

# **H** TECHNICAL PROCEDURE

## **RT™ • RTE™ Steel Leaf Spring Rear Suspension**

**SUBJECT:** Service Instructions

**LIT NO:** 17730-070

**DATE:** December 2017      **REVISION:** H

### **TABLE OF CONTENTS**

<b>Section 1</b>	<b>Introduction</b> .....	2	<b>Section 8</b>	<b>Component Replacement</b>	
<b>Section 2</b>	<b>Product Description</b> .....	2	Fasteners .....	36	
<b>Section 3</b>	<b>Important Safety Notice</b> .....	5	Leaf Spring Assembly .....	36	
<b>Section 4</b>	<b>Special Tools</b> .....	9	Spring Eye Bushing .....	39	
<b>Section 5</b>	<b>Parts Lists</b> .....	11	Saddle Assembly .....	41	
<b>Section 6</b>	<b>Preventive Maintenance</b>		#1 Forward Spring Hangers .....	43	
	Hendrickson Recommended		#2 Rear Spring Hangers .....	44	
	Inspection Intervals .....	18	RTE #3 Rear Extended Leaf Spring Hangers ..	46	
	Component Inspection .....	18	Top Pad Bolt Selection .....	47	
	Leaf Spring Assembly .....	19	Equalizing Beam .....	47	
	Spring Hangers .....	20	Rubber Center Bushing .....	52	
	Spring Eye Bushing and Pin .....	20	Bronze Center Bushing .....	54	
	Spring Eye Lubrication .....	21	Bar Pin End Bushings .....	57	
	Beam End Axle Brackets .....	21	Adapter Style End Bushing .....	60	
	Equalizing Beam End Connection .....	22	RT 65K • 70K Tightening Torque Procedure ..	63	
	Bar Pin End Bushing .....	25	Longitudinal Torque Rods .....	66	
	Bar Pin Shims .....	26	Transverse Torque Rods .....	67	
	Rubber Center Bushing .....	26	ULTRA ROD • ULTRA ROD PLUS Torque Rod		
	Bronze Center Bushing .....	26	Bushings .....	68	
	Longitudinal and Transverse Torque Rods ..	27	XTRB Torque Rod Bushings .....	70	
	Axle Stop Inspection .....	28	Cross Tube Equipped with Rubber Bushings ..	71	
	Saddle Connection .....	28	Cross Tube Equipped with Bronze Bushings ..	73	
	Cross Tube .....	29	<b>Section 9</b>	<b>Torque Specifications</b> .....	74
<b>Section 7</b>	<b>Alignment &amp; Adjustments</b>		<b>Section 10</b>	<b>Troubleshooting Guide</b> .....	80
	Axle Pinion Angle .....	30			
	Drive Axle Alignment .....	30			
	Lateral Alignment .....	32			
	Bar Pin with Shims Alignment .....	32			

## SECTION 1 Introduction

This publication is intended to acquaint and assist maintenance personnel in the preventive maintenance, service, repair and rebuild of the RT™ • RTE™ walking beam rear suspension systems.

### NOTE

Use only Genuine Hendrickson parts for servicing this suspension system.

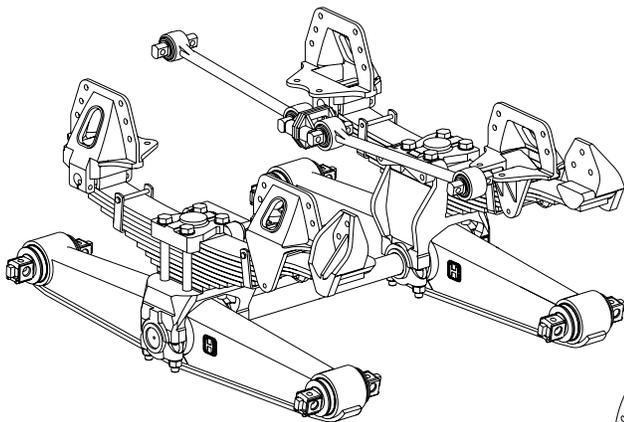
It is important to read and understand the entire Technical Procedure publication prior to performing any maintenance, service, repair, or rebuild of this product. The information in this publication contains parts lists, safety information, product specifications, features, proper maintenance, service,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

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

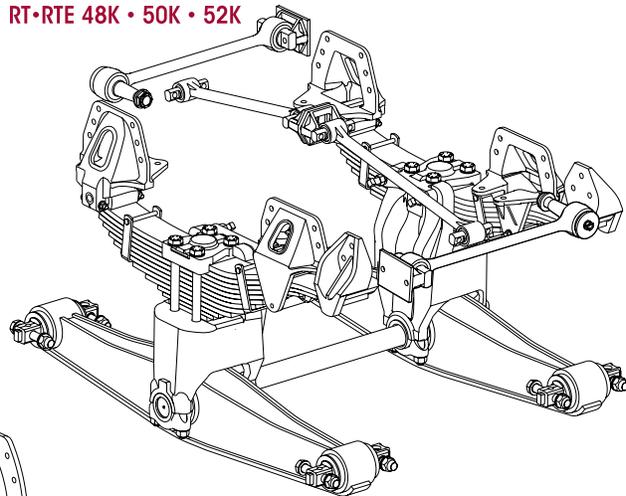
The latest revision of this publication is also available online at [www.hendrickson-intl.com](http://www.hendrickson-intl.com)

## SECTION 2 Product Description

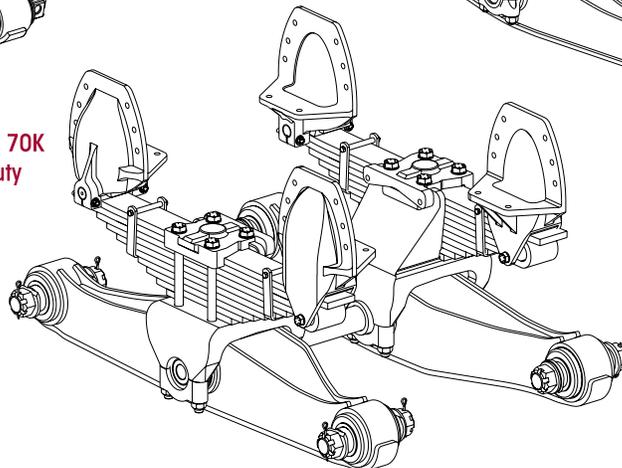
**FIGURE 2-1**  
RT•RTE 34K • 40K • 46K



**RT•RTE 48K • 50K • 52K**



**RT 65K • 70K**  
Heavy-duty



The RT•RTE steel leaf spring suspension systems are versatile suspensions known for durability in demanding on- and off-highway applications. The enhanced design gives the suspension superior durability, stability and off-highway maneuverability.

- **Hendrickson Rods** — Heavy-duty forgings reduce weight, yet improve durability over conventional rods. Optional transverse rods improve cornering by controlling lateral forces
- **Spring pack** — Genuine Hendrickson springs are made from high-strength steel and are heat treated and shot peened for exceptional fatigue life
- **Extended Leaf Springs** — Extended leaf spring design of the RTE provides a smooth, comfortable ride when empty or lightly loaded
- **No. 1 Spring Hanger** — Helps absorb the forces of braking and acceleration, while providing longer hanger and spring eye bushing life
- **No. 2 Spring Hanger** — Cam and leg areas receive a special flame hardening treatment that increases durability and extends life
- **No. 3 Spring Hanger** — Serves as the primary load point for the lengthened RTE spring pack in unloaded conditions
- **Equalizing beam** — Distributes load equally between both axles for improved traction and lowers the center of gravity to increase stability plus establishes a solid axle connection for improved handling
- **Bar pin end connection** — Rugged axle connection extends bushing life and allows easy axle alignment
- **Saddle** — Engineered to increase durability without adding weight. High stress concentration areas such as chair back and legs are fortified for strength and durability
- **Shock Absorbers** — Provide additional driver comfort. Available as production or aftermarket options

**RT Suspension** — uses leaf springs to cushion road shocks. The springs are mounted on saddle assemblies above the equalizing beams and are connected at the front ends to spring hangers with spring eye pins through the spring eyes. The rear ends of the springs have no rigid attachment to the spring hangers and they are free to move forward and backward to accommodate spring deflection.

**RTE Suspension** — The extended leaf spring design of the RTE suspension provides a smoother, more comfortable ride when empty or lightly loaded and uncompromised stability when fully loaded. The upper leaves of the RTE extend past the No. 2 spring hanger to the No. 3 hanger. In the empty or lightly loaded condition, the extended spring leaves do not make contact with the No. 2 hanger. The resulting longer effective spring length produces a softer ride for greater driver comfort and equipment protection. When load is added, the extended leaves deflect and make contact with the No. 2 hanger. This shortens the effective spring length to match that of the RT spring assembly for a more stable ride.

**SPECIFICATIONS**

Suspension Capacity <sup>1</sup> (lbs.)	Installed Weight <sup>2</sup> (lbs.)	Gross Vehicle Weight Approval <sup>3</sup> (lbs.)	Gross Combination Weight Approval (lbs.)	Site Travel Rating <sup>4</sup> (lbs.)
<b>RT SUSPENSIONS</b>				
34,000	1,199	60,000	125,000	46,000
40,000	1,207	73,000	160,000	55,000
46,000	1,301	80,000	190,000	60,000
50,000	1,418		225,000	65,000
52,000	1,443		245,000	
65,000	Varies	85,000	260,000	75,000
70,000				
<b>RTE SUSPENSIONS</b>				
34,000	1,253	60,000	125,000	46,000
40,000	1,242	73,000	160,000	55,000
46,000	1,338	80,000	190,000	60,000
50,000	1,465		225,000	65,000

- Contact Hendrickson for availability of additional capacities and axle spacing.
- Installed weight includes complete suspension, torque rods, axle brackets and frame brackets at 54 inch axle spacing. Capacities over 65K vary, contact Hendrickson engineering for more information.
- Contact Hendrickson for applications that may exceed Gross Vehicle Weight approval rating.
- Site Travel Rating – operations using vehicles equipped with liftable pusher or tag axles must not exceed published ratings. Ratings are limited to no more than five percent of vehicle operation at a speed not to exceed five mph. Liftable pusher or tag axles should only be raised (or unloaded) to improve vehicle maneuverability in off-road use or when vehicle is empty. Site ratings are consistent with published axle manufacturer’s limitations. Axle and suspension site travel specifications must not be exceeded.
- Transverse rods are standard with axle spacing of 60 inches or more and on 46,000 to 70,000 pound capacity suspensions with rubber center bushings, refer to Hendrickson publication 59310-004 and 59310-058 for more information.
- Heavy-duty equalizing beam option available at 46,000 pound capacity.

Aftermarket shock absorbers available, contact Hendrickson for details.

**FIGURE 2-2**



**RT Suspension**

**FIGURE 2-3**



**RTE Suspension**

## SECTION 3

# Important Safety Notice

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

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

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

## ■ EXPLANATION OF SIGNAL WORDS

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



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

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

 **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, COULD 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, which will make the servicing being performed a little easier and/or faster.

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



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

## ■ SAFETY PRECAUTIONS

### WARNING

#### **FASTENERS**

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

LOOSE OR OVER TORQUED FASTENERS CAN CAUSE COMPONENT DAMAGE, ADVERSE VEHICLE HANDLING, PROPERTY DAMAGE, OR SEVERE PERSONAL INJURY. MAINTAIN CORRECT TORQUE VALUE AT ALL TIMES. CHECK TORQUE VALUES ON A REGULAR BASIS AS SPECIFIED, USING A 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 ADVERSE VEHICLE HANDLING, POSSIBLY CAUSING PERSONAL INJURY OR PROPERTY DAMAGE.

### WARNING

#### **ALUMINUM COMPONENTS (IF EQUIPPED)**

ALUMINUM COMPONENTS ARE DESIGNED TO BE LIGHTWEIGHT OPTIONS WHERE WEIGHT REDUCTION IS DESIRABLE. THEIR USE ARE TO BE CONFINED TO APPLICATIONS WHERE THE RATED CAPACITY OF THE SUSPENSION WILL NOT BE EXCEEDED. FAILURE TO LIMIT ALUMINUM COMPONENT APPLICATIONS TO RATED CAPACITY COULD RESULT IN CATASTROPHIC FAILURE OF THE COMPONENT AND ADVERSE VEHICLE HANDLING, POSSIBLY CAUSING PERSONAL INJURY OR PROPERTY DAMAGE.

ALUMINUM COMPONENTS SUCH AS EQUALIZING BEAMS CAN BE DAMAGED BY PROLONGED EXPOSURE TO SALT, OR TO ACID WHICH IS SOMETIMES USED TO REMOVE CONCRETE. CONTINUED EXPOSURE COULD RESULT IN A FAILURE OF THESE PARTS AND ADVERSE VEHICLE HANDLING, POSSIBLY CAUSING PERSONAL INJURY OR PROPERTY DAMAGE.

ALUMINUM COMPONENTS CAN ALSO BE DAMAGED BY CONTACT WITH HARD OBJECTS WHICH GOUGE THESE PARTS. THESE CONDITIONS COULD RESULT IN A FAILURE OF THESE PARTS WHICH MAY RESULT IN ADVERSE VEHICLE HANDLING AND 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 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

#### **PROCEDURE 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

#### **LONGITUDINAL TORQUE RODS AND/OR TRANSVERSE TORQUE RODS (IF EQUIPPED)**

RT•RTE SUSPENSIONS INCORPORATE TORQUE RODS FOR VEHICLE STABILITY. IF THESE COMPONENTS ARE DISCONNECTED OR ARE NON-FUNCTIONAL, THE VEHICLE SHOULD NOT BE OPERATED. FAILURE TO DO SO CAN RESULT IN ADVERSE VEHICLE HANDLING, POSSIBLE TIRE CONTACT WITH THE FRAME, PREMATURE COMPONENT DAMAGE, OR SEVERE PERSONAL INJURY.

### 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**
**MODIFYING COMPONENTS**

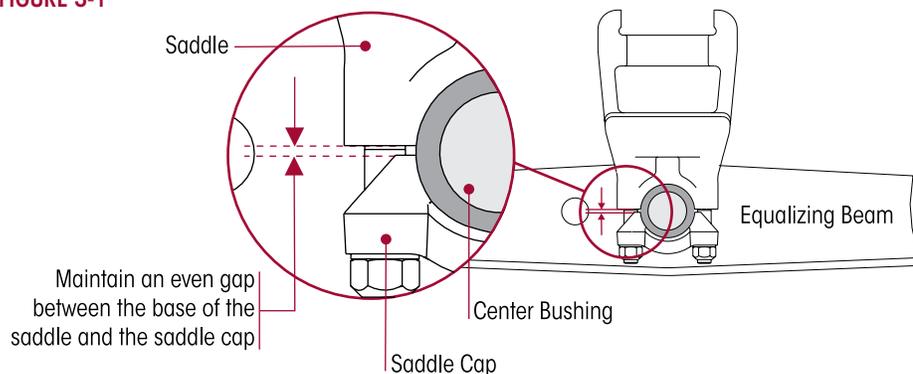
DO NOT MODIFY OR REWORK PARTS WITHOUT AUTHORIZATION FROM HENDRICKSON. DO NOT SUBSTITUTE REPLACEMENT COMPONENTS NOT AUTHORIZED BY HENDRICKSON. USE OF MODIFIED, REWORKED, SUBSTITUTE OR REPLACEMENT PARTS NOT AUTHORIZED BY HENDRICKSON MAY NOT MEET HENDRICKSON'S SPECIFICATIONS, AND CAN RESULT IN FAILURE OF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

**WARNING**
**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**
**SADDLE CONNECTION**

A SADDLE IS ATTACHED TO THE CENTER BUSHINGS OF EACH EQUALIZING BEAM WITH TWO (2) SADDLE CAPS. EACH SADDLE CAP USES TWO (2) STUDS TO CLAMP THE CENTER BUSHING INNER METAL TO THE SADDLE. A SADDLE CAP MUST BE INSTALLED SO THAT THERE IS AN EVEN GAP BETWEEN THE SADDLE CAPS AND THE BASE OF THE SADDLE LEGS, AS SHOWN IN FIGURE 3-1. IF EACH SADDLE CAP IS NOT INSTALLED EVENLY THE SADDLE LEGS COULD BECOME DEFORMED, RESULTING IN BENT BOLTS OR DAMAGED SADDLE LEGS.

**FIGURE 3-1**

**WARNING**
**EXCHANGING SUSPENSION COMPONENTS**

DO NOT EXCHANGE OR SWAP COMPONENTS (SUCH AS EQUALIZING BEAMS, SPRINGS, FRAME HANGERS, ETC.) FROM ONE HENDRICKSON SUSPENSION ASSEMBLY TO ANOTHER, ESPECIALLY WHEN THE ORIGIN, APPLICATION, OPERATION, LOADING, SERVICE, MAINTENANCE AND/OR REPAIR HISTORIES OF SUCH COMPONENTS ARE NOT KNOWN. EXCHANGING OR SWAPPING SUCH COMPONENTS CAN CAUSE PREMATURE COMPONENT FAILURE, POSSIBLY RESULTING IN ADVERSE VEHICLE HANDLING, PERSONAL INJURY OR PROPERTY DAMAGE, AND WILL VOID ANY APPLICABLE WARRANTIES.

**WARNING**
**EQUALIZING BEAM END CONNECTION AND SADDLE CAP FASTENERS**

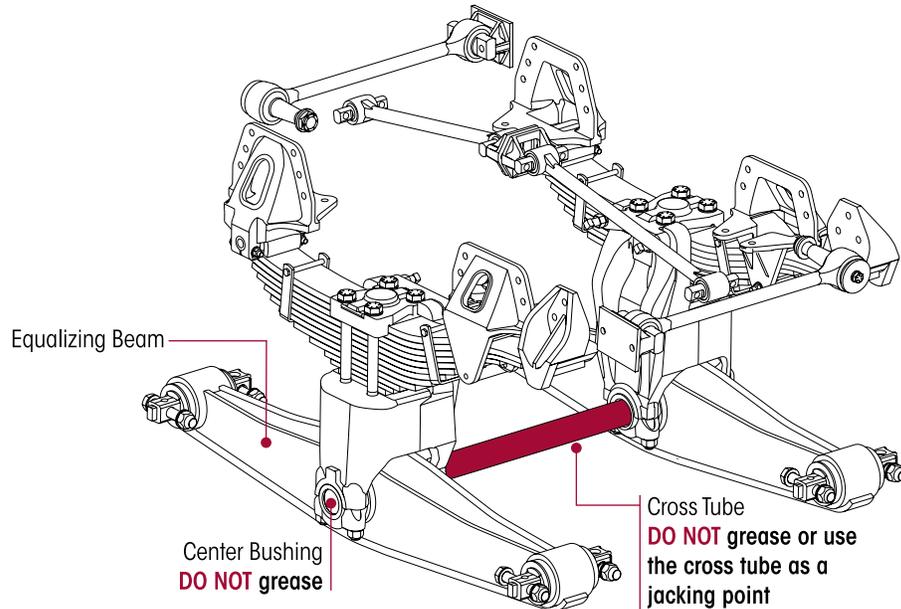
DO NOT ASSEMBLE BEAM END CONNECTION WITHOUT PROPER FASTENERS. HENDRICKSON RECOMMENDS THE USE OF HENDRICKSON FASTENERS TO SUSTAIN PROPER CLAMP FORCE. FAILURE TO DO SO CAN CAUSE ADVERSE VEHICLE HANDLING, PROPERTY DAMAGE OR PERSONAL INJURY.

ENSURE THAT BEAM END CONNECTION AND SADDLE CAP FASTENER TORQUE VALUES ARE SUSTAINED AS RECOMMENDED IN THE TORQUE SPECIFICATIONS SECTION OF THIS PUBLICATION. FAILURE TO DO SO CAN CAUSE ADVERSE VEHICLE HANDLING RESULTING IN PERSONAL INJURY OR PROPERTY DAMAGE.

IF BEAM END BUSHING MOVEMENT OR LOOSENESS IS NOTED IN THE EQUALIZING BEAM END HUB, DO NOT OPERATE THE VEHICLE. REPLACE THE END BUSHINGS AND ALL CONNECTING PARTS. THE ABOVE CONDITION CAN RESULT IN COSTLY REPAIR, DOWNTIME, POSSIBLE SEPARATION OF COMPONENTS, ADVERSE VEHICLE HANDLING, PROPERTY DAMAGE, OR PERSONAL INJURY.

**WARNING**
**IMPROPER JACKING METHOD**

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

**FIGURE 3-2**


- DO NOT USE THE SUSPENSION CROSS TUBE, BAR PIN AXLE BRACKETS AS A JACKING POINT, REFER TO VEHICLE MANUFACTURER FOR PROPER JACKING INSTRUCTIONS.
- ACCEPTABLE LIFTING POINTS FOR A VEHICLE AT THE RATED LOAD INCLUDE BUT ARE NOT LIMITED TO: THE AXLE, EQUALIZING BEAM AND THE VEHICLE FRAME RAIL. REFER TO THE VEHICLE MANUFACTURER FOR PROPER JACKING INSTRUCTIONS.

**WARNING**
**PARTS CLEANING**

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

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

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

**WARNING**
**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 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 CAN CAUSE ADVERSE VEHICLE HANDLING AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

## SECTION 4 Special Tools

### BAR PIN STYLE END BUSHING TOOLS

#### INSTALLATION TOOLS

Hendrickson Part No. 66086-103

OTC Part No. 1757

Visit otctools.com

Description	OTC P/N
1. Installer	520493
2. Cap	219554
3. Cap screw	520563
4. Washer	11253
5. Hex nut	10221
6. Shims	302401



#### REMOVAL TOOLS

Hendrickson Part No. 66086-104

OTC Part No. 206457

Visit otctools.com



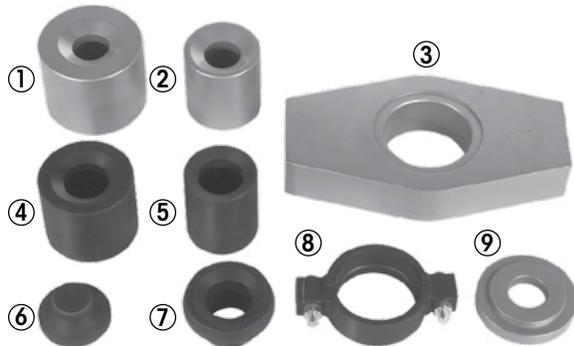
Hendrickson Part No. 66086-105

OTC Part No. 302030

Visit otctools.com



### ADAPTER STYLE END BUSHING TOOL SET PLUS RUBBER CENTER BUSHING TOOLS



#### 28K-52K lb. Capacity Bushings

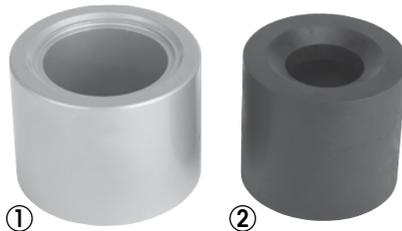
Hendrickson Part No. 66086-102

OTC Part No. 1764

Visit otctools.com

Description	OTC P/N	Description	OTC P/N
1. Installer	206457	6. Press	206457
2. Remover	302027	7. Remover	302030
3. Press plate	51100	8. Installer clamp	42052
4. Installer	302031	9. Clamp plate	206459
5. Remover	302032		

### RUBBER CENTER BUSHING TOOLS



#### 40K lb. Capacity Bushings

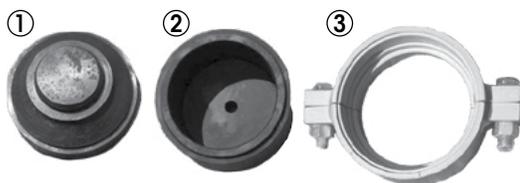
Hendrickson Part No. 66086-100

OTC Part No. 1746

Visit otctools.com

Description	OTC P/N
1. Remover	310248
2. Installer	310249

### CENTER AND END BUSHING TOOLS



#### 65K-85K lb. Capacity Bushings

Hendrickson Part No. 66086-101

OTC Part No. 1763

Visit otctools.com

Description	OTC P/N
1. Adapter	208350
2. Adapter	28541
3. Installer Clamp	208349

**BRONZE CENTER BUSHING TOOLS**

OTC Part No. 1744 Visit [otctools.com](http://otctools.com)

**34K Ib. Capacity Bushings**



Installing  
4<sup>5</sup>/<sub>8</sub>" O.D.  
(28538)

Removing / installing  
3<sup>1</sup>/<sub>2</sub>" O.D.  
(302025)

**38K-52K Ib. Capacity Bushings**

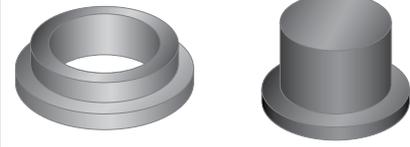


Installing  
5<sup>3</sup>/<sub>4</sub>" O.D.  
(28536)

Removing / installing  
4<sup>2</sup>/<sub>32</sub>" O.D.  
(302024)

**65K - 70K Ib. Capacity Bushings**

Visit [otctools.com](http://otctools.com)



Installing  
(204266)

Removing / installing  
(38095)

**TORQUE ROD BUSHING FUNNEL TOOLS**



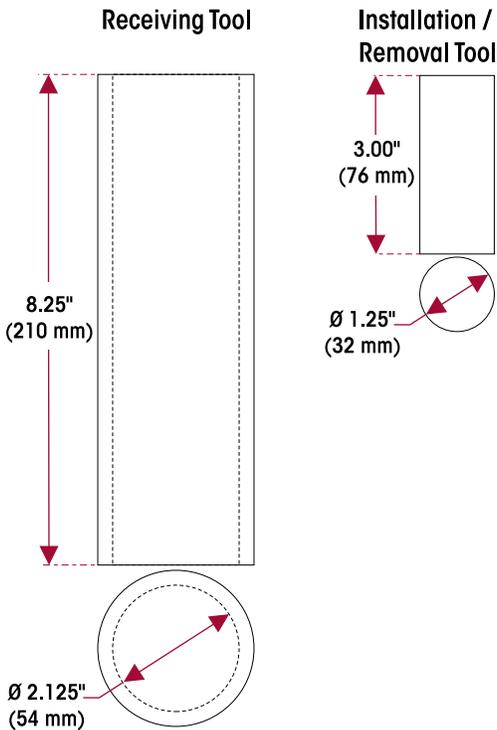
**ULTRA ROD**  
Hendrickson Part No. 66086-001L

**ULTRA ROD PLUS**  
Hendrickson Part No. 66086-000L

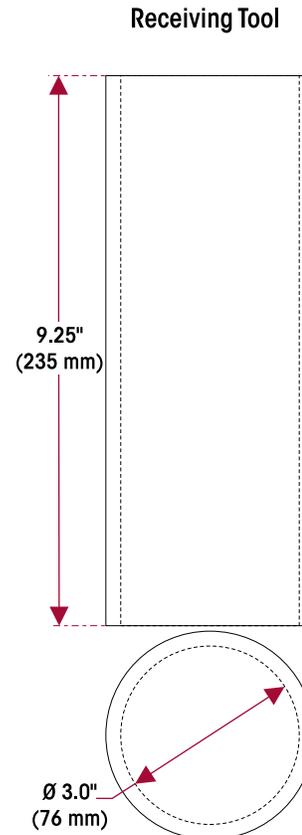
**TORQUE ROD BUSHING TOOLS**

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 these tools.

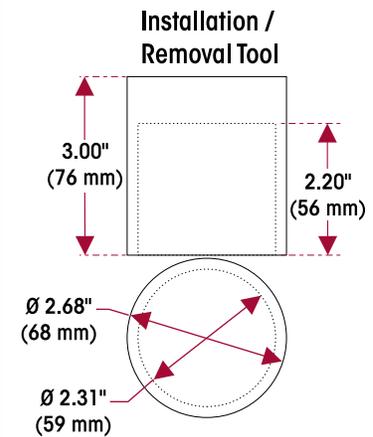
**ULTRA ROD BUSHING**



**ULTRA ROD PLUS AND XTRB BUSHING**



**XTRB BUSHING**





## SECTION 5 Parts Lists

### Selection Guide

**KEY NO. 2**

RT • RTE CROSS TUBES							
34K		34K • 40K • 46K • 48K • 50K		52K		65K • 70K	
Length	Part Number	Length	Part Number	Length	Part Number	Length	Part Number
33 <sup>7</sup> / <sub>8</sub> "	44642-020	33 <sup>7</sup> / <sub>8</sub> "	44643-027	46"	07622-003	34 <sup>3</sup> / <sub>4</sub> "	10397-015
36 <sup>1</sup> / <sub>2</sub> "	44642-022	40 <sup>3</sup> / <sub>4</sub> "	44643-011	53"	07622-018	40"	10397-018
42"	44642-009	42"	44643-008	64"	07622-031	40 <sup>3</sup> / <sub>4</sub> "	10397-014
44 <sup>7</sup> / <sub>8</sub> "	44642-008	44 <sup>7</sup> / <sub>8</sub> "	44643-009	68"	07622-014	41"	10397-019
		46"	44643-003			41 <sup>3</sup> / <sub>4</sub> "	10397-009
		47"	44643-002			42"	10397-001
		48"	44643-001			42 <sup>1</sup> / <sub>2</sub> "	10397-021
		49 <sup>1</sup> / <sub>4</sub> "	44643-024			43 <sup>1</sup> / <sub>4</sub> "	10397-017
		51"	44643-015			44 <sup>3</sup> / <sub>4</sub> "	10397-002
		53"	44643-018			46"	10397-010
		54 <sup>1</sup> / <sub>2</sub> "	44643-017			46 <sup>1</sup> / <sub>2</sub> "	10397-020
		57"	44643-010			47 <sup>1</sup> / <sub>2</sub> "	10397-027
		64"	44643-028			50"	10397-013
		68"	44643-014			51 <sup>1</sup> / <sub>4</sub> "	10397-003
		77"	44643-029			52 <sup>3</sup> / <sub>4</sub> "	10397-006
						54"	10397-025
						56 <sup>1</sup> / <sub>2</sub> "	10397-016
						61 <sup>1</sup> / <sub>4</sub> "	10397-008
						62 <sup>3</sup> / <sub>4</sub> "	10397-031
						67 <sup>1</sup> / <sub>2</sub> "	10397-004
						75 <sup>3</sup> / <sub>4</sub> "	10397-029

**KEY NO. 40**

TOP PAD BOLTS	
1" 14 UNS-2A	
Length	Part Number
8 <sup>1</sup> / <sub>4</sub> "	30550-018
8 <sup>1</sup> / <sub>2</sub> "	30550-019
8 <sup>3</sup> / <sub>4</sub> "	30550-001
9"	30550-002
9 <sup>1</sup> / <sub>4</sub> "	30550-003
9 <sup>1</sup> / <sub>2</sub> "	30550-004
9 <sup>3</sup> / <sub>4</sub> "	30550-005
10"	30550-006
10 <sup>1</sup> / <sub>4</sub> "	30550-007
10 <sup>1</sup> / <sub>2</sub> "	30550-008
10 <sup>3</sup> / <sub>4</sub> "	30550-009
11"	30550-010
11 <sup>1</sup> / <sub>4</sub> "	30550-011
11 <sup>1</sup> / <sub>2</sub> "	30550-012
11 <sup>3</sup> / <sub>4</sub> "	30550-013
12"	30550-014
16 <sup>5</sup> / <sub>8</sub> "	30550-028

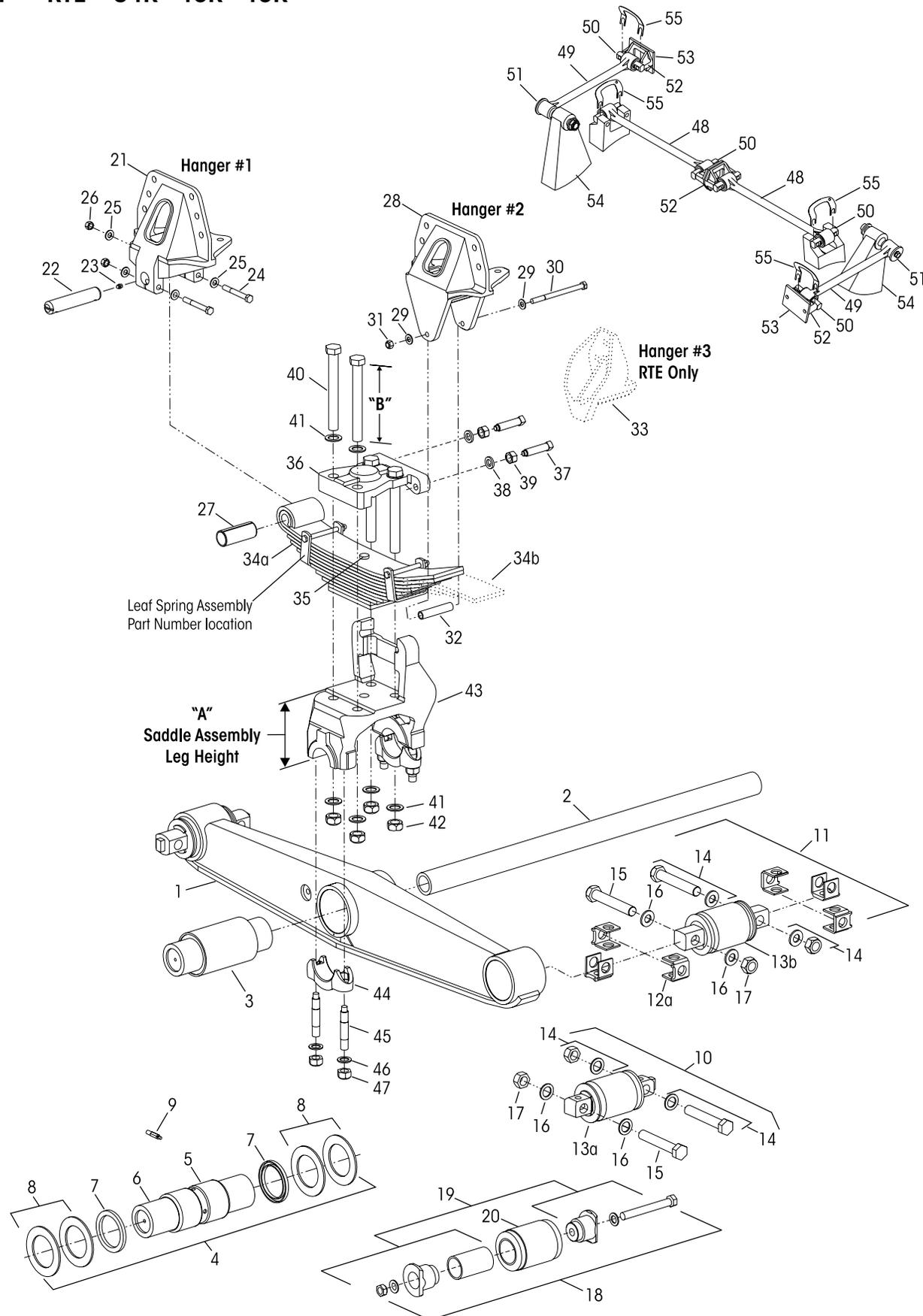
**KEY NO. 3, Pages 12 and 14**

♦Corresponding Center Bushing End Plug for Cross Tube Replacement – 34K through 52K Only		
	Rubber Center Bushing Part Number	♦♦ End Plug Part Number
34K	06664-000L • 22279-000L	22278-000
34K • 40K	49400-000L • 49600-000L	22281-000
34K • 40K • 46K • 48K • 50K • 52K	29483-005L • 34013-097L	

♦ Hendrickson recommends for high capacity walking beam suspensions, removal of the equalizing beam to replace the cross tube. Refer to the Cross Tube Equipped with Rubber Bushings section in this publication for 65K cross tube replacement.

♦♦ End Plugs are not needed if equipped with bronze center bushings.

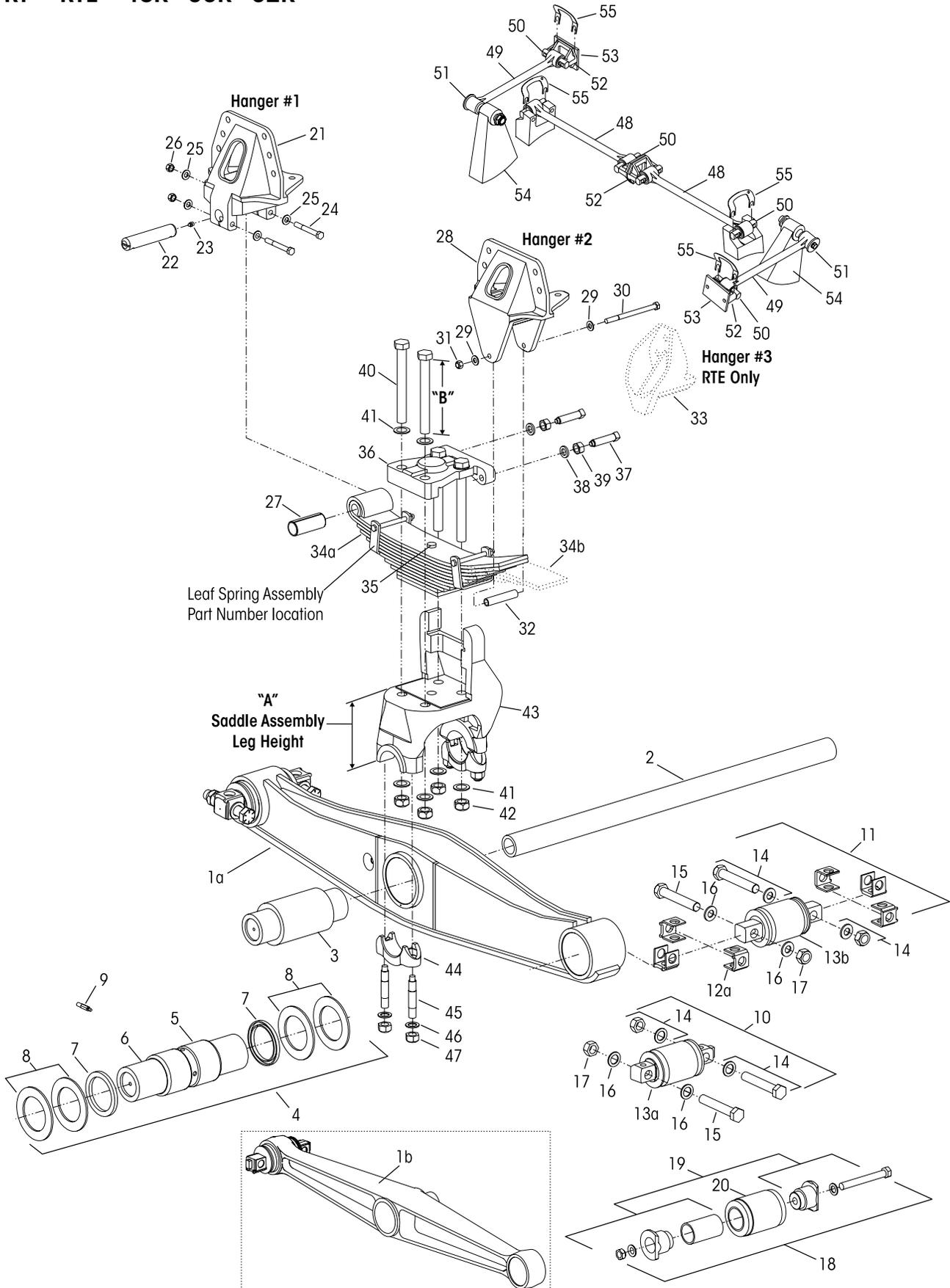
RT™ • RTE™ 34K • 40K • 46K





KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.	KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.
1		Equalizing Beam Assembly <i>See Selection Guide 45745-147</i>	2	32	00194-000	Rebound Bolt Spacer	2
2		Cross Tube, <i>See Selection Guide on Page 11</i>	1	33		RTE Extended Leaf Spring Hanger #3, <i>See Selection Guide 45745-038</i>	2
	44642-XXX	34K, 1 1/8" Diameter		34		Spring Assembly	2
	44643-XXX	34K-46K, 27/16" Diameter		a	53383-000	RT 34K Standard Duty, <i>Replaces 58193-000</i>	
3		Rubber Center Bushing, <i>See Center Bushing End Plug Selection Guide on Page 11</i>	2	a	53384-000	RT 34K Light Duty, <i>Replaces 58194-000</i>	
	06664-000L	34K Welded End Plug		a	45027-000	RT 40K	
	22279-000L	34K w/Loose End Plug		a	47057-000	RT 46K	
	49400-000L	34K-40K Welded End Plug		b	53382-000	RTE 34K, <i>Replaces 58192-000</i>	
	49600-000L	34K-40K w/Loose End Plug		b	45121-000	RTE 40K	
	29483-005L	• Optional for RT 34K-40K, <i>Requires Transverse Rods</i> 46K Welded End Plug		b	45322-000	RTE 46K	
	34013-097L	6K w/Loose End Plug		35	66662-001	5/8" Center Bolt, Cut to Length, <i>Replaces 05069-000</i>	2
4		<b>Bronze Center Bushing Service Kit, Two Beams</b>		36	35064-000	Top Pad	2
		Includes Key Nos. 5-9			35370-002	<b>Top Pad Set Screw Service Kit, One Set</b> Includes Key Nos. 37-39	
	30436-000L	34K		37	06813-000	3/4"-10 UNC Square Head Set Screw	4
	30437-000L	34K-46K		38	17339-000	3/4" Set Screw Lock Washer	4
5	30240-001	Bronze Center Bushing - 34K	2	39	17342-000	3/4"-10 UNC Set Screw Locknut	4
	30240-002L	Bronze Center Bushing - 34K-46K	2	40	30550-XXX	1"-14 UNS Top Pad Bolt, <i>See Selection Guide on Page 11</i>	8
6	14684-000	Beam Center Sleeve - 34K	2	41	22962-006	1" Hardened Washer	16
	14685-000L	Beam Center Sleeve - 34K-46K	2	42	08017-000	1"-14 UNS Locknut	8
7	30333-000	Beam Center Seal - 34K	4	43		Saddle Assembly, <i>See Leg Height-Dim. "A"</i>	2
	30334-000	Beam Center Seal - 34K-46K	4			Includes Key Nos. 44-47	
8	32364-000	Thrust Washer - 34K	8		31017-023	34K, 6 3/16" Height, (Casting No. 46529)	
	32365-000	Thrust Washer - 34K-46K	8		31017-025L	34K, 7 3/16" Height (Casting No. 46138)	
9	30087-000	Grease Fitting	As Req. 2		31017-022L	34K-40K, 6" Height (Casting No. 57167)	
		<b>Bar Pin End Bushing Kit, One Wheel End</b>			31017-109L	34K-40K, 7 3/16" Height (Casting No. 57143)	
10	34013-087L	Non-Shim Type, Includes Key Nos. 13a, 14			31017-096L	46K, 6" Height (Casting No. 57457)	
11	34013-088L	Shim Type, Includes Key Nos. 12a, 13b, 14			31017-110L	46K, 7 3/16" Height (Casting No. 57155)	
Not Shown	34013-188L	Rotating Shim Type, Includes Key Nos. 12a, 13c, 14		44	06662-000	Saddle Cap 34K	4
12		Bar Pin Shim	8		58795-000	Saddle Cap 34K-46K	4
a	50131-000	0.25" / 0.12" Standard		45		7/8"-14 UNF Saddle Cap Stud	8
b	50130-000	0.19" / 0.19" Optional			07002-000	34K	
c	57026-000	0.375" Optional flat shim			06696-000	34K-46K	
13		**Bar Pin End Bushing	4	46	22962-002	7/8" Hardened Washer	8
a		Non-Shim Type		47	04842-000	7/8"-14 UNF Saddle Cap Nut	8
b		Shim Type		48		***One-piece Longitudinal Torque Rod Assembly, Straddle/Straddle, Specify Length in mm ULTRA ROD®, Includes Key No. 50a	
c		Rotating Bar Pin, Shim Type (Not Shown)				Front	1
14	34013-104	<b>Bar Pin End Bushing Fastener Kit, One Wheel End</b> , Includes Key Nos. 15-17				Rear	1
15		**1"-8 UNC x 6" Hex Bolt	8		62000-XXX	ULTRA ROD® PLUS™, Includes Key No. 50b	
16		**1" Hardened Washer	16		62001-XXX	Front	1
17		**1"-8 UNC Locknut	8			Rear	1
18		<b>Rubber End Bushing and Adapter Service Kit, One Wheel End</b>		49		****One-piece Transverse Torque Rod Assembly, Straddle/Taper, Specify Length in mm	2
	34013-049L	34K-40K, Includes Key Nos. 19a, 20				ULTRA ROD, Includes Key Nos. 50a-51a	
	34013-073L	46K, Includes Key Nos. 19b, 20			62350-XXX	ULTRA ROD PLUS, Includes Key Nos. 50b-51b	
19		<b>Adapter w/o Bushing Service Kit, One Wheel End</b>			72350-XXX	XTRB, Includes Key Nos. 50c-51c	
a	45000-007L	34K-40K		50		Straddle Bushing	4
b	21140-034L	46K		a	47691-000L	ULTRA ROD	
20	45900-000L	Rubber End Bushing	4	b	64400-002L	ULTRA ROD PLUS	
21		Forward Spring Hanger #1, Double Lock Pin <i>See Selection Guide 45745-038</i>	2	c	66649-002L	XTRB	
22	43146-000L	Pin - 13/8" Diameter Double Lock	2	51		Taper Bushing	2
23	33117-000	Lube Fitting	2	a	64697-000L	ULTRA ROD	
		<b>Spring Mounting Service Kit</b>		b	64400-004L	ULTRA ROD PLUS	
	29828-035L	One Hanger, Includes Key Nos. 24-26		c	66649-004L	XTRB	
	29828-034	Vehicle Set, Includes Key Nos. 22-26, 30, 32				<b>Two-Piece Torque Rod Assembly with Bushings Service Kit</b>	
24	24531-009	1/2"-13 UNC x 4" Bolt	4			ULTRA ROD Straddle/Straddle	
25	22962-011	1/2" Hardened Washer	8		60218-000	ULTRA ROD Straddle/Taper	
26	49846-000	1/2"-13 UNC Locknut	4		60215-000	ULTRA ROD PLUS Straddle/Taper	
27	30057-008L	Spring Eye Bushing, 1 3/8" I.D.	2		65781-000	XTRB Straddle/Straddle	
28		Rear Spring Hanger #2, <i>See Selection Guide 45745-038</i>	2		65781-001	XTRB Straddle/Taper	
	29828-023	<b>Rebound Bolt &amp; Spacer Kit, One Hanger</b> Includes Key Nos. 29-32		52	22186-000	Torque Rod Bracket	4
29	22962-011	1/2" Hardened Washer	4	53	45045-003	Back-up Plate (for Torque Rod)	2
30	24531-005	1/2"-13 UNC x 6 1/2" Bolt	2	54		**Transverse Rod Axle Bracket	2
31	49846-000	1/2"-13 UNC Locknut	2	55	49689-000L	Torque Rod Shim	As Req.
				Not Shown	70867-001	P-80 Lubricant - 10 ml Per Rubber Bushing	1

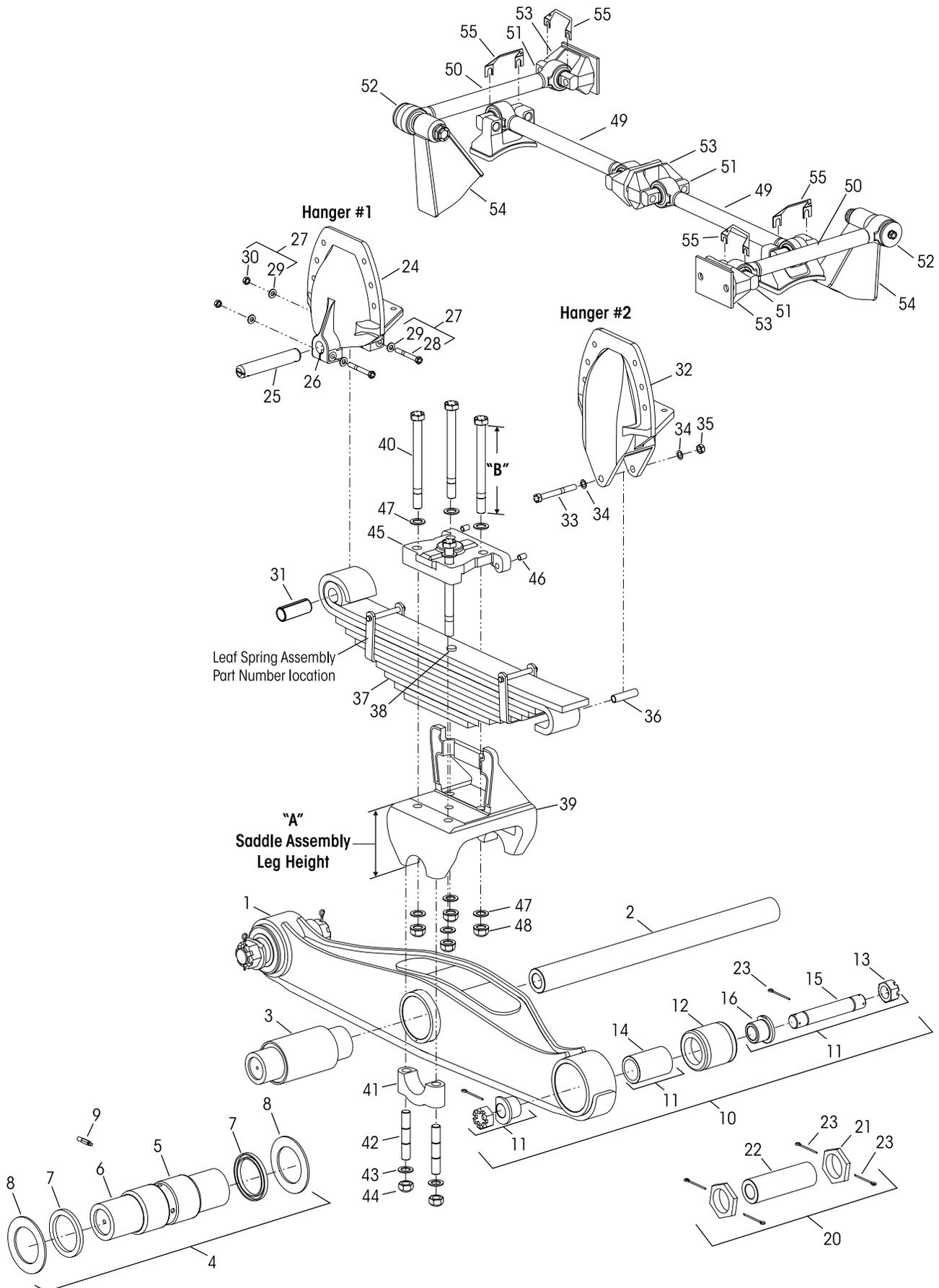
RT™ • RTE™ 48K • 50K • 52K





			VEHICLE				VEHICLE
KEY NO.	PART NO.	DESCRIPTION	QTY.	KEY NO.	PART NO.	DESCRIPTION	QTY.
1		Equalizing Beam Assembly, <i>See Selection Guide 45745-147</i>	2		29828-023	<b>Rebound Bolt &amp; Spacer Service Kit, One Hanger</b> Includes Key Nos. 29-32	
a		Fabricated Beam		29	22962-011	½" Hardened Washer	4
b		Cast Beam		30	24531-005	½"-13 UNC x 6½" Bolt	2
2		Cross Tube - Dia. 27/16", <i>See Selection Guide on Page 11</i>	1	31	49846-000	½"-13 UNC Locknut	2
	44643-XXX	48K		32	00194-000	Rebound Bolt Spacer	2
	07622-XXX	52K		33		RTE Extended Leaf Spring Hanger #3, <i>See Selection Guide 45745-038</i>	2
3		Rubber Center Bushing, <i>Requires Transverse Rods 2 See Center Bushing End Plug Selection Guide on Page 11</i>	2	34		Spring Assembly	2
	29483-005L	Welded End Plug		a	47057-000	RT 48K-52K	
	34013-097L	Loose End Plug		b	45322-000	RTE 48K	
4	30437-000L	<b>Bronze Center Bushing Service Kit, Two Beams</b> Includes Key Nos. 5-9	2	35	66662-001	5/8" Center Bolt, Cut to Length, <i>Replaces 05069-000</i>	2
5	30240-002L	Bronze Center Bushing	2	36	35064-000	Top Pad	2
6	14685-000L	Beam Center Sleeve	2		35370-002	<b>Set Screw Service Kit, One Set</b> Includes Key Nos. 37-39	
7	30334-000	Beam Center Seal	4	37	06813-000	¾"-10 UNC Square Head Set Screw	4
8	32365-000	Thrust Washer	8	38	17339-000	¾" Set Screw Lock washer	4
9	30087-000	Grease Fitting	As Req. 2	39	17342-000	¾"-10 UNC Set Screw Locknut	4
		<b>Bar Pin End Bushing Kit, One Wheel End</b>		40	30550-XXX	1"-14 UNS Top Pad Bolt, <i>See Selection Guide on Page 11</i>	8
10	34013-087L	Non-Shim Type, Includes Key Nos. 13a, 14		41	22962-006	1" Hardened Washer	16
11	34013-088L	Shim Type, Includes Key Nos. 12a, 13b, 14		42	08017-000	1"-14 UNS Locknut	8
Not Shown	34013-188L	Rotating Shim Type, Includes Key Nos. 12a, 13c, 14		43		Saddle Assembly, Specify Leg Height-Dim. "A" Includes Key Nos. 44-47	2
12		Bar Pin Shim	8		31017-053	6" Height, (Casting No. 32796)	
a	50131-000	0.25" / 0.12" Standard			31017-077	7¾" Height, (Casting No. 47476 or 47665)	
b	50130-000	0.19" / 0.19" Optional			31017-108	11" Height, (Casting No. 50965)	
c	57026-000	0.375" Optional flat shim		44	58795-000	Saddle Cap, <i>Replaces 48545-000</i>	4
13		**Bar Pin End Bushing	4	45	06696-000	7/8"-14 UNF Saddle Cap Stud	8
a		Non-Shim Type		46	22962-002	7/8" Saddle Cap Washer	8
b		Shim Type		47	04842-000	7/8"-14 UNF Saddle Cap Nut	8
c		Rotating, Shim Type (Not Shown)		48		***One-piece Longitudinal Torque Rod Assembly, Straddle/Straddle, Specify Length in mm ULTRA ROD, Includes Key No. 50a	
14	34013-104	<b>Bar Pin End Bushing Fastener Kit, One Wheel End</b> , Includes Key Nos. 15-17			62000-XXX	Front	1
15		**1"-8 UNC x 6" Hex Bolt	8		62001-XXX	Rear	1
16		**1" Hardened Washer	16			ULTRA ROD PLUS, Includes Key No. 50b	
17		**1"-8 UNC Locknut	8		72000-XXX	Front	1
18		<b>Rubber End Bushing and Adapter Service Kit, One Wheel End</b>			72001-XXX	Rear	1
	34013-050L	5¾" Length, Includes Key Nos. 19a, 20a		49		****One-piece Transverse Torque Rod Assembly, Straddle/Taper, Specify Length in mm	2
	34013-051L	6" Length, Includes Key Nos. 19b, 20b			62350-XXX	ULTRA ROD, Includes Key Nos. 50a-51a	
19		<b>End Bushing Adapter Service Kit, One Wheel End</b>			72350-XXX	ULTRA ROD PLUS, Includes Key Nos. 50b-51b	
a	21140-034L	5¾" Length			92350-XXX	XTRB, Includes Key Nos. 50c-51c	
b	21140-033L	6" Length		50		Straddle Bushing	6
20		Rubber End Bushing	4	a	47691-000L	ULTRA ROD	
a	29878-001L	5¾" Length		b	64400-002L	ULTRA ROD PLUS	
b	45407-000L	6" Length		c	66649-002L	XTRB	
21		Forward Spring Hanger #1, Double Lock Pin <i>See Selection Guide 45745-038</i>	2	51		Taper Bushing	2
22	43146-000L	Pin - 1¾" Diameter Double Lock	2	a	64697-000L	ULTRA ROD	
23	33117-000	Lube Fitting	2	b	64400-004L	ULTRA ROD PLUS	
		<b>Spring Mounting Service Kit</b>		c	66649-004L	XTRB	
	29828-035L	One Hanger, Includes Key Nos. 24-26				<b>Two-Piece Torque Rod Assembly with Bushings Service Kit</b>	
	29828-034	Vehicle Set, Includes Key Nos. 22-26, 30, 32			60218-000	ULTRA ROD Straddle/Straddle	
24	24531-009	½"-13 UNC x 4" Bolt	4		60215-000	ULTRA ROD Straddle/Taper	
25	22962-011	½" Hardened Washer	8		65781-000	ULTRA ROD PLUS Straddle/Taper	
26	49846-000	½"-13 UNC Locknut	4		65781-001	XTRB Straddle/Straddle	
27	30057-008L	Spring Eye Bushing 1¾" I.D.	2		65781-002	XTRB Straddle/Taper	
28		Rear Spring Hanger #2, <i>See Selection Guide 45745-038</i>	2	52	22186-000	Torque Rod Bracket	4
				53	45045-003	Back-up Plate (for Torque Rod)	2
				54		*Transverse Rod Axle Bracket	2
				55	49689-000L	Torque Rod Shim	As Req.
				Not Shown	70867-001	P-80 Lubricant - 10 ml Per Rubber Bushing	1

RT™ 65K • 70K





KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.	KEY NO.	PART NO.	DESCRIPTION	VEHICLE QTY.
1		Equalizing Beam Assembly <i>See Selection Guide 45745-147</i>	2	27	46825-001	<b>Forward Hanger Spring Mounting Service Kit, One Hanger</b> , Includes Key Nos. 28-30	
2	10397-XXX	Cross Tube, <i>See Selection Guide on Page 11</i>	4	28	24531-009	½"-13 UNC x 4" Bolt	4
3	10366-000L	Rubber Center Bushing	2	29	22962-011	½" Hardened Washer	8
4	45374-000	<b>Bronze Center Bushing Service Kit, Two Beams</b> Includes Key Nos. 5-9	2	30	49846-000	½"-13 UNC Locknut	4
5	30240-005	Bronze Center Bushing	2	31		Spring Eye Bushing	2
6	25102-000	Beam Center Sleeve	2		22285-000	Bronze 1½" I.D.	
7	31577-000	Beam Center Seal	4		50592-000	Steel Bushing 1½" I.D.	
8	45261-000	Thrust Washer	4	32		Rear Spring Hanger #2, <i>See Selection Guide 45745-038</i>	2
9	30087-000	Grease Fitting	As Req. 2		29828-033	<b>Rear Hanger Spring Mounting Service Kit, One Hanger</b> , Includes Key Nos. 33-36	
10		<b>Rubber End Bushing and Adapter Service Kit, Tandem Set</b>		33	21867-023	¾"-16 UNF x 6½" Bolt	2
	60872-010	for 6" Bushing, Includes Key Nos. 12a and 21140-007 Fastener Kit		34	22962-001	¾" Flat Washer	4
	60872-011	for 7" Bushing, Includes Key Nos. 12b, and 21140-004L Fastener Kit		35	30191-000	¾"-16 UNF Locknut	2
		<b>Rubber End Bushing and Adapter Service Kit, One Wheel End</b>		36	02276-000	Rebound Bolt Spacer	2
	34013-052	for 6" Bushing, Includes Key Nos. 12a and 21140-007 Fastener Kit		37		Spring Assembly, Includes Key No. 6	2
	34013-110	for 7" Bushing, Includes Key Nos. 12b, and 21140-004L Fastener Kit			27535-000	Spring Rate 27,300 lb.	
	34013-072	<b>Rubber End Bushing and Tube/Nut Service Kit, One Wheel End</b> , Includes Key Nos. 13 and 21140-006 Fastener Kit			02056-000	Spring Rate 29,400 lb. (Bronze Bushing)	
11		<b>Adapter Fastener Service Kit, One Wheel End</b> , (Bushing not included)			58596-000	Spring Rate 29,400 lb. (Steel Eye Bushing)	
	21140-007	for 6" Bushing includes 13, 15-16, 23			57961-000	Spring Rate 44,400 lb.	
	21140-004L	for 7" Bushing includes 13, 15-16, 18, 23,		38	66662-001	5/8" Center Bolt, Cut to Length, <i>Replaces 05069-000</i>	2
	21140-027	for 6" Bushing includes 13-16, 18, 23		39		Saddle Assembly, Specify Height-Dim. "A" Includes Key Nos. 41-44	2
	21140-031	for 6" Bushing includes 13, 15-16, 19, 23			31017-004	7½" Ht. (Casting No. 15784, 46895 or 48497)	
	21140-052	for 6" Bushing includes 13, 15-16, 18, 23			31017-071	9¾" Ht. (Casting No. 15784 or 46673-001)	
	21140-026	for 7" Bushing includes 13, 15-16, 18, 23			31017-070	10½" Ht. (Casting No. 15784 or 46673-002)	
	21140-043	for 7" Bushing includes 13, 15-18, 23			31017-069	11½" Ht. (Casting No. 15784 or 46673-002)	
12		Rubber End Bushing	4	40	30550-XXX	1"-14 UNS Top Pad Bolt, <i>See Selection Guide on Page 11</i>	8
a	10363-000L	6" Length		41	15785-000	Saddle Cap	4
b	10364-000L	7" Length		42	10948-000	1"-14 UNS Saddle Cap Stud	8
13	17491-022	17/8" 12 UNF Slotted Nut	8	43	22962-006	1" Hardened Washer	8
14		Adapter Tube	4	44	08017-000	1"-14 UNS Locknut	8
15		Beam End Shaft	4	45	19199-000	Top Pad (Casting No. 35431 or 48491) <i>Replaces 54112-000</i>	2
16		Beam End Adapter	8	46	19201-002	¾"-10 UNC x 1¾" Internal Hex Head Set Screw	4
17	46628-000	17/8" Hex Nut (Not Shown)	4	47	22962-006	1" Hardened Washer	16
18	45456-000	Thrust Washer (Not Shown)	4	48	08017-000	1"-14 UNS Locknut	8
19	48852-000	Split Adapter (Not Shown)	8	49	72100-XXX	***One-piece Longitudinal Torque Rod Assembly, 2 Straddle/Straddle, Specify Length in mm ULTRA ROD PLUS, Includes Key No. 51a	2
20	21140-006	<b>Threaded Tube/Nut Service Kit, One Wheel End</b> Includes Key Nos. 21-23		50		****One-piece Transverse Torque Rod Assembly, 2 Straddle/Taper, Specify Length in mm ULTRA ROD PLUS, Includes Key Nos. 51a-52a XTRB, Includes Key Nos. 51b-52b	2
21	10371-000	3" - 12 UNF - 2B Nut	8		72850-XXX	ULTRA ROD PLUS, Includes Key Nos. 51a-52a	
22	10372-000	Threaded Tube	4		92950-XXX	XTRB, Includes Key Nos. 51b-52b	
23	17800-010	Cotter Pin	16	51		Straddle Bushing	6
24		Forward Spring Hanger #1, <i>See Selection Guide 45745-038</i>	2	a	64400-003L	ULTRA ROD PLUS	
	29828-032	<b>Spring Mounting Service Kit, One Hanger</b> , Includes Key Nos. 25, 26, 28-30, 33-36		b	66649-003L	XTRB	
25	45797-000L	Pin 1½" Diameter (Double Lock)	2	52		Taper Bushing	2
26	33117-000	Lube Fitting	As Req.	a	64400-006L	ULTRA ROD PLUS	
				b	66649-004L	XTRB	
				53	46015-000	Torque Rod Bracket	4
				54		*Transverse Torque Rod Axle Bracket	2
				55	67779-002	Torque Rod Shim	As Req.
				Not Shown	70867-001	P-80 Lubricant - 10 ml Per Rubber Bushing	1

**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.

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

\*\*\* Hendrickson's part number is stamped on the torque rod for identification. Be sure to include the suffix number when ordering, this number indicates rod length. Hendrickson's two-piece ULTRA ROD • ULTRA ROD PLUS can be used to create the desired length, refer to Hendrickson Lit. No. 45745-148.

\*\*\*\* Transverse torque rods are mandatory for the RT•RTE rear suspension regardless of axle spacing, refer to Hendrickson Literature No. 59310-004 and 59310-058.

## SECTION 6 Preventive Maintenance

Following appropriate inspection procedures are important to help ensure the proper maintenance and operation of the suspension system and component parts. Hendrickson recommends the RT•RTE walking beam suspensions be inspected at pre-delivery, the first 1,000 miles or 100 hours and at the regular preventive maintenance intervals. Off-highway and severe service operating conditions require more frequent inspections than on-highway service operation. Inspection must include the following items and other components referenced 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.

<b>HENDRICKSON RECOMMENDED INSPECTION INTERVALS</b>	<b>PRE-DELIVERY / POST CONVERSION INSPECTION</b>	<b>FIRST INSPECTION</b>	<b>PREVENTIVE MAINTENANCE</b>
Visual inspection for proper assembly and function. Check for all of the following and replace components as necessary: <ul style="list-style-type: none"> <li>• Signs of unusual movement, loose or missing components</li> <li>• Signs of abrasive or adverse contact with other components</li> <li>• Damaged, or cracked parts</li> </ul>	<p style="text-align: center;"><b>Within the first 100 Miles</b></p>	<p style="text-align: center;"><b>Within the first 1,000 Miles or 100 Hours</b></p>	<p style="text-align: center;"><b>Every 6 Months, 1,200 Hours, 25,000 Miles, whichever comes first</b></p>
Inspection of fasteners for proper torque as recommended in the Torque Specification Section of this publication with special attention to the following suspension connections: <ul style="list-style-type: none"> <li>• Frame hanger assembly</li> <li>• Equalizing beam end connection</li> <li>• Torque rods</li> <li>• Saddle connection</li> </ul>			<p style="text-align: center;"><b>Every 12 Months</b></p>
Verify the lateral alignment of axles are within the vehicle manufacturer’s tolerances	<p><b>Application dependent not to exceed 3 Months</b></p> <p><b>For severe service increase frequency</b></p>		
Lubrication interval <ul style="list-style-type: none"> <li>• Bronze center bushing</li> <li>• Spring eye pin</li> </ul>	<p><b>Application dependent not to exceed 3 Months</b></p> <p><b>For severe service increase frequency</b></p>		

### COMPONENT INSPECTION

**NOTE** Hendrickson recommends the use of Grade 8 bolts, Grade C locknuts and hardened washers for all suspension component attachments.

- **Cross tube** — Clean the cross tube and inspect it for cracks or excessive wear 8" to 10" from each end where it enters into the equalizing beam center bushings. Use a straight edge to check the straightness of the cross tube. If there is a doubt as to fracture, wear or straightness, replacement is necessary.

- **Equalizing beam assembly, end connection and saddle cap fasteners** — Check the overall condition of the equalizing beam for dents, dings, or other damage. Inspect the equalizing beam end connection and saddle cap fasteners for proper torque. The beam end connection must sustain proper clamp force of the axle bracket legs to the bushing inner casting prevent any movement of the beam end connection. See Equalizing Beam End Connection in this section.
- **Fasteners** — Look for any loose or damaged fasteners on the entire suspension. Ensure all fasteners are tightened to a torque value within the specified torque range. See recommended torque specifications for Hendrickson supplied fasteners in Torque Specification Section of this publication. For fasteners not supplied by Hendrickson, see vehicle manufacturer. Use a calibrated torque wrench to check torque in the tightening direction. As soon as the fastener starts to move, record the torque. Correct the torque if necessary.
- **Leaf spring assembly** — Inspect all leaves and spring clips for cracks or damage. Refer to Leaf Spring Assembly in this section.
- **Spring Hangers** — Refer to Spring Hangers in this section.
- **Torque rods** — Check all torque rods for looseness, or torn or shredded rubber. Refer to Longitudinal and Transverse Torque Rods in this section.
- **Tire wear** — Inspect the tires for wear patterns that may indicate suspension damage or misalignment. Replace all worn or damaged parts per the vehicle manufacturer's specifications.
- **Wear and damage** — Inspect all parts of suspension for wear and damage. Look for bent or cracked parts. Replace all worn or damaged parts.
- **Spring eye bushing and pin** — A visual inspection, refer to Spring Eye Bushing and Pin inspection in this section.

## LEAF SPRING ASSEMBLY

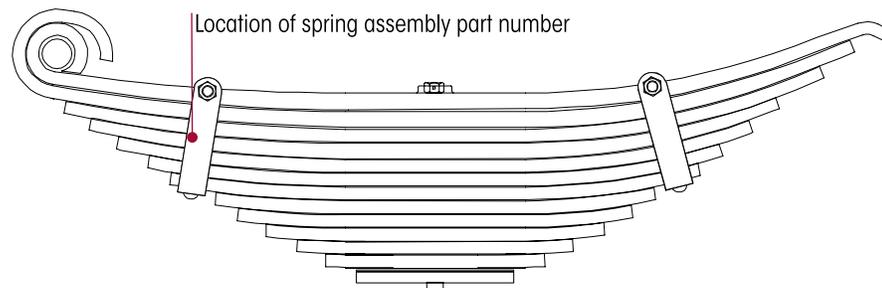
### NOTE

The spring assembly part number is stamped on the spring clip, see Figure 6-1.

Hendrickson recommends for high mileage springs that both leaf spring assemblies on the suspension be replaced at the same time to help 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 Hendrickson leaf springs be specified.

- Inspect the entire leaf spring assembly (see Figure 6-1), replacement of the entire assembly 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.

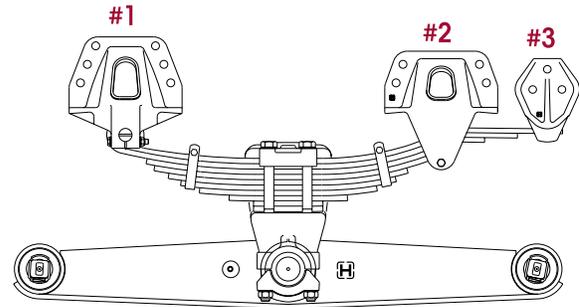
**FIGURE 6-1**



## SPRING HANGERS

- **#1 Forward spring hanger (Double lock bolt design)** — Check tightening torque lock bolt locknuts. If looseness of this connection has resulted in pin hole wear, replace the hanger.
- **#2 Rear spring hanger** — Inspect the cam surface for wear due to high mileage. Also inspect the outside legs for wear which can be caused by worn spring eye bushings. Excessive wear at either point requires hanger replacement.
- **#3 Extended leaf spring hanger** — This hanger is used on the RTE extended leaf spring series only. Inspect the cam surface for wear. Excessive wear will reduce the gap available at the #2 rear spring hanger.

FIGURE 6-2



### NOTE

The RTE suspension with extended leaf springs (Figure 6-2) requires a minimum gap of  $\frac{3}{8}$ " (10 mm) between the cam surface of the rear spring hanger and the top of the main leaf in the unloaded condition. If this gap is less than  $\frac{3}{8}$ " (10 mm), the extended leaf portion of the spring will not perform satisfactorily for empty ride.

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

## SPRING EYE BUSHING AND PIN

### PHYSICAL INSPECTION

In the unloaded condition check for spring eye bushing and pin wear:

**METHOD A:** Place a block of wood on the spring and, with a pry bar, attempt to lift the spring hanger and frame as shown in Figure 6-3.

**METHOD B:** With the brakes applied, attempt to rock the chassis back and forth, have a second technician observe the spring eye for movement.

If  $\frac{1}{8}$ " (3.175 mm) or more movement is noted between the spring eye bushing and the pin, replacement is required.

FIGURE 6-3

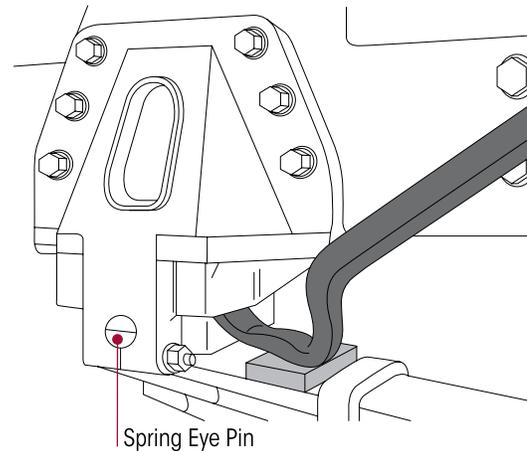
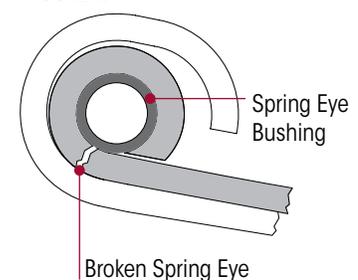


FIGURE 6-4



### NOTE

Such movement could also indicate a broken spring eye or leaf spring, see Figure 6-4. Component replacement is required.

## SPRING EYE LUBRICATION

The RT•RTE suspensions use bronze, ball indented bushings in the leaf spring eyes. These bushings ride on hardened steel pins which have lubrication channels.

Lubrication should be performed during routine vehicle Preventive Maintenance schedules with a good quality chassis lubricant. For severe service operations, the frequency of lubrication should be increased.

The rear of the chassis should be raised to relieve load on the bushings and pins to allow the proper flow of lubricant around the pins and bushings. Continue to lubricate until lubricant comes out both ends of the bushing. If the pin will not accept lubricant, remove the pin and clean the lubrication channels where lubricant may have hardened.

## BEAM END AXLE BRACKETS

### NOTE

The axle brackets are furnished and welded into position by the vehicle manufacturer or axle manufacturer.

When an equalizing beam is removed for repair or inspected, check for signs of movement. Also inspect the axle brackets:

- For damage and/or cracks, see Figures 6-5 and 6-6
- Measure the two dimensions on the axle bracket legs, see Figure 6-6

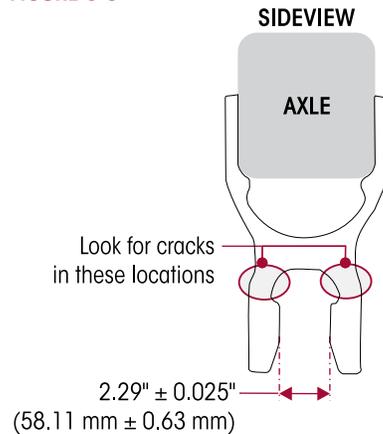
An axle bracket outside of the measurement range, damaged or cracked must be repaired or replaced. Consult the vehicle manufacturer for inspection, component repair and replacement instructions.

### PHYSICAL INSPECTION

#### ■ Bar Pin Style

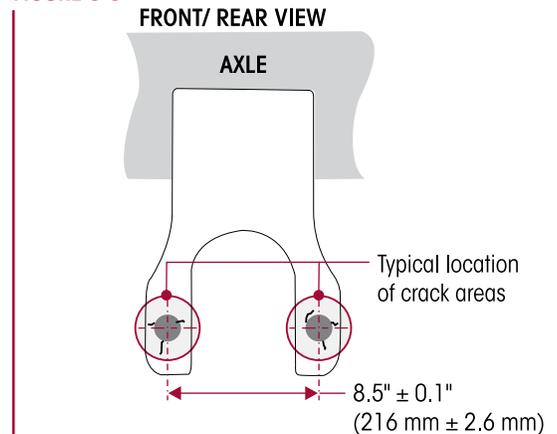
1. Inspect the axle brackets for damage or cracks in the locations shown in Figures 6-5 and 6-6. Any axle bracket that is found damaged or cracked must be repaired or replaced.
2. Measure the distance between the axle bracket legs for correct width, refer to Figures 6-5 and 6-6 for measurement location and dimensions. An axle bracket outside of the measurement range must be repaired or replaced.
3. Consult the vehicle manufacturer for inspection, component repair and replacement instructions.

FIGURE 6-5



**NOTE:** Typical axle brackets shown

FIGURE 6-6



### ■ Adapter Style

1. Inspect the 2½" (64 mm) diameter holes in each of the axle bracket legs as shown in Figure 6-7.

2. Remove any burrs or material left there by the old adapters.
3. Use a new adapter as a gauge for fit, being sure it enters the holes from the outside of each bracket leg.

The **A** dimension between the inside surfaces of the axle bracket legs for beam end adapter style, as shown in Figure 6-7 as dimension, must be as in determined in Table 6-1.

FIGURE 6-7

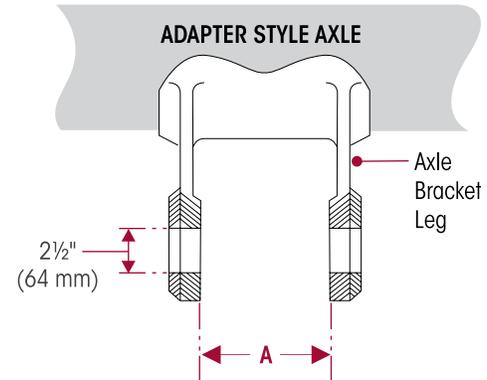


TABLE 6-1

Capacity	End Bushing Length	Dimension A
	Inches	Inches
34K	5¼" (133.4 mm)	5.265" ± 0.005" (133.73 mm ± 0.13 mm)
34K • 38K - 52K	5¾" (146.1 mm)	5.765" ± 0.005" (146.43 mm ± 0.13 mm)
48K - 52K	6" (152.4 mm)	6.015" ± 0.005" (152.78 mm ± 0.13 mm)

## EQUALIZING BEAM END CONNECTION

An inspection of the beam end connections are necessary when a vehicle is in the shop for major repair work or every six months, whichever comes first. Periodic visual inspection by the driver and service personnel is also recommended. Off-highway and severe service operating conditions require more frequent inspections than on-highway service operation.

### NOTE

The equalizing beam end connection requires that the fasteners are tightened to torque specifications to maintain the clamp load of the axle bracket legs to the bar pin. All bushing motion is accommodated by rubber deflection.

### VISUAL INSPECTION

#### ■ Bar Pin Style

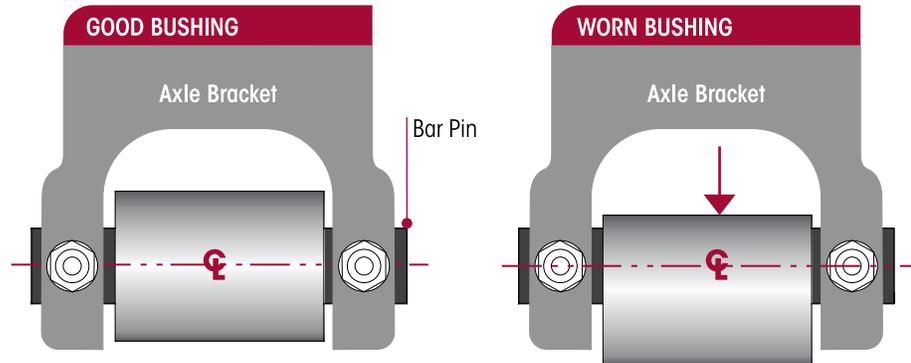
1. Chock the wheels.
2. Visually inspect suspension components for signs of movement or excessive wear.
  - Inspect alignment shims in equalizing beam end for looseness. Lightly tap on the alignment shims to see if they can be moved. If movement is detected, tighten fasteners to the proper torque value, see Figure 6-10.
  - Inspect the equalizing beam end connection for signs of excessive wear or looseness.

### SERVICE HINT

At the equalizing beam end connection, which is visibly cleaner than the other connections, may indicate a loose connection.

- Look for worn, frayed or distorted rubber in the bar pin beam end bushing, see Figure 6-8.
- Look for the equalizing beam to be lower in the beam hanger, see Figure 6-8.
- If the bar pin beam end bushing is visually offset a floor jack test should be performed, refer to Jack Test in this section.

FIGURE 6-8



A **GOOD** bushing will appear centered the centerline of the bar pin in the axle bracket and equalizing beam end hub

A **WORN** bushing will appear offset/below the centerline of the bar pin in the axle bracket and equalizing beam end hub

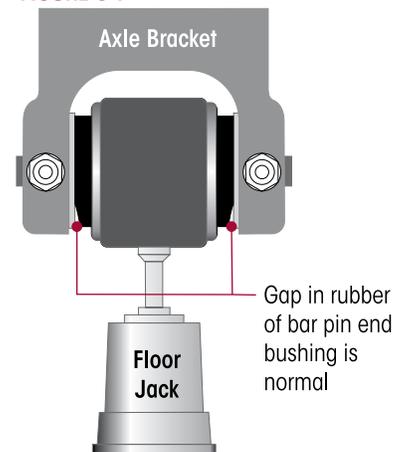
### JACK TEST

1. Place a jack under each beam end as shown. Raise the jack to check for movement in the connection or rubber components, see Figure 6-9.

### NOTE

The gap at each side of the visible rubber on the lower part of the bar pin end bushing is normal, see Figure 6-9, and is not an indication to replace the bushing. Because all rubber end bushings are in compression, with the load bearing on the top side, the lower side of the rubber is slightly relieved, allowing the rubber to move inward, and a gap appears.

FIGURE 6-9



### PHYSICAL INSPECTION

#### ■ Bar Pin Style

### WARNING

IF BAR PIN MOVEMENT OR LOOSENESS IS NOTED IN THE EQUALIZING BEAM END HUB, DO NOT OPERATE THE VEHICLE. REPLACE THE RUBBER END BUSHINGS AND ALL CONNECTING PARTS. THE ABOVE CONDITION CAN RESULT IN COSTLY REPAIR, DOWNTIME, POSSIBLE SEPARATION OF COMPONENTS, ADVERSE VEHICLE HANDLING, PROPERTY DAMAGE, OR PERSONAL INJURY.

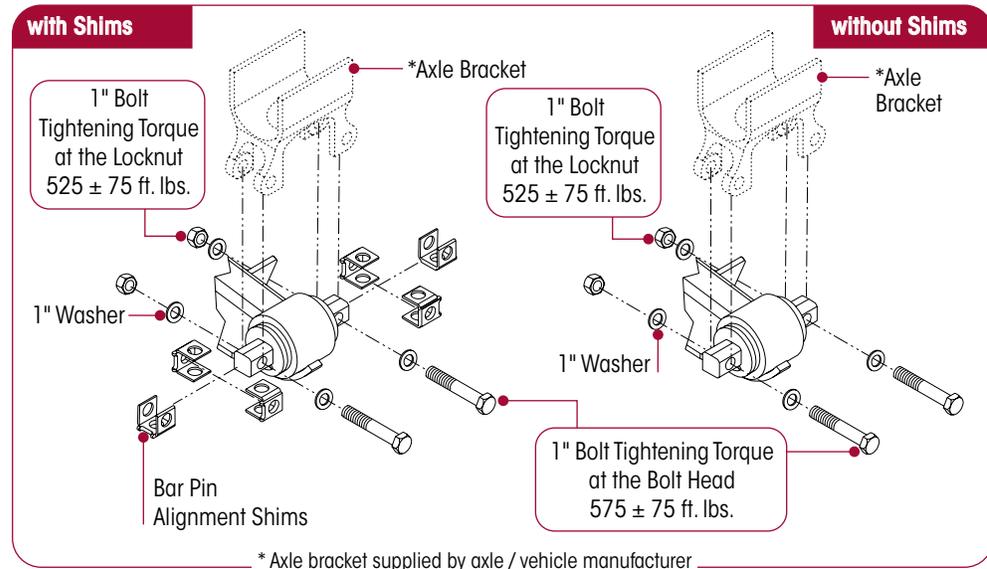
### SERVICE HINT

An equalizing beam end connection that is visibly cleaner than the other connections may indicate a loose connection.

2. If bar pin end bushing movement or looseness is detected in the equalizing beam end hub, replace the end bushings and all connecting parts. Refer to the Component Replacement Section of this publication.
3. Check and record torque values for each 1" (25.4 mm) bar pin fastener, see Figure 6-10. Ensure all fasteners are tightened to the following:
  - At the **locknuts** tighten to  $525 \pm 75$  foot pounds torque
  - At the **bolt head** tighten to  $575 \pm 75$  foot pounds torque
4. Recheck equalizing beam end connections for signs of looseness.
  - Inspect alignment shims in equalizing beam end for looseness. Lightly tap on the alignment shims to see if they can be moved. If movement is detected, tighten fasteners to the proper torque value, see Figure 6-10.
  - Inspect equalizing beam end connection for signs of excessive wear or looseness.

5. If bar pin looseness is still detected in the equalizing beam end hub, **DO NOT** operate the vehicle. One or more components will require replacement, see Component Replacement Section of this publication.

FIGURE 6-10

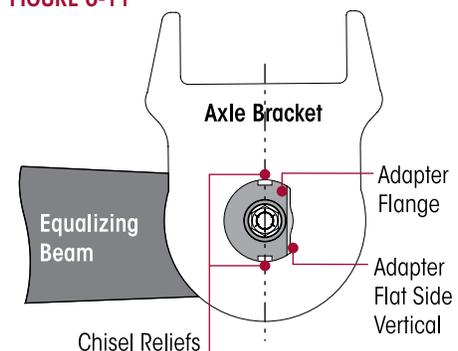


## VISUAL INSPECTION

### ■ Adapter Style

1. Check the wheels.
2. Visually inspect suspension components for signs of movement or excessive wear.
  - Inspect equalizing beam end connection for signs of excessive wear or looseness.
  - Look for worn, frayed or distorted rubber in the beam, see Figure 6-8.
  - Look for the equalizing beam to be lower in the axle bracket, see Figure 6-8.
  - If it is visually offset a jack test should be performed. Place a jack under each beam end as shown. Raise the jack to check for movement in the connection or rubber components, see Figure 6-9.
3. The beam end adapter style connections have the flange of the adapter cut off for assembly clearance with the axle housing bowl.
  - The flat must be positioned vertically as shown in Figure 6-11. If the flat of the adapter position is incorrect, removal of the fasteners will be necessary to correct position, refer to the Adapter Style End bushings in the Component Replacement Section.

FIGURE 6-11



## PHYSICAL INSPECTION

### ■ Adapter Style

#### WARNING

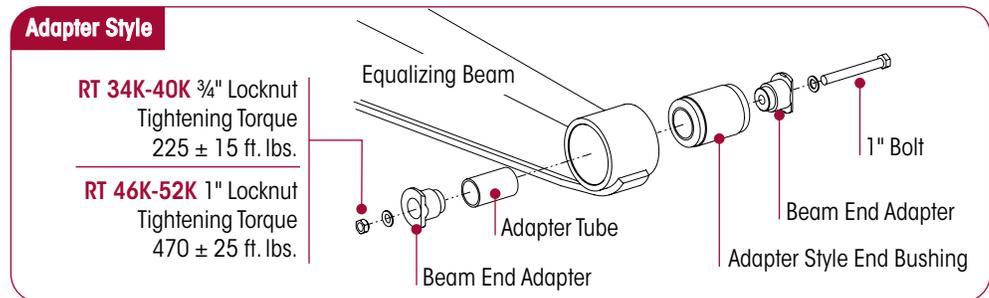
IF BUSHING MOVEMENT OR LOOSENESS IS NOTED IN THE EQUALIZING BEAM END HUB, DO NOT OPERATE THE VEHICLE. REPLACE THE RUBBER END BUSHINGS AND ALL CONNECTING PARTS. THE ABOVE CONDITION CAN RESULT IN COSTLY REPAIR, DOWNTIME, POSSIBLE SEPARATION OF COMPONENTS, ADVERSE VEHICLE HANDLING, PROPERTY DAMAGE, OR PERSONAL INJURY.

#### SERVICE HINT

An equalizing beam end connection that is visibly cleaner than the other connections may indicate a loose connection.

1. If bushing movement or looseness is detected in the equalizing beam end hub, **DO NOT** operate vehicle. Replace the equalizing beam end bushings and all connecting parts. Refer to the Component Replacement Section of this publication.
2. Check and record torque values, see Figure 6-12. Ensure all fasteners are tightened to the following:
  - **RT 34K-40K** – 225 ± 15 foot pounds torque
  - **RT 46K-52K** – 470 ± 25 foot pounds torque
3. Recheck equalizing beam end connections for signs of looseness.

FIGURE 6-12



## BAR PIN END BUSHING

An indication that the bar pin end bushing requires replacement is when one or more of the following conditions apply:

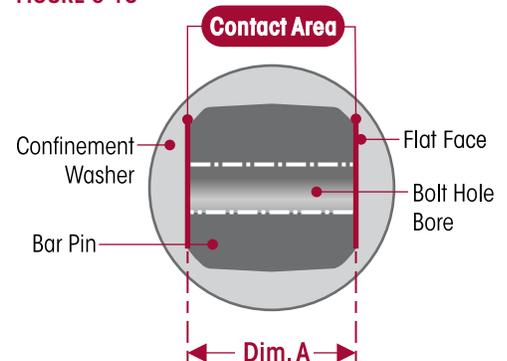
Visual inspection of:

- Contact areas (the flat face areas where bar pin contacts the axle bracket) on the bar pin reveals signs of excessive wear.
- The bolt holes in the bar pin reveal signs of elongation or wear, see Figure 6-13.

Bar pin replacement is required if the thickness between bar pin contact areas measures less than (see Figure 6-13):

- **With shims** – 1.874" (47.59 mm)
- **Without shims** – 2.252" (57.2 mm)

FIGURE 6-13



**Dim. A** - replacement is required if, bar pin measurement is less than:

- **With Shims** - 1.874" (47.59 mm)
- **Without Shims** - 2.252" (57.2 mm)

## BAR PIN SHIMS

An indication that the bar pin shims require replacement is when one or more of the following conditions apply:

- Visual inspection of contact areas on the shim reveals signs of excessive wear.
- The thickness of any single leg on the shim is less than the measurement shown in Figure 6-14, replacement is required.

FIGURE 6-14

	Part Number 50130-000	Part Number 50131-000	Part Number 57026-000	Original Thickness of Shim Leg	Minimum Thickness Required	Part Number
				1/8" (3.2 mm)	0.123" (3.1 mm)	50131-000
				3/16" (4.8 mm)	0.186" (4.7 mm)	50130-000
				1/4" (6.4 mm)	0.248" (6.3 mm)	50131-000
				1/8" (3.2 mm) Leg	3/8" (9.5 mm) Leg	57026-000

## RUBBER CENTER BUSHING

An inspection of the center bushing is necessary when a vehicle is in the shop for major repair work or every twelve months. Look for:

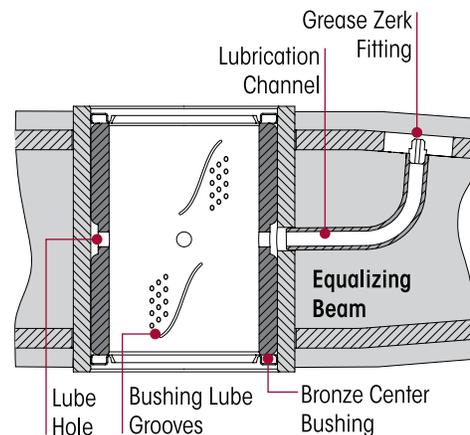
- Any metal to metal contact
- Worn, frayed, or distorted rubber in the center bushing
- The bushing inner metal that is not centered in the bushing
- Any equalizing beam to saddle contact

## BRONZE CENTER BUSHING

### LUBRICATION

1. The grease zerk fitting is located near the center hub area of the equalizing beam.
2. The rear of the chassis should be raised to relieve load on the bushings to allow the proper flow of lubricant around the bushings.
3. Lubricate bronze center bushings with NLGI#2 - EP (Extreme Pressure) lithium base grease until clean grease exits on both sides of the beam center hub. If the grease zerk will not accept lubricant, remove the grease zerk fitting and clean the lubrication channels where lubricant may have hardened, see Figure 6-15.
4. Refer to the Hendrickson recommended inspection intervals table at the beginning of the Preventive Maintenance section for more information on lubrication intervals.

FIGURE 6-15



### PHYSICAL INSPECTION

1. Inspect the bronze center bushing for wear.
2. Raise the saddle with a jack.

- If there is saddle movement of 0.125" (3.175 mm) or more before the equalizing beam raises this indicates excessive wear, and the bushing should be replaced.

### CAUTION

OPERATING A VEHICLE WITH AN INSUFFICIENT NUMBER OF THRUST WASHERS MAY ALLOW SIDE MOVEMENT BETWEEN THE SADDLES AND THE EQUALIZING BEAM THAT CAN AFFECT VEHICLE HANDLING AND STEERING BY THE OPERATOR AND CAN CAUSE PREMATURE COMPONENT WEAR.

- Original factory installations of bronze center bushings may have only one thrust washer on each side of each beam center hub. Often there is room for additional thrust washers.
- Hendrickson recommends that in all cases additional washers be installed until the gap is less than the thickness of one thrust washer, i.e., install as many thrust washers as will fit.

## LONGITUDINAL AND TRANSVERSE TORQUE RODS

### WARNING

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

All torque rods need to be inspected for looseness by one of the following methods.

- Method 1 — For Tractor applications only** with brakes applied, slowly rock the empty vehicle with power while a mechanic visually checks the action at both ends.
- Method 2** — with the vehicle shut down, a lever check can be made with a long pry bar placed under each rod end and pressure applied.

Visually inspect torque rod bushings for torn or shredded rubber, inspect for bent, cracked, or broken torque rods and also for end hubs that have an elongated "oval" shape. Any of these conditions require component replacement. If there is metal-to-metal contact, this is a sign of excessive bushing wear and the bushing needs to be replaced.

### NOTE

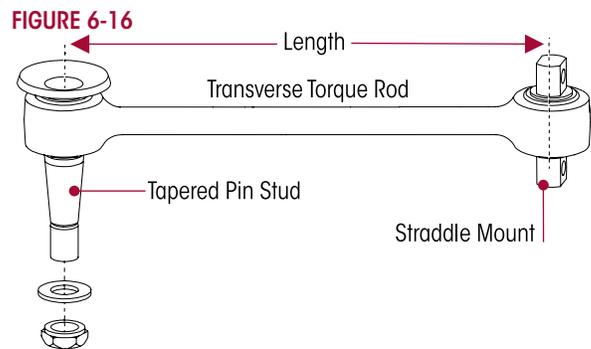
The lengths of the torque rods are determined by the vehicle manufacturer. Refer to vehicle manufacturer's service instructions for the proper torque rod length.

The lengths of these torque rods may be fine tuned by adding or removing shims at the straddle mount end of the torque rods in order to correct drive line angles or axle centering under the frame. The transverse torque rods center the axles under the frame and control axle walk-out during cornering.

A two-piece torque rod is also available to cut and weld to the desired length, see Hendrickson publication No. 45745-148.

The mounting brackets at the axle ends of the torque rods are furnished and welded into position on the axle housings by vehicle manufacturer or the axle manufacturer.

Both types of rods may have torque rod bushings designated "straddle mount" or "tapered stud" as shown in Figure 6-16. Whether the bushings are straddle mount or taper pin stud (see Figure 6-16), they can be replaced by pressing out the worn bushing and installing a new genuine Hendrickson bushing. For proper replacement instructions, refer to the Component Replacement Section in this publication.



It is important to check the torque rod fasteners for proper torque values, refer to the Torque Specifications Section in this publication.

### NOTE

Hendrickson recommends Grade 8 bolts, hardened flat washers and Grade C locknuts be used for all straddle mount torque rods.

## AXLE STOP INSPECTION

The axle stops are supplied by the vehicle manufacturer.

- Check the axle stop to frame fasteners for proper torque. Follow the vehicle manufacturer's specifications.
- Visually inspect for damage or excessive wear. Replace as necessary per the vehicle manufacturer's specifications.

## SADDLE CONNECTION

Visually inspect for any signs of movement or looseness. Ensure:

- Each saddle is centered on each equalizing beam center bushing.
- The center bushing inner metal is full seated to the saddle.
- The saddle cap fasteners are tightened to the proper torque, see Figure 6-17. Saddle cap fasteners have a phosphate oil coating.

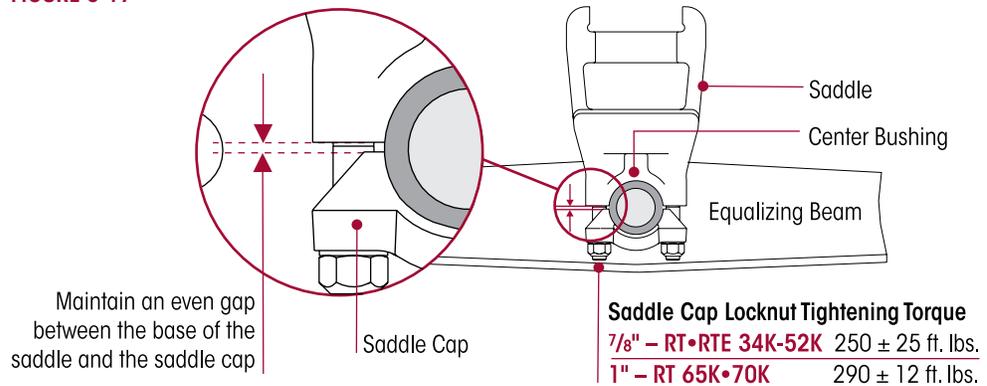
### CAUTION

THE SADDLE ASSEMBLY IS ATTACHED TO THE CENTER BUSHINGS OF EACH EQUALIZING BEAM WITH TWO (2) SADDLE CAPS. EACH SADDLE CAP USES TWO (2) STUDS TO CLAMP THE CENTER BUSHING INNER METAL TO THE SADDLE. THE SADDLE CAPS MUST BE INSTALLED SO THAT THERE IS AN EVEN GAP BETWEEN THE SADDLE CAPS AND THE BASE OF THE SADDLE ASSEMBLY AS SHOWN IN FIGURE 6-17. IF THEY ARE NOT INSTALLED EVENLY THE SADDLE ASSEMBLY COULD BECOME DEFORMED, RESULTING IN BENT BOLTS OR DAMAGED SADDLE ASSEMBLY.

### WARNING

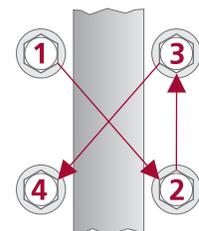
LOOSE OR OVER TORQUED FASTENERS CAN CAUSE COMPONENT DAMAGE, ADVERSE VEHICLE HANDLING, PROPERTY DAMAGE, OR SEVERE PERSONAL INJURY. MAINTAIN CORRECT TORQUE VALUES AT ALL TIMES. CHECK TORQUE VALUES ON A REGULAR INSPECTION INTERVAL.

FIGURE 6-17



1. While tightening the saddle cap stud fasteners maintain an even gap between the saddle assembly base and the saddle cap, see Figure 6-17.
2. Center the saddle on the equalizing beam center bushing.
3. Tighten the **saddle cap fasteners** evenly in 50 foot pounds increments in the proper sequence to achieve uniform bolt tension as shown in Figure 6-18 until the final torque value is achieved. **DO NOT** exceed specified torque on saddle cap fasteners.

FIGURE 6-18



- **RT•RTE 34K-52K** – Tighten 7/8" to 250 ± 25 foot pounds torque
- **RT 65K•70K** – Tighten 1" to 290 ± 12 foot pounds torque

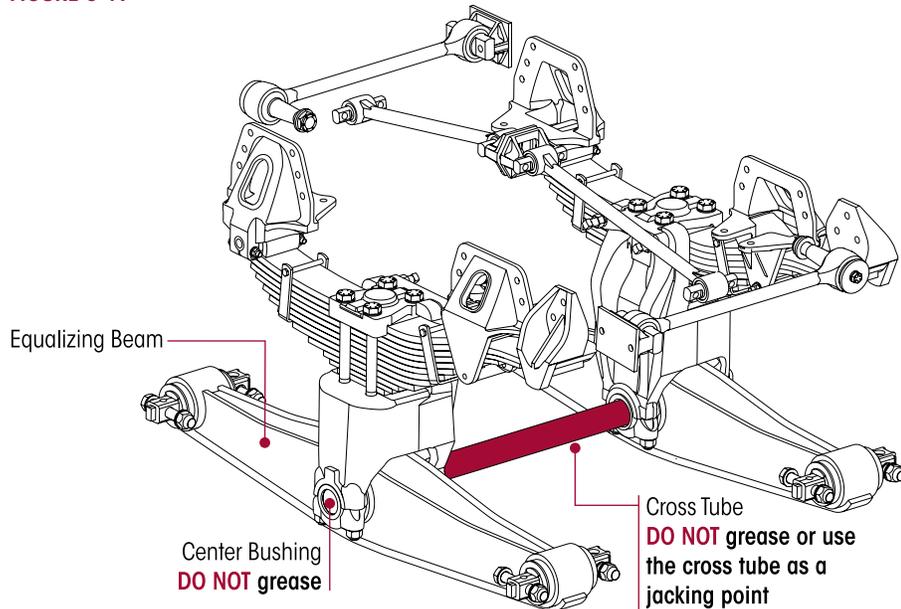
## CROSS TUBE

The RT•RTE cross tube connects the two (2) equalizing beams through the equalizing beam's center bushings, see Figure 6-19. The cross tube has clearance to float side-to-side in the center bushings.

The length of the cross tube will allow side-to-side movement of approximately 1.9685" (50 mm). For this reason, the cross tube **may appear polished** or have missing paint at each end where it enters into the center bushings, this is normal.

**DO NOT** grease or lubricate the cross tube or the center bushing and **DO NOT** use the cross tube as a jacking point, see Figure 6-19.

**FIGURE 6-19**



## VISUAL INSPECTION

- Clean the cross tube and inspect it for cracks or excessive wear 8" to 10" from each end where it enters into the equalizing beam center bushings.
- Visually inspect the overall condition of the cross tube for dents, dings, or bent condition, replace as necessary.

## NOTE

A bent cross tube may cause misalignment of the axles, which may cause abnormal tire wear.

- Use a straight edge to inspect the straightness of the cross tube, replace as necessary.

## WARNING

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

- DO NOT USE THE SUSPENSION CROSS TUBE, BAR PIN AXLE BRACKETS AS A JACKING POINT, SEE FIGURE 6-19, REFER TO VEHICLE MANUFACTURER FOR PROPER JACKING INSTRUCTIONS.
- ACCEPTABLE LIFTING POINTS FOR A VEHICLE AT THE RATED LOAD INCLUDE BUT NOT LIMITED TO: THE AXLE, EQUALIZING BEAM, AND THE VEHICLE FRAME RAIL. REFER TO THE VEHICLE MANUFACTURER FOR PROPER JACKING INSTRUCTIONS.

## SECTION 7

# Alignment & Adjustments

The points on the suspension that control alignment are determined by the vehicle manufacturer, these locations are: the frame hangers on the frame and the equalizing beam hangers on the axles.

### AXLE PINION ANGLE

Drive axle pinion angles are established by the vehicle manufacturer. If pinion angle adjustment is required, check for proper angles with the vehicle manufacturer. Pinion angle is set by the longitudinal torque rod length.

#### TO CHECK THE PINION ANGLE

1. Use a work bay with a level floor.
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. Roll to a stop without the brakes being applied. **DO NOT** set the parking brake.
3. Chock the front wheels of the vehicle.
4. Place a digital protractor on the axle housing as shown in Figure 7-1.
5. Check to see if the pinion angle is correct per the vehicle manufacturer's specified range.
6. If necessary, add/remove shims at the longitudinal torque rod connections as required to achieve the proper pinion angle.
7. When the pinion angle is correct tighten all fasteners to the proper torque specifications per the vehicle manufacturer and recheck the pinion angles.
8. Remove wheel chocks.

FIGURE 7-1



### DRIVE AXLE ALIGNMENT

#### NOTE

Drive axle alignment with suspensions equipped with adapter style beam or non-shim style end connections **ARE NOT** adjustable.

Computerized alignment equipment is the preferred method of measuring alignment. To calculate the shim thickness required, the target offset must be converted to thrust angle, see alignment equipment manufacturer for procedures. If, however, computerized axle alignment equipment is not available refer to the following Inspection in this section.

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

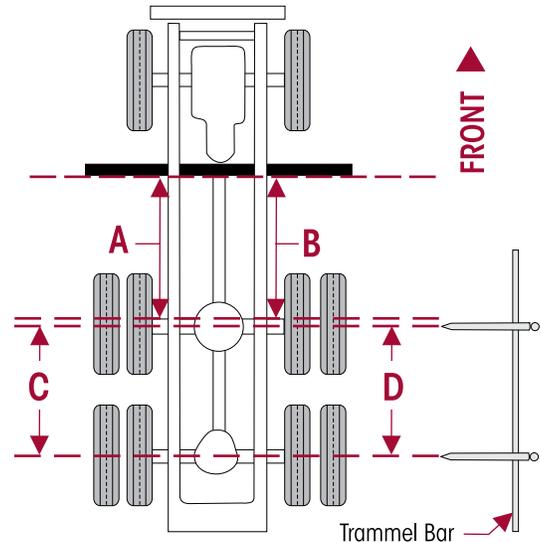
#### NOTE

Proper vehicle alignment can only be achieved when all axles are aligned to the vehicle's centerline and the steering axle's caster, camber and toe-in settings are within specifications.

## 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. This will slacken or loosen the suspension as the vehicle is positioned. End with all wheels positioned straight ahead.
3. **DO NOT** set the parking brake. Chock the front wheels of the vehicle.
4. Verify the vehicle system air is 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 at the same size.
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, dimensions **A** and **B**.
10. Calculate the difference between measurements **A** and **B**.
  - a. If the **front** drive axle is within vehicle manufacturer's specifications, proceed to check the rear drive axle (Step 11).
  - b. If alignment of the **front** drive axle **IS NOT** within the vehicle manufacturer's specifications, then the alignment of this axle **MUST** be corrected **BEFORE** measuring the rear drive axle alignment (Step 11).
  - c. If the suspension is equipped with bar pin end bushings, correct the alignment of this axle by following the bar pin alignment instructions in this section.

## NOTE

Since the remaining drive axle will be aligned relative to the front drive axle, it is essential that the front drive axle is aligned within the vehicle manufacturer's specifications prior to the alignment of the remaining drive axle.

11. Using a trammel bar, measure the distance from the spindle center of the **front** drive axle to the spindle center of the rear drive axle on both sides of the vehicle; see Figure 7-2, **C** and **D**.
12. Calculate the difference between measurements **C** and **D**.
  - a. If the measurements are within the vehicle manufacturer's specifications, then the **rear** drive axle alignment is acceptable.
  - b. If alignment of the **rear** drive axle **IS NOT** within the vehicle manufacturer's specifications, then the alignment of this axle **MUST** be corrected.
  - c. If the suspension is equipped with bar pin end bushings, correct the alignment of this axle by following the Bar Pin with Shims Alignment instructions in this section.
13. Recheck measurements to confirm adjustments. Repeat Steps 10 through 12 until the correct alignment is achieved.
14. After all drive axles are aligned, check the pinion angle of each drive, refer to the Axle Pinon Angle in this section.

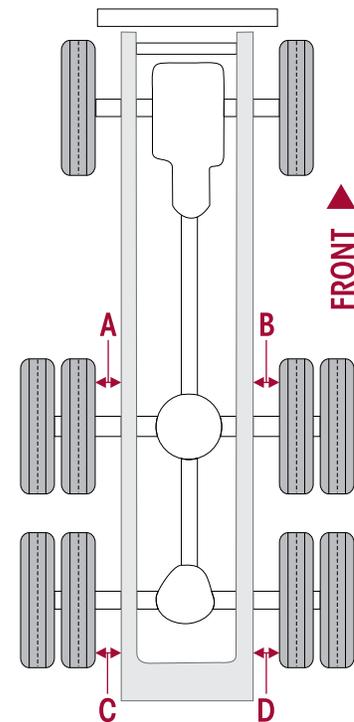
## LATERAL ALIGNMENT

### NOTE

For RT•RTE suspensions equipped with bronze center bushings there is no lateral alignment.

1. Use a work bay with a level floor.
2. Drive the vehicle slowly, straight ahead. Try to slacken or loosen the suspension as the vehicle is positioned. End with all wheels positioned straight ahead. Try to roll to a stop without the brakes being used. **DO NOT** set the parking brake.
3. Chock the front wheels of the vehicle.
4. Measure from the outside of the frame rail to the rim flange of the inner tire. Record the measurement **A** and **B**, see Figure 7-3.
5. Measure the same distance on the opposite side of the same axle. Record the measurement **C** and **D**, see Figure 7-3.
6. Verify the axle lateral alignment is within the vehicle manufacturer's specifications. Adding or removing shims that are located between the transverse torque rod and the frame rail will normally correct the axle lateral alignment.
  - A general rule of thumb is to use a torque rod shim with a thickness that is half of the difference between the two measurements

FIGURE 7-3



### EXAMPLE

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

### NOTE

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

## BAR PIN WITH SHIMS ALIGNMENT

The alignment feature consists of specially designed, tight tolerance steel shims which fills the  $\frac{3}{8}$ " (9.5 mm) total gap between the bushing's bar pin and the axle bracket legs. The gap must be filled by placing the shims on the bushing assembly in one of the positions shown in Figures 7-4 or 7-6. Hendrickson has three shim design options for alignment, see Figure 7-7.

### NOTE

Drive axle alignment with suspensions equipped with adapter style beam or non-shim style end connections **ARE NOT** adjustable.

### WARNING

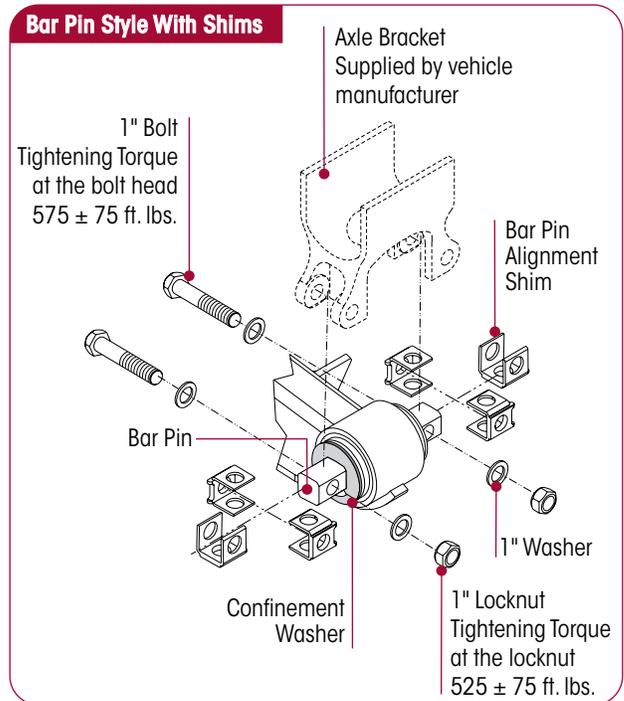
A BAR PIN SHIM MUST BE INSTALLED AT EACH BOLT LOCATION. THE SAME PART NUMBER SHIM IN THE SAME ORIENTATION MUST BE USED AT BOTH BOLT LOCATIONS ON ANY ONE END BUSHING. DO NOT INSTALL OR STACK MORE THAN ONE SHIM AT EACH BOLT LOCATION. USE GENUINE HENDRICKSON BAR PIN SHIMS, DO NOT USE STANDARD WASHERS. FAILURE TO FOLLOW THESE WARNINGS MAY RESULT IN IMPROPER VEHICLE ALIGNMENT, FRACTURE OF THE AXLE BRACKET OR BAR PIN WHICH COULD RESULT IN ADVERSE VEHICLE HANDLING AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

## ALIGNMENT ADJUSTMENT PROCEDURE

Computerized alignment equipment is the preferred method of measuring alignment. To calculate the shim thickness required, the target offset must be converted to thrust angle, see alignment equipment manufacturer for procedures. If alignment of the drive axles is required, as determined by an alignment inspection procedure, the following Steps will need to be performed.

1. Determine the direction of axle thrust angle. Figure 7-5 illustrates the forward drive axle with a thrust angle to the left (-negative thrust).

FIGURE 7-4



### SERVICE HINT

Axle movement is in the same direction as whichever side of the bar pin receives an increase in shim thickness, see Figure 7-6.

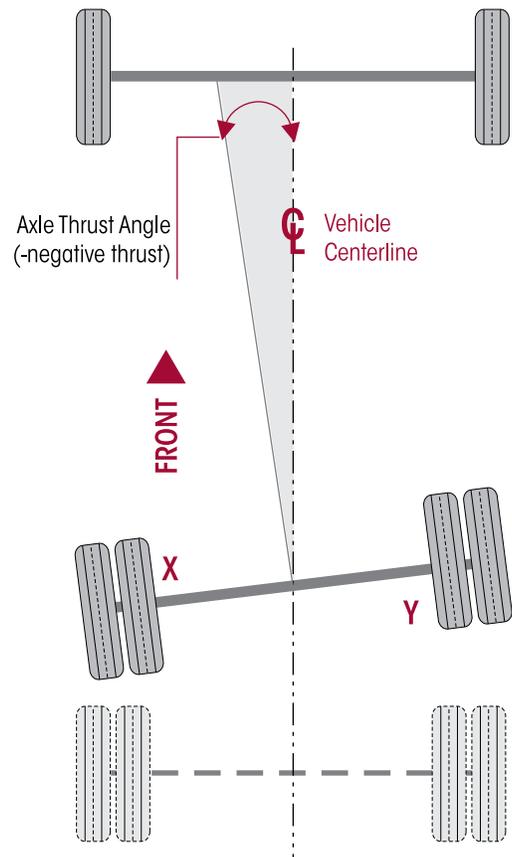
2. To determine where to adjust shim thickness use measurement (A and B) for the front drive axle or (C and D) for the rear drive axle, see Figure 7-2.

### SERVICE HINT

Axle movement will be on the side of the bar pin where shim thickness is increased. For example, to correct the axle thrust angle illustrated in Figure 7-5, shim thickness will need to be increased at the front of the bar pin (Location X) and/or the rear of the bar pin (Location Y).

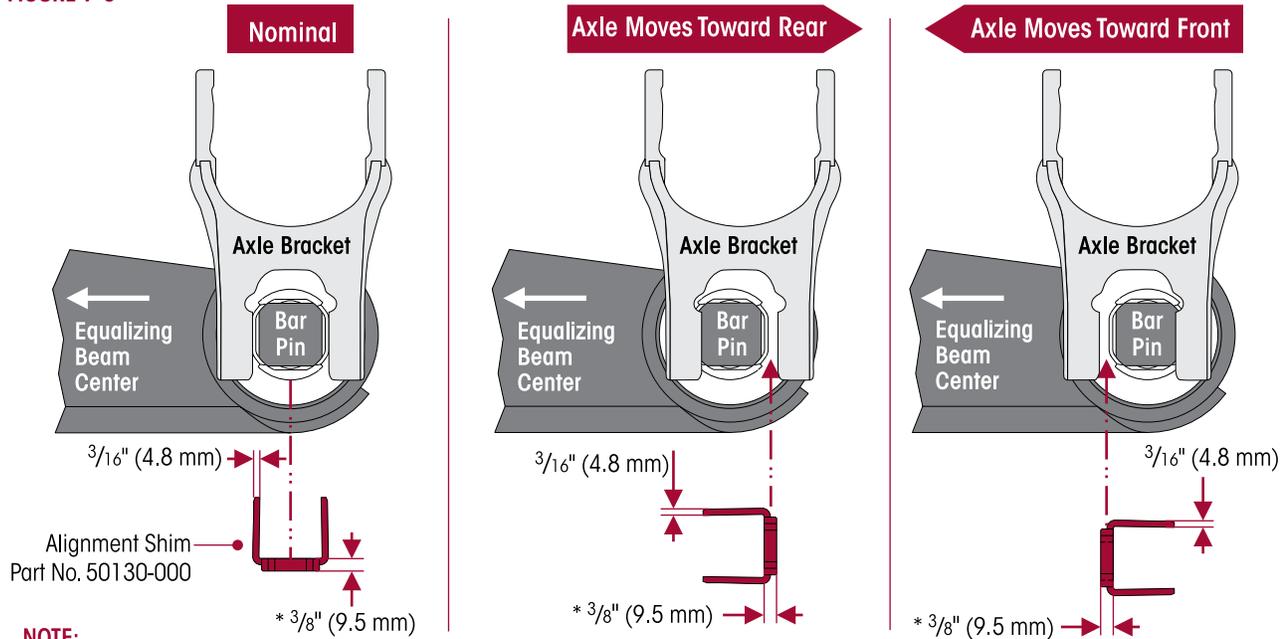
3. Chock the wheels of the front axles to prevent vehicle movement during service.
4. Raise the frame of the vehicle to remove the load from the suspension. Support the frame at this height.
5. Support the equalizing beam and remove the fasteners from the end bushing where the bar pin alignment shim adjustment is being made.
6. Adjust shim thickness to move the axle in the desired direction, see Figure 7-6.

FIGURE 7-5



**WARNING**

EACH BAR PIN END BUSHING HAS ONE INBOARD AND ONE OUTBOARD ALIGNMENT SHIM, FOR A TOTAL OF FOUR SETS OF TWO ALIGNMENT SHIMS PER SUSPENSION. EACH SET OF ALIGNMENT SHIMS ON A BAR PIN END BUSHING FOR A PARTICULAR BEAM END BUSHING MUST BE INSTALLED IN THE SAME ORIENTATION. SHIM ORIENTATION MAY DIFFER FOR EACH BEAM BUSHING. SEE FIGURE 7-8. FAILURE TO FOLLOW THESE WARNINGS MAY RESULT IN THE FRACTURE OF EITHER THE AXLE BRACKET OR BAR PIN WHICH COULD RESULT IN THE LOSS OF VEHICLE CONTROL AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

**FIGURE 7-6**

**NOTE:**

\* Refer to Figure 7-7 for leg and back dimensions on shim Part Nos. 50131-000 and 57026-000

**WARNING**

THE BAR PIN ALIGNMENT SHIM (PART NO. 50130-000) MUST BE INSTALLED WITH THE FOLDED EDGE FACING AWAY FROM THE CONFINEMENT WASHER, SEE FIGURE 7-7. FAILURE TO DO SO MAY RESULT IN SHIM DAMAGE, IMPROPER ALIGNMENT, DAMAGE OR FRACTURE OF THE AXLE BRACKET OR BAR PIN WHICH COULD RESULT IN ADVERSE VEHICLE HANDLING AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

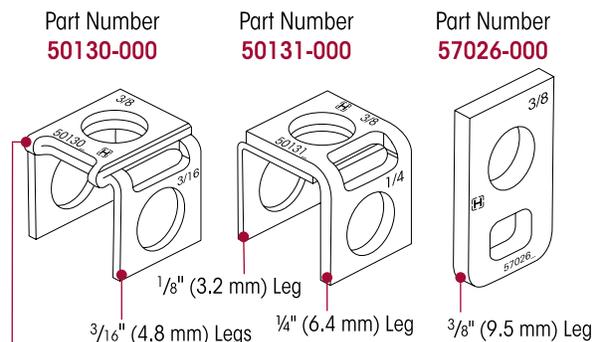
7. Install the new end bushing fasteners and tighten to:
  - At the **locknut** to  $525 \pm 75$  foot pounds
  - At the **bolt head** to  $575 \pm 75$  foot pounds torque
8. Remove support and lower the vehicle.
9. Verify the axles' alignments are within the vehicle manufactures tolerance.
10. Set brakes and remove wheel chocks.

FIGURE 7-7

## BAR PIN ALIGNMENT SHIMS

The following service notes will help when performing Hendrickson equalizing beam bar pin alignment

- The standard alignment shims supplied with each suspension (P/N 50130-000) have two  $\frac{3}{16}$ " (4.8 mm) legs and a  $\frac{3}{8}$ " (9.5 mm) back. Rotating the shim pairs 90° will change the axle alignment in  $\pm \frac{3}{16}$ " (4.8 mm) increments.
- If a finer adjustment is required use alignment shim (P/N 50131-000). This alignment shim has one  $\frac{1}{8}$ " (3.2 mm) leg, one  $\frac{1}{4}$ " (6.4 mm) leg, and a  $\frac{3}{8}$ " (9.5 mm) back. A total of  $\frac{3}{4}$ " (19 mm) adjustment is achievable to the axle. A  $\frac{3}{8}$ " (9.5 mm) flat shim is also available (P/N 57026-000).
- $\frac{1}{16}$ " (1.5 mm) shim thickness increases thrust angle by 0.10°.
- To accomplish a thrust angle adjustment rotate the alignment shims on the bar pin of the end bushing. Axle movement will be in the direction of the shim thickness increase.
- 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.



**NOTE** The folded edge in 50130-000 shim must be positioned away from bushing

**Example:** The alignment equipment shows the front drive axle to have a 0.40° thrust angle to the left. This will require a  $\frac{1}{4}$ " (6.4 mm) shim thickness increase to the front side of the left front equalizing beam end bushing. If there is less than  $\frac{1}{4}$ " (6.4 mm) of adjustment available at this location then some of the adjustment will have to be made at the rear of the right front end bushing. In this case a  $\frac{1}{8}$ " (3.2 mm) shim thickness increase at the front side of the left front bar pin **AND** a  $\frac{1}{8}$ " (3.2 mm) shim thickness increase at the rear side of the right front bar pin will correct the 0.40° thrust angle.

## SECTION 8

# Component Replacement

Experience in servicing the RT and RTE series suspensions indicates that when a major overhaul is required, the complete tandem unit should be removed from the frame. However, the torque rods, leaf spring assembly, equalizing beams and other components may be serviced separately.

### FASTENERS

Hendrickson recommends that when servicing a vehicle, replace all 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.

### NOTE

Hendrickson recommends the use of Grade 8 bolts and Grade C locknuts. If flange head bolts and locknuts are not used then hardened structural washers must be used under bolt heads and locknuts.

### 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. 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.

### DISASSEMBLY

1. Place the vehicle on a level floor.
2. Chock the wheels.
3. Raise the frame to remove the load from the suspension.
4. Support the frame.
5. Raise and support the axle.
6. Remove the tires.
7. Remove and discard the #1 forward hanger pinch bolt and fasteners, see Figure 8-1.
8. Drive out the pin in Figure 8-1.
9. Remove and discard the #2 rear spring hanger fasteners, see Figure 8-2.
10. Remove and discard the rebound bolt spacer from the leaf spring assembly.

FIGURE 8-1

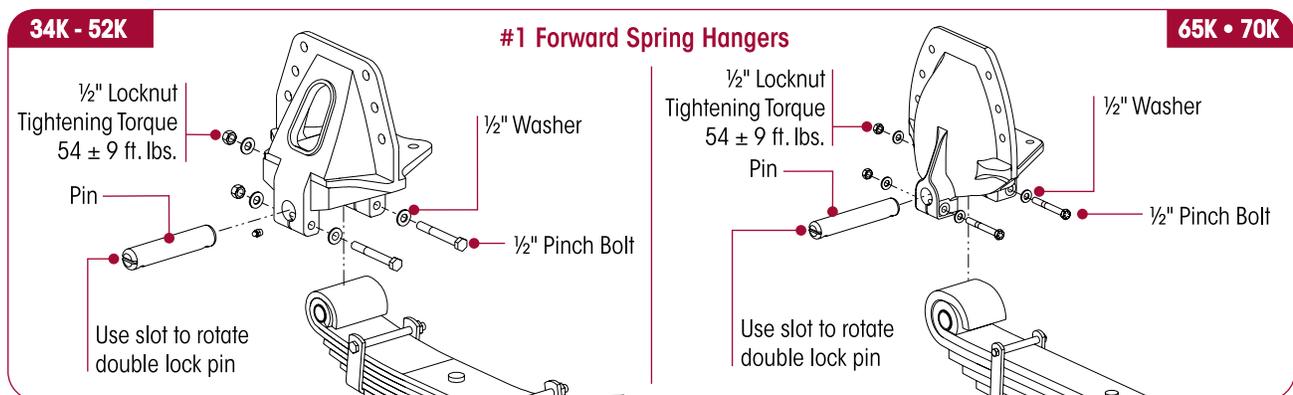


FIGURE 8-2

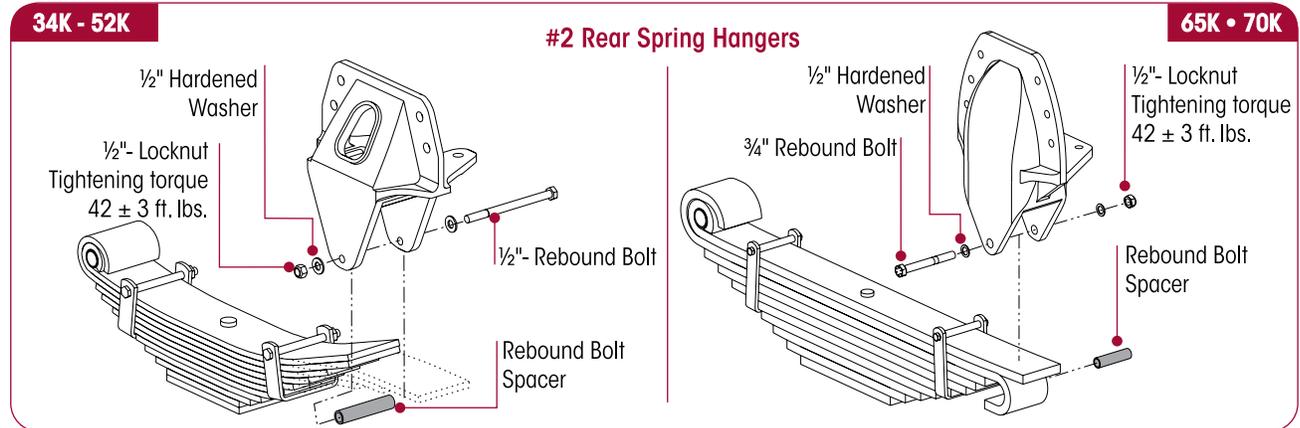
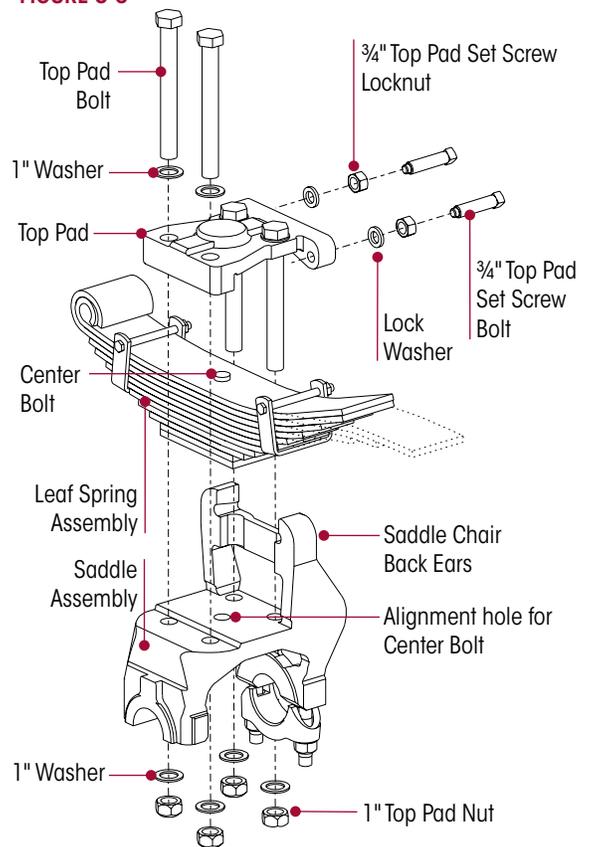


FIGURE 8-3



11. Loosen, **DO NOT** remove the top pad set screw locknuts, see Figure 8-3.
12. Remove and discard the top pad fasteners.
13. Remove the top pad, see Figure 8-3.

**CAUTION**

THE WEIGHT OF THE LEAF SPRING ASSEMBLY IS APPROXIMATELY 165 POUNDS (75 KG). CARE SHOULD BE TAKEN AT REMOVAL AND INSTALLATION TO PREVENT PERSONAL INJURY OR DAMAGE TO COMPONENTS.

14. Lower the axle enough to allow clearance to remove the leaf spring assembly.
15. Remove the leaf spring assembly.

**ASSEMBLY**

1. Position the new leaf spring assembly on the saddle.
2. The alignment hole in the spring seat of the saddle is a clearance hole for the leaf spring center bolt and is used to align the leaf spring assembly to the saddle assembly, see Figure 8-3.
3. Assemble the top pad between the saddle chair back ears (see Figure 8-3), and on top of the main leaf of the leaf spring assembly.

**SERVICE HINT**

The main leaf has a center bolt that pilots into a cavity in the spring top pad. This feature helps to provide alignment of the leaf spring assembly in the saddle.

4. Lubricate the top pad fasteners with SAE 20 oil prior to installation to obtain the correct relationship of torque and fastener tension.
5. Assemble the four (4) top pad fasteners through the top pad and saddle, see Figure 8-3.

**NOTE**

Some RT•RTE suspension configurations require inverted top pad bolt installation. See vehicle manufacturer for specific top pad fastener configuration.

6. Snug the saddle cap fasteners (**DO NOT** tighten at this time) enough to secure the assembly.

7. Assemble the top pad **set screws** for the appropriate RT•RTE suspension capacity as follows, see Figure 8-4.
  - **RT•RTE 34K-52K** — Lock washer, locknut, and square head bolt. Tighten the square head bolt to  $\mathbb{N}$  125 ± 25 foot pounds torque, then tighten the set screw locknut to  $\mathbb{N}$  125 ± 25 foot pounds torque
  - **RT 65K•70K** — Internal hex head set screw and tighten to  $\mathbb{N}$  160 ± 40 foot pounds torque

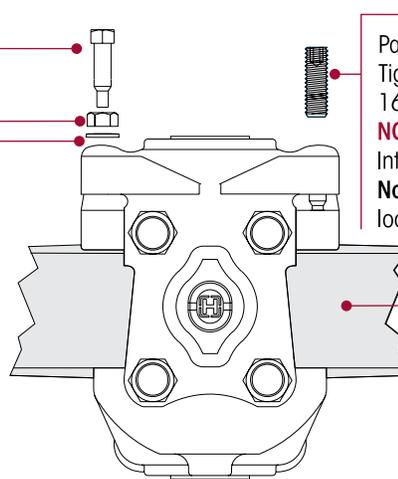
**FIGURE 8-4**

**RT•RTE 34K-52K**

Part No. 06813-000  
Square Head 3/4" Set Screw  
Tightening Torque 125 ± 25 ft. lbs.

Part No. 17342-000  
Set Screw 3/4" Locknut  
Tighten until lockwasher locks

Set Screw  
3/4" Lockwasher



**Heavy-duty RT 65K•70K**

Part No. 19201-001  
Tightening Torque  
160 ± 40 ft. lbs.

**NOTE:**  
Internal Hex Head Set Screw  
**No** set screw lockwasher or locknut needed

Leaf Spring Assembly

8. Apply final torque, evenly tighten the **top pad fasteners** in 100 foot pounds increments in the proper sequence to achieve uniform bolt tension as shown in Figure 8-6 until the final torque value is achieved. **DO NOT** exceed specified torque on top pad fasteners.
  - **RT•RTE 34K-52K** — Tighten 1" to  $\mathbb{N}$  300 ± 25 foot pounds torque
  - **RT 65K•70K** — Tighten 1" to  $\mathbb{N}$  385 ± 25 foot pounds torque

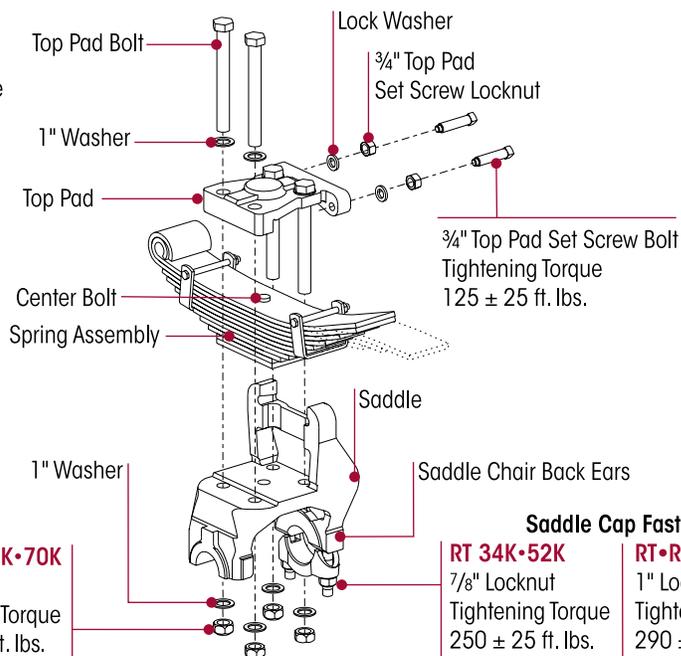
**NOTE**

Top pad bolt fasteners must be re-tightened after the first 500 miles of service, and at regular preventive maintenance intervals, not to exceed one year or 50,000 miles, whichever comes first. **DO NOT** exceed specified torque value on RT•RTE top pad fasteners.

**FIGURE 8-5**

**NOTE**

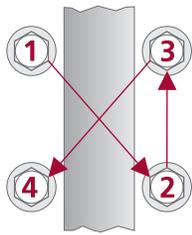
\*All threads must be lubricated with SAE 20 oil before assembly to obtain the correct relationship of torque and fastener tension



Top Pad Fasteners*	
<b>RT 34K•52K</b>	<b>RT•RTE 65K•70K</b>
1" Locknut	1" Locknut
Tightening Torque 300 ± 25 ft. lbs.	Tightening Torque 385 ± 25 ft. lbs.

Saddle Cap Fasteners	
<b>RT 34K•52K</b>	<b>RT•RTE 65K•70K</b>
7/8" Locknut	1" Locknut
Tightening Torque 250 ± 25 ft. lbs.	Tightening Torque 290 ± 12 ft. lbs.

FIGURE 8-6



9. Tighten the **saddle cap fasteners** evenly in 50 foot pounds increments in the proper sequence to achieve uniform bolt tension as shown in Figure 8-6 until the final torque value is achieved. **DO NOT** exceed specified torque on saddle cap fasteners.
  - **RT•RTE 34K-52K** – Tighten  $\frac{7}{8}$ " to  $\mathbb{N}$  250  $\pm$  25 foot pounds torque
  - **RT 65K•70K** – Tighten 1" to  $\mathbb{N}$  290  $\pm$  12 foot pounds torque
10. Lubricate the inner diameter of the spring eye bushing with NLGI#2 – EP (Extreme Pressure) lithium base grease.
11. Raise both axles and position the leaf spring and saddle assembly into the #1 and #2 spring hangers.
12. Align the spring eye with the pin hole in the #1 spring hanger.
13. Lubricate the spring hanger pin with NLGI#2 – EP (Extreme Pressure) lithium base grease and with the slotted end facing outboard, pilot the pin into the outside spring hanger leg, through the spring eye, and into the spring hanger inboard leg.
14. For the double lock pin on the #1 spring hanger, use the slot to rotate and align the key ways and assemble the fasteners as shown in Figure 8-1.
15. Tighten the front lock locknuts to  $\mathbb{N}$  54  $\pm$  9 foot pounds torque, see Figure 8-1.
16. Assemble the rebound bolt with spacer and locknut through the legs of the #2 rear spring hanger as shown in Figure 8-2.
17. Tighten the rebound locknuts to  $\mathbb{N}$  42  $\pm$  3 foot pounds torque, see Figure 8-2.
18. Remove axle support and install tires.
19. Raise the vehicle and remove the frame stands.
20. Lower the vehicle.
21. Remove the wheel chocks.

## SPRING EYE BUSHING

### YOU WILL NEED

- Hammer
- Driver or knock out punch O.D. 1.628"

### DISASSEMBLY

1. Place the vehicle on a level floor.
2. Chock the wheels.
3. Raise the frame to remove the load from the suspension.
4. Support the frame.
5. Raise and support the axle.
6. Remove the tires.
7. Remove and discard the #1 forward hanger pinch bolt and fasteners.
8. Mark the position of the spring eye bushing split, see Figure 8-9 with a paint stick on the leaf spring bore to ease in installation.
9. Drive out the pin in Figure 8-7.

### WARNING

DO NOT USE HEAT OR A CUTTING TORCH TO REMOVE THE SPRING EYE BUSHING FROM THE STEEL SPRING. THE USE OF SUCH HEAT CAN ADVERSELY AFFECT THE STRENGTH OF THE SPRING. A COMPONENT DAMAGED IN THIS MANNER CAN RESULT IN ADVERSE VEHICLE HANDLING AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

10. Drive out the spring eye bushing. Strike directly on the punch until the bushing clears the steel leaf spring eye bore, see Figure 8-8.
11. Inspect the spring eye for any cracks or burrs. If cracks are present replacement of the leaf spring assembly is required.
12. Remove any nicks or burrs with an emery cloth to provide a smooth surface for bushing installation.

FIGURE 8-7

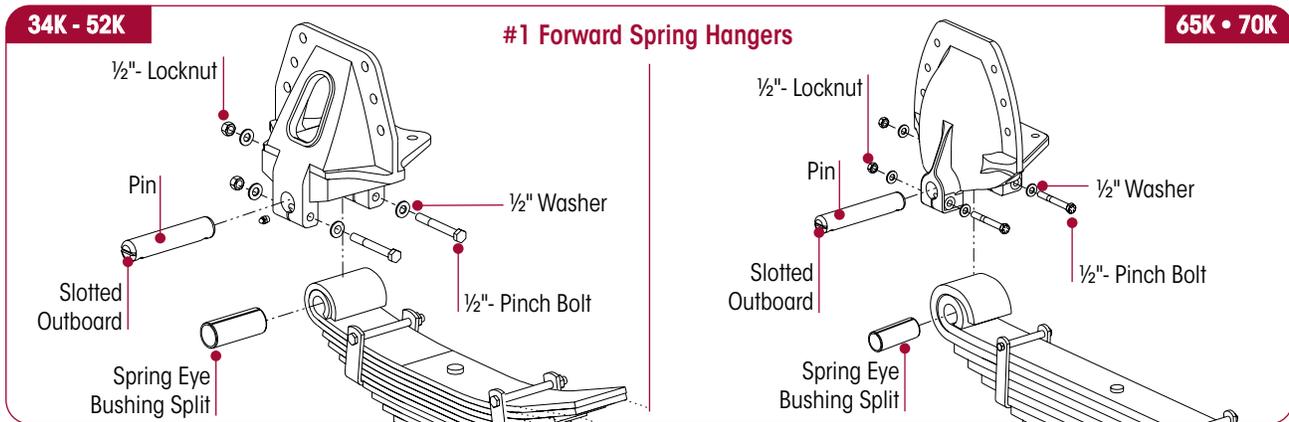


FIGURE 8-8

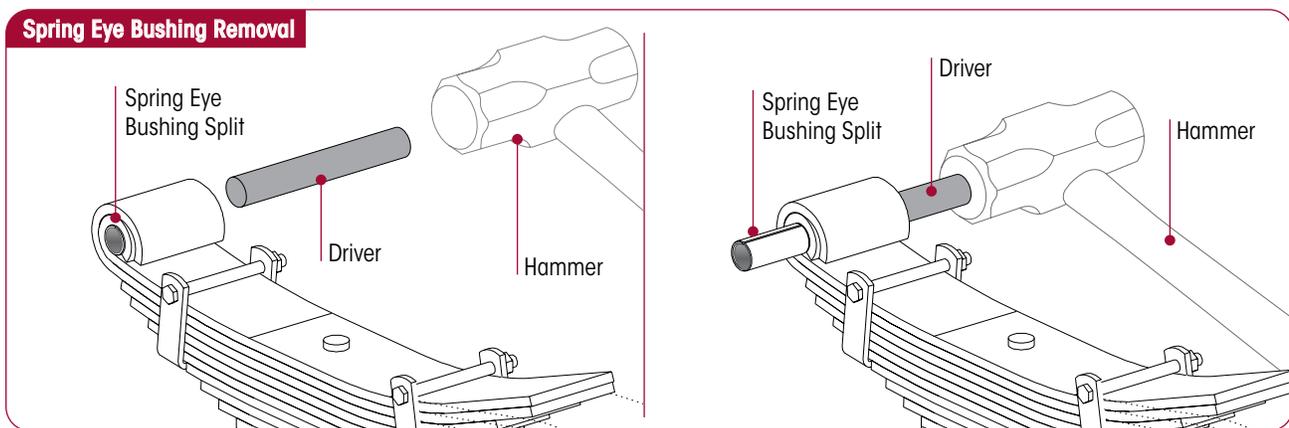
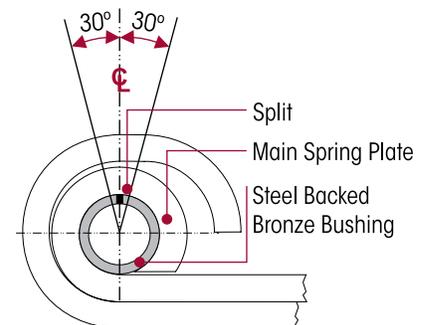
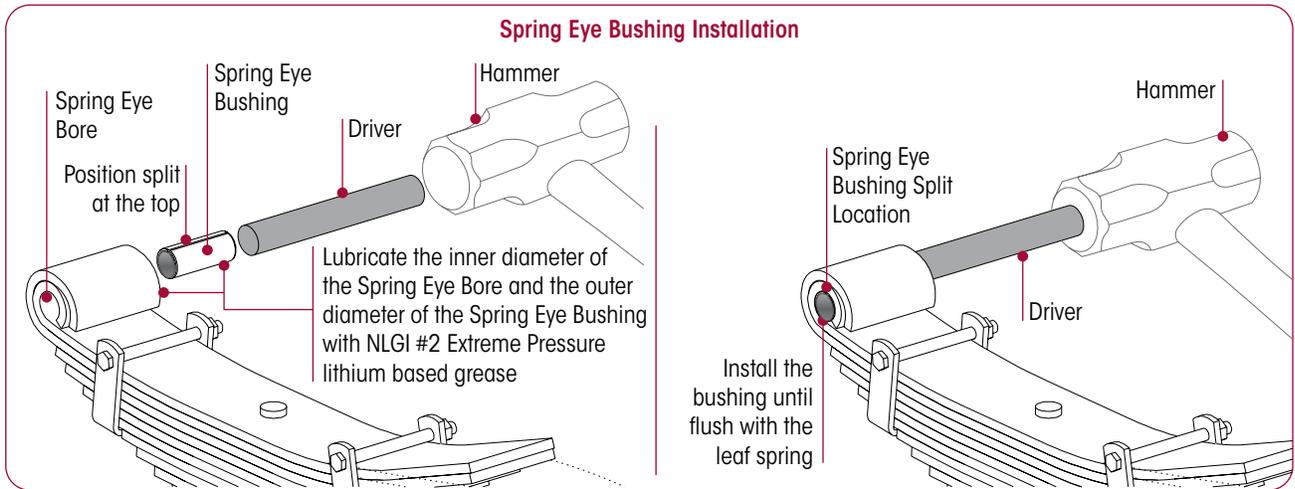


FIGURE 8-9

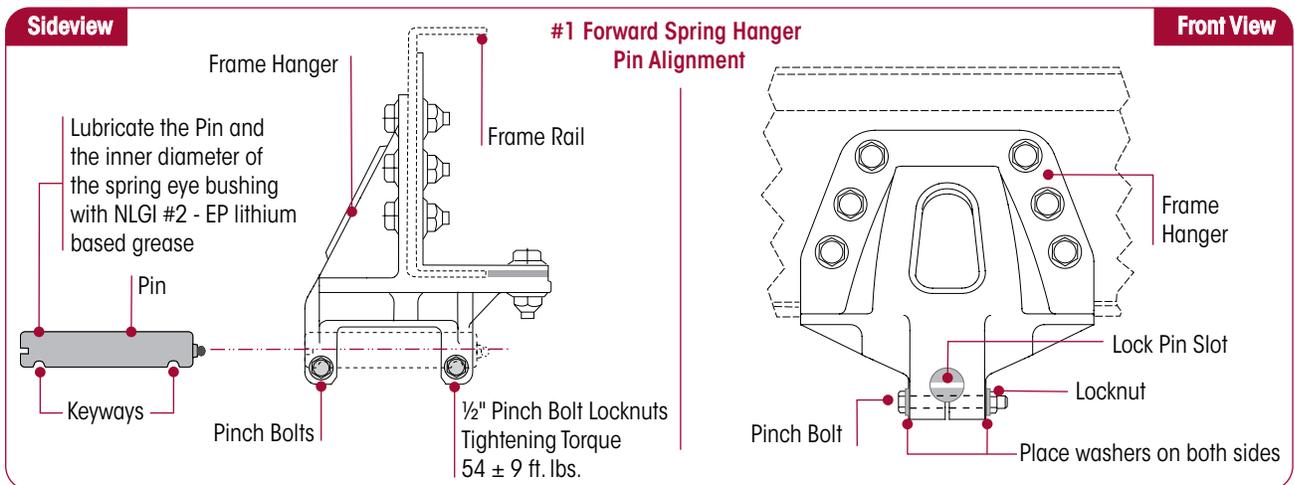


### ASSEMBLY

1. Lubricate the inner diameter of the spring eye bore and the outer diameter of the spring eye bushing with NLGI#2 – EP (Extreme Pressure) lithium base grease.
2. Position the split of the spring eye bushing at the top (within 30 degrees of either side of the centerline), as marked with a paint stick prior to disassembly, see Figure 8-9.
3. Use a hammer and driver to install the bushing into the spring eye until flush with the leaf spring, see Figure 8-10.
4. Lower the vehicle and align the spring eye with the pin opening of the frame hanger.
5. On the #1 forward hanger, lubricate the spring hanger pin and the inner diameter of the spring eye bushing with NLGI#2 – EP (Extreme Pressure) lithium base grease, see Figure 8-11.

**FIGURE 8-10**


6. With the slotted end facing outboard, pilot the pin into the outboard side of the front spring hanger leg, through the spring eye and into the spring hanger, see Figures 8-7 and 8-11.
7. Rotate the lock pin using the slot to align the key ways and install pinch bolts and fasteners as shown in Figure 8-11.

**FIGURE 8-11**


8. Tighten the front lock locknuts to 54 ± 9 foot pounds torque.
9. Remove axle support and install tires.
10. Raise the vehicle and remove the frame stands.
11. Lower the vehicle.
12. Remove the wheel chocks.

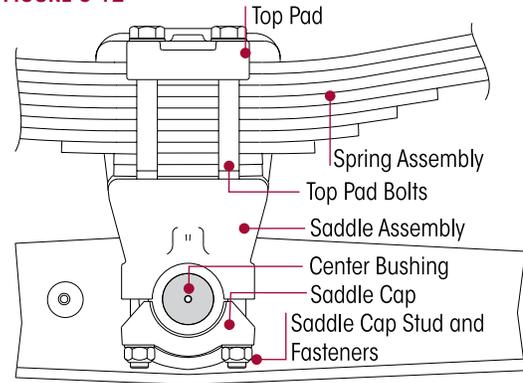
## SADDLE ASSEMBLY

### DISASSEMBLY

1. Place the vehicle on a level floor.
2. Chock the wheels.
3. Raise and support the axle.
4. Remove the tires.

5. Remove and discard the saddle cap fasteners that attach the saddle assembly to the center bushing, see Figure 8-12.
6. Remove the saddle cap.
7. Raise the vehicle's frame to create a ½" (13 mm) gap between the saddle assembly and center bushing. Support the vehicle's frame at this height.
8. Remove the top pad bolts from the saddle assembly.
9. Remove the leaf spring assembly, per the Leaf Spring Assembly in this section.
10. Remove the saddle assembly.

FIGURE 8-12



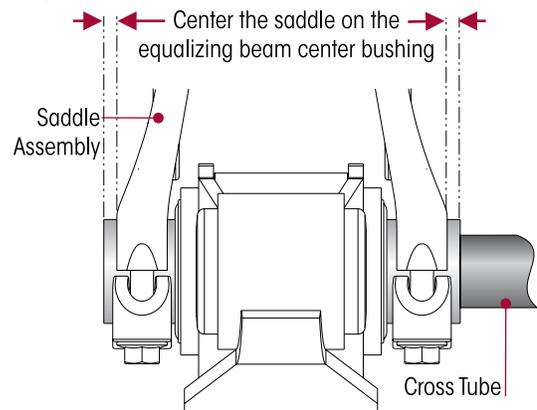
### ASSEMBLY

1. Install the new saddle assembly.
2. Install the leaf spring assembly per the Leaf Spring Assembly in this section.
3. Remove the frame supports.
4. Lower the frame of the vehicle while engaging and centering the saddles on the equalizing beam's center bushings, see Figure 8-13.

### CAUTION

THE SADDLE ASSEMBLY IS ATTACHED TO THE CENTER BUSHINGS OF EACH EQUALIZING BEAM WITH TWO (2) SADDLE CAPS. EACH SADDLE CAP USES TWO (2) STUDS TO CLAMP THE CENTER BUSHING INNER METAL TO THE SADDLE. THE SADDLE CAPS MUST BE INSTALLED SO THAT THERE IS AN EVEN GAP BETWEEN THE SADDLE CAPS AND THE BASE OF THE SADDLE ASSEMBLY AS SHOWN IN FIGURE 8-14. IF THEY ARE NOT INSTALLED EVENLY THE SADDLE ASSEMBLY COULD BECOME DEFORMED, RESULTING IN BENT BOLTS OR DAMAGED SADDLE ASSEMBLY.

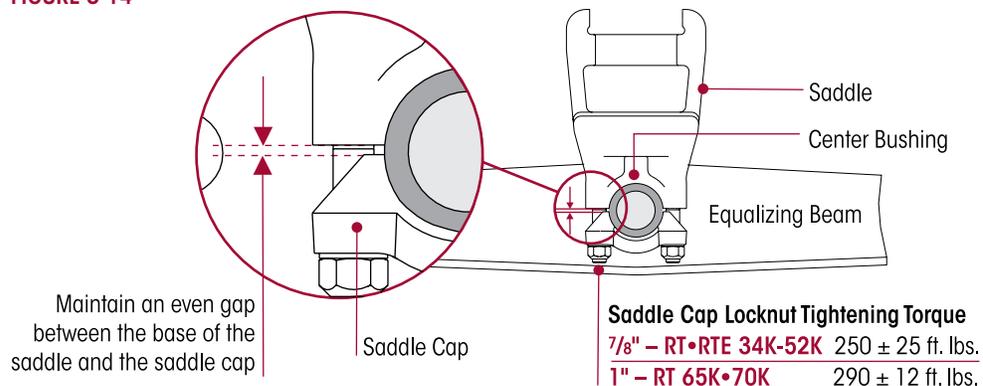
FIGURE 8-13



### WARNING

LOOSE OR OVER TORQUED FASTENERS CAN CAUSE COMPONENT DAMAGE, ADVERSE VEHICLE HANDLING, PROPERTY DAMAGE, OR SEVERE PERSONAL INJURY. MAINTAIN CORRECT TORQUE VALUES AT ALL TIMES. CHECK TORQUE VALUES ON A REGULAR INSPECTION INTERVAL.

FIGURE 8-14



**NOTE**

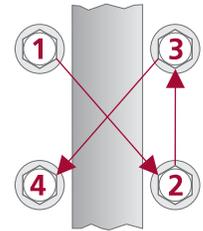
Tightening the saddle cap fasteners properly will help prevent wear of mating components, such as the beam center bushing, saddle, and saddle cap.

- While tightening the saddle cap fasteners maintain an even gap between the saddle and saddle cap, see Figure 8-14.

- Tighten the **saddle cap fasteners** evenly in 50 foot pounds increments in the proper sequence to achieve uniform bolt tension as shown in Figure 8-15 until the final torque value is achieved. **DO NOT** exceed specified torque on saddle cap fasteners.

- **RT•RTE 34K•52K** – Tighten  $\frac{7}{8}$ " to  $\mathbb{N}$  250  $\pm$  25 foot pounds torque
- **RT 65K•70K** – Tighten 1" to  $\mathbb{N}$  290  $\pm$  12 foot pounds torque

- Install the tires.
- Remove the support from the axles and lower the vehicle onto the ground.
- Remove the wheel chocks.

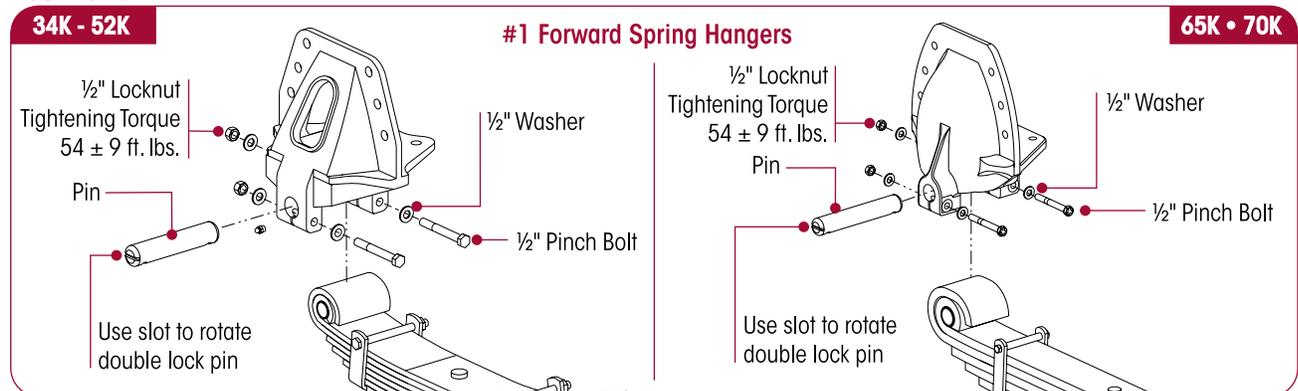
**FIGURE 8-15**


## #1 FORWARD SPRING HANGERS

Refer to RT•RTE Frame Hanger Selection Guide 45745-038 to aid in the proper identification of originally equipped RT•RTE•RU•RUE•U•UE drilled hangers in the aftermarket. This guide lists common drill patterns and castings.

### DISASSEMBLY

- Place the vehicle on a level floor.
- Chock the wheels.
- Raise the frame to remove the load from the suspension.
- Support the frame.
- Raise and support the axle.
- Remove the tires.
- Remove and discard the #1 forward hanger pinch bolt and fasteners, see Figure 8-16.
- Drive out the pin in Figure 8-16.
- Remove the #1 spring hanger frame fasteners per the vehicle manufacturer's instructions.
- Remove the #1 spring hanger.

**FIGURE 8-16**


## ASSEMBLY

### IMPORTANT

Thickness of the full length spacer must be equal to gap between the hanger and frame liner, see Figure 8-17.

1. Fit the horizontal flange of #1 spring hanger against the bottom horizontal flange of frame rail flush and tight, see Figure 8-17.
2. Install the #1 front spring hanger onto the frame.
3. Install #1 frame hanger fasteners per the vehicle manufacturer's instructions.
4. Lubricate the inner diameter of the spring eye bushing with NLGI#2 – EP (Extreme Pressure) lithium base grease.
5. Lower the vehicle and align the spring eye with the pin opening of the frame hanger.
6. Lubricate the spring hanger pin with NLGI#2 – EP (Extreme Pressure) lithium base grease.
7. With the slotted end facing outboard, pilot the pin into the outside spring hanger leg, through the spring eye and into the spring hanger inboard leg, see Figure 8-18.
8. Rotate the lock pin using the slot to align the key ways and install the pinch bolts and fasteners as shown in Figure 8-18.
9. Tighten the front pinch bolt locknuts to  $54 \pm 9$  foot pounds torque, see Figure 8-18.

FIGURE 8-17

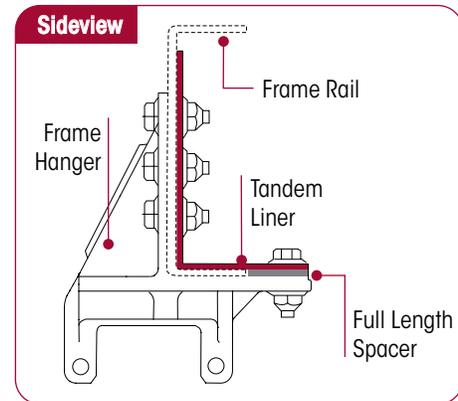
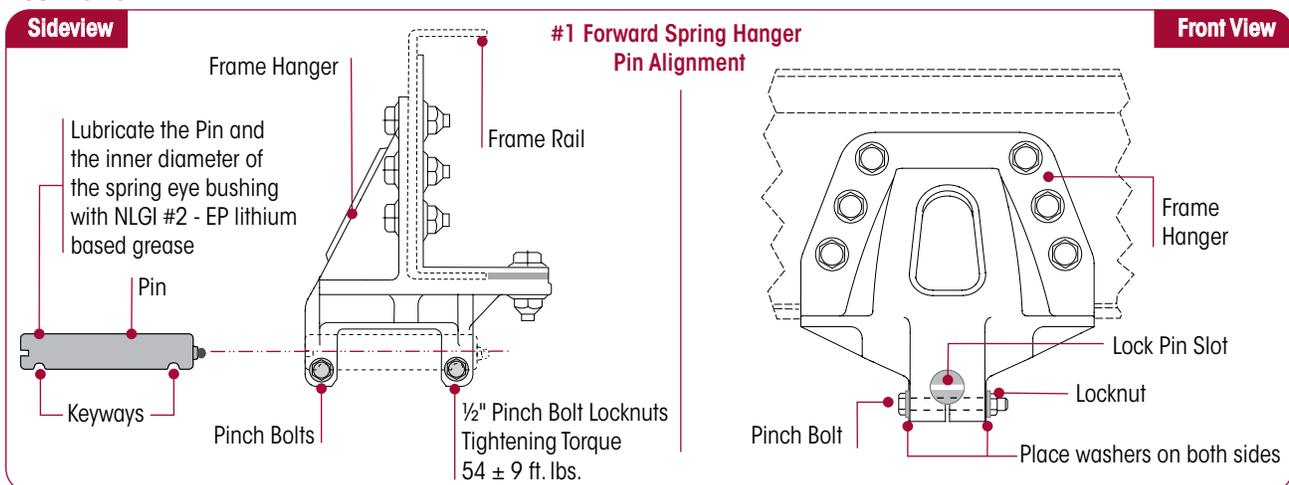


FIGURE 8-18



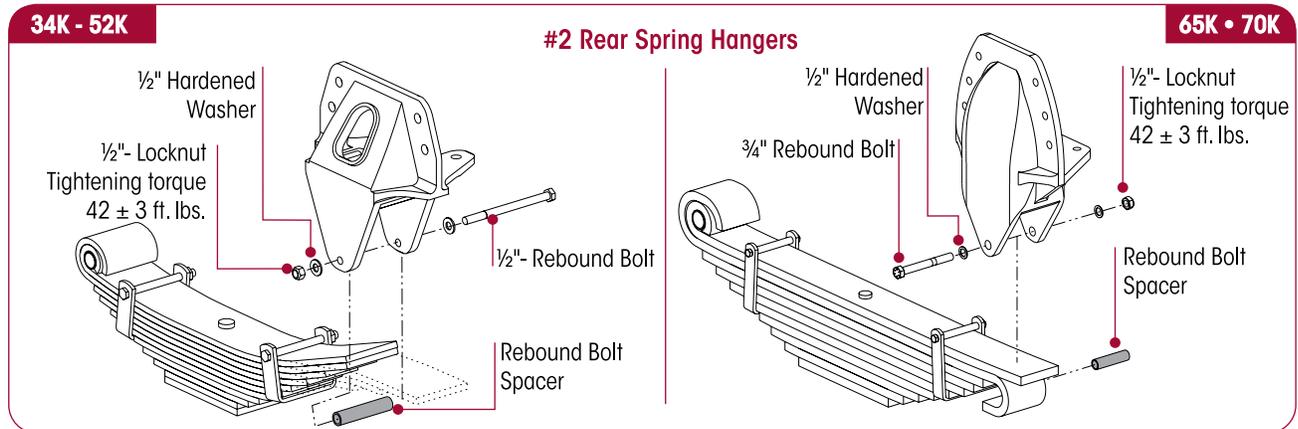
10. Raise the vehicle and remove the frame stands.
11. Lower the vehicle.
12. Remove axle support and install tires.
13. Remove the wheel chocks.

## #2 REAR SPRING HANGERS

Refer to RT•RTE Frame Hanger Selection Guide 45745-038 to aid in the proper identification of originally equipped RT•RTE•RU•RUE•U•UE drilled hangers in the aftermarket. This guide lists common drill patterns and castings.

### DISASSEMBLY

1. Place the vehicle on a level floor.
2. Chock the wheels.
3. Remove and discard the rebound bolt spacer and fasteners from the leaf spring assembly, see Figure 8-19.
4. Raise the frame to remove the load from the suspension.
5. Support the frame.
6. Raise and support the axle.
7. Remove the tires.
8. Remove #2 spring hanger frame fasteners per the vehicle manufacturer instructions.
9. Remove the # 2 rear spring hangers

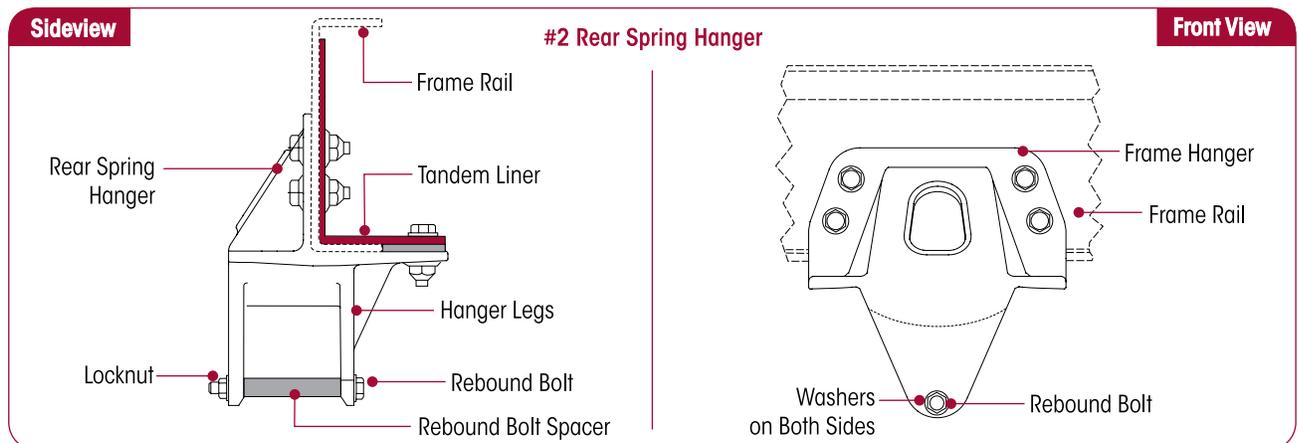
**FIGURE 8-19**


### ASSEMBLY

#### IMPORTANT

Thickness of full length spacer must be equal to gap between the hanger and frame liner, see Figure 8-20.

1. Fit the horizontal flange of #2 spring hanger against the bottom horizontal flange of frame rail flush and tight, see Figure 8-20.
2. Install the new #2 spring hanger frame fasteners per the vehicle manufacturer's specifications.
3. Raise the vehicle and remove the frame stands.
4. Lower the vehicle to seat the spring assembly into the #2 spring hanger.

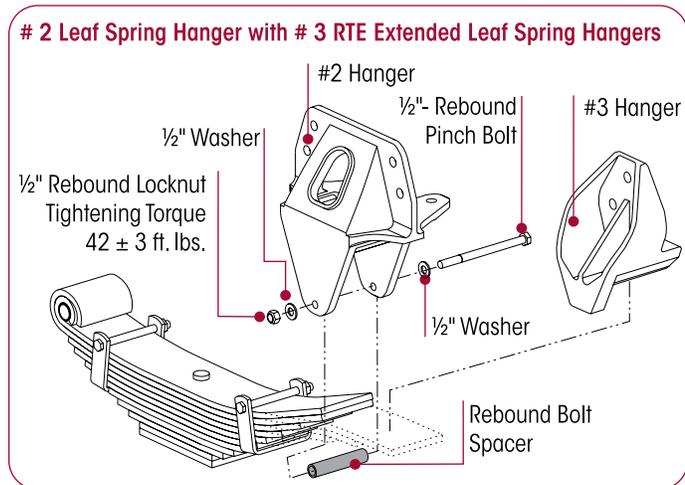
**FIGURE 8-20**


5. Assemble the rebound bolt with spacer and locknut through the legs of the #2 rear spring hanger as shown in Figure 8-19.
6. Tighten the rebound locknuts to  $42 \pm 3$  foot pounds torque.
7. Remove axle support and install tires.
8. Remove the wheel chocks.

### RTE #3 REAR EXTENDED LEAF SPRING HANGERS

Refer to RT•RTE Frame Hanger Selection Guide 45745-038 to aid in the proper identification of originally equipped RT•RTE•RU•RUE•U•UE drilled hangers in the aftermarket. This guide lists common drill patterns and castings.

FIGURE 8-21



#### DISASSEMBLY

1. Place vehicle on a level floor.
2. Chock the wheels.
3. Remove the rear rebound bolt and spacer from the #2 rear hanger.
4. Raise the frame to remove the load from the spring.
5. Support the frame.
6. Remove the #3 hanger frame fasteners per the vehicle manufacturer's instructions.
7. Remove the #3 extended leaf spring hanger.

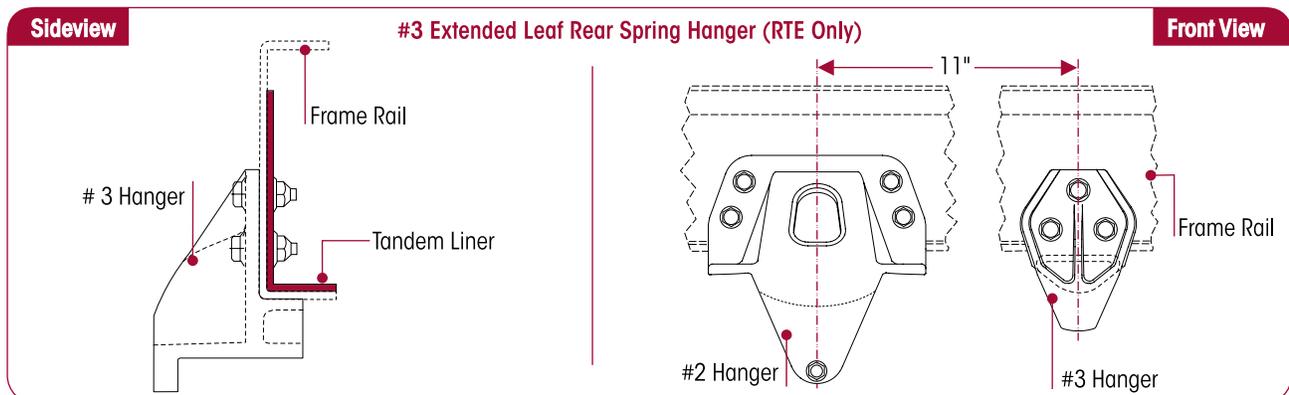
#### ASSEMBLY

#### IMPORTANT

Thickness of full length spacer must be equal to gap between the hanger and frame liner, see Figure 8-22.

1. Install the new #3 frame hanger flush against the frame.
2. Install the #3 frame fasteners per the vehicle manufacturer's instructions.
3. Lower the vehicle.

FIGURE 8-22



4. Assemble the rebound fastener with spacer through the legs of the #2 rear spring hanger as shown in Figure 8-21.
5. Tighten the rebound locknut to  $42 \pm 3$  foot pounds torque, see Figure 8-21.
6. Remove the wheel chocks.

## TOP PAD BOLT SELECTION

### NOTE

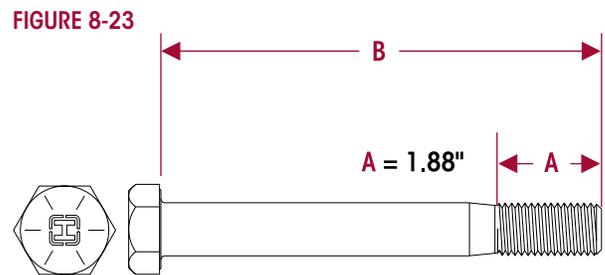
Using the correct length top pad bolt is important to help ensure the RT•RTE suspension system and components function to their highest efficiency. Refer to the Top Pad Bolt Selection Guide in the Part List section of this publication for proper top pad bolt selection.

### CAUTION

INCORRECT TOP PAD BOLT LENGTHS CAN RESULT IN (1) FAILURE TO SUSTAIN PROPER CLAMP FORCE, (2) REDUCED AXLE/BEAM ARTICULATION, (3) INAPPROPRIATE CONTACT BETWEEN THE TOP PAD BOLT AND THE BEAM OR FRAME RAIL, ALL OF WHICH CAN CAUSE PREMATURE COMPONENT DAMAGE, PERSONAL INJURY, ADVERSE VEHICLE HANDLING, OR PROPERTY DAMAGE.

The proper bolt length as shown in Figure 8-23, can be determined by using the following guidelines:

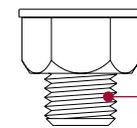
- **Dimension A** is 1.88" (47.8 mm).
- **Dimension B** – measure the removed bolt, refer to Parts List Section of this publication.
- Ensure **Dimension B** is  $3\frac{1}{4}$ " (82.6 mm) plus the length of the thickness of the leaf spring assembly, top pad, saddle cap height.



Tighten torque in the proper sequence, ensure there is a **MINIMUM** of three full threads to a **MAXIMUM** of five full threads that extend beyond the end of the locknut, see Figure 8-24. These guidelines are necessary to help ensure:

- Full thread engagement in the locknuts.
- Proper clearance between the top pad bolt and the equalizing beams, or the frame and the top bolt in inverse bolt installations.

**FIGURE 8-24**



**3 Minimum to 5 Maximum** full threads showing after tightening to torque specifications.

## EQUALIZING BEAM

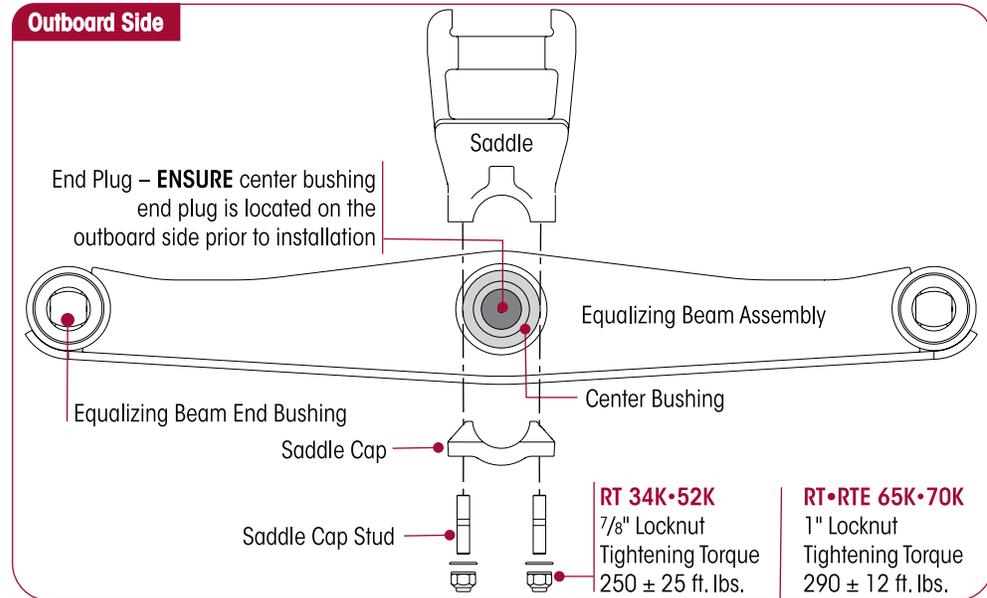
### SERVICE HINT

It is recommended to remove both equalizing beams and the cross tube as a group even if only one equalizing beam needs service.

### DISASSEMBLY

1. Chock the wheels of the steer axle.
2. Raise and support the drive axles with safety stands.
3. Remove the tires.
4. Support the pinion angle of the drive axles to prevent axle movement during service.
5. Remove and discard the saddle cap fasteners from both inboard and outboard sides of the equalizing beam.
6. Remove the saddle caps, see Figure 8-25.
7. Raise the vehicle's frame just enough to create a  $\frac{1}{2}$ " (13 mm) gap between the saddles and the center bushings. Support the vehicle's frame at this height.

FIGURE 8-25



**CAUTION**

THE WEIGHT OF THE EQUALIZING BEAM ASSEMBLY IS APPROXIMATELY 155 POUNDS. PRIOR TO REMOVING THE BEAM END FASTENERS FROM THE EQUALIZING BEAM, SUPPORT THE END OF THE EQUALIZING BEAM TO PREVENT FROM DROPPING. CARE SHOULD BE TAKEN AT REMOVAL AND INSTALLATION TO PREVENT PERSONAL INJURY OR DAMAGE TO COMPONENTS.

8. Support both equalizing beams with a floor jack.

**NOTE**

Prior to disassembly of the equalizing beam bar pin (if equipped) fasteners, note the orientation of the bar pin alignment shims, see Figure 8-26. It is required that the bar pin alignment shims are installed in the same orientation and location as removed to preserve the existing vehicle alignment. Improper vehicle alignment can increase tire wear.

9. Remove and discard beam end attaching fasteners.

10. Slowly lower the floor jacks and remove/pry the equalizing beams from the axle brackets.

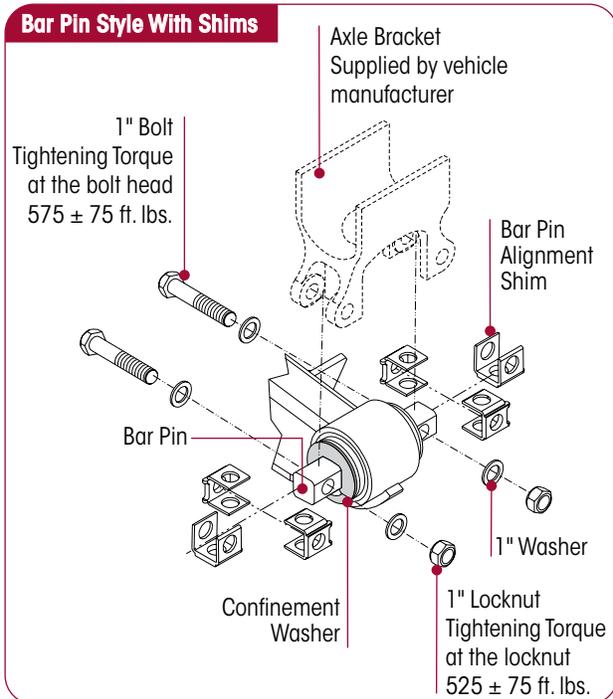
■ **For bronze center bushings**

- a. Remove bronze center bushings and make note of the thrust washer count
- b. Remove center sleeves and cross tube

■ **For rubber center bushings**

- a. Slide the equalizing beams off the cross tube and out from under the vehicle

FIGURE 8-26



**WARNING**

PRIOR TO REMOVING BOTH EQUALIZING BEAMS, SUPPORT THE PINION OF EACH DRIVE AXLE. FAILURE TO DO SO CAN RESULT IN PERSONAL INJURY OR ALLOW THE AXLES TO SHIFT MAKING REASSEMBLY MORE DIFFICULT.

11. Slide the equalizing beams off the cross tube and out from under the vehicle.
12. Remove the floor jacks from under the equalizing beams.

**ASSEMBLY**

1. Position the equalizing beams under the axles with a floor jack under the center of each equalizing beam.

- **For bronze center bushings**

- a. Install the center sleeve and cross tube.
- b. Install the new thrust washers in the correct position and count.

**SERVICE HINT**

Ensure the rubber center bushing end plug is located on the outboard side, see Figure 8-27.

- **For rubber center bushings**

- a. Install the cross tube into the center bushing of each equalizing beam.

**SERVICE HINT**

Increasing or decreasing the pinion angle may help align the axle bracket and equalizing beam end bushings.

2. Using the floor jacks, slowly raise both equalizing beams and cross tube as an assembly into the axle brackets. Ensure that each equalizing beam end bushing correctly engages the axle bracket.

**NOTE**

All equalizing beams are manufactured with the bar pin flats perpendicular to the equalizing beam's axis. It is not necessary to adjust the bar pins to the same pinion angle as prior to disassembly. The rubber in the bushings will gradually allow the bar pins to adapt to the pinion angles of the drive axles. This is a normal function of the bar pin bushings.

**SERVICE HINT**

Installing the front bar pin bushings (if equipped) prior to the rear bar pin bushings will ease in the installation of the equalizing beam.

**CAUTION**

THE WEIGHT OF THE EQUALIZING BEAM ASSEMBLY IS APPROXIMATELY 155 POUNDS (70 KG). CARE SHOULD BE TAKEN AT REMOVAL AND INSTALLATION TO PREVENT PERSONAL INJURY OR DAMAGE TO COMPONENTS.

3. Mount the equalizing beam into the **FRONT** drive axle brackets. **DO NOT** install the alignment shims (if equipped) at this time.
4. Slide a 3/4" (19 mm) bolt through both front axle brackets and the bar pin holes to temporarily support the beams.
5. Lift the **REAR** of the beam until the **FRONT** bar pin flats are parallel to the front drive axle bracket legs, see Figure 8-28.

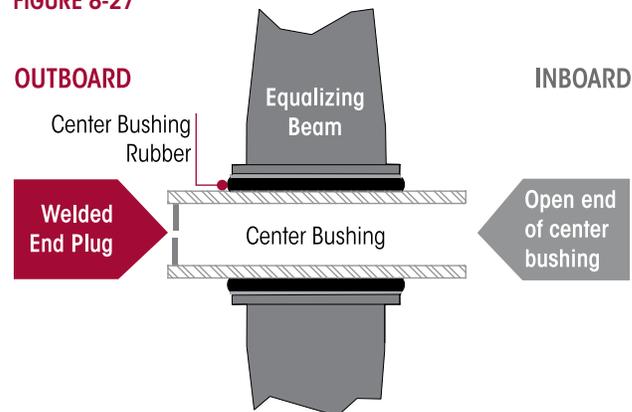
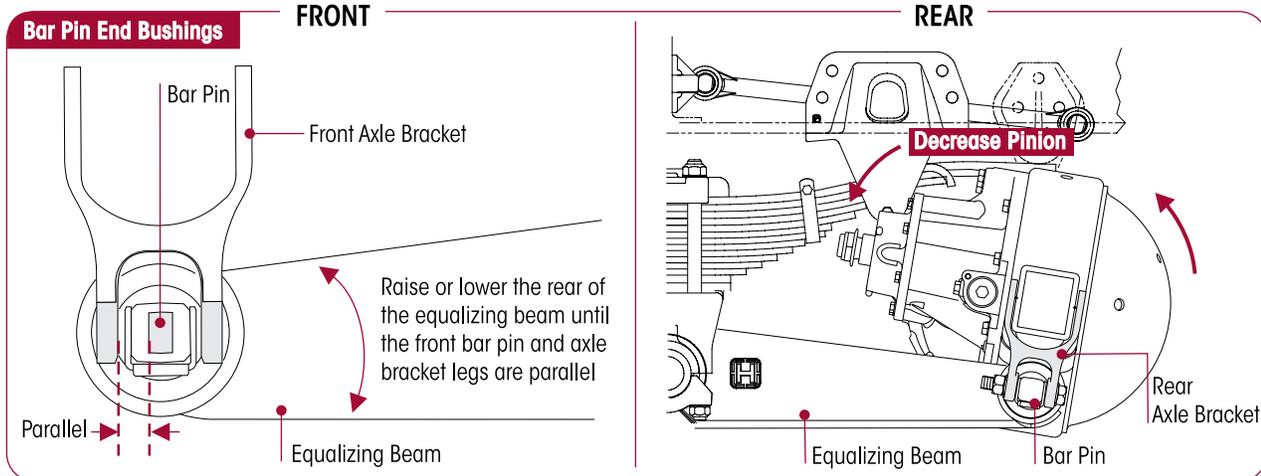
**FIGURE 8-27**
**OUTBOARD**
**INBOARD**


FIGURE 8-28


**WARNING**

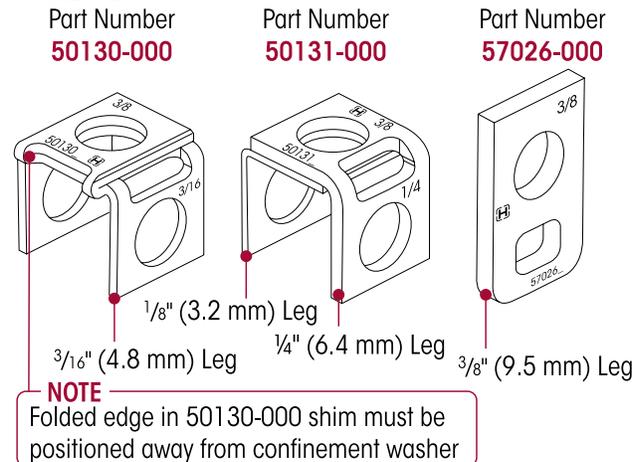
A BAR PIN SHIM MUST BE INSTALLED AT EACH BOLT LOCATION. THE SAME PART NUMBER SHIM IN THE SAME ORIENTATION MUST BE USED AT BOTH BOLT LOCATIONS ON ANY ONE END BUSHING. DO NOT INSTALL OR STACK MORE THAN ONE SHIM AT EACH BOLT LOCATION. USE GENUINE HENDRICKSON BAR PIN SHIMS, DO NOT USE STANDARD WASHERS. FAILURE TO FOLLOW THESE WARNINGS MAY RESULT IN IMPROPER VEHICLE ALIGNMENT, FRACTURE OF THE AXLE BRACKET OR BAR PIN WHICH COULD RESULT IN ADVERSE VEHICLE HANDLING AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

**WARNING**

THE BAR PIN ALIGNMENT SHIM (PART NO. 501 30-000) MUST BE INSTALLED WITH THE FOLDED EDGE FACING AWAY FROM THE CONFINEMENT WASHER, SEE FIGURE 8-29. FAILURE TO DO SO MAY RESULT IN SHIM DAMAGE, IMPROPER ALIGNMENT, DAMAGE OR FRACTURE OF THE AXLE BRACKET OR BAR PIN WHICH COULD RESULT IN ADVERSE VEHICLE HANDLING AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

6. Partially install the **FRONT INBOARD** bar pin alignment shim and verify that the shim is in the same orientation as prior to disassembly, see Figure 8-26.
7. To complete installation of the alignment shim, remove the temporary  $\frac{3}{4}$ " (19 mm) bolt from the inboard bar pin hole and complete installation of the inboard alignment shim.

FIGURE 8-29


**NOTE**

Folded edge in 501 30-000 shim must be positioned away from confinement washer

**NOTE**

Hendrickson recommends the use of Grade 8 bolts and Grade C locknuts. If flange head bolts and locknuts are not used then hardened structural washers must be used under bolt heads and locknuts.

8. Install the new 1" (25.4 mm) inboard bar pin fasteners. **DO NOT** tighten at this time.
9. Repeat Steps 6 through 8 for the **FRONT OUTBOARD** alignment shim.
10. Chock the **REAR** drive axle wheels to prevent movement while installing the rear bar pin into the axle bracket.
11. Support the current axle position of the rear axle pinion with a jack to assist with the installation of the rear bar pin.

**NOTE**

Prior to disassembly of the longitudinal torque rod, note the quantity and orientation of the longitudinal torque rod shims. It is required that the longitudinal torque rod shims are installed in the same orientation and location as removed to preserve the existing pinion angle.

12. Disconnect the **REAR** longitudinal torque rod from the **REAR** axle bracket, see vehicle manufacturer's specifications.
13. Release the rear parking brakes, this will allow the rear axle to rotate without rotating the tires.
14. Lower the rear drive pinion until the rear drive axle bracket legs are parallel to the rear bar pin flats, see Figure 8-28.
15. Mount the equalizing beam into the **REAR** drive axle brackets. **DO NOT** install the bar pin alignment shims at this time.
16. Slide a  $\frac{3}{4}$ " (19 mm) bolt through all rear axle bracket and the bar pin holes to temporarily support the beams.
17. Partially install the **REAR INBOARD** bar pin alignment shim and verify that the shim is in the same orientation as prior to disassembly, see Figure 8-26.
18. To complete installation of the alignment shim, remove the temporary  $\frac{3}{4}$ " (19 mm) bolt from the inboard bar pin hole and complete installation of the inboard alignment shim.
19. Install NEW 1" (25.4 mm) inboard bar pin fasteners. **DO NOT** tighten at this time.
20. Repeat Steps 17 through 19 for the **REAR OUTBOARD** bar pin alignment shim.

**NOTE**

Prior to assembly of the longitudinal torque rod, note the quantity and orientation of the longitudinal torque rod shims. It is required that the longitudinal torque rod shims are installed in the same orientation and location as removed to preserve the existing alignment.

21. Install the longitudinal torque rod and any longitudinal torque rod shims in the same orientation as prior to disassembly. Tighten the fasteners to the vehicle manufacturer's specifications.
22. Re-apply rear parking brake.
23. Install the longitudinal torque rod and any longitudinal torque rod shims in the same orientation as prior to disassembly. Tighten the fasteners to the vehicle manufacturer's specifications.

**NOTE**

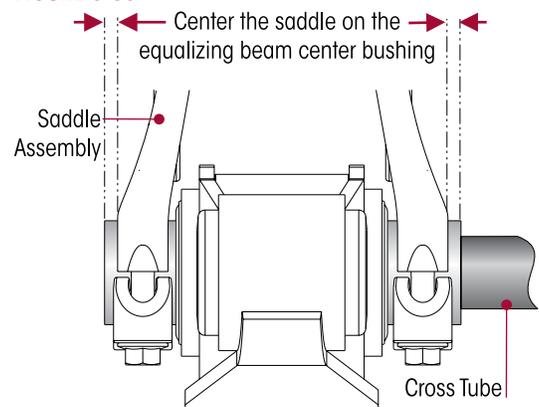
Prior to assembly of the rear fasteners, ensure that all the bar pin shims are installed in the same orientation as prior to disassembly.

24. Tighten the bar pin end fasteners to:
  - At the **locknuts** tighten to  $525 \pm 75$  foot pounds torque or
  - At the **bolt head** tighten to  $575 \pm 75$  foot pounds torque

25. Remove the frame supports and lower the frame of the vehicle being careful to engage the saddles on the equalizing beam's center bushings.
26. Center the saddle on the equalizing beam center bushing, see Figure 8-30.

**27. For bronze bushings**

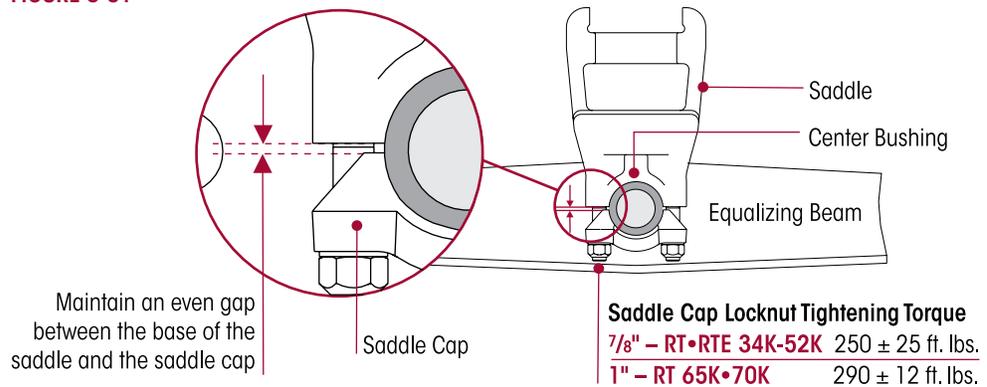
- a. It may be necessary to add or remove thrust washers to fill the gap.

**FIGURE 8-30**


**WARNING**

THE SADDLE ASSEMBLY IS ATTACHED TO THE CENTER BUSHINGS OF EACH EQUALIZING BEAM WITH TWO (2) SADDLE CAPS. EACH SADDLE CAP USES TWO (2) STUDS TO CLAMP THE CENTER BUSHING INNER METAL TO THE SADDLE. THE SADDLE CAPS MUST BE INSTALLED SO THAT THERE IS AN EVEN GAP BETWEEN THE SADDLE CAPS AND THE BASE OF THE SADDLE ASSEMBLY AS SHOWN IN FIGURE 8-30. IF THEY ARE NOT INSTALLED EVENLY THE SADDLE ASSEMBLY COULD BECOME DEFORMED, RESULTING IN BENT BOLTS OR DAMAGED SADDLE ASSEMBLY.

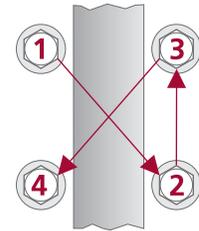
28. While tightening the saddle cap bolt fasteners maintain an even gap between the saddle and saddle cap, see Figure 8-31.

**FIGURE 8-31**

**NOTE**

Hendrickson recommends the use of Grade 8 bolts and Grade C locknuts. If flange head bolts and locknuts are not used then hardened structural washers must be used under bolt heads and locknuts.

29. Tighten the **saddle cap fasteners** evenly in 50 foot pounds increments in the proper sequence to achieve uniform bolt tension as shown in Figure 8-32 until the final torque value is achieved. **DO NOT** exceed specified torque on saddle cap fasteners.

- **RT•RTE 34K-52K** – Tighten 7/8" to 250 ± 25 foot pounds torque
- **RT 65K•70K** – Tighten 1" to 290 ± 12 foot pounds torque

**FIGURE 8-32**

**NOTE**

Tightening the saddle cap bolt fasteners properly will help prevent wear of mating components, beam center bushing, saddle, and saddle cap.

30. Install the tires.
31. Remove the supports from the drive axles and lower the vehicle onto the ground.
32. Remove the wheel chocks.

## RUBBER CENTER BUSHING

### YOU WILL NEED

- A vertical shop press with a capacity of at least 100 tons
- Refer to Special Tools Section of this publication
  - **28K-52K** Capacity – Tool Part No. 66086-102
  - **40K** Capacity – Tool Part No. 66086-100
  - **65K-85K** Capacity – Tool Part No. 66086-101

## DISASSEMBLY

### NOTE

Whenever an equalizing beam is removed for repair, or inspection of the equalizing beam end connection reveals movement, measure the distance between the axle bracket legs for correct width. Refer to Axle Bracket in Preventive Maintenance Section of this publication for measurement location and dimensions. An axle bracket outside of the measurement range must be repaired or replaced. Consult the vehicle manufacturer for inspection, component repair and replacement instructions.

1. Remove the equalizing beam assembly from the vehicle. Follow the equalizing beam disassembly procedure in this section.

### WARNING

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 ADVERSE VEHICLE HANDLING AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

2. Place the equalizing beam assembly in a shop press with the center hub firmly supported on the press bed.

### NOTE

Before attempting to remove the beam center bushings, inspect the inside face of each equalizing beam center hub. If the outer metal of the center bushing is worn, the edge may have mushroomed over the face of the beam hub. This material must be removed with a chisel or disc sander before tooling adapters can be positioned for bushing removal.

3. Install the center bushing removal tool centered on the center bushing.
4. Push directly on center bushing removal tool until the center bushing is pressed out of the equalizing beam bore.

## INSPECTION

After removing the center bushings, thoroughly inspect the beam bores. If damaged from center bushing removal, replace with a new equalizing beam. **DO NOT** re-bush or otherwise use an equalizing beam that has been damaged.

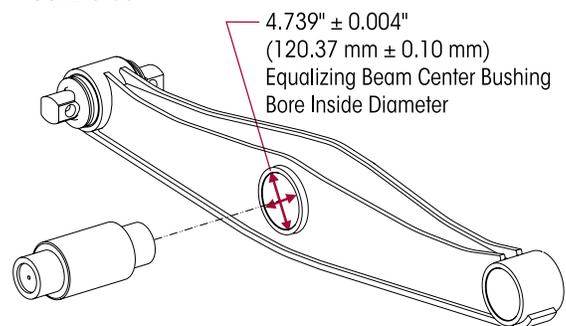
### WARNING

FAILURE TO REPLACE AN EQUALIZING BEAM THAT HAS BEEN DAMAGED FROM BUSHING REMOVAL CAN RESULT IN THE FAILURE OF THAT BEAM, LEADING TO ADVERSE VEHICLE HANDLING AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

1. Measure the inner diameter (I.D.) of the equalizing beam's center bushing bore and the center bushing's outer diameter (O.D.). The specification of the equalizing beam's center bore on a new RT•RTE equalizing beam:

- **Inside diameter:**  
4.739" ± 0.004"  
(120.37 mm ± 0.10 mm)
- Each measurement is to be taken as the average of any two readings at 90 degrees in the same plane, see Figure 8-33. If component is not within the specified range, replacement is required.

FIGURE 8-33



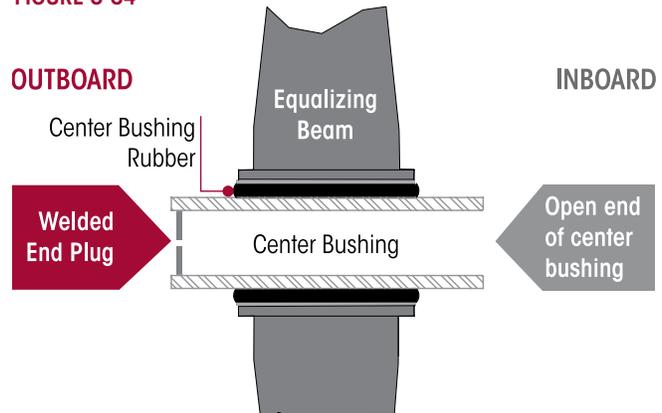
**NOTE:** Equalizing Beam inside diameter:  
Take any two readings at 90° in the same plane

## ASSEMBLY

When installing rubber center bushings the following steps will minimize the chance of damaging a new bushing:

1. Clean the bores of the equalizing beams with emery cloth, removing any nicks or metal buildup from bushing removal.
2. The equalizing beam bore may have a more substantial lead in chamfer at one end of the bore than the other. Take advantage of the larger chamfer by pressing in the new center bushing from this end.
3. Place the equalizing beam in a shop press on the receiving tool.
4. Support the beam squarely at the bore area to avoid distortion of the beam bore or bending of the beam.
5. Lubricate the outer diameter (O.D.) of the center bushing and the inner diameter (I.D.) of the beam bore with NLGI#2 – EP (Extreme Pressure) lithium base grease.
6. Ensure the bushing is square to the equalizing beam bore.
7. Install the center bushing installation tool and press in the new center bushing until the outer metal sleeve is centered in the equalizing beam's bore, see Figure 8-34.
8. Install the equalizing beam onto the vehicle, refer to the Equalizing Beam Assembly procedure in this section.

FIGURE 8-34



## BRONZE CENTER BUSHING YOU WILL NEED

- A vertical shop press with a capacity of at least 100 tons
- Bronze Center Bushing Tools, refer to Special Tools Section of this publication
  - **34K-52K** OTC Tool No. 1744
  - **65K-70K** OTC Tool Nos. 204266, and 38095

## BRONZE CENTER BUSHING SERVICE KITS

### NOTE

Each Bronze Center Bushing Service Kit contains eight (8) thrust washers, enough for two (2) thrust washers at each side of each equalizing beam center hub.

- **34K** – Service Kit No. 30436-000L
- **40K-52K** – Service Kit No. 30437-000L
- **65K-70K** – Service Kit No. 45374-000

FIGURE 8-35



## DISASSEMBLY

### NOTE

Whenever an equalizing beam is removed for repair, or inspection of the equalizing beam end connection reveals movement, measure the distance between the axle bracket legs for correct width. Refer to Axle Bracket in Preventive Maintenance Section of this publication for measurement location and dimensions. An axle bracket outside of the measurement range must be repaired or replaced. Consult the vehicle manufacturer for inspection, component repair and replacement instructions.

### WARNING

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 ADVERSE VEHICLE HANDLING AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

1. Remove the equalizing beam assembly from the vehicle. Follow the equalizing beam disassembly procedure in this section.
2. Remove center rubber seal on pressing side, see Figure 8-39.
3. Place the equalizing beam assembly squarely in a shop press with the center hub firmly supported on the press bed.
4. Install and center the removing / installing tool (see Figure 8-37) on the center bushing.
  - **34K** OTC Tool No. 302025
  - **38K-52K** OTC Tool No. 302024
  - **65K-70K** OTC Tool No. 38095
5. Using a shop press, push directly on the removing / installing tool until the center bushing is pressed out of the equalizing beam bore.

## INSPECTION

After removing the center bushings, thoroughly inspect the beam bores. If damaged from center bushing removal, replace with a new equalizing beam. **DO NOT** re-bush or otherwise use an equalizing beam that has been damaged.

### WARNING

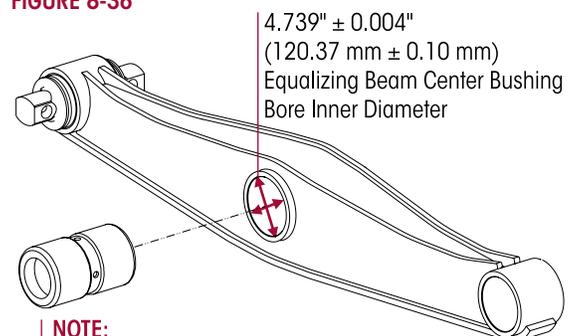
FAILURE TO REPLACE AN EQUALIZING BEAM THAT HAS BEEN DAMAGED FROM BUSHING REMOVAL CAN RESULT IN THE FAILURE OF THAT BEAM, LEADING TO ADVERSE VEHICLE HANDLING AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

### WARNING

IF TORCH UNDERCUTTING IS FOUND FROM PREVIOUS REBUSHING, REPLACE WITH A NEW EQUALIZING BEAM. DO NOT TAKE THE RESPONSIBILITY FOR POSSIBLE ROAD FAILURE BY REBUSHING A BEAM IN THIS CONDITION. FAILURE TO REPLACE AN EQUALIZING BEAM THAT HAS TORCH UNDERCUTTING COULD RESULT IN THE FAILURE OF THAT BEAM, LEADING TO ADVERSE VEHICLE HANDLING AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

1. Measure the inner diameter (I.D.) of the equalizing beam's center bushing bore and the center bushing's outer diameter (O.D.). The specification of the equalizing beam's center bore on a new RT•RTE equalizing beam:
  - **Inside diameter –**  
4.739" ± 0.004"  
(120.37 mm ± .10 mm)
  - Each measurement is to be taken as the average of any two readings at 90 degrees in the same plane, see Figure 8-36. If component is not within the specified range, replacement is required.

**FIGURE 8-36**



#### NOTE:

Equalizing Beam inside diameter: Take any two readings at 90° in the same plane

## ASSEMBLY

### NOTE

Hendrickson recommends the use of Grade 8 bolts and Grade C locknuts. If flange head bolts and locknuts are not used then hardened structural washers must be used under bolt heads and locknuts.

1. Clean the bores of the equalizing beams with emery cloth, removing any nicks or metal buildup from bushing removal.
2. The equalizing beam bore may have a more substantial lead chamfer at one end of the bore than the other. Take advantage of the larger chamfer by pressing in the new center bushing from this end.

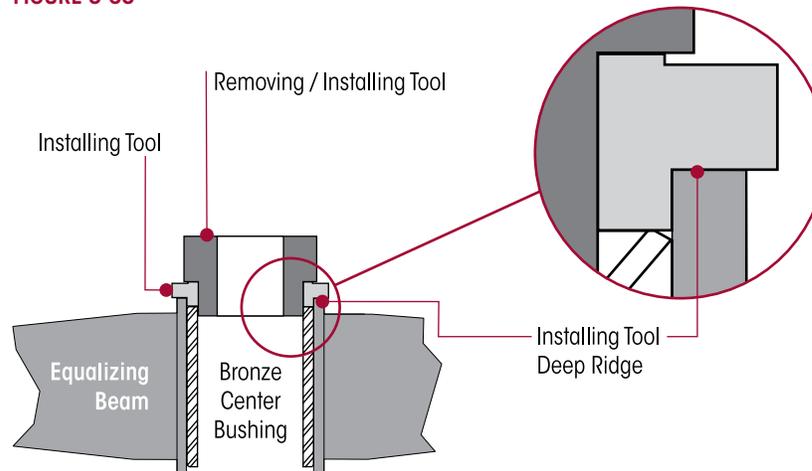
3. Place the equalizing beam in a shop press on the receiving tool.
4. Support the beam squarely at the bore area to avoid distortion of the beam bore or bending of the beam.
5. Lubricate the outer diameter (O.D.) of the bronze center bushing and the inner diameter (I.D.) of the equalizing center beam bore with NLGI#2 – EP (Extreme Pressure) lithium base grease.

**FIGURE 8-37**



6. Ensure the bronze center bushing is square to the equalizing beam bore.
7. Assemble the OTC tool components, see Figure 8-37. Position the deep ridge of the installing tool against the bronze center bushing. Center the removing / installing tool on top of the installing tool as shown in Figure 8-38.

**FIGURE 8-38**



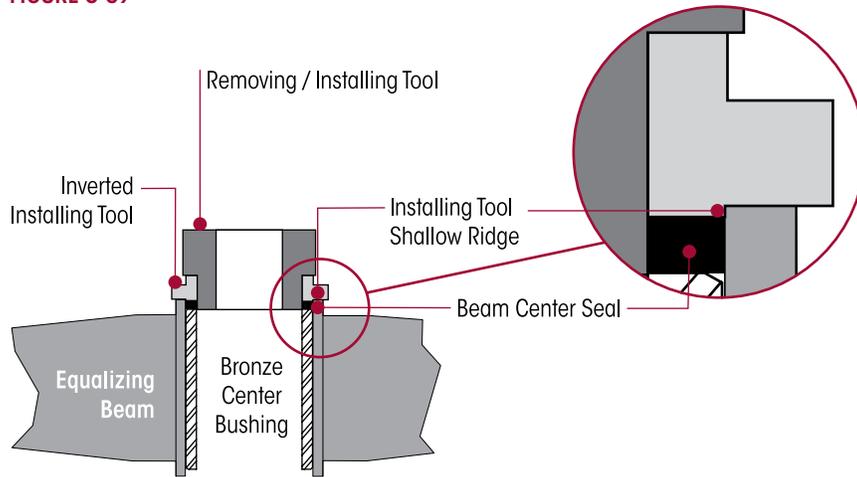
8. Using a shop press, push directly on the removing/installing tool and press in the new center bushing until the outer metal sleeve is centered and recessed in the equalizing beam's bore, see Figure 8-38.

### NOTE

The seals are installed with their lips pointing outward. This allows the grease to be purged past the seals during lubrication, and prevents outside contaminants from entering the bronze bushings.

9. Position the equalizing **beam center seal** on the bronze center bushing as shown in Figure 8-39.

10. Invert the installing tool so that the shallow ridge rests against the equalizing beam center seal as shown in Figure 8-39. Set the beam center seal in place by lightly tapping the removing / installing tool with a hammer, see Figure 8-37. Bronze center seals are installed at the correct depth when the installing tool makes contact at all points of the face of the equalizing beam.

**FIGURE 8-39**


11. Lubricate bronze center bushings with NLGI#2 – EP (Extreme Pressure) lithium base grease.
12. Install the center sleeve.
13. Install the cross tube.
14. Install the equalizing beam onto the vehicle, refer to the Equalizing Beam Assembly procedure in this section.

## BAR PIN END BUSHINGS

### WARNING

WHEN REMOVING AND INSTALLING BAR PIN END BUSHINGS IN THE EQUALIZING BEAMS, FOLLOW THE PROCEDURES OUTLINED IN THIS PUBLICATION. DO NOT USE A CUTTING TORCH TO REMOVE THE BUSHING OUTER METALS PRESSED IN THE EQUALIZING BEAM BORES. WELDING, TORCHING OR ATTACHING MATERIAL TO THE EQUALIZING BEAM MUST NEVER BE PERFORMED. THE USE OF HEAT CAN ADVERSELY AFFECT THE STRENGTH OF THE EQUALIZING BEAMS AND CAN CAUSE DAMAGE TO THE EQUALIZING BEAM ASSEMBLY, ADVERSE VEHICLE HANDLING AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

### NOTE

Hendrickson bar pin service kits containing alignment shims, (Kit No. 34013-088L) or (Rotating Bar Pin Bushing Kit No. 34013-188) contain all the components required for one (1) equalizing beam end, see Parts List Section of this publication.

### YOU WILL NEED

- A shop press with a capacity of at least 100 tons
- Bar pin style tool – Refer to the Special Tools Section of this publication
  - Installation tool Part No. 66086-103
  - Removal tools Part No. 66086-104 and 66086-105
- Shop Made Receiving tool – Refer to the Special Tools Section of this publication

### NOTE

The receiving tool completely supports the equalizing beam hub being serviced and is tall enough to receive the bushing as it is being pressed in or out.

## REMOVAL

### NOTE

Whenever an equalizing beam is removed for repair, or inspection of the equalizing beam end connection reveals movement, measure the distance between the axle bracket legs for correct width. Refer to Axle Bracket in Preventive Maintenance Section of this publication for measurement location and dimensions. An axle bracket outside of the measurement range must be repaired or replaced. Consult the vehicle manufacturer for inspection, component repair and replacement instructions.

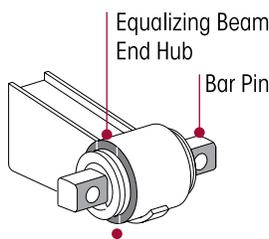
1. Remove equalizing beam assembly from vehicle as detailed in the Equalizing Beam Disassembly instructions in this section.
2. Place the equalizing beam in the shop press with the beam end hub squarely supported on the press bed.

### NOTE

If replacing the bar pin with a rotating bar pin end bushing, it is not necessary to mark the orientation of the bar pin flats.

3. Prior to removal, mark the orientation of the bar pin flats, see Figure 8-40. Mark orientation the equalizing beam with a paint stick.

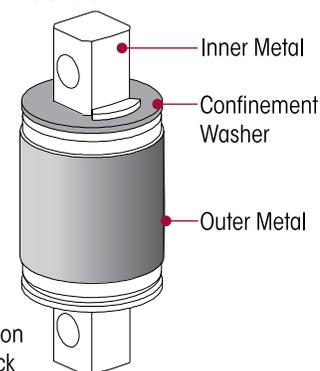
FIGURE 8-40



#### NOTE

Prior to removal mark the orientation of the bar pin flats with a paint stick on the equalizing beam end hub

FIGURE 8-41



4. Press on the end bushing inner metal, see Figure 8-41, of the end bushing until the inner metal is flush with the top of the beam end hub. This will dislodge the confinement washer and move the bushing rubber away from the outer metal of the bushing so the removal tool can be installed.

5. Center the bushing push out tool directly on the bushing's outer metal and press the bushing out of the equalizing beam end hub.
6. After removing the bar pin end bushings, thoroughly inspect each end hub bore.

## INSPECTION

After removing the bar pin end bushings, thoroughly inspect the beam bores. If the equalizing beam is damaged from end bushing removal, replacement of the equalizing beam is required, replace with a new equalizing beam. **DO NOT** re-bush or otherwise use an equalizing beam that has been damaged.

### WARNING

FAILURE TO REPLACE AN EQUALIZING BEAM THAT HAS BEEN DAMAGED FROM BUSHING REMOVAL CAN RESULT IN THE FAILURE OF THAT BEAM, LEADING TO ADVERSE VEHICLE HANDLING AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

When installing bar pin end bushings the following Steps will minimize the chance of damaging a new bar pin end bushing:

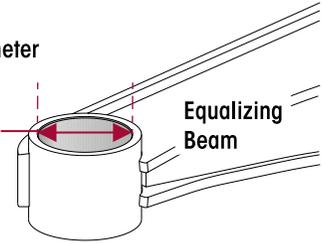
1. Clean the end hub bores with emery cloth or hone, removing any nicks or metal buildup from bushing removal.

- Measure the equalizing beam end hub bore inner diameter and the bushing outer diameter. The Hendrickson specification for the equalizing beam end hub bore diameter of the equalizing beam is  $4.365" \pm 0.004"$ , ( $110.87 \text{ mm} \pm 0.10 \text{ mm}$ ) see Figure 8-42. If components are **NOT** within the specified range, replacement is required.

**FIGURE 8-42**

Equalizing Beam  
End Hub Bore Inner Diameter

$4.365" \pm 0.004"$   
( $110.87 \text{ mm} \pm 0.10 \text{ mm}$ )

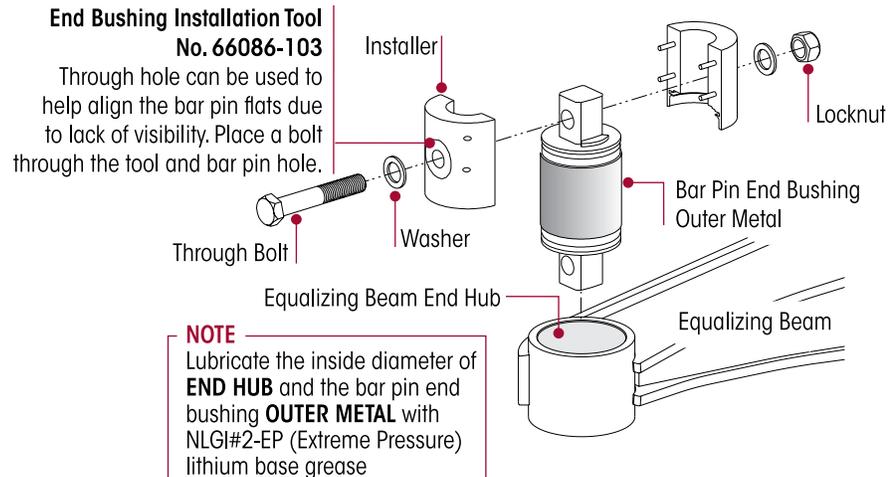


**CAUTION**

ALWAYS USE THE BUSHING'S OUTER METAL FOR PRESSING OPERATIONS, UNLESS OTHERWISE INSTRUCTED. PRESSING ON THE BUSHINGS INNER METAL MAY DAMAGE THE BUSHING REQUIRING BUSHING REPLACEMENT.

### BAR PIN END BUSHING INSTALLATION

- Place the equalizing beam in a shop press with the end hub (see Figure 8-43) squarely supported on the press bed or receiving tool, see Special Tools Section of this publication.

**FIGURE 8-43**


- Install Hendrickson Part No. 66086-103 (OTC 1757) end bushing installation tool (refer to Special Tools Section of this publication) on the new end bushing as shown in Figure 8-43. Tighten the through bolt until the two halves of the tool touch. The installation tool compresses the rubber between the inner and outer metal of the bushing to allow press force to be transmitted only to the outer metal of the bushing.

### SERVICE HINT

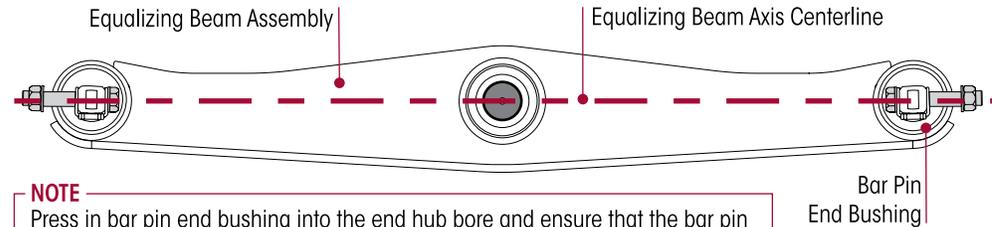
The end hub bore may have a more substantial leading chamfer at one end of the bore than the other. Take advantage of the larger chamfer by pressing in the new bushing from this end.

- Lubricate the equalizing beam end hub inside diameter AND the bar pin end bushing's outer metal with a heavy layer of NLGI #2 – EP (Extreme Pressure) lithium base grease, see Figure 8-43.
- Position the equalizing beam end bushing and installation tool on the end hub. Verify the bolt holes in the end bushing are in line with the beam axis, see Figure 8-44.

### NOTE

The end bushing must be square with the equalizing beam end hub before pressing the end bushing into the equalizing beam. End bushings pressed in at an angle will damage the end bushing and the equalizing beam.

FIGURE 8-44

**NOTE**

Press in bar pin end bushing into the end hub bore and ensure that the bar pin holes follow the same orientation as the centerline of the equalizing beam axis.

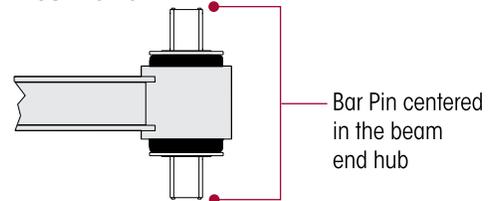
5. Verify the end bushing's outer metal is square with the end hub. Damage to the equalizing beam and the end bushing will result if the bushings are pressed in at an angle.

**CAUTION**

CARE MUST BE TAKEN DURING THE INSTALLATION OF THE BUSHING. DO NOT PUSH ON THE INNER METAL OF THE BUSHING, DOING SO WILL CAUSE DAMAGE TO THE BUSHING AND VOID WARRANTY.

6. Install the end bushing into the end hub by pressing on the installation tool until the installation tool contacts the end hub. This will center the bushing in the end hub, see Figure 8-45.
7. Install the equalizing beam onto vehicle, refer to the Equalizing Beam Assembly procedure in this section.

FIGURE 8-45



## ADAPTER STYLE END BUSHING

### YOU WILL NEED

- A shop press with a capacity of at least 100 tons
- Air hammer / chisel / Bent chisel, see Figure 8-46
- End Bushing tool – Refer to Special Tools Section of this publication
  - **28-52K** Capacity, Part No. 66086-101
  - **65K-85K** Capacity, Part No. 66086-102

FIGURE 8-46



### ADAPTER REMOVAL

**WARNING**

THE ADAPTER REMOVAL PROCESS CAN CAUSE DAMAGE. REUSE OF DAMAGED OR WORN ADAPTERS COULD RESULT IN A COMPONENT FAILURE LEADING TO ADVERSE VEHICLE HANDLING AND POSSIBLE PERSONAL INJURY.

### SERVICE HINT

It is recommended that a penetrating oil be applied to all beam end connections prior to removal to aide in disassembly.

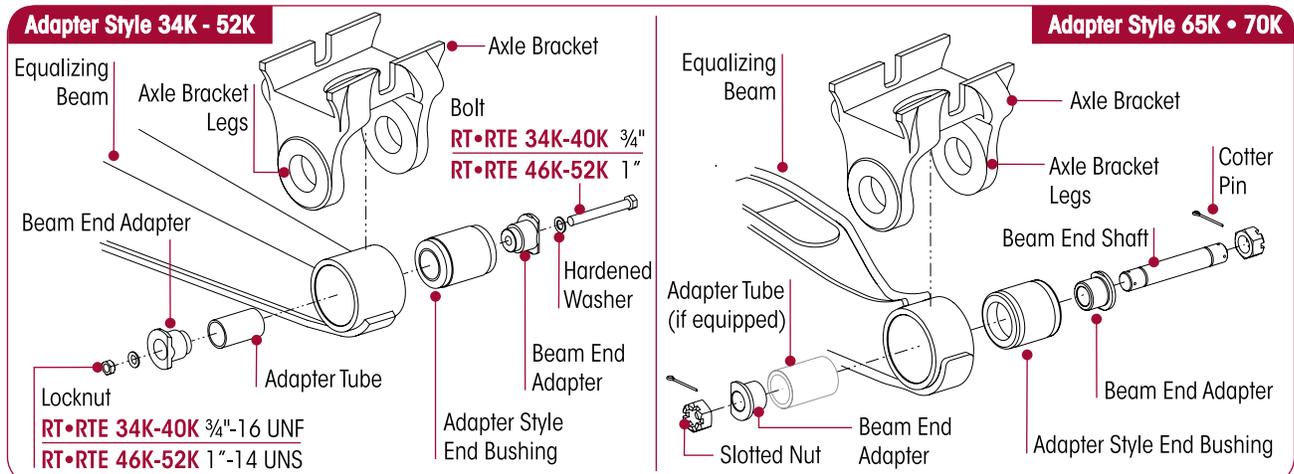
1. Chock the wheels of the steer axle.
2. Raise and support the drive axles with safety stands.
3. Remove the tires.

**WARNING**

PRIOR TO REMOVING BOTH EQUALIZING BEAMS, SUPPORT THE PINION OF EACH DRIVE AXLE. FAILURE TO DO SO CAN RESULT IN PERSONAL INJURY OR ALLOW THE AXLES TO SHIFT MAKING REASSEMBLY MORE DIFFICULT.

4. Support the pinion angle of the drive axles to prevent axle movement during service.

FIGURE 8-47



5. Remove and discard the saddle cap fasteners from both inboard and outboard sides of the equalizing beam.
6. Remove the saddle caps, refer to Saddle Cap Assembly in this section.
7. Raise the vehicle's frame just enough to create a 1/2" (13 mm) gap between the saddles and the center bushings. Support the vehicle's frame at this height.

**CAUTION**

THE WEIGHT OF THE EQUALIZING BEAM ASSEMBLY IS APPROXIMATELY 155 POUNDS. PRIOR TO REMOVING THE BEAM END FASTENERS FROM THE EQUALIZING BEAM, SUPPORT THE END OF THE EQUALIZING BEAM TO PREVENT FROM DROPPING. CARE SHOULD BE TAKEN AT REMOVAL AND INSTALLATION TO PREVENT PERSONAL INJURY OR DAMAGE TO COMPONENTS.

8. Support both equalizing beams with floor jacks.
9. Remove the cotter pin(s) and the locknut(s) or slotted nut(s) as equipped.

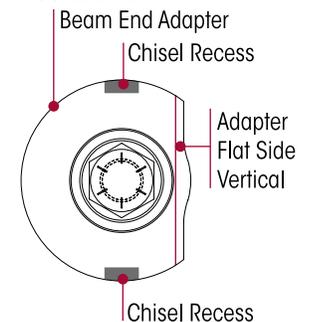
10. Remove the beam end bolt or shaft (as equipped), see Figure 8-47.

**NOTE**

Due to the process necessary to remove the beam end adapters, the adapter can be subjected to damage. **DO NOT** reuse worn or damaged adapters.

11. The beam end adapters have two chisel recesses located in their flanges as shown in Figure 8-48.
12. Locate the recess for the chisel, rotate the adapter if necessary. Place the air hammer/chisel in the recess to rotate the adapter collar.
13. If the beam end adapter does not turn, use a hammer to rap the outside of the axle bracket legs around the adapter area and repeat air hammer chisel procedure until removed.
14. Remove the beam end adapter from the other equalizing beam ends.
15. Slowly lower the floor jacks and remove/pry the equalizing beams from the axle brackets.
16. Remove the end bushing adapter tube (if equipped), see Figure 8-47.
17. Remove the floor jacks from under the equalizing beams.

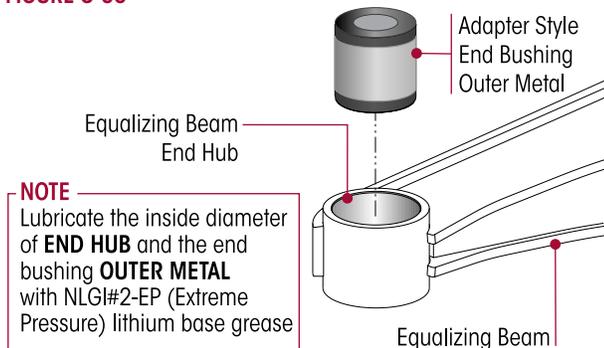
FIGURE 8-48



18. Position the equalizing beam in the shop press and align the end bushing removal / replacement adapter tool with the **tapered end down** on top of the rubber end bushing, see Figure 8-49.
19. Apply hydraulic force and push out the old bushing.
20. Inspect the axle bracket legs per the Beam End Axle Brackets, Physical Inspection for Adapter Style bushings in the Preventive Maintenance section of this publication.

### INSTALLATION

FIGURE 8-50



1. Clean the equalizing beam bushing bore with a cylinder ball hone or emery paper of any debris.
2. Lubricate the equalizing beam bore and the equalizing beam center bushing outer metal sleeve with NLGI#2 -EP (Extreme Pressure) grease, see Figure 8-50.
3. Position the end bushing removal/replacement adapter with the **tapered end up** onto the clamp, see Figure 8-51.
4. Use a wrench to tighten the installing clamp tool on the rubber bushing and the end bushing replacement adapter, see Figure 8-51.

### WARNING

CHECK TO ENSURE PROPER ALIGNMENT OF TOOLING ADAPTERS WITH EQUALIZING BEAM COMPONENTS BEFORE APPLYING FULL HYDRAULIC PRESSURE WITH A SHOP PRESS.

5. Apply hydraulic force and press the new bushing into place. The bushing will be completely seated when the clamp contacts the beam face.
6. Using the floor jacks, slowly raise both equalizing beams and cross tube as an assembly into the axle brackets. Ensure that each equalizing beam end bushing correctly engages the axle bracket.
7. Install one (1) adapter through the axle bracket leg at the wheel side, into the beam end bushing.
8. Install the other adapter through the axle bracket leg at the axle side, taking advantage of the cut-off flange on the adapter to clear the axle.

FIGURE 8-49

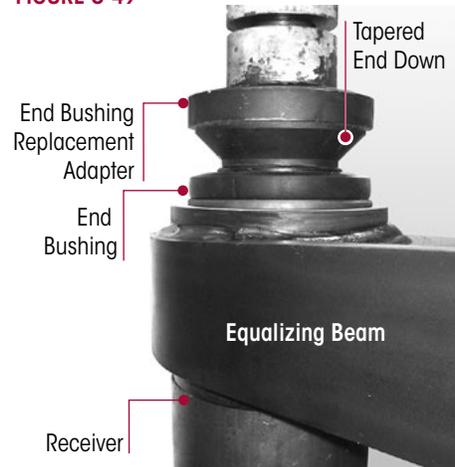
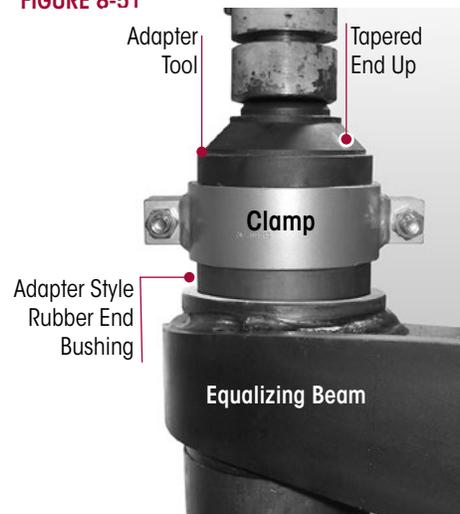


FIGURE 8-51



9. Rotate the adapters so that the adapter cut-off flats are vertical as shown in Figure 8-52.
10. Install the end shaft and slotted nuts.
11. Place the axles in their normal operating positions before the slotted nuts are torqued to specifications.

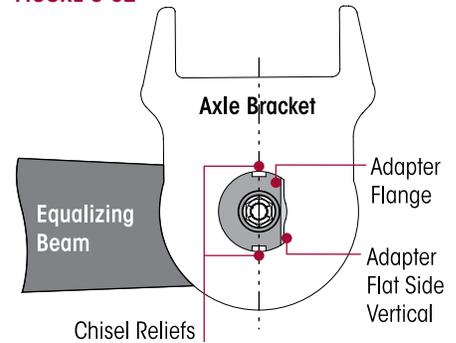
**WARNING**

IF THE TIGHTENING TORQUES RECOMMENDED BELOW ARE NOT PROPERLY MAINTAINED, THE METAL SURFACES OF THE AXLE BRACKET LEGS, HOLES, ADAPTERS AND RUBBER BUSHING INNER METALS CAN EXPERIENCE EXCESSIVE WEAR AND/OR FAILURE. THIS CAN CAUSE SEPARATION OF COMPONENTS AND ADVERSE VEHICLE HANDLING, PROPERTY DAMAGE OR PERSONAL INJURY.

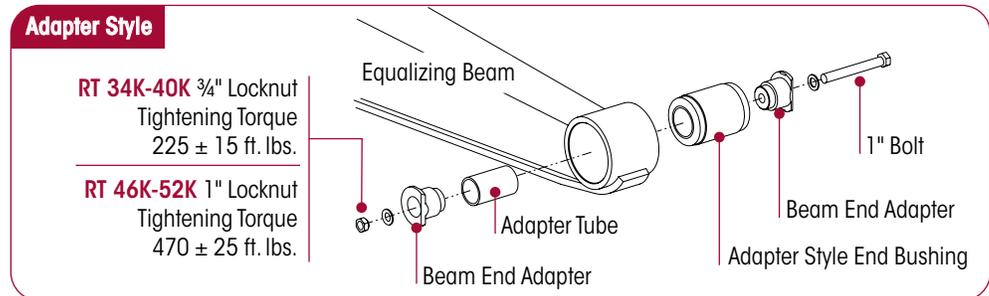
12. Tighten the locknuts until final torque value is achieved, **DO NOT EXCEED** specified torque value.

- **RT 34K-40K** – Tighten ¾" Locknut to 225 ± 15 foot pounds torque, see Figure 8-53
- **RT 46K-52K** – Tighten 1" Locknut to 470 ± 25 foot pounds torque, see Figure 8-53
- **RT 65K • 70K** – Refer to the RT 65K•70K Tightening Torque Procedure

**FIGURE 8-52**



**FIGURE 8-53**



13. Remove the frame supports and lower the saddle onto the center bushings.
14. Install the saddle caps, refer to Saddle Cap Assembly in this section.
15. Install the tires.
16. Remove the supports from the drive axles and lower the vehicle onto the ground.
17. Remove the wheel chocks.

### RT 65K • 70K TIGHTENING TORQUE PROCEDURE

The proper tightening torque procedure for the RT 65K • 70K suspensions, equipped with two or three piece adapter or the tube and nut type beam end connections must be performed to ensure that the proper clamp force of the axle bracket legs against the end bushing's inner metal is obtained to achieve the maximum service life from the suspension system and mounting hardware.

Two or three piece adapter type and tube and nut type beam end connections require the fasteners be tightened and maintained to a torque value within the specified torque range, see Table 8-1.

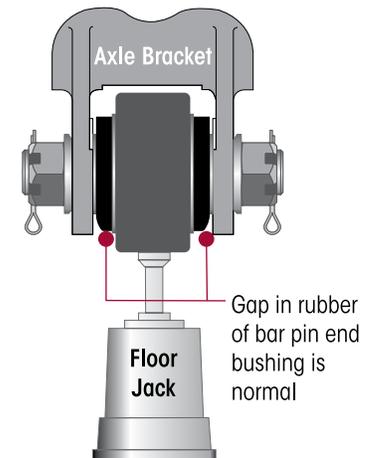
A simple torque wrench **will not** be sufficient to obtain the proper torque requirement. The proper torque requirement can be obtained with the use of a torque multiplier. If one is not available the use of a slug wrench is recommended, see Figure 8-57.

## TIGHTENING PROCEDURE

Prior to removing the equalizing beam assembly from chassis:

1. Ensure the vehicle is properly supported with frame stands.
2. Chock the front wheels of the vehicle.
3. Place a jack under each beam end, as shown in Figure 8-54.
4. Check for movement of the rubber end bushing inner metal. If movement is noted, it cannot be eliminated by tightening the fasteners due to the excessive wear of mating parts and increasing clearance tolerances. If movement is noted, **DO NOT** operate the vehicle. Replace the rubber end bushing and all connecting parts.

FIGURE 8-54



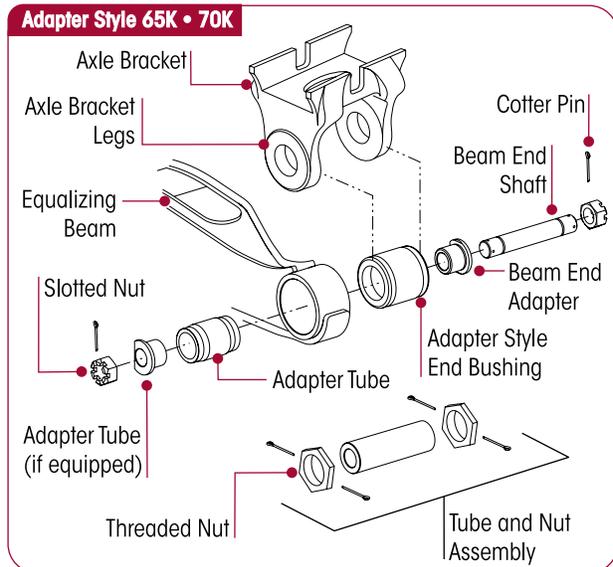
## ASSEMBLY

### NOTE

Axles must be in operational position before fasteners are tightened to prevent pre-loading of the rubber bushing.

1. Position the equalizing beam assembly in the axle bracket on the axle.
2. Apply an anti-seize compound to all mating metal surfaces of the axle brackets, end bushings, and mounting hardware. This will aid in the assembly as well as prevent possible corrosion making future disassembly difficult.
3. Insert the adapter or tube beam end connections, see Figure 8-55. For specific part numbers, see Table 8-2 on page 66.

FIGURE 8-55

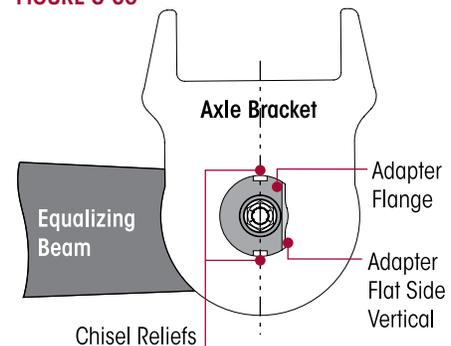


### NOTE

For the adapter type connection, rotate the adapters so the adapter flats are vertical, see Figure 8-56.

4. Assemble one (1) slotted nut to the shaft and install the cotter pin. Place a suitable wrench on the nut and ensure the wrench is locked in place (braced) to prevent movement.
5. Tighten using one of the following methods:

FIGURE 8-56



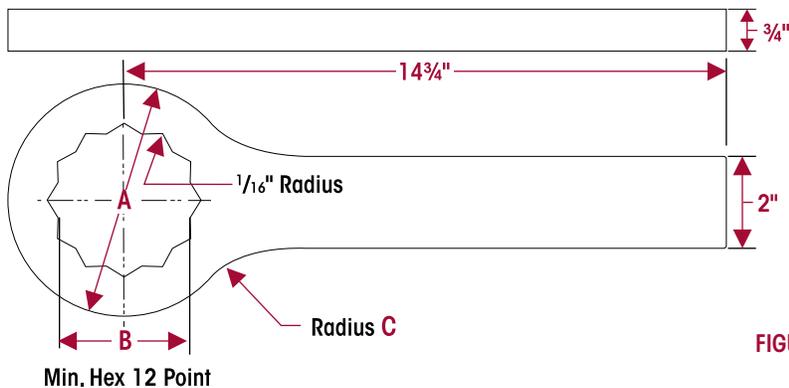
**METHOD A: Torque Multiplier, YOU WILL NEED**

- Torque Multiplier
  - a. Assemble the opposite nut and use a torque wrench with a multiplier.
  - b. Tighten the nut to torque multiplier value shown in Table 8-1 on page 66.
  - c. Install the cotter pin. The nut may be advanced to the next nut slot. **DO NOT** back off nut.

DO NOT BACK OFF NUT TO INSTALL COTTER PIN, DOING SO MAY REDUCE THE TIGHTENING TORQUE BELOW THE REQUIRED SPECIFICATION.

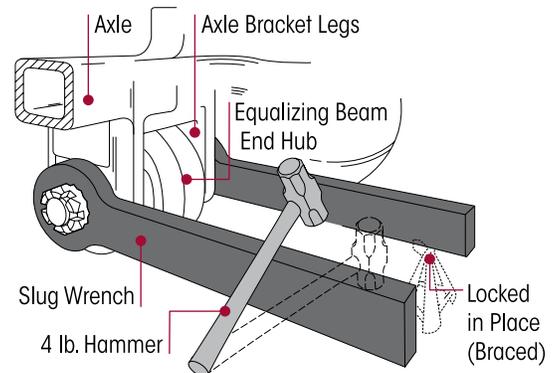
**METHOD B: Slug Wrench, YOU WILL NEED**

- Two (2) slug wrenches, see Figure 8-57
- 4 pound hammer
  - a. Assemble the opposite nut and using a torque wrench, tighten the nut to the initial torque value shown in Table 8-1 on page 66.

**FIGURE 8-57**


SLUG WRENCH SPECIFICATIONS		
	Adapter Style	Tube and Nut Type
A	5" Diameter	6 <sup>3</sup> / <sub>8</sub> " Diameter
B	2 <sup>1</sup> / <sub>16</sub> "	4"
C	2 <sup>1</sup> / <sub>2</sub> "	1 <sup>1</sup> / <sub>2</sub> "

- b. Remove torque wrench and replace with the Slug Wrench. Use a four pound hammer, tighten the assembly by hitting the slug wrench near the handle as shown in Figure 8-58 until the nut has been turned to the degrees specified in Table 8-1 on page 66.
- c. Install the cotter pin. The nut may be advanced to the next nut slot, **DO NOT** back off nut.

**FIGURE 8-58**


REPEATED HAMMERING BEYOND THE DEGREE SPECIFIED CAN CAUSE COMPONENT DAMAGE.

DO NOT BACK OFF NUT TO INSTALL COTTER PIN, DOING SO MAY REDUCE THE TIGHTENING TORQUE BELOW THE REQUIRED SPECIFICATION.

TABLE 8-1

RT 65K • 70K TORQUE SPECIFICATIONS

SLUG WRENCH METHOD		TORQUE MULTIPLIER
<b>• Tube and Nut End Connection</b>		
<b>Initial Torque</b>	<b>Plus</b>	
200 ft. lbs.	 120 DEGREES 1/3 or 120° turn on slotted nut	1,200 ± 100 ft. lbs.
<b>• Two and Three Piece Adapter End Connection</b>		
125 ft. lbs.	 90 DEGREES 1/4 or 90° turn on castle nut	700 ± 100 ft. lbs.

**WARNING**

INSUFFICIENT TIGHTENING TORQUE VALUE CAN CAUSE PREMATURE WEAR AND DAMAGE TO THE AXLE BRACKET LEGS, HOLES AND/OR BEAM END CONNECTION COMPONENTS, THIS CAN FURTHER CAUSE FAILURE AND SEPARATION OF COMPONENTS, AND RESULT IN ADVERSE VEHICLE HANDLING, SEVERE PERSONAL INJURY OR DEATH. MAINTAIN PROPER TIGHTENING TORQUE VALUE AT ALL TIMES.

TABLE 8-2

RT 65K • 70K ADAPTER FASTENER END KITS

TWO-PIECE	THREE-PIECE	TUBE AND NUT
Kit Nos. 21140-004 • 21140-007 21140-031 • 21140-043 • 21140-052	Kit Nos. 21140-026 • 21140-027	Kit No. 21140-006

**LONGITUDINAL TORQUE RODS**

**DISASSEMBLY**

1. Chock the front wheels of the vehicle.

**SERVICE HINT**

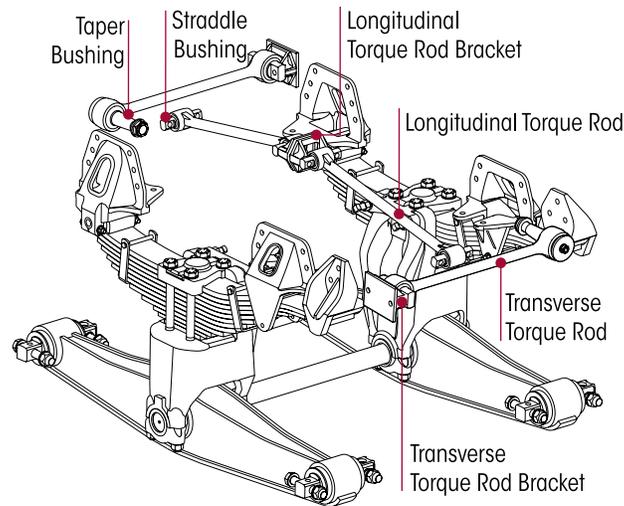
To remove all the load from the longitudinal torque rod, raise or lower the pinion as needed. This will ease the removal of the longitudinal torque rod.

2. Support the pinion on the axle being serviced.

**NOTE**

Prior to disassembly of the longitudinal torque rod, note the quantity and orientation of the longitudinal torque rod shims. It is required that the longitudinal torque rod shims are installed in the same orientation and location as removed to preserve the existing alignment.

3. Remove the torque rod mounting fasteners and shims (if equipped).
4. Remove the fasteners that connect the longitudinal torque rod to the cross member and axle brackets.
5. Remove longitudinal torque rod, see Figure 8-59.

**FIGURE 8-59**


### ASSEMBLY

1. Install longitudinal torque rods.
2. Install new fasteners and any shims (that were equipped) to the cross member and torque rod axle brackets.

---

### NOTE

Hendrickson recommends the use of Grade 8 bolts and Grade C locknuts. If flange head bolts and locknuts are not used then hardened structural washers must be used under bolt heads and locknuts.

3. Tighten all fasteners to vehicle manufacturer's torque specifications.
4. Verify proper pinion angle, and correct with drop in shims between the torque rod bar pin and the cross member or torque rod axle bracket depending on the direction of adjustment needed. Contact the vehicle manufacturer for proper pinion angle specifications.
5. Remove wheel chocks.

## TRANSVERSE TORQUE RODS

### DISASSEMBLY

1. Chock the wheels of the vehicle.

---

### SERVICE HINT

Note the quantity and location of shims removed to maintain the lateral alignment of the axle during assembly. See Alignment & Adjustments Section of this publication.

2. Remove the torque rod mounting fasteners.
3. Remove the transverse torque rod.
4. Inspect the mounting surfaces for any wear or damage. Repair or replace as necessary.

### INSPECTION

1. Inspect the torque rod mating surfaces for any wear or damage. Repair as necessary.
2. Inspect the rubber bushings for wear or damage. Replace as necessary.
3. Inspect the torque rod for straightness, wear, or cracks. Replace as necessary.
4. Inspect the inner spacer plate and outer backup plates for wear or damage. Replace as necessary.
5. Inspect the frame rail for wear or damage. Repair as necessary.

## ASSEMBLY

1. Install the transverse torque rod.
2. Install the mounting fasteners and any shims that were removed.

### NOTE

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

3. Tighten all fasteners to the required torque specification. Refer to vehicle manufacturer for specifications.
4. Check the lateral alignment. If not within vehicle manufacturer's specified range, a lateral alignment is necessary. See Lateral Alignment in the Alignment & Adjustments Section of this publication.
5. Remove the wheel chocks.

## ULTRA ROD • ULTRA ROD PLUS TORQUE ROD BUSHINGS

FIGURE 8-60

### YOU WILL NEED

- A vertical press with a capacity of at least 10 tons
- Shop made receiving tool and installation/removal tool, refer to the Special Tools Selection of this publication for more information
- Funnel Tools, refer to the Special Tools Selection of this publication for more information
  - **ULTRA ROD**, Tool Part No. 66086-001
  - **ULTRA ROD PLUS**, Tool Part No. 66086-000

Taper Pin Bushing



Straddle Pin Bushing

### DISASSEMBLY

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

### WARNING

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

2. 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 mount bar pin, 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.
4. Remove the fasteners from the tapered bar pin bushing, and support the torque rod end on the receiving tool with the tapered stud pointing up and the end tube centered on the tool. Be sure the torque rod is squarely supported on the press bed for safety.
5. Push directly on the tapered stud until the bushing clears the torque rod end tube.

### ASSEMBLY

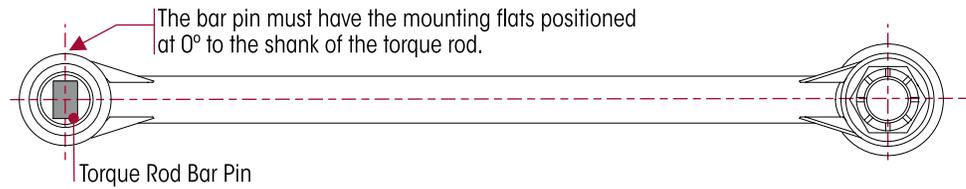
1. Clean and inspect the inner diameter of the torque rod end tubes.

### NOTE

**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. Use **ONLY** a light Naphthenic base oil, such as 60 SUS at 100°F.

2. Lubricate the inner diameter of the torque rod end tubes and the new rubber bushings with a light Naphthenic base oil, such as 60 SUS at 100°F, see Figure 8-61.
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 8-62.

**FIGURE 8-61**

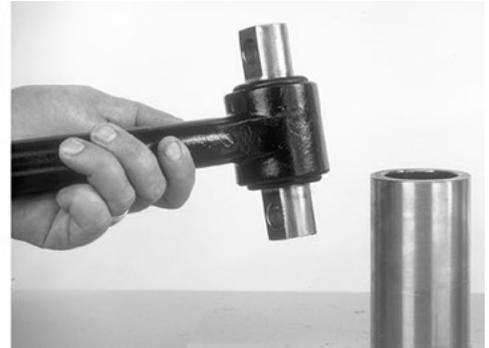
**FIGURE 8-62**


4. Push directly on the straddle mount bar pin, or the tapered stud. The bushing must be centered within the end hubs of the torque rod.
  - When pushing in the new rubber bushings, overshoot the desired final position by approximately  $\frac{3}{16}$ " (4.76 mm), see Figure 8-63
  - Push the rubber bushing again from the opposite side to center the rubber bushing within the end hub, see Figure 8-64

**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 HUB CAUSING THE BUSHING TO BE REMOVED AND A NEW BUSHING RE-INSTALLED.

**FIGURE 8-63**

**FIGURE 8-64**


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

## XTRB TORQUE ROD BUSHINGS

### YOU WILL NEED

- A vertical press with a capacity of at least 10 tons
- Shop made receiving tool and installation / removal tool, see the Special Tools Section of this publication for more information

### DISASSEMBLY

1. Remove the torque rod(s) as detailed in Torque Rod Disassembly instructions in this section.

### WARNING

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

### 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 8-66. 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 8-66.
3. Support the torque rod end hub centered on the receiving tool. Be sure the torque rod is squarely supported on the press bed for safety.

4. Push directly on the straddle mount bar pin, until the top of the bar pin is level with the top of torque rod end hub, see Figure 8-67.
5. Place the shop made removal tool on the bar pin and press until the bushing clears the torque rod hub, see Figure 8-68.
6. Remove the fastener from the tapered bar pin bushing, and support the torque rod hub on the receiving tool with the tapered stud pointing down and the end hub centered on the tool. Be sure the torque rod is squarely supported on the press bed for safety.

FIGURE 8-65



FIGURE 8-66

Mark the clocking position of the bar pin flats with a paint stick on the torque rod end hub

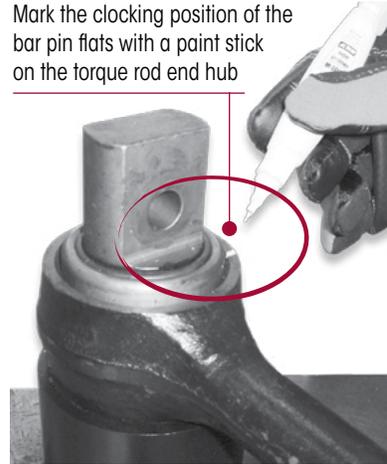


FIGURE 8-67



FIGURE 8-68

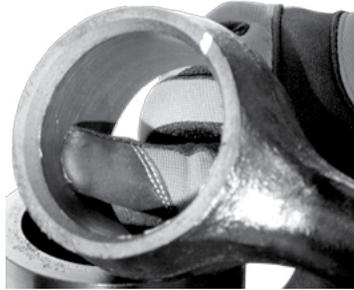


## ASSEMBLY

1. Clean and inspect the inner diameter of the torque rod end hubs, see Figure 8-69.

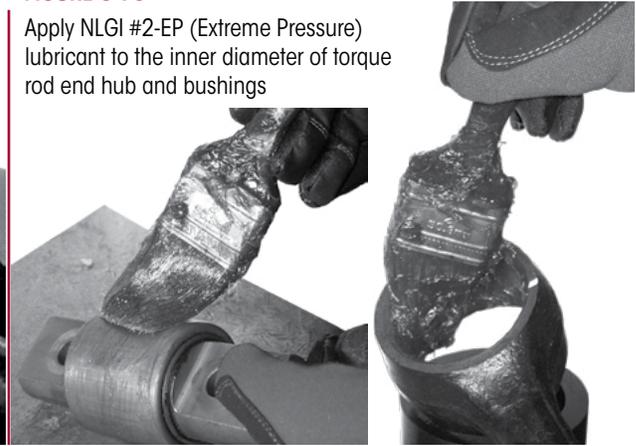
**FIGURE 8-69**

Inspect and clean the inner diameter of torque rod end hubs



**FIGURE 8-70**

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



### 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 (Extreme Pressure) lithium base grease, see Figure 8-70.
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 8-66.
5. Using the shop made tool, place the installer tool on the bushing and press in. The bushing must be centered within the hub of the torque rod.
6. Wipe off the excess lubricant.
7. Install the torque rod as detailed in the Torque Rod Assembly instructions in this section.

## CROSS TUBE EQUIPPED WITH RUBBER BUSHINGS

A cross tube seldom requires replacement, usually only when it has been bent, possibly due to hitting an object. A bent cross tube may cause misalignment of the axles, and must be replaced immediately to eliminate abnormal tire wear.

### NOTE

**Method A** can only be used for **RT 65K** and up.

**Method A Equalizing Beam Removal Method** - Follow the Equalizing Beam component replacement procedure in this section. Within the procedure, after removal of the equalizing beams when the equalizing beams are separated, remove and replace cross tube.

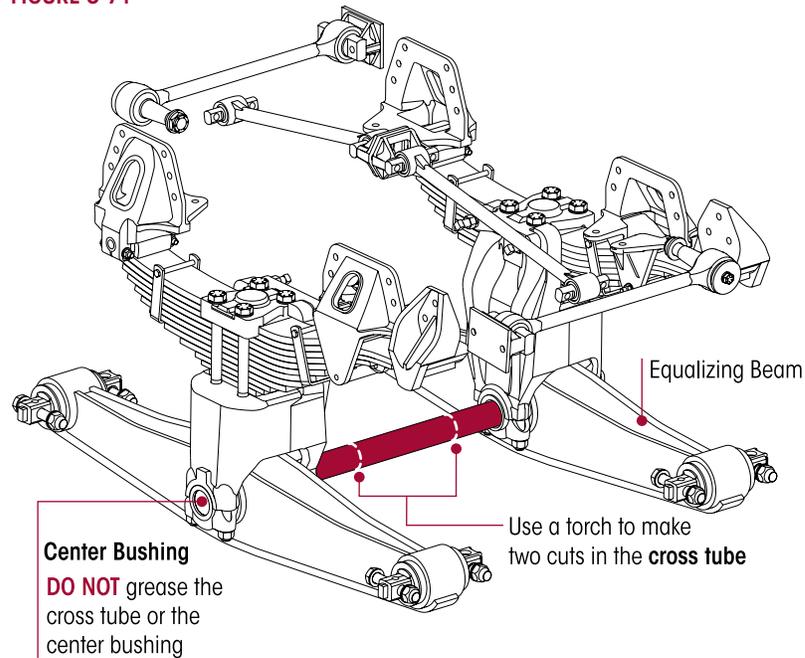
**Method B Center Bushing End Plug Removal** (RT•RTE 34K through 52K only).

#### YOU WILL NEED

- Center Bushing End Plug (see Parts Lists Section)
- Cutting Torch
- Welding Equipment
- Hole Saw

## DISASSEMBLY

FIGURE 8-71



1. Use a work bay with a level surface.
2. Chock the front steer axle wheels.

### CAUTION

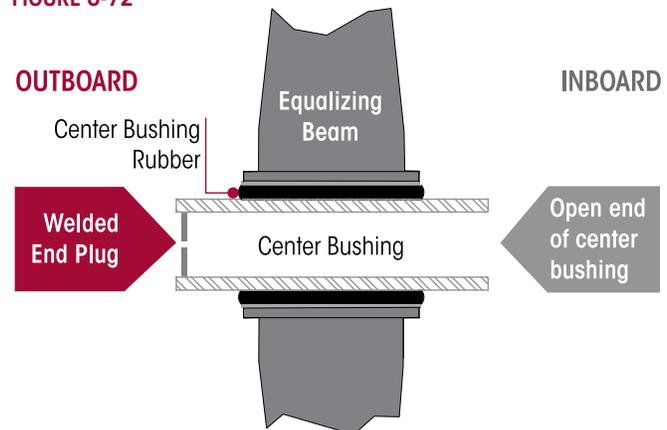
FOLLOW THE SAFETY GUIDELINES FOR OPERATING THE TORCH. USE CAUTION AS PARTS MAY BE HOT.

3. Use a cutting torch to make two cuts in the cross tube, see Figure 8-71.
4. Remove the cut section of the cross tube and slide the remaining sections out of the center bushings and discard.
5. Use a 2" hole saw and remove only one (1) center bushing end plug from the suspension.

FIGURE 8-72

## ASSEMBLY

1. Clean the open end of the center bushing bore to approximately 1" (25.4 mm) depth of weld and debris.
2. From the open center bushing slide the new cross tube into both center bushings.
3. It may be necessary to use a floor jack under one or both equalizing beams to align the cross tube.
4. Position the end plug  $\frac{1}{4}$ " (6.35 mm) recessed in the center bushings and tack weld, see Figure 8-72.
5. Check end plug position, final weld shall be a  $\frac{1}{4}$ " (6.35 mm) fillet.



## CROSS TUBE EQUIPPED WITH BRONZE BUSHINGS

A cross tube seldom requires replacement, usually only when it has been bent, possibly due to hitting an object. A bent cross tube may cause misalignment of the axles, and must be replaced immediately to eliminate abnormal tire wear.

### DISASSEMBLY

1. Use a work bay with a level surface.
2. Chock the front steer axle wheels.
3. Remove and discard saddle cap fasteners.
4. Remove the saddle cap.
5. Raise the vehicle frame just enough to create a gap between the saddles and center sleeves.
6. Prior to removal of the center bushing sleeves, note the quantity and position of thrust washers.
7. Remove the center bushing sleeves.
8. Remove the cross tube.

### ASSEMBLY

1. Ensure the center bushing is clean of debris and has a good film of NLGI#2 – EP (Extreme Pressure) lithium base grease applied.
2. Insert one (1) center sleeve.
3. From the other side of the vehicle, insert the cross tube through the equalizing beam and into the installed center sleeve.
4. Insert the second center bushing sleeve.
5. Clean any excess grease from the outside of the center sleeves.

### CAUTION

OPERATING A VEHICLE WITH AN INSUFFICIENT NUMBER OF THRUST WASHERS MAY ALLOW SIDE MOVEMENT BETWEEN THE SADDLES AND THE EQUALIZING BEAM THAT CAN AFFECT VEHICLE HANDLING AND STEERING BY THE OPERATOR AND CAN CAUSE PREMATURE COMPONENT WEAR.

6. Reinstall the thrust washers.
7. Install as many thrust washers as possible until the remaining gap is less than the thickness of one (1) thrust washer.

### NOTE

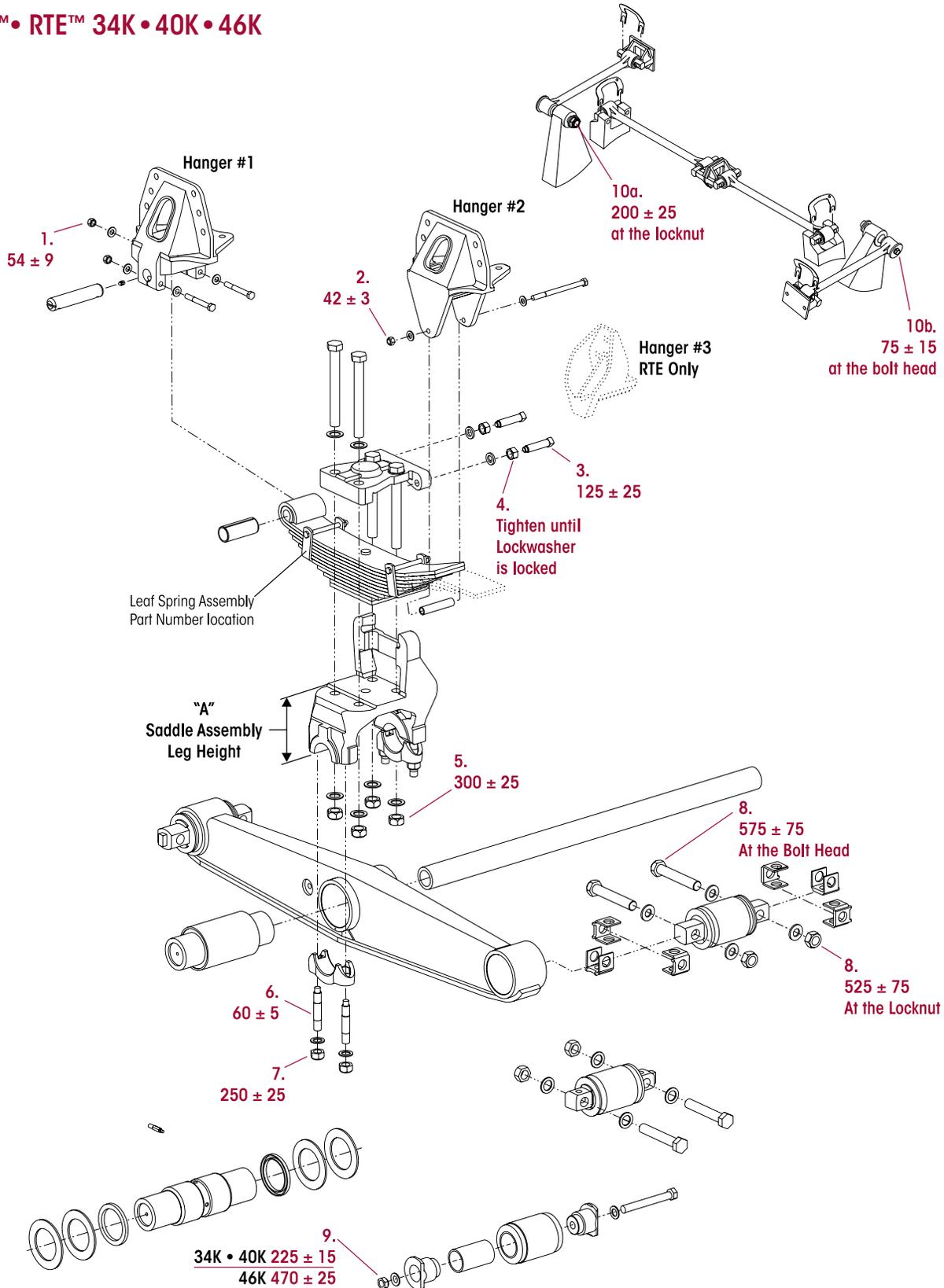
Each bronze center bushing kit, contains eight (8) thrust washers, enough for two (2) washers at each side of each beam center hub, see Figure 8-35.

8. Slowly lower the vehicle ensuring the saddles are centered on the center bushing sleeves.
9. Install the saddle caps and fasteners.
10. Tighten saddle cap fasteners to  250 ± 25 foot pounds torque.
11. Remove wheel chocks.

# SECTION 9 Torque Specifications

Hendrickson recommended torque values provided in Foot Pounds

RT™ • RTE™ 34K • 40K • 46K





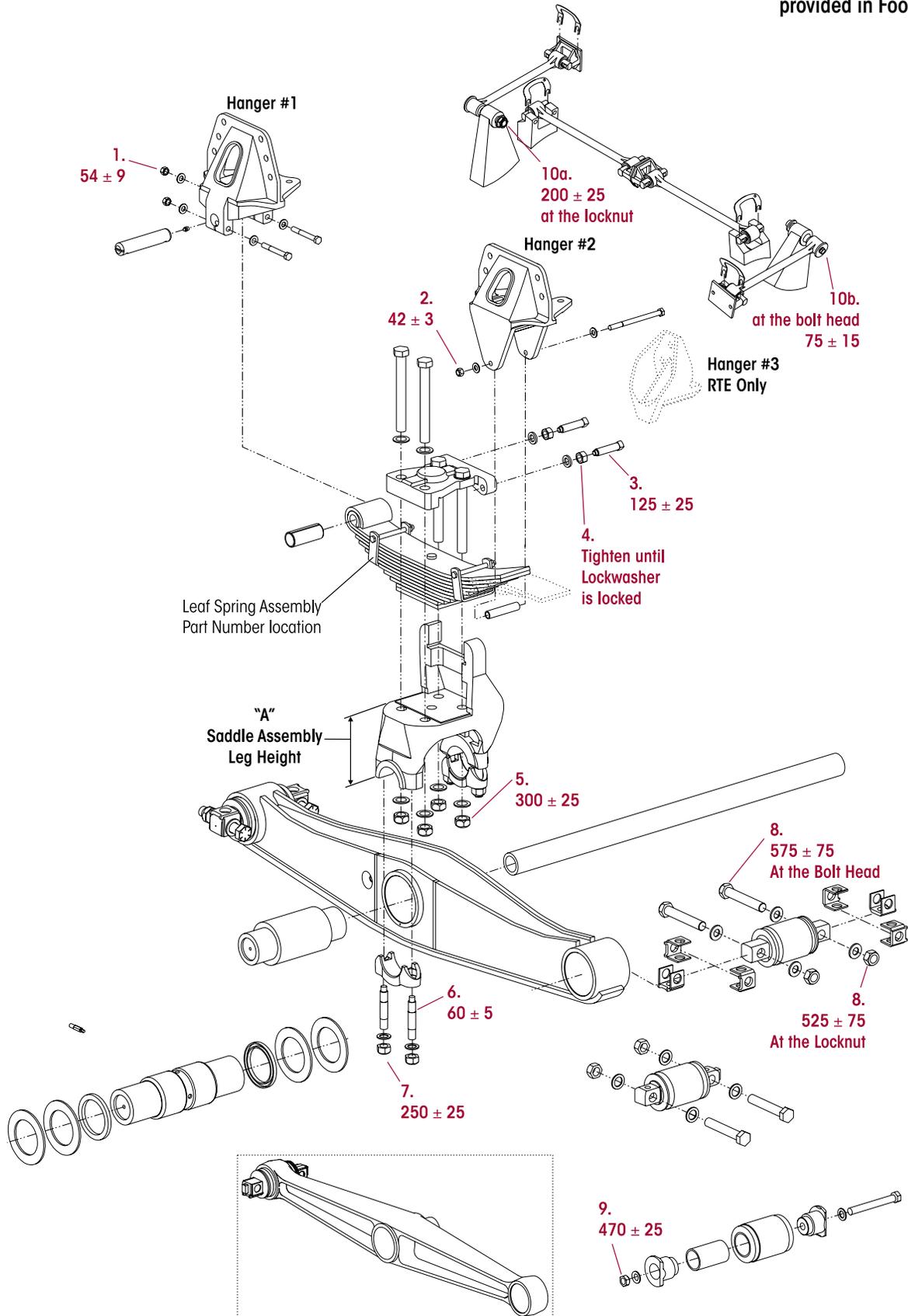
## RT™ • RTE™ 34K • 40K • 46K

## HENDRICKSON RECOMMENDED TORQUE SPECIFICATIONS

NO.	COMPONENT	FASTENER		TORQUE VALUE FOOT POUNDS	
		QTY.	SIZE		
Frame Fasteners furnished and installed by Truck Manufacturer					
1	Spring Pin Double Lock Locknut	4	½"-13 UNC	54 ± 9	
2	Rear Spring Hanger Locknut	4	½"-10 UNC	42 ± 3	
3	Top Pad Set Screw	4	¾"-10 UNC	125 ± 25	
4	Top Pad Set Screw Locknut	8	1"- 10 UNC	Tighten until Lockwasher locks	
5	Top Pad Locknut	8	1"- 14 UNS	*300 ± 25	
6	Saddle Cap Stud	8	7/8"-14 UNF	60 ± 5	
7	Saddle Cap Stud Locknut	8	7/8"-14 UNF	250 ± 25	
8	Bar pin Attachment to Axle	at the Bolt Head	8	1"-8 UNC	575 ± 75
		at the Locknut	8	1"-8 UNC	525 ± 75
9	Adapter Style	34K • 40K	4	¾"-16 UNF	225 ± 15
		46K	4	1"-14 UNS	470 ± 25
10a	Transverse Torque Rod to Axle Bracket	at the Locknut	2	1¼"-12 UNF	200 ± 25
10b		at the Bolt Head	2	5/8"-11 UNC	75 ± 15
<p><b>NOTE:</b> 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>* All threads must be lubricated with SAE 20 oil before assembly to obtain the correct relationship of torque and fastener tension.</p>					

RT™ • RTE™ 48K • 50K • 52K

Hendrickson recommended torque values provided in Foot Pounds





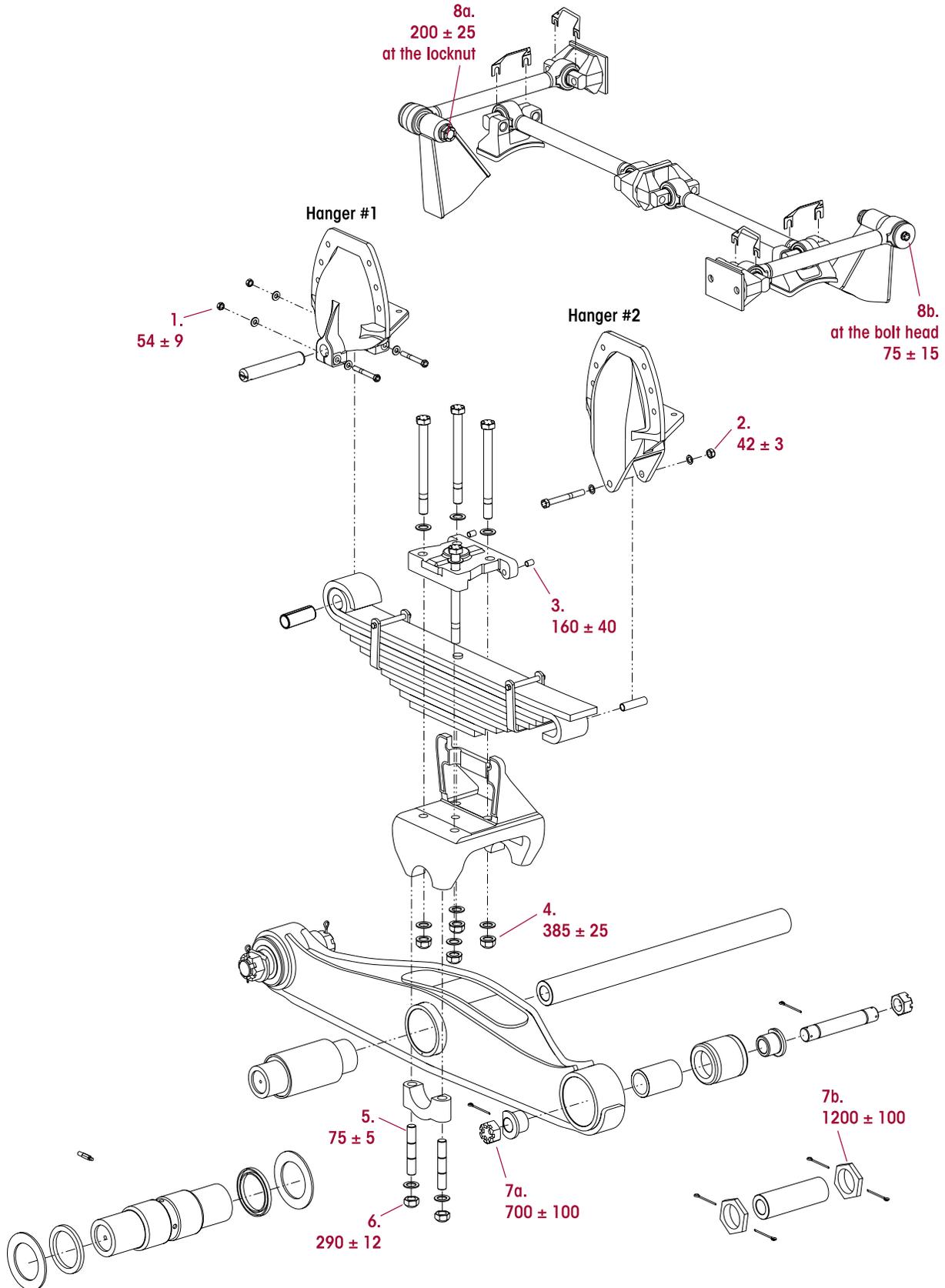
## RT™•RTE™ 48K • 50K • 52K

## HENDRICKSON RECOMMENDED TORQUE SPECIFICATIONS

NO.	COMPONENT	FASTENER		TORQUE VALUE FOOT POUNDS	
		QTY.	SIZE		
Frame Fasteners furnished and installed by Truck Manufacturer					
1	Spring Pin Double Lock Locknut	4	½"-13 UNC	54 ± 9	
2	Rear Spring Hanger Locknut	4	½"-13 UNC	42 ± 3	
3	Top Pad Square Head Set Screw	4	¾"-10 UNC	125 ± 25	
4	Top Pad Set Screw Locknut	4	¾"- 10 UNC	Tighten until Lockwasher locks	
5	Top Pad Locknut	2	1" -14 UNS	*300 ± 25	
6	Saddle Cap Stud	8	7/8"-14 UNF	60 ± 5	
7	Saddle Cap Stud Locknut	8	7/8"-14 UNF	250 ± 25	
8	Bar pin Attachment to Axle	at the Bolt Head	8	1"-8 UNC	575 ± 75
		at the Locknut	8	1"-8 UNC	525 ± 75
9	Adapter Style	4	1"- 14 UNS	470 ± 25	
10a	Transverse Torque Rod to Axle	at the Locknut	2	1¼"-12 UNF	200 ± 25
10b		at the Bolt Head	2	5/8"-11 UNC	75 ± 15
<p><b>NOTE:</b> 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>* All threads must be lubricated with SAE 20 oil before assembly to obtain the correct relationship of torque and fastener tension.</p>					

RT™ 65K • 70K

Hendrickson recommended torque values  
provided in Foot Pounds





## RT™ 65K • 70K

## HENDRICKSON RECOMMENDED TORQUE SPECIFICATIONS

NO.	COMPONENT	FASTENER		TORQUE VALUE FOOT POUNDS	
		QTY.	SIZE		
Frame Fasteners furnished and installed by Truck Manufacturer					
1	Spring Pin Double Lock Locknut	4	½"-13 UNC	54 ± 9	
2	Rear Spring Hanger Locknut	4	¾"-16 UNF	42 ± 3	
3	Top Pad Internal Hex Head Set Screw	8	¾"-10 UNC	160 ± 40	
4	Top Pad Locknut	8	1"- 14 UNS	*385 ± 25	
5	Saddle Cap Stud	8	1"-14 UNS	75 ± 5	
6	Saddle Cap Stud Locknut	8	1"-14 UNS	290 ± 12	
7a	Slotted Nut Beam End Connection	4	1"- 14 UNS	**700 ± 100	
7b	Tube Nut	8	3" - 12 UNF	**1200 ± 100	
8a	Transverse Torque Rod to Axle	at the Locknut	2	1¼"-12 UNF	200 ± 25
8b		at the Bolt Head	2	5/8"-11 UNC	75 ± 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.

\* All threads must be lubricated with SAE 20 oil before assembly to obtain the correct relationship of torque and fastener tension.

\*\* Refer to RT 65K • 70K Torque Procedure in this publication, see Table 8-1 and 8-2.

## SECTION 10

# Troubleshooting Guide

### RT•RTE TROUBLESHOOTING GUIDE

CONDITION	POSSIBLE CAUSE	CORRECTION
Main leaf spring broken	Spring eye broken	Replace entire leaf spring assembly
Vehicle bouncing excessively	No shock absorber installed	Install shock absorbers. See Preventive Maintenance Section
	Leaking shock absorber	Replace shock absorber
	Damaged shock absorber	
Suspension has harsh or bumpy ride	Damaged leaf spring assembly	Replace leaf spring assembly
Vehicle leans	Damaged leaf spring assembly	Replace leaf spring assembly
Irregular tire wear	Incorrect axle alignment	Align axles. Refer to vehicle manufacturer's specifications
Loose saddle fasteners	Suspension is overloaded	Redistribute load to correct weight
	Frequent hard stop/start	Increase inspection interval of fasteners Review driving habits to reduce frequency of hard stop/start
Outer frame bracket cracked	Suspension is overloaded	Redistribute load to correct weight
	Loose saddle fasteners	Increase inspection interval of fasteners
Saddle leg to beam contact	Slipped/loose/broken inner frame bracket	Correct inner frame bracket condition
	Axles not centered	Center axles under frame rails

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