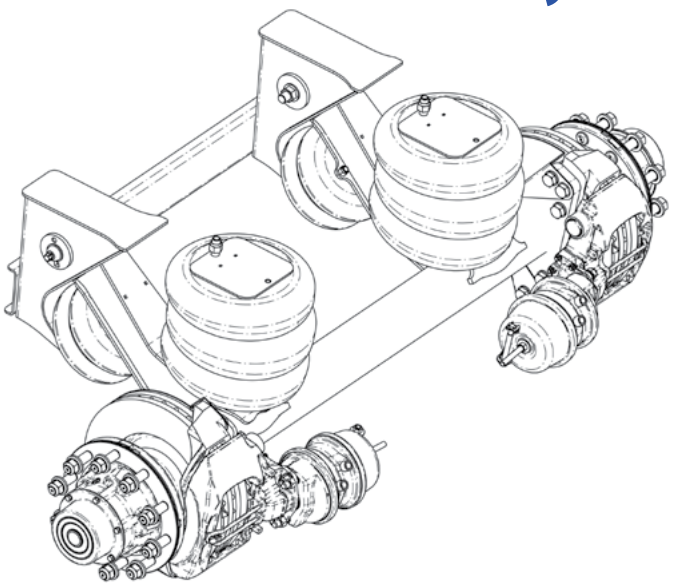
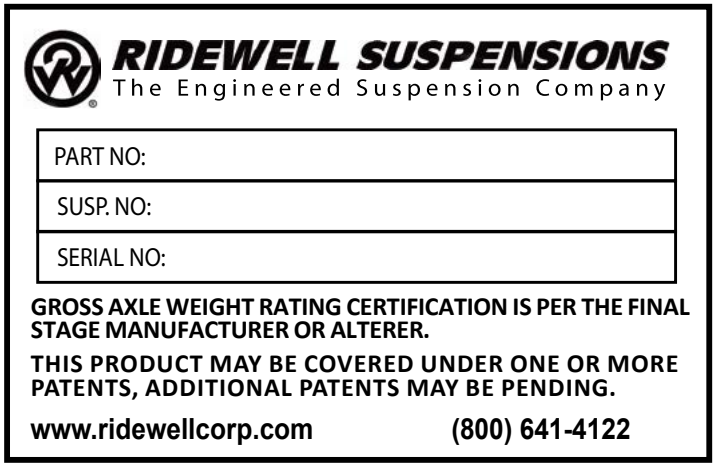
RUL-245T Trailer Suspension

NonSteerable Auxiliary Axle Suspension



Installation and Service Manual

RIDEWELL SUSPENSIONS


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 ID Tag

A **(606-) Installation/Assembly Number** is listed as the **Part Number** when other components are factory installed onto the suspension system.
The **Suspension Number** and the **Serial Number** refer to the model and date of manufacture.

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

Notes and Cautions

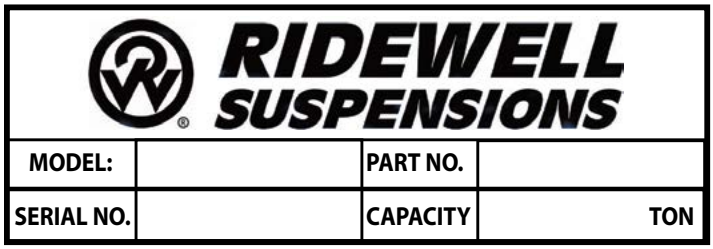
Read through entire Installation and Service Manual (ISM) before performing any procedures.

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

The ISM uses two service notes for safety guidelines:

"NOTE": Provides additional instructions and procedures to complete tasks and ensure that suspension system components function properly.

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


RIDEWELL SUSPENSIONS

MODEL:		**PART NO.**	
SERIAL NO.		**CAPACITY**	**TON**

Axle-Body ID Tag

The **165– Base-Axle Part Number** refers to 5″ and 5 3/4″ Ridewell-branded round axles available in various axle-wall thicknesses and track-widths.

The **165– Base-Axle Part Number** and **Serial Number** are listed on the Axle-Body Identification Tag.

Standard Trailer Dimensions				
Trailer	Track Width	Frame Center	Beam Center	Air Spring Center
96″	71.5″	38″	35″	31″
102″	77.5″	44″	41″	37″

Prior to Installation

Refer to the engineering drawing for suspension system component information; available ride heights; dimensional requirements; and, operating parameters.

The suspension is designed to fit up onto standard I-beam trailer frames at beam centers that correspond to standard axle track-widths (Chart).

Installation at wider beam centers will reduce the suspension system clearances. Installation at narrower beam centers will de-rate the axle beam capacity.

For non-standard beam centers, frames, frame centers, axle track widths and wheel-end equipment, the installer is responsible for verifying clearances, axle capacity, fit-up, and any required additional support structure.

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 such changes are permitted.
- Welding/altering of the suspension components is not permitted without the express written permission of Ridewell Suspensions.

Installer Responsibilities

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

- The installer is responsible for locating the suspension 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 the applicable federal, state and local bridge laws.
- The installer must verify air reservoir volume requirements are met after suspension installation. Consult 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 suspension including the air springs, brake chambers, axle and tires.

Pressure-Regulated Load Capacity

The auxiliary axle load capacity is adjusted by increasing or decreasing the pressure to the air springs.

The axle takes on a greater percentage of the load's weight as more air pressure is applied. The load capacity is decreased as the air springs air pressure decreases.

Accurate readings of load capacity can be obtained by parking the loaded vehicle over a calibrated scale and lowering the auxiliary axle onto the scale.

The pressure to the air springs is then manually adjusted up or down to obtain the various axle load weights.

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

Axle Integration

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

Use the top-center mark on the axle, if available, to identify the axle center and orient the axle assembly.

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 personal injury as well as cause 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).
Preheat the weld zone to the axle manufacturer's recommended preheat temperature

Welding Procedure

1. Center axle assembly on the beams (Figure 1).
2. Check 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. Confirm that the brake chamber brackets are oriented properly before clamping the axle assembly into place.
   2.2. Disc brake assemblies have a right- and left-hand caliper assembly. Make sure 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 (Figure 2).
   Side gaps should be no greater than 1/8".
   The bottom of the axle-seat gap should be no greater than 1/16".
4. Weld the axle to the axle-seat according to Ridewell Weld Process #1 (Page 5).
   NOTE: Mounted air springs should be covered to protect them from welding spatter.

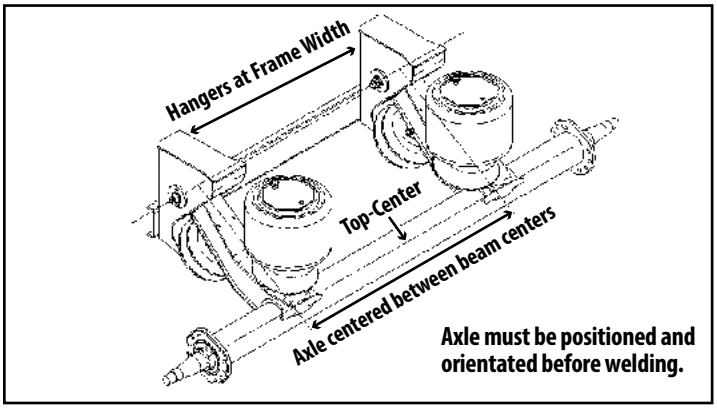


Figure 1.
Axle should be centered between beam centers with the beams and the axle perpendicular to each other. Refer to the engineering drawing for the correct beam center measurements.

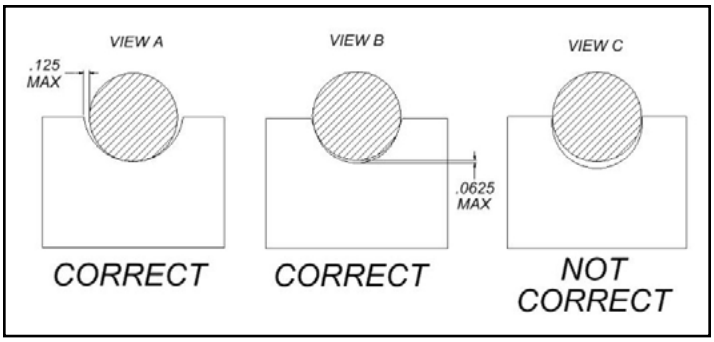
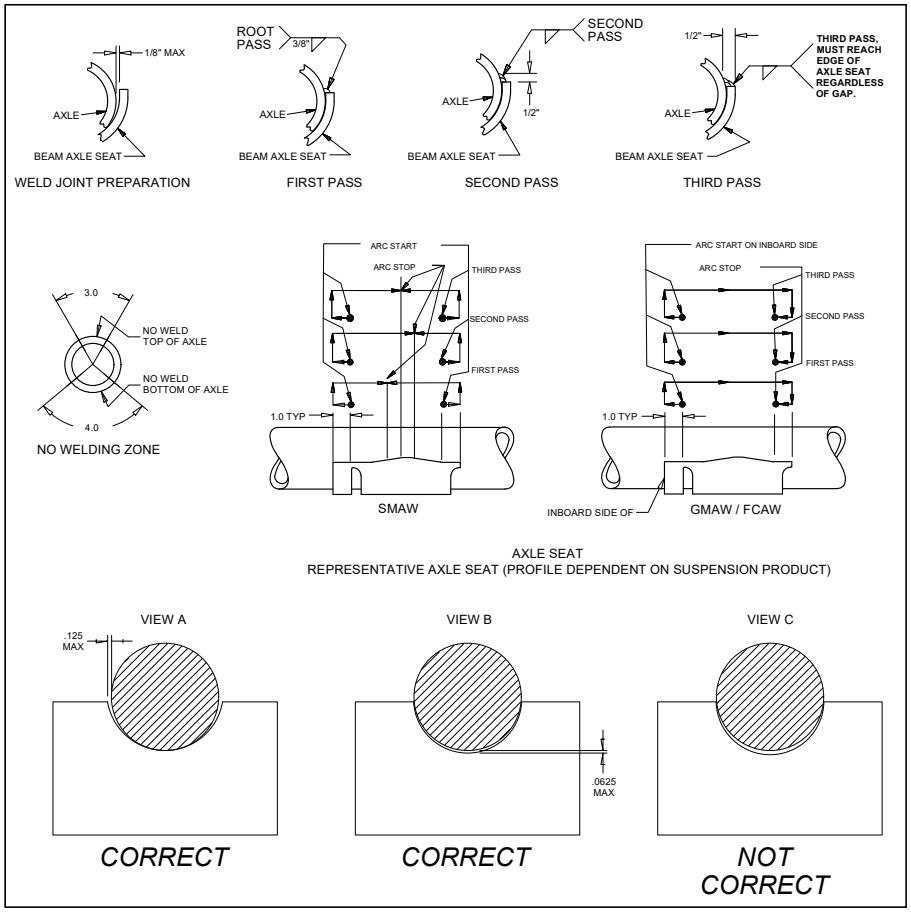


Figure 2.
Correct axle tube seating for welding.

Ridewell Weld Process #1 – 5”-6” Diameter Axle, 3-Pass Weld (ENG DWG 9710039-K)

1. All welds must be kept away from the top and bottom of the axle where maximum stresses occur (see “NO WELDING ZONE” illustration). 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. It is recommended that paint be removed a minimum of 2” away from the weld joint.
   CAUTION: Never weld when the axle is cold. The axle and beam assemblies 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). The root gap should be as equal as possible on each side of the beam axle seat. The axle must be centered laterally in the beams.
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 - View A or B). When installing a drop-center axle, a gap of up to 1/4” is allowed on one side of each seat, while the other side of seat has a max gap of .0625”.
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 total weld. Weld size increases with gap size proportionally.
   - 8.2. Weld pass starts and stops should be performed as illustrated.
   - 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 back-weld 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 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.



Suspension Mounting

Refer to the engineering drawing for mandatory customer-supplied crossmember locations; any recommended bolt-hole locations; and, component spacing/clearance requirements.

Weld-On Installation Procedure

Refer to the engineering drawing for customer-furnished filler plate and supporting crossmember locations for the hangers and air spring mounting plates.

⚠CAUTION Welding method must use a minimum weld tensile strength of 70,000 psi, per AWS specifications.

1. Mark desired location of the hangers and filler plates on the frame. Hangers must be installed parallel to each other for proper axle alignment.
2. Mark desired location of the air spring mounting plates and filler plates on the vehicle frame.
   NOTE: Protect other chassis components from weld spatter during installation, if necessary.
3. Install any customer-furnished filler plates for the frame hangers and air spring mounting plates. Weld the filler plates to the crossmembers with ¼" fillet welds down the length of the crossmember.
4. Weld the hangers to the frame/filler plates with 1/4" fillet welds completely around the hangers. Stop the welds 1/2" from the corners and edges.
5. Weld the air spring mounting plates to the frame/filler plates with 3/16" fillet welds.
6. If required, attach supporting crossmember or diagonal brace to the front of the hangers with 1/4" fillet welds (Refer to engineering drawing).
7. Perform the final assembly and inspection. Align the suspension per TMC- or SAE-recommended standards.
   NOTE: Axle alignment should be performed with the suspension at the installed ride height.

Bolt-On Installation

Make sure that wires, hoses or other components will not be affected by drilling into the frame rail before installation.

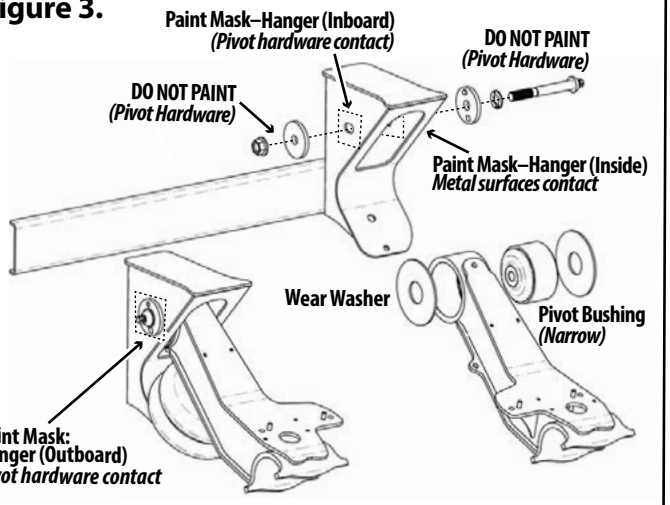
Bolts/nuts for attaching the suspension are supplied by installer. Grade 8 bolts and flanged locknuts or locknuts with hardened washers are recommended.

Bolt holes are not provided in the air spring mounting plates. Clamp mounting plates and filler plates, if used, in place and drill (minimum) two bolt-holes in each mounting plate for installation onto the chassis.

Final Assembly and Inspection

- Verify hanger and air spring mounting plate attachment.
- Check location for sufficient clearance of all components.
- Attach the beam and axle assembly to the frame hangers. ⚠CAUTION Do not apply any undercoating; paint or other top coat to the suspension, frame hangers or pivot hardware until axle alignment is completed (Page 15).
  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 assembly (Fig 3).
- Complete air spring installation as shown on the engineering drawing. Torque to specifications (Pages 9-11).

Figure 3.



- Install/connect air control kit (ACK) to suspension (Pg 7). Check air system after installation for leaks and proper air controls operation.
- Perform final assembly and inspection and align the suspension per TMC or SAE recommended standards.
  NOTE: Alignment should be performed with the suspension at installed ride height (Page 15).
- Perform Installation and Operations Check before releasing the suspension into service.

⚠CAUTION Failure to torque suspension components to specifications can result in suspension failure and void the warranty.

Installation and Operation Check

- Check hanger and air spring mounting plate attachment.
- Check for loose or missing fasteners on the suspension assembly. Verify suspension fasteners are torqued to the proper values (Pages 9-11; Engineering Drawing).
- Lift axle to the fully raised position. Check air system tubing and fitting connections for leaks.
- Confirm tires are inflated to recommended pressure. Check the wheel hubs for the proper level of lubricant recommended by the manufacturer.
- Verify wheel lug nuts are torqued; wheels rotate freely.
- Confirm brakes/slack adjusters are properly adjusted.
- Raise and lower the suspension assembly (wheels and tires installed) through entire range of suspension travel. Confirm there are sufficient clearances for air springs, brake chambers and other components.

⚠CAUTION Reduce load springs pressure below 10 psi when lowering an auxiliary axle on an unloaded vehicle. Failure to do so could cause the vehicle's drive axles to rise from the ground and the vehicle could roll in an unsafe manner.

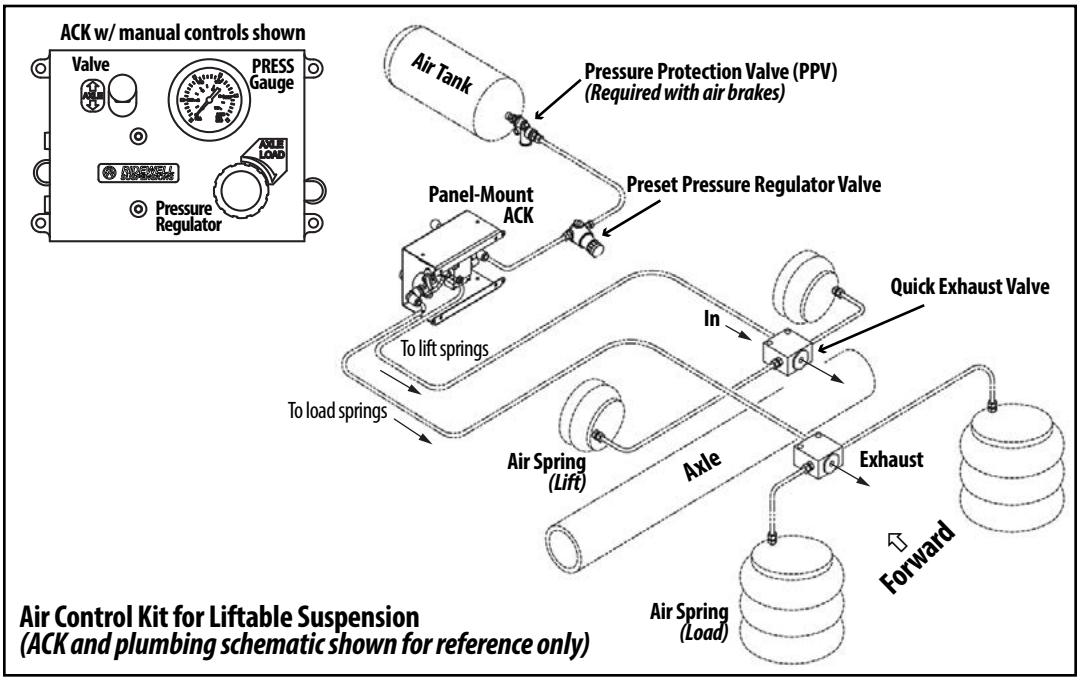
⚠CAUTION Do not lower lift-axle while vehicle is moving in forward or reverse travel above 10 mph.
Lowering the axle above the recommended speed can cause component damage and premature wear.

Lift-Axle Air Controls Kit– Plumbing Example

The air control kit is installed into the vehicle's air brake system. The ACK consists of a pressure regulator with a gauge connected to an air valve controlled by a manual knob or electric switch.

The operator uses the air controls to increase/decrease the air pressure to the air springs to support different loads.

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



Air Control Kit for Liftable Suspension
(ACK and plumbing schematic shown for reference only)

Air Control Kit – Troubleshooting

Problem	Possible Cause	Solution
Air springs fill but do not exhaust.	— Obstructed air line.	— Check for pinched/blocked lines.
	— Faulty controls wiring.	— Check controls wiring with voltmeter. Correct wiring/installation.
	— Manual override pushed in.	— Release manual override.
Air system leaks down after a short period of time.	— Air system leak beyond accepted standards. NOTE: Some valves leak at an acceptable rate.	— Pressurize system. Spray soapy water solution onto the tubing, valves and fittings. Check for bubbles (leaks). — Check that tubing cuts are straight and smooth. Re-cut and reassemble fitting joints, if necessary.
Auxiliary unit will not stay up	— Loose fitting connection/Damaged air lines.	— Check and retighten fittings. Repair or replace component, as necessary.
	— Air lines to the lift springs and the load springs are reversed.	— Check installation. Air line from regulator goes to (load) springs.
	— Damaged or worn air springs.	— Replace air spring if worn or damaged.
Auxiliary unit not achieving correct lift	— Air lines to the lift springs and the load springs are reversed.	— Check installation. Air line from regulator goes to (load) springs.
	— Lift springs do not have proper air pressure.	— Check for loose fittings or worn/damaged lines. Verify air tank pressure with gauge.
	— Interference with driveline/other components.	— Visually inspect auxiliary unit operation for proper clearance. Retighten any loose fasteners.
	— Air control system not installed correctly.	— Check air control kit installation; refer to the OEM installation procedures.

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/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 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 fasteners to specifications (Pages 9-11; Engineering Drawing).
NOTE: Do not re-torque shear-type pivot bolt.

___ Verify suspension is operating at designed ride height.

Every 12,000 miles of use

___ Inspect air springs for damage/excessive wear. Torque fasteners to specification (Pages 9-11; ENG Drawing).

___ Check air lines and connections for leaks.

___ Lubricate Brake Cams and Slack Adjusters.

Refer to these Technology & Maintenance Council (TMC) Recommended Practices for additional information

RP 607	Maintenance - S-Cam Brakes
RP 618	Wheel Bearing Adjustment Procedure
RP 619	Air System Inspection Procedure
RP 622	Wheel Seal/Bearing Maintenance
RP 631	Wheel End Lubrication
RP 643	Air Ride Suspension Maintenance
RP 652	Inspection/Service - Air Disc Brakes
RP 708	Trailer Axle Alignment
RP 728	Trailer Axle Maintenance
RP 1515	Maintenance Guide - Auxiliary Axle

First 50,000 miles of use

___ Torque suspension fastener components to specifications (Pages 9-11; 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 hardware to specifications (Pages 9-11; Engineering Drawing).

___ 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 components to specifications can result in suspension failure and void the warranty.

Scan/double-click QR-Code to visit online support page: www.ridewellcorp.com

Pivot Bushing Inspection Procedure

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

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; 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 hanger.
Drop the beams for further inspection if any large/easy beam movement or damage to the wear washers is observed. Replace components as necessary.

Bushing Replacement Kit – RUL-245T w/ Triple Convoluted Air Spring (#1003B12339G)

Part Number	Item Description	Size	Torque Values foot-pound	Torque Values Newton-meter
6040128 - Bushing Kit **Bushing Tool - 6100044**	Pivot Bolt/Nut - (Shear-Type Bolt/Locknut) Requires E-20 Torx® socket (RW #6100054)	7/8″-9NC	*Do not lubricate bolt/nut threads. Use 1″-drive impact wrench to tighten until Torx® head shears off.*	
6040078 - Bushing Kit **Bushing Tool - 6100044**	Pivot Bolt/Nut - (Traditional Hardware) Hex Head Cap Screw (HHCS)/Locknut	7/8″-9NC	500 ft-lb	678 N-m
Fasteners	Locknut (Air Spring, Upper)	3/4″-16NF	50 ft-lb	68 N-m
	HHCS (1″LG); Lock Washer (Air Spring, Lower)	3/8″-16NC	25 ft-lb	34 N-m
	HHCS (5 3/4″LG); Lock Washer (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 ships with minimal torque applied to fasteners.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.*

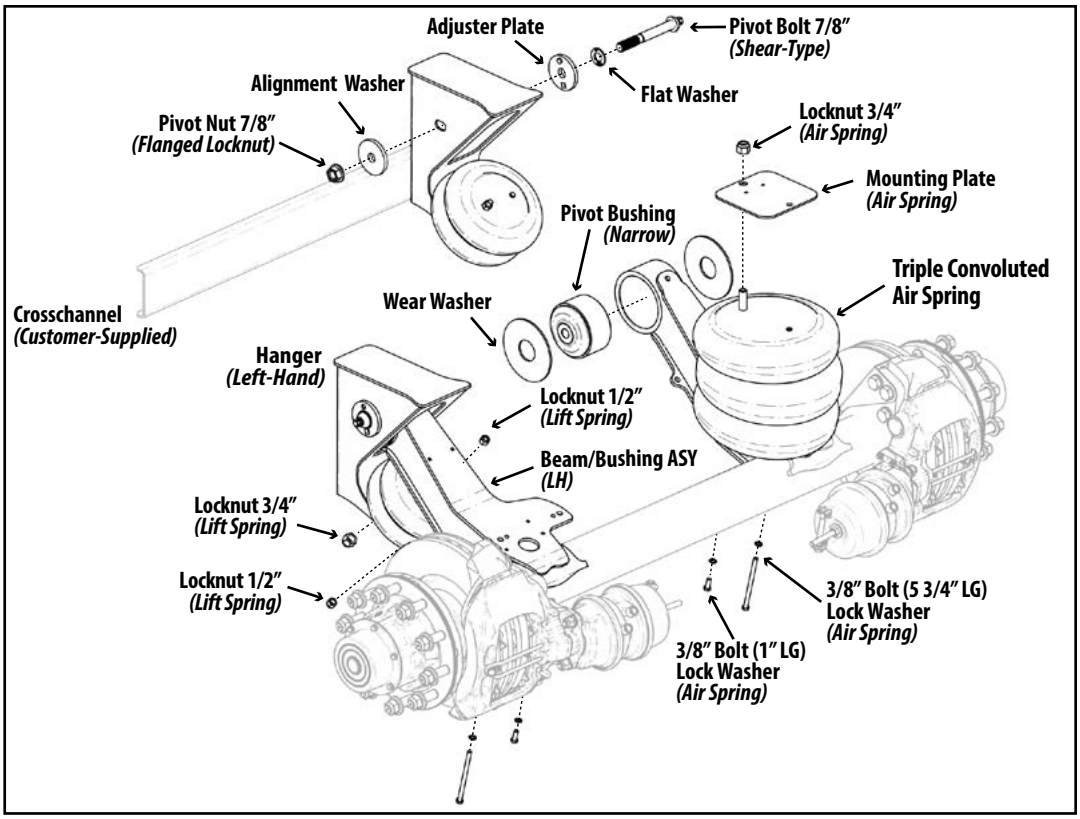


Figure 4. RUL-245– Triple Convoluted Air Spring Configuration

Integrated 5″ Disc-Brake Modified Axle shown for reference only. Refer to engineering drawing for component part numbers.

Bushing Replacement Kit – RUL-245T w/ Dual-Stud Air Spring (#1000043)

Part Number	Item Description	Size	Torque Values foot-pound	Newton-meter
6040128-Bushing Kit Bushing Tool-6100044	Pivot Bolt/Nut - (Shear-Type Bolt/Locknut) Requires E-20 Torx® socket (RW #6100054)	7/8″-9NC	*Do not lubricate bolt/nut threads. Use 1″-drive impact wrench to tighten until Torx® head shears off.*	
6040078-Bushing Kit Bushing Tool-6100044	Pivot Bolt/Nut - (Traditional Hardware) Hex Head Cap Screw (HHCS)/Locknut	7/8″-9NC	500 ft-lb	678 N-m
Fasteners	Locknut (Air Spring, Upper)	3/4″-16NF	50 ft-lb	68 N-m
	SHCS (1130084 - 5/8″LG); Lock Washer (1160011) (A/SPG, Upper)	3/8″	25 ft-lb	34 N-m
	HHCS (1″ LG); Lock Washer (Air Spring, Lower)	1/2″-13NC	25 ft-lb	34 N-m
	HHCS (5-3/4″ LG); Lock Washer (Air Spring, Lower)	1/2″-13NC	25 ft-lb	34 N-m
	Locknut (Lift Spring)	1/2″-13NC	25 ft-lb	34 N-m
	Locknut (Lift Spring)	3/4″-16NC	25 ft-lb	34 N-m

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

CAUTION *Suspension ships with minimal torque applied to fasteners.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.*

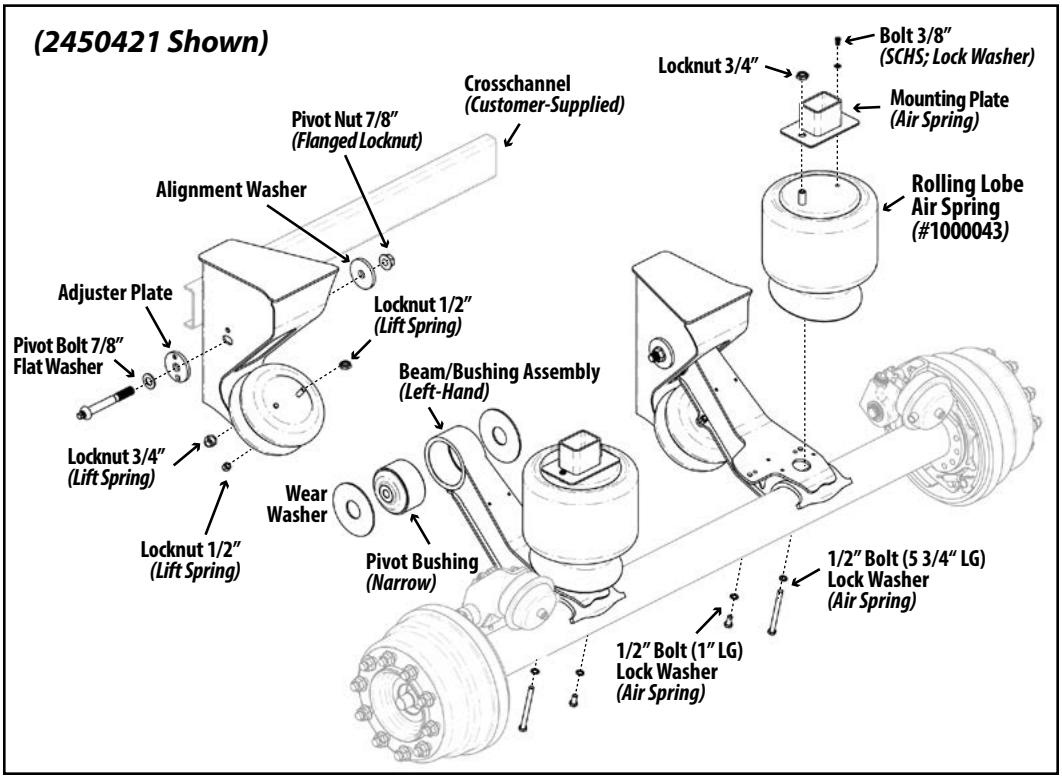


Figure 5.
RUL-245–
MFG After AUGUST 2023

2450411 (MMT)
2450420 (HMT)
2450421 (HMT)
2450425 (HMTB)
2459001 (HMTB)
Dual-Stud (1000043) Air Spring required.

Integrated 5″ Drum Brake-Modified Axle shown for reference only. Refer to engineering drawing for component part numbers.

Bushing Replacement Kit – RUL-245T – Single- or Dual-Stud Air Spring Configuration

Part Number	Item Description	Size	Torque Values foot-pound	Newton-meter
6040128 - Bushing Kit Bushing Tool-6100044	Pivot Bolt/Nut - (Shear-Type Bolt/Locknut) Requires E-20 Torx® socket (RW #6100054)	7/8″-9NC	*Do not lubricate bolt/nut threads. Use 1″-drive impact wrench to tighten until Torx® head shears off.*	
6040078 - Bushing Kit Bushing Tool-6100044	Pivot Bolt/Nut - (Traditional Hardware) Hex Head Cap Screw (HHCS)/Locknut	7/8″-9NC	500 ft-lb	678 N-m
Air Spring (Bolt-On) Mounting Plate	Carriage Bolt (1130030 - 1.75″LG); Locknut (1150026)	5/16-18NC	25 ft-lb	34 N-m
Fasteners	Locknut (Air Spring, Upper)	3/4″-16NF	50 ft-lb	68 N-m
	HHCS (1″ LG); Lock Washer (Air Spring, Lower)	1/2″-13NC	25 ft-lb	34 N-m
	HHCS (5-3/4″ LG); Lock Washer (Air Spring, Lower)	1/2″-13NC	25 ft-lb	34 N-m
	Locknut (Lift Spring)	1/2″-13NC	25 ft-lb	34 N-m
	Locknut (Lift Spring)	3/4″-16NC	25 ft-lb	34 N-m

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

CAUTION *Suspension ships with minimal torque applied to fasteners.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.*

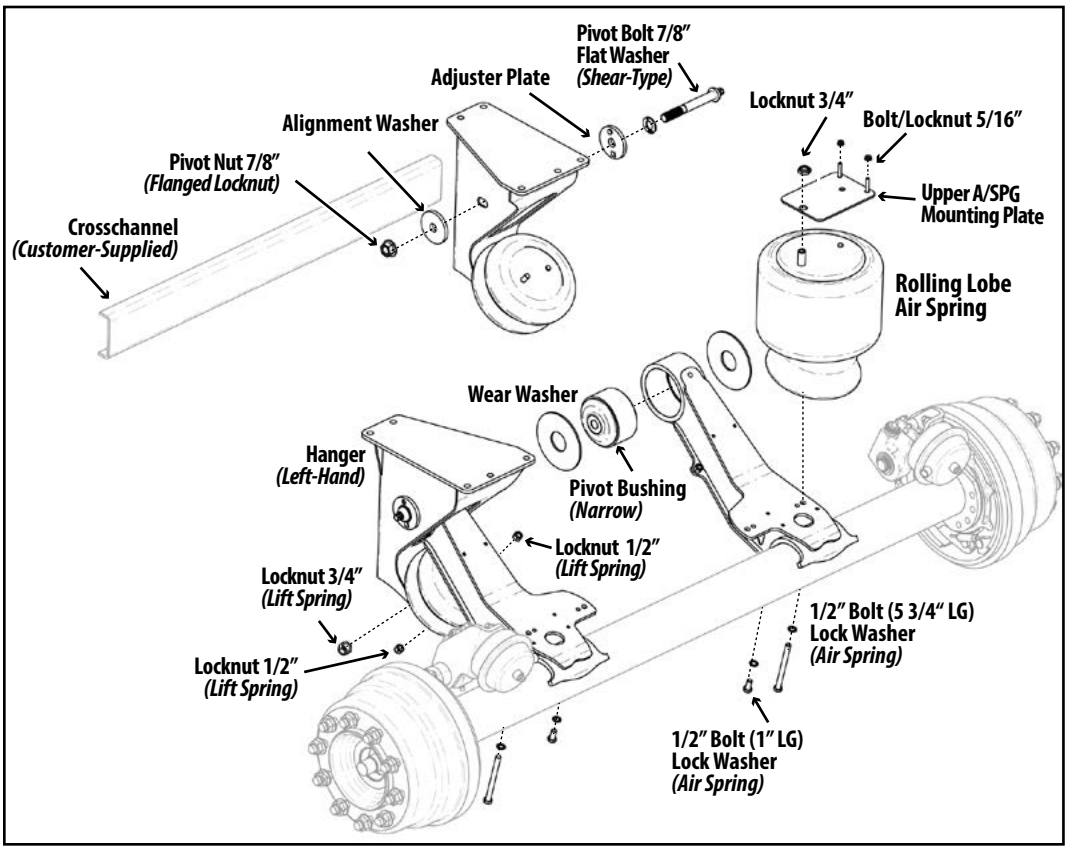


Figure 6.
RUL-245–
MFG After AUGUST 2023
2450415 (MMTB)
2459003 (MMTB)
Single-Stud (1001R12584G) or Dual-Stud (1000043) Air Spring configuration.
Integrated 5″ Drum Brake-Modified Axle shown for reference only. Refer to engineering drawing for component part numbers.

Narrow Bushing Replacement Procedure – Bushing Replacement 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 with jack stands.

Disconnect linkage from height control valve(s), if equipped. Exhaust all air from the air system.

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

Disassemble the suspension

Remove wheels and tires, if necessary. Remove the shock absorbers, if installed.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 components as 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 for Bushing Removal

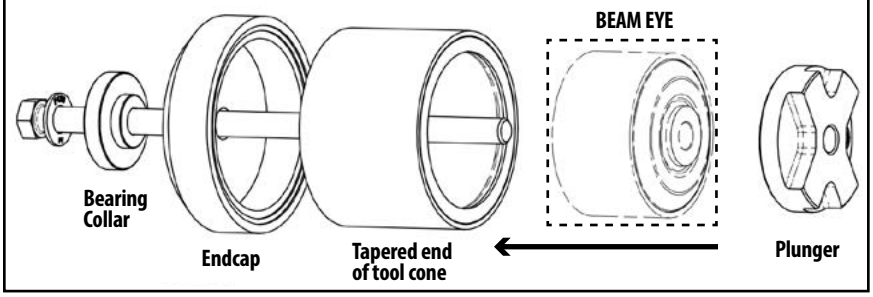
Verify thrust bearing is installed in the flat, outside edge of endcap. Inspect the tool cone tapered insert and the endcap for damage. Repair or replace components as needed.

Lubricate Hex-Head Cap Screw and thrust bearing threads with supplied 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 HHCS head. Place the open end of the bushing tool cone onto the endcap (Figure 7).

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

Narrow Bushing Removal **Figure 7.**



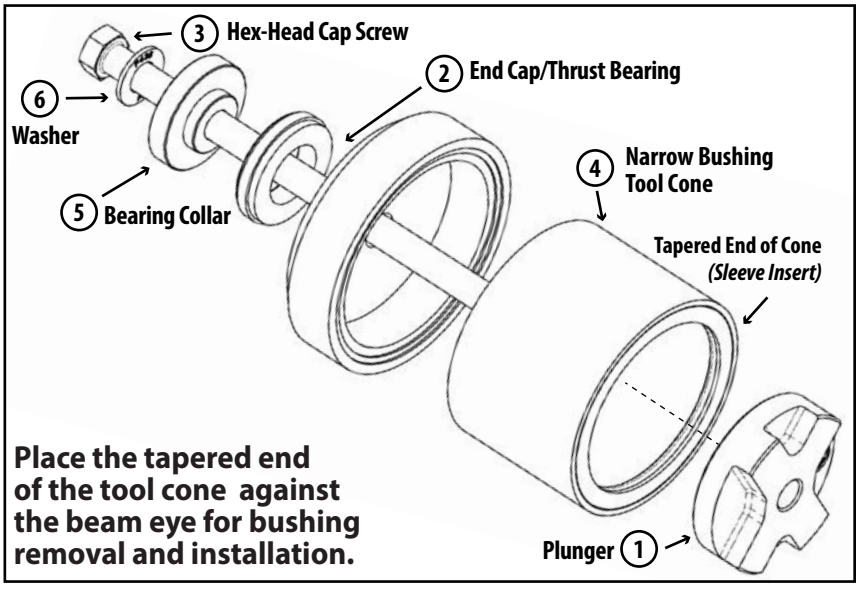
Bushing Removal

1. Push hex-head cap screw through the bushing inner sleeve until the tool cone is against the beam eye. Thread plunger onto HHCS until the tool cone is held firmly against the beam (Fig 7).
   NOTE: The tool cone's tapered end is placed against the beam eye for bushing removal and installation.
2. Confirm 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 the Hex Head Cap Screw and pull the bushing into the cone.
   NOTE: In some cases, a small amount of heat may be needed to break the friction bond between the rubber bushing and the 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

6100044 – Narrow Bushing Installation Tool

No.	Part No.	Item Description
1	6100091	PLUNGER BUSH TOOL NARROW MACH'D
2	6100089	END CAP BUSHING TOOL ASY (DWG)
	1660009	BEARING, THRUST, 12-16K WESPORT
	6100090	END CAP BUSH TOOL 260 MACHINED
3	1130088	HHCS 7/8-6 ACMEx18.0LG 12" THRD
4	6100092	CONE ASSY,BUSH INSTALL, NARROW
5	1120051	BRNG COLLAR BUSH TOOL
6	1160036	WASHER 7/8" F436 ZINC/COATED
—	1980014	EXTREME PRESSURE LUBE



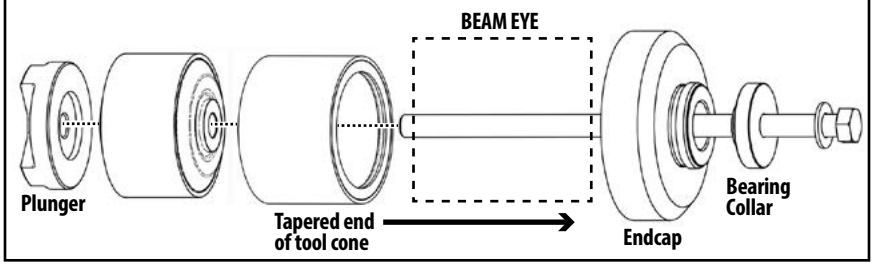
Bushing Tool Assembly

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

Bushing Installation

1. Use wire brush to clean debris /corrosion from the beam eye.
2. Liberally apply P80® 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 8).
3. Center the smaller opening of the tool cone against the beam eye.
   Push the hex-head cap screw through the bushing inner sleeve from the opposite side of the beam until the end-cap 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 hex-head cap screw to press bushing into the beam eye.
6. Remove bushing tool from the beam. Confirm bushing is centered inside the beam. Realign bushing to be centered if necessary.

Narrow Bushing Installation **Figure 8.**



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 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 15).

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 and voided warranty.

Glue-In/Clamped Bushing Replacement – RUL-245T Manufactured Before 2009

Suspension No.	Part Number	Item Description	Size	Torque (foot-pound Newton-mtr)	
2457615D000	**6040192**	**Wide (6 3/4") Bushing Kit**			
2457616D000	**1135873B105**	Hex Head Cap Screw (HHCS) 8.5" LG	1-1/2"-6NC	1000 ft-lb	1356 N-m
2457666D000	**1151065B002**	Nut	1-1/2"-6NC		
2457666D001	**1160673B000**	Lock Washer			
2457666D002	**1987625B000**	Epoxy Adhesive FUSOR-320 50ML			
2457666D101	**1117625C060**	Monopivot Bushing 70DURO			
2457666D011					
2450000-to-0021	**6040193**	**Wide (6 3/4") Bushing Kit**			
24510700	**1137694B000**	Eccentric Bolt - 9.5" LG	1 1/4" - 7 UNC-2A	1000 ft-lb	1356 N-m
2457666D003	**1155648B108**	Locknut	1 1/4" - 7 UNC-2B		
2457666D005	**9003092B000**	Anti-Turn Washer			
2457666D007	**1987625B000**	Epoxy Adhesive FUSOR-320 50ML			
2457666D008	**1117625C060**	Monopivot Bushing 70DURO			
2457572xxxx	**2457661xxxx**	**2457718xxxx**	***Clamped Bushing (See ENG Drawing)***		
Fasteners		Locknut (Air Spring, Upper)	3/4"-16NF	50 ft-lb	68 N-m
		1" HHCS; L'Washer (Air Spring, Lower)	3/8"-16NC	25 ft-lb	34 N-m
		5-3/4"HHCS (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
6100045		(OPT) Bushing Replacement Tool – 245 Wide Bushing (1117625C060)			

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/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.

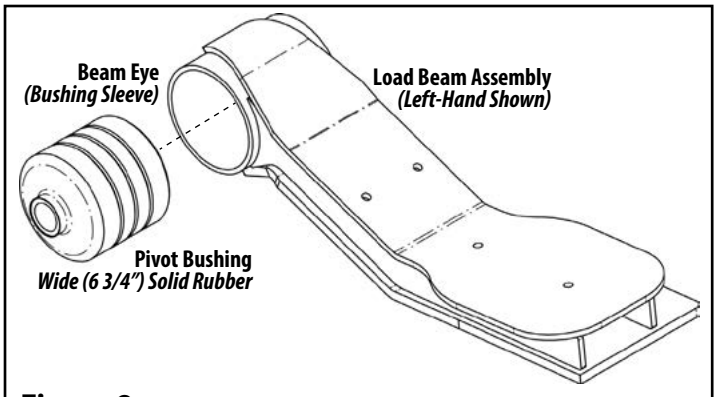


Figure 9.
Solid Rubber Bushing 6 3/4" (1117625C060)

Bushing Replacement Procedure

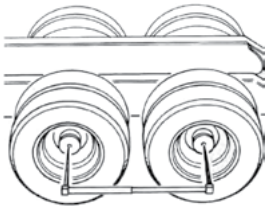
1. Remove bushing from load beam. (Figure 9).
   NOTE: Apply heat to the outside of the beam eye with oxyacetylene torch to destroy remaining bonding element.
2. Use a wire brush to remove bonding residue - rubber, dirt, rust, etc. - from the inside of the beam eye.
3. Thoroughly wash inner bore of the beam eye and the surface of the new bushing with paint thinner.
   CAUTION Epoxy adhesive/paint thinner are flammable materials. Read all label instructions before use.
4. Remove cap from Epoxy Adhesive tube. Squeeze out entire contents. Thoroughly mix the adhesive.
   NOTE: Mixed adhesive must be used in 20 minutes.
5. Spread mixed adhesive on the entire surface of bushing. Apply adhesive to the inside bore of the beam eye.
6. Press bushing into beam eye until bushing is centered.
   NOTE: Bushing tool #6100045 can be used in place of a bushing press or rubber mallet.
7. Wipe away excess adhesive from installed bushing ends with paint thinner and rag. Adhesive can be handled after four hours and will totally cure after 24 hours.
   CAUTION Adhesive must be totally cured before the vehicle can return to service.
8. Reassemble the suspension. Torque to specifications. (Chart/Engineering Drawing).

Refer to the engineering drawing for the designed ride heights of the suspension model. Align the suspension per TMC- or SAE- recommended standards.

On a multiple-axle vehicle, the forward (lead) axle is moved into proper alignment, then the following (rear) axles are positioned to be parallel to the lead axle (Figure 10).

Position trailer for alignment

- The suspension must be in a "relaxed" state without any preloading applied to the bushings.
- Disengage the trailer parking brakes. Pull the trailer forward in a straight line at least three feet.
- Adjust the landing legs to place the trailer at the designed kingpin height. Place the kingpin adapter/kingpin extender onto the kingpin.
- Install wheel-end extender or trammel bar onto each end of the lead and rear axle.



Wheel-End Extenders/Trammel Bar

CAUTION An axle alignment performed with a pre-loaded (compressed) bushing can provide incorrect measurements and may cause tracking problems/premature tire wear.

Recommended Equipment

- 50-ft 1/32"-ruled steel tape measure.
- 12-ft 1/32"-ruled tape measure.
- A device to keep tension on the tape measures.
- A kingpin adapter/kingpin extender (pogo stick).
- Wheel-end (spindle) extenders/Trammel bar.

Axle Alignment Measurements

Use extreme care; as measurement errors can take up most, if not all, of the alignment tolerances (Figure 10).

1. Attach the 50-ft tape measure to the kingpin. Measure Distance "A" and Distance "B" from the kingpin to the centers of the lead axle. The difference between the "A" and "B" measurements must not exceed 1/8-inch.
2. Measure Distance "C" and Distance "D" from the lead axle to the next axle with the 12-ft measuring tape or trammel bar. The difference between the "C" and "D" measurements must not exceed 1/16-inch.

Axle Alignment Procedure

Select either the left-hand or right-hand beam of the lead axle to begin the alignment procedure.

1. Tighten the pivot nut on the selected side until snug.
2. Move to the opposite side of the selected beam. Tighten the pivot nut on this side until snug.
   CAUTION Do not reuse the pivot hardware if the Torx® head is damaged or missing after tightening the pivot connection. A new shear-type pivot bolt, washer, and locknut must be installed and the Torx head sheared off at final torque to complete the alignment.

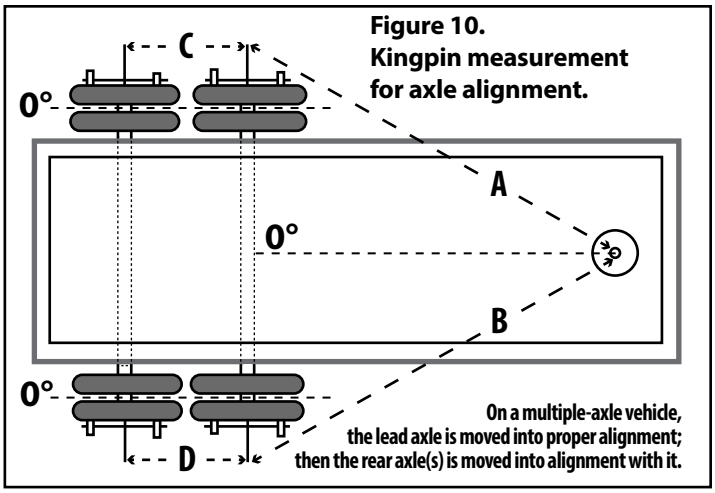


Figure 10.
Kingpin measurement for axle alignment.

3. Return to starting location. Insert a 1/2"-shank breaker bar into square hole of the adjuster plate (Figure 11).
4. Push/pull on breaker bar to adjust the beam forward or backward into lead axle alignment (Figure 10).
   NOTE: Verify that pivot bushing is not wedged sideways during beam movement. The adjuster plate and the alignment washer should both rotate as the beam moves.

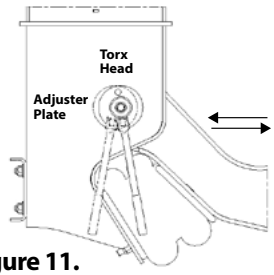


Figure 11.
Move beam back-and-forth with breaker bar until axle reaches alignment position.

5. Move to the opposite beam. Recheck the alignment measurements. Use breaker bar procedure if necessary to move axle into the correct alignment location.
6. Recheck alignment measurements. Adjust if needed, then tighten pivot nut on each side so that axle cannot move.
   NOTE: Confirm the adjuster plate and alignment washer are flat against hanger before applying final torque.
7. Tighten pivot bolt on both sides with a 1"-drive impact wrench and E-20 Torx® socket (Ridewell tool #6100054) until the Torx head is sheared off.
8. Repeat measurements "A" and "B" to verify alignment is within tolerances. Redo alignment if necessary.

Align the rear axle to the lead axle.

Check "C" and "D" axle alignment measurements to verify the difference does not exceed 1/16-inch tolerance (Fig 10).

Repeat Axle Alignment Procedure Steps 1-8, if necessary, to bring the rear axle into alignment with the lead axle.

CAUTION Failure to properly torque pivot hardware could result in suspension failure/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. 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.

All work under warranty must have prior written approval from the Ridewell warranty department. All warranty claim submissions must have the owner's name; the In-Service Date; the VIN and the Ridewell serial number for each suspension submitted; and, clear photos of the failure as well as a description of the failure for the submission to be considered.

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 nontransferable 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.