



# Trailer Axle Maintenance Manual

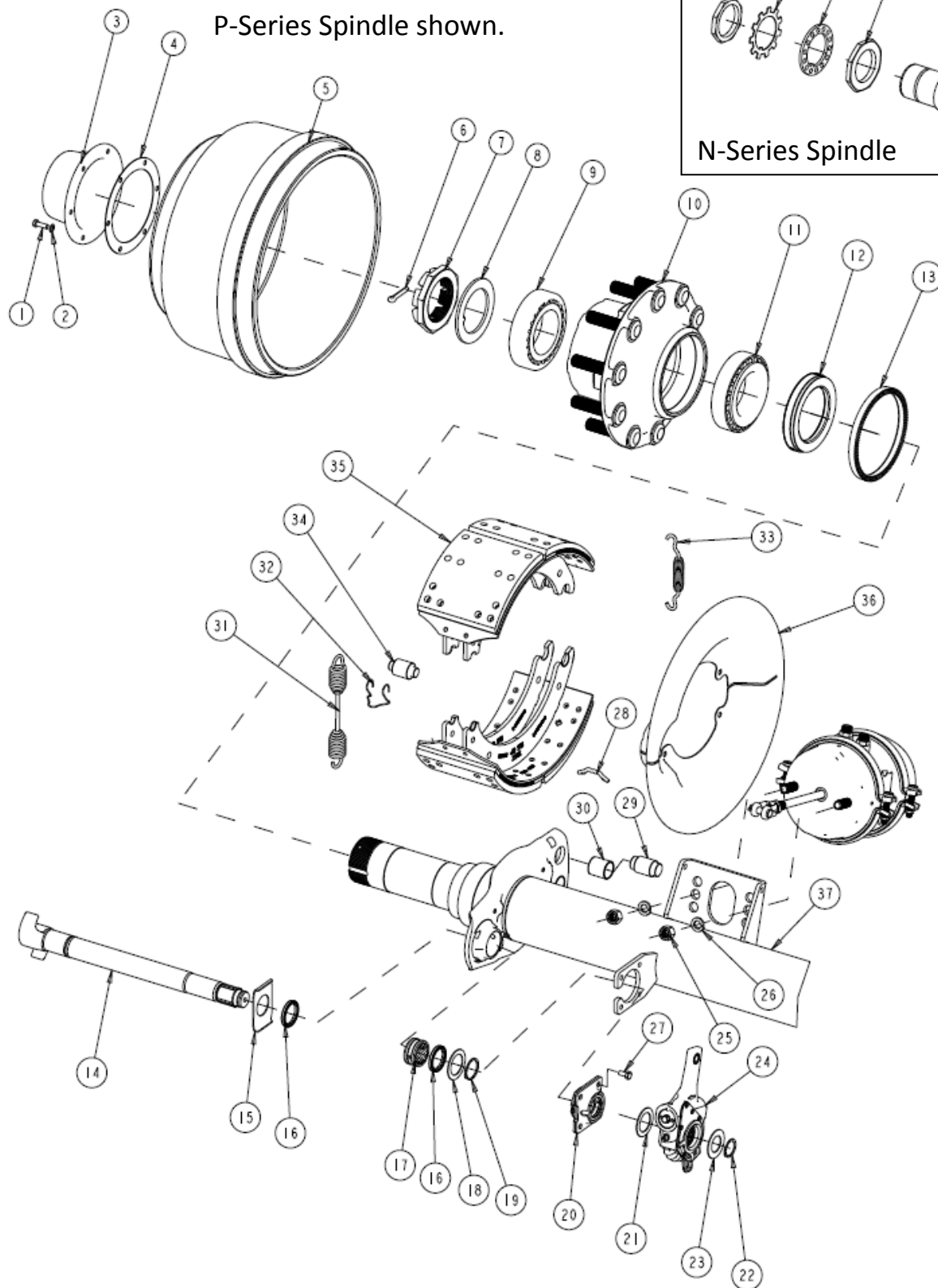
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## Exploded View:

P-Series Spindle shown.



Item	Description
1	Capscrew - Hubcap
2	Lock Washer - Hubcap
3	Hubcap
4	Gasket
5	Brake Drum
6	Cotter Pin
7	Castellated Nut
8	Lock Washer - Spindle
38	Outer Jam Nut
39	Lock Washer
40	Inner Jam Nut Washer
41	Inner Jam Nut
9	Outer Wheel Bearing - Cup and Cone
10	Hub
11	Inner Wheel Bearing - Cup and Cone
12	Wheel Bearing Seal
13	ABS Sensor Ring
14	Camshaft
15	Washer - Spider End
16	Seal - Spider End
17	Bushing - Spider End
18	Washer - Spider End
19	Snap Ring - Spider End
20	Bushing Assembly
21	Washer - Slack Adjuster
22	Snap Ring - Slack Adjuster
23	Washer - Slack Adjuster
24	Automatic Slack Adjuster
25	Lock Nut - Air Chamber
26	Lock Washer - Air Chamber
27	Capscrew - Camshaft Bushing Assembly
28	Brake Shoe Return Spring Pin
29	Anchor Pin

Item	Description
30	Anchor Pin Bushing
31	Brake Shoe Return Spring
32	Brake Shoe Roller Retainer
33	Brake Shoe Retaining Spring
34	Brake Shoe Roller
35	Brake Shoe and Lining Assembly
36	Dust Shield
37	Axle Beam

### About this Manual

Maintenance and service procedures outlined in this manual apply to Traxium trailer axle.

Information contained in this manual is subject to change without notice.

### General Warnings

#### Before You Begin

1. Read and understand all instructions and procedures before servicing components.
2. To prevent serious personal injury always wear eye protection and appropriate personal protection equipment when performing brake maintenance or service.
3. Use of special tools will aid in performing service and maintenance as well as help avoid serious personal injury and damage to components.
4. Follow all warning and caution messages in this publication to prevent personal injury and/or damage to components.
5. Follow your company's guidelines when performing diagnostic, maintenance, service or installation procedures.

#### Vehicle Preparation

1. Park the vehicle on level surface. Set the parking brake and block the wheels to prevent the vehicle from moving.
2. Raise the trailer and support vehicle by placing safety stands under each axle spring seat. Do not work under a vehicle supported only by jacks.
3. For axles equipped with spring brake chambers, compress and lock the springs to prevent them from actuating.
4. Disengage brakes by using the manual adjusting nut on the slack adjusters until the linings clear the drums

### Automatic Slack Adjusters (ASAs)

Automatic slack adjuster installation, maintenance and service should be performed according to manufacturer's recommended procedures.

For additional information regarding slack adjusters refer to **TMC RP 609**.

### Description of Axle Models

#### Beam Design

Traxium trailer axles are available in following beam designs variations.

- Straight beam - TA model (Figure 1.1)

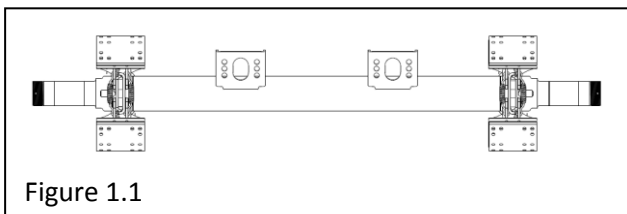


Figure 1.1

- Drop Axle -TAD model (Figure 1.2)

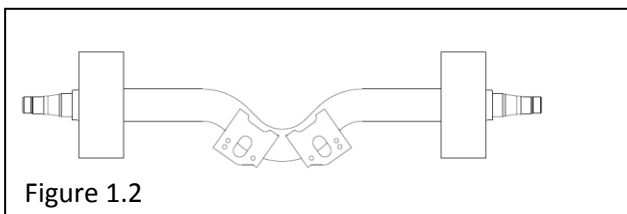


Figure 1.2

#### Spindle Design

-N/Q series (taper) or P series (parallel) spindles designs with standard retention hardware.

#### Brakes

- Cam brakes

## Identification

### Identification Tag

All the information needed to identify a specific Traxium trailer axle can be found on the identification tag located at the center of the axle beam. ID tag is stamped with trailer axle part number, serial number, manufacture date and nominal beam rating (Figure 1.3).

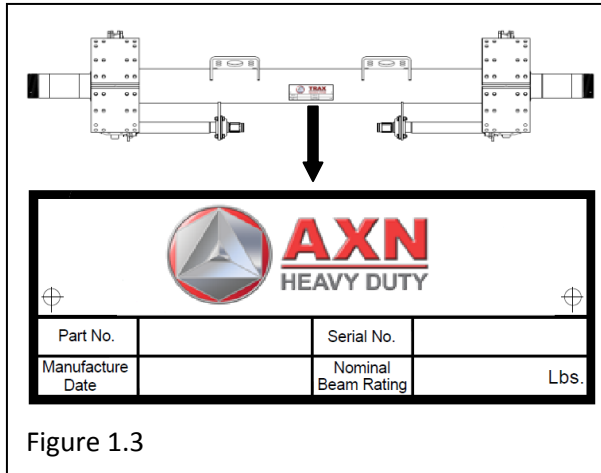


Figure 1.3

- Part number is composed of letters and numbers for example, TA225T67E7751001. It contains information regarding axle assembly.
- Serial number is composed of letters and numbers for example C10D00001. It is used to identify individual trailer axle.
- Manufacture date is indicated by MM/DD/YY.
- Nominal beam rating is specified in pounds.

### Trailer Axle Model Nomenclature

Part number composed of letters and numbers found on the ID tag is used to identify an axle model. These letters and numbers correspond to information regarding beam design, nominal beam rating, spindle type, brake size and type, track and variant related to a trailer axle model.

Trax Trailer Axle Model Nomenclature						
Product	Nominal Beam Rating (lbs)	Spindle Type	Brake Size	Brake Type	Track (in)	Variant
TA	225	T	67	E	775	1001 or 5001
↓ ↓ ↓ ↓ ↓ ↓ ↓						
TA - Trailer Axle (Straight)	200 - 20,000 Lbs	T - Tapered	67 - 16.5" x 7"	E - Extended Service	715 - 71.5"	1001-1999 - Standard Series
TAD - Trailer Axle Drop	225 - 22,500 Lbs	P - Parallel	27 - 12.25" x 7.5"	S - Standard Service	775 - 77.5"	5001-6999 - Premium Series
	250 - 25,000 Lbs		68 - 16.5" x 8"		Etc.	
	300 - 30,000 Lbs		69 - 16.5" x 8.625"			

## Installation

Follow all warning and caution messages in this publication to prevent personal injury and/or damage to components.

### **Warning!**

**To prevent serious eye injury always wear eye protection when performing brake maintenance or service**

**Park the vehicle on level surface. Set the parking brake and block the wheels to prevent the vehicle from moving.**

**Support vehicle by placing safety stands under each axle spring seat. Do not work under a vehicle supported only by jacks. Jacks can slip and fall over causing serious personal injury and damage axle components.**

## Axle Installation Guideline

1. Locate the top and front of axle (refer to procedures in Axle Positioning in this section).
2. Verify that the brackets fit the axle correctly, then weld the suspension bracket to the axle (refer to Welding Section)
3. Position the axle under the vehicle and tighten the suspension installation fasteners. Follow the recommended procedures to prevent over torquing of the fasteners. Final tightening must be performed using a calibrated torque wrench to the torque value specified by the manufacturer.
4. Inspect the assembly to ensure that:
  - a. Suspension springs are located correctly on their wear pads.
  - b. Sufficient clearance exists between the axle and vehicle components for

both loaded and unloaded conditions.

- c. All fasteners are tightened to correct torque values.
5. After an initial break-in period and during regular intervals, inspect all suspension fasteners to ensure that correct torque values are being maintained according to manufacturer's specifications.

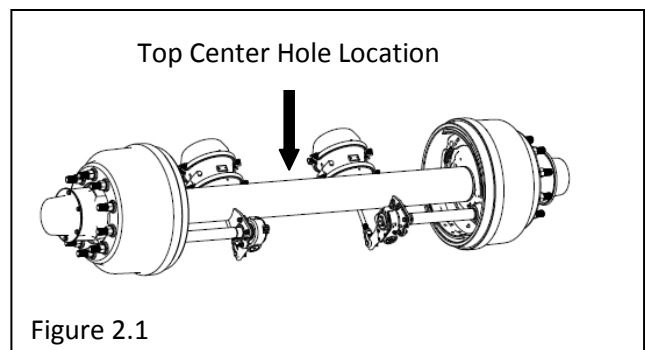
## Axle Positioning

### **Caution!**

**Follow these instructions to correctly position an axle. Incorrectly positioned axle or brake components welds that are in unauthorized location can cause an axle to crack. Incorrectly positioned axle can cause incorrect axle camber or toe resulting in excessive tire wear. Damage to other components can also result.**

### **Axle Top and Bottom**

1. On axles built **WITH** top center hole , the partially drilled 0.31" diameter hole identifies the top of the axle (Figure 2.1).



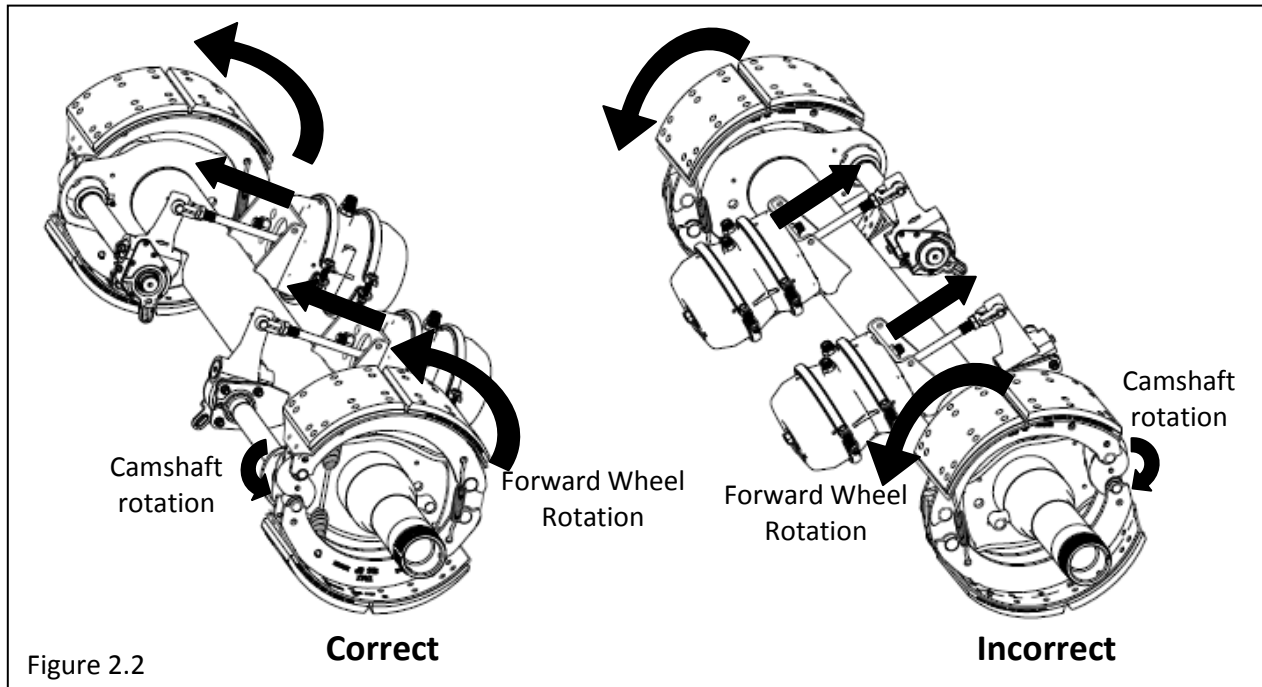
2. On axles built **WITHOUT** the top center hole, the axle can be rotated 180 degrees and axle top and bottom are interchangeable.

### Axle Front and Rear

1. On axles built with top center hole, the ID tag is located towards the rear of the axle.
2. On axles built without top center hole, axle can be rotated 180 degrees and axle front and rear are interchangeable. Refer to brake installation guideline regarding these models.

### Brake Orientation

Trailer axles should be installed so that the camshaft rotates in the same direction as the tires when the vehicle is moving forward (Figure 2.2).



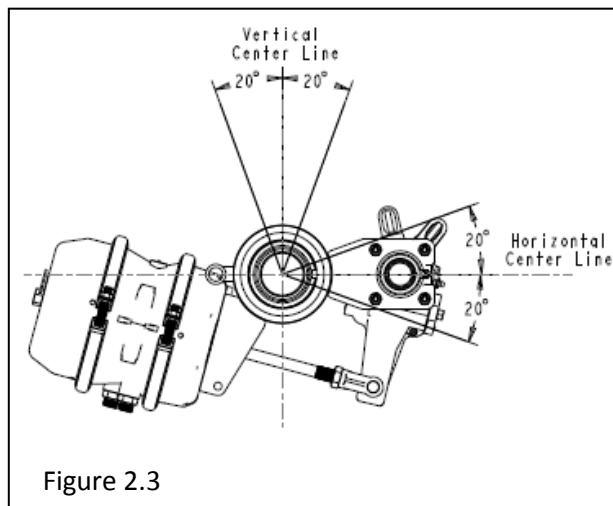
### Axle Rotation

#### Non Cambered Axles

1. On axles built with top center hole, locate the top center hole within 20 degrees from vertical centerline and locate the brake hardware within 20 degrees from horizontal centerline (Figure 2.3).
2. On axles built without top center hole, locate the brake hardware within 20 degrees of horizontal centerline.

#### Cambered Axles

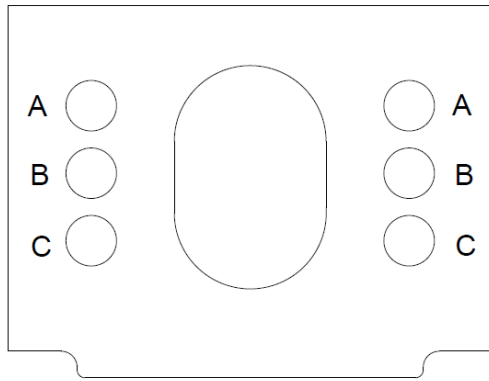
All cambered axles are built with the top center hole. Cambered axles must be installed so that the top center hole located at the exact top position.





## Brake Chamber Mounting

Install the air chamber in the mounting holes in the chamber bracket according to the slack adjuster length required. (Figure 2.4)



Air Chamber Mounting Locations	Slack Adjuster Length
A-A	5"
B-B	6"
C-C	7"
B-A	5.5"
B-C	6.5"

Figure 2.4

## Suspension

### **Caution!**

**U-bolts must be tightened to the manufacturer's specifications. Over tightened U-bolts can damage the axle at the point where the bolts contact the axle.**

Trailer axle suspension installation, maintenance and service should be performed according to suspension manufacturer's specification.

For additional information refer to **TMC RP 728**.

## Welding

### **Warning!**

**Incorrect welding methods and weld in unauthorized location can lead to reduction in fatigue life of the trailer axle. Serious personal injury can result.**

Refer to **TMC RP 728** for information regarding welding on the trailer axle.

## Axle Alignment

### **Caution!**

**Incorrectly positioned axle can cause incorrect axle camber or toe resulting in excessive tire wear. Damage to other components can also result.**

Refer to **TMC RP 708** regarding trailer axle alignment.

## Wheel End Installation

Wheel end components must be correctly installed and periodically inspected to ensure optimal performance of the trailer axle.

Refer to **TMC RP 618, 622, and 631** regarding installation, service and maintenance of wheel end components.

**Brake Service Inspection**

1. Inspect brake shoe anchor pins, rollers and bushings for wear and damage. Replace as required.
2. Inspect brake shoe "D" holes for wear and damage. Replace as required.
3. Inspect return and retaining springs for any relaxation in the coils and wear in the hooks. Replace as required.

Use of new return and retaining springs are highly recommended when servicing drum brakes.

4. Inspect brake linings for wear. If worn down to wear indicator, replace as an axle set.
5. Check camshaft for up-down and side-side end play. If end play is more than 0.030" (0.76 mm) in either direction, replace the camshaft bushings or camshaft. (Figure 3.1)
6. Check camshaft for axial end play. If end play is more than 0.060" (1.52 mm), replace camshaft and/or bushings as required. (Figure 3.2)



**CHECK UP-DOWN  
/SIDE-SIDE  
END PLAY**

Figure 3.1



**CHECK AXIAL  
END PLAY**

Figure 3.2

## Removal and Disassembly

### Brake Shoe Assembly Removal

Use caution when handling brake components as they could contain asbestos and non asbestos fibers.

1. Remove the two retaining springs.  
(Figure 3.3)
2. Push down on the bottom brake shoe and disengage it from the anchor pin. Move the bottom brake shoe to the outboard side of the brake spider (Figure 3.4).
3. Lift up the top brake shoe and disengage it from the anchor pin then remove brake shoe assembly (still connected by the return spring) from the brake spider (Figure 3.5).
4. Remove the return spring from the top and bottom brake shoe.
5. Remove brake shoe roller by carefully pulling on the retaining clip.
6. Remove the Anchor pin.

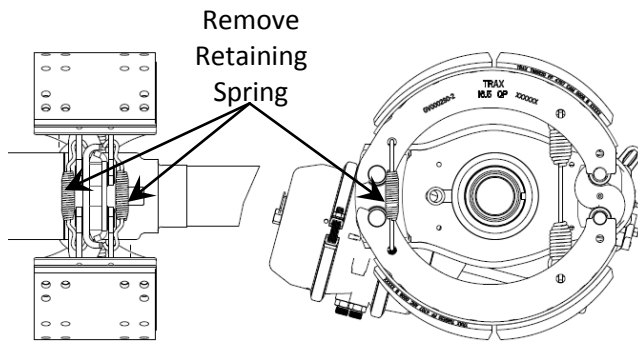


Figure 3.3

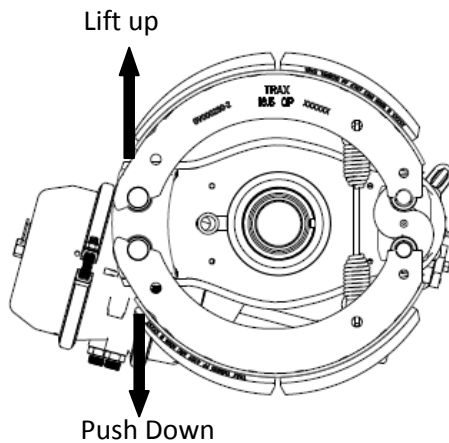


Figure 3.4

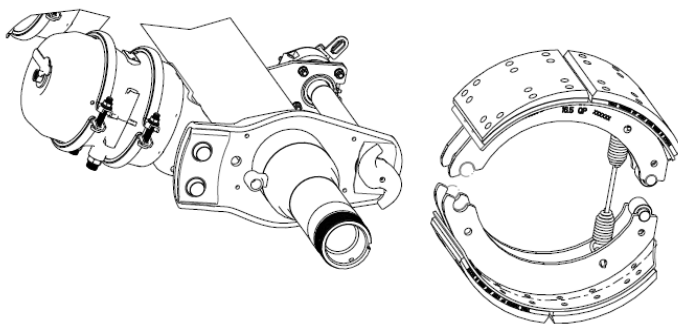
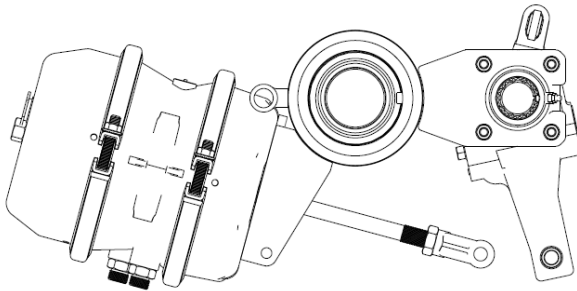


Figure 3.5



**Move Slack Adjuster away from  
push rod clevis**

Figure 3.6

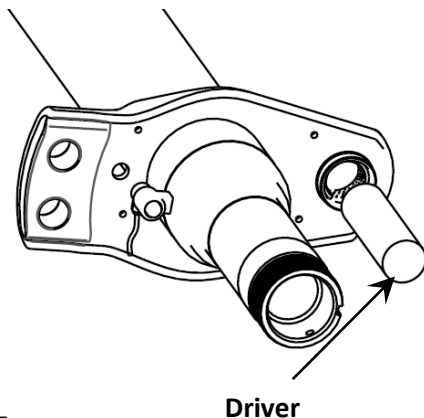


Figure 3.7

### Camshaft and Bushing Removal

1. Remove the clevis pin connecting the slack adjuster to the brake chamber push rod clevis.
2. Move the slack adjuster away from the clevis by rotating the adjusting nut (Figure 3.6).
3. Remove snap ring at the end of the camshaft spline and remove the slack adjuster from the camshaft spline.
4. Remove the snap ring at the spider end and remove camshaft from the brake spider.
5. Remove all the loose parts including seals and washers from the camshaft and retainer bore (figure 3.8).
6. Use a correct size driver to drive the bushings out of the retainer bore. Use care to prevent damage to the retainer bore (Figure 3.7).
7. Remove the bushing assembly at the slack adjuster end by removing the four cap screws.

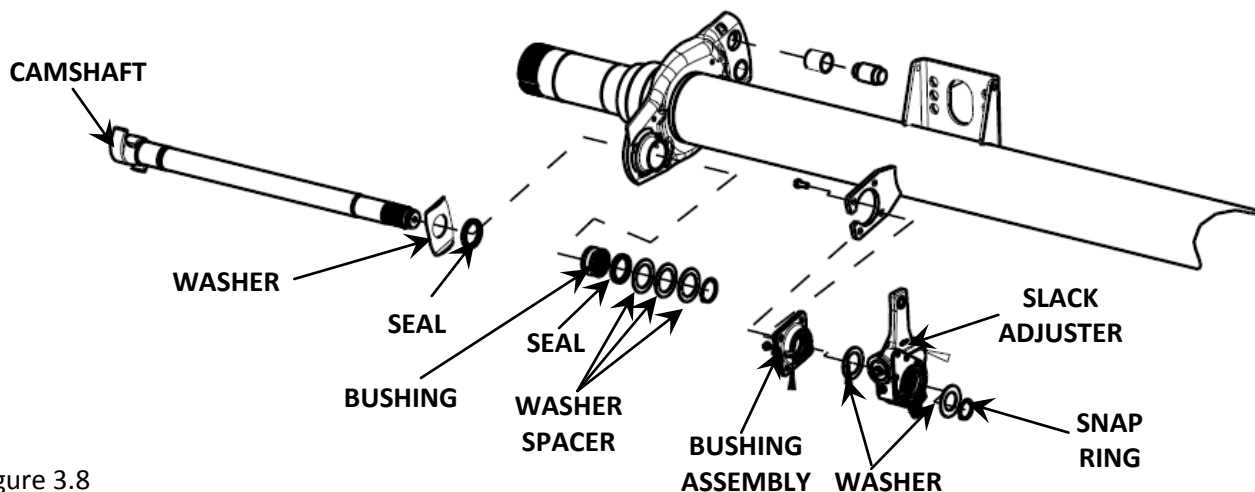
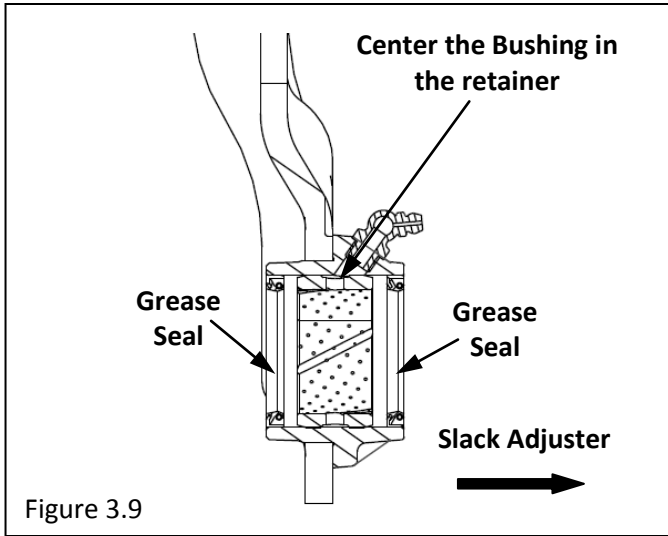


Figure 3.8



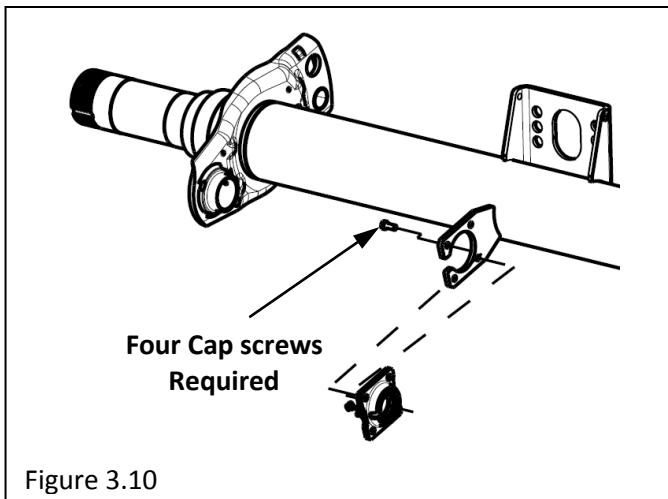
## Install and Assembly

### Bushing and Seal install at the Spider End.

1. Drive the metal bushing into the retainer bore until the bushing is centered in the retainer (Figure 3.9).
2. Install the grease seal on each side of the bushing with the seal lips facing toward the slack adjuster.

### Bushing install at the Slack Adjuster End

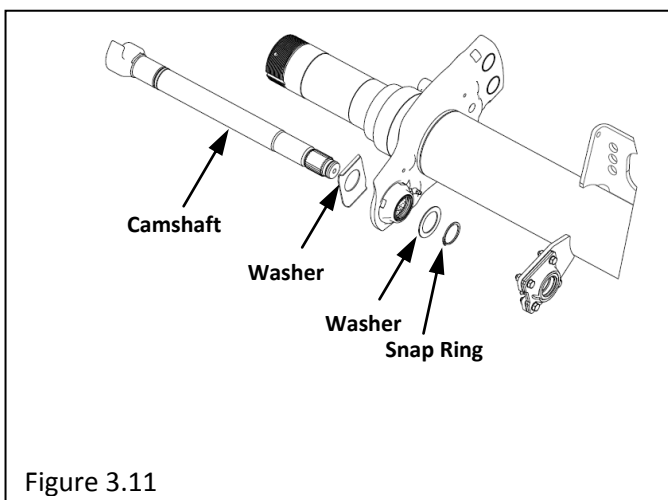
Install the bushing assembly by tightening four cap screws to 25-35 lb-ft (34-48 N•m) (Figure 3.10).

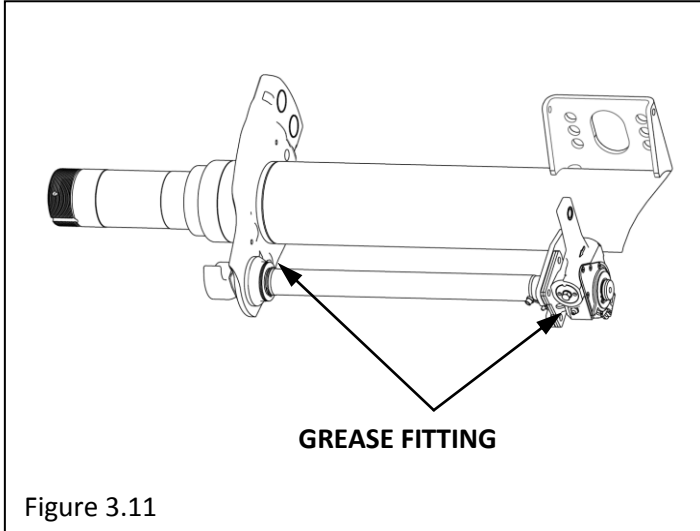


### Camshaft install

1. Clean the entire camshaft, this prevents the bushing from being contaminated when the camshaft is pushed through the bushing.
2. Apply light grease to the camshaft bushing and journals.
3. Install a large rectangular washer onto the camshaft.
4. Install the camshaft by pushing through the bushing at the spider end. Do not push through the bushing at the slack adjuster end.
5. Install a washer as needed onto the camshaft.
6. Install the camshaft by pushing through the bushing assembly at the slack adjuster end.
7. Install the snap ring onto the camshaft at the spider end.

Turn the camshaft by hand to ensure that it is installed correctly.

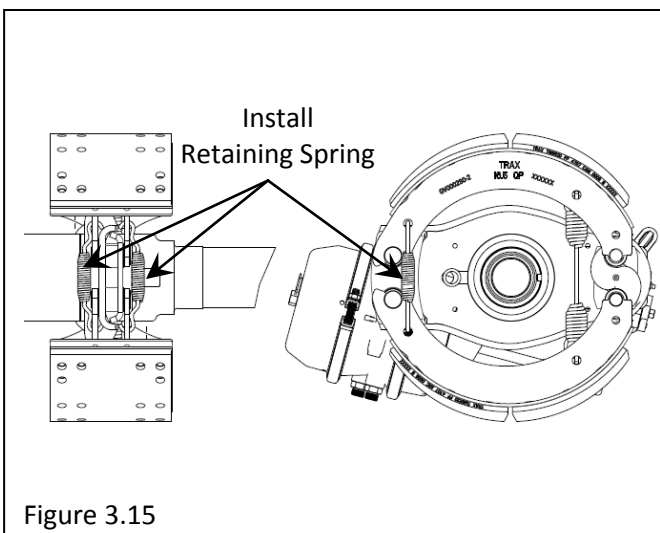
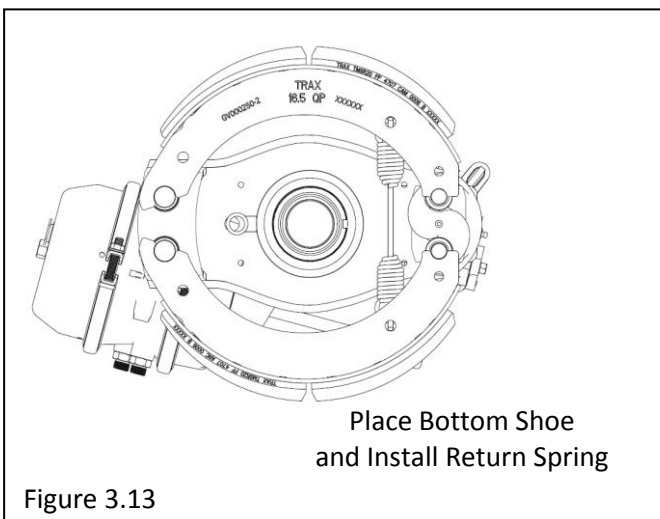
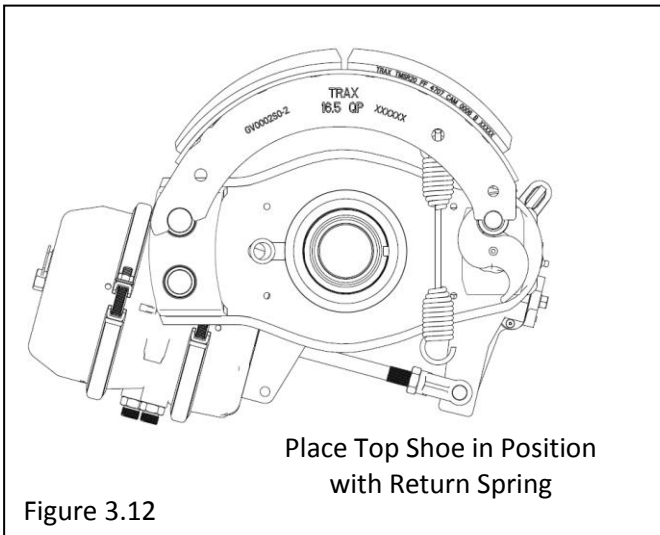




8. Apply anti-seize compound to the camshaft and slack adjuster spline.
9. Install the slack adjuster by installing one washer on each side of the slack adjuster and install the snap ring.
10. Using the slack adjuster manual adjusting nut align the hole in the slack adjuster with the hole in the push rod clevis on the brake chamber.
11. Apply anti-seize compound to the clevis and install through the hole in the push rod clevis and slack. Secure using a cotter pin.
12. Apply grease to the grease fitting at the spider and bushing assembly until new grease purges from all the seals (3.11).

### Brake Shoe Assembly and Install

1. Lubricate inside the anchor pin bushings and install anchor pin.
2. Lubricate the anchor pin and brake shoe rollers where they touch the brake shoe.
3. Install brake shoe roller on both top and bottom brake shoes by pressing the ear of the retainer clip and fitting the retainer between brake shoe webs. Push the retaining clip into the brake shoes until the ears lock in holes in the brake shoe webs.
4. Place the top brake shoe in position on the top anchor pin and camshaft head and attach the return spring to the brake shoe return spring pin (Figure 3.12).
5. Hold the bottom brake shoe in position on the bottom anchor pin and install brake shoe retaining springs (Figure 3.13).
6. Install retaining spring to the top and bottom brake shoes (Figure 3.14).





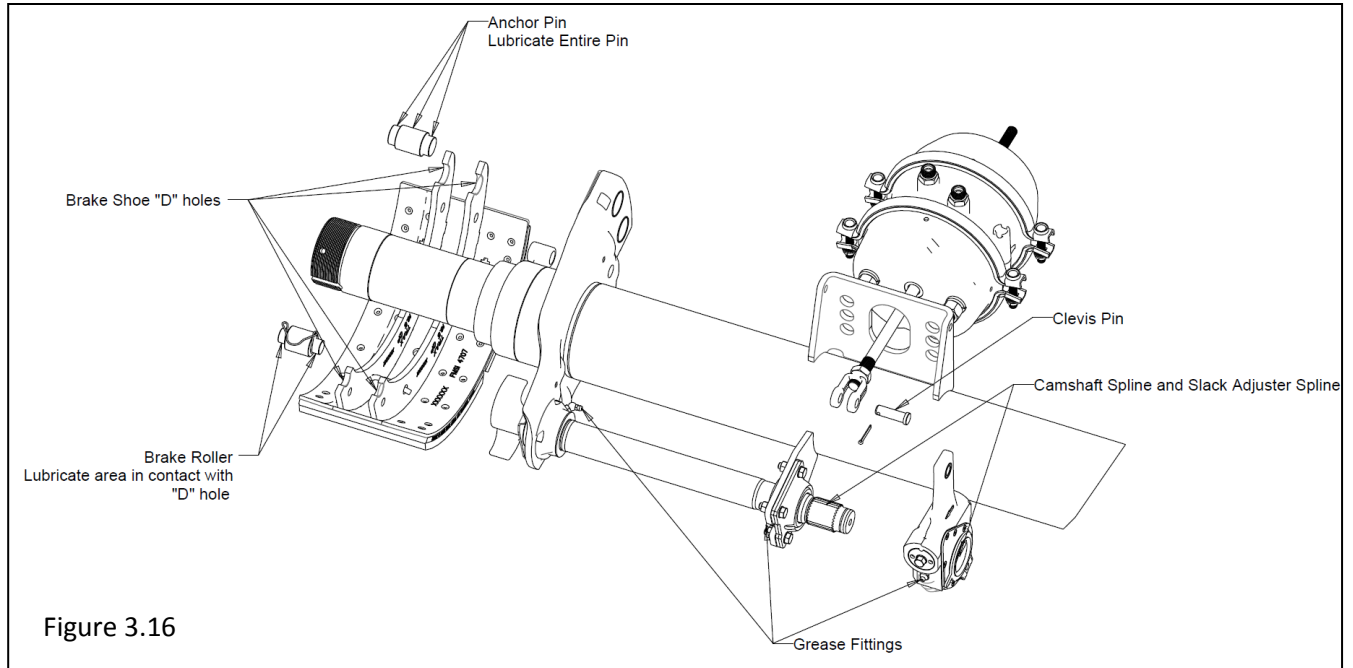


Figure 3.16

### Lubrication Schedule

To ensure optimum brake performance and maintain life of brake components use one of following schedules that provide most frequent interval.

**Note:** Following recommended schedules are for on-highway application under standard driving conditions. More frequent lubrication schedule are required for on-highway heavy duty, off-highway driving conditions or combination of both.

- Vehicle manufacturer's schedule.
- Company fleet lubrication schedule.
- Every 6 months.
- Four times during the life of brake lining.

In addition to lubrication schedule, lubricate brake components as needed or when they are disassembled.

**Caution:** Do not allow grease or any other lubricants to come in contact with the brake surface or brake lining. Clean brake drums or rotors and replace contaminated linings if grease or any other lubricants are found on these components.

### Lubrication

**Camshaft Bushings** - Apply specified grease at the grease fitting on the spider bushing and on the slack adjuster bushing.

**Slack Adjuster** - Apply specified grease at the grease fitting.

**Camshaft Spline** - Apply specified lubricant to the entire area in contact with the spline on the slack adjuster.

**Anchor Pin** - Apply specified grease to the entire pin.

**Brake Shoe Roller** - Apply specified grease to the part of roller in contact with the brake shoe "D" hole. Do not grease the area in contact with the camshaft head.

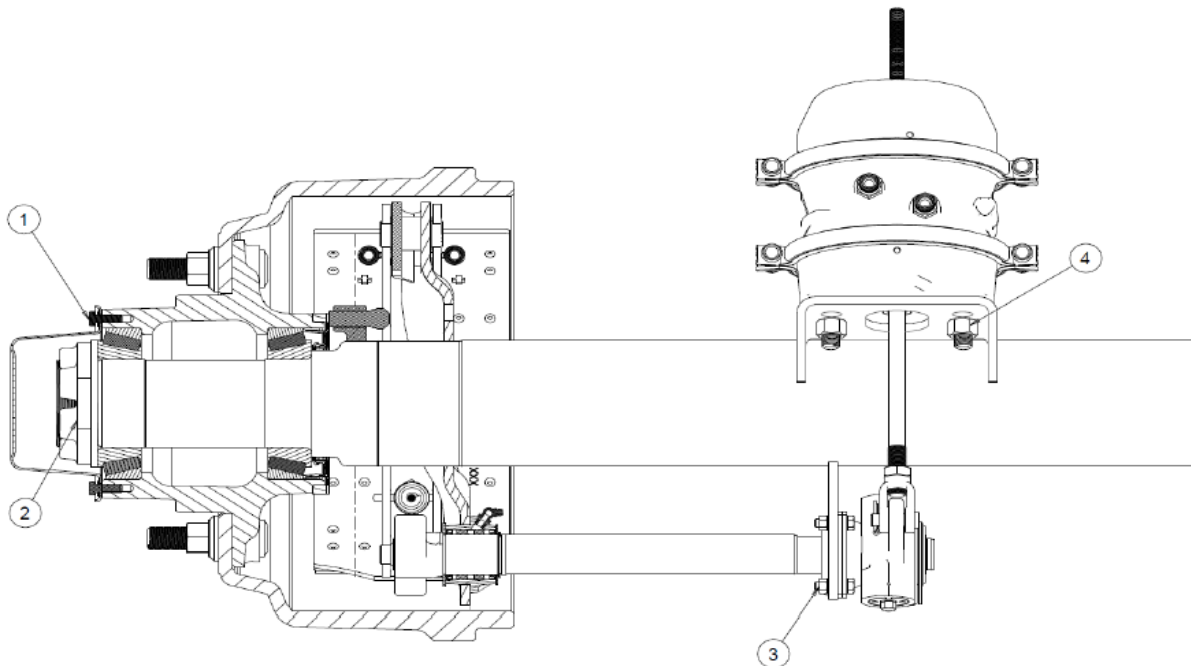
**Clevis Pin** - Apply specified lubricant to entire pin.



**Brake Component Grease Specification**

Component		NLGI Grade	Type	Operating Temperature
Camshaft bushings	Recommend	2	Calcium Sulfonate Complex	Down to -30°F (-34.4°C)
Anchor Pin		1	Clay Base	Down to -40°F (-40°C)
Brake Shoe Roller	Optional	2*	Synthetic Oil, Clay Base*	Down to -65°F (-54°C)
		1 and 2	Lithium Base	Refer to Manufacturer's Specification
Automatic Slack Adjusters -at grease fitting	Recommend	2	Calcium Sulfonate Complex	Down to -30°F (-34.4°C)
		1	Clay Base	Down to -40°F (-40°C)
	Optional	2*	Synthetic Oil, Clay Base*	Down to -65°F (-54°C)
		1 and 2	Lithium Base	Refer to Manufacturer's Specification
Camshaft Spline		Any of Above	Refer to above	Refer to above
Clevis Pin		-	Anti-Seize	Not Applicable

\*Do not mix synthetic,clay base grease with any other grease in this table. Purge and wipe off all previously intalled grease prior to using synthetic,clay base grease to prevent cross contamination



Item	Description	Torque Range	
		Lb-Ft	N•m
1	Hubcap bolts	15-30	20-41
2	Spindle Nuts	Refer to TMC RP 618	
3	Cam Bushing Bolt	25-35	34-48
4	Air Chamber Nut	80-125	109-170



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