



RAR 254-50K

Air Ride Single Point Suspension

- **2540001 (Narrow Bushing)**
- **2540003 (Narrow Bushing)**
- **2540004 (Wide Bushing)**

Notes and Cautions

This instruction uses two types of service notes definitions:

“NOTE” Provides additional instructions or procedures to complete tasks and make sure components function properly.

CAUTION Indicates a hazardous situation or unsafe practice that could result in equipment damage and serious injury if not avoided.

Bushing replacement procedure with Narrow Tool #6100044

Vehicle Preparation

Park vehicle on a level surface. Chock wheels. Raise vehicle to a height that removes the load on the suspension. Support vehicle with jack stands.

Disconnect the linkage from the height control valve(s). Exhaust all air pressure from the air system.

CAUTION Failure to properly chock wheels, exhaust the air system and safely support the vehicle could allow vehicle/suspension movement that could result in serious injury.

Disassemble suspension

Remove wheels and tires, if necessary. Remove the shock absorbers.

Take the pivot connections apart. Remove and discard pivot bolt, flat washer and pivot nut. Inspect adjuster plate and alignment washer for damage. Replace if necessary.

CAUTION Do not reuse pivot hardware.

Rotate beams down and away from frame. Inspect pivot-bolt holes and wear washers for unusual wear or damage. Repair/replace as needed.

Tool Assembly

Verify thrust bearing is installed in the flat, outside edge of endcap. Inspect tapered insert and endcap for damage. Repair/replace as needed.

Lubricate HHCS and thrust bearing threads with Extreme Pressure Lubricant (#1980014).

Thread flat washer, bearing collar and endcap onto HHCS until the bearing collar and endcap rest against HHCS head. Place tool cone onto endcap (Fig. 2).

NOTE: Failure to apply lubricant to the threads could result in decreased tool performance and reduce the life of the bushing tool.

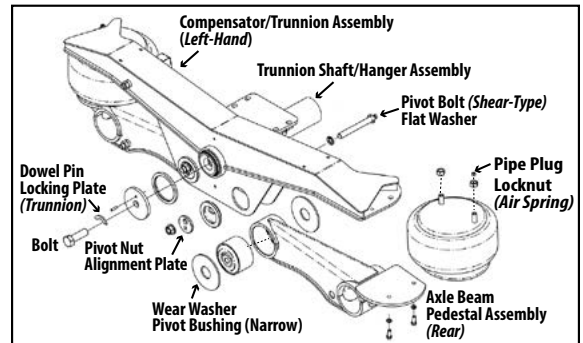


Figure 1.
2540001 Air Ride Single Point - Narrow Bushing Suspension

Bushing Removal

1. Push the hex-head cap screw through the bushing inner sleeve until the tool cone is against the beam eye.
Thread the plunger onto the HHCS until the tool cone is held firmly against the beam (Fig. 2).
NOTE: The smaller, tapered end of the cone is placed against the beam eye for both removal and installation of the bushing.
2. Check that tool cone is centered on the beam eye. Use a 1 5/16" socket on a 3/4"-drive impact wrench (1"-drive impact wrench recommended) to rotate HHCS and pull the bushing into cone.
NOTE: In some cases, a small amount of heat may be needed to break the bond between the bushing and beam eye.
Do not overheat. Allow the beam to cool before installing replacement bushing.
3. Remove the bushing tool from the beam. Detach tool cone from endcap, remove bushing and discard

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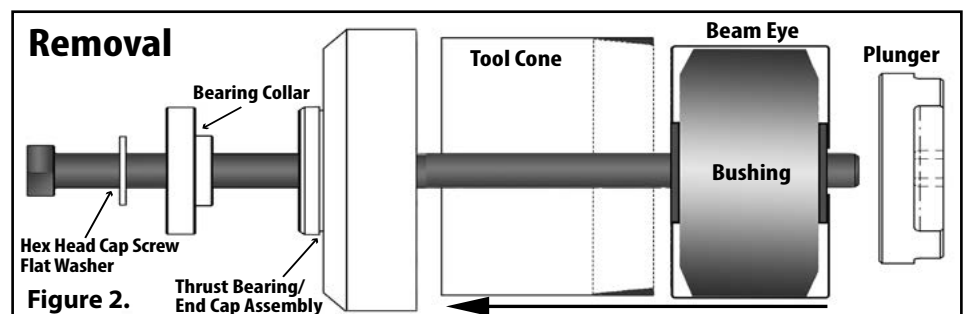


Figure 2.

2540001; 2540003 AIR RIDE SINGLE POINT SUSPENSION — NARROW BUSHING REPLACEMENT/TORQUE SPECIFICATIONS

Part Number (Component)	Item Description	Size	Torque Values (foot-pound Newton-meter)	
6040194-Bushing Kit 6100044-Narrow Tool	Pivot Bolt/Nut - (Shear-Type Bolt/Locknut) <i>Requires E-20 Torx® socket (RW #6100054)</i>	7/8"-9NC	<i>Do not lubricate bolt/nut threads. Use 1"-drive impact wrench to tighten until Torx® head shears off.</i>	
Fasteners	Shock Absorber Bolt (HHCS)	3/4"- 10NC	200-230 ft-lb	271-312 N-m
	Air Spring Nut, Upper	3/4"- 16NF	45-50 ft-lb	61-68 N-m
	Air Spring Bolt, Lower	1/2"- 13NC	45-50 ft-lb	61-68 N-m
	Trunnion Bushing Bolt	1 1/8"- 12NC	500 ft-lb	678 N-m

Torque values reflect a lubricated thread condition (Nuts are pre-lubed). Do not overtorque.

CAUTION Suspension is shipped with minimal torque applied to fasteners. All fasteners must be re-torqued after first 6,000 miles of operation. Failure to install and maintain fasteners at torque specifications could result in suspension failure and void the warranty.

Replacement Procedure with Narrow Bushing Tool #6100044 (continued)

Tool Assembly-Installation

Thread flat washer, bearing collar and endcap onto the hex-head cap screw until bearing collar and endcap rest against the HHCS head.

Bushing Installation

1. Use wire brush to clean debris/corrosion from eye.
2. Liberally apply P80® lubricant or soap solution to the inside of the beam eye, the outside of new bushing and inside the tool cone. Insert bushing into the larger opening of the tool cone (Fig. 3).
3. Center smaller opening of the tool cone against beam eye. Push the hex-head cap screw through the bushing inner sleeve from the opposite side of the beam until the endcap rests against the beam eye.
4. Thread the plunger onto the HHCS until tool cone is held firmly against the beam.

5. Check that bushing tool cone is centered on the beam eye. Use a 1 5/16" socket and 3/4"-drive impact wrench (1"-drive impact wrench recommended) to rotate the hex-head cap screw and press the bushing into the beam eye.

6. Remove bushing tool from the beam. Check that bushing is centered inside the beam. Re-align bushing if necessary.

Reassemble suspension

Rotate the beams into hangers. Assemble pivot connection — alignment washer, adjuster plate, wear washers, shear-type pivot bolt, flat washer and flanged locknut. NOTE: Do not lubricate pivot bolt/nut.

Tighten the locknut until the adjuster plate pin is engaged and the pivot connection hardware is snug against the hanger. Do not apply final torque until the axle alignment has been checked.

Connect the height control valve linkage. Inflate the air springs.

Install wheels and tires. Raise vehicle and remove support stands. Lower vehicle to ground.

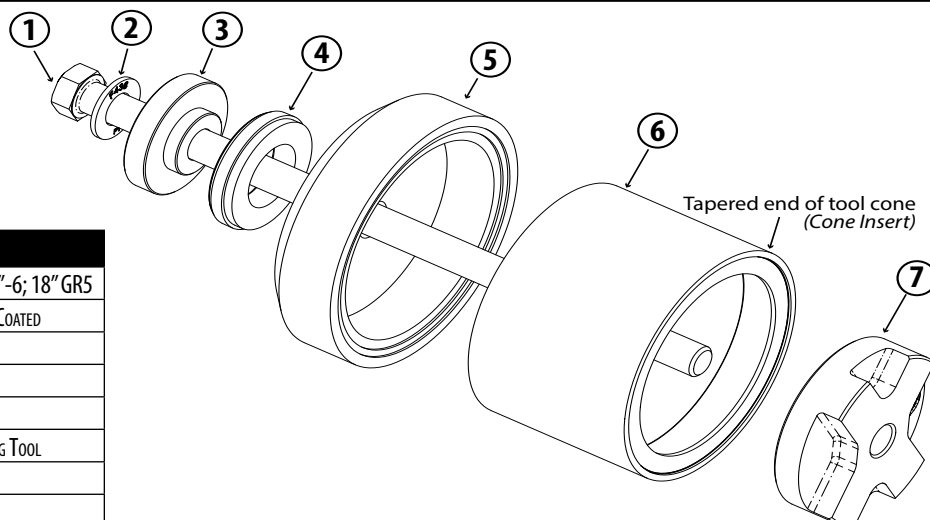
Verify suspension ride height. Check axle alignment. Realign if necessary (Page 6).

Tighten pivot bolt with a 1"-drive impact wrench and E-20 Torx® socket (Ridewell tool #6100054) until Torx® head is sheared off.

Install shock absorbers.

CAUTION Failure to torque hardware to specifications can result in suspension failure/void the warranty.

Figure 3.
Tapered cone expands/compresses bushing for removal and installation.



No	Part No.	Item Description
1	1130088	HEX HEAD CAP SCREW (HHCS) 7/8"-6; 18" GR5
2	1160036	FLAT WASHER — 7/8" F436 ZINC COATED
3	1120051	BEARING COLLAR
4	1660009	THRUST BEARING
5	6100089	ENDCAP — NARROW BUSHING TOOL
6	6100092	CONE ASSEMBLY — NARROW BUSHING TOOL
7	6100091	PLUNGER — NARROW BUSHING TOOL
—	1980014	EXTREME PRESSURE LUBRICANT

2540004 Air Ride Single Point Suspension – Wide Bushing Replacement/Torque Specifications

Part Number (Component)	Item Description	Size	Torque Values (foot-pound Newton-meter)	
6040098-Bushing Kit 6100051-Wide Tool	Pivot Bolt/Nut - (Shear-Type Bolt/Locknut) <i>Requires E-20 Torx® socket (RW #6100054)</i>	7/8"-9NC	<i>Do not lubricate bolt/nut threads. Use 1"-drive impact wrench to tighten until Torx® head shears off.</i>	
Fasteners	Shock Absorber Bolt/Nut	3/4"- 10NC	200-230 ft-lb	271-312 N-m
	Air Spring Bolt - Upper; Lower	3/8"- 16NC	20-25 ft-lb	27-34 N-m
	Trunnion Bushing Bolt	1 1/8"- 12NC	500 ft-lb	678 N-m

Torque values reflect a lubricated thread condition (Nuts are pre-lubed). Do not overtorque.

CAUTION Suspension is shipped with minimal torque applied to fasteners. All fasteners must be re-torqued after first 6,000 miles of operation. Failure to install and maintain fasteners at torque specifications could result in suspension failure and void the warranty.

Vehicle Preparation

Park vehicle on level surface. Chock wheels. Raise vehicle to a height that removes the load from the suspension. Support with jack stands. Disconnect the linkage from the height control valve(s), if equipped. Exhaust all air from the system.

CAUTION Failure to properly chock wheels, exhaust air system and safely support vehicle could allow movement resulting in serious injury.

Disassemble suspension

Remove wheels and tires, if necessary. Remove the shock absorbers.

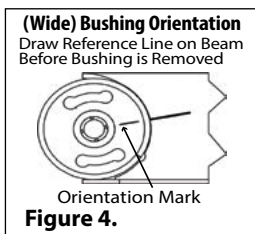
Take the pivot connections apart. Remove and discard pivot bolt, flat washer and pivot nut. Inspect adjuster plate and alignment washer for wear/damage. Replace if necessary.

CAUTION Do not reuse pivot hardware.

Rotate beams down and away from frame. Inspect pivot-bolt holes and wear washers for unusual wear or damage. Repair/replace as needed.

Tool Assembly

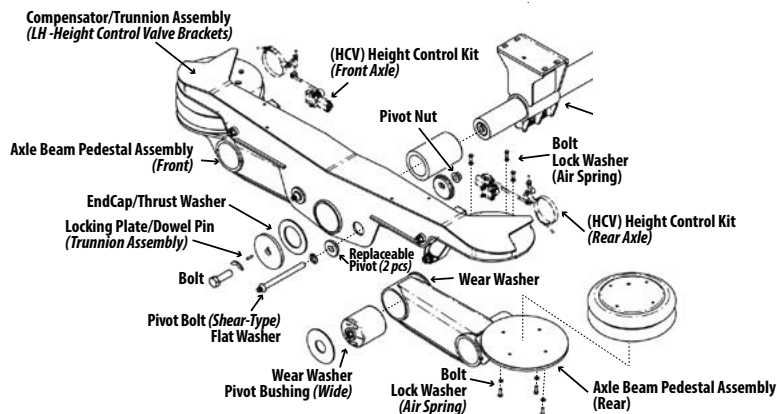
Make sure thrust washer is seated firmly in flat (outside) edge of the endcap. Examine the tool cone tapered insert and large end for damage/out-of-round. Repair or replace as necessary (Fig.6).



Removal

1. Draw/scribe line on beam using locator mark on installed bushing as reference (Fig. 4).

Figure 5.
Wide Bushing Suspension



Removal

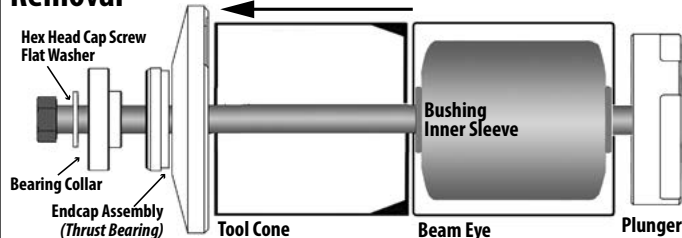


Figure 6.
#6100051

Place tapered end of cone against beam eye for bushing removal.

2. Lubricate HHCS threads and thrust washer bearings with Extreme Pressure Lube (P/N 1980014).
NOTE: Failure to apply lubricant could result in decreased performance and reduced tool life.
3. Place flat washer onto HHCS, followed by the bearing collar and endcap assembly.
4. The bushing tool cone is tapered inside to a smaller opening on one end. Place the larger opening of the cone onto the endcap. NOTE: The tapered end of tool cone is placed on the eye of the beam for removal/installation.
5. Insert the end of the hex bolt through the bushing sleeve into the center opening of plunger.

Center cone on the beam eye. Tighten hex bolt until plunger is held firmly against the bushing.

6. Use a 1 5/16" socket on a 3/4"-drive impact wrench (1"-drive impact wrench recommended) to rotate the hex bolt and press the bushing out of the beam eye into the tool cone. NOTE: In some cases, a small amount of heat may be required to break the bond between the bushing and the beam eye. Do not overheat. Allow the beam to cool before installing replacement bushing.
7. Disassemble the bushing tool. Remove the bushing from the bushing tool cone and discard.

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Replacement Procedure with Wide Bushing Tool #6100051 (continued)

Tool Assembly-Installation

Place flat washer, the bearing collar, and the end-cap assembly on the hex-head bolt.

Insert the smooth end of each Cavity Alignment Stud (Socket Head Cap Screw-SHCS) into the four holes on the outside edge of the bushing tool plunger.

Tighten the alignment stud(s) until the socket head is flush with the edge of the plunger.

NOTE: The smooth ends of the studs should extend beyond the inside edge of the plunger (Fig 7).

Bushing Installation

1. Use a wire brush to clean foreign debris and corrosion out of the beam eye.

2. Coat the inside of the beam eye, the outside of the bushing and the inside of the bushing tool cone with S.G. Type "M" Rubber Assembly Oil.

NOTE: Do not substitute lubricant. Type "M" Oil included with all replacement kits.

3. Insert the replacement bushing into the large end of tool cone. Make sure the locator mark on the new bushing is visible.

4. Line up locator mark on the tool plunger with the locator mark on the bushing. Insert the four cavity alignment studs into the bushing cavity holes. Press the plunger firmly against the end of the bushing.

NOTE: The stud threads should NOT touch the bushing. Reinstall studs if necessary (Figure 7).

5. Align the plunger locator mark with the line previously drawn on the beam. Place (center) the assembled plunger/cone/bushing onto the beam eye.

6. Insert the hex-head bolt assembly through the beam eye. Thread the hex bolt into the plunger until the endcap rests against the beam.

7. Center the bushing tool cone on the beam eye. Use a 1 5/16" socket and 3/4"-drive impact wrench (1"-drive impact wrench recommended) to rotate the hex-head cap screw and press the bushing into the beam eye.

8. Disassemble and remove the bushing replacement tool. Check placement to make sure bushing is centered in the beam.

9. Check bushing locator mark against the line drawn on beam to make sure new bushing is properly oriented.

Reassemble suspension

Rotate the beams into hangers.

Assemble pivot connection—alignment washer, adjuster plate, wear washers, shear-type pivot bolt, flat washer and locknut.

NOTE: Do not lubricate pivot bolt/nut. Tighten flanged locknut until adjuster plate pin is engaged and pivot connection hardware is snug against hanger. Do not apply final torque until axle alignment has been checked.

Connect height control valve linkage (if linkage has been disconnected). Inflate air springs.

Install wheels and tires (if removed). Raise vehicle and remove support stands. Lower vehicle to ground.

Verify suspension ride height. Check axle alignment. Realign if necessary (Page 6).

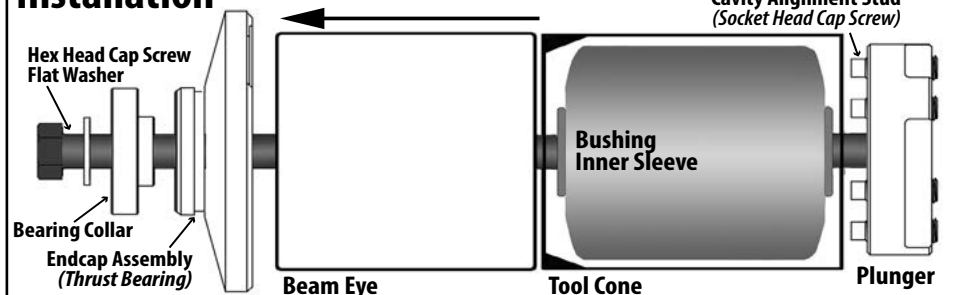
Tighten pivot bolt with a 1"-drive impact wrench and E-20 Torx® socket (Ridewell tool #6100054) until Torx® head is sheared off.

Install shock absorbers.

CAUTION Failure to torque pivot hardware to specifications can result in suspension failure and void the warranty.

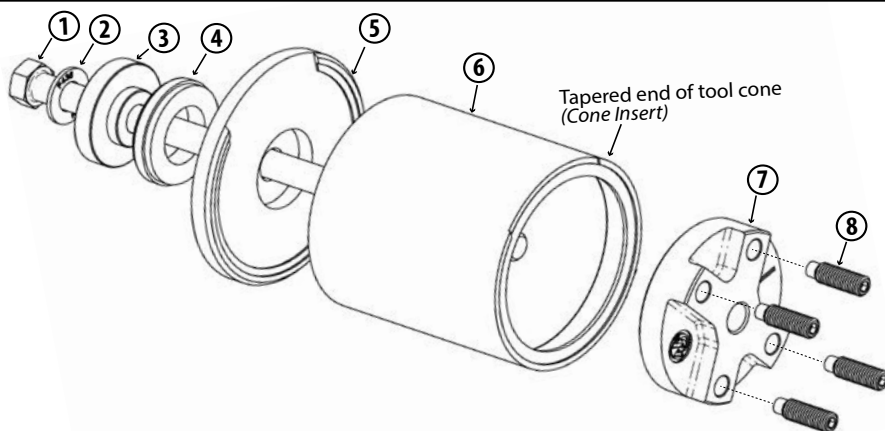
Figure 7.

Installation



Wide Bushing Tool #6100051

No	Part No.	Item Description
1	1130088	Hex Head Cap Screw (HHCS)—7/8"–6 Acme; 18"
2	1160036	Flat Washer 7/8" – F436 Zinc/Coated
3	1120051	Bearing Collar – Bushing Tool
4	1660009	Thrust Bearing
5	6100086	End Cap – Wide Bushing Tool
6	6100083	Cone Assembly – Wide Bushing Tool
7	6100087	Plunger – Wide Bushing Tool
8	1130087	Cavity Alignment Stud (SHCS) 5/8" – 11x2"
–	1980014	Extreme Pressure Lubricant



RAR-254 TRUNNION - CENTER BUSHING REPLACEMENT

Part No.	Item Description	Torque Values – foot-pound; Newton-meter	
1120049	Trunnion-Center Bushing	Narrow Bushing Suspension	
1143773B105	Trunnion Shaft Bolt (HHCS) 1-1/8" -12NF (Grade 5)	500 ft-lb	678 N-m
1130048	Pivot Bolt - Shear-Type	<i>Do not lubricate bolt/nut threads. Use 1"-drive impact wrench to tighten until Torx® head shears.</i>	
1150067	Pivot Nut (Flanged Locknut)		
1120048	Trunnion-Center Bushing	Wide Bushing Suspension	
1143773B105	Trunnion Shaft Bolt (HHCS) 1-1/8" -12NF (Grade 5)	500 ft-lb	678 N-m
1130031	Pivot Bolt - Shear-Type	<i>Do not lubricate bolt/nut threads. Use 1"-drive impact wrench to tighten until Torx® head shears.</i>	
1150067	Pivot Nut (Flanged Locknut)		

CAUTION Failure to install and maintain fasteners at torque specifications could result in suspension failure and void the warranty. Refer to the suspension model engineering drawing for torque values.

Vehicle Preparation

Park the vehicle on a level surface. Chock wheels. Raise vehicle to height that removes load from suspension. Support with jack stands.

Exhaust all air from the system before disassembling the suspension.

CAUTION Failure to properly chock wheels and exhaust the air system could allow vehicle movement that could result in serious injury.

Disassemble Suspension

1. Disconnect and remove the air springs. Remove the shock absorber assemblies.
2. Disconnect and remove height control valve. Loosen clamp on P-Connector. Remove height control valve and linkage.
NOTE: Do not loosen or remove axle band-clamp.
3. Remove pivot bolts and lower the beam assembly from compensator/trunnion assembly.
CAUTION Do not reuse shear-type pivot bolts.
4. Grind off the weld on locking plate over the trunnion shaft bolt. Remove locking plate, dowel pin, trunnion shaft bolt, end cap; thrust washer (Fig 8).
NOTE: Dowel pin required for trunnion reassembly.
5. Support compensator/trunnion assembly by wrapping chains around assembly as close to trunnion shaft as possible. Place a portable hydraulic power unit (PPU) between the end of the trunnion hanger shaft and the chains around the trunnion.
NOTE: PPU should not press against the internal threaded area of the trunnion shaft.

6. Remove compensator/trunnion assembly from the trunnion hanger/shaft assembly. Press the center bushing out of the trunnion assembly.
7. Lubricate opening in trunnion assembly with silicon spray.
CAUTION Do not use solvent-based lubricants.
8. Place bushing so that the number on the end of the bushing (RW60000-Narrow; 1120048-Wide) faces the center of the trailer. Press bushing into place, making sure it is centered in trunnion opening.
9. Manually dress the outside of the shaft of the trunnion hanger/shaft assembly with emery cloth. Lubricate the outside of the shaft and inside of the center bushing with silicon spray.
10. Place thrust washer on trunnion hanger/shaft assembly. Install the trunnion assembly.

11. Install thrust washer, end cap, dowel pin and trunnion shaft bolt on installed trunnion assembly. Torque the shaft bolt to 500 ft-lb.

12. Place locking plate on the shaft bolt head to cover the dowel pin and weld in place.

Reassemble suspension

Install axle beam assemblies with one wear washer on each side of pivot bushing. Torque pivot bolt to specifications (Chart).

Install and reconnect height control valve and linkage assemblies.

Install air springs. Install shock absorber assemblies.
NOTE: Check air system after installation for leaks.

Replace wheels and tires. Remove jack stands. Lower suspension to ground.

Check installed ride height; adjust if necessary.

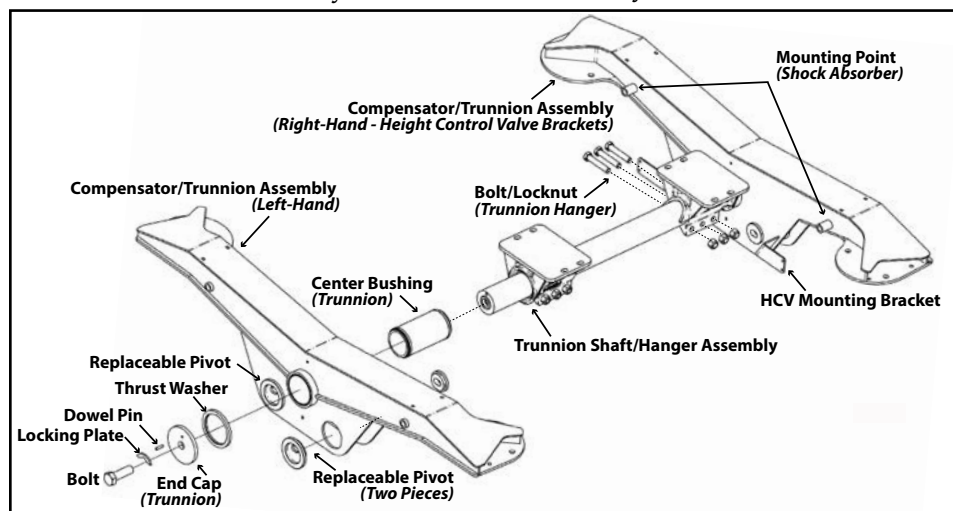


Figure 8.
Compensator/Trunnion Components – 254 Narrow Bushing (P/N 6110039/610042)
(254 Wide bushing components – P/N 6110043)

RAR-254 Axle Alignment

Alignment should be performed on a level surface with the suspension at the desired ride height.

Front axle alignment shall be in accordance with SAE or TMC recommended standards.

1. Loosen pivot nut (Figure 9).
2. Using 1/2" drive breaker bar, rotate front axle beam alignment plate opposite the direction of desired axle movement. It is important that the pivot bushing is not skewed in the hanger prior to tightening.
3. Measure from the kingpin center point (Figure 10). Verify that dimension "A" and "B" are within $\pm 1/8"$. Snug the pivot fasteners and recheck alignment.
4. Repeat alignment process on rear axle, ensuring that "C" and "D" dimensions are equal within $\pm 1/16"$.
5. Check dimension "E", the lateral centerline relationship of the trailer body and axles. Dimension "E" must not exceed 1/4-inch.
6. Recheck alignment of the front axle with the kingpin. Verify alignment of the rear axle with the front axle.
7. Torque all four pivot bolts using a 1"-drive impact wrench and #610054 E-20 Torx socket (or equivalent) until Torx head shears off from the bolt.

Welding of the alignment plates/washers to hanger sidewalls is not required nor recommended.

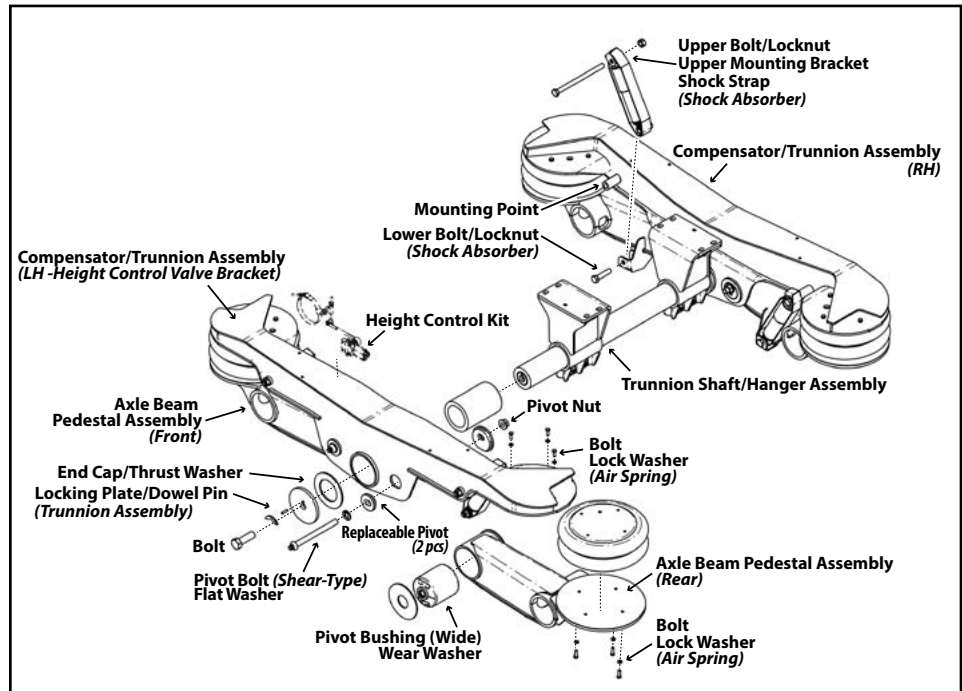


Figure 9. Trunnion and pivot connections hardware (254 wide bushing version shown)

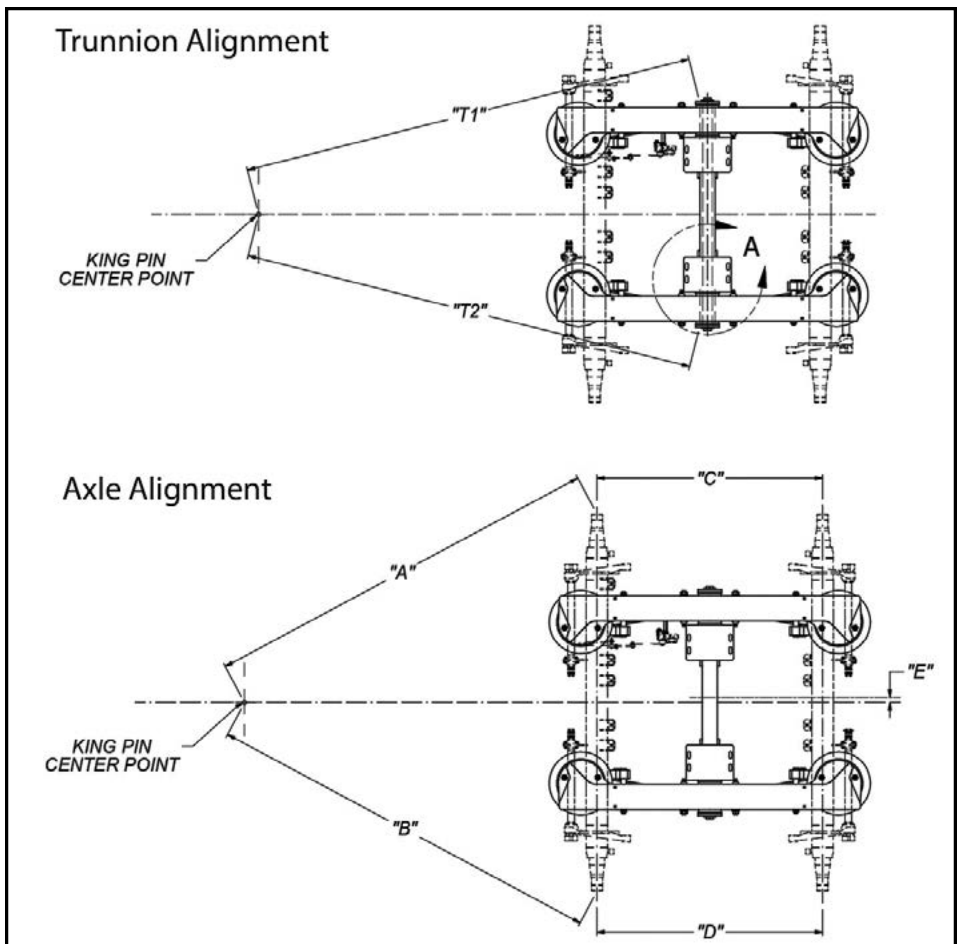


Figure 10. Kingpin measurements for 254 air ride single point suspension trunnion and axle alignment.