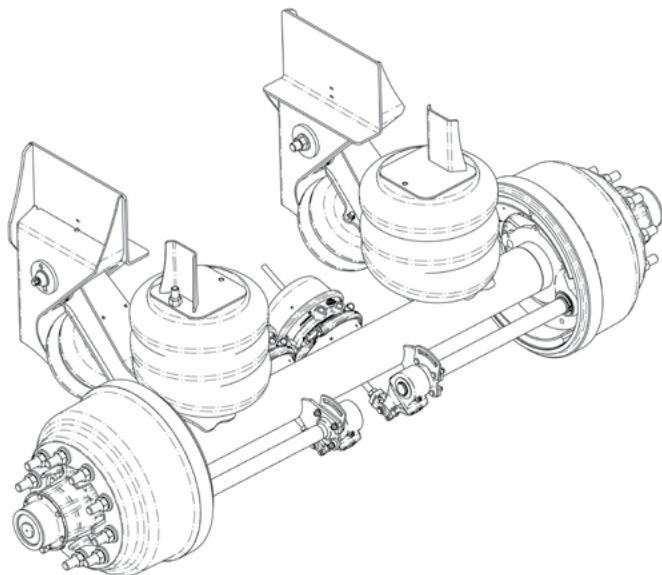


# RUL-245 - Truck

## *NonSteerable - Auxiliary Axle Suspension*



## Installation and Service Manual

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**RIDEWELL SUSPENSIONS**  
The Engineered Suspension Company

PART NO:

SUSP. 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.

www.ridewellcorp.com

(800) 641-4122

## Suspension Identification Tag

A (606-) Installation/Assembly Number will be listed as the **Part Number** when other system components are factory installed with the suspension.

The **Suspension Number** and **Serial Number** on the Suspension ID Tag refer to the model and the date of manufacture of an individual suspension system.

Please refer to the suspension number/part number and serial number on the Suspension Identification Tag when contacting Ridewell for customer service, replacement parts and warranty information.



**RIDEWELL SUSPENSIONS**

MODEL:		PART NO.	
SERIAL NO.		CAPACITY	TON

## Axle-Body Identification Tag

The **Base-Axle Part Number** (165-) and the **Serial Number** of the axle tube are listed on the Axle-Body ID Tag of Ridewell-branded round axles.

The **Base-Axle Part Number** refers to Ridewell-branded round axles manufactured in various axle wall thicknesses and widths.



Scan or click on QR-Code for more information on Ridewell-branded Axles. The "Trailer Axle Parts Guide" publication is located under "Axles-Service Parts Information."

## NonSteerable Lift-Axle Operation

Raising non-steerable lift axles is recommended before turning a corner, especially when navigating a sharp corner. A non-steerable axle that is not lifted when turning will scrub concrete - causing premature wear and possibly damage the tires - and impose a high lateral stress on the wheel/chassis vehicle components.

Raising the non-steerable lift-axle decreases tire wear, reduces maintenance costs, and ensures the proper functioning of the lift-axle.

Operators should be aware of the wide variety of federal, state and local regulations that apply to the lifting of axles. If lifting is prohibited, it may be best to configure a steerable lift-axle for the vehicle.

## Notes and Cautions

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

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

The ISM uses two service notes to provide important safety guidelines for the suspension operation. 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.

---

## Prior to Installation

Refer to the engineering drawing for detailed information on the suspension system components; to confirm dimensional requirements; and, the range of ride heights available.

Operating the suspension outside of design parameters can result in improper performance, damaged equipment, and void the warranty.

The methods and procedures listed in this manual are considered to be general practices. Installations can vary and procedures should be adapted for different vehicles, as needed.

- The Gross Axle Weight Rating (GAWR) is determined by the system component with the lowest load rating. Please consult with tire, wheel, axle and brake manufacturers before installation to determine the GAWR.
- 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.

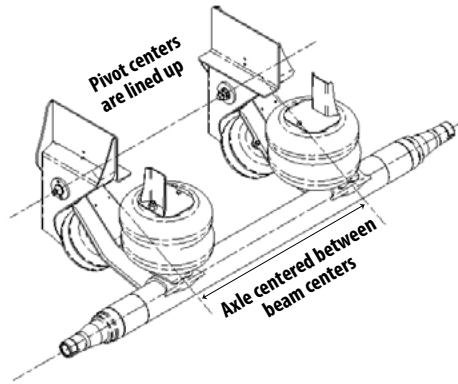
## Installer Responsibilities

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

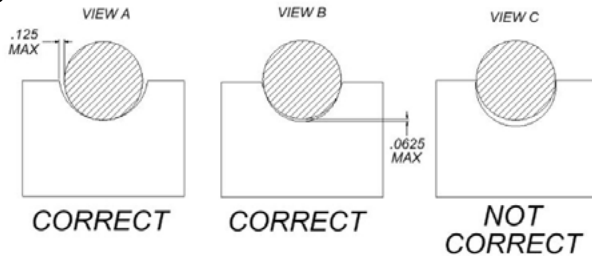
- The installer is responsible for locating the suspension system on the vehicle to provide the proper load distribution.
- The installer must verify that vehicle crossmembers are positioned to support the suspension at the installing location.
- It is the installer's responsibility to determine that axle spacing conforms to any applicable federal and local bridge laws.
- 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.
- The installer must verify there is sufficient clearance for proper functioning of the auxiliary suspension and installed components - air springs; brake chambers; axle; and, tires and wheels.

## Axle Integration

**Figure 1.**  
Center Axle  
between beams.



**Figure 2.**



Suspension systems are available with and without a factory integrated axle. Customer-supplied axle assemblies must be positioned and oriented (rotated) properly before welding the axle.

Use the top-center mark on the axle, if available, to identify the center of the axle and orient the axle assembly on the suspension. The axle assembly should be installed so that the camshafts, when activated, rotate in the same direction as the wheels.

**CAUTION** Failure to follow procedures and design specifications could result in injury, damage to the axle or suspension and void the warranty.

### Weld Preparation

Position the joint to be welded in a flat or horizontal position. All grease, dirt, paint, slag or other contaminants must be removed from the weld joint.

The axle and suspension components should be at a minimum temperature of 60°F (15.5°C). Pre-heat the weld zone to the axle manufacturer's recommended pre-heat temperature, if required.

### Welding Procedure

1. Center the axle assembly on the beams (Fig. 1).
2. Check the engineering drawing for the brake component orientation (rotation) before clamping into place and making the final welds.
  - 2.1 Drum brake camshafts are spaced off the tail of the trailing arm beam. Make sure the brake chamber brackets are oriented properly and clamp the axle assembly into place.
  - 2.2 Disc brake assemblies have a right- and left-hand caliper assembly. Make sure the calipers are located on the correct side and rotated to the proper position before clamping the axle assembly into place.
3. Check the gap between the axle and the axle seats before welding (Fig. 2).

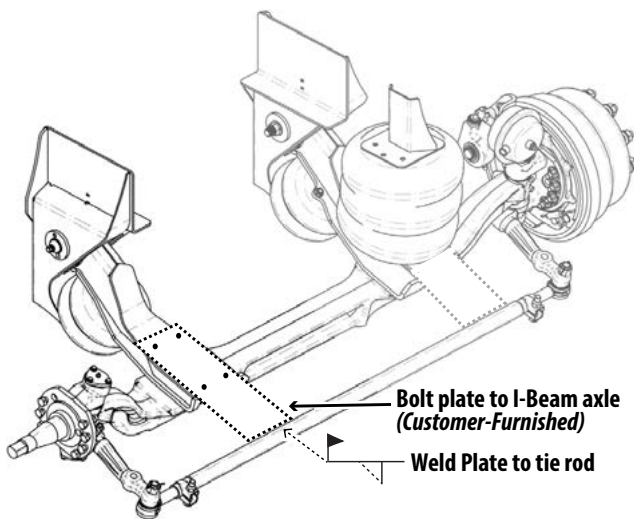
Side gaps should be no greater than 1/8".  
The gap at the bottom of the axle seat should be no greater than 1/16".
4. Weld axle to the axle seat according to Ridewell Weld Process #1 (Pg 5).

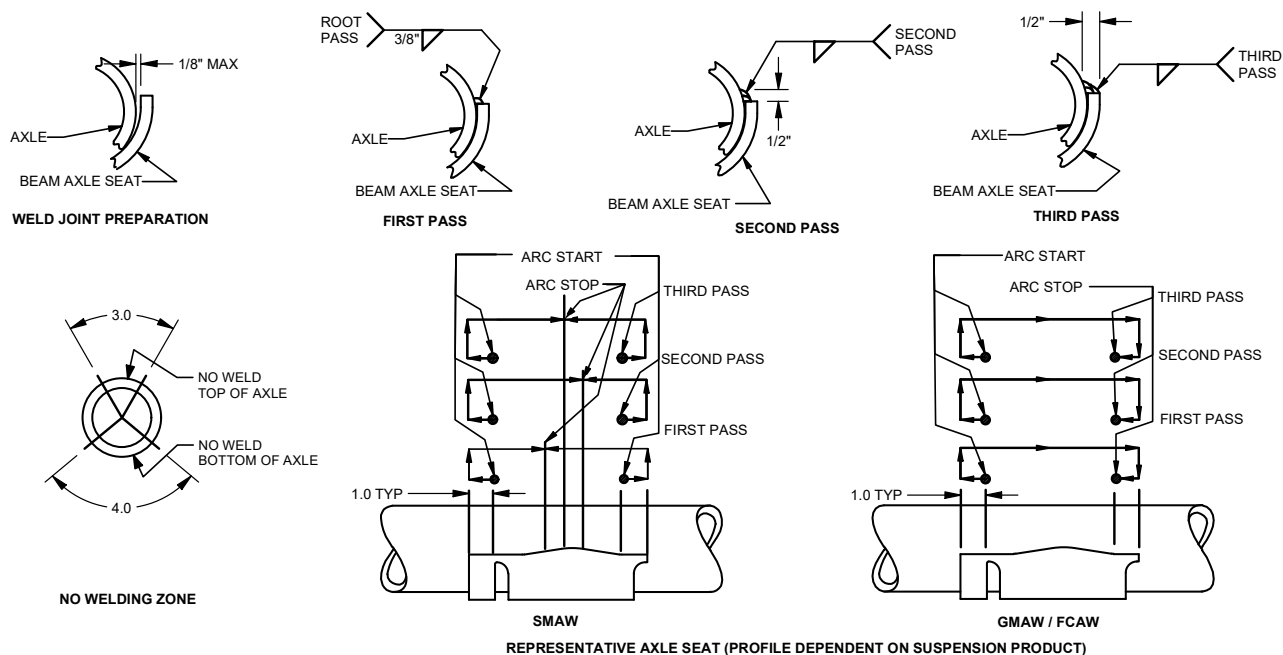
NOTE: Mounted air springs should be covered to protect them from welding spatter.

### Customer-Furnished I-Beam Axle Integration

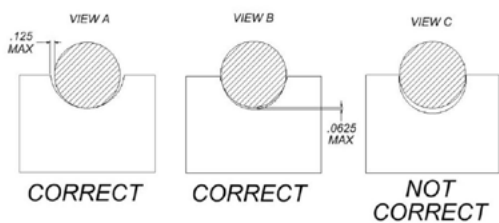
1. Use locator tabs on the bottom of beams to verify suspension beams are located at the proper frame width. Center axle between the beams and clamp into place.
2. Drill four 25/32" holes in each beam (two holes in front of the axle and two behind the axle).
3. Fasten each beam to the axle with four 3/4" Grade-8 fasteners. Verify axle and beams are square before applying final torque.
4. Adjust wheel toe-in to the recommended setting (1/32" to 3/32").
5. Lock knuckles in place to prevent self-steering.

NOTE: A bolt-on tie-rod/steering damper lock kit is available (P/N 6030007).





- 1 - CAUTION: All welds must be kept away from the top and bottom of the axle where maximum stresses occur (see "NO WELDING ZONE" illustration above). Do not test-weld the arc on any part of the axle tube.
- 2 - All welders and welding operators should be certified as per the requirements of the American Welding Society (AWS) or equivalent. All electrodes used should meet the AWS specifications and classifications for welding carbon and low-alloy steels.
- 3 - Recommended Welding Methods: Shielded Metal Arc Welding (SMAW), Gas Metal Arc Welding (GMAW) or Flux Cored Arc Welding (FCAW). The welding method used and the electrode selected must develop a minimum weld tensile strength of 70,000 psi per AWS specifications. The best fusion and mechanical properties will be obtained by using the voltage, current, and shielding medium recommended by the electrode manufacturer. If the SMAW method is used, the stick electrodes must be new, dry, free of contaminants and stored per AWS specifications.
- 4 - Weld Joint Preparation: The joint to be welded should be positioned in the flat or horizontal position. All grease, dirt, paint, slag or other contaminants must be removed from the weld joint without gouging the axle tube. CAUTION: Never weld when the axle is cold. The axle and beam assemblies to be welded should be at a temperature of at least 60°F (15°C). Pre-heat the weld zone to the axle manufacturer's recommended pre-heat temperature, if required. This will reduce the chance of an area of brittle material forming adjacent to the weld.
- 5 - The axle should fit into the beam assembly with a maximum root gap of 1/8-inch between the axle and the beam axle seat (see "WELD JOINT PREPARATION" illustration above).
- 6 - NOTE: Clamp the axle to the beam axle seat with a C-clamp prior to welding to make sure that proper contact occurs (see "CORRECT" illustration below).
- 7 - Ground the axle to one of the attached axle parts such as the brake chamber brackets, cam brackets or brake spider. Never ground the axle to a wheel or a hub as the spindle bearing may sustain damage.
- 8 - Multiple pass welding should be used on the beam/axle connection using the following guidelines:
  - 8.1-Total fillet weld size should be 1/2-inch.
  - 8.2-Weld pass starts and stops should be performed as illustrated above.
  - 8.3-Never start or stop welds at the end of the weld joint.
  - 8.4-Each pass must be accomplished in one or two segments.
  - 8.5-Start welds at least 1-inch from the end and backweld over the start. Backstep fill all craters.
  - 8.6-If process is not GMAW all slag must be removed between passes.
  - 8.7-Welds must go to within 1/8-inch +/- 1/16-inch of the ends of the axle seat and must not go beyond or around the ends of the axle seat.
  - 8.8-Post-weld peening is recommended, but not required: Needle peen the entire toe of the second pass, including around the ends of the axle seat. Hold the needles perpendicular to the axle. A uniform dimpled pattern will appear when properly peened.



G	22101	REVISED "NO WELDING ZONE" DETAIL	11/7/22	AAS	BB	CJB
F	16101	ADDED MAXIMUM TO 5, ADDED GMAW NOTE TO 8.6 UPDATED CORRECT VIEWS	2/10/2016	G.H.	B.B.	CJB
REV	PROJ/ECR	DESCRIPTION	DATE	BY	CHK	APPD
DRAWN BY: CBC		11/7/2022	<b>RIDEWELL CORPORATION</b> PO BOX 4586 SPRINGFIELD, MISSOURI 65808			
CHECKED: MDJ		2/21/2003				
APPROVED: CJB		2/21/2003				
PROJECT NO: 03103		SCALE: A-SIZE: NTS	<b>TITLE:</b> RIDEWELL WELD PROCESS #1, 5" DIA. AXLE, 3 PASS WELD			
MATERIAL: -		WEIGHT: -				
SHEET 1 OF 1			PART NO: WELD PROCESS #1		REV: G	

UNCONTROLLED IF PRINTED



## Suspension Mounting

Refer to the suspension model engineering drawing for the travel table; mandatory customer-supplied crossmember locations; mounting bolt-hole locations; and, suspension spacing and clearance requirements.

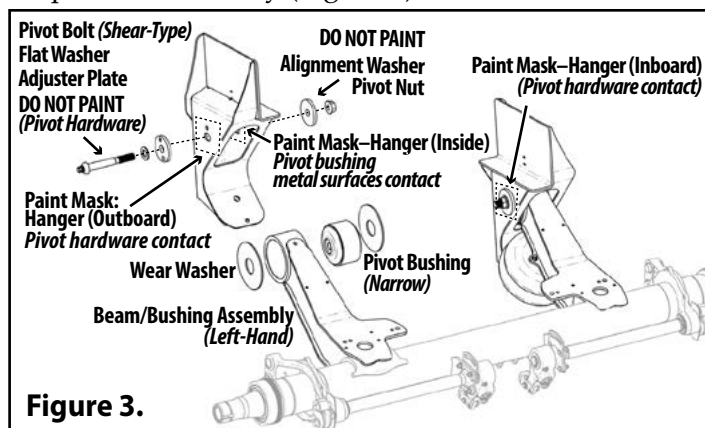
Suspension mounting height is adjusted with a 1" or 2" mounting spacer kit (Kit inc. Hanger/Air Spring brackets).

<b>6040223</b>	245 – 1" Spacer Kit	<b>6040092</b>	245I – 1" Spacer Kit
<b>6040224</b>	245 – 2" Spacer Kit	<b>6040093</b>	245I – 2" Spacer Kit

**CAUTION** Components must be reassembled with the proper torque applied if the suspension is taken apart for installation (Torque Chart-Page 9).

Do not apply any undercoating; paint or other top coat to the suspension, frame hangers or pivot hardware until axle alignment is completed (Page 14).

NOTE: Areas where metal surfaces of alignment plates; washers; pivot bolts/nuts or pivot bushing (bushing sleeve) contact the frame hanger must be masked if applying under- or top coating prior to suspension assembly (Figure 3).



**Figure 3.**

### Bolt-On Installation Procedure

Grade-8 bolts, flanged locknuts/locknuts with hardened washers for mounting are supplied by the installer.

1. Locate hangers and air spring mounting plates/spacers on the chassis and clamp firmly into place.  
**CAUTION** Corresponding hanger mounting spacer must be installed with the air spring spacer. All Hangers/Mounting Plates/Spacers must have full contact with the bottom of the vehicle frame.

2. Check that hangers/mounting plates/spacers are evenly located and square to the frame. Verify that location provides adequate clearance.

3. Center-punch and drill eight bolt-holes (min 5/8") in each frame hanger. Center-punch and drill two bolt-holes (min 5/8") in each air spring mounting plate.  
NOTE: Space mounting bolt-holes as far apart as possible if recommended locations are not available.

**CAUTION** Verify wires, hoses or other components located within the chassis are not affected by drilling.

### Regulate load with air spring pressure

The load capacity of the auxiliary axle is adjusted by increasing or decreasing air pressure to the air springs. By applying more air, the lift axle takes on a greater percentage of the load's weight. The load capacity is decreased as the air pressure decreases.

Accurate readings of the load capacity are obtained by parking a loaded vehicle over a calibrated scale and lowering the axle onto the scale. The system's air pressure to the air springs is manually adjusted up or down to obtain the axle load weight at various air pressures.

**CAUTION** Do not exceed rated load capacity of suspension system or other components. Exceeding capacity can cause component failure and void the warranty.

4. Bolt suspension assembly to vehicle chassis with 5/8" Grade 8 bolts and locknuts.
5. Attach the load springs to the air spring mounting plates. Torque to specifications (Page 9).
6. Install/connect the air control kit (ACK). Check the air system after installation for leaks (Page 7).
7. Perform final assembly and inspection and align the suspension per TMC or SAE recommended standards. Alignment should be performed with suspension at installed ride height (Page 14).

### Final Assembly and Inspection

1. Verify all suspension components are torqued to specifications (Page 9).

2. Install wheels and tires.

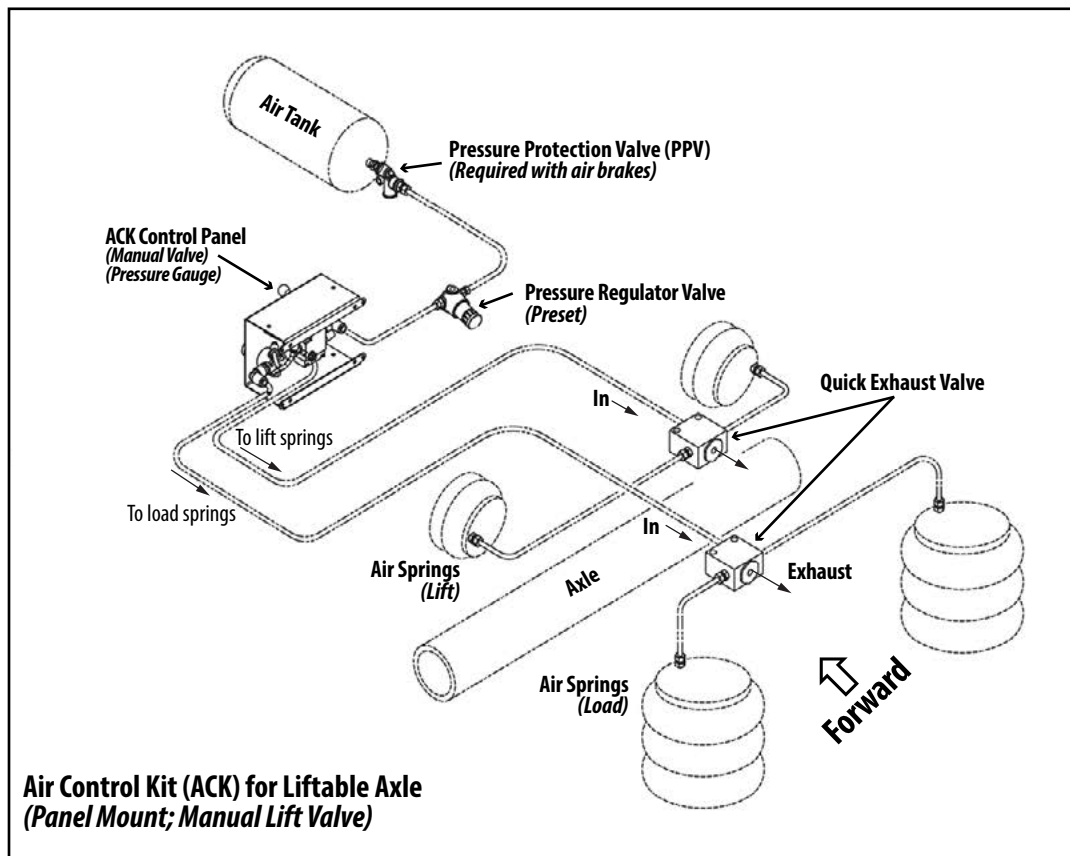
**CAUTION** When lowering an auxiliary axle on an unloaded vehicle, pressure to the load air springs must be reduced to below 10 psi.

Failure to reduce the air pressure could cause the vehicle's drive axles to rise from the ground and the vehicle could roll in an unsafe manner.

3. Check that tires are inflated to recommended pressure. Check wheel hubs for proper level of lubricant recommended by the manufacturer.
4. Lift the axle to the raised position. Check the air system tubing and connections for leaks.
5. Check that wheels can rotate freely and that brakes are properly adjusted.
6. Raise and lower the suspension assembly through the entire range of travel. Check for sufficient vehicle clearances of air springs, brake chambers and other components.

**CAUTION** Do not lower the auxiliary axle while the vehicle is moving above 10 mph.

## Air Control Kit (ACK) Components - Liftable Axle



The air control kit consists of a pressure regulator with a gauge; connected to an air valve that is operator-controlled by a manual knob or by an electric switch.

The operator uses the air control kit to control the pressure to the air springs to support different loads.

Contact Ridewell Customer Service for the various manual/electric ACK configurations available. Installation will vary by ACK configuration.

**CAUTION** The installer is responsible for verifying air system requirements comply with the appropriate Federal Motor Vehicle Safety Standards.

### Air Control Kit – Troubleshooting

Problem	Possible Cause	Solution
<b>Air springs fill but do not exhaust.</b>	<ul style="list-style-type: none"> <li>— Obstructed air line.</li> <li>— Faulty controls wiring.</li> <li>— Manual override pushed in.</li> </ul>	<ul style="list-style-type: none"> <li>— Check for pinched/blocked lines.</li> <li>— Check controls wiring with voltmeter. Correct wiring/installation.</li> <li>— Release manual override.</li> </ul>
<b>Air system leaks down after a short period of time.</b>	<ul style="list-style-type: none"> <li>— Leak in air system beyond accepted standards. NOTE: Some valves will leak at an acceptable rate.</li> </ul>	<ul style="list-style-type: none"> <li>— Pressurize system. Spray soapy water solution onto the tubing, valves and fittings. Check for bubbles (leaks).</li> <li>— Check that tubing cuts are straight and smooth. Re-cut and reassemble fitting joints, if necessary.</li> </ul>
<b>Auxiliary unit will not stay up</b>	<ul style="list-style-type: none"> <li>— Loose air fitting connection/Damaged air lines.</li> <li>— Air lines to lift and load air springs are reversed.</li> <li>— Damaged or worn air springs.</li> </ul>	<ul style="list-style-type: none"> <li>— Check and retighten fittings. Repair or replace component, as necessary.</li> <li>— Check installation. Air line from regulator goes to (load) air springs.</li> <li>— Replace air spring if worn or damaged.</li> </ul>
<b>Auxiliary unit not achieving correct lift</b>	<ul style="list-style-type: none"> <li>— Air lines to lift and load air springs are reversed.</li> <li>— Lift air springs do not have proper air pressure.</li> <li>— Interference with driveline/other chassis components.</li> <li>— Air control system not installed correctly.</li> </ul>	<ul style="list-style-type: none"> <li>— Check installation. Air line from regulator goes to (load) air springs.</li> <li>— Check for loose fittings or worn/damaged lines. Verify air tank pressure with gauge.</li> <li>— Visually inspect auxiliary unit operation for proper clearance. Retighten any loose fasteners.</li> <li>— Check air control kit installation; refer to OEM installation procedures.</li> </ul>

## Recommended Service Intervals

Ridewell Suspensions recommends these minimum service intervals for standard duty, on-highway usage applications. More frequent intervals are recommended for heavier duty applications.

### 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.
- \_\_\_ Check axle assemblies for damage/ loose 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 suspension fastener components to specifications (Page 9/Engineering Drawing).  
NOTE: Do not re-torque shear-type pivot bolt.
- \_\_\_ Verify the suspension is operating at the designed ride height.

### Every 12,000 miles of use

- Inspect air springs for damage/excessive wear.
- Torque fasteners to specification (Page 9).
- Check air lines and connections for leaks.
- Lubricate Brake Cams and Slack Adjusters.

### First 50,000 miles of use

- \_\_\_ Torque suspension fastener components to specifications (Page 9/Engineering Drawing).  
NOTE: Do not re-torque shear-type pivot bolt.
- \_\_\_ Check wheel ends for excessive play.

### Annually/100,000 miles of use

- \_\_\_ Inspect pivot connections for worn bushings/ wear washers. Replace, if necessary. Torque pivot hardware to specifications (Page 9).
- \_\_\_ Check suspension hanger and air spring mounting plate connections to frame.

#### Check lubrication level in wheel ends:

- \_\_\_ 1) Oil-Filled Wheel Ends:  
Refill/Replace lubricant as needed  
(TMC RP 631-“100K/Annual Inspection”).
- \_\_\_ 2) Semi-Fluid Grease:  
Pull outer bearing and visually inspect the lubrication level. Refill/Replace as needed  
(TMC RP 631-“Level 3 Lubrication Level Inspection”)  
(TMC RP 618-“Wheel Bearing Adjustment”)
- \_\_\_ Check air system for leaks.
- \_\_\_ Test air system pressure protection valve (if equipped).
- \_\_\_ Check brake chambers and brakes for damage and proper function.

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

#### Refer to these Technology & Maintenance Council (TMC) publications for maintenance information

RP 609	Brake Adjuster Installation/Maintenance
RP 618	Wheel Bearing Adjustment Procedure
RP 619	Air System Inspection Procedure
RP 622	Wheel Seal and Bearing Removal, Installation, and Maintenance
RP 631	Wheel End Lubrication Recommendations
RP 643	Air Ride Suspension Maintenance
RP 728	Trailer Axle Maintenance

## Pivot Bushing Inspection Procedure

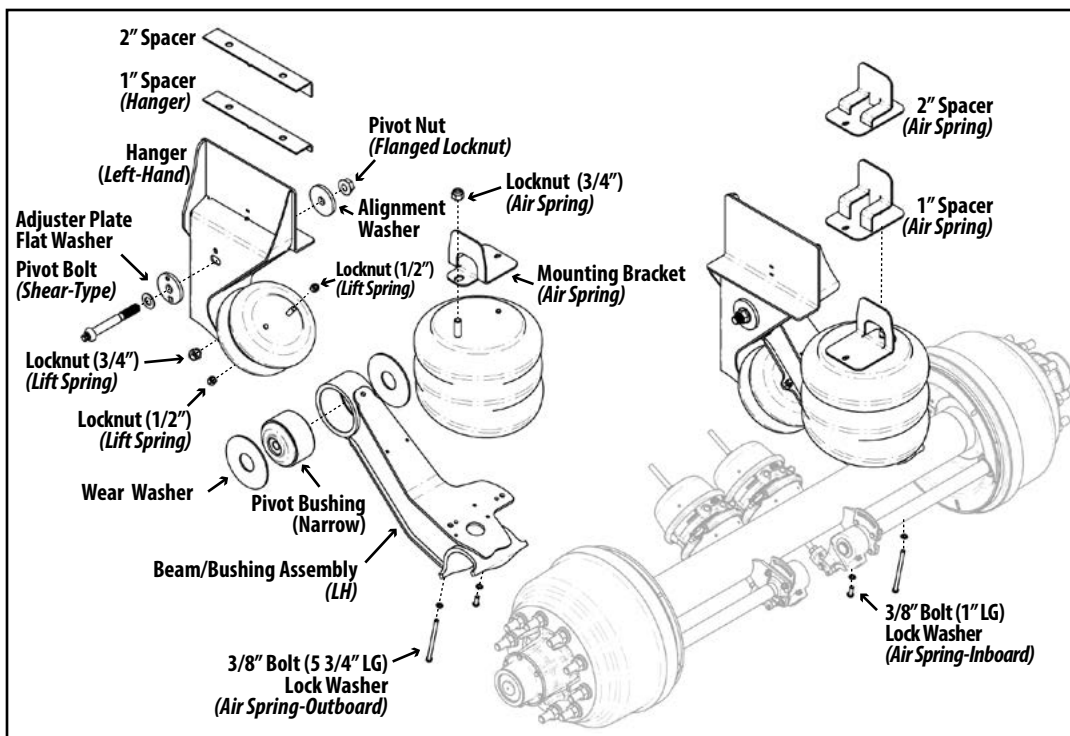
Park the unloaded trailer on a level surface.  
Set the brakes and chock the tires so vehicle cannot move during inspection.

Insert the flat end of a pry-bar between one side of the hanger sidewall and the wear washers.  
Move the pry-bar back-and-forth and look for excessive movement of the beam

(NOTE: A small amount of beam movement because of the rubber flexing is normal). Inspect the wear washers for excessive wear/damage.

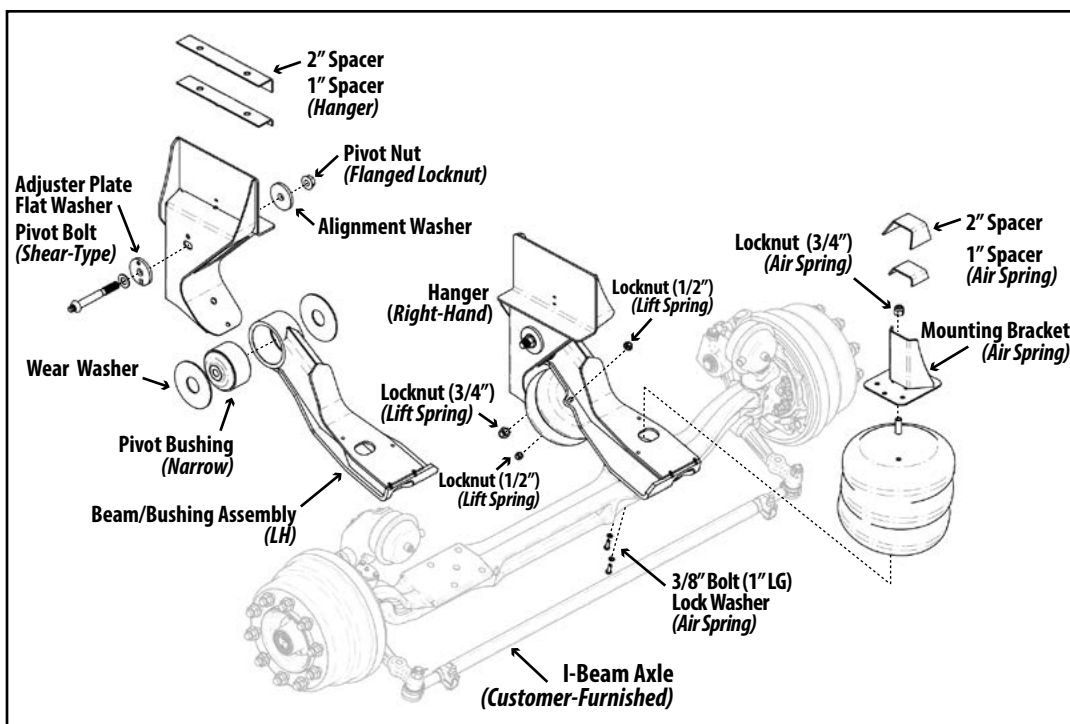
Repeat the pry-bar process and wear washer inspection on the other side of the hanger.  
If any large/easy movement or damaged wear washers is observed, drop the beams for further inspection. Replace components as necessary.





**Figure 4.**  
**Suspension Components**  
**(Drum Brake Axle)**

Refer to the suspension  
model engineering drawing  
for the individual  
component part number.



**Figure 5.**  
**245I Truck**  
**Suspension Components**  
**(Customer-Supplied**  
**I-Beam Axle)**

Refer to the suspension  
model engineering drawing  
for the individual  
component part number.

# **NARROW BUSHING REPLACEMENT – RUL-245/245I TRUCK SUSPENSION**

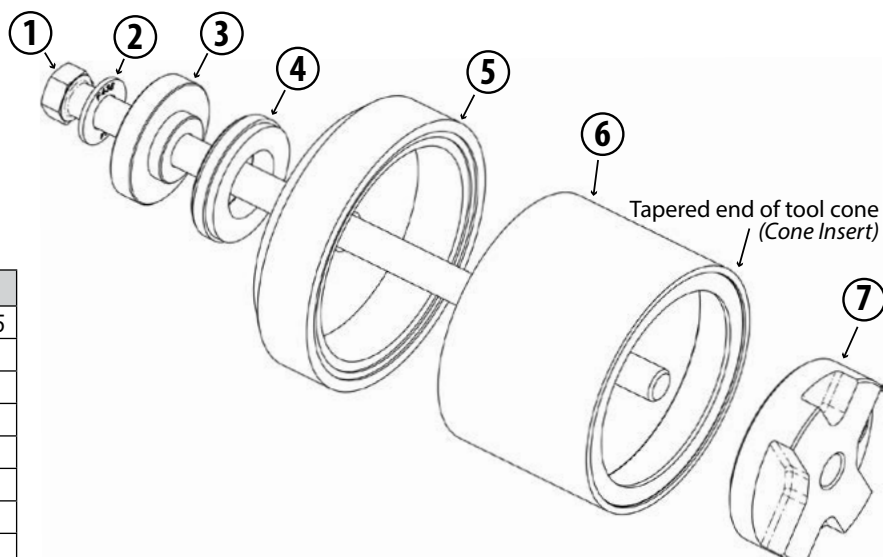
Part Number (Narrow Bushing Kits)	Item Description	Size	Torque Values foot-pound Newton-meter	
6040128 – Bushing Kit Replacement Tool - 6100044	Pivot Bolt/Nut - (Shear-Type Bolt/Locknut) <i>Requires E-20 Torx® socket (RW #6100054)</i>	7/8"-9NC	<i>Do not lubricate bolt/nut threads. Use 1"-drive impact wrench to tighten until Torx® head shears off.</i>	
6040078 – Bushing Kit Replacement Tool - 6100044	Pivot Bolt/Nut - (Traditional Hardware) Hex Head Cap Screw (HHCS)/Locknut	7/8"-9NC	500 ft-lb	678 N-m
<b>Fasteners</b>	Locknut (Air Spring, Upper)	3/4"-16NF	50 ft-lb	68 N-m
	1" HHCS-Hex-Head Cap Screw (Air Spring, Lower)	3/8"-16NC	25 ft-lb	34 N-m
	5-3/4" Hex-Head Cap Screw (Air Spring, Lower)	3/8"-16NC	25 ft-lb	34 N-m
	Locknut (Lift Spring)	1/2"-13NC	25 ft-lb	34 N-m
	Locknut (Lift Spring)	3/8"-16NC	25 ft-lb	34 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.*

## **P/N 6100044 Narrow Bushing Replacement Tool**

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



## Narrow Bushing Replacement Tool (#6100044) Procedure

### Vehicle Preparation

Park vehicle on a level surface. Chock wheels. Raise vehicle to a height that removes the load on 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 the air system and safely support the vehicle could allow vehicle/suspension movement that could result in serious injury.

### Disassemble the suspension

Remove wheels and tires, if necessary. Remove 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/damage. Repair or replace components as needed.

### Tool Assembly

Make sure thrust bearing is installed in the flat, outside edge of endcap. Inspect tool cone tapered insert and endcap for damage. Repair or replace bushing tool components as needed.

Lubricate the Hex-Head Cap Screw (HHCS) and the threads of the thrust bearing with Extreme Pressure Lubricant (P/N 1980014).

Thread the flat washer, the bearing collar and the endcap onto the HHCS until the bearing collar and endcap rest against the head of the HHCS. Place tool cone onto endcap (Figure 6).

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

### 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 (Figure 6).

NOTE: The smaller, tapered end of the cone is placed against the beam eye for both removal and installation of the bushing.

2. Verify 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 Hex Head Cap Screw to pull 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 bushing tool from the beam. Detach tool cone from endcap, remove bushing and discard

*continued on next page*

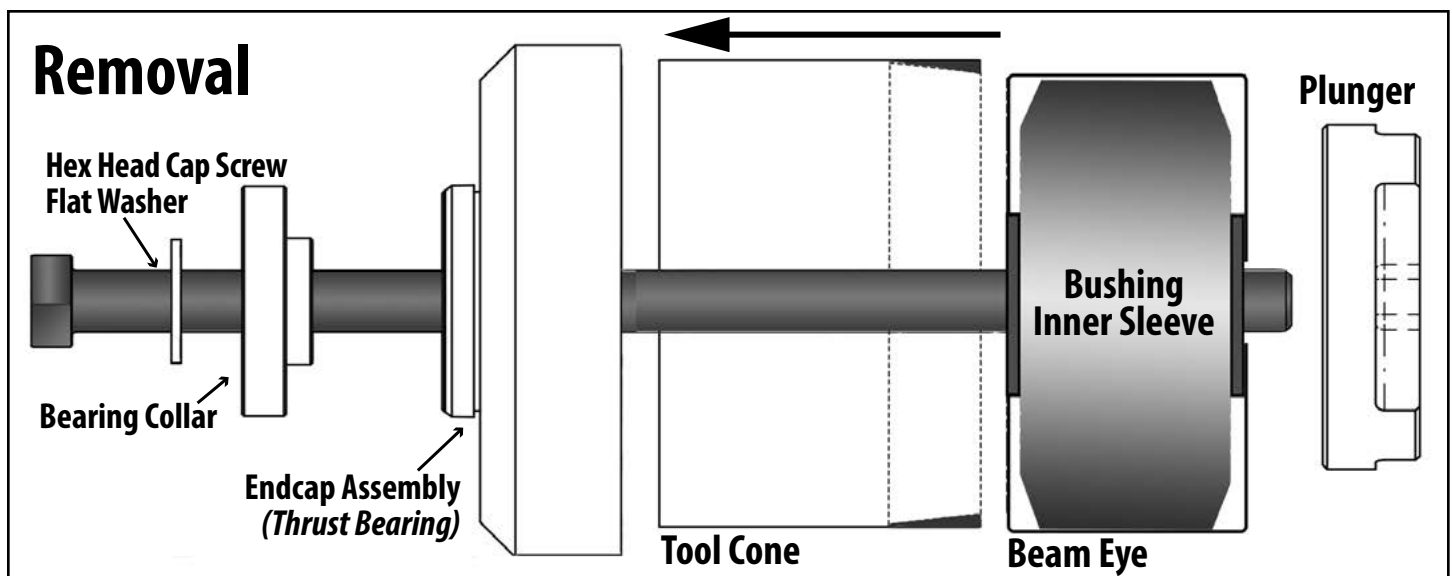


Figure 6.

Always place the tapered end of the cone against the beam eye for bushing installation and removal. The tapered cone expands the bushing during removal and compresses the bushing for installation.

### Tool Assembly

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

### Bushing Installation

1. Use wire brush to clean debris /corrosion from eye.
2. Liberally apply P80<sup>®</sup> lubricant or a soap solution to the inside of the beam eye, the outside of the new bushing and inside the tool cone. Insert new bushing into the larger opening of the tool cone (Figure 7).
3. Center the 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 hex-head cap screw until tool cone is held firmly against the beam.  
NOTE: The smaller opening of the tool cone is placed against the beam eye for both removal and installation of the bushing.
5. Verify 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. Verify that bushing is centered inside beam. Realign bushing if necessary.

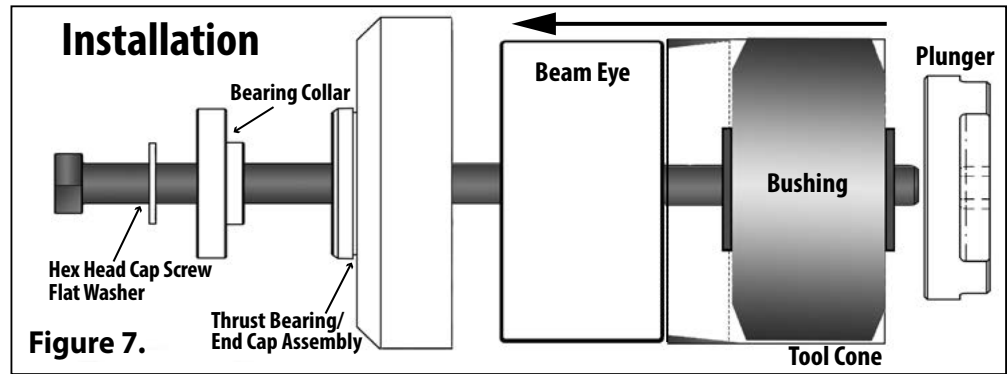


Figure 7.

### Reassemble suspension

Rotate beams into the hangers. Assemble the 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 locknut until adjuster plate pin is engaged and 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 (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 (Pg 14).

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

Install shock absorbers.

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



# WIDE BUSHING REPLACEMENT (GLUE-IN/CLAMPED BUSHING) – 245 TRUCK SUSPENSION MANUFACTURED BEFORE 2009

Part Number (Component)	Item Description	Size	Torque Values	
			foot-pound	Newton-meter
6040192-Bushing Kit Wide Bushing (6 3/4")	Suspension Model: 2457615D000	2457616D000	2457666D000	
	2457666D001	2457666D002	2457666D011	
1135873B105	Hex Head Cap Screw (HHCS) 8.5" LG	1-1/2"-6NC	1000 ft-lb	1356 N-m
1151065B002	Nut	1-1/2"-6NC		
1160673B000	Lock Washer			
1117625C060	Monopivot Bushing 70DURO			
1987625B000	Epoxy Adhesive FUSOR-320 50ML			
6040193-Bushing Kit Wide Bushing (6 3/4")	Suspension Model: 2450000-to-2450021	24510700	2457666D003	
	2457666D005	2457666D007	2457666D008	
1137694B000	Eccentric Bolt - 9.5" LG	1 1/4"-7 UNC-2A	1000 ft-lb	1356 N-m
1155648B108	Locknut	1 1/4"-7UNC-2B		
9003092B000	Anti-Turn Washer			
1117625C060	Monopivot Bushing 70DURO			
1987625B000	Epoxy Adhesive FUSOR-320 50ML			
Clamped Bushing	Refer to Engineering Drawing:	2457572xxxx	2457661xxxx	2457718xxxx
Fasteners	Locknut (Air Spring, Upper)	3/4"-16NF	50 ft-lb	68 N-m
	1" Hex-Head Cap Screw (Air Spring, Lower)	3/8"-16NC	25 ft-lb	34 N-m
	5-3/4" Hex-Head Cap Screw (Air Spring, Lower)	3/8"-16NC	25 ft-lb	34 N-m
	Locknut (Lift Spring)	1/2"-13NC	25 ft-lb	34 N-m
	Locknut (Lift Spring)	3/8"-16NC	25 ft-lb	34 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

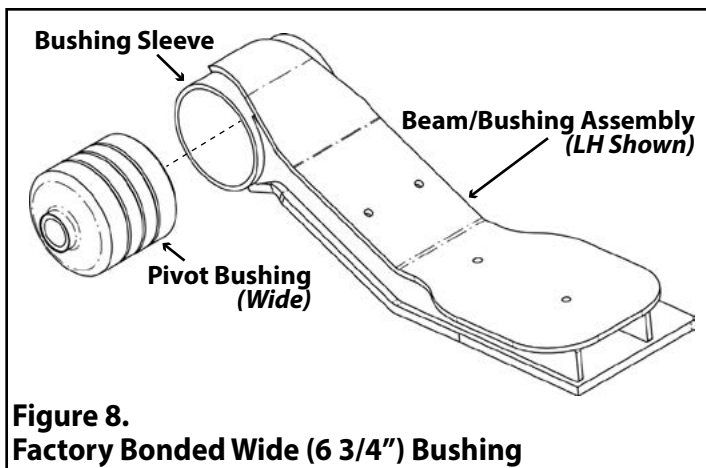
Park the vehicle on a level surface. Chock wheels to keep vehicle from moving.

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.

Disassemble suspension to reach pivot connection.

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



**Figure 8.**  
**Factory Bonded Wide (6 3/4") Bushing**

## Bushing Replacement Procedure - Service Parts:

1. Remove bushing from load beam/sleeve (Fig 8).  
NOTE: Apply heat to the outside of the sleeve with oxyacetylene torch to destroy any remaining bonding element and make removal easier.
2. Use a wire brush to remove any remaining bonding residue - rubber, dirt, rust, etc. - from sleeve bore.
3. Thoroughly wash the inner bore of bushing sleeve with paint thinner. Thoroughly wash the surface of the replacement bushing with paint thinner.  
**CAUTION** Epoxy adhesive and paint thinner are flammable materials that irritate the eyes, respiratory system and skin. Read all label instructions before use.
4. Remove cap from Epoxy Adhesive 50ml tube. Squeeze out entire contents. Thoroughly mix adhesive  
NOTE: Mixed adhesive must be used within 20 minutes.
5. Spread mixed adhesive on entire surface of bushing. Apply adhesive to the inside of sleeve bore.
6. Press replacement bushing into the bore of the sleeve until bushing is centered.
7. Wipe 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.

Reassemble the suspension. Torque to specifications (Chart/Engineering Drawing).

## Axle Alignment

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

On a multiple-axle vehicle, the forward axle is moved into 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 9).

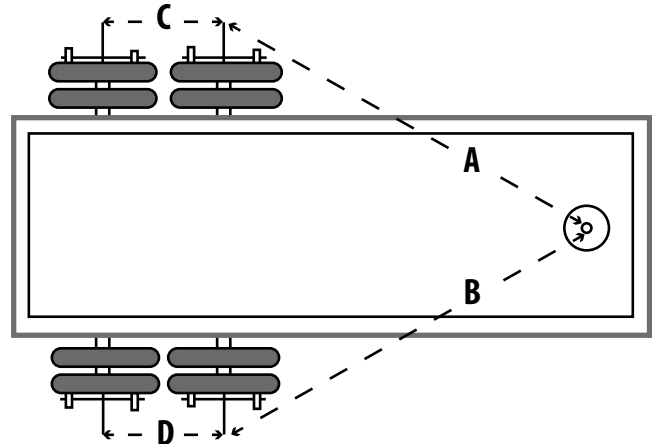
The RUL 245 suspension is equipped with the Ridewell Speed Set® alignment feature for manual alignment.

**Figure 9.**  
**Kingpin measurement for axle alignment.**

**Check forward axle alignment by measuring from the kingpin to both ends of axle centers.**

**If the difference between the "A" measurement and the "B" measurement is greater than 1/8-inch, the forward axle needs to be aligned.**

**Adjust the aft axle if the difference between the "C" measurement and the "D" measurement is greater than 1/16-inch.**



### Axle alignment procedure

1. Loosen the pivot nut enough for the beam to move within the hanger (Figure 10).

**CAUTION** Do not reuse pivot hardware if Torx® head is damaged or missing. A new shear-type pivot bolt, flat washer and locknut must be installed and the Torx head sheared off to complete the alignment.

2. Locate the adjuster plate at the pivot connection. Insert a 1/2"-shank breaker bar into the square hole of the adjuster plate. Push on the breaker bar to move the beam forward or backward until the axle reaches alignment measurements (Figure 10).

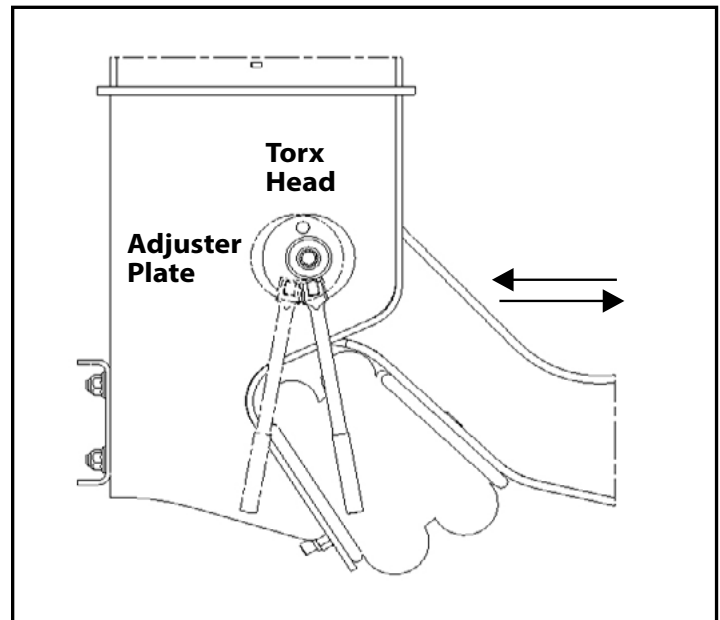
NOTE: Verify that the pivot bushing is not wedged sideways during beam movement. The adjuster plate and alignment washer should move in unison with beam movement.

3. Tighten the pivot nut so that the beam can no longer move. Re-check alignment measurements and adjust if necessary.

NOTE: Check to make sure both the adjuster plate and alignment washer are flat against the hanger before final torque is applied.

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

**CAUTION** Failure to properly torque pivot hardware could result in suspension failure/void the warranty.

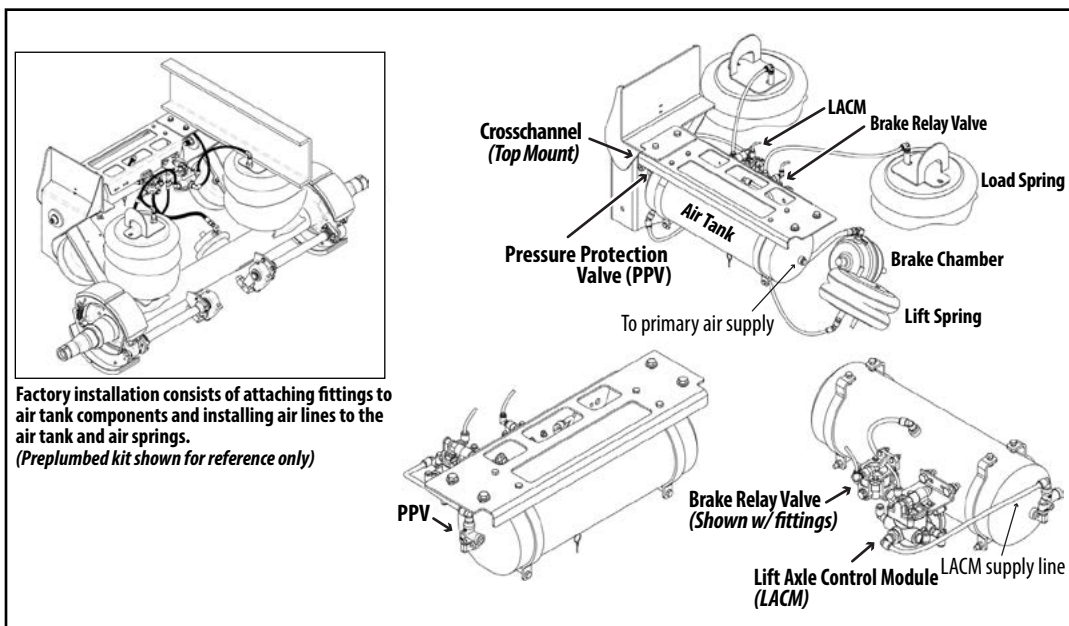


**Figure 10.**  
**Move beam back-and-forth using breaker bar until axle reaches the desired position.**

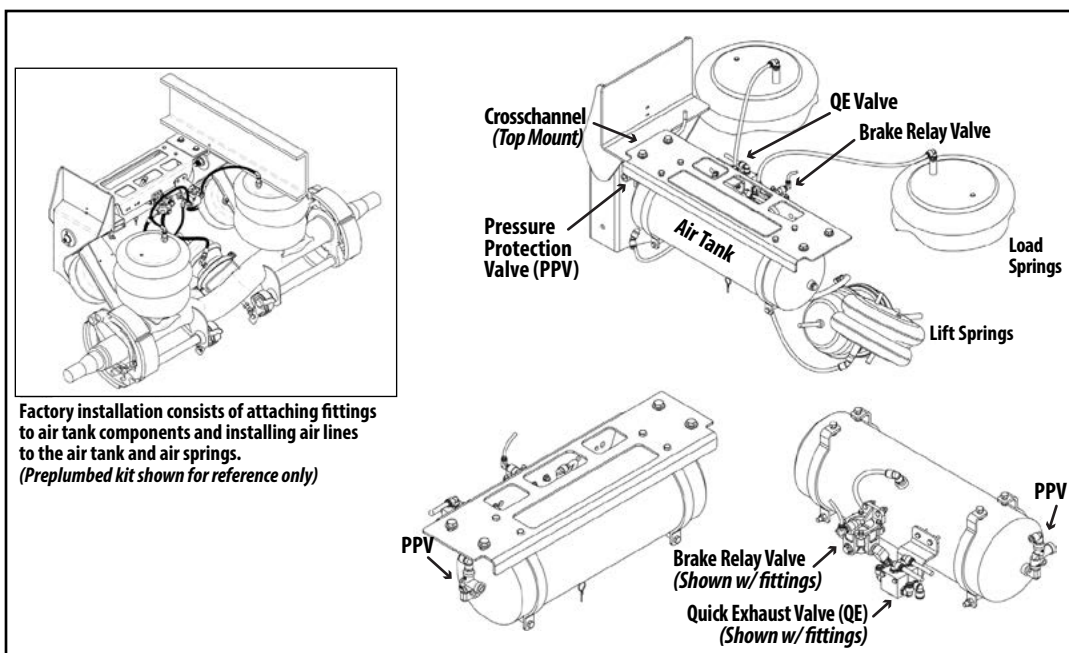
## Air Tank Integration (Preplumbed Kit)

Part No.—Kit Components	P/N—Factory Installation* (*Requires Integrated Axle)	Item Description	Air Tank— 1175-Cu In	Pressure Protection Valve (PPV)	Lift Axle Control Module (LACM)	Brake Relay Valve	Quick Exhaust Valve (QE)
1200286*	1200287	*2459005; 2459006 – LACM Kit <i>Installation—Valves; fittings and air lines from air springs to tank.</i>	1234256B001	1230060	1230195	1230081	
1200288*	1200289	*2459005; 2459006 – Quick Exhaust Valve Kit <i>Installation—Valves; fittings and air lines from air springs to tank.</i>					1230078 (2) valves needed

**CAUTION** Verify that vehicle is compliant with vehicle manufacturer standards and Federal Motor Vehicle Safety Standards (FMVSS) 121 (Page 3).



**Figure 11.**  
Preplumbed example –  
1200286-LACM Integration Kit  
(2459005; 2459006 Only)



**Figure 12.**  
Preplumbed example –  
1200288-QE Valve Kit:  
(2459005; 2459006 Only)

**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.

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