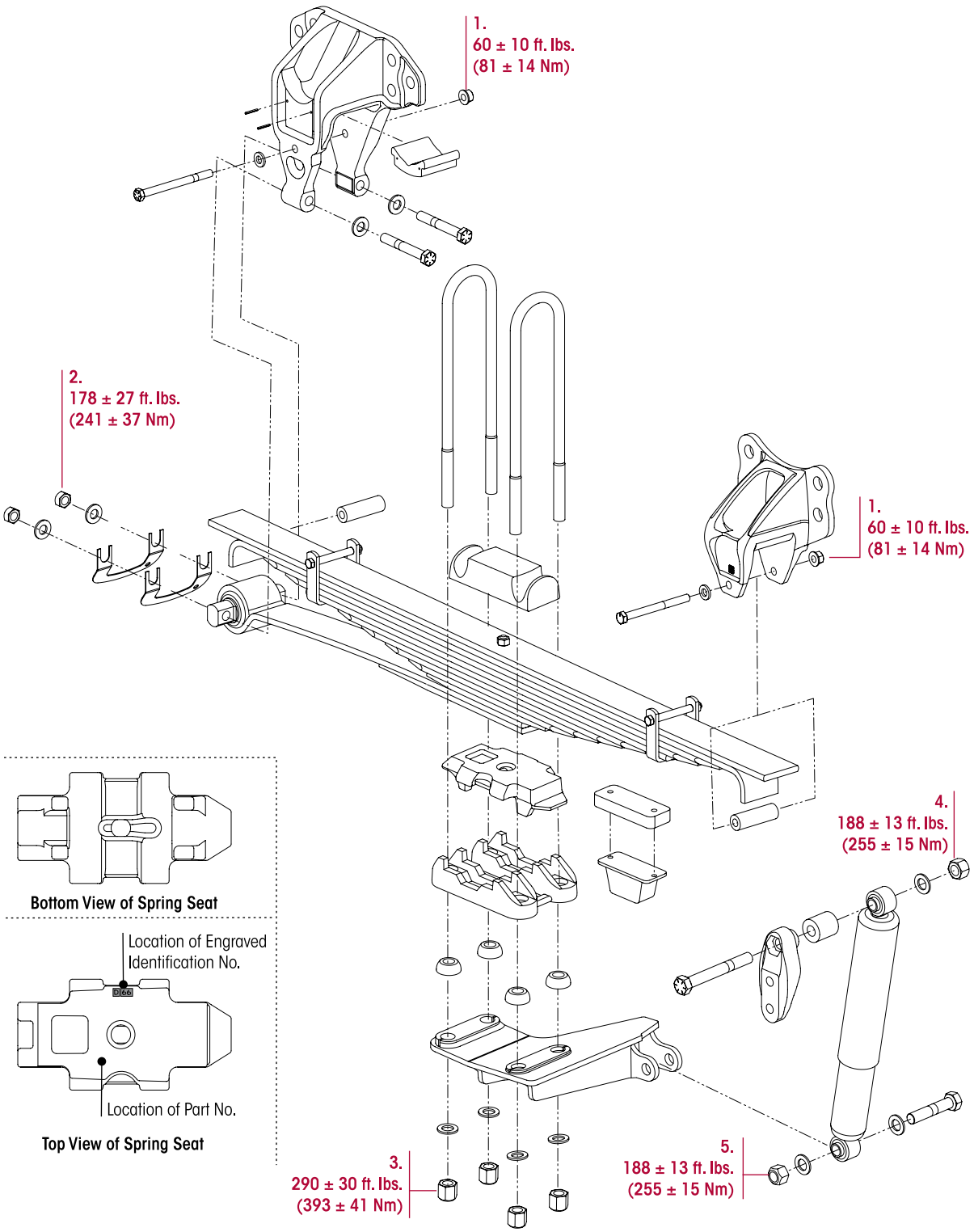
TROUBLESHOOTING GUIDE		
CONDITION	**POSSIBLE CAUSE**	**CORRECTION**
Suspension has harsh or bumpy ride	Suspension is overloaded	Redistribute the load to correct weight.
	Damaged or leaking shock absorber	Replace the shock absorber.
Irregular tire wear	Incorrect tire inflation pressure	Correct the tire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

SECTION 9

Torque Specifications

Hendrickson Recommended Torque Values Provided in Foot Pounds and in Nm

HTS 15.5K



HTS for Workhorse W56 Medium-duty Electric Trucks

HENDRICKSON RECOMMENDED TORQUE SPECIFICATIONS					
NO.	COMPONENT	FASTENER		*TORQUE VALUE	
		QTY.	***SIZE	FOOT POUNDS	Nm
Frame hanger to vehicle frame fasteners furnished and installed by vehicle manufacturer					
1	Rebound Roller Fastener	4	½"-13 UNC	60 ± 10	81 ± 14
2	Radius Leaf Spring to Frame Hanger	4	⅝"-11 UNC	178 ± 27	241 ± 37
3	U-bolt Locknut	8	¾"-16 UNF	**290 ± 30	**393 ± 41
4	Shock Absorber to Upper Shock Bracket	2	¾"-10 UNC	188 ± 13	255 ± 15
5	Shock Absorber to Lower Shock Bracket	2	¾"-10 UNC	188 ± 13	255 ± 15

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.

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

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

HENDRICKSON

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