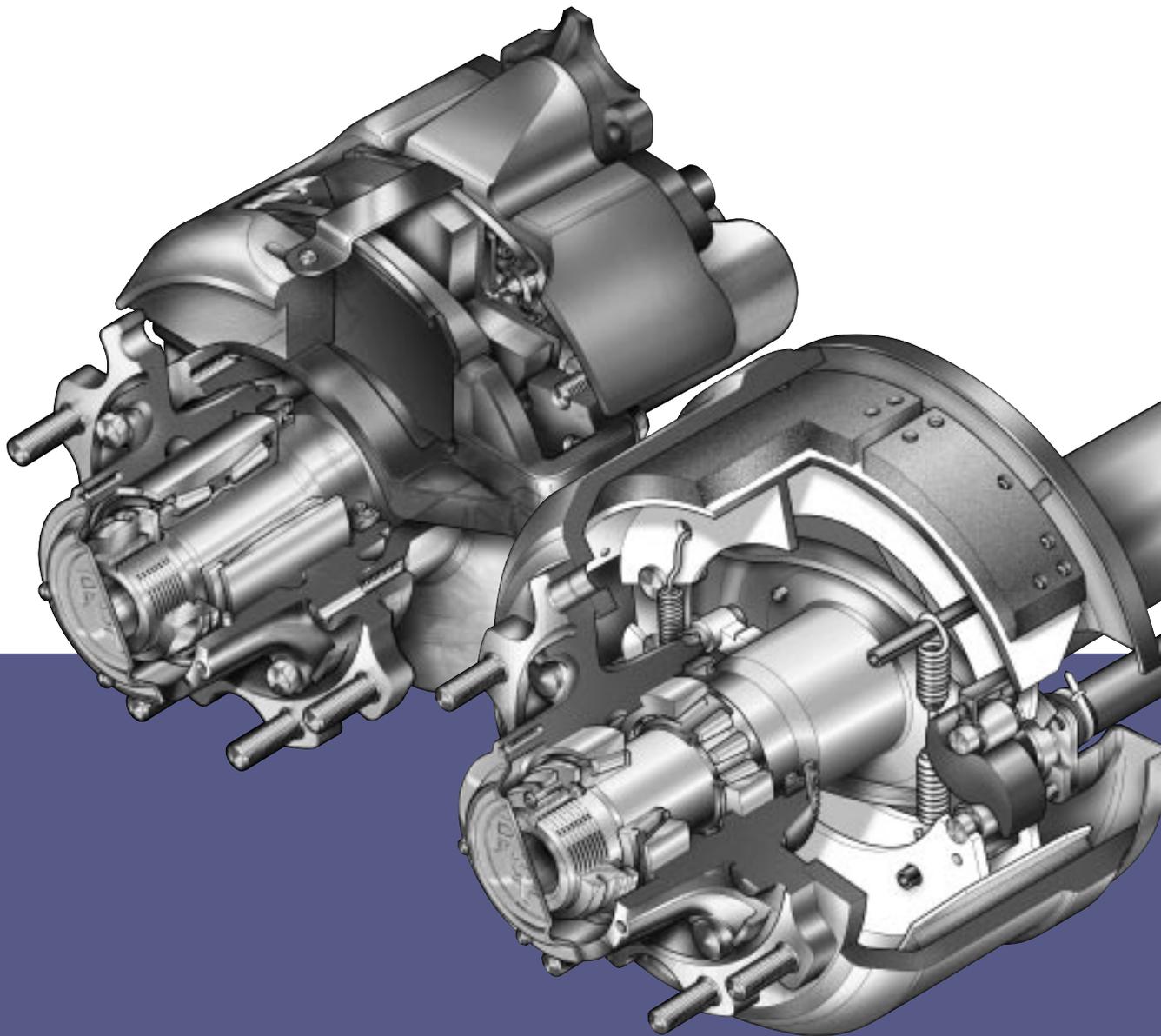




an **ArvinMeritor** brand

Meritor Axle & Brake Service Manual

TA and TAC Series Axles including Disc and Drum Brake variants



ArvinMeritor[™]



an ArvinMeritor brand

INDEX

Section	Description	Page
	QUICK REFERENCE WARRANTY CHART	3
	THE AXLE IDENTIFICATION PLATE Identifying the Axle Type, Identifying the Serial Number	6
	INTRODUCTION TO THE AXLE RANGE	7
	TA/TAC MAINTENANCE SCHEDULE	8
	TECHNICAL DATA TABLES	9
1	TA/TAC DRUM BRAKE SERVICE	11
2	TA/TAC DISC BRAKE SERVICE	17
3	TA/TAC HUB SERVICE FOR DRUM BRAKES	27
4	TA/TAC HUB SERVICE FOR DISC BRAKES	41
5	ADDITIONAL PROCEDURES	45

Quick Warranty Reference Chart

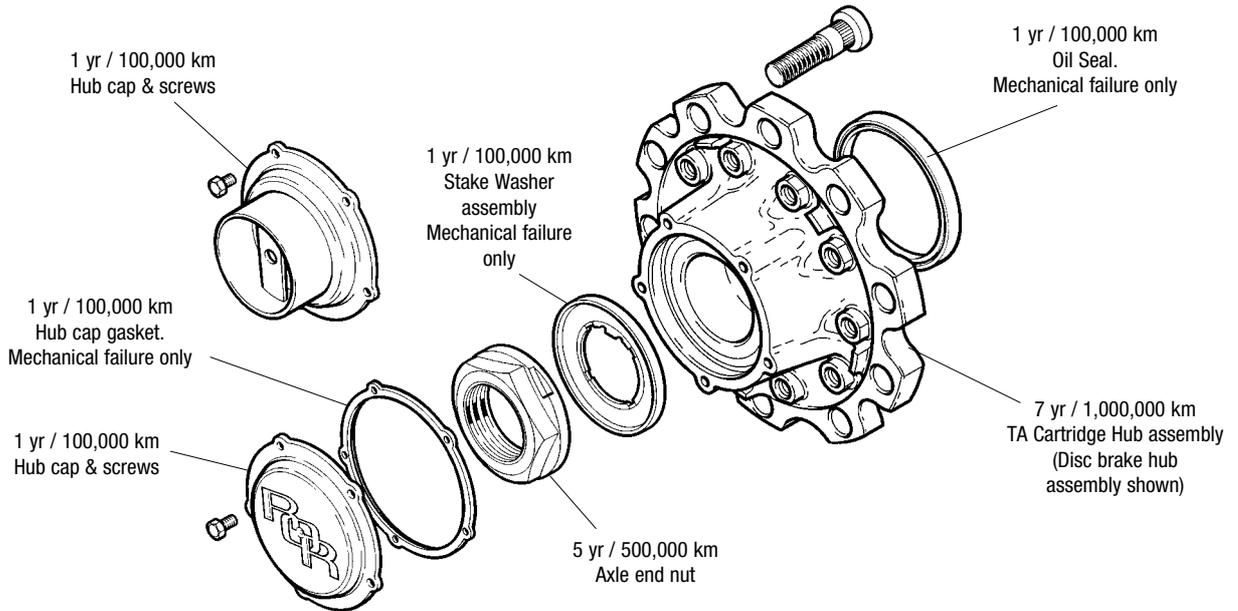
TA Cartridge and TA Hubs

Any component not referred to below is covered by a 1 yr / 100,000 km warranty for mechanical failure only.

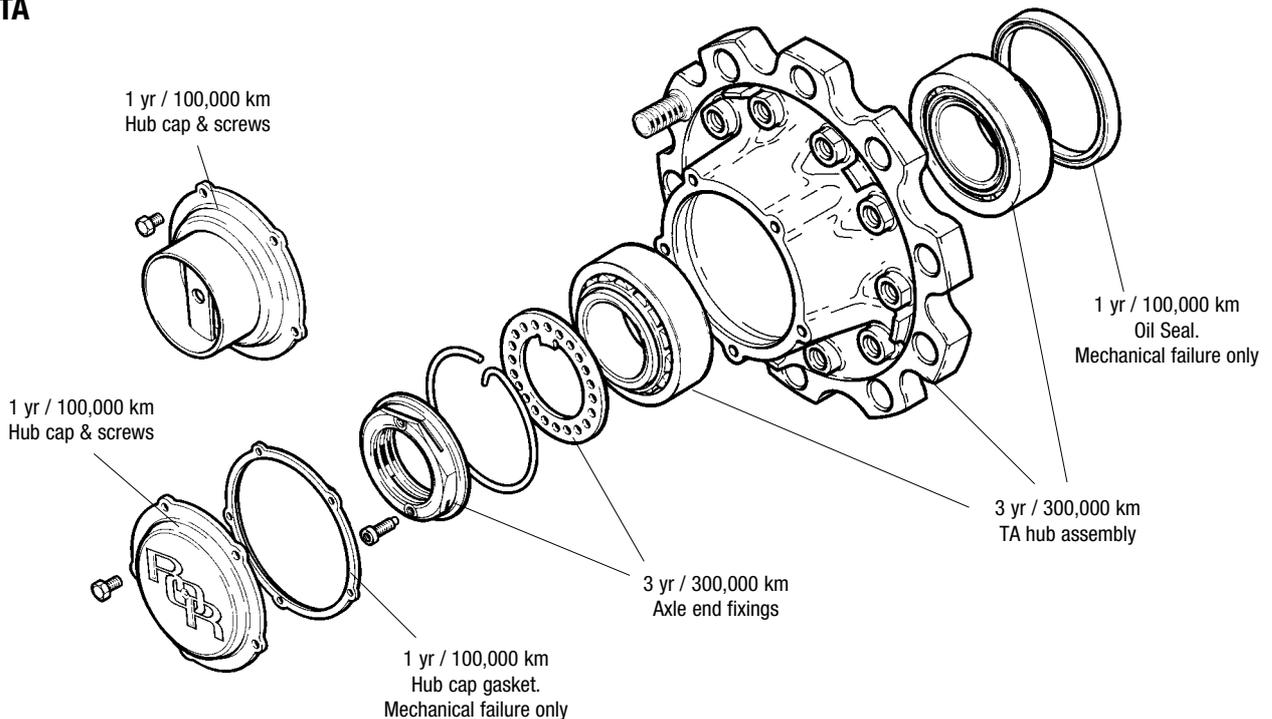
Labour costs can only be claimed at an agreed rate with Meritor Service Department prior to work commencing.

For full warranty terms and conditions see 'Meritor Warranty Terms and Conditions' Publication No 4.84.1

TA CARTRIDGE



TA





an ArvinMeritor brand

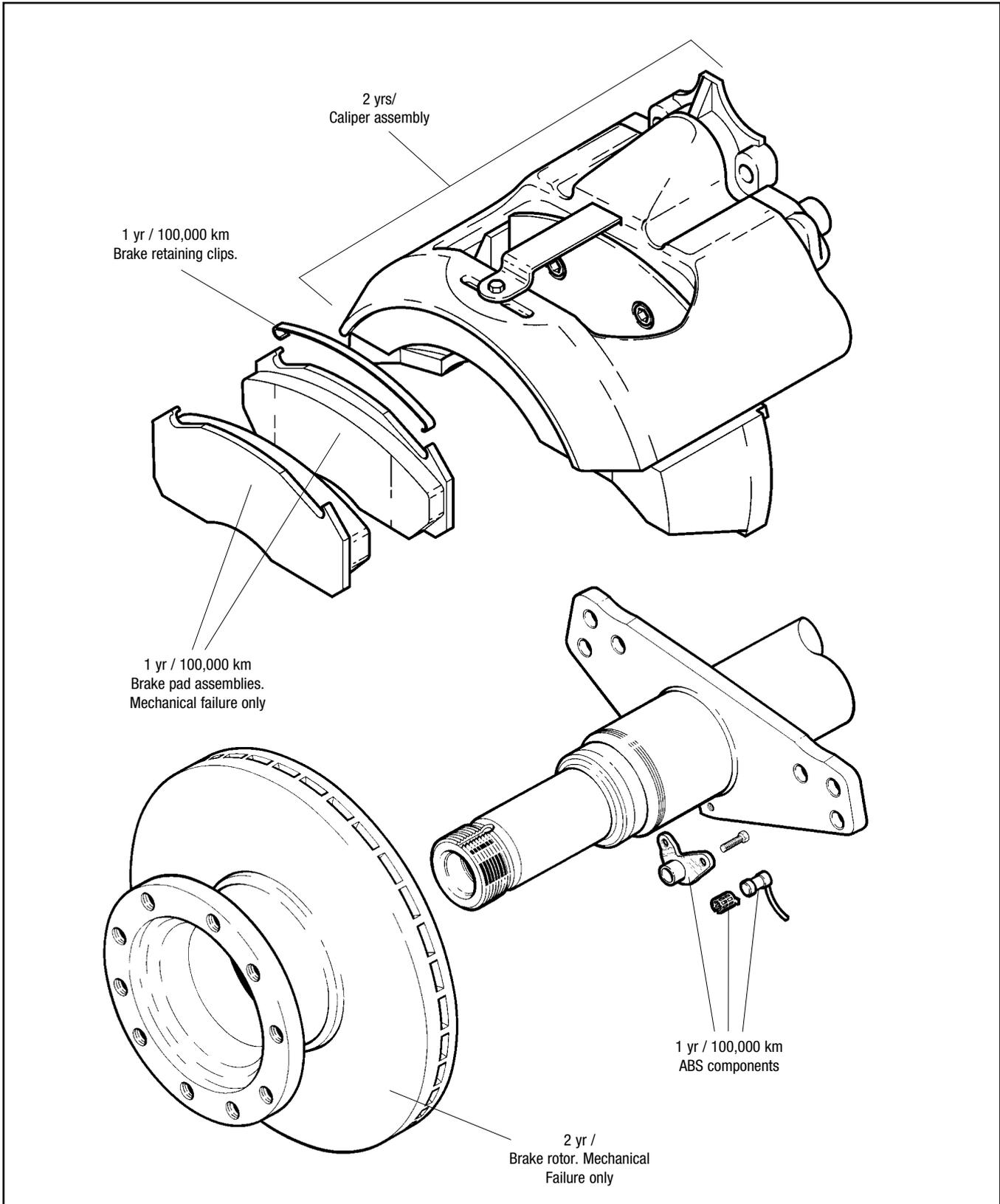
Quick Warranty Reference Chart

D Duco Disc Brake for TA Axle

Any component not referred to below is covered by a 1 yr / 100,000 km warranty for mechanical failure only.

Labour costs can only be claimed at an agreed rate with Meritor Service Department prior to work commencing.

For full warranty terms and conditions see 'Meritor Warranty Terms and Conditions' Publication No 4.84.1



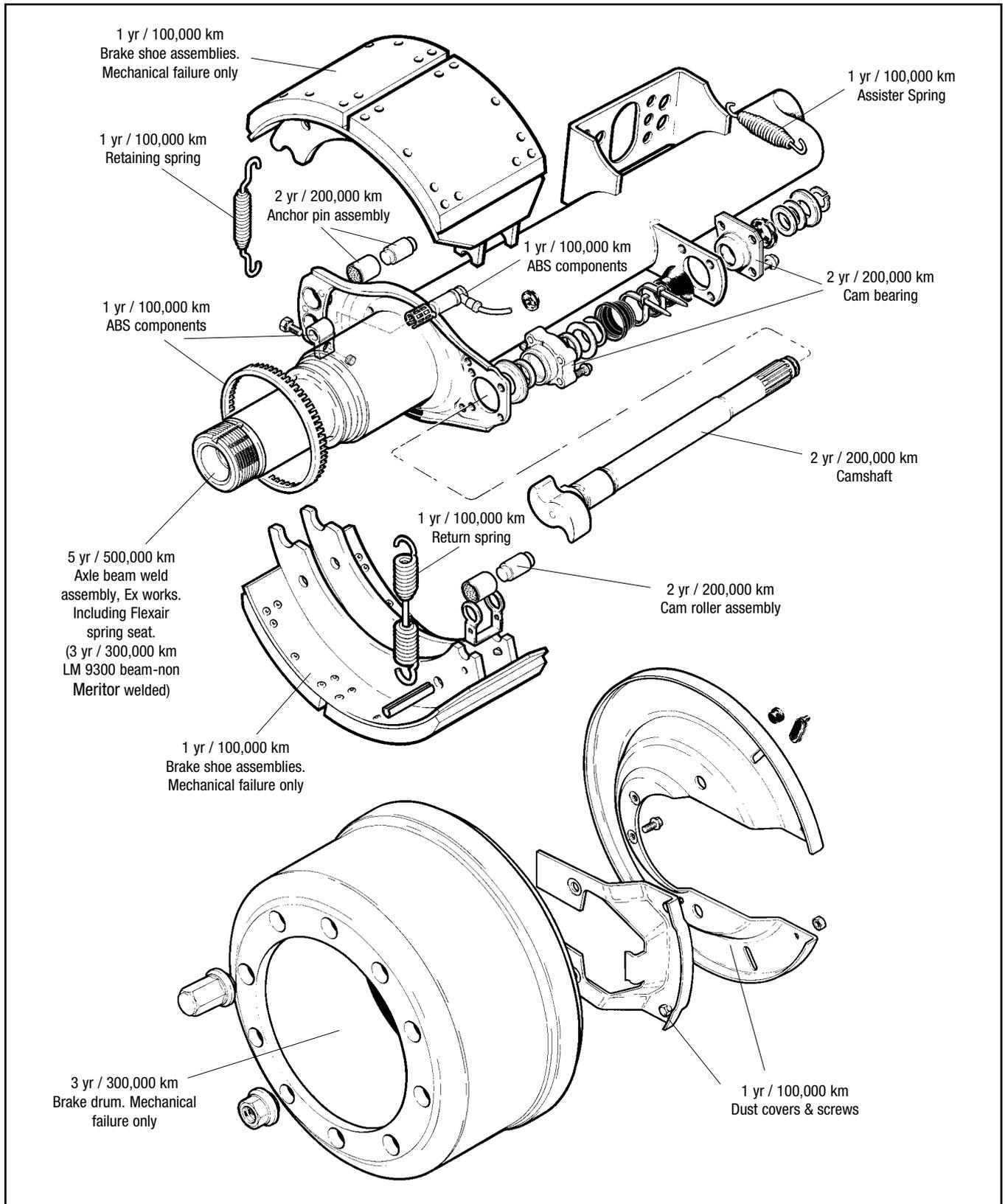
Quick Warranty Reference Chart

TA Axle shown

Any component not referred to below is covered by a 1 yr / 100,000 km warranty for mechanical failure only.

Labour costs can only be claimed at an agreed rate with Meritor Service Department prior to work commencing.

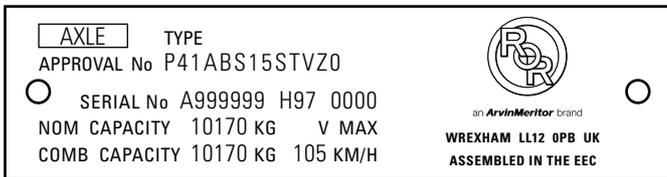
For full warranty terms and conditions see 'Meritor Warranty Terms and Conditions' Publication No 4.84.1



TA & TAC Service

The Axle Identification Plate

Every axle leaving the Meritor factory is fitted with an identification plate which contains all the information needed to ensure the correct replacement parts are obtained.



IDENTIFYING THE AXLE TYPE

All TA series axles are fitted with 10 stud, ISO 4107 spigot mount wheel fixings and asbestos free brake pads or linings as standard. Other options are as shown below.

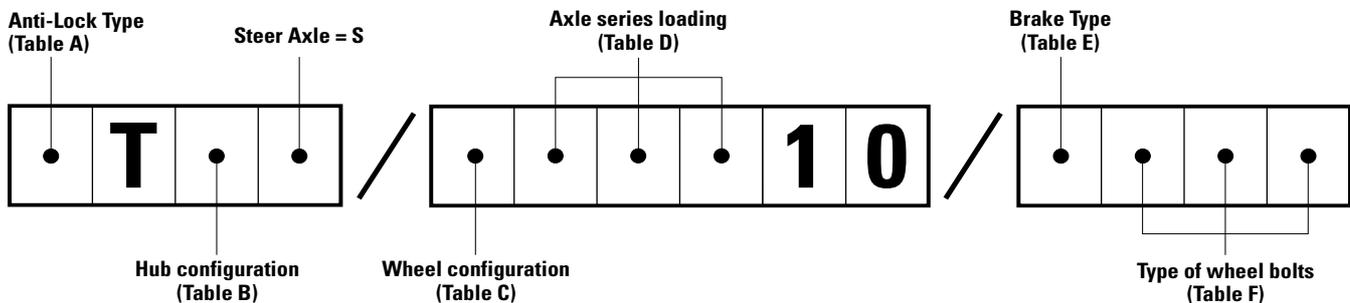


Table 'A'

Axle Letter Code	Exciter Ring Type	Suitable For
W	100t Solid Ring	Wabco Bosch Grau DGX & MGX100

Table 'B'

Axle Letter Code	Hub Configuration
A	Standard Bearing Hub
C	Cartridge Bearing Hub

Table 'C'

Axle Letter Code	Wheel Configuration
S	Single
T	Twin

Table 'D'

Axle Series	Nominal Highway Rating, Kg	Tube Wall Thickness, mm
200	9300	13
225	10170	16
250	11690	19

For maximum and minimum suspension offsets, refer to relevant Meritor TA D DUCO Suspension installation layout.

The axle ratings shown are for normal highway use and any special application must be approved by Meritor Technical Sales.

Table 'F'

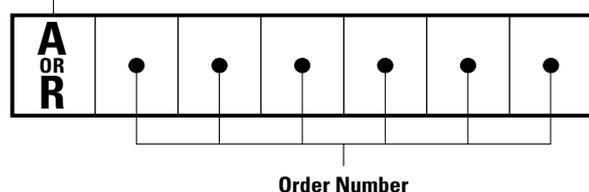
Axle Letter Code	ISO 4107 Wheel Mounting Type
MX	M22 x 1.5p wheel studs for single steel wheels
MXA	M22 x 1.5p wheel studs for single alloy wheels

Table 'E'

Axle Letter Code	Brake Type
Q	420 x 180 Drum Brake
Z	420 x 220 Drum Brake
D	D Duco Disc Brake

IDENTIFYING THE SERIAL NUMBER

Non Asbestos Brake Lining



TA & TAC Service

Introduction to the TA Axle Range

The Meritor TA range of axles are manufactured to the same high standards expected of all Meritor products.

The TA Series has been specifically designed to introduce the new 22.5" disc brake whilst bringing the drum brake range up to date for higher capacity axles.

The TA Series compliments the existing LM axle range in its modular concept and customised features aimed at lower cost of ownership.

It is primarily intended for 22.5" wheel applications where the axle load is 10.5 tonnes or greater but also provides an ideal solution to all heavy duty braking applications.

Introduction to the TA Cartridge Concept

The TA cartridge bearing hub is an innovative part of the TA series building on the success of the LMC fully sealed, maintenance free bearing unit which has set the standard for European trailer axles.

The TA cartridge offers the optimum combination of bearing performance and reduced service times.

The cartridge bearing is manufactured to extreme levels of accuracy allowing it to be operated in a precisely controlled preloaded condition for optimum life performance.

Whilst the hub can be left for up to 7 years without removal from the beam, the sealed bearing allows for quick and clean routine brake servicing should the hub need to be removed more frequently.

Introduction to the Meritor D Duco Disc Brake

The Meritor D Duco disc brake is a high performance, high efficiency brake designed for Trailers, Trucks, Coaches, Buses and other Commercial Vehicles. With a proven truck background, this brake offers the highest levels of truck and trailer compatibility whilst providing impressive versatility in braking applications.

The air chamber is attached to the caliper body and operates directly onto the internal operating shaft assembly, thus removing the necessity for the conventional external lever and linkage arrangement. Sealing between actuator and caliper is achieved by seals located in the caliper coverplate and actuator assembly. The carrier, secured to the vehicle, straddles the disc and supports the brake pads. The body assembly slides on two fully sealed guide pins bolted to the brake carrier. As the pads wear, adjustment takes place automatically and independently of load.

Axle Installation

The following notes and recommendations are offered as a guide to the trailer manufacturer and service engineer. They are based on experience gained from both the manufacture and servicing of single and multiple axle installations.

Limitations of use

The following limitations apply to the TA axle series fitted with either 22.5" super single or twin tyres and used in semi-trailer or drawbar arrangements.

For normal on-highway and RO-RO use the axle beam is supplied in a range of three beam wall thickness dependant axle loading. For full details of capacity and Flexair suspension installation options please consult Meritor Technical Sales Department.

In cases where suspensions of non-Meritor manufacture are used, the trailer builder or suspension manufacturer must satisfy themselves as to the suitability and compatibility of the axle and suspension, particularly from an installation and durability standpoint. Meritor will be pleased to assist in assessing such compatibility, but cannot warrant the fitment of its axles to suspensions of unknown characteristics.

Stresses and welding

During use the axle beam is subjected to a wide variety of forces. These are caused by the payload, bumps in the road surface, cornering and braking. Because these forces are constantly varying, the stresses in the axle beam also vary, causing fatigue. The top and bottom of the beam generally experience the greatest stresses and hence the most fatigue, whilst the section of beam around the horizontal centre line sees the least stress and fatigue.

Welds in the high stress areas will adversely affect the fatigue strength, for this reason do not weld in the area 95mm wide top and bottom of the beam, or 50° either side of the vertical centre line, as shown in the diagram below. Weld tacks or weld spatter are not allowed in this area.

The beam material is controlled to ensure that pre-heating is normally not necessary when welding as per BS5135.

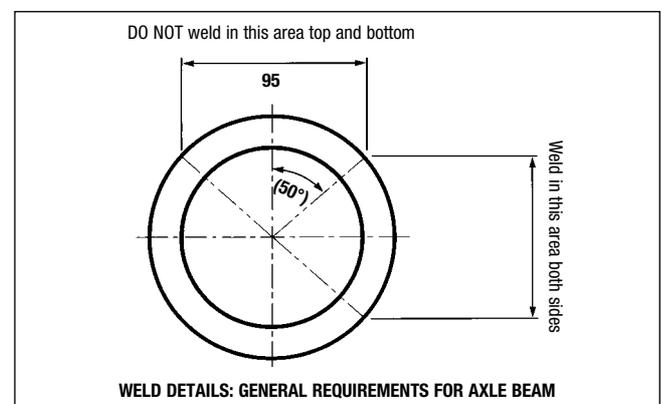
The direction of welding should be as near the horizontal as possible and welding around the corners of brackets or spring seats should be avoided. Separate drawings exist on request from the Meritor Technical Sales Department detailing seat welding procedures for both air and mechanical Meritor suspensions.

The effects of welding will be minimised if:

- all tack welds are at least 25mm long.
- the number of tack welds is kept to a minimum. If possible clamp the bracket tightly to the beam and eliminate the tack welds.
- the welding procedure recommended in the Meritor suspension manual is followed.
- more than one weld run is required make the following run with a different start/finish point and before the previous run has cooled down. Descalate between runs.
- oil, rust and thick deposits of paint are removed from the surfaces to be joined.
- the welding consumables meet the relevant British Standards and are used as recommended by the manufacturer.
- at the end of fillet welds, the weld is 'backed up' to fill the crater.

The following precautions will prevent damage to the axle and suspension during welding and improve service life:

- prevent weld spatter from falling on the axle and road springs.
- ensure the earth connection is made to the axle beam, preventing the passage of current through the wheel bearings.
- do not test the arc on the axle beam or springs.
- remove scale and slag from fillet welds before painting to prevent corrosion.





an ArvinMeritor brand

TA & TAC Service

TA Axle Maintenance Schedule

SERVICE ROUTINE	FREQUENCY
TA, TAC – Disc & Drum CHECK BRAKE ADJUSTMENT AND CHECK WHEEL NUT TORQUES	<ul style="list-style-type: none"> • Before entering service. • After 150 km. • After 1500 km. • Every 3 months. • After any wheel fixing removal. • After any brake service.
TA, TAC – Drum LUBRICATE CAMSHAFT BEARINGS	<ul style="list-style-type: none"> • Recommended maximum at 3 monthly intervals. <p>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.</p>
TA, TAC – Drum BRAKE INSPECTION & SERVICE	<ul style="list-style-type: none"> • 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). <p>Full stripdown should be prior to 1st annual test or at 1st reline, whichever is soonest.</p> <p>THEN Annually or at every subsequent brake reline. Whichever is most frequent.</p>
TA, TAC – Disc BRAKE INSPECTION & SERVICE	<ul style="list-style-type: none"> • Pads, caliper and rotor should be inspected every 50,000 kms or 3 months. Pads should be replaced as an axle set if worn to a lining thickness approaching 3mm. <p>At intervals of 100,000 kms, or every 6 months, (preferably when changing pads), the opportunity should be taken to remove any accumulations of wear debris and rust from the edge of the rotor, and from the pad location points in the caliper. Check also condition and location of sealing boots.</p> <p>The above service intervals are recommended maximums under normal operating conditions. Unusual ambient temperatures or adverse operating conditions (e.g. dusty atmospheres or severe gradients) will require more frequent service intervals. It is the responsibility of the vehicle operator to establish these intervals.</p>
TA – Disc & Drum HUB AND BEARING INSPECTION INCLUDING OIL SEAL REPLACEMENT	<ul style="list-style-type: none"> • Whenever hubs are removed from axle. • Annually after 1st major hub overhaul.
TA – Disc & Drum MAJOR HUB SERVICE	<ul style="list-style-type: none"> • If a problem is found during inspection. • Prior to 2nd annual test or after 300,000 km, whichever occurs first.
TAC – Disc & Drum HUB AND BEARING INSPECTION INCLUDING OIL SEAL REPLACEMENT	<ul style="list-style-type: none"> • The TAC hub assembly is maintenance free. However a visual inspection should be carried out and the auxiliary oil seal replaced whenever the hub is removed from the axle. <p>Note: The TAC hub is not a serviceable item. Any problems should be reported to Meritor Service Department.</p>

TA & TAC Service

Technical Data Tables

TABLE 1: FASTENER TORQUE VALUES – DRUM/DISC BRAKE

Hub cap screws	11/15 Nm
TA Axle lock nut	Refer to setting procedure, Section 3.16
Button head screws (axle lock nut)	15/20 Nm
TAC Axle lock nut	700/750 Nm
Wheel nuts	680/750 Nm

TABLE 2: FASTENER TORQUE VALUES – DRUM BRAKE ONLY

Dust cover bolts (Q & Z brakes)	50/60 Nm
Dust cover nuts (Q brake only)	11/15 Nm
Spherical bearing bolts (spline end)	50/60 Nm
Cam head bearing bolts	50/60 Nm
ABS sensor block fixing bolt	30/50 Nm

TABLE 3: FASTENER TORQUE VALUES – DISC BRAKE ONLY

Rotor fixing bolts	230/270 Nm
Caliper retaining bolts Torque & Angle Procedure:	Initial torque 300 Nm PLUS ADDITIONAL 45° bolt rotation <i>or</i> 500/550 Nm full torque
Air chamber nuts	Tighten evenly to initial torque 80/100 Nm then re-tighten to a final torque of 160/180 Nm
ABS sensor bracket fixing bolts	20/25 Nm

TABLE 4: RECOMMENDED LUBRICANTS

Hub Bearings:		
Meritor Hub Grease, Blue Lithium EP2	Total Multis EP2	Castrol Spheroil EPL2
Elf Lithium EP2	Shell Alvania Grease EP(LF)2	Texaco Multifak EP2
Shell Calithia EP2T	BP LS EP2	Fina Marson EPL2 Silkolene G62
Mobil Mobilux EP2	Euroil Universalfett EP2	
SKF LGEP2	Axel Christiernsson Lithac 162 EP	Esso Beacon EP2
GB Lithium EP2		
Brake Components and Camshaft Bearings:		
Meritor Brake Lubricant – (Total Fina CERAN WRC2)		
Spindle Bearing Journal:		
Optimol Optimoly White Paste T		

TABLE 5: HUB & BEARING GREASE FILL VOLUMES

TA Hub	
Hub Cavity	150-200 gm
Inner Bearing	63-68 gm
Outer Bearing	63-68 gm
Hub Cap	Nil
TAC Hub	
Hub is pre-packed no maintenance unit	



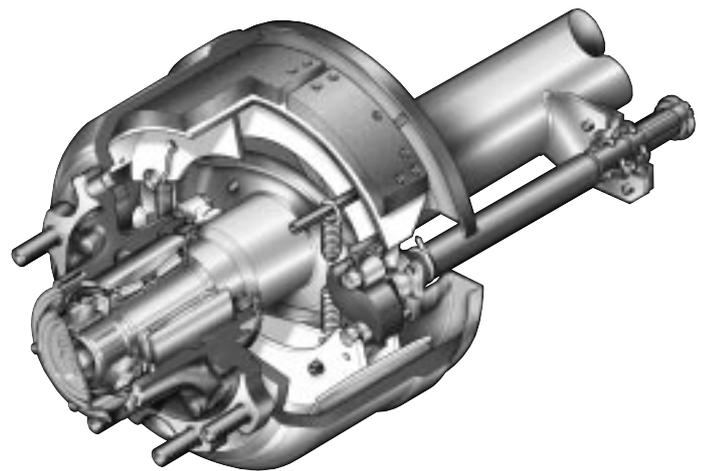
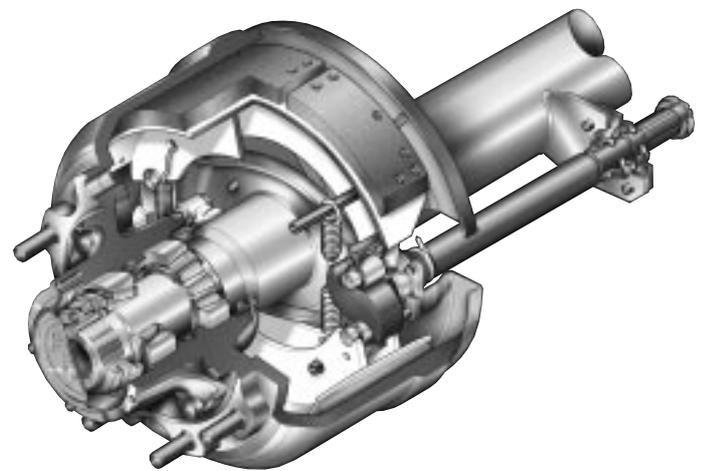
an **ArvinMeritor** brand

TA & TAC Service

TA & TAC Service

Section 1

TA/TAC Drum Brake Service





an ArvinMeritor brand

TA & TAC Service

SECTION 1

Drum Brake Service

1.1 DE-ADJUST BRAKES

De-adjust the brakes and remove the hub and drum assembly as described in Section 3.

1.2 REMOVE BRAKE SHOES

1.2.1. Using a screwdriver between brake shoe gussets ease out both retainer springs (Fig. 1).



FIG. 1

1.2.2. Take hold of bottom shoe pulling it off the anchor pin, tilt forward and lift off camshaft head (Fig. 2).

1.2.3. Remove brake return spring.

1.2.4. Lift off top shoe.



FIG. 2

1.3 INSPECTION

1.3.1. Inspect brake anchor pins and bushes for wear. Check and replace 'O' rings as required.

1.3.2. Inspect cam rollers. If removed from the brake shoe, the roller-retained clip must be replaced.

1.3.3. Inspect brake shoes for wear at anchor pin and cam roller location points.

1.3.4. Prior to re-assembly the following parts should be lightly coated with Meritor Brake Lubricant.

- (i) Bores of Camshaft Bushes.
- (ii) Cam Roller trunion bearing surfaces and D-slots in brake shoe.
- (iii) Brake Anchor Pin bearing surfaces and D-slots in Brake Shoe.

1.3.5. Ensure greasing is carried out to the four grease nipples on each axle. Use Meritor Brake Lubricant.

1.3.6. Check brake drums for cracks, scoring or other damage.

1.3.7. Replace all worn parts with genuine Meritor parts. The use of non-Original Meritor parts will nullify all warranty and may substantially reduce service life.

1.4 REFITTING BRAKE SHOES

1.4.1. Fit return spring roll pin (if not already fitted) and cam rollers, lubricate 'D' holes with Meritor Brake Lubricant (Fig. 3).

1.4.2. Fit anchor pins applying Meritor Brake Lubricant inside the anchor pin bushes and between the 'O' ring seals. (Fig. 4)



FIG. 3



FIG. 4

TA & TAC Service

Note: If anchor pin bushes are worn or damaged they should be replaced using Meritor Anchor Pin Bush Removal Tool 21205456. See Fig. 5



FIG. 5

1.4.3. Fit top shoe and hang return spring from pin (Fig. 6).



FIG. 6

1.4.4. Attach bottom shoe to spring, push down and in towards cam head, and onto anchor pin (Fig. 7).



FIG. 7

1.4.5. Fit both retaining springs to top shoe, and with a screwdriver, pull spring down and ease into bottom shoe (Fig. 8).



FIG. 8

1.5 CAMSHAFT WEAR INSPECTION

With the brake shoes removed as described in the previous section inspect the camshaft and bearings for wear.

Lever the camshaft up and down to detect free movement (Fig. 9) at both the cam head bearing and spline end bearing.

Camshaft movement should not exceed 3mm total at either bush. (The amount at the lever will depend on the lever length so discretion and judgement is required).

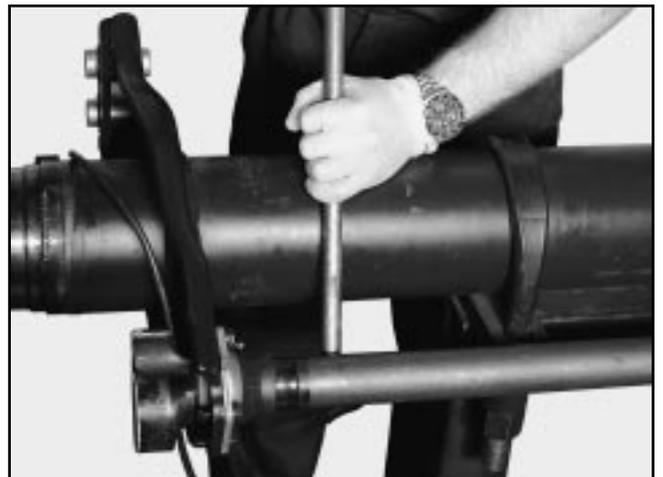


FIG. 9



an ArvinMeritor brand

TA & TAC Service

1.6 DUST COVER REMOVAL

1.5.1 420 x 220 'Z' Brake

Remove the two halves of the dust cover from the anchor bracket by removing the four M10 screws. Release the ABS sensor cable strain relief bush and pass the cable through the dust cover.

1.5.2 420 x 180 'Q' Brake

Remove the dust cover by releasing the two M10 screws and the two M8 flange nuts. Release the ABS sensor cable strain relief bush and pass the cable through the dust cover. Release the filler plate by removing the two M10 screws. The filler plate can be finally be removed once the camshaft has been removed.

1.7 CAMSHAFT AND CAMSHAFT BEARING REMOVAL

Detach the clevis on the slack adjuster and rotate the lever away from the clevis sides. Remove the circlip retaining the slack adjuster, and slide the assembly off the camshaft spline, remove all packing washers and boots around the slack adjuster.

Release the camshaft from the head end retaining clip by striking the end of the shaft with a copper mallet (Fig. 10). Make sure the cam head rubber boot retaining clip is removed before attempting to remove the shaft. The camshaft can now be removed.



FIG. 10

1.8 SPHERICAL BEARING INSPECTION AND REMOVAL

Inspect both spherical bearing for damage and wear. Both bushings can be removed using a 13mm A.F. spanner to remove the four M10 screws securing the inner and outer bushings. See Fig. 11.



FIG. 11

1.9 REPLACEMENT OF CAMSHAFTS AND CAMSHAFT BEARINGS

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

(* In the case of 420 x 180 drum brake only.)

Fasten both camshaft bearings in place using the M10 screws. DO NOT FULLY TIGHTEN THE BEARING SECURING SCREWS UNTIL THE BRAKE SHOES ARE REASSEMBLED.

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.

1.10 REFIT DUST COVERS

Dust cover replacement is a reversal of the removal procedure. See section 1.6.

TA & TAC Service

1.11 GREASE CAMSHAFT BEARINGS

Grease the camshaft bearings using a grease gun (Fig. 12). Always use Meritor Brake Lubricant.

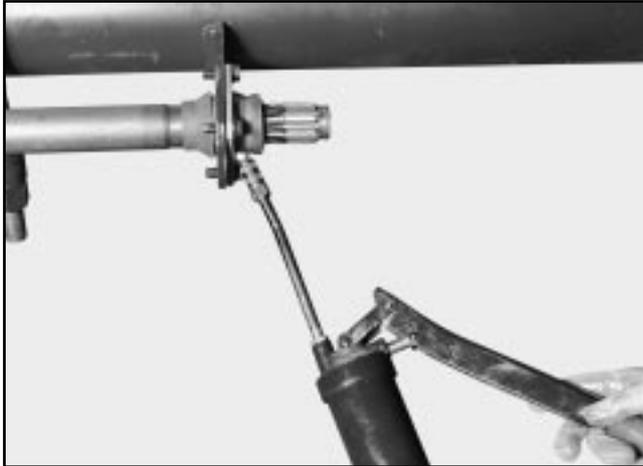


FIG. 12

1.12 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 by hand.

1.13 INSPECT BRAKE DRUM

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

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 surface shows signs of light heat crazing it usually can be reused (Fig. 13A) but if the heat crazing is severe the drum should be replaced (13B).

Should the drum life be extended by turn-out machining the recommended machining limit should be 423 mm diameter so that during the projected wear-out life of the shoes the final drum diameter must not exceed 424.0 mm.

Similarly excessively worn drums should be inspected and on no account should drums of diameter exceeding 423 mm be re-assembled with new brakes shoes.

1.14 BRAKE DRUM REPLACEMENT

To replace the brake drum, the hub and drum assembly must be removed from the axle with the wheels removed. It is necessary to remove all the wheel bolts using the procedures described in Section 5.1.



FIG. 13A

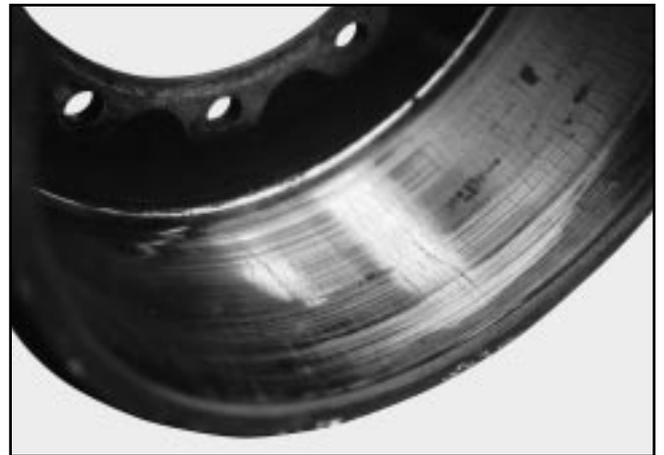


FIG. 13B



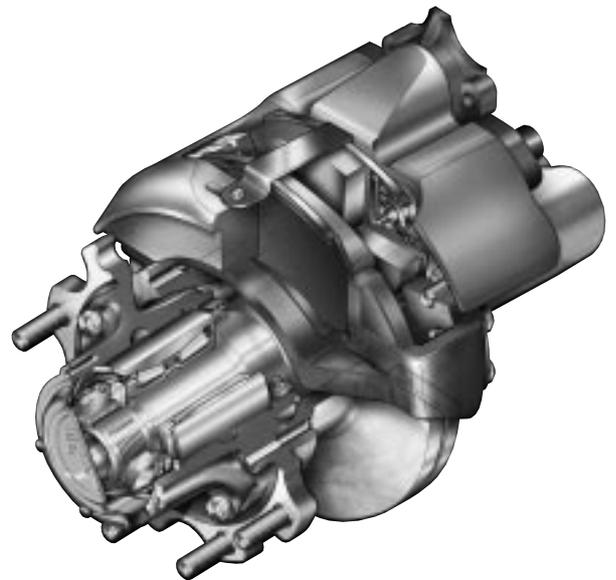
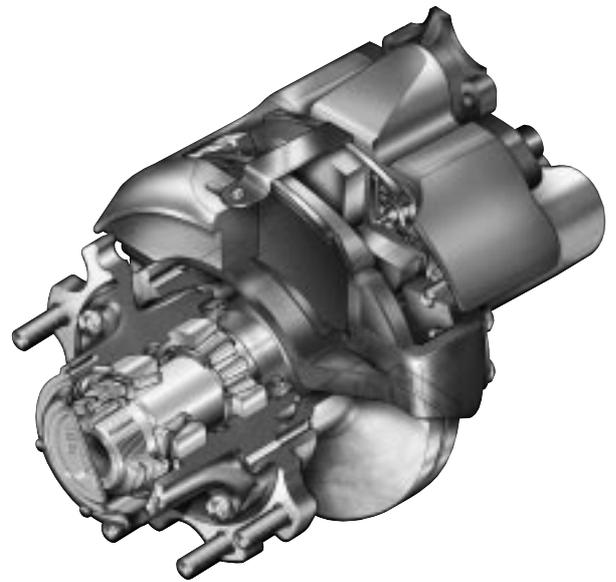
an **ArvinMeritor** brand

TA & TAC Service

TA & TAC Service

Section 2

TA/TAC Disc Brake Service





TA & TAC Service

SECTION 2

2.1 INTRODUCTION

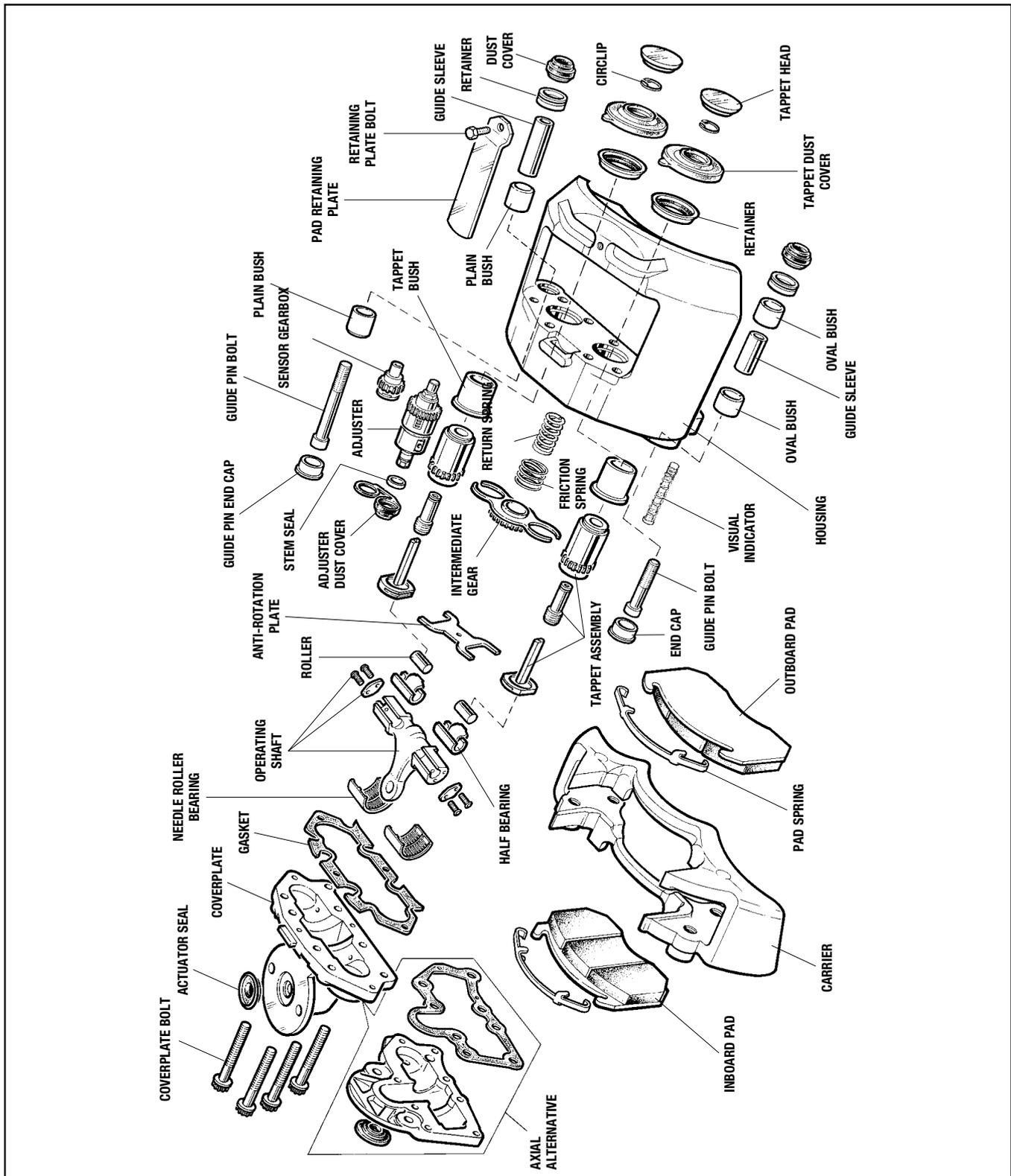


FIG. 1



an ArvinMeritor brand

TA & TAC Service

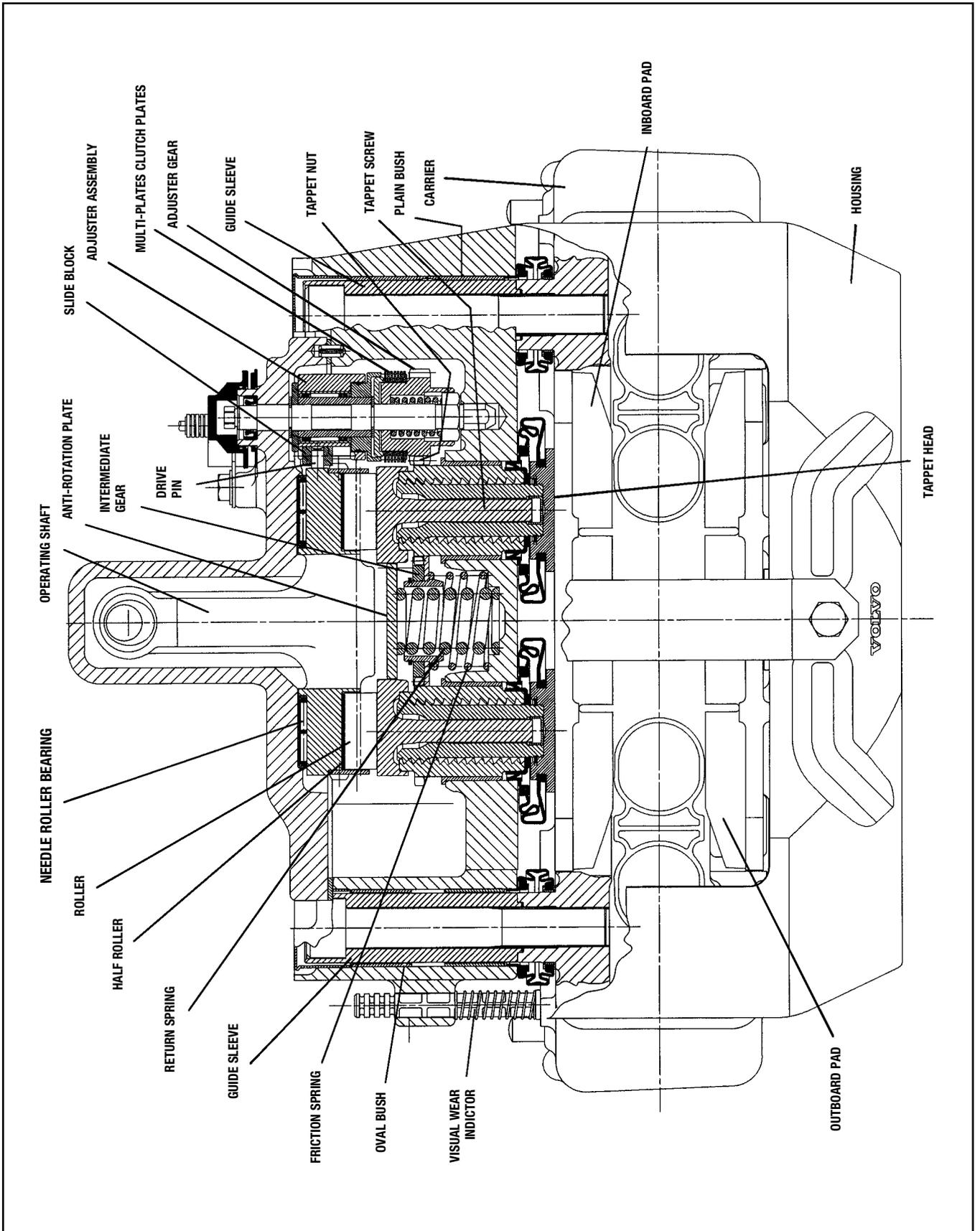


FIG. 2

TA & TAC Service

The air actuated disc brake has been designed to incorporate a direct mounted air chamber (Fig. 3). The basic operation of the caliper is simple, but it is important that the features of the load insensitive automatic adjuster are clearly understood.

It is essential that the correct service procedures are observed to ensure that the caliper gives satisfactory service throughout its working life.

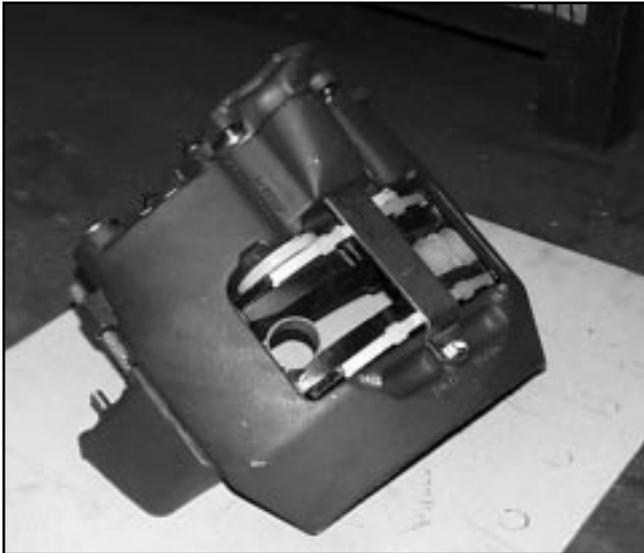


FIG. 3

How it works

The air chamber/actuator is attached to the caliper body and operates directly onto the internal operating shaft assembly, thus removing the necessity for the conventional external lever and linkage arrangement. Sealing between actuator and caliper is achieved by seals located in the caliper coverplate and actuator assembly. The carrier, secured to the vehicle, straddles the disc and supports the brake pads. The body assembly slides on two fully sealed guide pins bolted to the brake carrier. As the pads wear, adjustment takes place automatically and independently of load.

NOTE:

"Load Independent" means adjustment takes place under very small clamping forces only, therefore preventing over-adjustment and minimising air consumption.

Brake Application (without automatic adjustment)

The actuating mechanism is mechanically driven and incorporates an eccentric operating shaft, two hardened rollers, and a twin tappet arrangement. The fully integrated, automatic, load insensitive adjusting mechanism is situated to the side of the operating shaft/tappet arrangement. As the operating shaft rotates it also turns the automatic adjuster via the adjuster drive pin which engages with the sliding block incorporated in the adjuster assembly. The adjuster gear meshes with the adjacent tappet nut and, therefore, is able to transmit the rotation to the tappet arrangement. An intermediate gear assembly located between the two tappet assemblies ensures any rotation is transmitted equally across both tappets. The tappet screws are prevented from rotating by an anti-rotation plate.

The sprag clutch arrangement incorporated in the adjuster assembly has a pre-set clearance which the initial movement of the op-shaft takes up before any rotation of the adjuster gear, and therefore, tappet assemblies can take place. This pre-set clearance maintains the correct running clearance of the brake pads (nominally 0.7mm).

When the brake is applied the air chamber applies a load to the operating shaft lever arm thus rotating the operating shaft and adjuster assembly taking up the pre-set clearance. As the operating shaft rotates further the hardened rollers, which sit in half bearings in the operating shaft, act against the two tappet assemblies and thus generate movement of the tappet assemblies in a linear direction.

This movement generates a clamp force which is transmitted by the tappet heads evenly across the inner disc pad forcing it against the brake disc. The reaction force generated causes the housing to slide on the guide sleeves bolted to the carrier and clamp the outer pad against the disc.

When the pads contact the disc the clamp load generated in the tappet assemblies rises rapidly. This results in a rise in the torque required to rotate the tappet gears. This torque lever overcomes the friction between the multi-plate clutch assembly causing the clutch plates to slip and, therefore, preventing any un-necessary adjustment.

When the brakes are released the return spring, in conjunction with the actuator, return the operating mechanism to its original brakes off position.

Brake Application (with automatic adjustment)

The actuator operates in the same manner as described above and takes up the backlash clearance in the adjuster. Because the clearance between pads and disc is greater than the pre-set running clearance, no load is generated to cause the adjuster clutch to slip.

As a result the multi-plate clutch becomes a solid link, thereby rotating the adjuster gear which in turn rotates the adjacent tappet gear and, via the intermediate gear assembly, the second tappet gear extending the length of the tappet screw to reduce the pad to disc clearance. Once the pads contact the disc any further rotation of the operating shaft will increase the clamp load between pad and disc and cause the multi-plate clutch to slip and the adjuster stops operating, preventing over adjustment.

When the brakes are released, the actuating mechanism returns, removing the clamp load from the pads. At the same time the adjuster returns to its original position, providing the designed pad to disc running clearance. Any further reverse movement of the adjuster assembly results in the sprag clutch slipping until the op-shaft reaches its rest position. The friction spring, return plate and tappet nuts prevents de-adjustment, therefore, leaving the tappet arrangement in its newly adjusted position.

TA & TAC Service

2.2 MANUAL ADJUSTMENT

The brake adjuster assembly is provided with a manual override facility which allows the brake to be de-adjusted and adjusted manually when fitting new pads. To manually adjust or de-adjust the brake carefully remove the adjuster stem cover, locate a suitable 10 mm socket spanner on the adjuster stem (Fig. 4) and rotate the adjuster stem with the socket spanner in the appropriate direction.



FIG. 4

To indicate the direction required to adjust or de-adjust the brake + and – symbols are cast onto the cover plate, on the front face of the adjuster turret. (Fig. 5)



FIG. 5

NOTE:

Turn the adjuster stem in the direction of the + sign to adjust the brake. Turn the adjuster stem in the direction of the – sign to de-adjust the brake. From a fully worn pad condition it will require approx. 9 full revolutions of the adjuster stem to fully de-adjust the brake.

IMPORTANT:

Always de-adjust/adjust the brake carefully by hand with a suitable spanner. Never exceed a maximum torque of 40 Nm in either direction and NEVER use power tools, air or electric, to de-adjust or adjust the brake.

2.3 BRAKE INSPECTION AND TROUBLE SHOOTING

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.

Inspection Schedules

Inspect the brake according to one of the following schedules. Use the schedule that gives the most frequent inspection.

- The schedule for chassis lubrication used by your fleet.
- The schedule for chassis lubrication recommended by the manufacturer of the chassis.
- At least every 3 months.
- During tyre replacement.

Inspection should include the following:

1. **Pad wear:** The pads must be replaced at or before the amount of pad material reaches a thickness of 3mm.
2. **Anti-rattle springs:** The pads have anti-rattle springs attached. Inspect for bent, cracked or broken springs. If springs are damaged, replace with new. Refer to "Pad Removal and Replacement".
3. **Seals:** Caliper should be replaced if any of the seals are found to be cracked, torn or damaged in any way.
4. **Caliper slides freely on slide pins:** Clearance between the rotor and the pad should be transferred from the inboard rotor surface to the outboard rotor surface by sliding the caliper back and forth.
5. **Disc (Rotor):** Inspect the rotor for cracks, deep scores or other damage. Replace the rotor when necessary.



an ArvinMeritor brand

TA & TAC Service

INSPECTION AND TROUBLE SHOOTING

CONDITION	POSSIBLE CAUSES	CHECK FOR	CORRECTIONS
1 Brake Drag	Incorrect pad to rotor clearance	Total pad gap to be 0.5 to 1.5 mm in service operation.	Replace caliper/saddle assembly
	Improper initial adjustment		Readjust per Section 2.2
	Vehicle air system malfunction		Repair or replace parts as required
2 Short outboard/inboard pad life	Caliper seized or sticking on slide pins	Damaged slide pin seals Caliper should move back and forth by hand with pads removed	Replace caliper/saddle assembly
3 Short pad life	Refer to 2 and 3	Refer to 2 and 3	Refer to 2 and 3
	Abusive use of brake system	Driver technique	Train drivers
	Rotor surface	Cracks or heavy heat checking. Refer to Section 1.8	Refer to Section 2.5 for rotor inspection
	Non genuine pads		Fit Meritor pads
	Vehicle overload	See GAWR limitations on vehicle I.D. plate.	Observe vehicle manufacturers load recommendations
	Companion brakes not working properly	Inspect companion vehicles brakes and air systems	Adjust or repair as required
4 Brake smoking	High brake temperature	Refer to 2, 3 and 4	Refer to 2, 3 and 4
	Contamination of pads	Grease, oil etc., on pads	Inspect hub seal. Replace as required. Clean rotor and caliper assembly. Replace pads per Section 2.4
	Incorrect pad to rotor clearance	Check running clearance	
5 Poor stopping power • Long stopping distances • Poor driver feel • High brake pressures • Lack of normal response • Vehicle pulls to one side	Vehicle air systems malfunction	Proper air pressure at the chamber inlet	Have the air system evaluated by a qualified brake system specialist
	Brakes out of adjustment	Check running clearance	Replace caliper/saddle assembly. Refer to Section 2.6
	Vehicle overload	See GAWR limitations on vehicle I.D. plate	Observe vehicle manufacturer's load recommendations
	Contamination on pads	Grease, oil etc., on pads	Inspect hub seal and replace pads per Section 2.4
	Companion brakes not working properly	Inspect companion vehicle brakes and air system	Adjust or repair as required
6 Shimmy or brake pull	Refer to 1, 2 and 6	Refer to 1, 2 and 6	Refer to 1, 2 and 6
	Rotor run out and thickness variation		Replace hub and rotor assembly

TA & TAC Service

2.4 PAD REMOVAL AND REPLACEMENT

The pads must be replaced at or before the amount of pad materials reaches a thickness of 3mm.

WARNING:

Caution should be exercised in handling both asbestos and non-asbestos materials.

CAUTION:

Replace the pads on both brakes of a single axle, or all six brakes of a triaxle at the same time. If you do not replace all the pads at the same time, poor brake performance may occur.

1. Put blocks in front and behind the wheel so that the vehicle cannot roll.

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.

A visual pad wear indicator is incorporated into the brake which provides a quick and simple method of assessing the pad life remaining.

In a new pad condition the end of the indicator stem will extend past the edge of the housing casting (Fig. 6). As the pads wear the length of indicator visible past the edge of the casting will reduce.

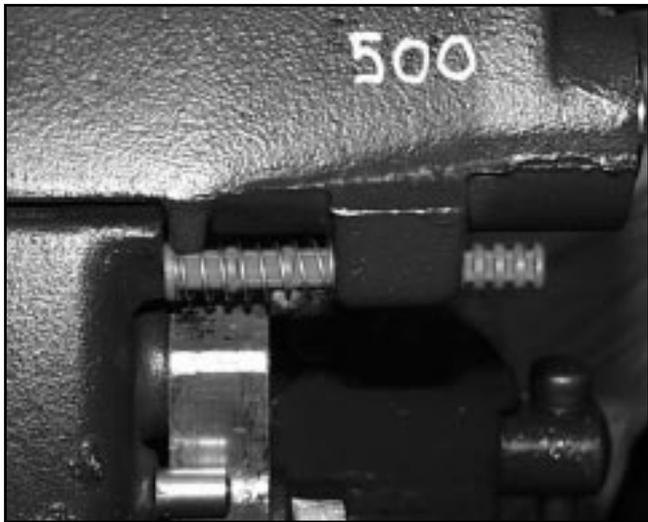


FIG. 6

The indicator is marked with each increment equating to a level of pad wear (Fig. 7).

2. Apply air pressure and fully charge the system to ensure the park brake is fully released. Wind off the spring brake retraction bolt (where appropriate). Jack up the axle and fit suitable axle stands securely. Remove the road wheels and it is advisable to exhaust all air from the system. Remove any dirt from the caliper assembly. Ensure the rubber dust covers fitted to the tappet heads and guide sleeves are not damaged.

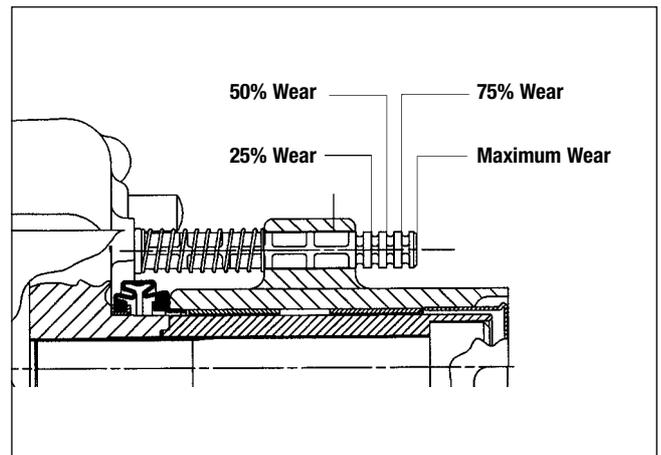


FIG. 7

WARNING:

Never use an air line to blow dust from the brake/disc area. If inhaled any form of dust can at best be an irritant, at worst dangerous. Wherever 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.

3. Remove the pad retaining plate bolt and pad retaining plate from the caliper.
4. It may be necessary to de-adjust the brake initially to remove the worn brake pads. Locate a suitable 10 mm socket spanner on the adjuster stem and rotate the spanner in the appropriate direction, refer to the Manual Adjust section 2.2 for details.

IMPORTANT:

Always de-adjust/adjust the brake carefully by hand with a suitable spanner. Never exceed a maximum torque of 40 Nm in either direction and NEVER use power tools, air or electric, to de-adjust or adjust the brake.

5. Remove the brake pads (Fig. 8)

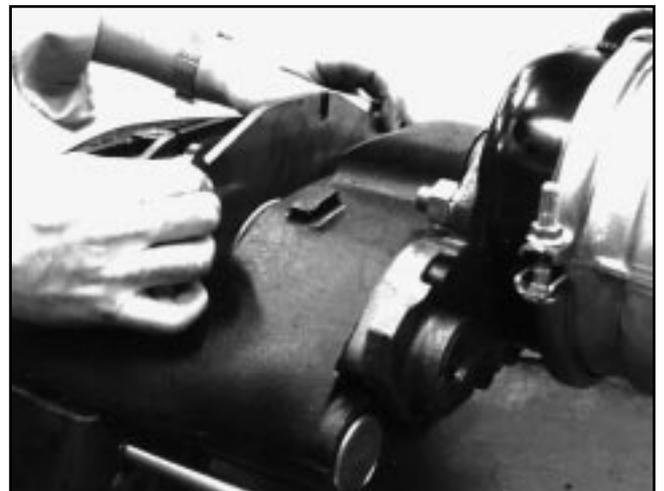


FIG. 8

TA & TAC Service

Cleaning and Inspection

- With the brake pads removed check the integrity of the guide pin and tappet dust covers. They should be secure and free from any signs of damage. Check that the caliper housing assembly slides freely on the guide pins.

WARNING:

Take care not to trap fingers whilst checking the sliding action of the brake.

Examine the brake disc for corrosion, grooving and signs of deep crazing. If there is any doubt in the serviceability of any component refer to the vehicle manufacturer for corrective action. Whilst wearing suitable eye protection remove all traces of scale, dirt etc., from the pad apertures/ abutment faces and around the edge of the disc, particularly that encroaching onto the braking area. A scraper, or old screwdriver, supported on the caliper body whilst the disc is rotated will remove most of the corrosion. Finish off if necessary with emery cloth. Remove all traces of scale, dirt etc., from the pad apertures and abutment faces that may restrict the movement of the pads and therefore prevent efficient adjustment of the brake.

Fitting New Pads

- Position the new pads springs correctly on the pad backing plates.
- De-adjust the brake until, with the housing pulled across, there is a sufficient aperture to fit the new outboard pad. Fit the new outboard pad, (Fig. 9).



FIG. 9

- Push the housing back towards the disc until the new pad contacts the disc face. Continue to de-adjust the brake until the aperture gap between the tappet heads and the disc face is large enough to accept the new inboard pad.

NOTE:

This dimension should be approximately 29mm–31mm. Do not exceed the 40Nm maximum torque on the adjuster shaft.



FIG. 10

With the brake fully de-adjusted it may be necessary to lift the tappet boots to release any trapped air which may be inflating the dust cover (Fig. 10).

- Fit the new inboard pad.
- To adjust the pads locate a 10 mm socket spanner on the adjuster stem and turn it in the appropriate direction, refer to the Manual Adjustment section 2.2 for details.

Continue to adjust the brake until the pads contact the disc.

NOTE:

Do not exceed 40 Nm torque on the adjuster stem.

- De-adjust the brake by turning the adjuster stem back 1/4 of a revolution. Ensure the brake disc is free to spin. Ensure the sealing area on the cover plate is clean. Always replace the adjuster stem cover (Fig. 11).



FIG. 11

TA & TAC Service

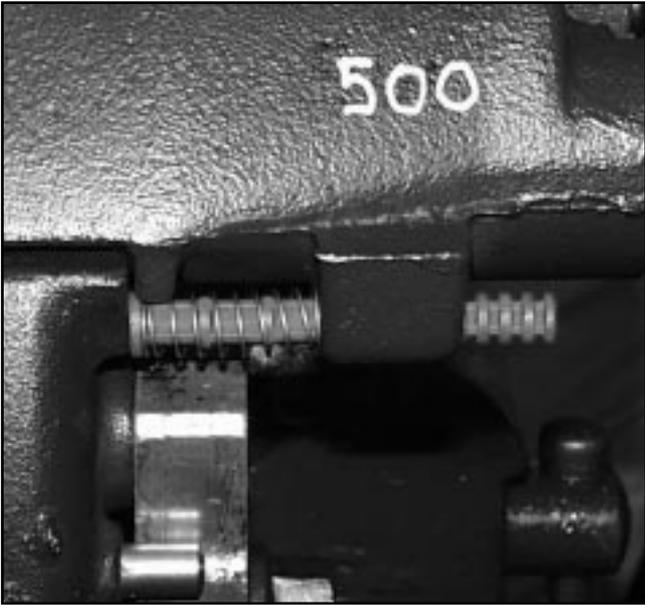


FIG. 12

13. Refit the pad retaining plate and torque the fixing bolt to 33-40Nm.
14. In a new pad condition the end of the indicator stem will extend past the edge of the housing casting (Fig. 12).

As the pads wear, the length of indicator visible past the edge of the casting will reduce. The indicator is incremented with each increment equating to a level of pad wear Fig. 13.

15. Wind in the spring brake retraction bolt (where applicable). Refit the road wheels, remove the axle strands and lower the vehicle to the ground. Charge the system with air.

NOTE:

Before driving the vehicle or applying the park brake, apply the service brake five times at low pressure to ensure correct adjustment of the pads.

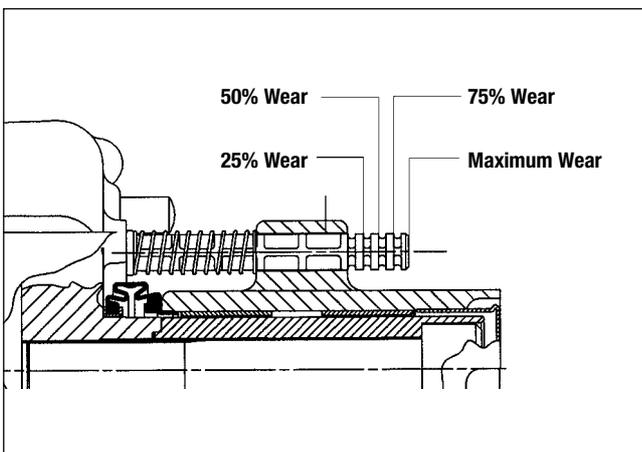


FIG. 13

TA & TAC Service

2.5 ROTOR INSPECTION

Rotors should be examined in situ, whenever the brakes are serviced or new pads are fitted – or immediately if erratic braking performance is noted. The rotor condition should be visually checked for the following surface conditions, and replaced with a new rotor if suspect or defective.

A Surface Cracking (Fig. 14)

Light short random crazing surfaces are normal and acceptable.

B Radial Cracks (Fig. 14)

Short light cracks up to 0.5mm in width and a maximum of 1.0mm in depth are acceptable – providing they do not extend radially across more than 75% of the braking surface.

C Tangential Scoring (Fig. 14)

A series of light circular grooves is normal, and permissible if the maximum depth of the grooves is 0.5mm. Severe grooving indicated that skimming of the rotor is required – providing the minimum thickness of the rotor can be maintained (see skimming). Wear and grooving should be approximately equal on both surfaces. If the wear patterns differ significantly, the brake is not functioning correctly and should be examined.

D Heat Spotted Rotor (Fig. 14)

This condition indicates that the rotor has been subjected to extremely high temperatures that have caused a structural change in the rotor material and have caused the rotor to be more susceptible to cracking. Rotors may be turned to remove hard raised areas (See skimming). If resurfacing does not remove the spots the rotor must be replaced.

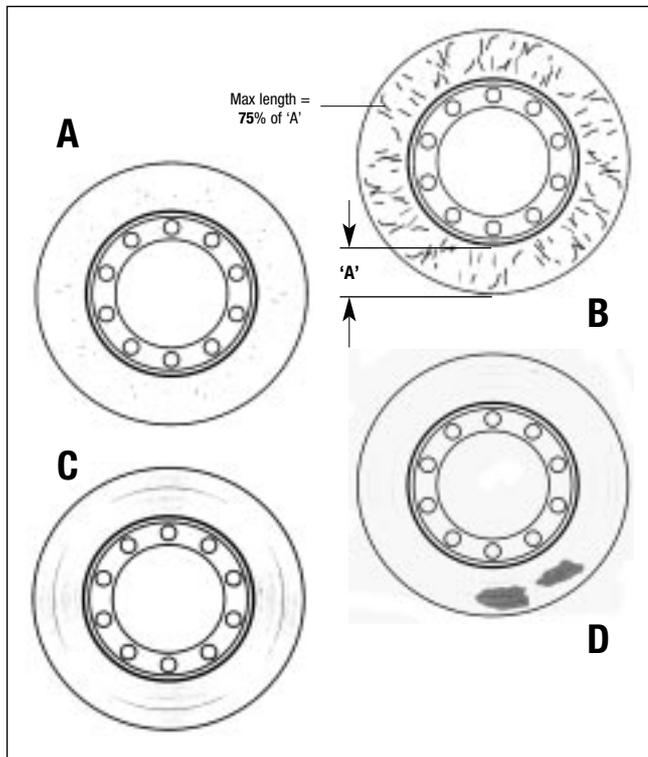


FIG. 14

Rotor Run Out

Use a Dial test Indicator (DTI) to check the run-out both axially and radially as in (Fig. 15).

Axial

Run-out should not exceed 0.3mm over the rotor braking surface when the rotor is turned on properly adjusted wheel bearings. Excessive run-out may be due to incorrect mounting of the hub, fastener torque's or mal-adjusted bearings.

Radial

Run out should not exceed 0.8mm total indicator reading.

Thickness

Rotor thickness must not vary by more than 0.13mm across any two points of the rotor faces.

Skimming

Resurfacing the rotor is permissible to a minimum thickness of 42mm.

Rotor must be replaced at 40mm thickness.

Surface finish after machining should be 5 microns maximum.

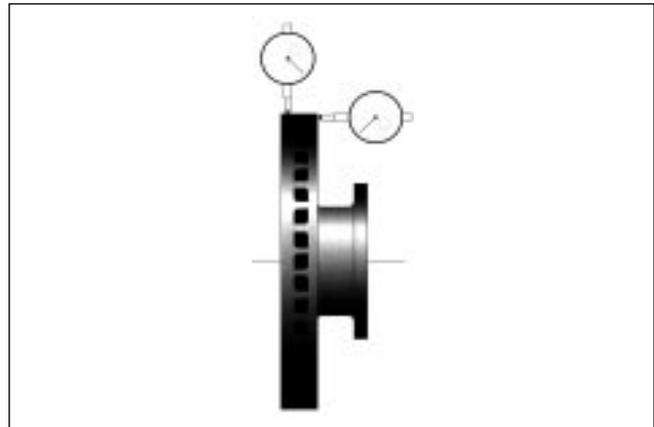


FIG. 15

Additionally, the condition of the cast ABS teeth should be checked to ensure that there are no broken or damaged teeth or that there is no excessive corrosion.

If in doubt a full ABS functionality check should be carried out.

TA & TAC Service

2.6 CALIPER REMOVAL AND REPLACEMENT

Removing the Caliper Assy:

1. Follow step 1-5 of the Pad Removal and Replacement (section 2.4) to remove the pads.
2. Remove the air chamber by removing the two chamber mounting nuts and lifting away the air chamber.(Fig. 16)



FIG. 16

3. Remove the six caliper mounting bolts.(Fig. 17)

WARNING:

Take care not to allow the caliper to fall. Remember the caliper has a weight of 45kg.

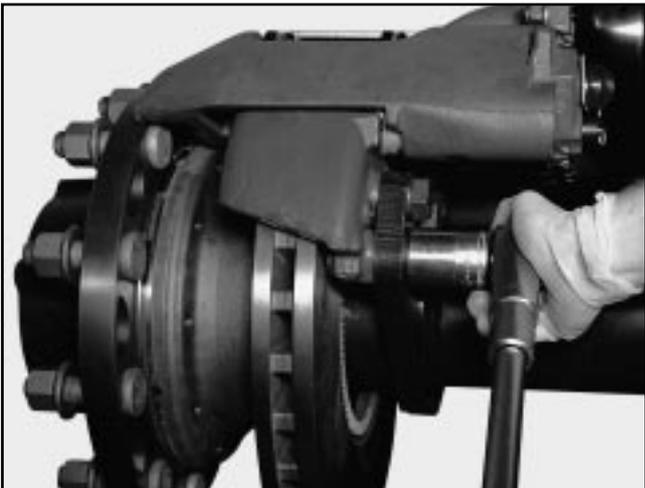


FIG. 17

4. Lift the caliper away from the rotor.

Installing the Caliper Assembly:

1. Lift the caliper over the rotor.
2. Align the caliper bolt holes and hand start one of the inner fasteners, fitted with a hardened washer.
3. Hand start the remaining 5 bolts, starting on the top half of the torque plate.

4. Using an 30 A/F socket, tighten the 6 bolts using the 'torque and angle' sequence specified in Table 1. (Fig. 18).



FIG. 18

IMPORTANT:

Ensure 'torque and angle' procedure is adhered to in order to achieve final tightening requirement. (Fig. 19)



FIG. 19



an ArvinMeritor brand

TA & TAC Service

5. Mount the air chamber onto the caliper assembly ensuring the spherical end of the push rod engages into the spherical socket on the caliper.

Ensure the chamber is positioned such that the air inlet ports are orientated correctly. (This is dependant on the suspension type. Full installation options are available from Meritor Technical Sales.)

Assemble the supplied washer and nut to the two protruding studs on the air chamber. Sequentially tighten each nut to an initial torque shown in table 1. This ensures correct engagement of the air chamber seal against the caliper sealing face and prevents permanent distortion of the air chamber canister.

Tighten the air chamber nuts to the final torque shown in table 1. (Fig. 20)

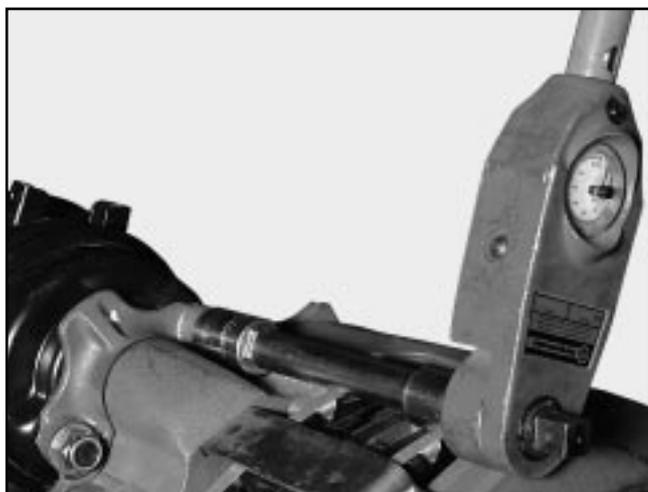


FIG. 20

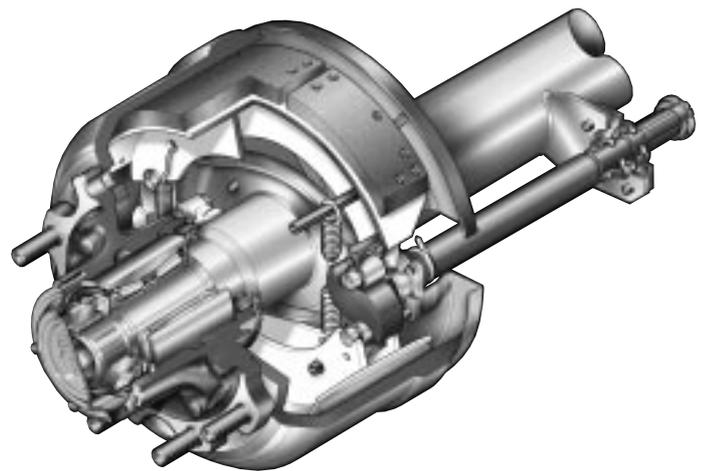
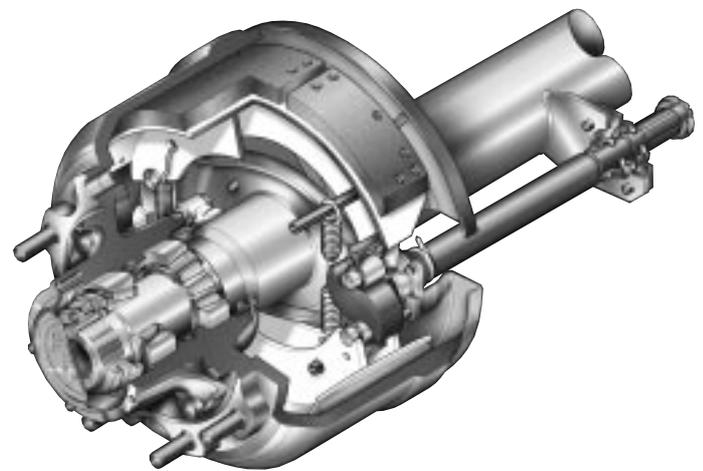
Ensure the rubber drainage hole sealing bungs are correctly fitted to the air chamber such that when installed on the vehicle at correct suspension ride height, the holes closest to the vertically downward position are left open and all other holes are sealed.

6. Follow steps 7-15 of pad removal and replacement (section 2.4) to refit the pads.

TA & TAC Service

Section 3

TA/TAC Hub Service for Drum Brakes





an ArvinMeritor brand

TA & TAC Service

SECTION 3

TA Hub and Bearing Inspection

The following procedures can be performed either with the road wheel and brake drum assembled to the hub or with the road wheel removed.

3.1 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.

3.2 REMOVAL OF HUB LOCKNUT

Remove the five M8 hub cap screws.

Remove hub cap and gasket (Fig. 1).



FIG. 1

Remove the two socket button head screws using 5mm A/F Allen key (Fig. 2).

The hub locknut should be removed using hub nut spanner from the Meritor TA Service Kit (Meritor part number 21226884).

It is recommended that the retaining clip and retaining washer are left in the hub until the hub assembly has been removed from the spindle.

3.3 REMOVAL OF HUB

Remove the hub assembly from the axle using a hub puller (Meritor part number 21224863). The five M8 hub cap screws may be used to secure the hub puller to the hub face (Fig. 3).

If the hub is to be removed whilst still assembled to the road wheel and brake drum, use a wheel dolly to support the weight of the assembly.

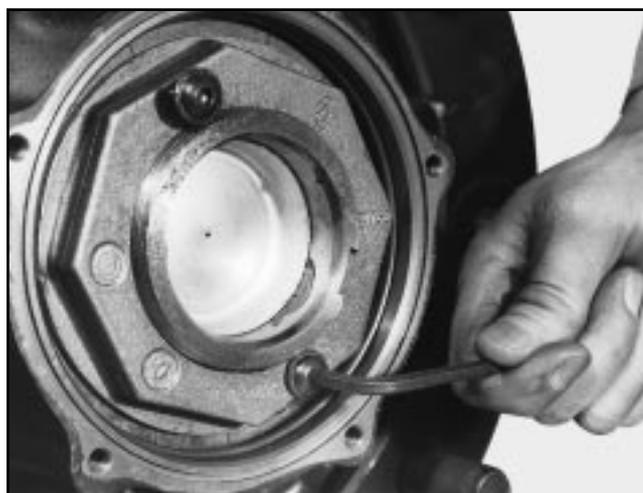


FIG. 2

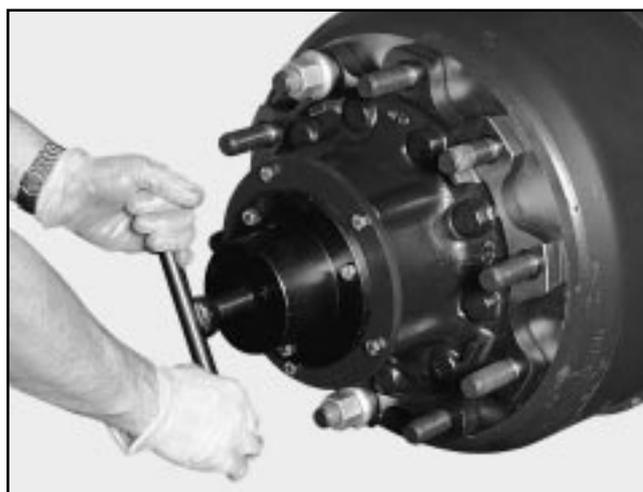


FIG. 3

3.4 REMOVAL OF OIL SEAL AND INNER BEARING CONE

The oil seal should be removed from the hub using an oil seal removal tool (Meritor part number 21218565) and suitable lever (Fig. 4).

THE SEAL MUST BE DISCARDED. NEVER RE-USE AN OIL SEAL AFTER THE HUB HAS BEEN DISMOUNTED FROM THE AXLE SPINDLE.

Remove the inner bearing cone and place it in a clean area. Identify the bearing cone clearly to ensure that it is refitted to its original position in the hub.

TA & TAC Service

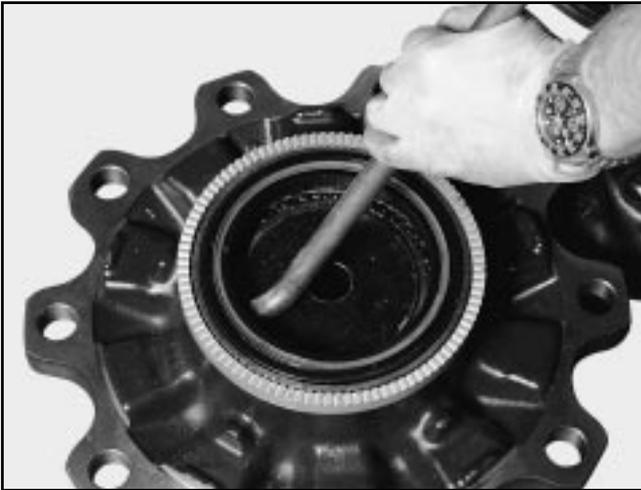


FIG. 4

3.5 REMOVAL OF RETAINING WASHER AND OUTER BEARING CONE

The retaining clip can now be removed from the outer side of the hub with a pair of pliers or suitable screw driver.

Remove the retaining washer (Fig. 5).

Remove the outer bearing cone and place it in a clean area. Identify the bearing cone clearly to ensure that it is refitted to its original position in the hub.

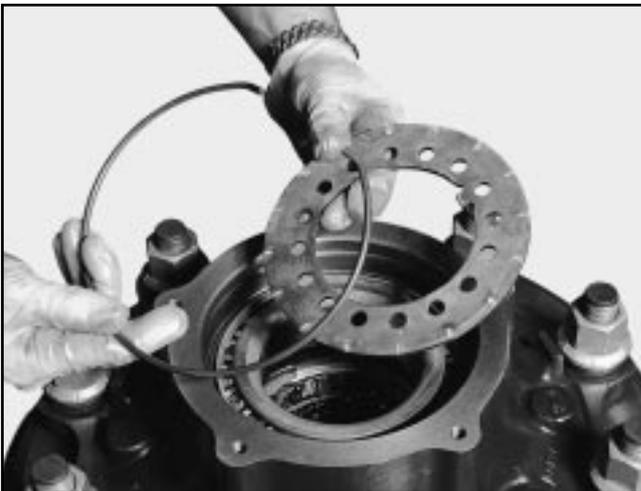


FIG. 5

3.6 CHECK GREASE CONDITION

If the grease within the bearing is clean and does not appear burnt there should be no necessity to totally clean down the assembly.

Check the hub cavity for any grease contamination caused during hub removal from the spindle. Any contamination must be removed or if this is excessive a complete hub clean down must be carried out. Refer to Section 3.7.

3.7 CLEANING OF HUB

Wipe clean the hub cavity removing all the old grease and any contamination.

3.8 INSPECT BEARINGS

Check both bearings, cones and raceways for:

Cage damage

Corrosion

Roller and raceway damage or pitting

Metallic debris or flaking

Bearing cup security – Ensure both bearing cups are well secured in the hub, by checking they are fully seated within the hub bore, and with a good grip of the cups try to rotate them. If any movement of the cups is detected then the hub will have to be replaced. Do not attempt to fit new bearings into a hub with worn bores.

If any of the above defects are evident the complete bearing (cup and cone) **MUST** be replaced.

3.8.1 Replace Hub:

It is advisable to replace with a complete new hub and bearing assembly which is available from Meritor Aftermarket Distributors.

3.8.2 Individual Bearing Replacement Procedure:

Drift out the bearing cup from the hub ensuring that the bearing bore within the hub is not damaged.

Bearing Cup Refitment:

ALWAYS USE GENUINE MERITOR BEARINGS – STANDARD ISO BEARINGS CANNOT BE USED.

Insert the bearing cup into the hub and using a bearing cup driver (Meritor part number 21218569) drive the cup fully home ensuring the cup sits squarely against the hub shoulder.

3.9 REGREASE BEARINGS

Thoroughly pack both bearing cones with Meritor Hub Grease, Blue Lithium EP2 and refill the bearing cavity. Refer to table 5 for correct grease quantities.

Note: Greased bearings should always be placed in a clean area.

3.10 REFIT INNER BEARING

Refit inner bearing cone into the inner bearing cup pressing fully home to assist location of oil seal driver.

TA & TAC Service

3.11 FIT NEW OIL SEAL

Press a **NEW OIL SEAL** onto the oil seal driver (Meritor part number 21218568) ensuring the 'OIL SIDE' marking on the seal is visible (i.e. faces away from the plate of the driver) such that the seal will be installed the correct way round in the hub.

Locate the nose of the driver into the bore of the inner bearing cone and drive the seal fully home ensuring the seal remains square to the hub at all times (Fig. 6). The outer face of the seal should be flush with the back face of the hub when fully installed.

Check the hub cavity grease and top up as necessary with Meritor Hub Grease, Blue Lithium EP2. Refer to table 5 for correct grease quantity.



FIG. 6

3.12 REFIT OUTER BEARING AND RETAINING WASHER

Refit the outer bearing cone. Fit the retaining washer into the hub, ensuring the adjustment indicator markings are facing outwards and fit the retaining clip to hold the bearing cone in place ready for re-assembling the hub to axle spindle (Fig. 7). Refer to Section 3 for refitting procedure.

TA Hub Re-Fitment Procedure

3.13 CLEAN SPINDLE BEARING JOURNAL

Prior to re-assembling the hub onto the spindle, check the spindle for damage and remove any fretting or rust on bearing journals using medium grade emery cloth strip. Also ensure the inner bearing abutment shoulder is clean and free from damage.

Clean the oil seal journal, removing brake dust or corrosion from adjacent areas.

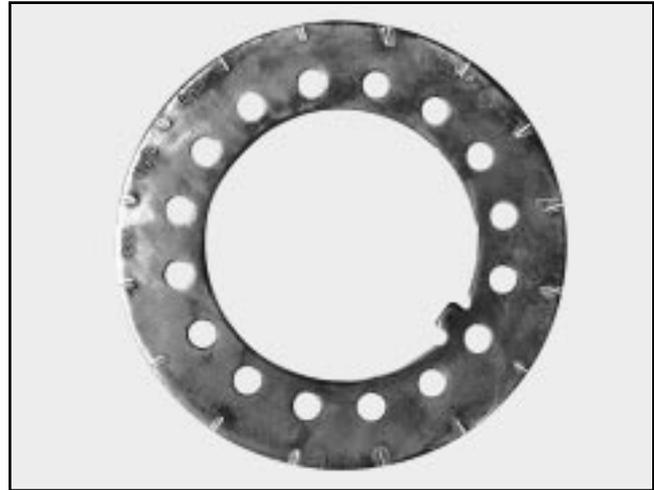


FIG. 7

3.14 CHECK SPINDLE END THREAD

Any minor damage can be repaired using a 3.48" UNS-2a die nut and holder (Meritor part numbers 21226885 and 21224940).

Apply a thin, even coating of Optimol 'Optimoly White Paste T' (available from Meritor Aftermarket Distributors) to the bearing journal and abutment shoulder (Fig. 8).

This will reduce spindle wear and assist future removal of the hub assembly.



FIG. 8

RE-MOUNT HUB ASSEMBLY

If the hub is still assembled to the road wheel and brake drum, use a wheel dolly to align the hub assembly with the axle spindle, adjusting the height until the brake drum fits over the brake linings.

If the hub and drum assembly is to be replaced separately from the road wheel, ensure it is squarely aligned to the axle spindle during refitting.

TA & TAC Service

Assemble the hub bearing guide sleeve (Meritor part number 21226490) over the thread of the spindle ensuring the split in the clip is orientated equally over the spindle keyway. (Fig. 8a).

Before fitting the hub, ensure the hub bearing bore is in line with the guide sleeve and the key on the retaining washer is aligned with the keyway on the spindle end.

Push the hub assembly over the sleeve and fully onto the spindle bearing journal, taking care not to damage the oil seal.

Remove the guide sleeve from the spindle thread.



FIG. 8a

3.15 REFIT HUB LOCKNUT

Fit the hub locknut (Fig. 9) and tighten using hub nut spanner from the TA Service Kit (Meritor part number 21226884) until the nut is fully engaged on the spindle thread.



FIG. 9

3.16 HUB LOCKNUT SETTING PROCEDURE

3.16.1 Torque the nut to 100 Nm **WHILST ROTATING THE HUB**. The hub **MUST** be rotated 5-10 revolutions whilst the end nut torque is continuously applied.

3.16.2 Back off the nut one flat of the socket (i.e. 1/8 turn) anti-clockwise.

3.16.3 Remove the hub nut spanner. Rotate the nut in a **CLOCKWISE** direction (i.e. in the 'tightening' sense) until the corners of the nut align with the **NEXT** nearest mark on the face of the retaining washer (Fig. 10).

Should the corners of the nut already line up **EXACTLY** with an index mark, do not further rotate the nut.

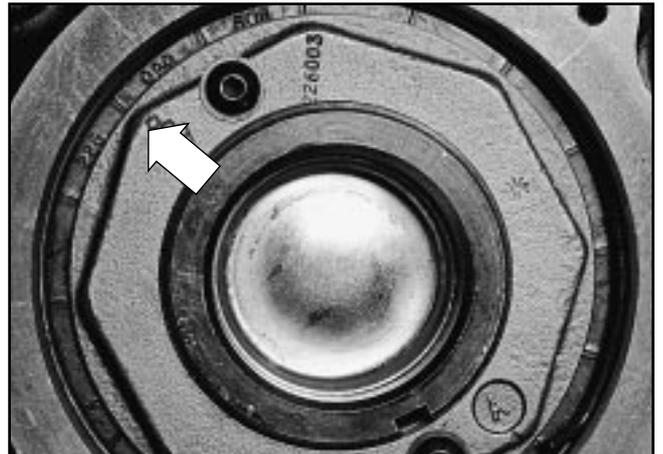


FIG. 10

3.16.4 Fit the two button-head screws to the locknut and tighten evenly until both the heads are flush with the face of the locknut.

Ensure the screws correctly engage into the holes in the lockwasher.

NOTE:

The button-head screws include a nylon thread locking patch. The locking properties of this patch are effective for two further applications of the screw after initial factory assembly. The screws should then be replaced.

3.16.5 Tighten the two button-head screws to the torque value specified in table 1 using a 5mm A/F Allen socket and torque wrench (Fig. 11).



FIG. 11



an ArvinMeritor brand

TA & TAC Service

3.17 CHECK BEARING ADJUSTMENT

Check for free rotation of the hub assembly and ensure the bearing clearance is not excessive.

If in doubt repeat procedure 3.16.

3.18 REFIT HUB CAP

Check the hub face is clean. Fit the hub cap gasket (Fig. 12), and hub cap.



FIG. 12

Tighten the bolts evenly. Finally tighten the hub cap screws to the torque value specified in table 1. (Fig. 13). Care should be taken not to damage any of the sealing lips on the gasket.



FIG. 13

TAC Hub Removal Procedure

The TAC hub and bearing assembly is fully sealed and normally does not require maintenance. However, the TAC axle fitted with Q or Z drum brakes features an inboard mounted brake drum. Thus requiring the hub assembly to be removed for brake service.

The following procedures can be performed either with the road wheel assembled to the hub and drum or with the road wheel removed.

3.19 REMOVAL OF HUB CAP

Remove the five M8 hub cap screws.

Remove the hub cap and gasket (Fig. 14).



FIG. 14

3.20 UNDO LOCKING STAKE

Using a suitable small chisel or screwdriver, lever back the flange of the staking washer where it has been staked to one of the slots in the axle end nut. Ensure the washer flange is clear of the nut flange (Fig.15).



FIG.15

TA & TAC Service

3.21 REMOVAL OF AXLE END NUT AND RETAINING WASHER ASSEMBLY

The axle end nut can now be removed using the end nut socket from the Meritor TAC service kit (Meritor part No. 21226453) and a suitable $\frac{3}{4}$ " drive wrench.

NOTE: The torque required to remove the nut will be at least 700Nm.

Fully remove the axle end nut and lift away the retaining washer assembly (Fig. 16)



FIG. 16

3.22 REMOVAL OF THE HUB ASSEMBLY

Remove the hub assembly from the axle using a hub puller (Meritor part No. 21224863).

The five M8 hub cap screws may be used to secure the hub puller to the hub face (Fig. 17)

If the hub and drum is to be removed whilst still assembled to the road wheel, use a wheel dolly to support the weight of the assembly.



FIG. 17

3.23 HUB AND BEARING INSPECTION

The TAC bearing unit is fully sealed and cannot be serviced.

It is however, recommended that for maximum bearing life, the auxiliary seal at the back of the hub is replaced whenever the hub is removed from the axle, as damage may have occurred during the hub removal process.

The oil seal should be removed from the hub using an oil seal removal tool (Meritor part No. 21218565) (Fig. 18).

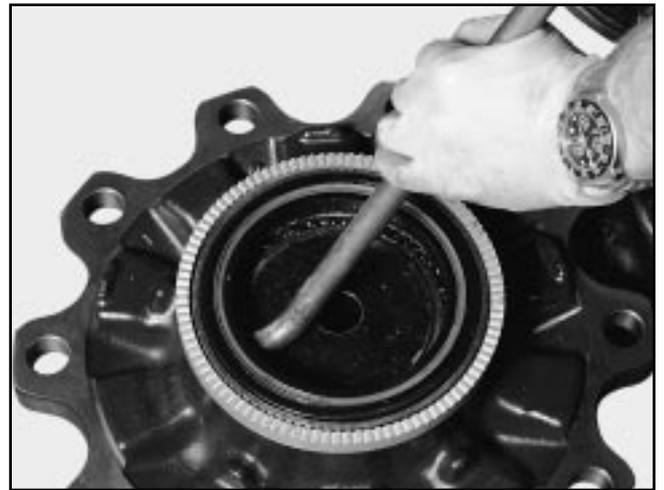


FIG. 18

WARNING:

This seal must not be confused with the inner and outer main bearing seals which are integral to the bearing unit and cannot be serviced.

Inspect the hub assembly for general signs of damage. Check the two bearing oil seals for leakage. NOTE: A small witness of grease may be in evidence around the seals. This is normal and should simply be wiped clean.

Wipe the inner bore of the bearing unit with clean dry paper to remove any residue of assembly paste.

Inspect the spring clip between the two halves of the bearing cone for damage.

NOTE: Never attempt to remove:-

- The circular spring bearing retaining clip from the hub
- The bearing assembly from the hub
- Either of the two oil seals integral to the bearing unit from the bearing
- The spring clip between the two halves of the inner bearing cone.

THIS WILL CAUSE IRREPARABLE DAMAGE TO THE HUB ASSEMBLY AND AUTOMATICALLY INVALIDATE ALL HUB WARRANTY.

TA & TAC Service

3.24 FIT NEW AUXILIARY OIL SEAL

Press a new oil seal onto the oil seal driver (Meritor part No. 21218568) ensuring the 'oil side' marking on the seal is visible (i.e. faces away from the plate of the driver) such that the seal will be installed the correct way round in the hub.

Locate the nose of the driver into the bore of the inner bearing cone and drive the seal fully home ensuring the seal remains square to the hub at all times (Fig. 19). The seal will bottom out on the inner hub shoulder and the outer face will remain proud of the hub when fully installed.



FIG. 19

TAC Hub Re-fitment Procedure

3.25 CLEAN SPINDLE BEARING JOURNAL

Prior to re-assembling the hub onto the spindle, check the spindle for damage and remove any fretting or rust on bearing journals using medium grade emery cloth strip. Also ensure the inner bearing abutment shoulder is clean and free from damage.

Clean the oil seal journal, removing brake dust or corrosion from adjacent areas.

3.26 CHECK SPINDLE END THREAD

Any minor damage can be repaired using a 3.480" UNS die nut and holder (Meritor part numbers 21226885 and 21224940).

Apply a thin, even coating of Optimol 'Optimoly White Paste T' (available from Meritor Aftermarket Distributors) to the bearing journal and bearing abutment shoulder (Fig. 20).

This will reduce spindle wear and assist future removal of the hub assembly.



FIG. 20

3.27 RE-MOUNT HUB ASSEMBLY

If the axle is fitted with ABS check the condition of the sensor and pull it fully forward in its mounting block or bracket. (dependant on whether axle is fitted with drum or disc brakes.)

If the hub and drum is still assembled to the road wheel use a wheel dolly to align the hub assembly with the axle spindle, adjusting the height until the brake drum fits over the brake linings.

If the hub and drum assembly is to be replaced separately from the road wheel, ensure it is squarely aligned to the axle spindle during refitting.

Assemble the hub bearing guide sleeve (Meritor part no 21226490) over the thread of the spindle. (Fig. 20a).

Before fitting the hub, ensure the hub bearing bore is in line with the guide sleeve.

Push the hub assembly over the sleeve and fully onto the spindle bearing journal, taking care not to damage the oil seal.

Remove the guide sleeve from the spindle thread.



FIG. 20a

TA & TAC Service

3.28 REFIT THE RETAINING WASHER ASSEMBLY

The retaining washer assembly may be re-used twice after original factory fitment. After the flange of the staking washer has been bent over in three positions the retaining washer assembly **MUST** be replaced.

Lightly lubricate the full dished face of the stake washer with Optimol 'Optimoly white paste T' or a conventional hub bearing grease.

Fit the retaining washer assembly (Fig. 21) by aligning the retaining washer key with the spindle keyway. Ensure the washer assembly is fitted the correct way round with the dish of the stake washer facing outwards (Fig. 22)



FIG. 21



FIG. 22

3.29 REFIT AXLE END NUT

Fit the axle end nut to the spindle thread. Wind the nut down the spindle thread using the end nut socket from the Meritor TAC Service Kit (Meritor part No. 21226453). Continue until the hub is fully located and at the same time continuously rotate the hub (15 - 20 complete revolutions) to ensure the bearing rollers are seated.

Using a suitable $\frac{3}{4}$ " drive torque wrench, apply a final tightening torque to the value specified in table 1. Continue to rotate the hub whilst the final torque is applied (Fig. 23).



FIG. 23

TA & TAC Service

3.30 STAKING THE WASHER TO AXLE END NUT

Using the staking tool from the Meritor TAC Service Kit (Meritor part No. 21226453) stake a previously unused section of the outer flange of the stake washer into ONE of the slots on the face of the nut flange (Fig. 24). The washer material should be split along the edge of the flat end of the slot in the nut and formed over progressively into the remaining length of the slot so as to resist the unwinding of the nut in the event that torque is lost (Fig. 25).



FIG. 24



FIG.25

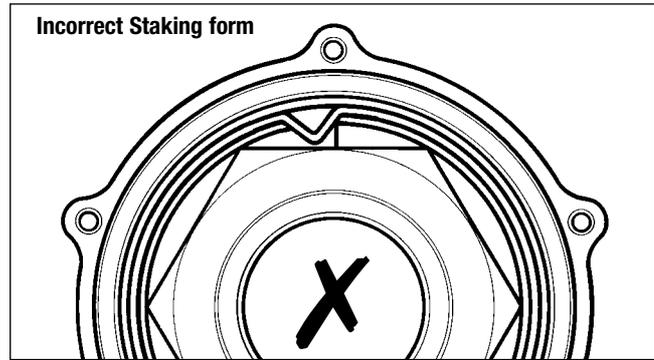


FIG.26

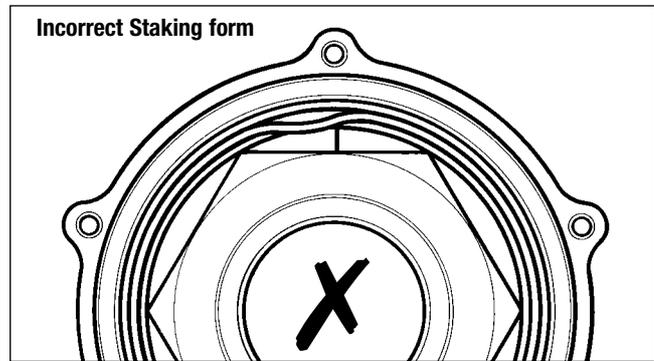


FIG.27

Fig. 26 and Fig. 27 show incorrect locking procedure.

It is possible to complete the staking operation by using a piece of 10mm x 10mm square bar by placing the end of the bar on the staking washer flange at a shallow angle. Carefully align it so that the one side of the bar is in line with the flat end of the slot in the nut flange.

Do not use a sharp bladed tool such as a chisel or screw driver.

TA & TAC Service

3.31 CHECKING THE BEARING SETTING

Check for free rotation of the hub assembly. It should not be possible to detect any axial bearing clearance.

3.32 REFIT HUB CAP

Check hub face is clean. Fit the hub cap gasket and the hub cap (Fig. 28).



FIG. 28

Tighten the bolts evenly. Finally tighten the hub cap screws to the torque value specified in table 1 (Page 9). (Fig. 29). Care should be taken not to damage any of the sealing lips on the gasket.



FIG. 29



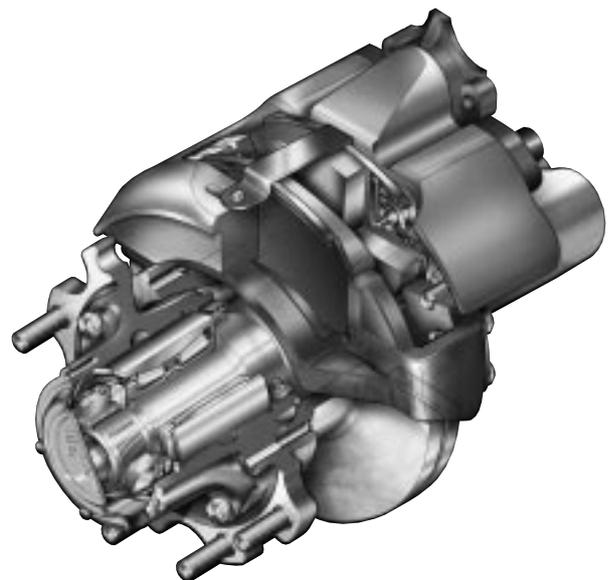
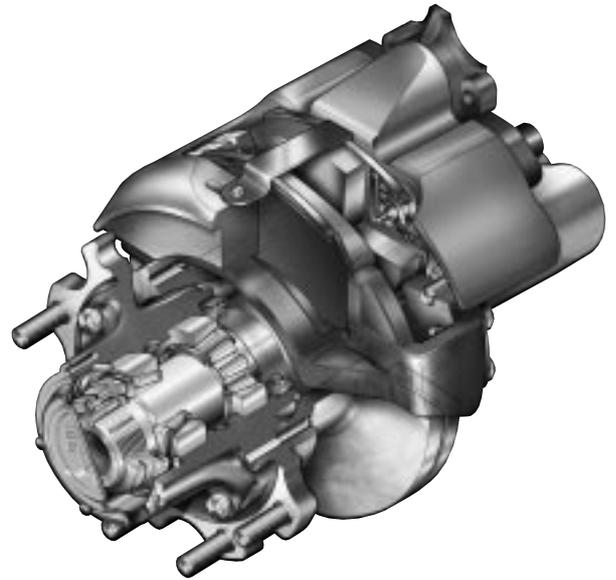
an **ArvinMeritor** brand

TA & TAC Service

TA & TAC Service

Section 4

TA/TAC Hub and Rotor Service for Disc Brakes



TA & TAC Service

SECTION 4

Hub Recognition

There are two basic hub types for the TA Disc Brake Axle series dependant on wheel type. See Figs. 1A and 1B. Either type can be obtained in separate bearing (TA) or cartridge bearing (TAC) format.



FIG. 1A



FIG. 1B

Fig. 1A Hub type for SINGLE WHEEL WITH DISC BRAKE

Fig. 1B Hub type for TWIN WHEEL WITH DISC BRAKE

TAC with disc brakes

The TAC hub and bearing assembly is fully sealed and can normally be left undisturbed for a 7 year or 1 million km (whichever is soonest) maintenance free period.

The TAC axle fitted with D Duco disc brakes would normally only require hub removal when it is necessary to change the disc rotor.

Hub and Bearing Removal and Inspection (TA & TAC)

The hub removal, service and re-fitting procedures are similar to those described in Section 3. However, in the case of disc brake installations, the following additional procedures are required.

4.1 SLACKEN ROTOR BOLTS:

Before lifting the axle it is advisable to slacken the wheel nuts.

Lift axle enough to get clearance to remove wheel. Support axle with safety stands and remove 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 and block the wheels to prevent the vehicle from moving.

With the park brake applied slacken the 10 rotor fixing bolts. (Fig. 2)

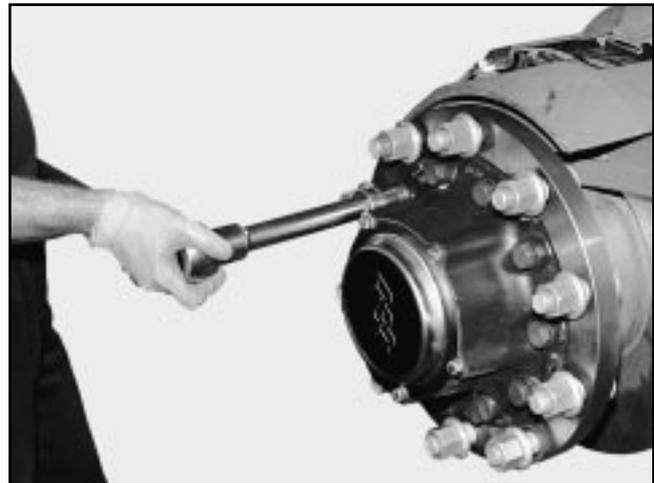


FIG. 2

4.2 RELEASE BRAKES AND REMOVE THE PADS

Release trailer brakes and remove pads as described in Section 2 of this Manual.

4.3 REMOVE CALIPER

Remove the brake caliper as described in Section 2 of this Manual.

4.4 HUB REMOVAL PROCEDURE (TA or TAC)

Remove the hub and rotor assembly as described in Section 3 of this Manual.

4.5 ROTOR REMOVAL

With the inboard face of the disc rotor laying flat, remove the 10 rotor bolts and washers. Lift the hub clear of the rotor.

4.6 HUB SERVICE AND INSPECTION

Carry out hub service and inspection procedures as described in Section 3 of this Manual.

4.7 ROTOR REPLACEMENT

If the existing rotor is to be re-used, refer to Section 2 of this Manual for inspection details prior to re-fitting.

With the in-board face of the disc rotor laying flat, assemble the hub to the rotor as shown in Fig. 3, ensuring that the spigot mountings and abutment faces on both hub and rotor are clean and free from damage.

Rotate the hub relative to the rotor until the rotor fixing bolt holes are aligned.

Fit the 10 rotor bolts and washers. Tighten bolts progressively in a diagonal sequence until the final torque specified in table 3 is achieved.

TA & TAC Service



FIG. 3

4.8 HUB AND REPLACEMENT

Replace the hub and rotor assembly as described in Section 3 of this Manual.

4.9 CALIPER AND PAD REPLACEMENT

Replace the caliper, refit the pads and ensure correct brake adjustment as described in Section 2 of this Manual.



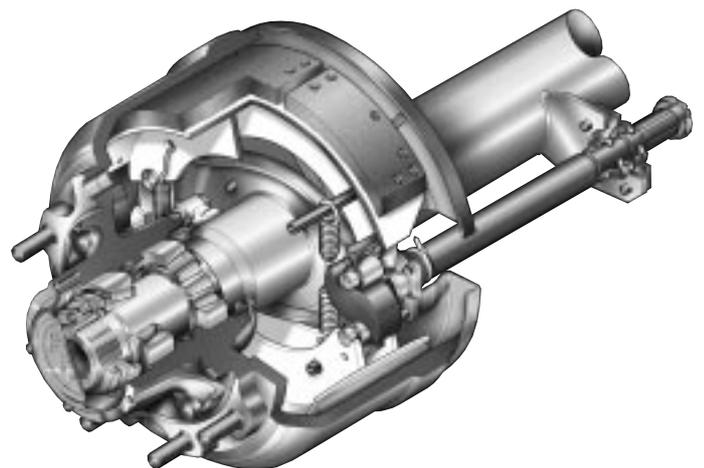
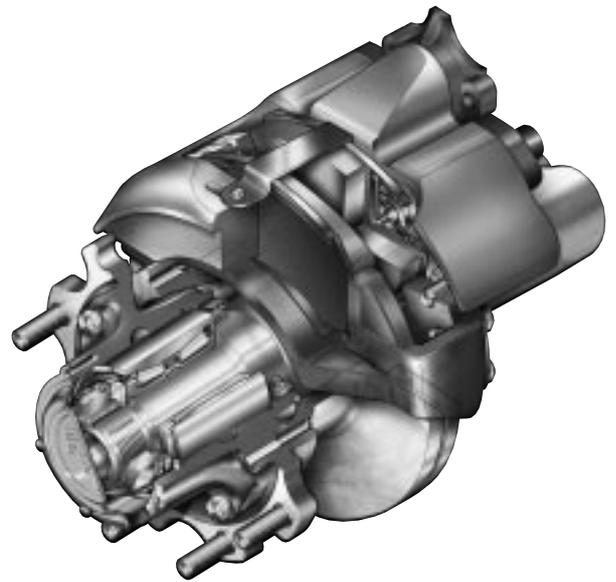
an **ArvinMeritor** brand

TA & TAC Service

TA & TAC Service

Section 5

Additional Procedures for Disc & Drum Brakes



SECTION 5

Additional Procedures

Drum Brake

5.1 REMOVAL AND REFITTING OF WHEEL BOLTS

Meritor wheelsbolts are pressed into the hub and drum assembly and retained by serrations on the bolt shank.

Damage to wheelbolts is caused by:-

- Loose wheel nuts
- Overtightened wheel nuts
- Mismatched wheel type and fixings
- Cross threaded nut and bolt
- Mismatched nut and bolt types

With the hub and drum assembly removed from the axle, place the back face of the drum onto a firm flat surface (so that the studs are pointing vertically upwards). Using the wheel bolt removal tool (Meritor part number 21205455), drive out the wheel bolts (Fig. 1).

To replace the wheel bolts, invert the hub and locate the drum onto the hub spigot and rotate to align the bolt holes.



FIG. 1

CAUTION:

Ensure all mating surfaces are clean, dry and free from burrs prior to assembly.

If reusing the original hub, care should be taken to align the serrations on the bolt with the channels previous cut in the hub. Using the wheelbolt driving tool (Meritor part number 21211274) drive each bolt until the head is fully seated against the drum flange (Fig. 2). Assemble the ten studs in a diagonal sequence.

CAUTION:

Ensure that there is NO gap between the hub flange and wheel bolt head after assembly.



FIG. 2

5.2 FITTING AN ABS POLE WHEEL

With the hub and drum removed from the axle, place it, oil seal end upwards, on a clean, flat surface and cover the bore with a clean cloth to protect the bearings and grease from contamination. Check that the pole wheel mounting spigot on the hub is clean and free from rust using medium emery paper to clean it up if necessary. Ensure no emery dust or other debris contaminates the bearings or grease.

The pole wheel can be fitted hot or cold using the oil seal driving tool (Meritor Part No. 21224749). If fitting hot, heat the pole wheel evenly to a **maximum** of 150°C using a hot plate or induction heater and place onto the hub spigot ensuring it fully seats. If fitting cold, use the oil seal driving tool to drive the pole wheel onto the hub spigot ensuring it bottoms out against the mounting shoulder (Fig. 3).



FIG. 3

TA & TAC Service

5.3 FITTING AN ABS SENSOR

5.3.1 Sensor Block Assembly:

Apply Meritor Brake Lubricant grease to bush.

Assemble the spring bush into the sensor mounting block (Fig. 4). Push the sensor fully into the mounting block assembly.

When the hub is refitted the pole wheel will push the sensor back thus attaining the correct clearance.



FIG. 4

5.3.2 Fix Sensor Block Assembly to Axle Beam:

All axle beams are provided with a sensor block bolt fixing hole and location step. The hole is located on the spindle end behind the oil seal journal and is orientated between the two anchor pin bushes.

Position the mounting block assembly so that the two small feet on the front edge of the block locate over the step on the spindle just forward of the bolt hole.

Line up the bolt hole in the block with the hole in the beam and engage the M10 thread forming fixing bolt. ALWAYS USE THE CORRECT BOLT. Refer to Meritor Parts List.

Tighten the fixing bolt evenly to the torque specified in table 1. Ensure the block is correctly seated and fully clamped.

The sensor may be rotated in the mounting block to allow the cable to pass either side of the anchor bracket.

Pass the sensor cable through the dust cover using the uppermost hole and fit the strain relief grommet.

Ensure the lower cable exit hole in the dust cover is fitted with a blanking plug.

5.3.3 Checking Sensor Output:

Connect the output cable to a suitable multimeter. Rotate the hub by hand at a constant rate of approximately 30 rpm and note the maximum and minimum readings. The minimum permissible voltage reading is 400 millivolts and the ratio of maximum/minimum should not exceed 2. If either values are not obtained check the installed air gap between the sensor and pole wheel does not exceed 0.7 millimeters and the pole wheel run out does not exceed 0.2 millimeters. If the installation is still not correct, contact the supplier of the ABS equipment for further advice.

5.4 FITTING OF HUBODOMETER

The TA axle may be fitted with an hubodometer by using a special hub cap. It is not possible to fit an hubodometer to a standard hub cap and attempting to do so will affect the hub sealing and may damage the spindle.

For hubodometer types up to 85mm outside diameter use hub cap Meritor Part No. 21226118.

It is advisable to assemble the hubodometer to the hub cap prior to fitting the hub cap to the axle. Place the hub cap on a clean, flat surface. Fit the nut to a suitable open ended spanner and using a small amount of grease place the washer onto the nut.

Using the spanner, position the nut and washer under the mounting hole in the cross bar of the hub cap. Lower the hubodometer through the hole to engage the thread. Rotate the hubodometer to screw the nut along the mounting stud until hand tight. Finally tighten the nut with the spanner in the normal way (Fig. 5).

The hub cap and gasket can now be fitted to the axle as described in Section 4.7.



FIG. 5

5.5 REMOVAL AND REFITTING OF WHEEL BOLTS

With the hub removed from the axle, support it by placing blocks under the flange, or if the rotor is still attached, stand the inboard face of the rotor on a clean, flat, firm surface. Using the wheel bolt removal tool (Meritor Part No. 21205455) drive out the wheel bolts (Fig. 6)



FIG. 6

Wind the new stud into the hub using spacer washers and a wheel nut. Ensure the gap under the bolt head does not exceed 0.1 mm. (Fig. 7)

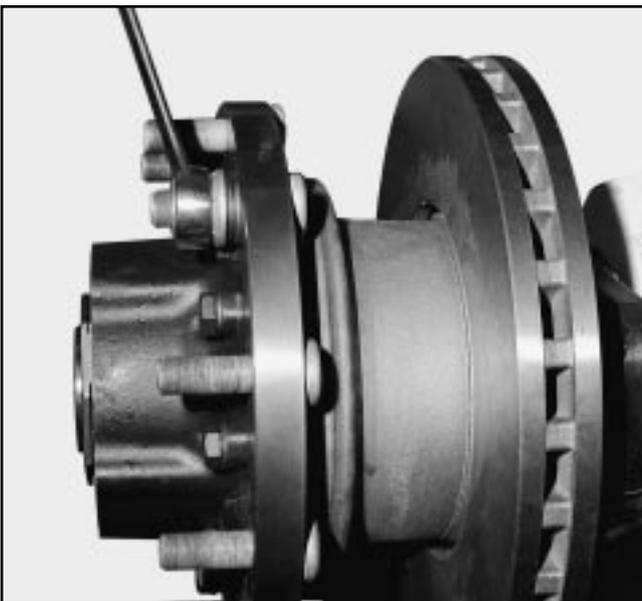


FIG. 7

5.6 FITTING AN ABS SENSOR

5.6.1 Sensor Block Assembly:

Apply Meritor Brake Lubricant to the bush.

Assemble the spring bush into the sensor mounting bracket. Push the sensor fully into the mounting bracket assembly (Fig. 8).



FIG. 8

When the hub is refitted, the pole wheel will push the sensor back thus attaining the correct clearance.

5.6.2 Fix Sensor Bracket to Axle Beam:

All disc brake axle beams are provided with two sensor bracket fixing holes on the torque plate.

Locate the bracket against the outboard side of the torque plate such that the fixing holes line up.

Assemble the two fixing screws from the inboard side of the torque plate, through the holes and into the threaded holes in the sensor mounting bracket as shown in Fig. 9.



FIG. 9

Tighten the two screws evenly to the torque specified in table 3. Ensure the bracket is seated squarely on the torque plate and fully clamped into position.

The sensor may be rotated in the mounting bracket to obtain the desired cable angle.

TA & TAC Service

5.6.3 Checking Sensor Output:

Connect the output cable to a suitable multimeter. Rotate the hub by hand at a constant rate of approximately 30 rpm and note the maximum and minimum readings. The minimum permissible voltage reading is 400 millivolts and the ratio of maximum/minimum should not exceed 2. If either values are not obtained check the installed air gap between the sensor and pole wheel does not exceed 0.7 millimeters and the pole wheel run out does not exceed 0.2 millimeters. If the installation is still not correct, contact the supplier of the ABS equipment for further advice.

5.7 FITTING OF HUBODOMETER

The TA axle may be fitted with an hubodometer by using a special hub cap. It is not possible to fit an hubodometer to a standard hub cap and attempting to do so will affect the hub sealing and may damage the spindle.

For hubodometer types up to 85mm outside diameter use hub cap Meritor Part No. 21226118.

It is advisable to assemble the hubodometer to the hub cap prior to fitting the hub cap to the axle. Place the hub cap on a clean, flat surface. Fit the nut to a suitable open ended spanner and using a small amount of grease place the washer onto the nut.

Using the spanner, position the nut and washer under the mounting hole in the cross bar of the hub cap. Lower the hubodometer through the hole to engage the thread. Rotate the hubodometer to screw the nut along the mounting stud until hand tight. Finally tighten the nut with the spanner in the normal way (Fig. 5) to a maximum of 27 Nm.

The hub cap and gasket can now be fitted to the axle as described in Section 3.18.



an **ArvinMeritor** brand



an **ArvinMeritor** brand

Meritor HVS Limited
Commercial Vehicle Systems
Rackery Lane, Llay
Wrexham LL12 0PB
U.K.
Telephone: +44 (0)1978 852141
Fax: +44 (0)1978 856173

Meritor HVS (Mityr-Mory) S.A.
Commercial Vehicle Systems
Z.I. du Moulin à Vent
9 rue des Frères Lumière
77290 Mityr-Mory
France
Telephone: +33 (0)1 64.27.44.61
Fax: +33 (0)1 64.27.30.45

Meritor HVS (Verona) s.r.l.
Commercial Vehicle Systems
Via Monte Fiorino, 23
37057 San Giovanni Lupatoto
Verona
Italy
Telephone: +39 045 8750399
Fax: +39 045 8750640 / 8750513

Meritor HVS (Barcelona) S.A.
Commercial Vehicle Systems
Ctra. Granollers - Sabadell Km. 13,3
Poligono Argelagues
08185 Lliçà de Vall
Spain
Telephone: +34 (9)3 843 95 68
Fax: +34 (9)3 843 83 59

ArvinMeritor Inc.
World Headquarters
2135 West Maple Road
Troy, Michigan 48084
U.S.A.
Telephone: +1 248 435 1000

ArvinMeritor
Commercial Vehicle Aftermarket AG
Neugutstrasse 89
8600 Dübendorf
Switzerland
Telephone: +41 (0)1 824 8200
Fax: +41 (0)1 824 8264

ArvinMeritor
Commercial Vehicle Systems
Postbus 255
5700AG Helmond
Churchillaan 204A
5705BK Helmond
Holland
Telephone: +31 (0)492 535805
Fax: +31 (0)492 547175

ArvinMeritor South Africa
Commercial Vehicle Systems
Telephone: +27 (0) 83 602 1603

For further information contact

Meritor HVS Limited
Commercial Vehicle Systems
Rackery Lane, Llay
Wrexham LL12 0PB
U.K.
Telephone: +44 (0)1978 852141
Fax: +44 (0)1978 856173

www.arvinmeritor.com

© Copyright 2001
Meritor Automotive
All rights Reserved

Publication 4.92.1B

Descriptions and specifications were in effect at the time of publication and are subject to change without notice or liability. Meritor reserve the right to make design improvements, change or discontinue parts at any time.

ArvinMeritor™