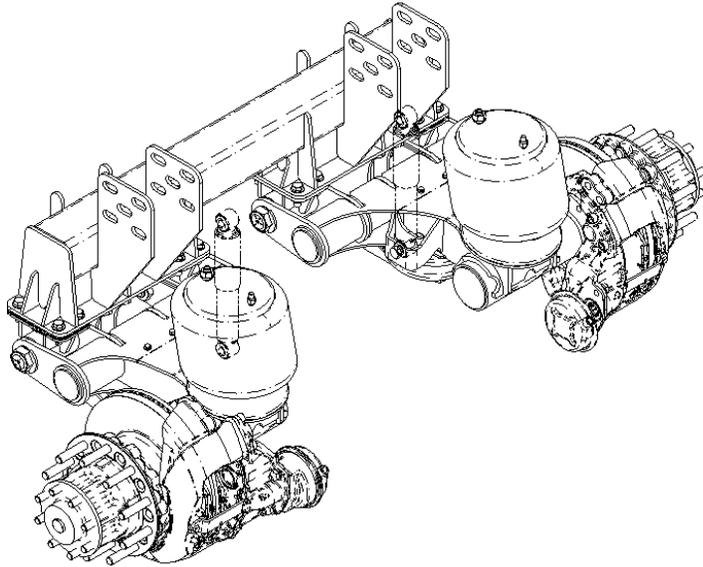


# RIT-207

## Bus/RV Air-Ride Suspension



# Installation and Service Manual

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## SUSPENSION IDENTIFICATION

Refer to the engineering drawing for detailed information on the suspension system components and operating parameters.

Read through the entire Installation and Service Manual (ISM) before performing any installation or maintenance procedures.

### Suspension Serial Tag

The Suspension Serial Tag provides information on the suspension model (Figure 1).

The **Part Number (207xxxx)** refers to the individual model of the suspension system.

Please refer to both the part number and serial number when contacting Ridewell for customer service, replacement parts and warranty information.

### Notes and Cautions

All work should be performed by a properly trained technician using the proper/special tools and safe work procedures.

The ISM uses two types of service notes to provide important safety guidelines, prevent equipment damage and make sure that the suspension system operates correctly. The service notes are defined as:

“NOTE”: Provides additional instructions or procedures to complete tasks and make sure that the suspension functions properly.

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

	<b>RIDEWELL SUSPENSIONS</b>
PART NO:	
SERIAL NO:	
GROSS AXLE WEIGHT RATING CERTIFICATION IS PER THE FINAL STAGE MANUFACTURER OR ALTERER.	
THIS PRODUCT MAY BE COVERED UNDER ONE OR MORE PATENTS. ADDITIONAL PATENTS MAY BE PENDING.	
FOR MORE INFORMATION ON PATENT OR SUSPENSION/AXLE CAPACITY RATING CONTACT RIDEWELL CORPORATION.	
<a href="http://www.ridewellcorp.com">www.ridewellcorp.com</a>	(800) 641-4122

**Figure 1. The Suspension Serial Tag is located on the left-hand (driver's side) suspension hanger.**

### **Prior to Installation**

Refer to the engineering drawing to confirm dimensional requirements and range of available ride heights. Installations can vary and procedures should be adapted for different vehicles, as needed.

- If vehicle chassis modifications are required, consult with the vehicle manufacturer to ensure that such changes are permitted.
- Welding or altering suspension components is not permitted without the express written permission of Ridewell Suspensions.

### **Installer Responsibilities**

The installer of the suspension has the sole responsibility for proper attachment of the suspension system to the vehicle chassis.

- The installer is responsible for locating the suspension system on the vehicle to provide the proper load distribution.
- The installer must verify there is sufficient clearance for proper functioning of the suspension, air springs, brake chambers, axle and tires.
- The installer must verify that air reservoir volume requirements are met after suspension installation. Consult the vehicle manufacturer or Federal Motor Vehicle Safety Standards (FMVSS) 121 for more information.

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## Mounting the suspension to the frame

Refer to the engineering drawing for torque values, component spacing and clearance requirements of the suspension. The suspension installer has the final responsibility of attaching the suspension to the vehicle frame.

### Bolt-On Installation

Bolts/nuts for attaching the suspension to the vehicle are supplied by the installer. Grade 8 bolts and flanged lock nuts or lock nuts with hardened washers are recommended.

1. Check that location provides adequate clearance for suspension components.
2. Locate hangers and air spring mounting plates on the chassis and clamp firmly into place. Make sure that hangers and air spring mounting plates are evenly located and square to the frame for proper axle alignment.
3. Refer to the engineering drawing for the recommended bolt hole locations on hangers. Center punch and drill bolt holes (minimum 5/8") in each hanger.
4. Center punch and drill bolt holes for air spring mounting plates.  
**CAUTION** Check to make sure that wires, hoses or other components located within the chassis are not affected by drilling.

5. Bolt the hangers and air spring mounting plates to the vehicle chassis with customer-supplied Grade 8 bolts and lock nuts.
6. Install bushing support assemblies, shock absorbers and air springs. Do not apply final torque until axle alignment procedure is completed (Appendix). Alignment should be performed with suspension at installed ride height.
7. Perform final assembly and inspection of suspension and vehicle components. Verify that all suspension component bolts/nuts are torqued to specifications (Appendix).
8. The pressure in the tag axle air springs must be adjusted after final assembly. The pressure must be set at 70-to-75 PSIG with the spindle set at installed ride height.  
NOTE: Optimum set-up requires the verification of the ground load weight with a certified scale.

**CAUTION** Failure to torque bolts/nuts of suspension components to specifications can result in failure of the suspension and void the warranty.

# MAINTENANCE

A visual inspection of the suspension structure should be performed during each pre-trip/safety inspection. Ridewell Suspensions recommends the following minimum service intervals for standard duty, on-highway usage applications. More frequent intervals are recommended for heavier duty applications.

## Ridewell suggests the following Technology & Maintenance Council (TMC) publications for additional maintenance information.

TMC RP 607	Preventive Maintenance and Inspection of S-Cam Foundation Brakes
TMC RP 609	Self-Adjusting and Manual Brake Adjuster Removal, Installation and Maintenance
TMC RP 618	Wheel Bearing Adjustment Proced.
TMC RP 619	Air System Inspection Procedure
TMC RP 631	Recommendations for Wheel End Lubrication
TMC RP 643	Air Ride Suspension Maintenance Guidelines
TMC RP 652	Service and Inspection of Air Disc Brakes
TMC RP 728	Trailer Axle Maintenance
TMC RP 1509	Drive Axle Suspension Maintenance and Inspection Guidelines for Vocational Vehicles

## Daily/Pre-Trip Inspections

- \_\_\_ Check tires for proper inflation, damage or excessive wear.
- \_\_\_ Check wheel-ends for obvious signs of lubricant leakage. Check for missing components.
- \_\_\_ Visually inspect suspension structure for signs of damage or excessive wear.
- \_\_\_ Check for loose or missing bolts/nuts. Check for irregular movement in suspension components.
- \_\_\_ Make sure air controls are operating properly. Drain all moisture from air reservoirs.

## First 6,000 miles of use

- \_\_\_ Torque all suspension component bolts/nuts to specifications (Appendix).
- \_\_\_ Check air lines and connections for leaks.
- \_\_\_ Verify that the suspension is operating at the installed ride height.

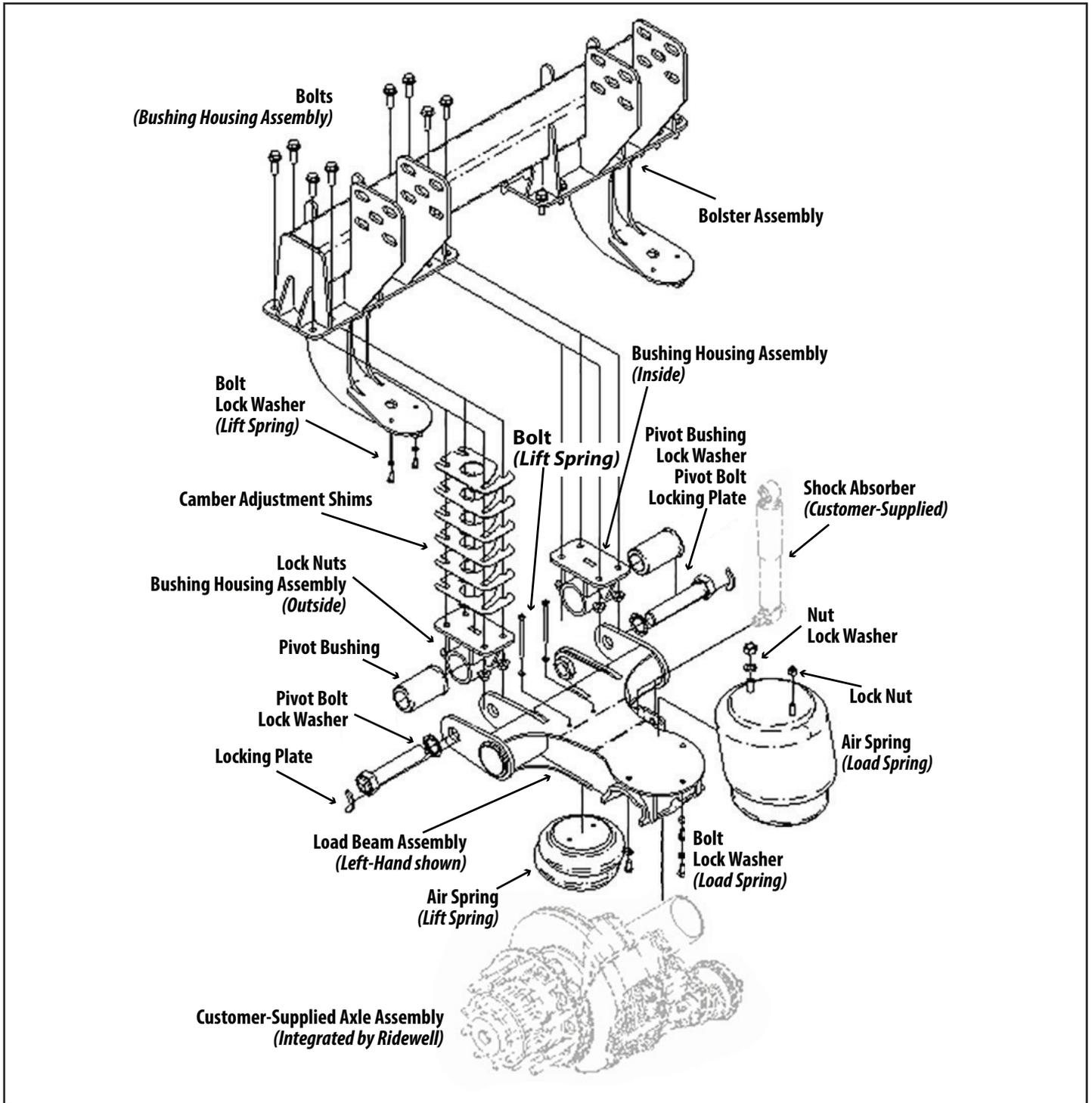
## Every 50,000 miles of use

- \_\_\_ Inspect pivot connection for wear/damage.
- \_\_\_ Torque all suspension component bolts/nuts to specifications (Appendix).
- \_\_\_ Check air lines and connections for leaks.
- \_\_\_ Inspect air spring for signs of chafing or component damage. Check for proper fastener torque.

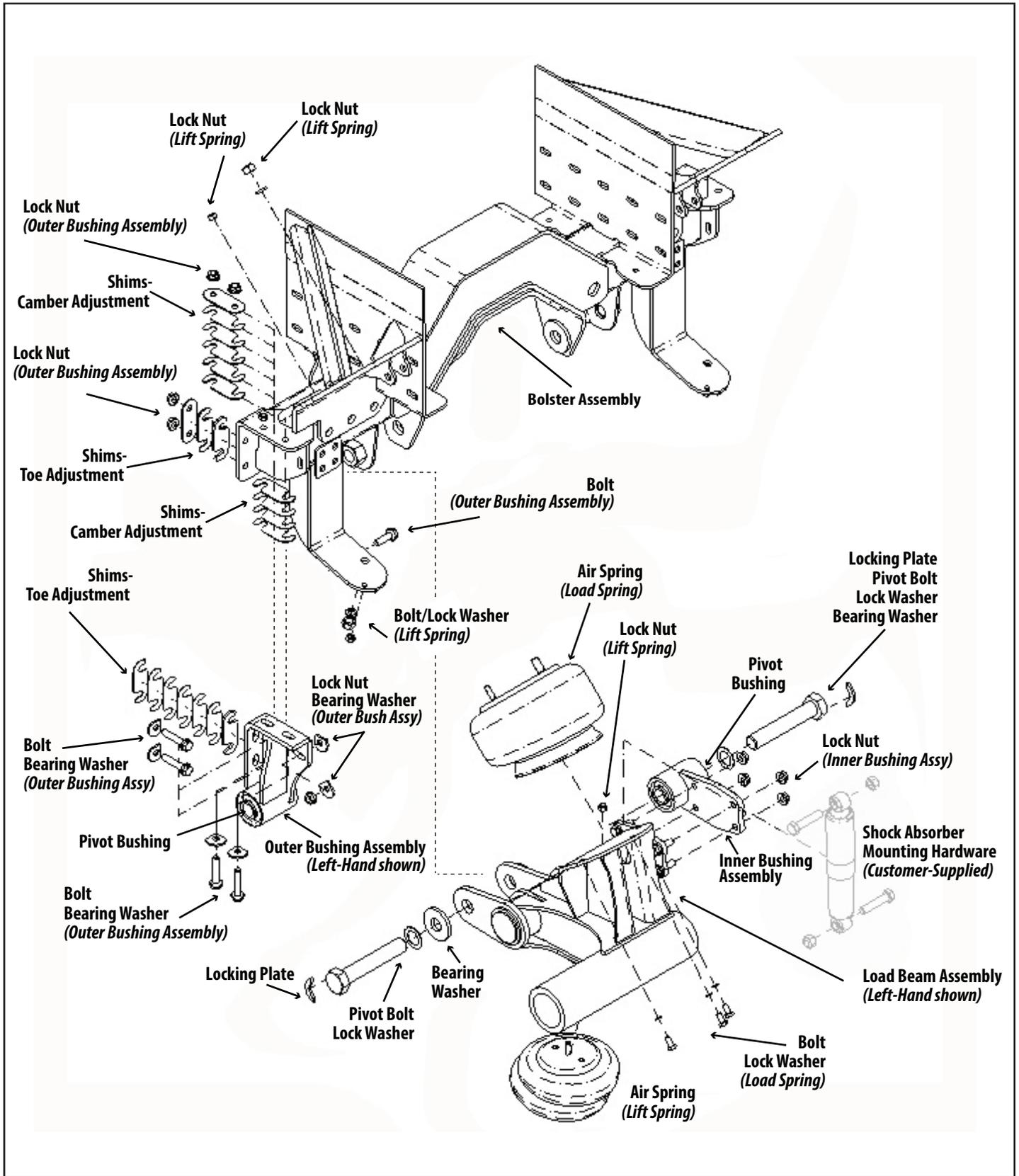
## Annually/100,000 miles of use

- \_\_\_ Inspect pivot connection for worn bushing. Replace components, if necessary. Torque all component bolts/nuts to specifications (see chart or refer to engineering drawing).
- \_\_\_ Check air lines and connections for leaks.
- \_\_\_ Check height control valve (HCV) adjustment.
- \_\_\_ Verify that the suspension is operating at the installed ride height.

**⚠ CAUTION** Failure to torque suspension components bolts/nuts to specifications can result in failure of the suspension and voiding of the warranty.



**Figure 2.**  
**RIT-207 Parts Illustration (Chassis-Mounted Air Spring Assembly)**  
 Refer to the engineering drawing for the individual component part number.



**Figure 3.**  
**RIT-207 Parts Illustration (Integrated Air Spring Mount)**  
 Refer to the engineering drawing for the individual component part number.

## Bushing Replacement Procedure

Park the vehicle on a level surface. Chock wheels to keep vehicle from moving. Exhaust all air from the air system. Disassemble suspension, if necessary, to reach pivot connections.

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

Service Parts Needed	
	1987625B000 Adhesive Epoxy - Fusor-320 50ML
BUSHING OPTIONS	1116176B001 Bushing-(5.25"X1.5")
	1117427B000 Bushing (4.44"X1.5")

1. Remove old bushing from sleeve. Apply heat to the outside of the sleeve with an oxyacetylene torch to destroy any remaining bonding element and make bushing removal easier.
2. Use a wire brush to remove any remaining bonding residue, rubber, dirt, rust, etc, from the sleeve bore.
3. Wash bore of bushing sleeve with paint thinner. Wash replacement bushing surface with paint thinner.  
**CAUTION** Epoxy adhesive and paint thinner are flammable materials that are irritating to the eyes, respiratory system and skin. Read label instructions before use.
4. Remove cap from Epoxy Adhesive 50ml tube kit. Squeeze out entire contents of adhesive. Thoroughly mix the two-parts of the adhesive. NOTE: Adhesive must be used within 20 minutes after mixing.
5. Spread mixed adhesive on the entire surface of the replacement bushing. Apply adhesive to the inside of the sleeve bore.
6. Press bushing into sleeve bore until bushing is centered.
7. Wipe the excess adhesive from the ends of installed bushing with paint thinner.
8. Adhesive can be handled after four hours and will totally cure after 24 hours.  
**CAUTION** Adhesive must be totally cured before returning vehicle to service.
9. Perform axle alignment feature (Appendix) and reassemble the suspension, if necessary. Torque to specifications.

Refer to the engineering drawing for additional component part numbers and torque values.

## APPENDIX

### 207 Bus/RV Suspension – Torque Specifications

Fastener Type	Size	Torque Specifications	
		foot-pound	Newton-meter
Pivot Bolt (HHCS)	1 1/2"-(Grade 5)	1,100 ft-lb	1,490 N-m
Bolt (HHCS)	3/4"-(Grade 5)	160 ft-lb	220 N-m
Bolt (HHCS)	5/8"-(Grade 8)	160 ft-lb	217 N-m
Bolt/Lock Nut (Air Spring)	3/4"-(Grade 5)	50 ft-lb	70 N-m
Bolt/Lock Nut (Air Spring)	1/2"-(Grade 5)	25 ft-lb	35 N-m

**⚠CAUTION** Suspension is shipped with minimal torque applied to fasteners. It is the installer's responsibility to apply the proper torque values. All fasteners must be re-torqued after the first 6,000 miles of operation. Failure to install and maintain suspension component fasteners at torque specifications could result in suspension failure and void the warranty.

# Axle Alignment

Align the suspension per TMC or SAE recommended standards. Alignment should be performed on a level surface with the suspension at the desired ride height.

On a multiple-axle vehicle, the forward axle is moved into the proper alignment, then the remaining axles are positioned so that they are parallel to the forward axle. A maximum tolerance of 1/8-inch difference from side-to-side of the forward axle and 1/16-inch difference from side-to-side for the aft axles is acceptable.

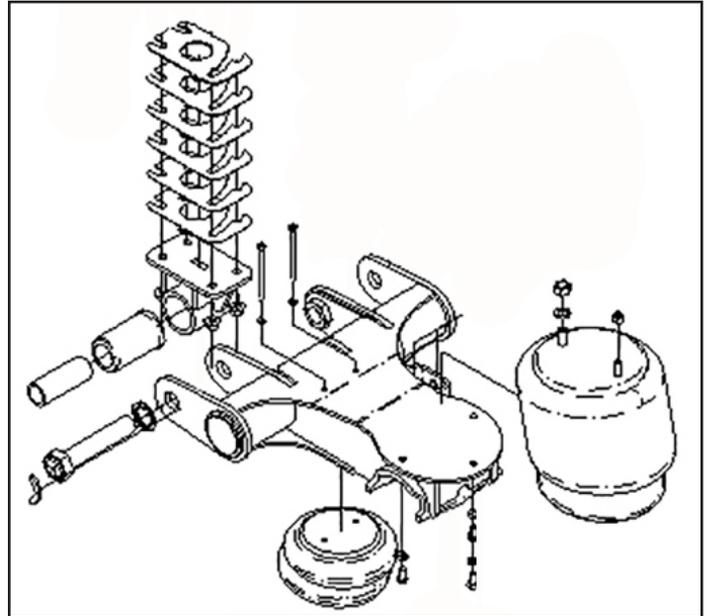
## Alignment Procedure Chassis-Mounted Air Spring

Refer to the engineering drawing for number and location of camber adjustment shims, camber angle, toe adjustment bolt locations and torque values.

### Camber/Toe Adjustment procedure:

1. Loosen bolster hanger assembly nuts at bushing supports connection.
2. Insert camber adjustment shims on each side of the hanger/bushing supports. Different sizes and number of shims may be needed to set the appropriate camber angle (Right and left side camber must be 0.8 degrees;  $\pm$  0.25 degrees).
3. Snug bolster hanger bushing support nuts. Adjust toe by turning toe adjustment bolts located on bolster hanger assembly to desired toe (Toe for both sides must be positive 0.04 inches;  $\pm$  0,02 inches).
4. Torque toe adjustment bolts to specifications and jam "toe" with lock nut. Torque bushing support bolts to specifications.
5. Torque pivot bolt to specifications. Weld locking plate over head of bolt as shown on drawing.
6. The air spring pressure must be set at 70-to-75 PSIG with the spindle set at installed ride height. NOTE: Optimum set-up requires the verification of the ground load weight with a certified scale.

**CAUTION** Failure to torque bolts/nuts of suspension components to specifications can result in failure of the suspension and void the warranty.

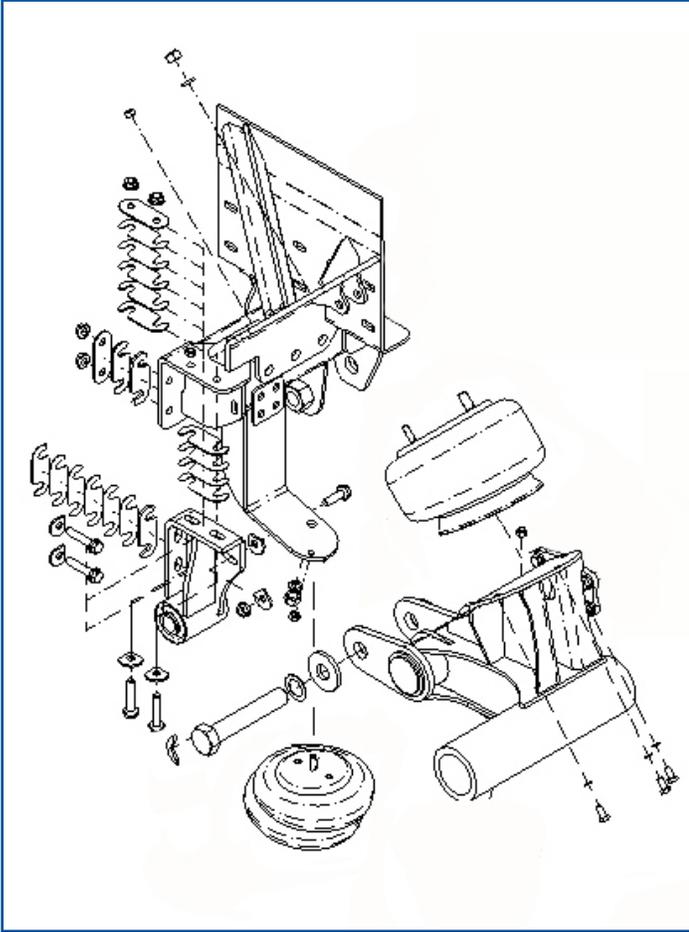


**Figure 4.** Adjustment shims and pivot bushing parts illustration for RIT-207 - Chassis-Mounted Air Spring Assembly. Refer to the engineering drawing for the individual component part number.

# Axle Alignment

Align the suspension per TMC or SAE recommended standards. Alignment should be performed on a level surface with the suspension at the desired ride height.

On a multiple-axle vehicle, the forward axle is moved into the proper alignment, then the remaining axles are positioned so that they are parallel to the forward axle. A maximum tolerance of 1/8-inch difference from side-to-side of the forward axle and 1/16-inch difference from side-to-side for the aft axles is acceptable.



**Figure 5.**  
**Adjustment shims and pivot bushing parts Illustration for RIT-207 - Integrated Air Spring Mount Assembly. Refer to the engineering drawing for the individual component part number.**

## Alignment Procedure- Integrated Air Spring Mount Assembly

Refer to the engineering drawing for location of camber adjustment shim kit and locations, camber angle, toe adjustment bolt locations and torque values.

1. Loosen bolster hanger assembly nuts and bushing support nuts at bushing support connection.
2. Insert camber adjustment shims between hanger/ bushing supports as needed to set the appropriate camber angle (Right and left side must be positive 0.75 degrees +/- 0.25 degrees. ).
  - 2a. To increase camber, add shims between the outer bushing bracket and the tag frame (horizontal shims).
  - 2b. To increase toe, remove (vertical) shims between outer bushing bracket and the tag frame. Stack the removed shims on the outside.
3. Torque toe adjustment bolts to specifications and jam "toe" with lock nut. Torque bushing support bolts to specifications.
4. Torque pivot bolt to specifications. Weld locking plate over head of bolt as shown on drawing.
5. The air spring pressure must be set at 70-to-75 PSIG with the spindle set at installed ride height.

NOTE: Optimum set-up requires the verification of the ground load weight with a certified scale.

**CAUTION** Failure to torque bolts/nuts of suspension components to specifications can result in failure of the suspension and void the warranty.

**Terms and coverage in this warranty apply only to the United States and Canada.**

Ridewell Suspensions warrants the suspension systems manufactured by it to be free of defects in material and workmanship. Warranty coverage applies only to suspensions that have been properly installed, maintained and operated within the rated capacity and recommended application of the suspension. The responsibility for warranty coverage is limited to the repair/replacement of suspension parts. The liability for coverage of purchased components is limited to the original warranty coverage extended by the manufacturer of the purchased part.

All work under warranty must have prior written approval from the Ridewell warranty department. Ridewell has the sole discretion and authority to approve or deny a claim and authorize the repair or replacement of suspension parts. All parts must be held until the warranty claim is closed.

Parts that need to be returned for warranty evaluation will be issued a Returned Materials Authorization (RMA). Parts must be returned to Ridewell with the transportation charges prepaid. The transportation charges will be reimbursed if the warranty claim is approved.

This non-transferable warranty is in lieu of all other expressed or implied warranties or representations, including any implied warranties of merchantability or fitness or any obligations on the part of Ridewell. Ridewell will not be liable for any business interruptions, loss of profits, personal injury, any costs of travel delays or for any other special, indirect, incidental or consequential losses, costs or damages caused by Ridewell.

**Contact the Ridewell Warranty Dept. at 417.833.4565 - Ext. 135, for complete warranty information.**