

Meritor Inc. Trailer Axle Service Manual S Cam Drumbrake

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pg. 4 Section 1 - General Information

- pg. 5 Service Notes
- pg. 5 Safety Instructions
- pg. 6 Warranty

pg. 8 Section 2 - Introduction

- pg. 9 Cam Brakes Leading & Trailing Shoes
- pg. 10 Exploded View - Pre Sept 1999 Camshaft
- pg. 11 Exploded View - Post Sept 1999 Camshaft
- pg. 12 Exploded View - Post Sept 1999 Camshaft (Forged Anchor Bracket)
- pg. 13 Parts List - Exploded Views

pg. 14 Section 3 - Inspection & Maintenance Procedures

- pg. 15 Camshaft & Camshaft Bearing Inspection
- pg. 15 Brake Drum Inspection
- pg. 16 Lining Inspection
- pg. 16 Lubricating Brake Chamber Clevis Pin
- pg. 16 Push Rod Adjustment - Slack Adjuster

pg. 18 Section 4 - Brake Shoe & Cam Roller Replacement

- pg. 19 Removal of Brake Shoes
- pg. 20 Removal of Cam Rollers
- pg. 20 Cleaning & Inspection
- pg. 21 Fitting Brake Shoes
- pg. 23 Brake Adjustment

pg. 24 Section 5 - Camshaft & Bearing Replacement

- pg. 25 Camshaft & Bearing Replacement - Pre Sept 1999 Axles
- pg. 27 Camshaft & Bearing Replacement - Post Sept 1999 Axles
- pg. 32 Camshaft Bush Replacement - Forged Anchor Brackets

pg. 33 Section 6 - Anchor Pin & Bush Replacement

- pg. 34 Removal of Anchor Pins
- pg. 34 Replacement of Anchor Pin Bushes
- pg. 35 Fitting Anchor Pins

pg. 37 Section 7 - Drum Replacement

- pg. 38 Brake Drum Removal
- pg. 38 Fitting the Brake Drum

pg. 39 Section 8 - Torque Values & Grease Specification

- pg. 40 Maintenance Schedules
- pg. 40 Torque Values
- pg. 40 Recommended Lubricants

pg. 41 Section 9 - Service Tools

- pg. 42 MST 3101 Anchor Pin Bush Removal Tool
- pg. 42 MST 3102 Anchor Pin Bush Insertion Tool
- pg. 42 MST 3212 Cam Bush Replacement Tool
- pg. 42 MST 3214 Cutter
- pg. 42 MST 3215 Shaft
- pg. 42 MST 3216 Sleeve
- pg. 42 MST 3217 Pin (2 required)
- pg. 42 MST 3218 Jig for 310mm Diameter Brakes
- pg. 42 MST 3219 Jig for 350mm Diameter Brakes
- pg. 42 MST 3220 Jig for 394mm Diameter Brakes
- pg. 42 MST 3221 Jig for 420mm Diameter Brakes

General Information

1

PG. 5 Service notes

PG. 5 Safety instructions

PG. 6 Warranty

1 General Information

Service Notes

This manual describes the correct lubrication, service and installation procedures for MERITOR HVS's S Cam series Drumbrakes. Information contained in this publication was in effect at the time the publication was approved for printing and is subject to change without notice or liability.

The designated trademarks are registered marks of their respective owners and Meritor HVS and its affiliates are not commercially connected, affiliated, or associated with any of the owners of such marks. The Meritor HVS products presented herein are not endorsed or authorized by any of the trademark owners.

You must follow company procedures and understand all procedures and instructions before you begin to service or repair a unit. Some procedures require the use of special tools and lubricants for safe and correct service. Failure to use special tools when required can cause serious personal injury to service personnel, as well as damage to equipment and components.

MERITOR HVS uses the following notations to warn the user of possible safety issues and to provide information that will prevent damage to equipment and components.



WARNING

A Warning indicates you must follow a procedure exactly. Otherwise serious Personal injury can occur.

NOTE:

A NOTE indicates an operation, procedure or instruction that is important for correct service. A NOTE can also supply information that can help to make service quicker and easier.



CAUTION

A caution indicates that you must follow a procedure exactly. Otherwise, damage to equipment or components can occur. Serious personal injury can also result, in addition to damaged or malfunctioning equipment or components.



This symbol indicates that you must tighten fasteners to a specific torque value.

Safety Instructions

- Observe the manufacturer's safety instructions for jacking up and securing the vehicle
- Only use original Meritor inc. parts
- Always ensure appropriate safety glasses and gloves are worn when carrying out the procedures detailed in this publication.
- Use only the tools recommended
- Observe the following service instructions and notes
- When working on the brake assembly you must ensure that it cannot be activated inadvertently
- Never use compressed air to remove brake dust or for the purpose of drying. Any type of dust can be injurious to health if inhaled. Use Meritor HVS brake cleaner for cleaning the caliper.



CAUTION: Ensure any grease removed from the assembly/components, or contaminated cloth, is disposed of in accordance with local environmental regulations.



CAUTION: Ensure any discarded friction product, or cloth contaminated with brake dust, is disposed of in accordance with local environmental regulations.

Access Information on Meritor HVS's Web Site

Additional maintenance and service information for Meritor HVS's commercial vehicle systems component lineup is also available at www.meritorhvs.com/tech library.

To access information, go to Products & Services Icon: from drop down menu click on Tech Library\Manuals\Brakes. The screen will display an index of publications by type.

1 General Information

MERITOR HVS Warranty

For full warranty terms and conditions see 'MERITOR HVS Warranty Terms and Conditions

Unless otherwise stated, Aftermarket components are warranted for 1 year, parts only, mechanical failure only.

Warranty Procedure

Should any MERITOR HVS equipment fitted to your trailer become unserviceable within the warranty period, contact the trailer manufacturer or MERITOR HVS Service Department who will advise on the appropriate action.

A comprehensive network of original parts distributors and service stations operate throughout Europe; this is supported internationally with agents strategically placed around the world.

MERITOR HVS reserves the right to make changes in specifications shown herein or add improvements at any time without notice or obligation.

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The high quality assurance management systems applied by MERITOR HVS are endorsed with the awarding of ISO 9001, Lloyd's Register Quality Assurance.

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Introduction

2

- pg. 9 Cam Brakes Leading & Trailing Shoes
- pg. 10 Exploded View - Pre Sept 1999 Camshaft
- pg. 11 Exploded View - Post Sept 1999 Camshaft
- pg. 12 Exploded View - Post Sept 1999 Camshaft (Forged
Anchor Bracket)
- pg. 13 Parts List - Exploded Views

2 Introduction

Introduction to the Drumbrake

The Meritor HVS range of drum brakes are manufactured to the same high standards expected of all Meritor products. They come in several sizes depending on the application and axle type which is summarised below:

- AC** Dimensions: 310mm x 190mm
Features: Low loader drum brake - TM Series,
17.5 & 19.5 inch wheel sizes
- B** Dimensions: 350mm x 200mm
Features: Low loader drum brake - LM & TM Series,
19.5 inch wheel
- Q** Dimensions: 420mm x 180mm
Features: Standard drum brake - TM & TA Series,
22.5 inch wheel
- Q+** Dimensions: 420mm x 180mm
Features: 20% longer brake lining life than Q brake -
LM Series, 22.5 inch wheel
- Z** Dimensions: 420mm x 220mm
Features: Heavy duty drum brake - TM & TA Series,
22.5 inch wheel

The main components of the brakes are very similar, with the only differences being the size of the shoes, and the geometry of the components to suit.

CAM BRAKE LEADING AND TRAILING SHOES

Although the two brake shoes are physically identical the friction forces between the brake linings and drum act on the two shoes with very different effect.

The direction of the friction forces act in the direction of rotation of the drum (Fig. 2.1).

On one shoe the friction forces are additive to the cam head force and this shoe is referred to as the "leading" shoe, as a result the net torque produced by this shoe increases at a greater rate than the increase in actuating force.

The friction forces act in the opposite direction on the other brake shoe and detract from the cam head force and this shoe is referred to as the "trailing" shoe, as a result the net torque produced by this shoe increases at a lesser rate than the actuation force.

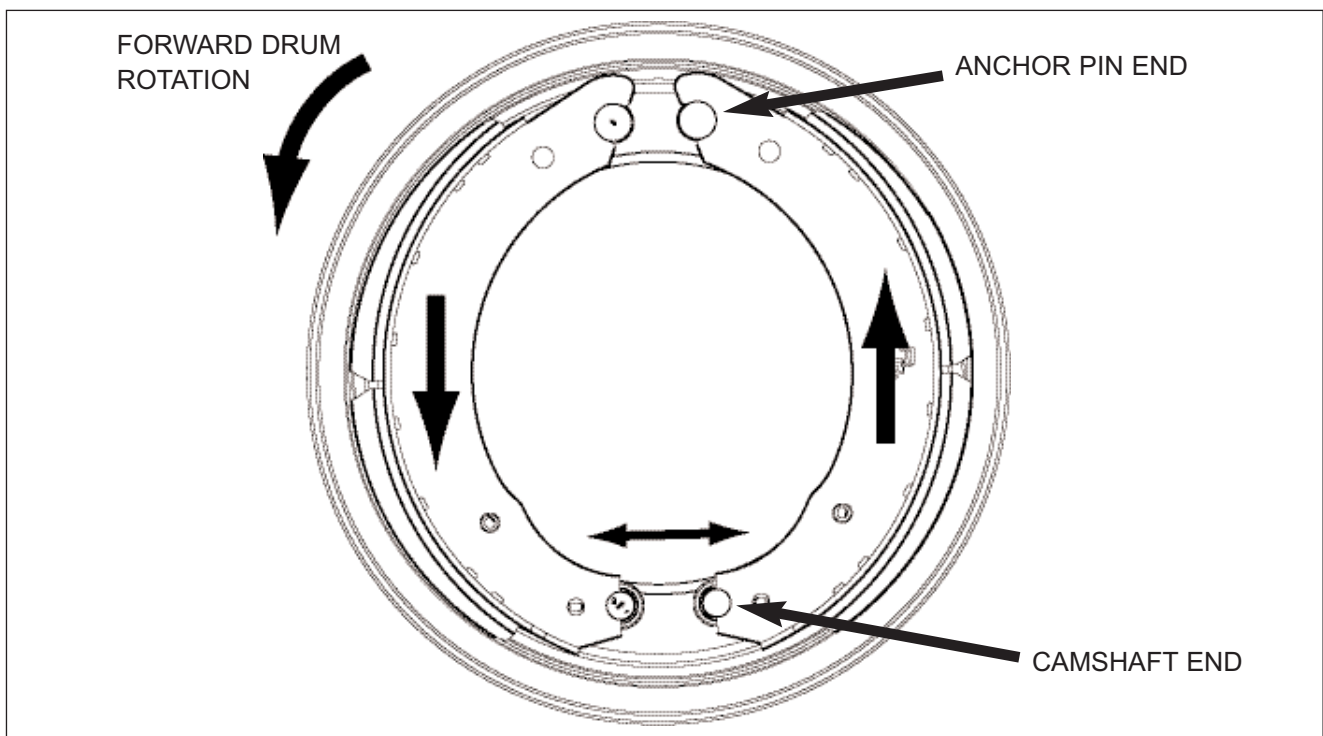


Fig 2.1

2 Introduction

Exploded View - Pre 1999 Camshaft (Typical)

Pressed Spider bracket (Q, Q+ and Z type brakes)

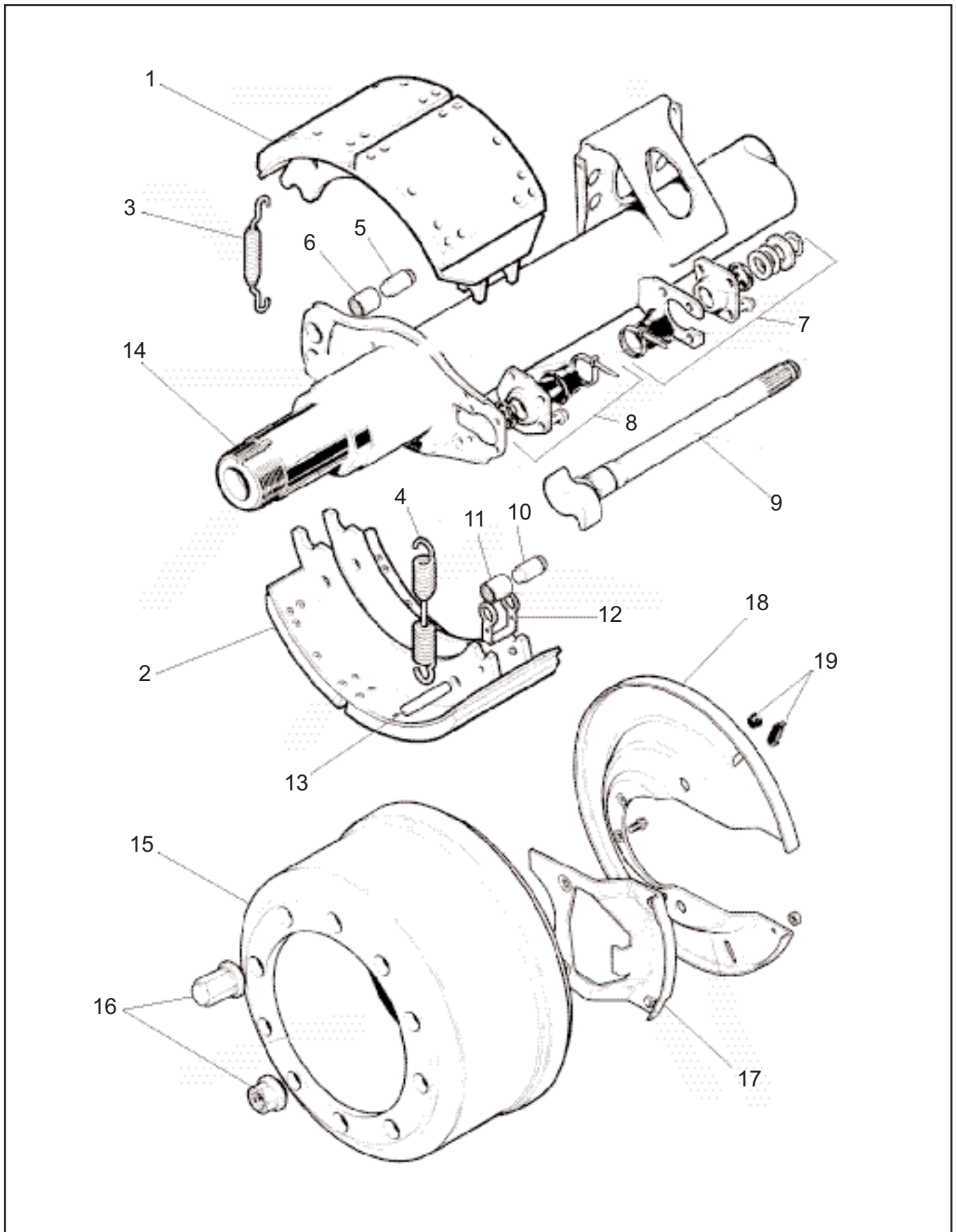


Fig 2.2

2 Introduction

Exploded View - Post 1999 Camshaft (Typical)

Pressed Spider bracket (Q, Q+ and Z type brakes)

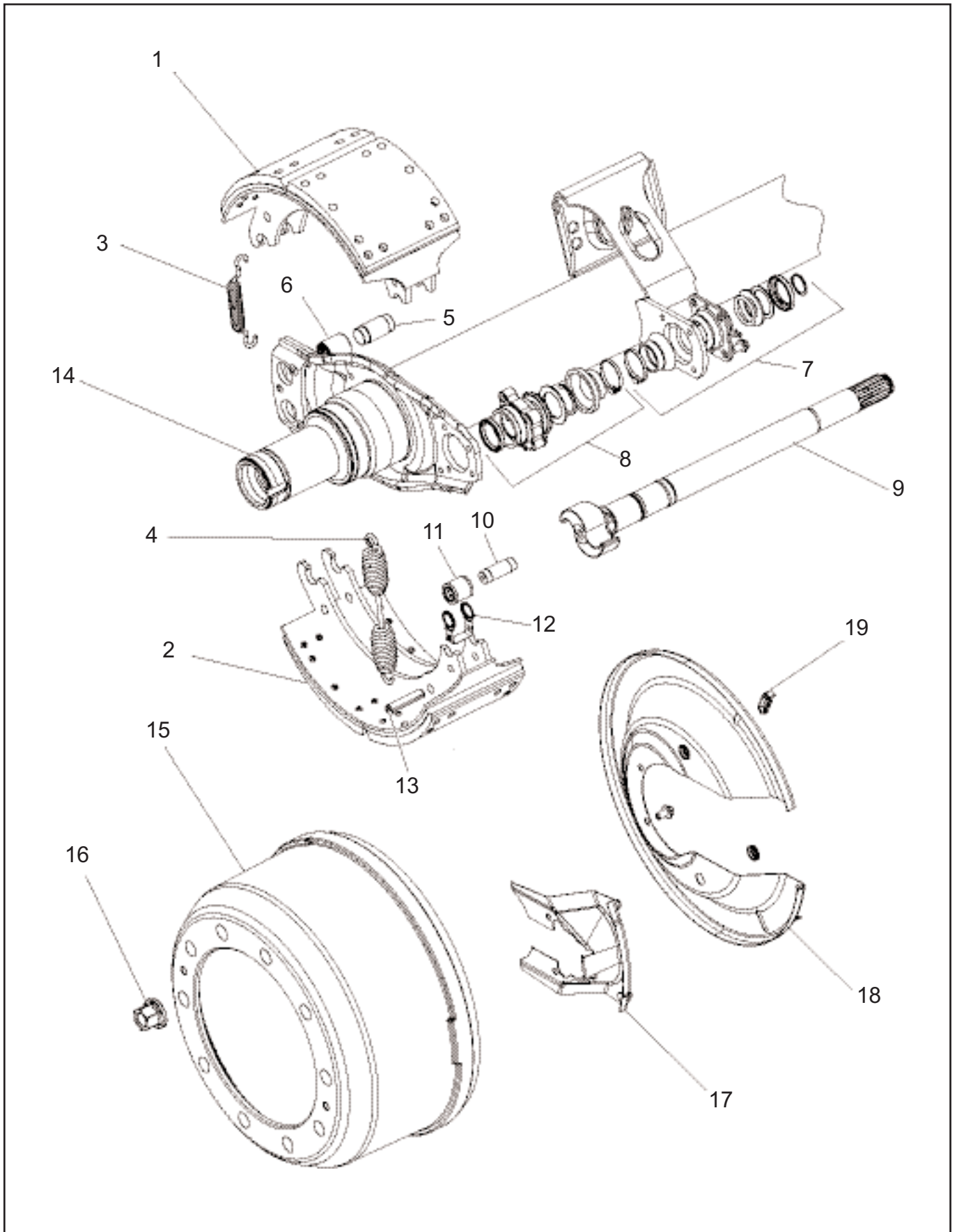


Fig 2.3

2 Introduction

Exploded View - Post 1999 Camshaft (Typical)

Forged Spider Bracket (AC and B type brakes)

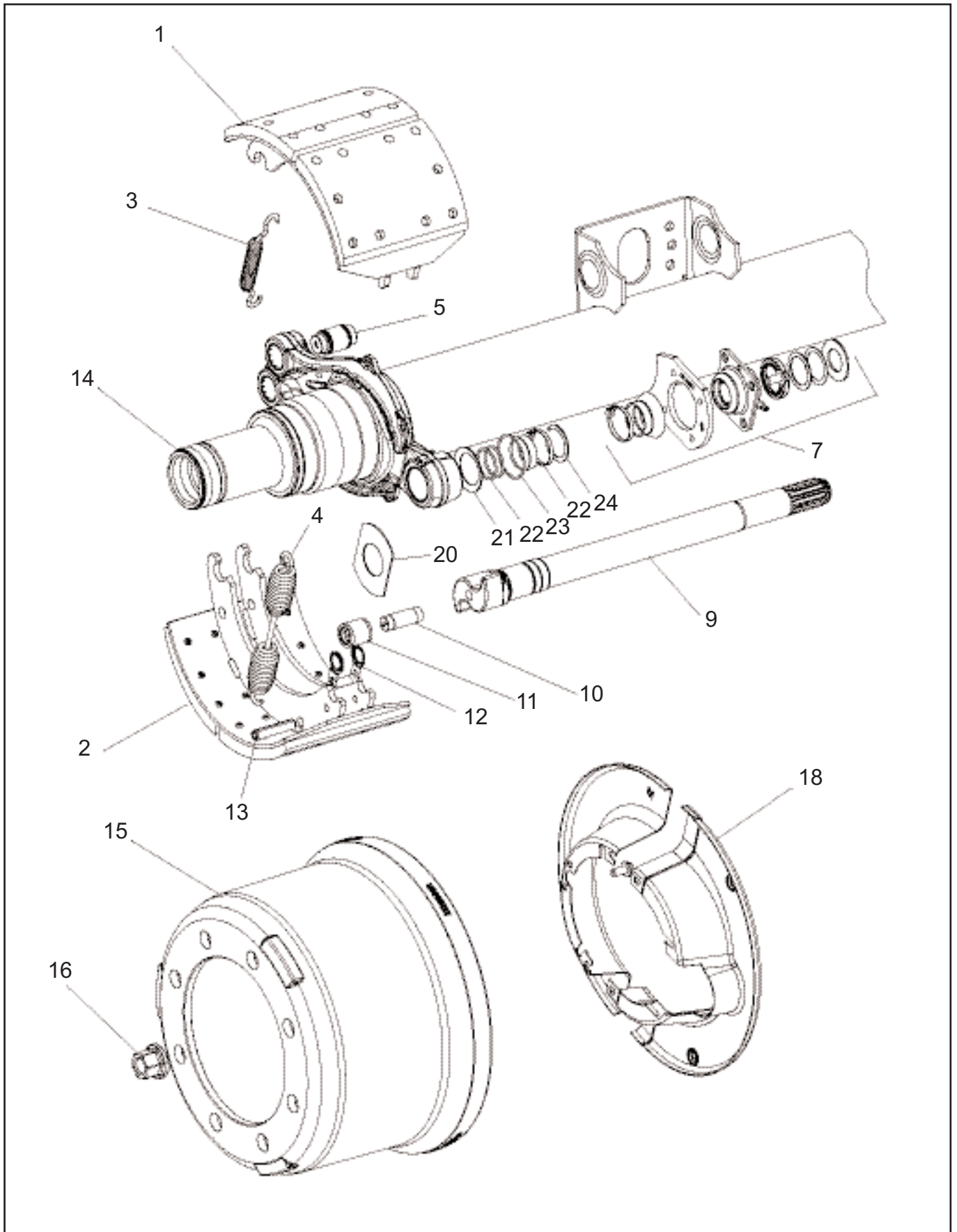


Fig 2.4

2 Introduction

Parts List

(Fig 2.2, Fig 2.3 & Fig 2.4)

Item No.	Description
1	Brake Shoe
2	Brake Shoe
3	Return Spring
4	Return Spring
5	Anchor Pin
6	Anchor Pin Bush
7	Camshaft Bearings - Spine End
8	Camshaft Bearings - Cam Head End
9	Camshaft
10	Cam Roller
11	Cam Roller Sleeve
12	Cam Roller Clip
13	Roll Pin
14	Axle Beam
15	Brake Drum
16	Wheel Nut
17	Dirt Shield
18	Dirt Shield
19	Inspection Grommet
20	Cam Head Washer
21	Bevel Washer
22	Washer - Spacer
23	Rubber Boot
24	Circlip

Inspection & Maintenance

3

- pg. 15 Camshaft & Camshaft Bearing Inspection
- pg. 15 Brake Drum Inspection
- pg. 16 Lining Inspection
- pg. 16 Lubricating Brake Chamber Clevis Pin
- pg. 16 Push Rod Adjustment - Slack Adjuster

3 Inspection & Maintenance

Inspect Camshaft and Camshaft Bearings for Wear

Place a lever between the camshaft and axle beam close to the cam head bearing assembly and lever up and down to detect free movement (Fig. 3.1). This should not exceed 3mm total movement at the bearing (the amount at the lever will depend on the lever length so discretion and judgement is required).

Similarly place the lever between the axle and camshaft close to the cam spline bearing assembly (spherical) at the spline end of the camshaft and lever up and down checking for similar play as at the cam head bearing assembly.

If the play at either bearing exceeds the 3mm value stated above, this suggests wear has occurred. The camshaft and bearings should be replaced as necessary.

Inspect Brake Drum

With the brake drum removed from the vehicle.

Clean excess brake dust from the brake drum and inspect the drum braking surface for corrosion, excessive wear or other damage.



CAUTION: Never use an air line to blow dust from the brake/drum area. If inhaled any form of dust can at best be an irritant, at worst dangerous. Whenever possible remove dry brake dust with a vacuum brush. Alternatively wipe the areas with a damp cloth, never try to accelerate drying time by using an air line.

Remove light corrosion by using coarse emery cloth at an angle of 45 degrees in one direction and then 45 degrees in the other direction to produce a cross hatch effect. **DO NOT USE ANY FORM OF POWER TOOL.**

If the drum braking surface shows signs of light heat crazing it usually can be reused (Fig. 3.2) but if the heat crazing is severe the drum should be replaced. (Fig. 3.3)

Should the drum life be extended by turn-out machining the recommended machining limit should be;

Q+ Drumbrakes 423 mm diameter.

B Drumbrakes 352.5 mm diameter.

During the projected wear-out life of the shoes the final drum diameter must not exceed;

Q+ Drumbrakes 424.0 mm diameter.

B Drumbrakes 353.5 mm diameter.

Excessively worn drums must not be re-assembled with new brake shoes if the diameter exceeds the dimensions below.

Q+ Drumbrakes 423 mm diameter.

B Drumbrakes 352.5 mm diameter.

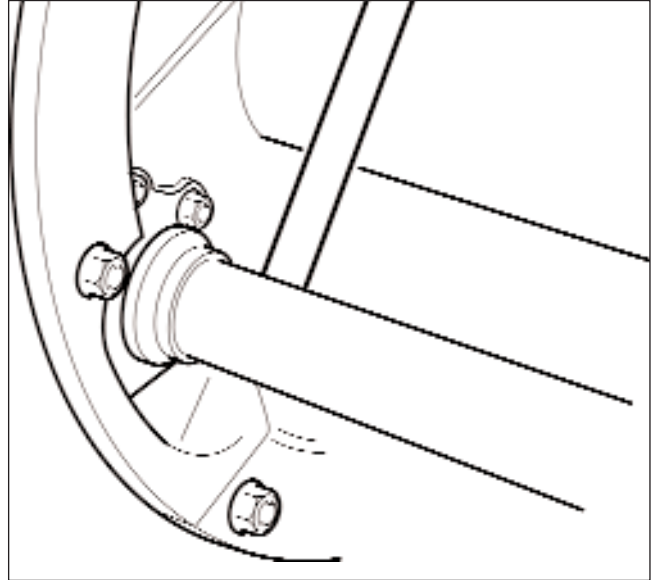


Fig. 3.1

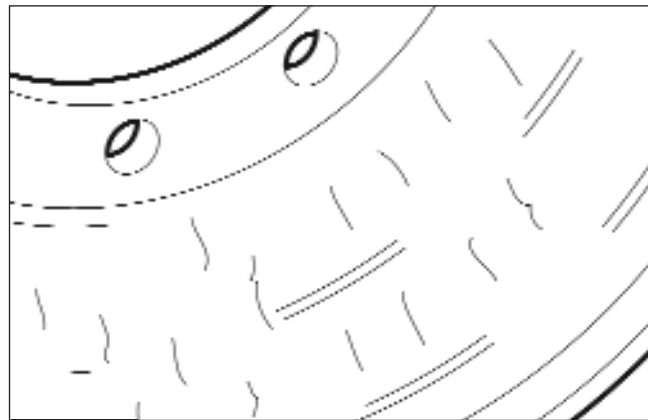


Fig. 3.2

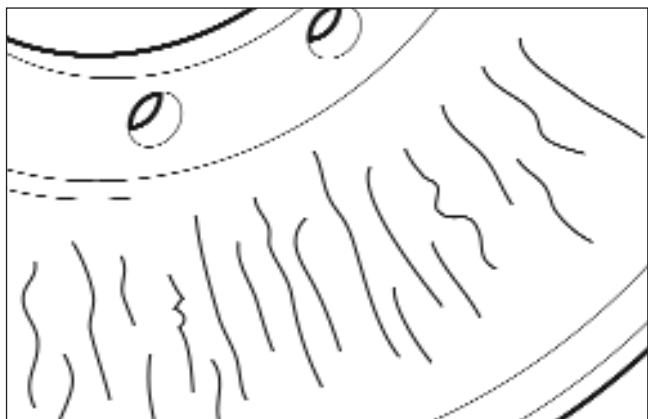


Fig. 3.3

3 Inspection & Maintenance

INSPECT BRAKE LININGS

Do not disturb the brake lining surfaces if these show normal working appearance. Do not contaminate the surface of the linings with grease etc. Clean any compressed lining debris from the rivet holes. The brake lining surface may be carefully cleaned by hand using suitable abrasive paper if contaminated by dirt etc.

DO NOT USE ANY FORM OF POWER TOOL.



CAUTION: Ensure any discarded friction product, or cloth contaminated with brake dust, is disposed

of in accordance with local environmental regulations.

LUBRICATE BRAKE CHAMBER CLEVIS PIN ASSEMBLY

Lubricate the clevis pin assembly from both sides with oil, and make sure the brake can be operated easily by pulling the slack adjuster back by hand

PUSH ROD SETTING LENGTHS FOR MANUAL AND AUTOSLACK ADJUSTERS (Haldex & Meritor HVS)

To ensure the correct installed slack adjuster positions, it is necessary to identify the type of air chamber bracket fitted.

Refer to the table provided below and Figs 3.4 to 3.8 for alternative installation dimensions.

The dimensions shown are from the chamber / bracket interface to the centre of the clevis pin.

NOTE: To ensure maximum articulation is achievable when the clevis is assembled to the brake chamber, No push rod thread should protrude into the clevis throat area.

Follow the published procedure for auto slack installation and setting once these dimensions are set.

Brake Diameter (mm) Axle Series (Illustration Reference)	Slack Adjuster Arm Centres (mm)	ACB Mounting Face to Clevis Pin Centre Dimension A (mm) *	Push Rod Cut Length Dimension B (mm) *
310 TM (Fig 3.4)	127	195	140
	140	212	157
	152	190	135
350 TM & LM (Fig 3.5)	127	164	109
	140	161	106
	152	158	103
350 TM (Fig 3.6)	127	195	140
	140	190	135
	152	186	131
420 LM, TM & TA (Fig 3.7)	127	186	131
	140	181	126
	152	178	123
420 LM, TE & TM (Fig 3.8)	127	172	117
	140	187	132
	152	164	109

* Dimension 'B' is the finished length, including allowance for the clevis throat depth.
e.g. Dimension 'A' minus the throat depth (55mm assumed) equals the cut length dimension 'B'

3 Inspection & Maitenance

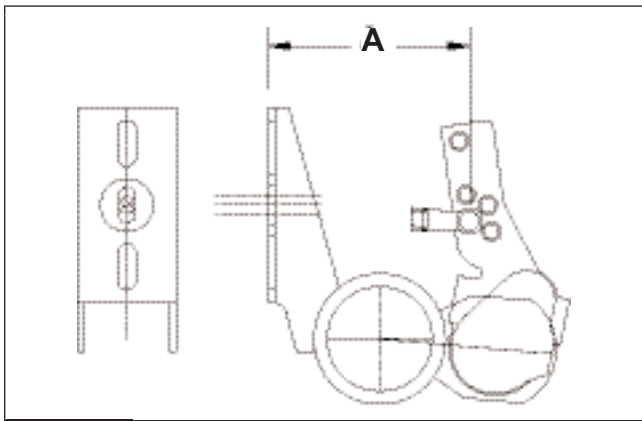


Fig. 3.4

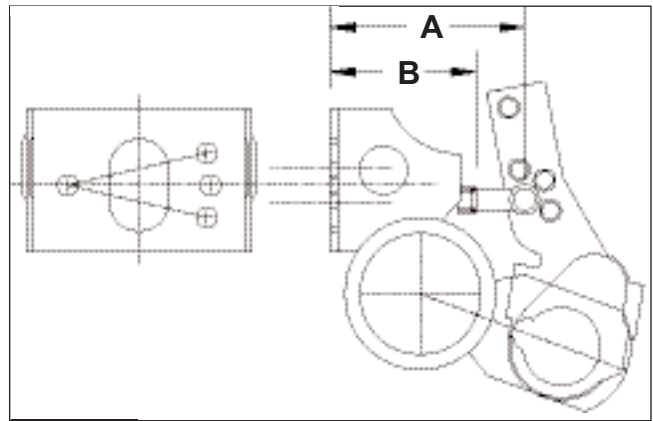


Fig. 3.5

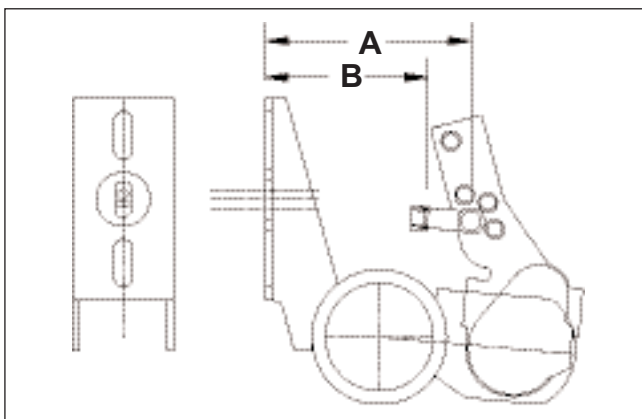


Fig. 3.6

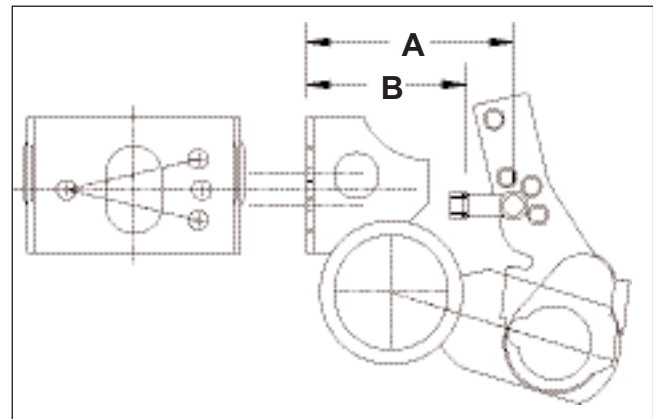


Fig. 3.7

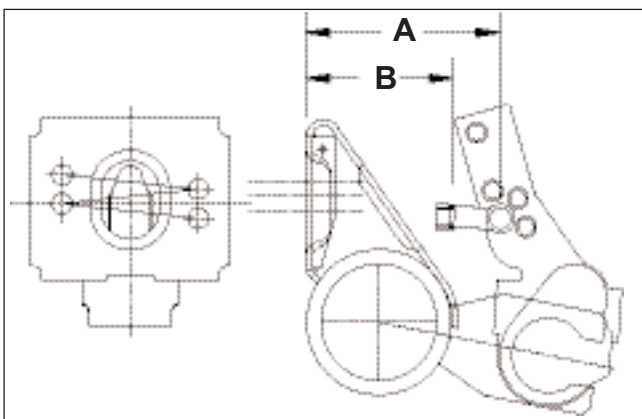


Fig. 3.8

Fig 3.9 provides the correct clevis hole positions X, Y and Z for slack adjusters with 127mm, 140mm and 152mm arm centres .

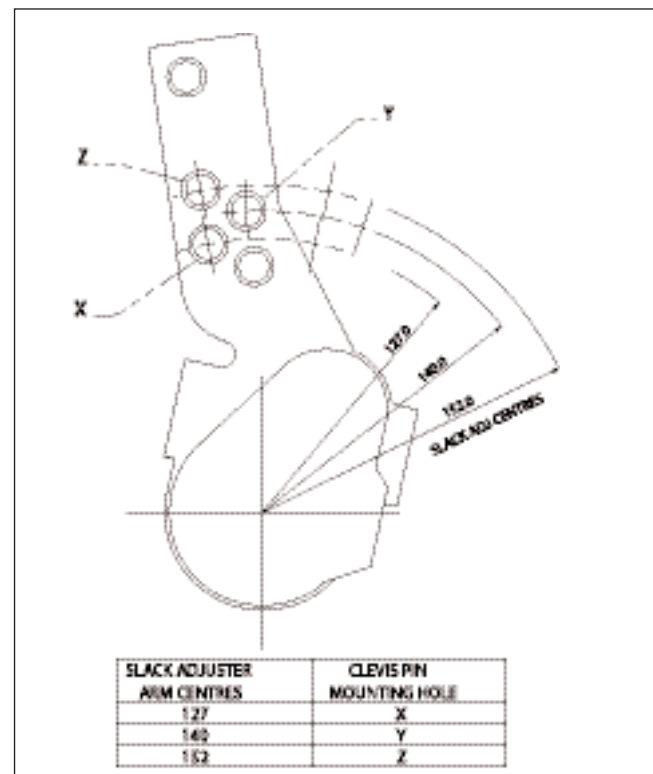


Fig. 3.9

Brake Shoe & Cam Roller Replacement

4

- pg. 19 Removal of Brake Shoes
- pg. 20 Removal of Cam Rollers
- pg. 20 Cleaning & Inspection
- pg. 21 Fitting Brake Shoes
- pg. 23 Brake Adjustment

4 Brake Shoe & Cam Roller Replacement

Raise the vehicle enough to get clearance to remove the wheel and tyre. Support the axle with safety stands. Remove the wheel and tyre.



WARNING: Do not work under a vehicle supported only by jacks. Jacks can slip or fall over and cause serious personal injury. Support the vehicle with safety stands, block the wheels to prevent the vehicle from moving.



CAUTION: Ensure any discarded friction product, or cloth contaminated with brake dust, is disposed of in accordance with local environmental regulations.

DE-ADJUST BRAKES

Using the manual adjustment nut on the slack adjuster fully de-adjust the brake. Follow the appropriate procedure for the type of automatic slack adjuster fitted. Instructions are available through the Meritor Technical Sales Department.

Remove the Brake Drum as described in **Section 7 Brake Drum Replacement**.

Removing Brake Shoes

NOTE: Brake shoes to the latest 'Q Plus' design are NOT interchangeable with original Q type or any other design brake shoes fitted to Meritor products.

Q Plus Brake Shoe Identification

The 'Q plus' brake shoes can easily be identified by two 'plus' shaped holes stamped through the shoe platform (Fig 4.1). The 'Q plus' linings can be identified by the edge markings. Additionally, the 'Q plus' brake shoe and lining have a unique rivet hole pattern.

If refitting the original brake shoes identify the LEADING & TRAILING shoe in order that they are refitted to the same position on re-assembly.

This is not necessary if new brake shoes are to be fitted

Remove the brake shoe retainer spring at the anchor pin side (Fig. 4.2).

Press down on the lower brake shoe to disengage from the anchor pin.

The lower brake shoe can now be lifted to the side of the brake anchor bracket. The upper brake shoe can now be lifted clear of the anchor bracket and both brake shoes, connected by the brake return spring, can be lifted clear of the axle (Fig 4.3).

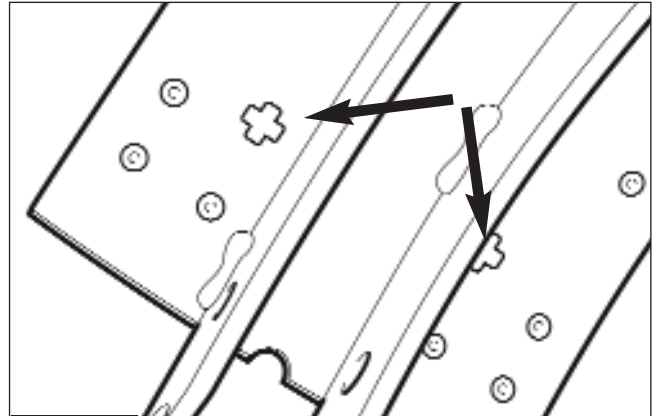


Fig. 4.1

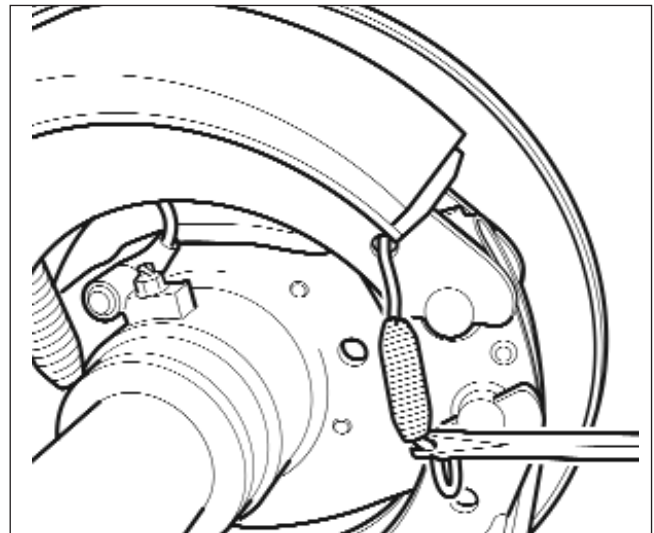


Fig. 4.2

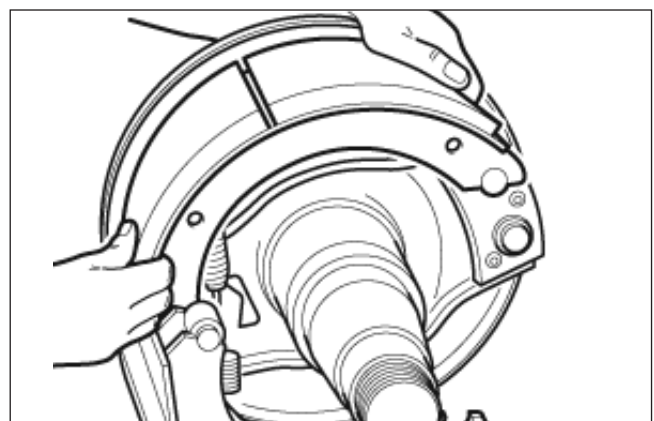


Fig. 4.3

4 Brake Shoe & Cam Roller Replacement

REMOVE CAM ROLLERS FROM BRAKE SHOES

Insert a screwdriver into the hole in the brake shoe gusset and carefully press the retaining tab of the cam roller clip whilst gently pulling the roller. Keeping pressure on the cam roller turn the brake shoe over and repeat on the other side. The cam roller and clip will now pull out from the shoe (Fig. 4.4).

Remove the clip from the roller and examine for damage to the retaining tabs.

Remove the pin from the roller, LM applications only (Fig. 4.5).

NOTE: TM applications use a one piece cam roller assembly (Fig 4.6)

If there is any doubt in the suitability for further service replace with new components

Cleaning & Inspection



CAUTION: Ensure any grease removed from the assembly/components, or contaminated cloth, is disposed of in accordance with local environmental regulations.

CLEAN CAM ROLLERS AND ANCHOR PINS

The working surfaces of the cam rollers, cam roller pins and the anchor pins should be cleaned to remove any build up of compressed debris.

Where applicable, check and replace the O rings fitted to the anchor pins as required.

Care should be taken to avoid damage. Do not use abrasives as surface damage will result.

CLEAN ANCHOR BRACKET AND ANCHOR PIN BUSHES

Clean each side of the anchor bracket in the area of the anchor pin bushes, clean the bore of the anchor pin bushes. If there is any doubt in the suitability for further service replace as detailed in **Section 6**

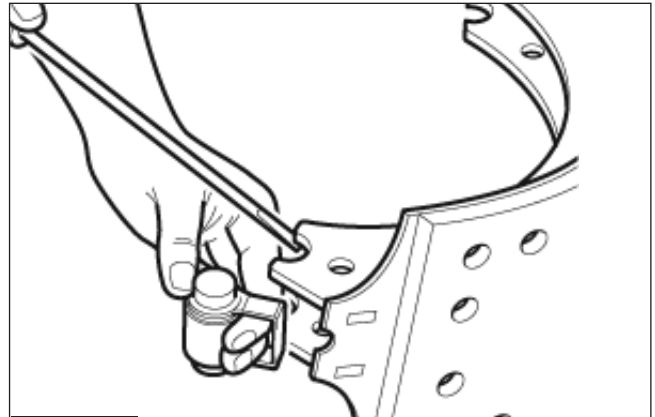


Fig. 4.4

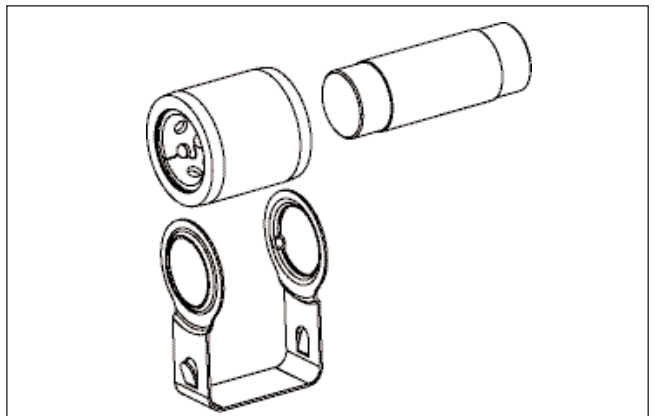


Fig. 4.5

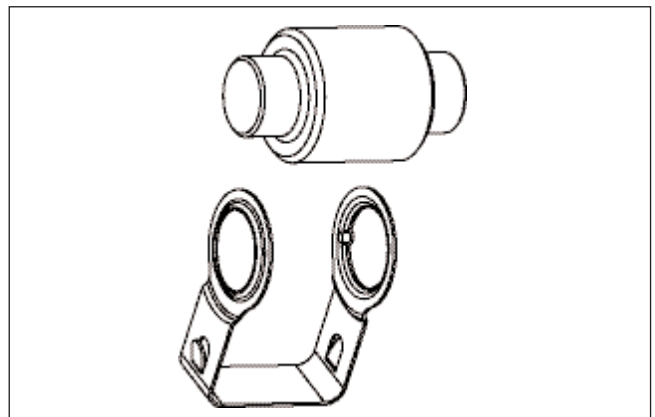


Fig. 4.6

4 Brake Shoe & Cam Roller Replacement

CLEAN AND REPOSITION ABS SENSOR

If the axle is fitted with an ABS sensor system, clean the exposed portion of the sensor and then push the sensor from the rear until it contacts the pole wheel (Fig. 4.7).

BRAKE RETURN SPRINGS

Inspect the brake return spring and retaining springs for damage.

ANY SPRING SHOWING SIGNS OF COIL SEPARATION MUST BE REPLACED.

INSPECT CAMSHAFT AND CAMSHAFT BEARINGS FOR WEAR

Place a lever between the camshaft and axle beam close to the cam head bearing and lever up and down to detect free movement (Fig. 4.8).

This should not exceed 3.0mm total movement at the bush (the amount at the lever will depend on the lever length so discretion and judgement is required).

Similarly place the lever between the axle and camshaft close to the spherical bearing at the spline end of the camshaft and lever up and down checking for similar play as at the cam head bearing.

If the play exceeds the above amount this suggests wear has occurred and the camshaft and bearings should be replaced as necessary.

Fitting Brake Shoes

RE-ASSEMBLE CAM ROLLERS AND ANCHOR PINS

Lubricate anchor pins and bushes with Meritor Brake Lubricant. (Fig. 4.9)



CAUTION:

Only use the grease supplied with replacement components/kits, or that specified. Under no circumstance should any other type of grease be used.

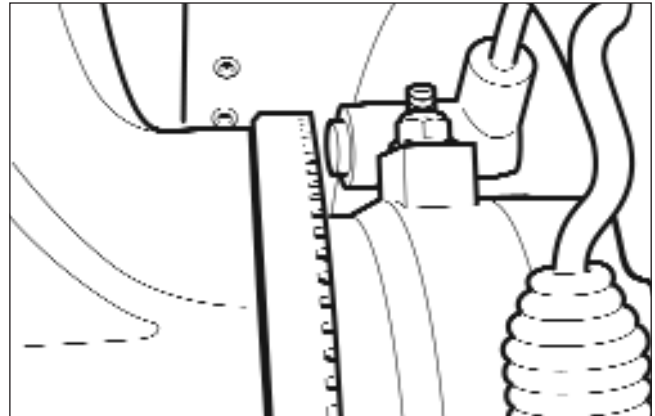


Fig. 4.7

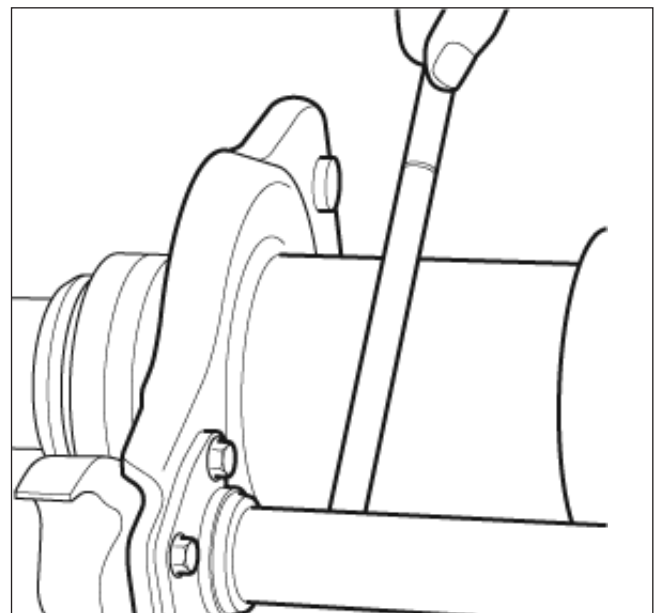


Fig. 4.8



Fig. 4.9

4 Brake Shoe & Cam Roller Replacement

Push both anchor pins into their bushes in the brake anchor bracket (Fig 4.10).

Push the cam roller pins into their sleeves (LM applications only) (Fig. 4.11).

Assemble the cam roller clips to the rollers Fig 4.12).

RE-ASSEMBLE BRAKE SHOES

Clean any corrosion from both the anchor pin and the cam roller pivot areas of the brake shoes using emery cloth.

Fit the cam roller and clip assembly into the brake shoe, ensuring the locking clips engage securely into the location holes in the brake shoe.

Lubricate the 'D' holes of the brake shoes with ROR high performance brake lubricant (Fig 4.13).

Fit the double coil brake return spring over the roll pin of the top brake shoe.

NOTE: If refitting the original brake shoes ensure they are refitted in the correct LEADING / TRAILING shoe positions.



Fig. 4.10

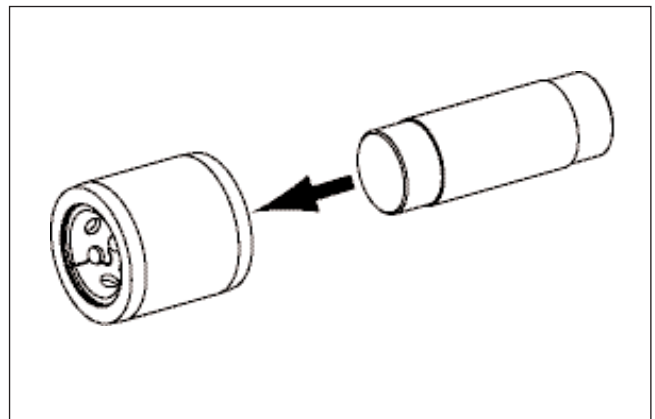


Fig. 4.11

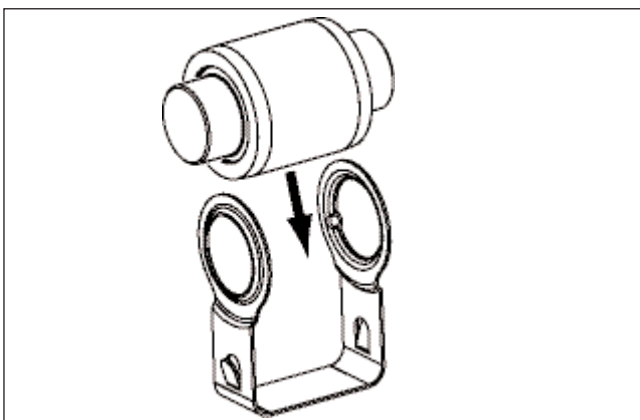


Fig. 4.12

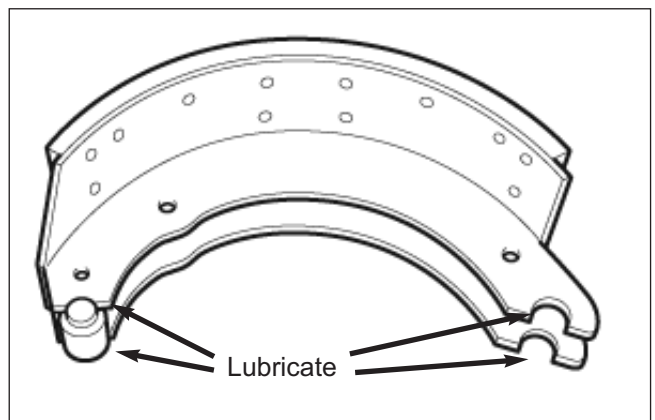


Fig. 4.13

4 Brake Shoe & Cam Roller Replacement

Place the roller of the upper shoe in the dwell of the cam head and locate the "D" slots onto the top anchor pin (Fig 4.14).

Attach the return spring to the lower brake shoe.

Tilt the lower brake shoe and locate the cam roller in the lower cam head dwell and locate the "D" slots onto the shoulders of the lower anchor pin Fig 4.15).

Fit the second brake shoe retainer spring to the top and bottom brake shoes (Fig. 4.16).

With the shoes sitting correctly on the cam head apply the brake several times by manually pulling on the slack adjuster.

Ensure the brake linings are clean, wiping, if necessary, with clean absorbent paper.

Refit the Brake Drum as detailed in **Section 7 Brake Drum Replacement**.

Refit the road wheel tightening the wheel bolts to the torque specified in **Section 8 Torque Values**.

Brake Adjustment

Manual Slack Adjusters:

Using the manual adjustment nut on the slack adjuster, adjust the brake until the wheel can not be turned by hand. Where applicable, ensure the locking sleeve around the adjustment nut is fully depressed.

Back off the adjustment until it is just possible to freely turn the wheel without resistance from the brake linings. Ensure the locking sleeve has re-engaged.

Automatic Slack Adjusters:

Follow the appropriate setting procedure for the type of automatic slack adjuster fitted. Instructions are available through the Meritor Technical Sales Department.

All measurements are made with the brakes in the **OFF POSITION**.

Ø 420 Brakes LM, TE, TM Post - 97.

For installation and adjustment of Meritor ASA's, Refer to Meritor Auto Slack Brochure, Publication No. 4.61.2

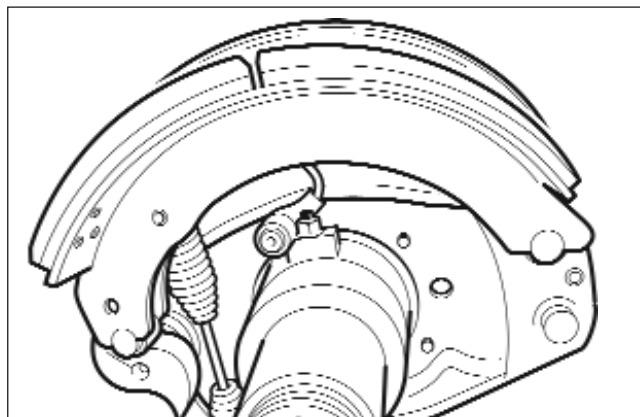


Fig. 4.14

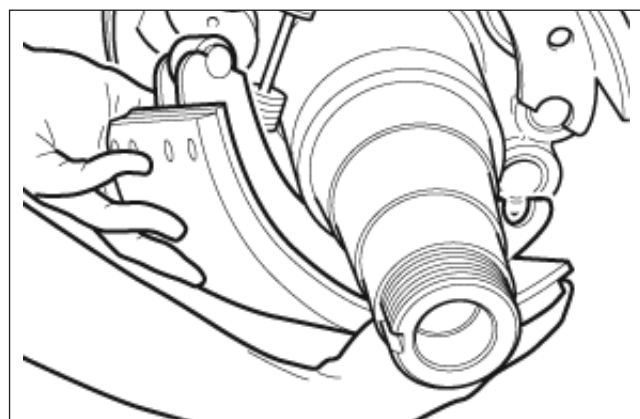


Fig. 4.15

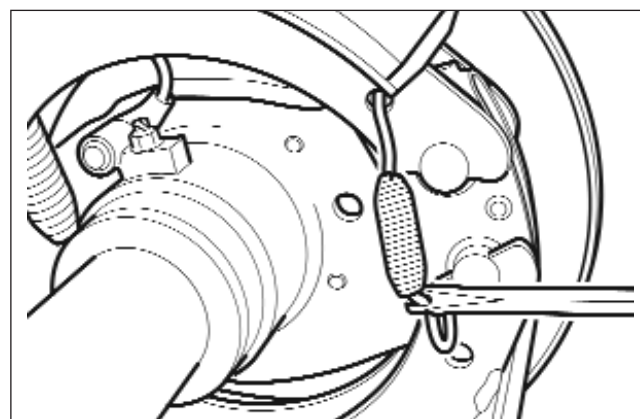


Fig. 4.16

Camshaft & Bearing Replacement

5

- pg. 25 Camshaft & Bearing Replacement - Pre Sept 1999
Axles
- pg. 27 Camshaft & Bearing Replacement - Post Sept 1999
Axles
- pg. 32 Camshaft Bush Replacement - Forged Anchor
Brackets

5 Camshaft & Bearing Replacement

Raise the vehicle enough to get clearance to remove the wheel and tyre. Support the axle with safety stands. Remove the wheel and tyre.



WARNING: Do not work under a vehicle supported only by jacks. Jacks can slip or fall over and cause serious personal injury. Support the vehicle with safety stands, block the wheels to prevent the vehicle from moving.

Remove the brake drum as described in **Section 7 Brake Drum Replacement**. Remove the brake shoes as detailed in **Section 4 Brake Shoe Replacement**

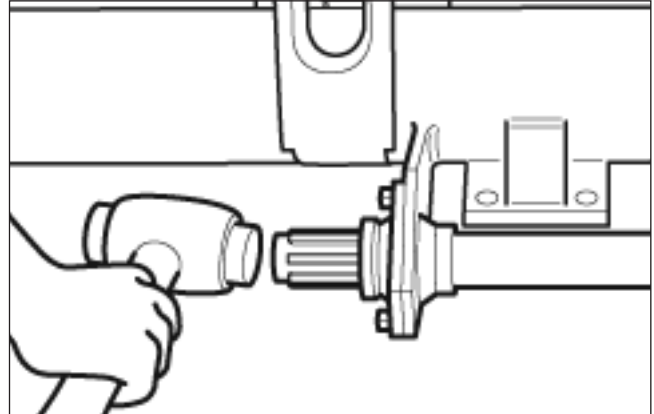


Fig. 5.1

CAMSHAFT AND CAMSHAFT BEARING REPLACEMENT (pre September 1999 axles only)

Camshaft and Camshaft Bearing Removal

With Dust Covers Fitted:

Remove the clevis pin connecting the slack adjuster to the brake chamber and rotate the slack adjuster out of the clevis by turning the adjusting nut.

Refer to the appropriate procedure for the type of slack adjuster fitted. Remove the circlip, packing washers, slack adjuster and outer rubber boot from the camshaft.

Release the clips from the spherical bearing and cam head bearing rubber boots.

Release the camshaft from the cam head bearing retaining clip by striking the end of the shaft with a copper faced hammer (Fig. 5.1).

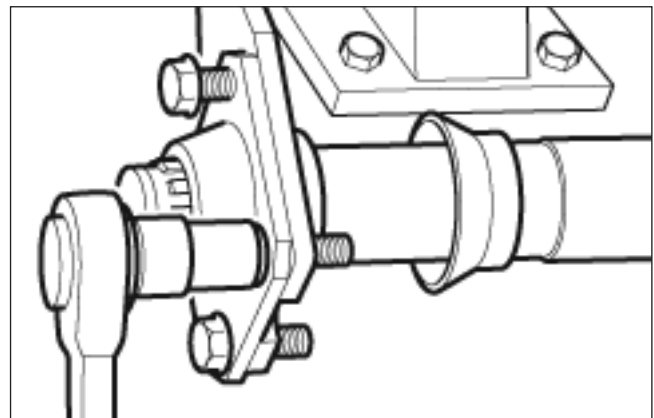


Fig. 5.2



CAUTION: The camshaft has a hardened surface. DO NOT use a conventional hammer to strike any area of the camshaft.

Remove the M10 retaining screws securing the spline end spherical bearings (Fig. 5.2), and where applicable, cam head bearings and remove the spline end spherical bearing assembly from the camshaft.

NOTE: If the cam head spherical bearing is to be re-used, remove all paint and/or corrosion and thoroughly clean the full length of the camshaft prior to removal.

The camshaft can now be removed by sliding it forwards through the brake anchor bracket, tilting it to pass between the scallops of the hub (Fig. 5.3).

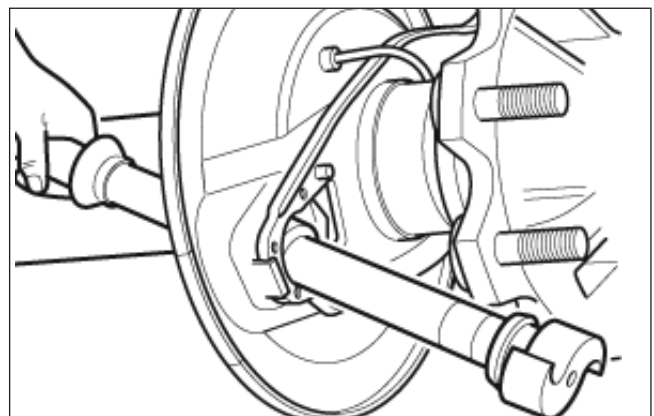


Fig. 5.3

5 Camshaft & Bearing Replacement

With Dust Covers Removed:

Remove the dust cover by releasing the two M10 screws and the two M8 flange nuts (Fig. 5.4). Release the ABS sensor cable strain relief bush and pass the cable through the dust cover.

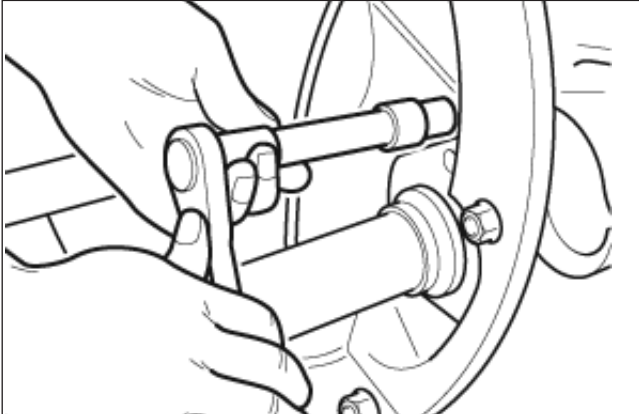


Fig. 5.4

The two M10 screws securing the cover plate should now be removed and the camshaft removed rearwards through the keyhole slot in the brake anchor bracket (Fig. 5.5).

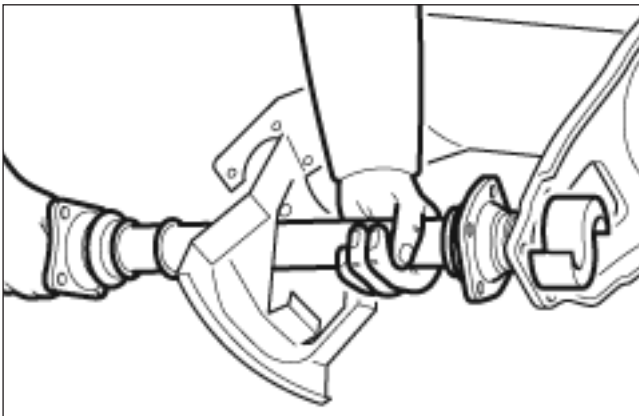


Fig. 5.5

Camshaft and Camshaft Bearing Fitment



CAUTION: Ensure any grease removed from the assembly/components, or contaminated cloth, is disposed of in accordance with local environmental regulations.

With Dust Covers Fitted:

Clean the full length of the camshaft prior to assembly.

Ensure the faces of the anchor bracket and camshaft bracket are clean.

Slide the under-head rubber boot onto the camshaft. Pass the camshaft through the brake anchor bracket from the outboard side, slide the cam head bearing (where applicable), inner rubber boots and spline end spherical bearing onto the camshaft.

Fasten both camshaft bearings in place using the M10 screws.

DO NOT FULLY TIGHTEN THE BEARING SECURING SCREWS UNTIL THE BRAKE SHOES ARE RE-ASSEMBLED.

A hard tap on the cam head with a copper mallet will be required to locate the spring clip into the camshaft groove.

With the camshaft in position refit the spline end rubber boot, slack adjuster, packing washers and circlip.

With Dust Covers Removed:

Clean the full length of the camshaft prior to assembly. Slide the underhead rubber boot onto the camshaft, lightly grease the cam head journal and slide the cam head bearing onto the camshaft towards the cam head until the spring clip is ready to engage in the groove (light resistance will be felt).

Slide the inner rubber boots, cover plate and spline end spherical bearing onto the camshaft.

Ensure the faces of the anchor bracket and camshaft bracket are clean.

Pass the cam head through the key hole slot in the brake anchor bracket and slide the spline end through the cam bracket slot. Fasten both camshaft bearings in position using the M10 screws

DO NOT FULLY TIGHTEN THE BEARING SECURING SCREWS UNTIL THE BRAKE SHOES ARE RE-ASSEMBLED.

5 Camshaft & Bearing Replacement

Ensure the filler plate locating tag is engaged around the end of the anchor bracket and secure with two M10 screws. Tighten to the torque specified in **Section 8 Torque Values**.

Fit the one piece dust cover (Fig. 5.6) ensuring it is correctly located onto the two filler plate studs. Tighten the two M10 screws and the two M8 nuts to the torque values specified in **Section 8 Torque Values**.

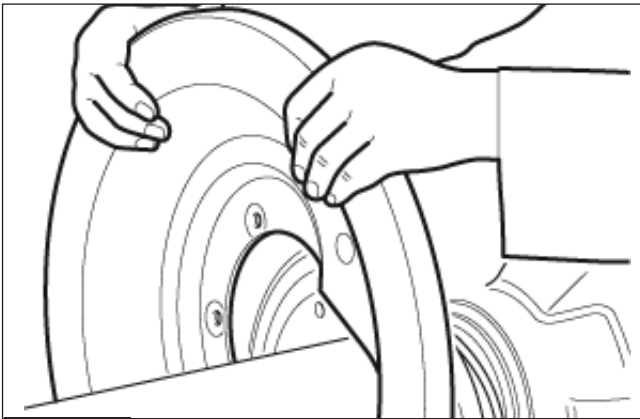


Fig. 5.6

CAMSHAFT AND CAMSHAFT BEARING REPLACEMENT

(post September 1999 axles only)

Camshaft and Camshaft Bearing Removal

Remove the slack adjuster split pin and clevis pin (Fig 5.7).

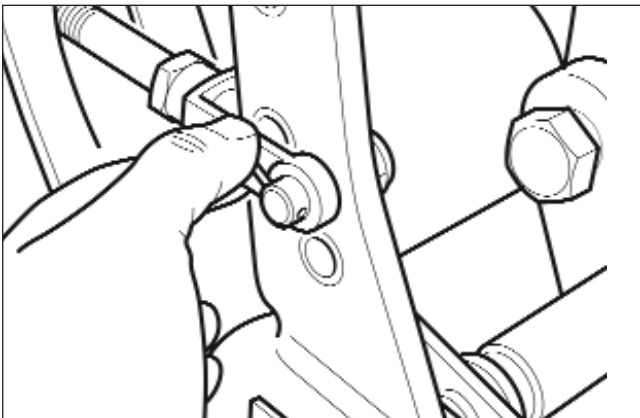


Fig. 5.7

Remove the circlip retaining the slack adjuster to the camshaft (Fig 5.8).

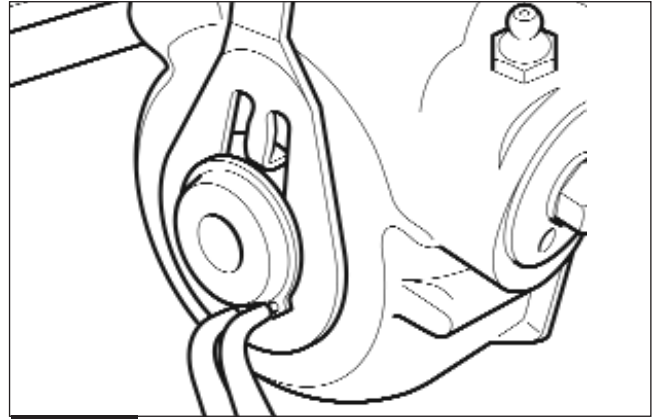


Fig. 5.8

Remove the brake shoe lining wear indicator from the spline end of the camshaft and place to one side for re-use (Fig 5.9).

Remove the slack adjuster.

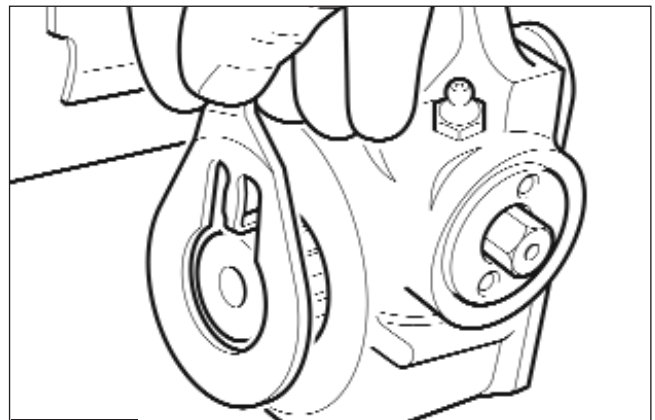


Fig. 5.9

Remove the spline end bearing assembly seal (Fig 5.10).

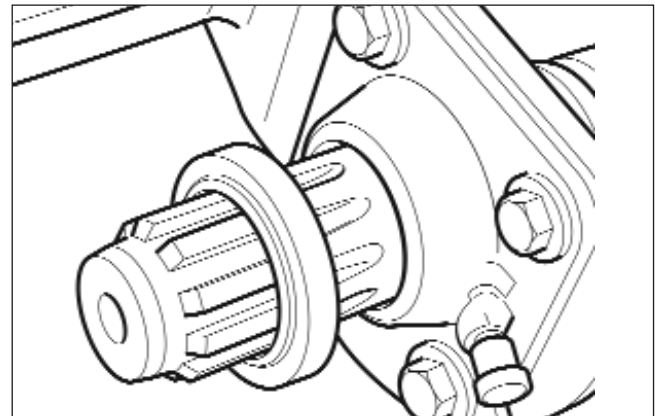


Fig. 5.10

5 Camshaft & Bearing Replacement

Carefully cut and remove the cable ties retaining the bearing dust excluders at the spline end and cam head end of the camshaft (Fig 5.11).

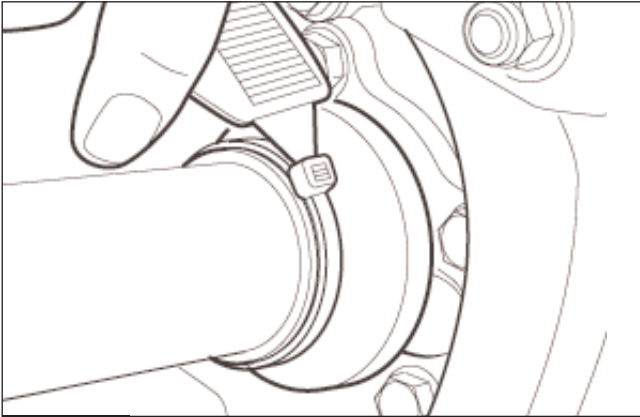


Fig. 5.11

Carefully peel back the dust excluder to gain access to the E clip which retains the camshaft in the cam head bearing assembly.

Remove the E clip (Fig 5.12).

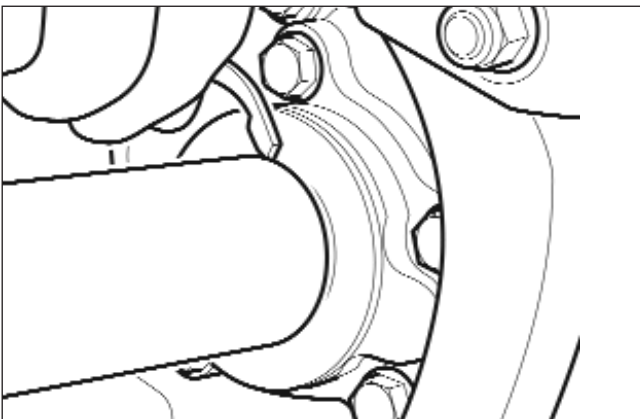


Fig. 5.12

Using a copper faced hammer strike the spline end of the camshaft to release it from the inner and outer bearing assemblies (fig 5.13).



CAUTION: The camshaft has a hardened surface. DO NOT use a conventional hammer to strike any area of the camshaft.

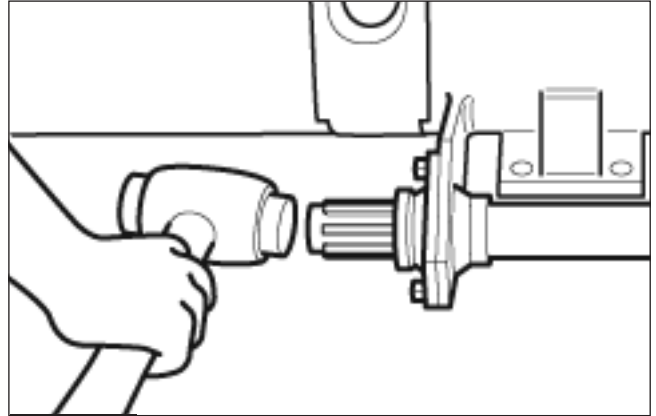


Fig. 5.13

NOTE: If the cam head bearing assembly is to be re-used, remove all paint and/or corrosion and thoroughly clean the full length of the camshaft prior to removal.

Carefully slide the camshaft out of the spline end and cam head end bearing assemblies, removing both bearing assembly dust covers and the cam head spacer washer during the process.

NOTE: The cam head bearing seal will be removed with the camshaft (Fig 5.14).

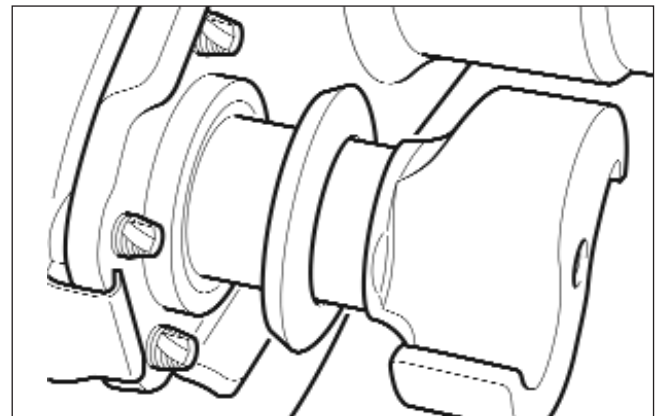


Fig. 5.14

Remove the cam head bearing seal from the camshaft.

Remove the M10 retaining screws securing the spline end bearing assembly, and remove the bearing assembly.

Remove the M10 retaining screws securing the cam head end bearing assembly, and remove the bearing assembly.

5 Camshaft & Bearing Replacement

Camshaft and Camshaft Bearing Fitment

Ensure the faces of the anchor bracket and camshaft bracket are clean.



CAUTION: Ensure any grease removed from the assembly/components, or contaminated cloth, is disposed of in accordance with local environmental regulations.

locate the spline end bearing assembly in position in the camshaft bracket and secure with the M10 retaining screws (Fig 5.15).

DO NOT FULLY TIGHTEN THE BEARING SECURING SCREWS UNTIL THE BRAKE SHOES ARE RE-ASSEMBLED.

locate the cam head end bearing assembly in position in the anchor bracket and secure with the M10 retaining screws.

DO NOT FULLY TIGHTEN THE BEARING SECURING SCREWS UNTIL THE BRAKE SHOES ARE RE-ASSEMBLED.

Smear a small amount of grease to the bearing journals of both spline end and cam head end bearing assemblies to aid camshaft fitment.



CAUTION: Only use the grease supplied with replacement components/kits, or that specified. Under no circumstance should any other type of grease be used.

Clean the full length of the camshaft prior to assembly.

Fit a new cam head bearing seal onto the camshaft, ensuring it is in the correct orientation (Fig 5.16). Carefully slide the seal along the camshaft until it abuts the cam head (Fig 5.17).

Carefully slide the spline end of the camshaft through the cam head bearing assembly.

While supporting the camshaft, slide the cam head spacer washer along the camshaft towards the cam head (Fig 5.18).

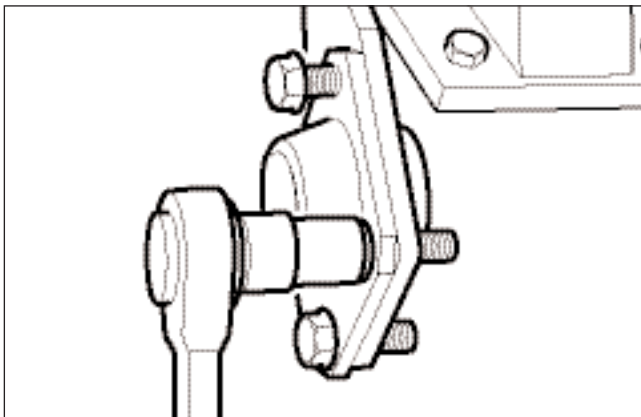


Fig. 5.15

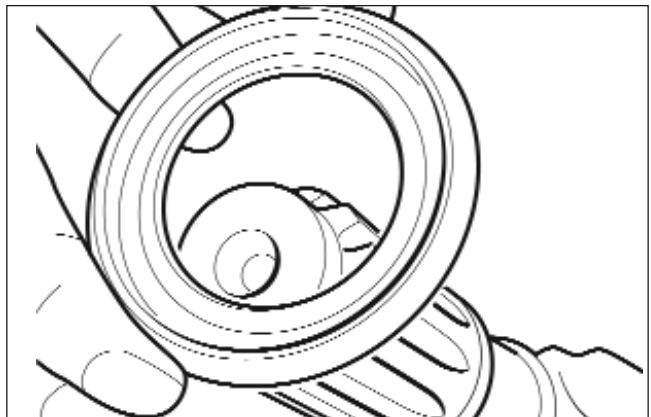


Fig. 5.16

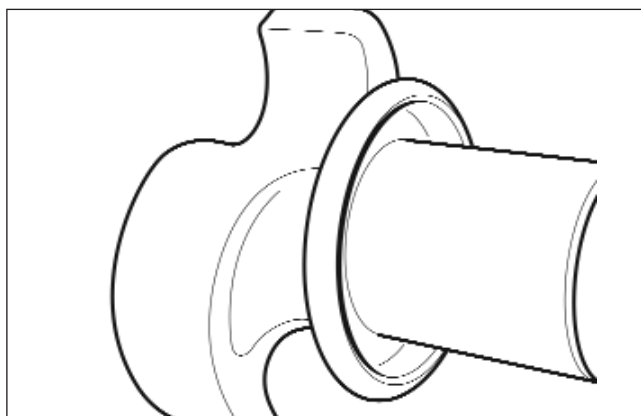


Fig. 5.17

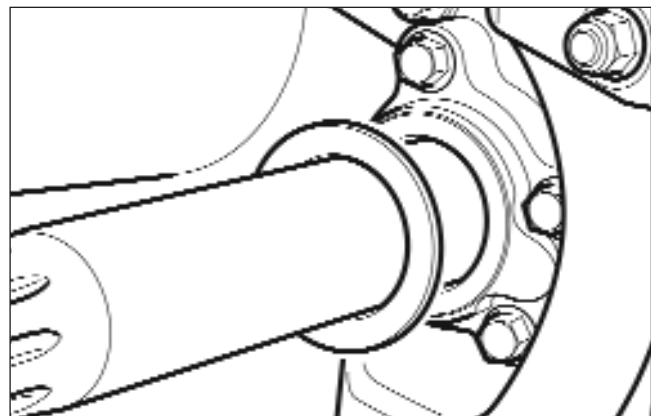


Fig. 5.18

5 Camshaft & Bearing Replacement

Fit both bearing dust excluders onto the camshaft in the correct orientation (Fig 5.19).

IMPORTANT: The dust excluder with the extended shoulder **A** on the larger diameter (Fig 5.19) must be fitted to the cam head bearing.

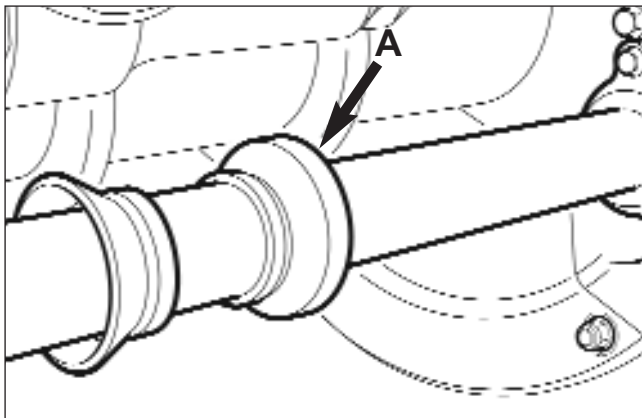


Fig. 5.19

Slide the camshaft through the spline end bearing assembly.

Using a copper faced hammer, tap the cam head to locate the camshaft correctly in the bearing assemblies.

Locate the cam head spacer washer against the cam head bearing and secure the camshaft to the bearing assembly with a new E clip (Fig 5.20).

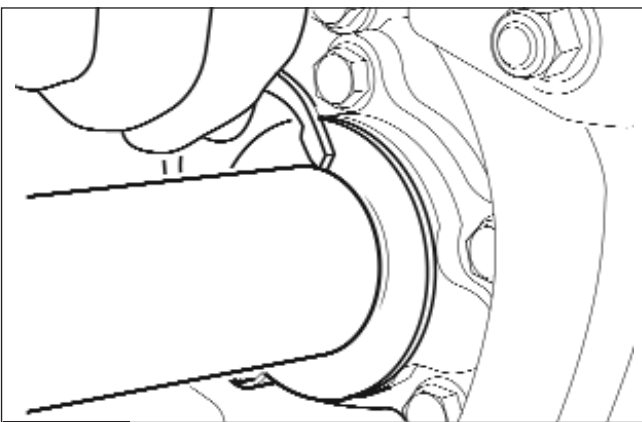


Fig. 5.20

Fit a new spline end bearing seal (Fig 5.21).

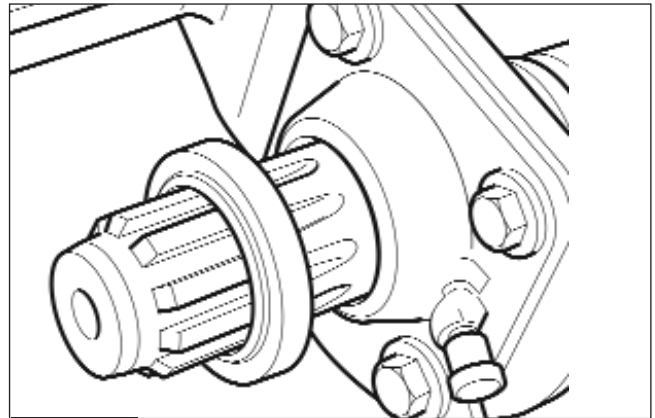


Fig. 5.21

Refit the slack adjuster onto the camshaft.

Refit the brake lining wear indicator onto the camshaft and retain with a new circlip. (Fig 5.22).

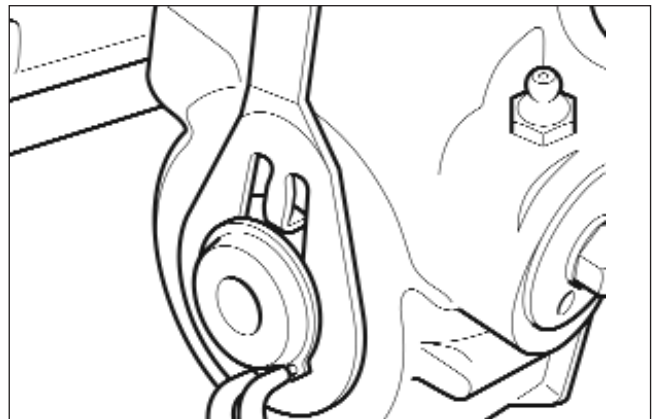


Fig. 5.22

Locate the dust excluders correctly onto the bearing assemblies and secure with new tie wraps.

Refit the slack adjuster clevis pin and secure with a new split pin.

5 Camshaft & Bearing Replacement

CAMSHAFT BUSH REPLACEMENT (FORGED ANCHOR BRACKET)

Remove the original camshaft bush, using a suitable drift tool where necessary.

NOTE: Meritor HVS recommends replacing the plastic bushes with phosphor bronze bushes. These are available in four sizes as detailed below:

- 21204703 – old type camshafts
- 21209990 – new type “stepped” camshafts
- 21209623 – oversize bush for old type camshaft bores after reaming
- 21213259 – oversize bush for stepped camshaft

It is necessary for the phosphor bronze bush to be a tight press fit into the anchor bracket. Should the anchor bracket be worn (Fig. 5.23) it will be necessary to machine the cam bore to accommodate the oversize phosphor bronze cam bush (part number 21213259). If it is necessary to fit oversize cam bushes the anchor bracket ArvinMeritor CVA reamer tool should be used and is available as follows:

Part Number	Description
MST 3214	Cutter
MST 3215	Shaft
MST 3216	Sleeve
MST 3217	Pins (two required)
MST 3218	Jig for 310mm diameter brakes
MST 3219	Jig for 350mm diameter brakes
MST 3220	Jig for 394mm diameter brakes
MST 3221	Jig for 420mm diameter brakes

Replace the cam bushings using ArvinMeritor CVA service tool MST 3212 (Fig. 5.24). The cam bush must be inserted from camhead side of anchor bracket.

IMPORTANT: When fitting cam bush the cross holes must be towards the cam head, as shown (Fig. 5.25).

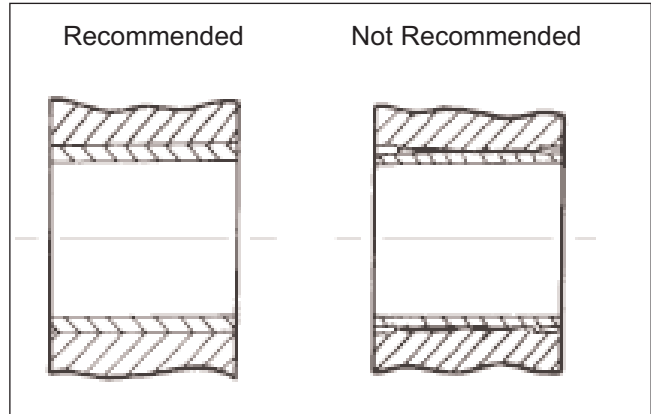


Fig. 5.23

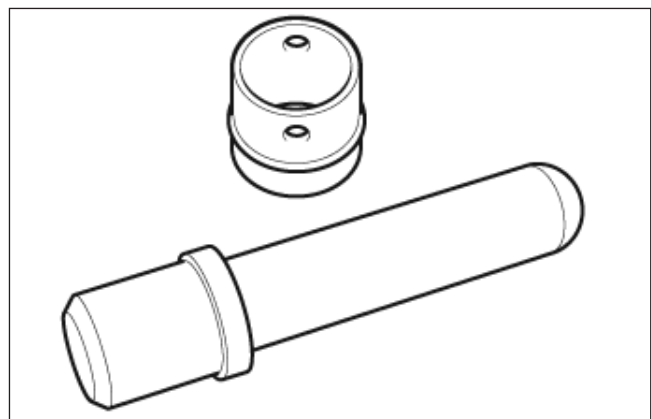


Fig. 5.24

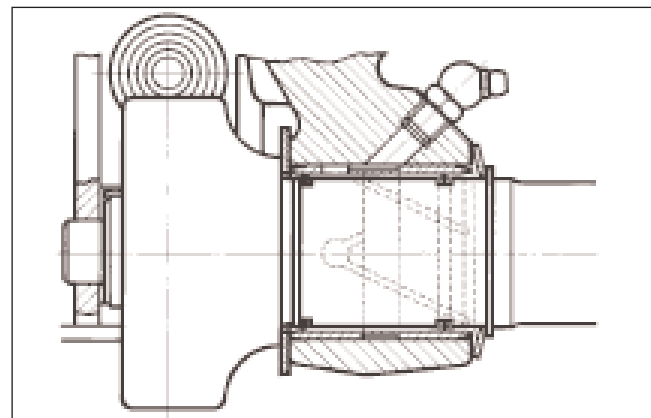


Fig. 5.25

5 Camshaft & Bearing Replacement

ALL VARIANTS

Refit the brake shoes as detailed in **Section 4 Brake Shoe Replacement**

Tighten the camshaft bearing securing screws to the torque value provided in **Section 8 Torque Values**.

GREASE CAMSHAFT BEARINGS

Grease the camshaft bearings using a grease gun.



CAUTION: Only use the grease supplied with replacement components/kits, or that specified.

Under no circumstance should any other type of grease be used.

Refit the Brake Drum as detailed in **Section 7 Brake Drum Replacement**

Refit the road wheel tightening the wheel bolts to the torque specified in **Section 8 Torque Values**.


Anchor Pin & Bush Replacement

6

- pg. 34 Removal of Anchor Pins
- pg. 34 Replacement of Anchor Pin Bushes
- pg. 35 Fitting Anchor Pins

6 Anchor Pin & Bush Replacement

Raise the vehicle enough to get clearance to remove the wheel and tyre. Support the axle with safety stands. Remove the wheel and tyre.

 **WARNING:** Do not work under a vehicle supported only by jacks. Jacks can slip or fall over and cause serious personal injury. Support the vehicle with safety stands, block the wheels to prevent the vehicle from moving.


Remove the Brake Drum as detailed in **Section 7 Brake Drum Replacement**

Remove the brake shoes as detailed in **Section 4 Brake Shoe Replacement**

REMOVAL OF ANCHOR PINS

Remove both anchor pins by sliding out of their bushes in the brake anchor bracket (Fig. 6.1).

CLEAN ANCHOR BRACKET AND ANCHOR PIN BUSHES

 **CAUTION:** Ensure any grease removed from the assembly/components, or contaminated cloth, is disposed of in accordance with local environmental regulations.

Using a wire brush, clean each side of the anchor bracket in the area of the anchor pin bushes, clean the bore of the anchor pin bushes.

REPLACEMENT OF ANCHOR PIN BUSHES

NOTE: ArvinMeritor CVA Anchor Pin Bush Removal Drift part no. MST 3101 and Intallation Tool part no. MST 3102 are required for removing and replacing bushes in axles manufactured after April 2000 and for any replacement of the latest bush being fitted to older axles. (Fig.6.2)

Drift out the anchor pin bushes from the anchor bracket using ArvinMeritor CVA Drift Tool pt. No. MST 3101 (Fig 6.3)

Fit the new anchor pin bushes into the anchor bracket using the ArvinMeritor CVA installation tool part No. MST 3102.



Fig. 6.1

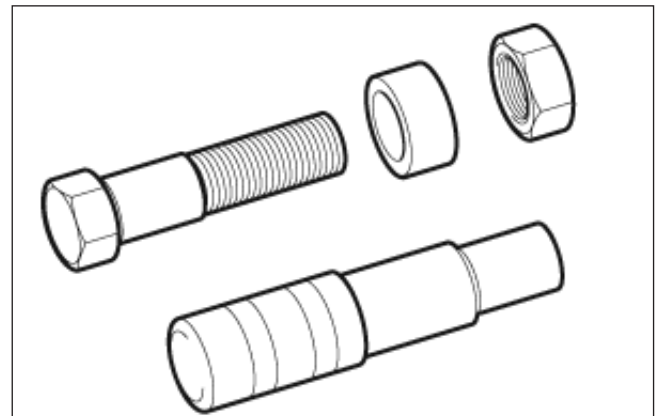


Fig. 6.2

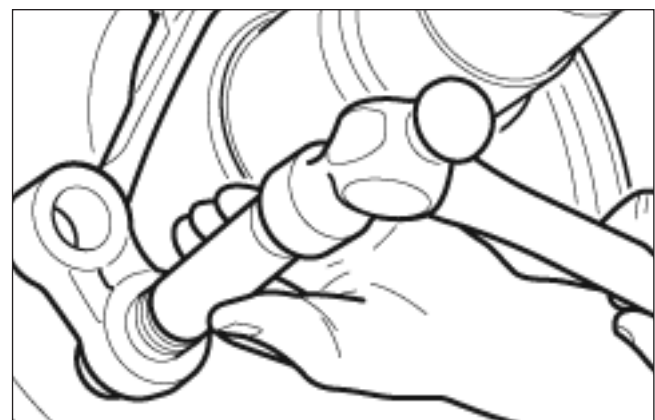


Fig. 6.3

6 Anchor Pin & Bush Replacement

FITTING ANCHOR PIN BUSHES

Apply a small amount of Meritor Brake Lubricant to the bores of the anchor pin bushes and a light covering to both sides of the anchor bracket around the anchor pin bushes. Push the anchor pins into position in the anchor bracket (Fig 6.4). Where applicable, fit new O rings to the anchor pins (Fig 6.5).



CAUTION

Only use the grease supplied with replacement components/kits, or that specified. Under no circumstance should any other type of grease be used.

Refit the brake shoes as detailed in **Section 4 Brake Shoe Replacement**

Refit the Brake Drum as detailed in **Section 7 Brake Drum Replacement**

Refit the road wheel tightening the wheel bolts to the torque specified in **Section 8 Torque Values**



Fig. 6.4

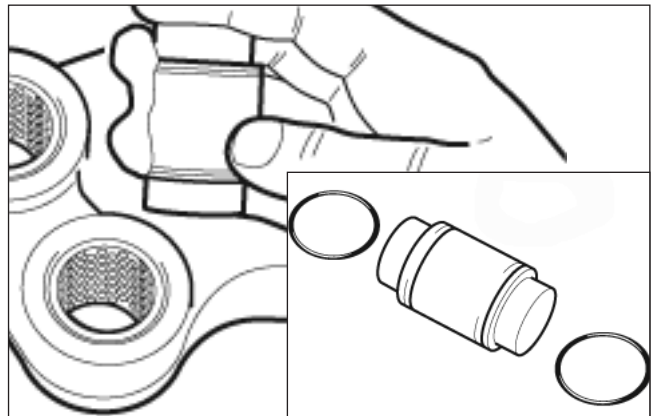


Fig. 6.5

Brake Drum Replacement

7

pg.38 Brake Drum Removal
pg. 38 Fitting the Brake Drum

7 Brake Drum Replacement

Raise the vehicle enough to get clearance to remove the wheel and tyre. Support the axle with safety stands. Remove the wheel and tyre.



WARNING: Do not work under a vehicle supported only by jacks. Jacks can slip or fall over and cause serious personal injury. Support the vehicle with safety stands, block the wheels to prevent the vehicle from moving.

DE-ADJUST BRAKES

Using the manual adjustment nut on the slack adjuster fully de-adjust the brake. Follow the appropriate procedure for the type of automatic slack adjuster fitted. Instructions are available through the Meritor Technical Sales Department.

BRAKE DRUM REMOVAL

Use two suitable M12 x 1.75 screws to jack the brake drum face from the hub. The screws should be tightened evenly to prevent the drum from jamming on the hub spigot (Fig. 7.1).

The brake drum can then be lifted clear of the hub.

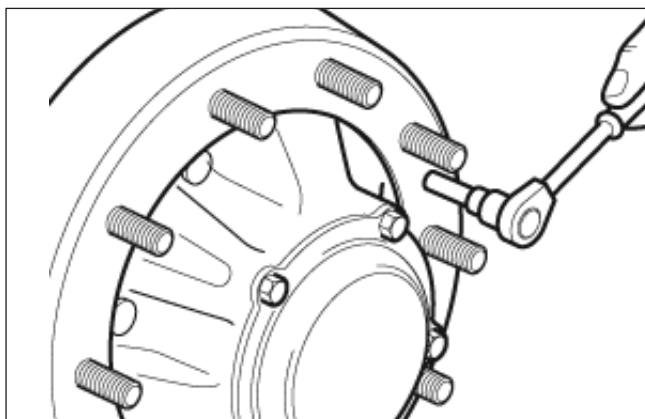


Fig. 7.1

FITTING THE BRAKE DRUM

Fit the brake drum by locating over the ten wheel studs. To assist with future drum removal, ensure the two threaded jack – off holes in the drum flange are aligned with the two bosses on the hub flange (Fig 7.2).

Ensure the drum is fully seated on its location spigots.

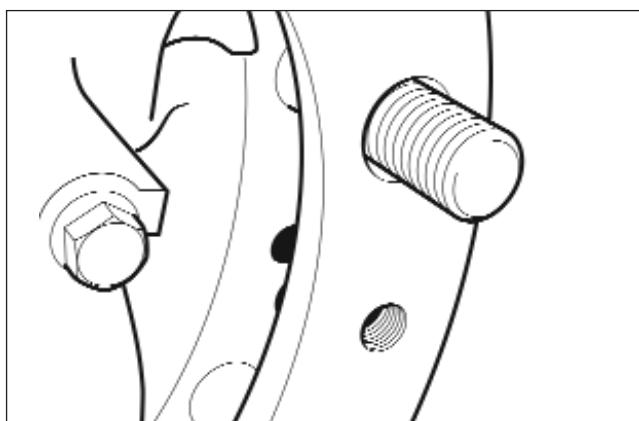


Fig. 7.2



WARNING: THE BRAKE DRUM IS NOT POSITIVELY SECURED TO THE HUB AND IS LOOSE ON THE AXLE UNTIL THE ROAD WHEEL IS REPLACED AND THE WHEEL NUTS SECURED.

IF THE TRAILER IS TO BE MOVED OR LEFT UNATTENDED PRIOR TO REPLACEMENT OF THE ROAD WHEEL, ENSURE THE BRAKE DRUM IS TEMPORARILY SECURED BY FITTING A MINIMUM OF TWO WHEEL NUTS PLACED DIAMETRICALLY OPPOSITE TO EACH OTHER.

Maintenance Schedules, Torque Values & Grease Specifications

8

pg. 40 Maintenance Schedules
pg. 40 Torque Values
pg. 40 Recommended Lubricants

8 Maintenance Schedules, Torque Values & Grease Specification

MAINTENANCE SCHEDULES

Check Brake Adjustment & Wheel Nut Torques

- Before entering service.
- After 150 km.
- After 1500 km.
- Every 3 months.
- After any wheel fixing removal.
- After any brake service.

Lubricate Camshaft Bearings

- Recommended maximum at 3 monthly intervals.

NOTE: If other than Meritor Brake Lubricant Total Fina is used or where vehicles are in contact with severe abrasives a max of 6 week interval necessary.

Brake Inspection & Service

- Linings should be inspected every 6 weeks or 25,000 kms and must be replaced as an axle set if worn down to the wear indicator (8mm).

Full stripdown should be prior to 2nd annual test or at 1st reline, whichever is soonest.

Then

Annually or at every subsequent brake reline. Whichever is most frequent.



CAUTION: Ensure any discarded friction product, or cloth contaminated with brake dust, is disposed of in accordance with local environmental regulations.



FASTENER TORQUE VALUES

Dust cover bolts	50/60 Nm
Dust cover nuts	11/15 Nm
Spherical bearing bolts (spline end)	50/60 Nm
Spherical bearing bolts (cam head end)	50/60 Nm
Sensor fixing bolts	30/50 Nm
Wheel nuts	680/750 Nm

RECOMMENDED LUBRICANTS

Brake Components and Camshaft Bearings:

Meritor Brake Lubricant - (Total Fina CERAN WRC2)

Spindle Bearing Journal:

Optimol Optimoly White Paste 'T' (*available as detailed below*)

1 Kg Tub - Meritor CVA Part Number99538008

100 gm Tube - Meritor CVA Part umber.....99538009



CAUTION: Only use the grease supplied with replacement components/kits, or that specified. Under no circumstance should any other type of grease be used.

Service Tools

9

- pg. 42 MST 3101 Anchor Pin Bush Removal Tool
- pg. 42 MST 3102 Anchor Pin Bush Insertion Tool
- pg. 42 MST 3212 Cam Bush Replacement Tool
- pg. 42 MST 3214 Cutter
- pg. 42 MST 3215 Shaft
- pg. 42 MST 3216 Sleeve
- pg. 42 MST 3217 Pin (2 required)
- pg. 42 MST 3218 Jig for 310mm Diameter Brakes
- pg. 42 MST 3219 Jig for 350mm Diameter Brakes
- pg. 42 MST 3220 Jig for 394mm Diameter Brakes
- pg. 42 MST 3221 Jig for 420mm Diameter Brakes

9 Service Tools

MST 3101 Anchor Pin Bush Removal Tool

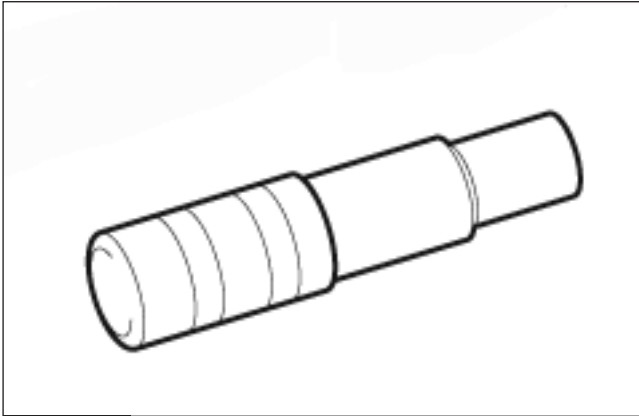


Fig. 9.1

MST 3102 Anchor Pin Bush Insertion Tool

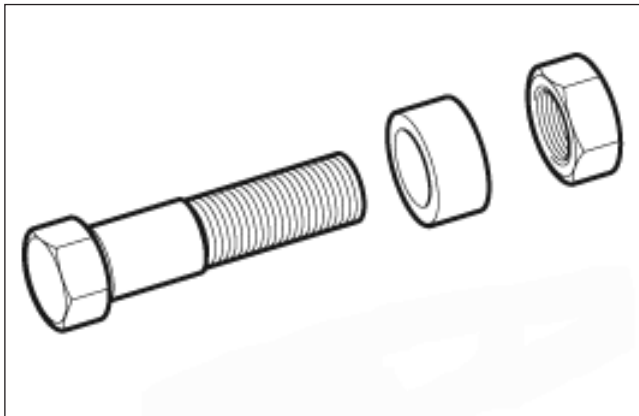


Fig. 9.2

MST 3212 Cam Bush Replacement Tool

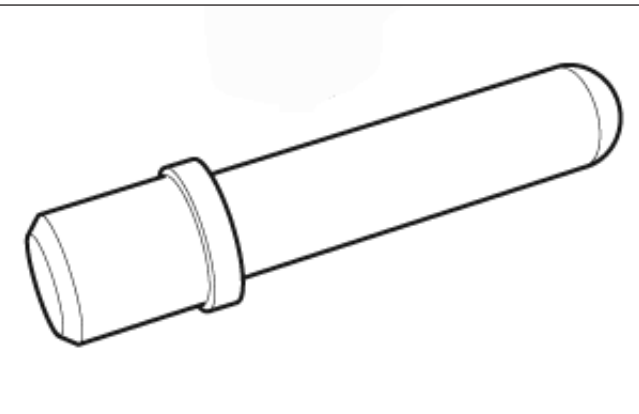


Fig. 9.3

Not Illustrated;

- MST 3214** Cutter
- MST 3215** Shaft
- MST 3216** Sleeve
- MST 3217** Pin (2 required)
- MST 3218** Jig for 310mm Diameter Brakes
- MST 3219** Jig for 350mm Diameter Brakes
- MST 3220** Jig for 394mm Diameter Brakes
- MST 3221** Jig for 420mm Diameter Brakes

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