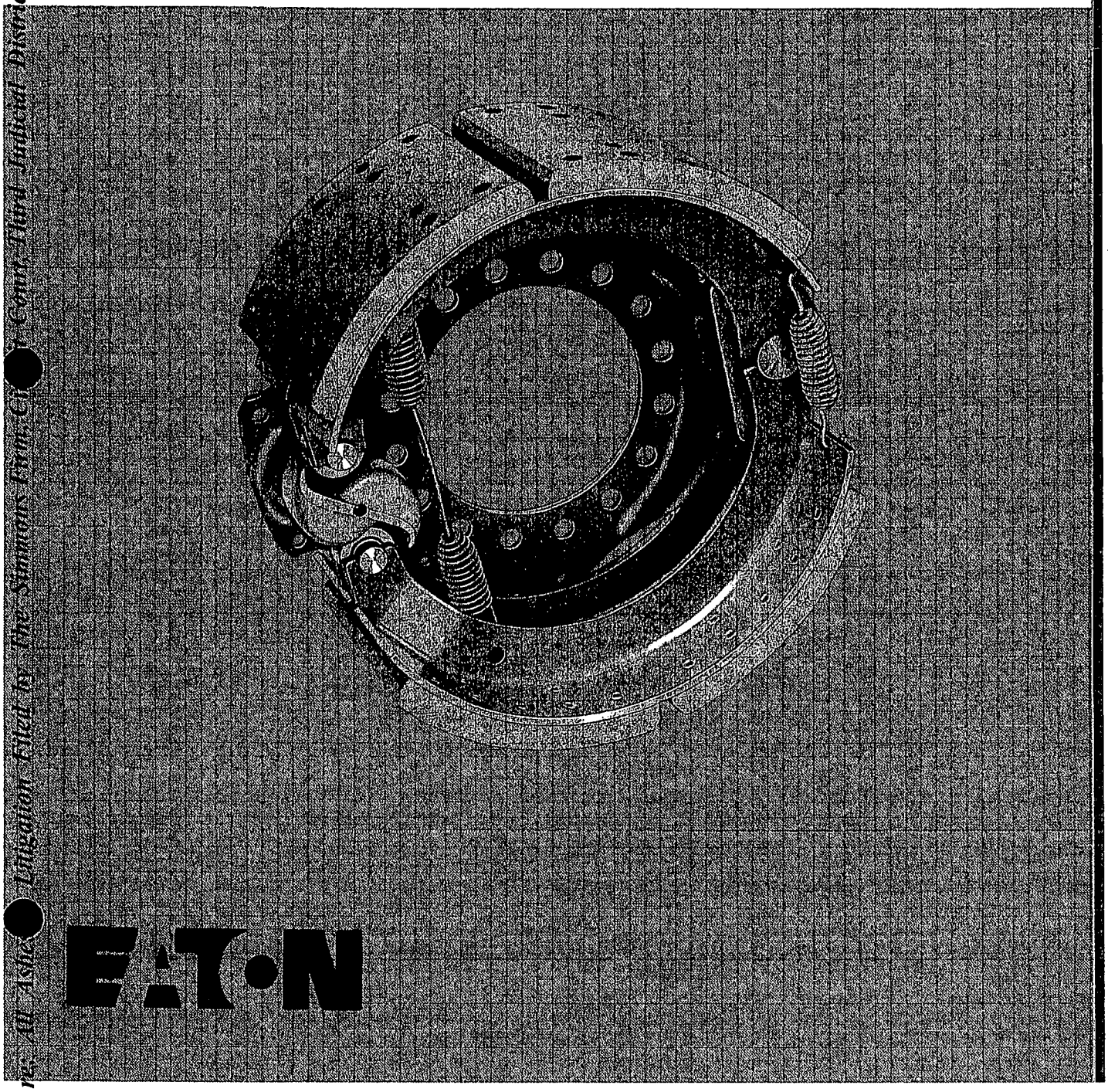
In re: All Asbestos Litigation Filed by The Simmons Firm, Circuit Court, Third Judicial District, Madison Cty., IL; 8/28/03

Service Manual EB-32
March 1984

Single Anchor Pin
Brakes
16½" & 18" Series

Eaton® Axles & Brakes



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EAB 001112

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The description, testing procedures, and specifications contained in this service publication were current at the time of printing.

Eaton Corporation reserves the right to discontinue or modify its models and/or procedures and to change specifications at any time without notice and without incurring obligation.

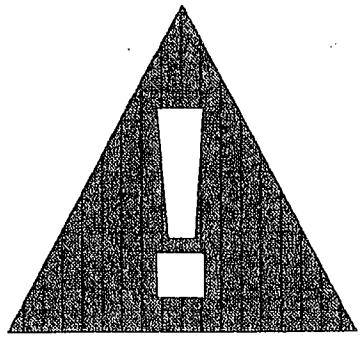
The recommendations of the vehicle manufacturer should be considered as the primary source of service information regarding this Eaton product. This manual is intended to be used as a supplement to such information.

Any reference to brand names in this publication is made simply as an example of the types of tools and materials recommended for use and, as such, should not be considered as an endorsement. Equivalents, if available, may be used.

IMPORTANT NOTICE

The symbol shown below is used throughout this publication to call your attention to areas in which carelessness or failure to follow specific procedures may result in personal injury and/or component malfunction or damage.

WARNINGS: Used in areas where failure to follow listed procedures creates a **high probability of personal injury** to the **servicing technician.**



CAUTIONS: Used in areas where failure to follow listed procedures **may cause personal injury due to component damage or subsequent malfunction.**

Anyone departing from the instructions contained in this publication through procedures used or choice of tools, materials, and parts may jeopardize his personal safety and/or the safety of the vehicle user.

SPECIAL NOTICE ON FASTENER TORQUE

THIS SYMBOL IS USED THROUGHOUT THIS MANUAL TO CALL YOUR ATTENTION TO FASTENERS REQUIRING A SPECIAL INSTALLATION TORQUE.

Always use genuine Eaton replacement parts.

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PARTS IDENTIFICATION/NOMENCLATURE

The service procedures and specifications in this publication cover the Eaton® Single Anchor Pin Brakes, 16½" *(419.1 mm)* and 18" *(457.2 mm)* Series. Applications and variations in brake widths are shown below.

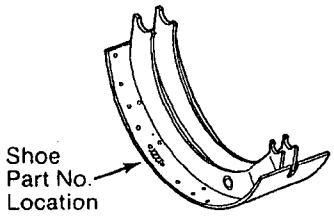
The basic instructions cover all brake sizes unless specified otherwise. For more detailed information on trailer axle brakes, refer to Service Manual EB-21.

Eaton® Single Anchor Pin Brakes

Size		Type
16½" x 5"	*(419.1 mm x 127.0 mm)*	Steer Axle
16½" x 6"	*(419.1 mm x 152.4 mm)*	Steer & Drive Axles
16½" x 7"	*(419.1 mm x 177.8 mm)*	Drive & Trailer Axles
16½" x 8⅝"	*(419.1 mm x 219.1 mm)*	Drive Axles
18" x 7"	*(457.2 mm x 177.8 mm)*	Heavy-Duty Drive Axles

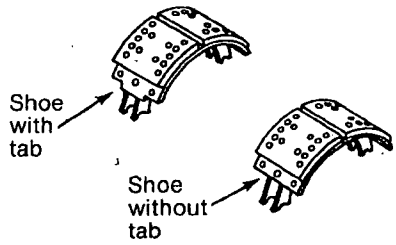
Brake Shoes and Springs

Shoe Assembly

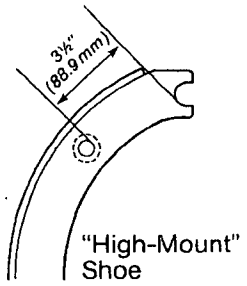


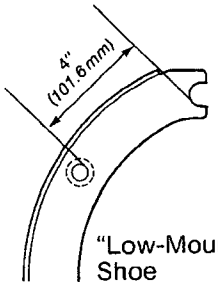
Shoe / Lining Assembly

NOTE: This identification is not used in all applications.

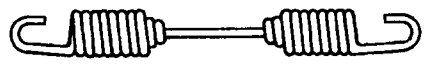


NOTE: Shoe with tab cannot be used on lightweight brakes with stamped spiders.





Shoe Return Spring
Color-coded by application



Red...Use with "high-mount" shoes

Black...Use with 16-1/2" x 8-5/8" "low-mount" shoes

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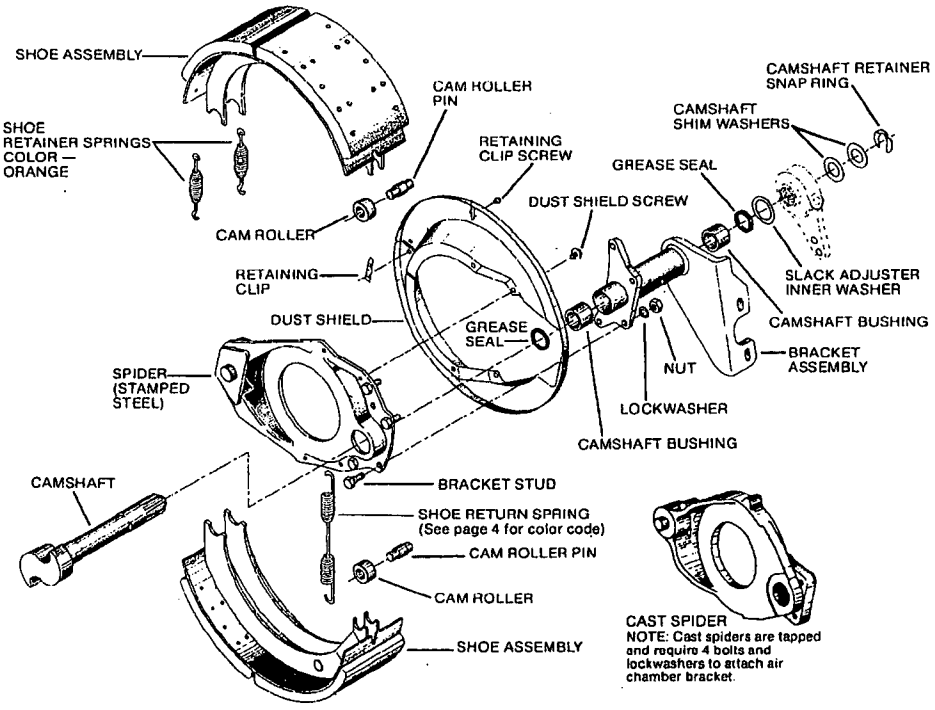
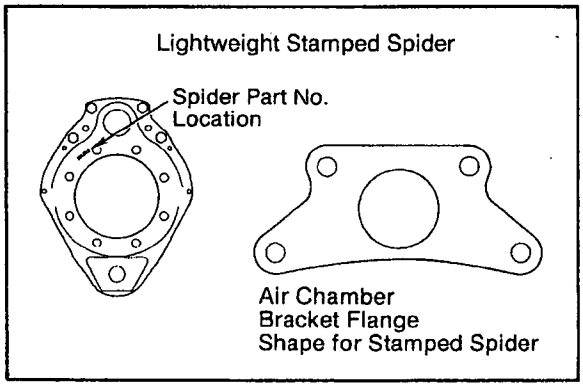
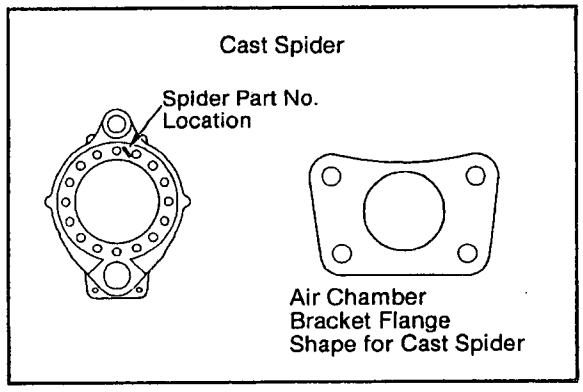
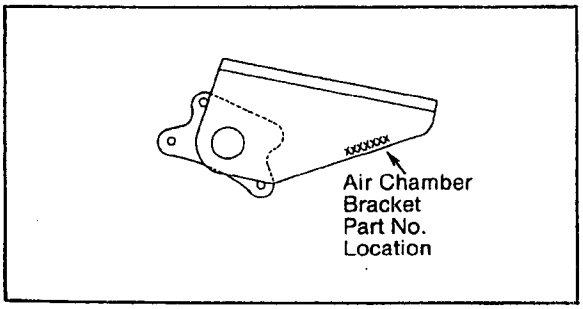
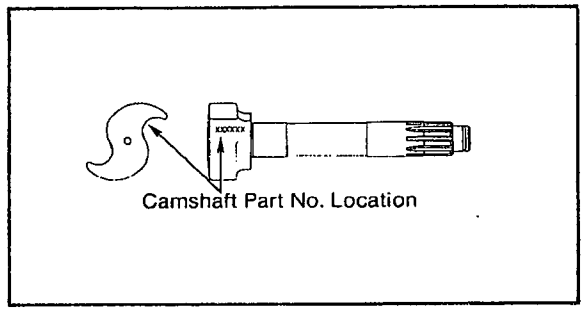
PARTS IDENTIFICATION/NOMENCLATURE











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BRAKE DESCRIPTION

Brake Components / Assemblies

The SPIDER assembly consists of a spider (either stamped steel or cast iron), an ANCHOR PIN and attaching hardware. If an optional DUSTSHIELD is supplied, it is attached by screws to the spider.

The SPIDER serves as a mounting platform for the air chamber bracket and shoe and lining assemblies, and transmits the torque generated by the brake into the chassis components through its attachment to the brake mouting flange on the axle.

The AIR CHAMBER BRACKET assembly is attached to the stamped steel spider by studs pressed into the bracket mounting flange and secured to the spider by nuts. On cast spiders, the bracket is attached with bolts through tapped holes in the spider. CAMSHAFT BUSHINGS are installed in the bracket tube to support the camshaft journals. The bracket incorporates a grease fitting and spring type GREASE SEALS to retain grease. The seals are installed with the lip and spring of each seal facing toward the slack adjuster so grease can flow out toward the slack adjuster during lubrication but not onto the cam head.
The AIR CHAMBER BRACKET serves as a mounting surface for the air chamber and provides support for the camshaft.

The SHOE AND LINING assemblies are mounted to pivot at one end on the fixed anchor pin and bear against the CAM ROLLER at the other end. SHOE RETAINER SPRINGS hold the anchor pin ends of the shoes tightly against the anchor pin, and the SHOE RETURN SPRING assists the shoes in pulling away from the drum as brake application is released.

The CAMSHAFT is splined at one end to accept a SLACK ADJUSTER. The cam head bears against the cam rollers and transmits the rotary motion of the shaft into a lift which pushes the rollers and shoes toward the drum.

Brake Operation

As the brake valve in the vehicle is applied, air pressure is delivered to the brake air chamber. Movement of the air chamber push rod causes the slack adjuster to move and rotate the camshaft.

As the camshaft rotates, the rollers "ride-up" on the convex side of the cam head and force the shoes out against the drum. As the brake is released, the return spring pulls the shoes away from the drum, and the air chamber return spring rotates the camshaft to the "at-rest" position.

Brake adjustment is accomplished by rotating the adjustment nut of the slack adjuster to regulate the amount of "free-stroke" or slack adjuster travel before the shoes start to contact the drum.

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EAB 001117

INSPECTION

Inspection Recommendations and Intervals

General Recommendations

Due to the importance of a well-maintained braking system, Eaton recommends that the inspections and maintenance listed below be accomplished by Commercial Vehicle Operators at the intervals suggested.

Since driver technique and vehicle use can both contribute to rate of brake component wear, it may be appropriate to increase the frequency of the inspections to fit individual needs based upon past experience.

Brake Adjustment
Brake adjustment should be checked (and adjusted if necessary) WEEKLY or at any time the limits found in Section 2, page 13 are exceeded.

Lubrication
AIR CHAMBER BRACKET — The lubricant specified in Section 2, page 15 should be applied through the grease fitting at intervals coincident with the Vehicle Manufacturer's recommendations for chassis lubrication. In no case should the lubrication interval exceed 6 months of service.

Lining Inspection
A visual check of lining thickness and condition should be made each time the brake drum is removed. Inspection of lining thickness either from the axle side of the brake spider or through the dustshield inspection holes should be made each time the vehicle is being serviced in the maintenance shop. In no case should the lining thickness/condition inspection interval exceed 3 months of service.

General Inspection
A thorough visual inspection for brake wear, broken parts and/or obvious damage should be made each time the brake is being serviced or wheel and drum have been removed. In no case should the general inspection interval exceed 3 months of service.

Specific Component/Assembly Inspections
The specific component/assembly inspections found in Section 2, page 8 should be made at each brake overhaul.

Brake Reline
A brake reline should be accomplished at any time the lining thickness or lining condition indicates the need. Refer to Section 2, page 8.

Brake Overhaul
A complete brake overhaul following the instructions contained in this Service Manual should be accomplished at every third brake reline. In no case should overhaul interval exceed 2 years.

A complete brake overhaul consists of:
- ☐ Complete disassembly
- ☐ Cleaning
- ☐ Inspection
- ☐ Camshaft bushing, camshaft seal, cam roller, shoe retainer springs, and shoe return spring replacement
- ☐ Assembly
- ☐ Brake operational check

Brake Operational Check
A complete operational check of the braking system should be made following the instructions found in Section 2, page 15 at every brake service. In no case should the operational check interval exceed 3 months of service.

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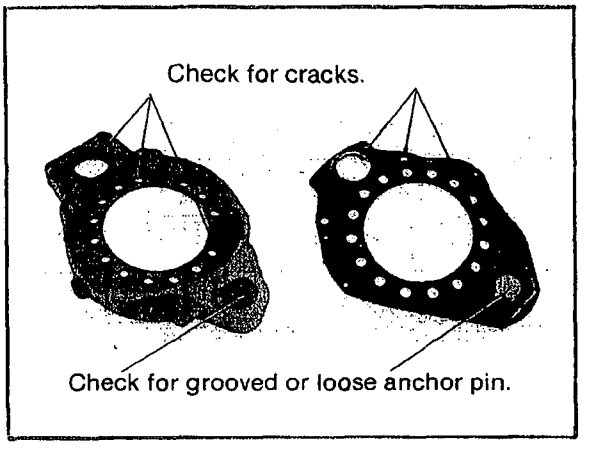
INSPECTION

Periodic Service

Spider Inspection

1. Check visually for cracks at fastener attachment bolt holes, cam area and around the anchor pin. Replace if defective.

2. Check anchor pin. If pin is loose or grooved more than .031 inches *(.79 mm)* below original surface, the Spider assembly must be replaced.



Shoe and Lining Inspection

1. Check linings and replace if contaminated, cracked, or worn to less than 1/4 inch *(6.35 mm)* or 1/16 inch *(1.59 mm)* from rivet heads at any point.

2. Check shoes for bent or cracked webs or table, broken welds, loose rivets or elongated rivet holes. Replace if any of these is found.

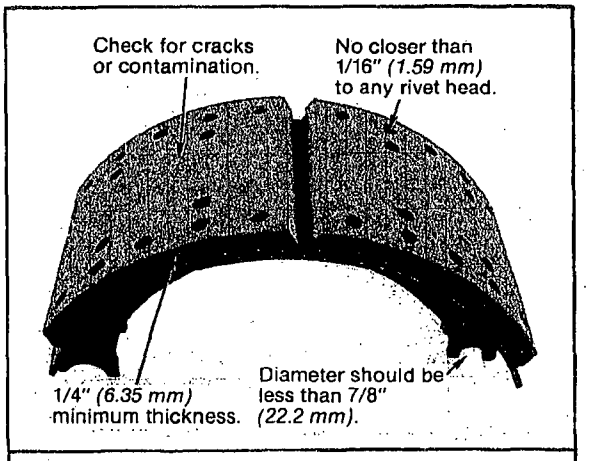
3. Check Anchor Pin and Camshaft Roller recesses in shoe webs for elongation or visible wear. Shoes should be replaced if wear at roller end increases diameter to more than 7/8" *(22.2 mm)*. Use 7/8" bar stock as a "no-Go" gauge.

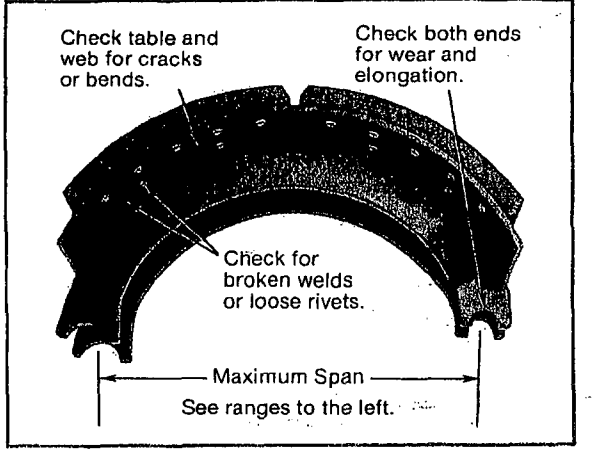
4. Check shoe span by measuring the distance between the centerlines of the Anchor Pin and Camshaft Roller recesses in the shoe web.

Replace shoe if this dimension does not fall within the range shown:

Steer Axle Brakes... 12-5/16" min. *(312.7 mm)*, 12-1/2" max. *(317.5 mm)*.

Drive and Trailer Axle Brakes... 12-5/16" min. *(312.7 mm)*, 12-9/16" max. *(319.1 mm)*.





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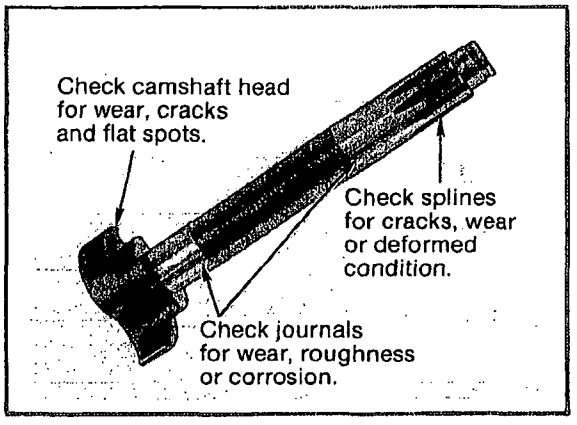


Camshaft Inspection — General

1. Check spline end for cracks or worn or deformed splines. Replace as necessary.

2. Check camshaft bushing journals for wear and corrosion. Replace camshaft if it shows visible wear or if roughness is felt in journal area.

3. Inspect camshaft head for brinelling, cracking, or flat spots. Replace if ridge can be felt between worn area and cam head surface.

Camshaft Inspection — End Play (Axial)

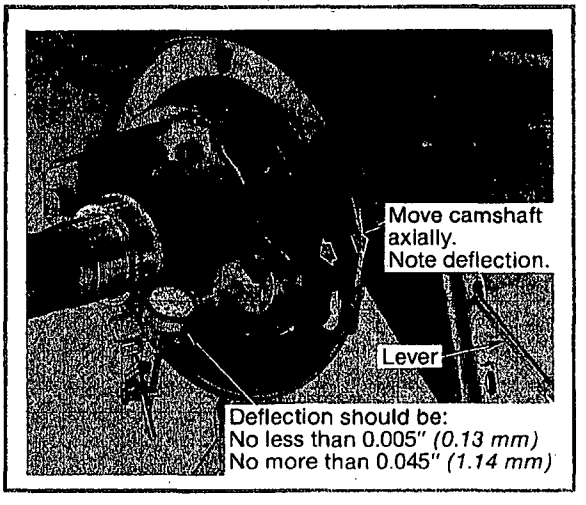
1. Mount a suitable dial indicator with plunger referencing cam head at 90° from cam face.

2. Pull inboard on slack adjuster end of cam to take up end play.

3. Zero indicator.

4. Push outboard on slack adjuster end of cam and note maximum reading.

5. By adding or subtracting washers at the outer position, adjust end play to be within 0.005" *(.13 mm)* to 0.045" *(1.14 mm)* range.



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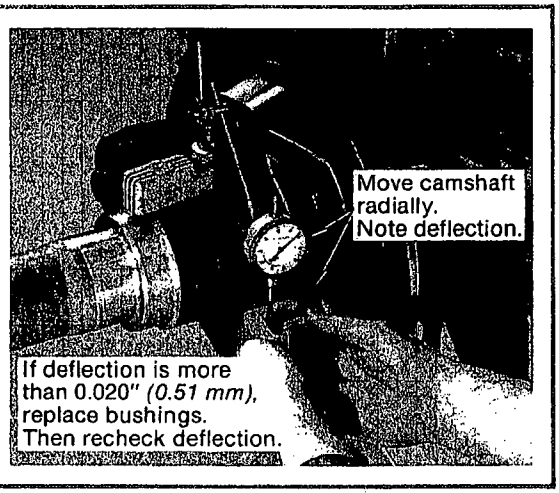
INSPECTION



Camshaft Inspection — Fit into Air Chamber Bracket (Radial Play)

1. Mount a suitable dial indicator with plunger referencing cam face at 90° to cam bearing journal.

2. Zero indicator.

3. Move cam head radially back and forth and note maximum reading.

4. Mount dial indicator at slack adjuster end of camshaft and repeat procedure. If play exceeds .020 inches *(.51 mm)* in either location, rebush camshaft bracket. Refer to Section 3, page 20. After rebushing, recheck. If radial play is still excessive, replace camshaft.

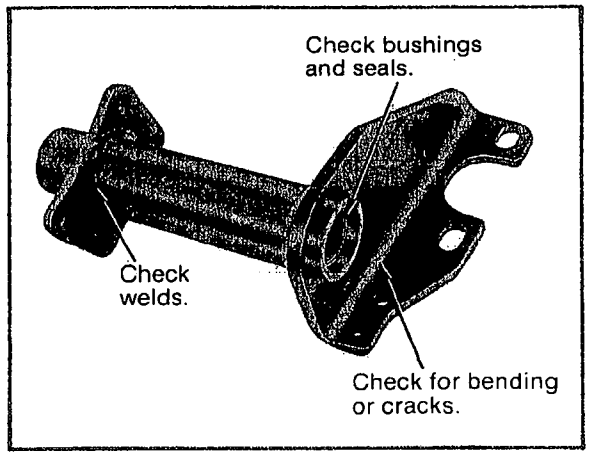
Air Chamber Bracket Inspection

1. Check for bent, broken, or cracked arm and cracked welds. Replace if any of these are evident.

2. Check mounting studs for looseness, damaged threads, or a bent condition.

3. Check camshaft bushings for deterioration. Inner surface must be smooth. If surface is rough or abrasive, bushings must be replaced. Refer to Section 3, page 20.

4. Inspect seals. Replace if lip is nicked, cut, or distorted. Refer to Section 3, page 20.



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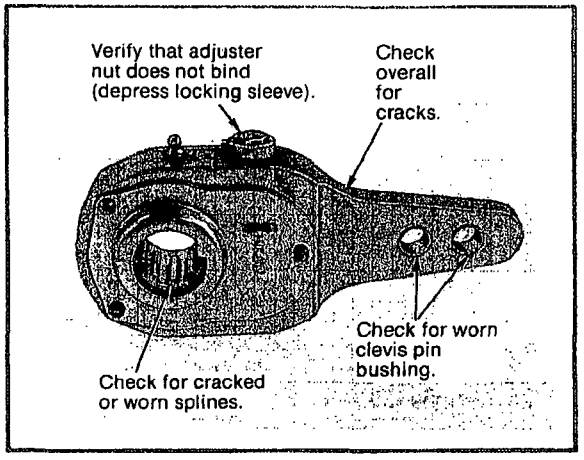


Manual Slack Adjuster Inspection

NOTE: This information is general in nature. For specific slack adjuster inspection guidelines, refer to manufacturer's instructions.

1. Check clevis for cracks and bushing wear. Replace as necessary.

2. Check splines for chipped teeth and deformation. Replace as necessary.

3. Depress locking sleeve and turn adjuster nut with wrench at least one turn in each direction. If binding is present or if excessive force is required to rotate, replace slack adjuster.

CAUTION: If any slack adjuster defect is found, it should be replaced. Do not attempt to repair a faulty slack adjuster!

Automatic Slack Adjuster Inspection. Refer to manufacturer's instructions.

Air Chamber Inspection

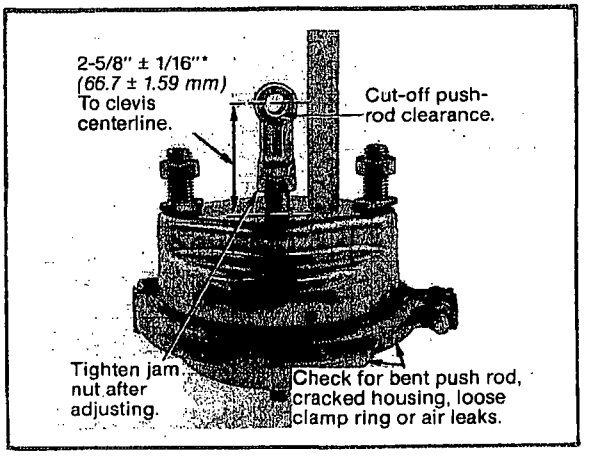
WARNING: To prevent personal injury, be sure to "cage" spring before removing spring-brake type air chamber.

NOTE: This information is general in nature. For specific air chamber inspection guidelines, refer to manufacturer's instructions.

1. Check for air leaks, cracked housing, bent pushrod, loose clamp ring, clogged vent holes, or loose air fitting. Repair or replace as recommended by manufacturer.

2. If air chamber is repaired or replaced, check distance from clevis pin hole centerline-to-air chamber face. This distance must measure 2-5/8" ± 1/16" *(66.7 ± 1.59 mm)* *except Mack 16-1/2" *(419.1 mm)* brake which is 4-3/8" *(111.1 mm)*.

3. If a new air chamber is installed, insure that cut-off pushrod does not project too far into clevis. Minimum clearance: clevis centerline to pushrod end should be 7/8" *(22.2 mm)*.



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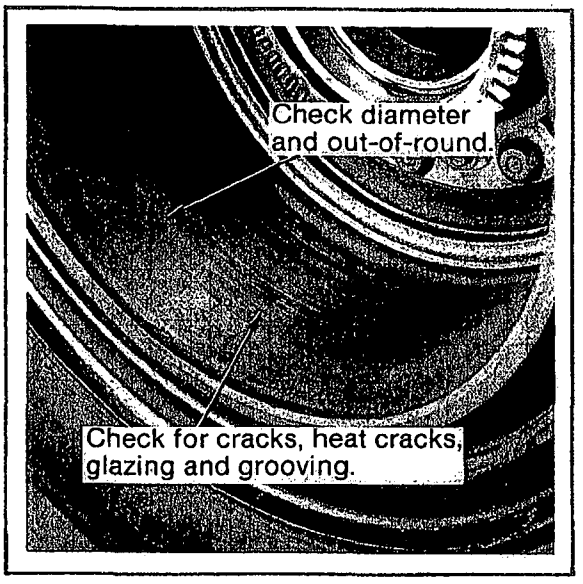

Drum Inspection

NOTE: This information is general in nature. For specific brake drum inspection guidelines, refer to manufacturer's instructions.

1. Check for cracks, heat-checks, glazing, grooving, runout and out-of-round. Cracked drums must be replaced. Drums which are glazed, grooved, etc., may be repaired for return to service.

2. Check drum diameter. Replace if it exceeds maximum diameter stamped in drum.

⚠CAUTION: Under no circumstances should drum be used if it exceeds manufacturer's recommended maximum diameter or runout specification.

In the absence of other specifications, the installed drum T.I.R. (Total Indicated Runout) should not exceed:

0.015" *(0.38 mm)* for Steer Axle Drums.

0.020" *(0.51 mm)* for Drive or Trailer Axle Drums.

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Brake Maintenance Preliminary Steps

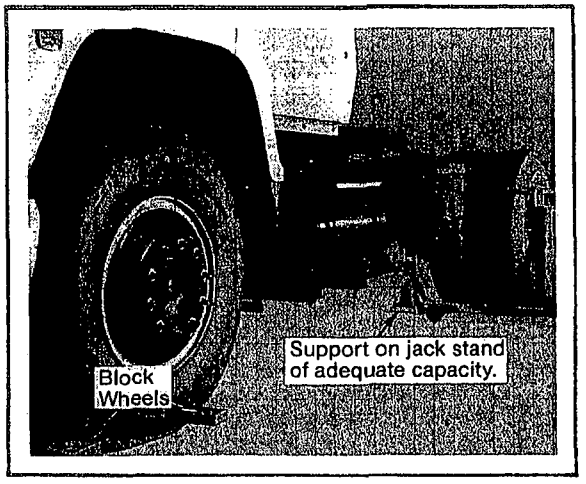
Prior to performing any maintenance requiring removal of the tire and wheel, the following preliminary steps should be accomplished.

1. Set parking brake and block wheels to prevent vehicle movement.

2. Raise steering axle with a jack and support on suitable stands.

WARNING: Never work under a vehicle supported by a jack.

3. Cage spring-type brake/chamber following vehicle manufacturer's instructions.



Brake Adjustment - Manual Slack Adjuster

To determine if brake adjustment is required, measure applied stroke and adjust brakes if value exceeds those in table below for appropriate size air chamber.

NOTE: Refer to the procedure on page 14 for determining applied stroke. The difference between applied stroke and free stroke is simply the method used to move the slack adjuster from rest. To check applied stroke, move the slack adjuster with an 80 psi air application instead of with a lever.

Chamber Size	Adjust when applied stroke at 80 psi exceeds:	Adjust to Free Stroke
30" *(762.0 mm)*	2" *(50.8 mm)*	
24" *(609.6 mm)*	1-3/4" *(44.5 mm)*	3/8" to 5/8"
(1) 24" *(609.6 mm)*	2" *(50.8 mm)*	*(9.5 to 15.9 mm)*
20" *(508.0 mm)*	1-3/4" *(44.5 mm)*	Without Drag
16" *(406.4 mm)*	1-3/4" *(44.5 mm)*	
12" *(304.8 mm)*	1-3/8" (34.9 mm)	

NOTE: (1) 24" *(609.6 mm)* chamber with 2-1/2" *(63.5 mm)* extended stroke.

If maximum stroke at 80 psi is still exceeded after free stroke adjustment, check the following:

A. DRUM: Cracks or excessive runout, see page 12. Maximum diameter being exceeded.

B. SHOES: Poor fit...lining to drum. Shoe centers must contact drum first. Verify 0.020-0.060" *(0.51-1.52 mm)* clearance at both shoe ends.

C. CAMSHAFT BUSHING CLEARANCE: 0.020" *(0.51 mm)* maximum (see page 10).

D. SHOE SPAN: See page 8.

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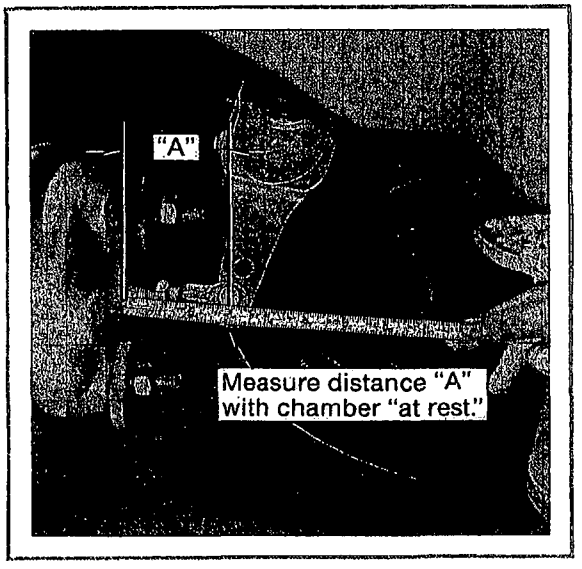
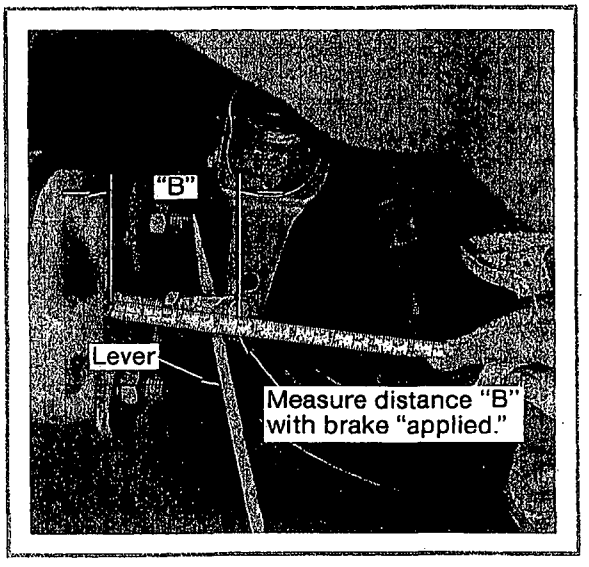
Brake Adjustment — Manual Slack Adjuster (cont'd)

1. Perform "Brake Maintenance Preliminary Steps."



2. If applied stroke at 80 psi is outside the recommended range shown on page 13, depress locking sleeve on slack adjuster and adjust as required. Ensure that locking sleeve is in "locked" position after adjustment is completed.

3. With Air Chamber push rod fully retracted, measure distance "A" from face of air chamber to clevis pin hole centerline. Distance should be 2-5/8" ± 1/16" *(66.7 ± 1.6 mm) except Mack 16½" (419.1mm)* brake which is 4⅜" *(111.1mm)*. If distance is outside this range, disconnect slack adjuster from push rod clevis and reposition clevis. Reconnect slack adjuster and remeasure distance.



4. Move slack adjuster by hand or with the aid of the lever in the apply direction. Measure distance "B" from face of air chamber to centerline of clevis pin hole.

5. Subtract measurement in Step 3 from Step 4 measurement. Difference is free stroke.

Dim. "B" - "A" = Free Stroke.

6. After brake adjustment, verify that brake is not dragging by rotating wheel or noting sharp ringing sound when drum is tapped with a hammer.

⚠ CAUTION: Brake must be adjusted to recommended free stroke without appreciable drag. If brake cannot be adjusted in this manner, check for an improperly assembled brake, improperly riveted or ground linings, damaged shoes or linings or excessive drum out-of-round.

7. Perform Brake Operational Check.

⚠ CAUTION: Do not release vehicle without verifying proper and safe brake operation.

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Brake Adjustment — Automatic Slack Adjuster

For adjustment procedures on automatic slack adjusters, refer to slack adjuster manufacturer's instructions.

Brake Operational Check

NOTE: An assistant is required to make a thorough brake operational check.

1. Apply brakes at 80 psi and hold. Check all air line fittings and air chambers for leakage.

2. Apply and release brakes while observing operation of slack adjusters on each axle. As brakes are applied and released, slack adjusters should move in unison visually.

3. Investigate source and make corrections for any discrepancies found in Steps 1 and 2.

4. Drive vehicle at low speeds in a safe area and make several brake applications to verify safe operation and lack of pulling, grabbing or noise. If any of these are noted, investigate and repair prior to releasing vehicle for service.

⚠ **CAUTION:** Never release a vehicle for service if any brake discrepancy — no matter how minor — is evident!

Lubrication

Air Chamber Bracket/Slack Adjuster — Pressure lubricate with the grease specified by Vehicle Manufacturer for chassis lubrication through the appropriate grease fitting. Continue filling until grease flows out of Slack Adjuster end of tube or around slack adjuster splines. The same grease may be used on assembly of the camshaft, slack adjuster, and bushings.

⚠ **CAUTION:** Grease should not flow out end of tube toward cam head. If it does, seal is defective and must be replaced.

⚠ **CAUTION:** Do not replace existing grease fitting with a pressure relief type. Only standard non-vented fittings are to be used with spring-loaded lip seals.

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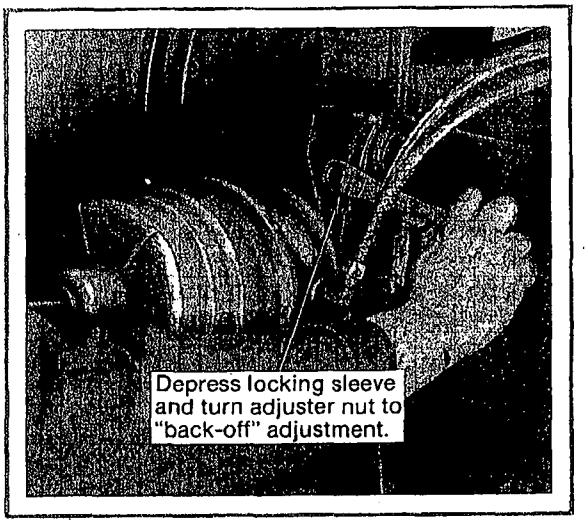
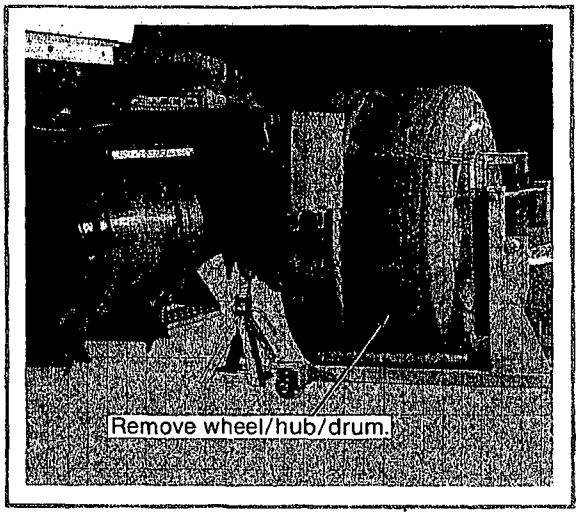
Drum Removal

1. Perform "Brake Maintenance Preliminary Steps." Refer to Section 2, page 13.

2. While depressing locking sleeve, back off slack adjuster adjustment nut on slack adjuster. Continue turning until shoes are fully returned to the released position and clear of drum.



Depress locking sleeve and turn adjuster nut to "back-off" adjustment.



Remove wheel/hub/drum.

3. Remove spindle hubcap, cotter key, hex nut, and spindle washer.

4. While rocking drum, pull outboard enough to allow removal of outer wheel bearing.

5. Remove drum by pulling outboard while rocking from side to side. If shoes are not clear of drum, return to Step 2 above.

⚠ **CAUTION:** If difficulty is found on removal — do not force drum. Excessive pulling force may damage brake parts.

6. Clean and inspect drum. Refer to Section 2, page 12.

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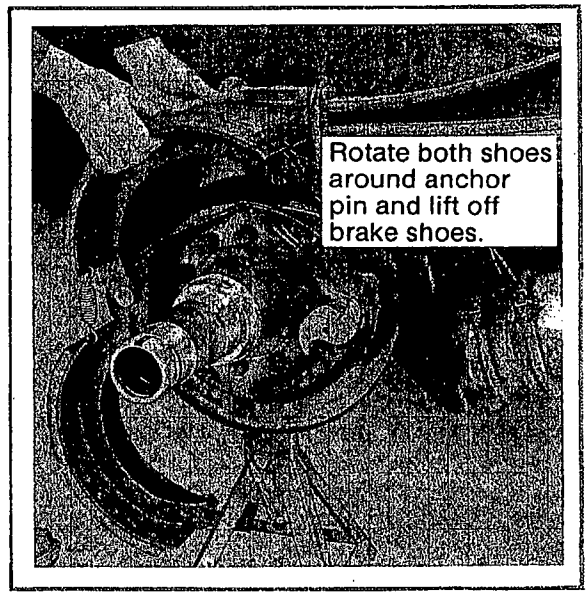
REMOVAL / DISASSEMBLY

Shoe Removal

1. Perform steps necessary for drum removal.
2. Using a large screwdriver or lever, lift upper shoe to stretch return spring.
3. Remove upper cam roller and pin.
4. Repeat Steps 2 and 3 for lower shoe and roller and pin.

5. Push cam end of both shoes toward cam and unhook shoe return spring.

6. Rotate both shoes around anchor pin and remove from vehicle.
7. Discard cam rollers and pins, shoe return spring, and shoe retainer springs.
8. Clean and inspect brake. Refer to Section 2, page 8.



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Manual Slack Adjuster Removal

1. Remove cotter pin and clevis pin from air chamber push rod clevis.

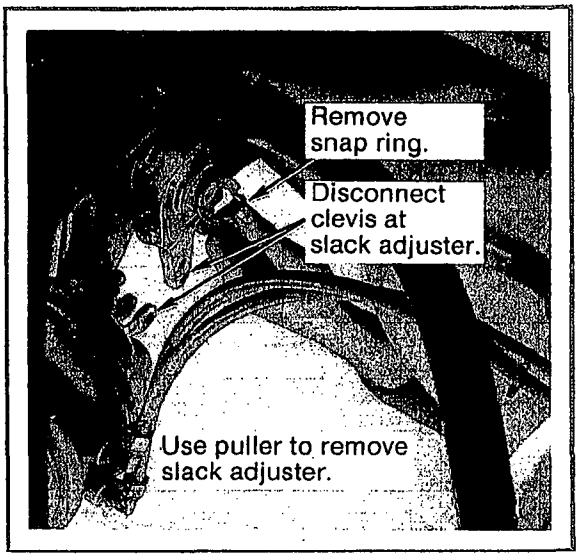
2. While depressing locking sleeve, turn adjuster nut until slack adjuster is clear of air chamber push rod clevis.

3. Remove snap ring and outer washer from camshaft.

4. Remove slack adjuster with a suitable puller.

⚠ **CAUTION:** Do not hammer on slack adjuster to remove! Damage to slack adjuster and/or camshaft splines may result.

5. Clean and inspect. Refer to Section 2, page 11.



Camshaft Removal

1. Perform all steps for drum removal, shoe removal and slack adjuster removal. Refer to Section 3, pages 16, 17, 18.

2. Remove inner washer.

3. Grasp camshaft head and pull camshaft outboard to remove.

4. Clean and inspect. Refer to Section 2, page 9.

Air Chamber Bracket Removal
(with air chamber installed)

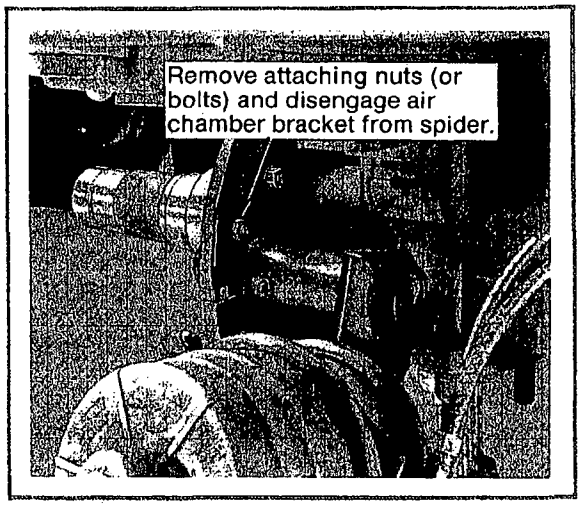
1. Perform all steps for drum removal, shoe removal, slack adjuster removal, and camshaft removal. Refer to Section 3, pages 16, 17, 18.

2. Disconnect chamber air line.

3. Remove the attaching nuts (bolts on brakes with cast spider) and pull the air chamber bracket away from the spider.

NOTE: On brakes with stamped spiders, the air chamber bracket-to-spider studs are press fit into the bracket. Their removal is not required to remove the air chamber bracket.

4. Clean and inspect. Refer to Section 2, pages 10, 11.



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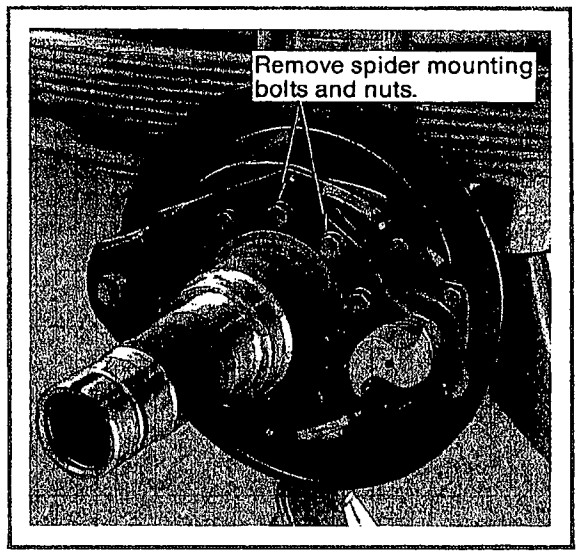
CLEANING

Spider Removal



1. Perform steps necessary for drum removal, shoe removal, slack adjuster removal, camshaft and camshaft bracket removal.
2. Remove the spider-to-axle attachment nuts and bolts.
3. Remove spider.
4. Clean and inspect. Refer to Section 2, page 8.

Cleaning

After removing the brake parts being serviced from the vehicle, the following cleaning procedures should be followed:

1. Wire brush all parts exposed to mud, road dirt, and salt, including exterior of drum, spider, air chamber bracket, and dustshields (if so equipped). If shoes are to be relined, thoroughly wire brush shoe table and paint with rust inhibitive coating.

⚠ **CAUTION:** A layer of oxidation and dirt on the outside of a brake drum acts as an insulator and may hinder normal heat dissipation. Make sure excessive deposits of oxidation and dirt are removed by wire brushing.

2. Wipe interior of drums with a greaseless solvent to remove lining material dust. Use a vacuum cleaner to pick up excessive dust accumulation.

⚠ **WARNING:** Do not use compressed air to blow dust from interior of drums. Asbestos dust, when inhaled, can be injurious to health.

3. Clean all remaining brake parts thoroughly with a suitable shop solvent. Wipe dry with a clean, lint-free cloth or use low-pressure, filtered, compressed air.

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Camshaft Bushing and Grease Seal Replacement

1. Remove Air Chamber Bracket. Refer to Section 3, page 18.

2. Remove old bushings and grease seals by driving out with a punch.

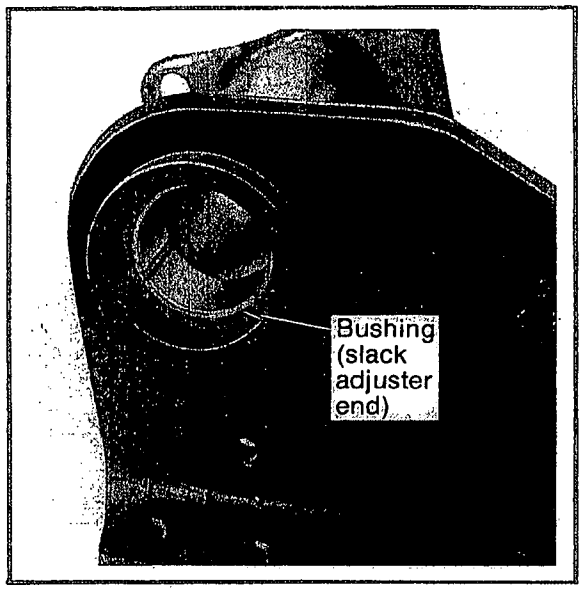
3. Clean and inspect Air Chamber Bracket. Refer to Section 2, page 10.

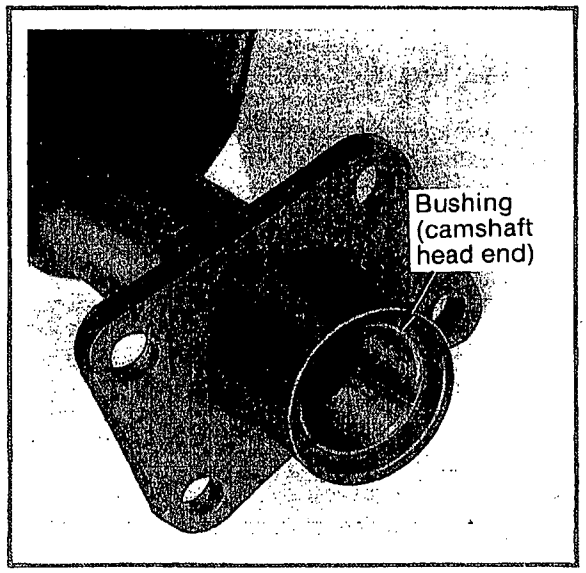
4. Install bushings with a suitable piloted driver.

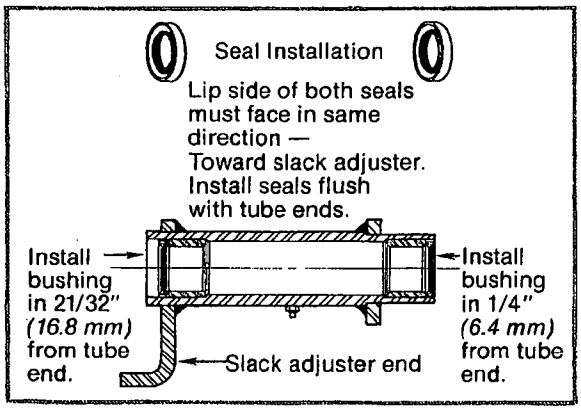
NOTE: When installing bushings, be sure they are positioned in the bracket tube to the depths indicated in the illustration below.

5. Install grease seals with a suitable piloted driver.

NOTE: Install grease seals so seals are flush with end of air chamber bracket tube.







CAUTION: Seals must be installed as indicated so that lip side (with spring) of both seals faces toward slack adjuster end of bracket. Improperly oriented seals may allow grease to exit camshaft head end of air chamber bracket and contaminate lining material.

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Lining Replacement

1. Remove shoe and lining assemblies. Refer to Section 3, page 17.

2. Using a suitable riveting mandrel, push out old rivets.

3. Clean shoe table. Refer to Section 3, page 19.

⚠ **CAUTION:** Drilling out rivets or cutting off upset head with chisel may cause rivet hole elongation.

4. Inspect to determine if shoe is serviceable. Refer to Section 2, page 8.

5. Verify that replacement lining material conforms to FMSI No. (see chart).

⚠ **CAUTION:** Use of an improper FMSI lining specification or friction material type may cause brake dragging, grabbing, or improper brake performance.

6. Insert the proper size rivets into all holes and hold heads temporarily in place with masking tape.

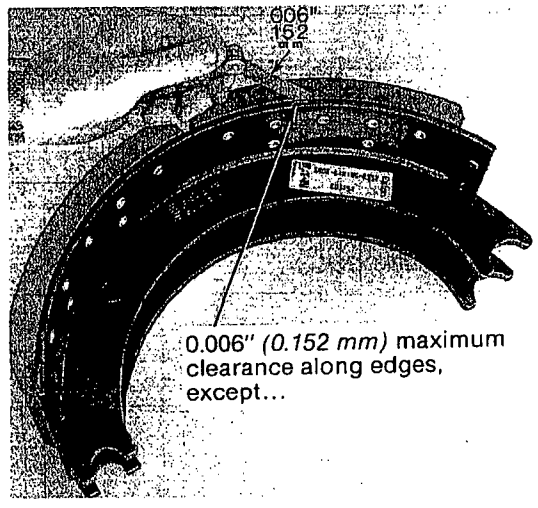
SPECIAL NOTE: It is important to use rivets of the correct material, shank diameter, length, head size, and shape. Refer to chart on page 22.

7. Begin riveting at the center of each edge of shoe and lining and progress uniformly toward each end.

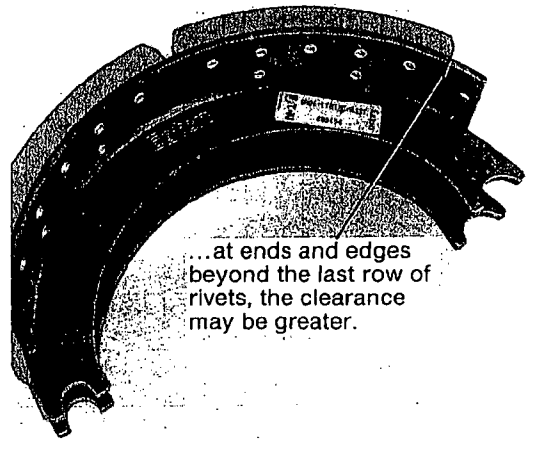
8. Check installation by trying to insert a .006" *(.152 mm)* feeler gage between lining and shoe table along edges. It should not be possible to insert the feeler gage in this manner anywhere along the edge with the exception of each end beyond the last row of rivets. A larger clearance may exist in these areas.

Replacement Linings
FMSI No. vs. Brake Size

Brake Size	FMSI No.
16-1/2" x 5" *(419.1 mm x 127.0 mm)*	4223A
16-1/2" x 6" *(419.1 mm x 152.4 mm)*	4317G
16-1/2" x 7" *(419.1 mm x 177.8 mm)*	4311J
16-1/2" x 8-5/8" *(419.1 mm x 219.1 mm)*	4674
18" x 7" *(457.2 mm x 177.8 mm)*	4527B



0.006" *(0.152 mm)* maximum clearance along edges, except...



...at ends and edges beyond the last row of rivets, the clearance may be greater.

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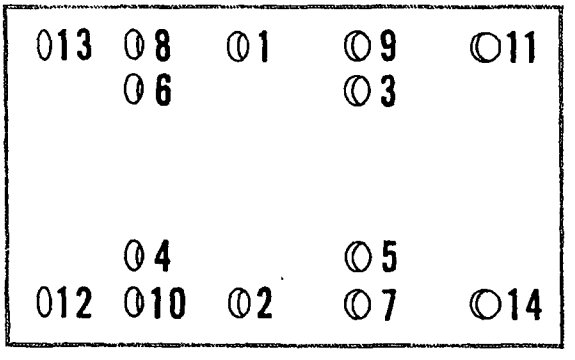
Riveting Sequence for Lining Replacement



Begin riveting at center of each lining segment then progress uniformly toward each end.

Bolt/Nut Tightening Sequence

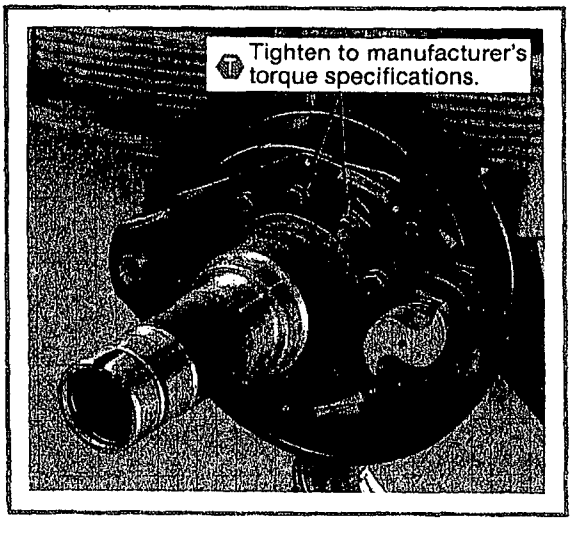
Same as riveting: Tighten center bolts first.

Rivets and Bolts

Rivets ..... Brass plated steel (1/4" x 1/2")
(Part No. 35861) *(6.35 mm x 12.7 mm)*

Bolts/Nuts ... Flat head, brass plated steel
(Part No. 1000149) (3/8"-16 x 1.25")
SAE #10-8 *(9.5 mm-16 x 31.75 mm)*
Head Angle - 81°

Tightening Torque ..... 170-200 Lbs-in.
(19.21 - 22.6 N·m)



Spider Installation

1. Verify the available spider is serviceable. Refer to Section 2, page 8.

2. Verify that available spider is correct part number for axle being serviced.

3. Position spider on axle flange and install attaching bolts and nuts.

4. Sequentially torque nuts according to manufacturer's specifications.

NOTE: Use hardened washer under 5/8" *(15.87 mm)* bolt heads.

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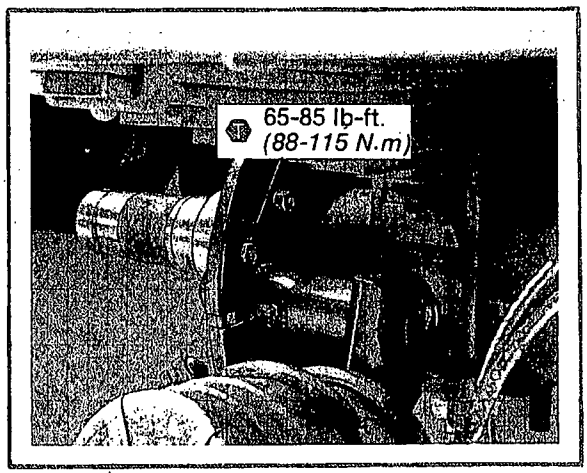
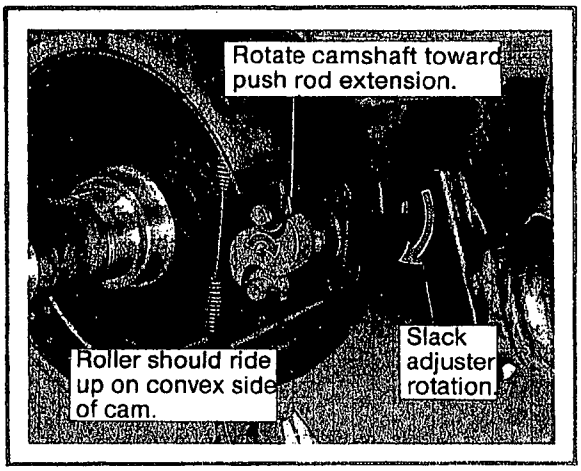
INSTALLATION / ASSEMBLY

Air Chamber Bracket Installation

1. Verify that available Air Chamber Bracket is serviceable. Refer to Section 2, page 10.
2. Orient bracket to align mounting studs with holes in spider.
3. Position bracket against spider and install lockwashers and nuts on mounting studs.
4. Torque stud nuts to 65-85 lb-ft. *(88-115 N·m).*
5. If air chamber was removed, install and tighten nuts to correct torque.

7/16"-20 Nuts ..... 35-40 lb-ft. *(47.5-54.2 N·m)*
5/8"-18 Nuts ..... 110-115 lb-ft. *(149-156 N·m)*





Camshaft Installation

1. Verify that available camshaft is serviceable and the correct part for the application. Refer to Section 2, page 9.

CAUTION: To ensure that camshaft being installed is correct for the application, rotate camshaft in the direction of air chamber push rod extension and check that the roller starts to ride up on the convex side of the cam head.

2. Apply a thin film of grease (as specified in Section 2, page 15) on inside of camshaft bushings, seals, and spline area of camshaft.

CAUTION: Do not grease camshaft head area!

3. Carefully slip camshaft into bracket.

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Slack Adjuster Installation

1. Verify that slack adjuster is serviceable. Refer to Section 2, page 11.

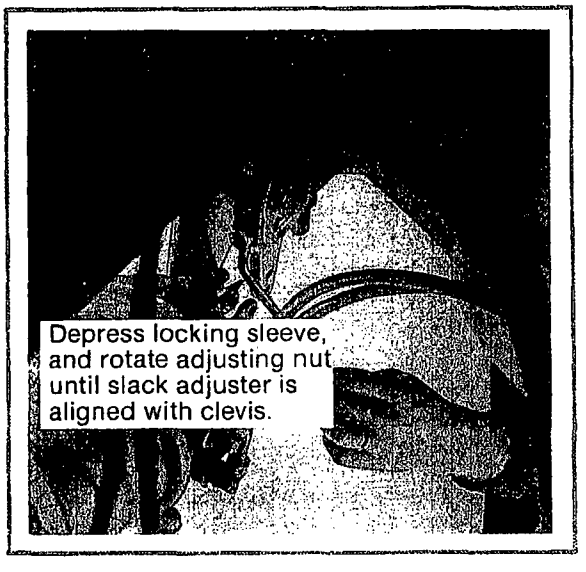
2. Install the inner camshaft washer on the camshaft.

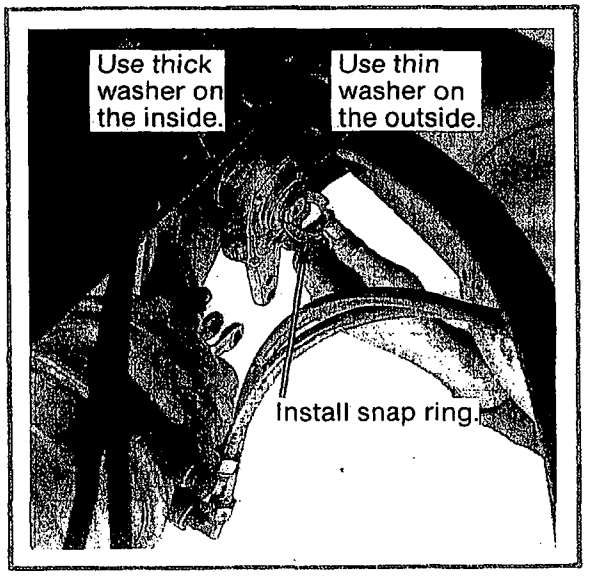
SPECIAL NOTE: Two different thickness camshaft washers are used. The thin washer is .030 inches *(.76 mm)* thick — the thick washer is .060 inches *(1.52 mm)* thick. The thick washer should be used as the inner camshaft washer.

3. Apply a thin film of grease, as specified in Section 2, page 15, to slack adjuster splines.

4. Verify that camshaft head is oriented properly. Turn camshaft as required.

5. Install the slack adjuster on the camshaft oriented with the adjuster nut on the side opposite the Air Chamber.





6. Install the outer shim washer and snap ring.

7. Check camshaft end play. Refer to Section 2, page 9. If necessary, add or delete washers to obtain end play between .005"-.045" *(.13 - 1.14 mm)* and slack adjuster centering between air chamber bracket and snap ring groove.

8. Verify that air chamber face-to-clevis centerline dimension is correct. Refer to Section 2, page 11. Ensure that clevis locknut is securely tightened.

9. While depressing the locking sleeve, rotate adjusting nut counterclockwise until appropriate hole in slack adjuster is aligned with hole in air chamber pushrod clevis.

10. Install clevis pin and cotter pin.

11. Pressure lubricate slack adjuster with chassis grease.

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INSTALLATION / ASSEMBLY

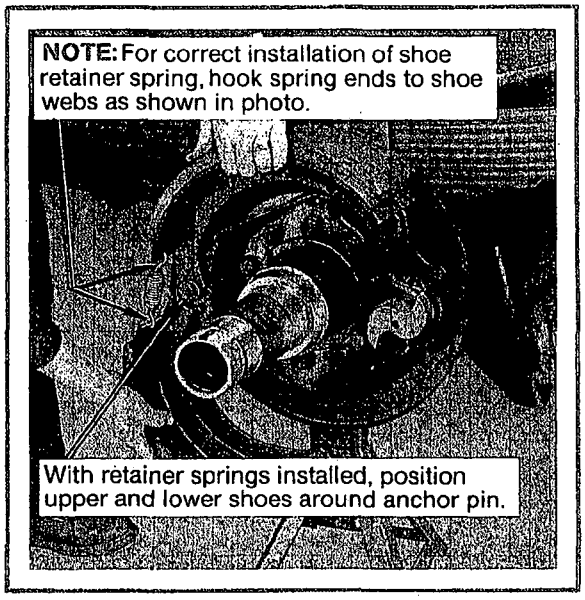
Shoe Installation

1. Verify that spider, camshaft and bracket, and slack adjuster are serviceable. Refer to Section 2, pages 8 through 11.

2. Hook ends of new retainer springs into holes in both shoe webs.

NOTE: For correct installation of shoe retainer springs, the spring ends must be positioned as shown in the adjacent photo.

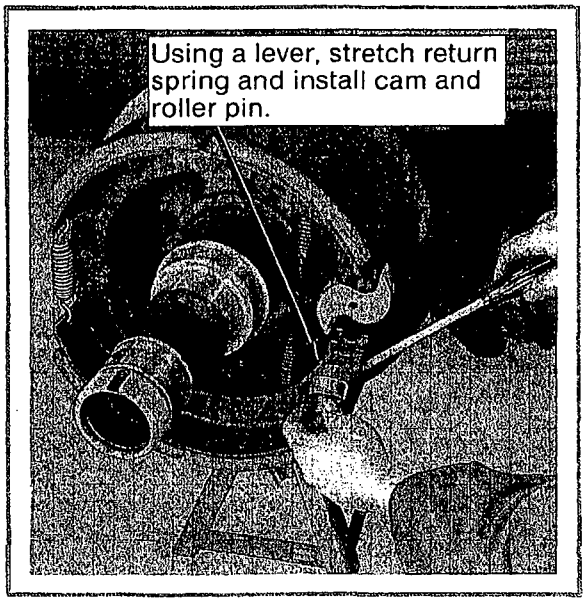
3. Position upper and lower shoes around anchor pin.



4. Install a new shoe return spring.

5. Using a large screwdriver or lever, stretch shoe return spring to allow insertion of new cam roller and pin on the lower shoe web.

6. Repeat process on upper shoe.



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Drum Installation

The following instructions are general. For your specific application, follow manufacturer's instructions.

1. Verify that drum is serviceable. Refer to Section 2, page 12.

2. Prior to drum installation, verify proper positioning of shoes, cam rollers, and springs.

3. Verify that slack adjuster has been backed off to allow drum installation.

4. Verify proper lubrication of wheel bearings. Refer to vehicle manufacturer's instructions.

5. Adjust and lubricate wheel bearings. Refer to vehicle manufacturer's instructions.

6. Verify proper drum installation and lack of drum-to-dustshield (if so equipped) interference.

7. Adjust brake. Refer to Section 2, page 13.

8. Perform brake operational check. Refer to Section 2, page 15.

⚠ **CAUTION:** Do not release vehicle without adjusting and verifying proper operation of brakes!

Key Dimensional Specifications

Maximum Anchor Pin Groove Depth:
0.031" *(.79 mm).*

Minimum Lining Thickness:
1/4" *(6.35 mm)* or 1/16" *(1.59 mm)* from rivet heads.

Camshaft End Play (Axial):
0.005"-0.045" *(.13-1.14 mm).*

Camshaft Radial Play-Maximum:
0.020" *(.51 mm).*

Air Chamber Face to Clevis Center:
See page 14.

Maximum Free Stroke: See page 13.

Desired Free Stroke: See page 13.

Key Torque Specifications

Dustshield Attachment Screws:
11-16 lb-ft. *(14.9-21.6 N·m).*

Air Chamber Bracket to Spider Nuts:
65-85 lb-ft. *(88-115 N·m).*

Air Chamber Mounting Nuts:
(7/16-20) Nuts 35-40 lb-ft. *(47.5-54.2 N·m).*

(5/8-18) Nuts 110-115 lb-ft. *(149-156 N·m).*

Lining Bolts/Nuts:
(3/8-16) 170-200 lbs-in. *(19.21-22.6 N·m).*

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Additional Service Information

Additional service information on Eaton® Single Anchor Pin Brakes may be found in the following Service Publications:

- EB-31 - 15" x 4" Steer Axle Brakes
- EB-21 - Trailer Axles (Includes brake service unique to trailer axles)

Parts Information

Complete information for identifying replacement parts for Eaton Single Anchor Pin Brakes may be found in the following Parts Publications:

- EB-64 - 15" x 4" and 16½" Brakes
- EB-62 - 18" x 7" Brakes
- EB-66 - Camshafts and Air Chamber Brackets
- EB-68 - Spiders and Dustshields

These publications may all be ordered through the Eaton publications order system. An order form may be obtained by calling one of our Regional Offices shown on the back cover of this publication.

Single Anchor Pin Brake Kits

Various kits are available for brake service parts as noted below. See Parts Books for applications and part numbers.

Reline Kits - Consist of your choice of lining material and rivets.

Spring Kits - Consist of the correct return spring (matched to lining material and shoe use) and a pair of shoe retainer springs.

Minor Overhaul Kits - Consist of the correct Spring Kit plus Cam Rollers and Pins.

Major Overhaul Kits - Consist of the correct Minor Overhaul Kit plus your choice of lining materials on new shoe assemblies.

Air Chamber Bracket Overhaul Kits - Consist of Camshaft Bushings, Grease Seals, and Snap Rings.

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Eaton® Axles and Brakes... Backup by Eaton's unique Roadranger℠ Service Support.

When you spec Eaton, you automatically receive help from the largest field service network in the industry. You can call on our factory-trained experts for everything from spec'ing advice to parts expediting to on-the-spot troubleshooting, and you get this help whether you're a fleet or just a one truck owner. If you should ever have any question involving any Eaton axle or brake, the answer comes easy. "Ask a Roadranger.℠"

Call the nearest Eaton Truck Components Regional Office or write the Eaton Field Service Department (address below).

Eaton Truck Components Regional Offices:

Western Region:
Oakland, CA
(415) 487-8880

Northeast Region:
Allentown, PA
(215) 395-1212

Southeast Region:
Charlotte, NC
(704) 372-5840

Midwest Region:
Dallas, TX
(214) 242-8615

Great Lakes Region:
Kalamazoo, MI
(616) 342-3680

Canadian Region:
Toronto, Ontario
(416) 678-2751

Calgary, Alberta
(403) 250-2942

For further assistance...

Ask a Roadranger.℠

For emergency parts assistance or toll-free service consultation, call:

1-800-TCM-HELP
(USA)
1-800-387-3935
(Canada)

For further information, contact Eaton Corporation, **Axle & Brake Division,** P.O. Box 4008, Kalamazoo, Michigan 49003.

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