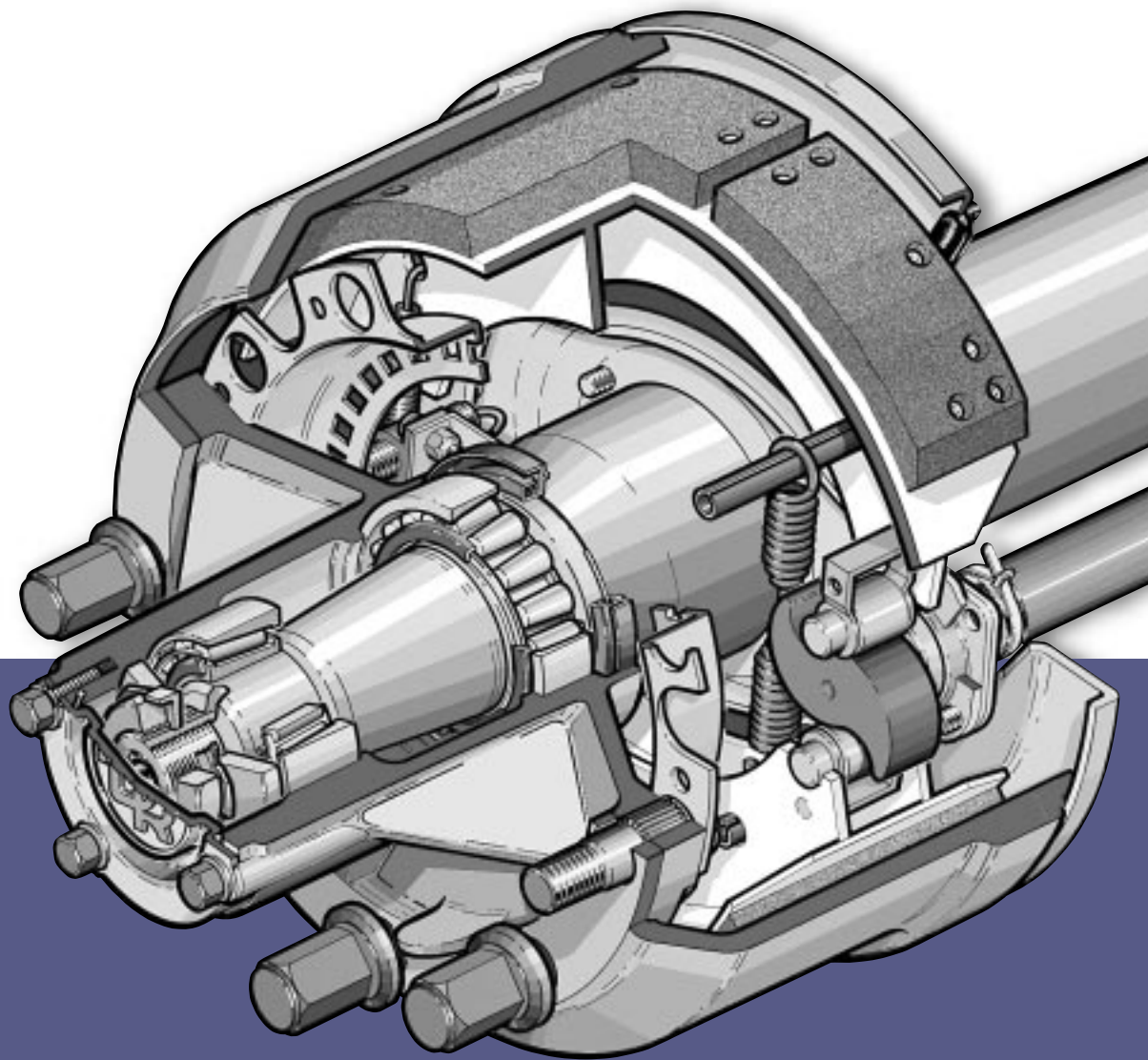




an **ArvinMeritor** brand

Meritor Axle & Brake Service Manual TE Series Axle



ArvinMeritor[™]

TE9000 / 93000 Service

INDEX

Section	Description	Page
	THE MERITOR WARRANTY	3
	THE AXLE IDENTIFICATION PLATE Identifying the Axle Type, Identifying the Serial Number	4
	INTRODUCTION TO THE TE9000 AND TE9300 SERIES AXLES	5
	AXLE INSTALLATION Limitations of Use, Stresses and Welding	5
	MAINTENANCE SCHEDULE Torque Recommendations, Recommended Lubricants	6
1	SERVICE PROCEDURES AXLE ANNUAL SERVICE AND SERVICE AFTER 3 YEARS OR 300,000 KM De-adjust Brake, Remove Wheel, Hub and Drum Assembly, Remove Brake Shoes, Remove Anchor Pins, Clean Anchor Pin Bushes, Anchor Bracket and Cam Head, Clean Spindle, Remove Cam Rollers from Brake Shoes, Clean Cam Rollers and Anchor Pins, Assemble Anchor Pins, Inspect Brake Linings, Clean and Assemble Brake Shoes, Inspect Brake Springs, Inspection of Camshafts and Camshaft Bearings for Play, Removal of Camshafts and Camshaft Bearings,, Replacement of the Camshafts and Camshaft Bearings, Refit Brake Shoes, Grease Camshaft Bearings, Inspect Brake Drums, Remove Oil Seal, Wheel Bearing Inspection and Greasing, Routine Annual Hub Service, 3 Year/300,000 km Major Hub Service, Apply Anti-fretting Paste to Spindle, Refit Hub, Drum and Wheel Assembly, Lubricate Brake Chamber Clevis Pin Assembly, Adjust Brakes	7
2	ADDITIONAL PROCEDURES AFTER 3 YEARS OR 300,000 KM Removal and Refitting of Wheel Bolts, Fitting of the Pole Wheel, Fitting of the Sensor, Sensor Output, Removal and Refitting of Dust Covers, Fitting of a Hubodometer, Removal and Refitting of Brake Drum, Removal and Fitting of Antilock Equipment	16

TE9000 / 93000 Service

MERITOR HVS Limited Warranty

1. AXLES, MECHANICAL AND FLEXAIR SUSPENSIONS, INDAIR, OTHER MERITOR ACCESSORY PRODUCTS

24 MONTHS PARTS AND LABOUR

Effective 1st March 1989

2. AXLES AND FLEXAIR UNITS ASSEMBLED BY MERITOR HVS

36 MONTHS PARTS AND LABOUR

Effective 1st May 1992

The Company warrants that at its option it will repair or replace without charge any original MERITOR axle, suspension, trailer component and any axle and suspension assembly which is found on examination by the Company to be defective as to material or workmanship.

Subject to: such assembly or component having been used solely on a vehicle for which the specification and applications have been approved by the Company's engineering department and in accordance with the approved applications and the vehicle not having been altered from the manufacturer's specification.

This warranty and the obligation to repair or exchange are complete and exclusive. No liability is accepted for special or consequential expenses/damages of any nature. The warranty does not apply to normal wear and tear, abuse, damage caused by accident, failure to lubricate as specified in accordance with manufacturer's instructions, and, if adequate storage facilities and protection are not provided, the damage resulting from deterioration up to the time MERITOR products are delivered to the first owner-user.

Allowances for labour will be paid for repair or replacement only as determined and APPROVED by MERITOR Service Department BEFORE SUCH LABOUR HAS STARTED.

All claims submitted under this warranty period must be filed in writing with the MERITOR Aftermarket Services Division within 60 days from the date of failure and all components involved in the claim must be retained and available for inspection for 90 days from the date of claim being submitted.

No deductions shall be made from remittances or current accounts in respect of any warranty claims whilst those claims are being processed.

All claims must quote component Serial Numbers (where applicable) and relevant vehicle number identification and also assembly Serial Number and manufacturing date code where applicable.

This warranty is in substitution for and excludes all express or implied statutory or other conditions, warranties, guarantees, or liabilities (whether as to fitness for a particular purpose, quality, standard of workmanship or otherwise). Save as provided herein the Company accepts no liability whatsoever for defects in parts or for any injury, loss or damage attributable thereto, howsoever arising (whether direct, indirect or consequential).

Warranty Procedure

Should any MERITOR equipment fitted to your trailer become unserviceable within the warranty period, contact the trailer manufacturer or MERITOR 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 Ltd reserve the right to make changes in specifications shown herein or add improvements at any time without notice or obligation.

PARTS SHOWN ARE MADE FROM DRAWINGS IN WHICH COPYRIGHT SUBSISTS. THE MAKING OF COPIES OF ANY OF THESE PARTS IS PROHIBITED.

© MERITOR HVS LIMITED



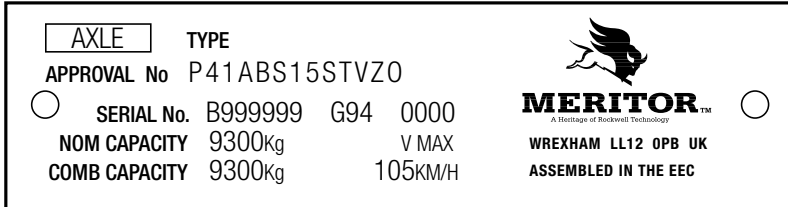
The high quality assurance management systems applied by MERITOR are endorsed with the awarding of ISO 9001, Lloyd's Register Quality Assurance.

"MERITOR" is a registered trade mark of MERITOR HVS Ltd in Great Britain, No. 1405496 in Class 12.

TE9000 / 93000 Service

The Axle Identification Plate

Every axle leaving the ROR 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 TE series axles are fitted with 10 stud, ISO 4107 spigot mount wheel fixings and asbestos free Ø 420 x 180mm brakes as standard. Other options are as shown below.

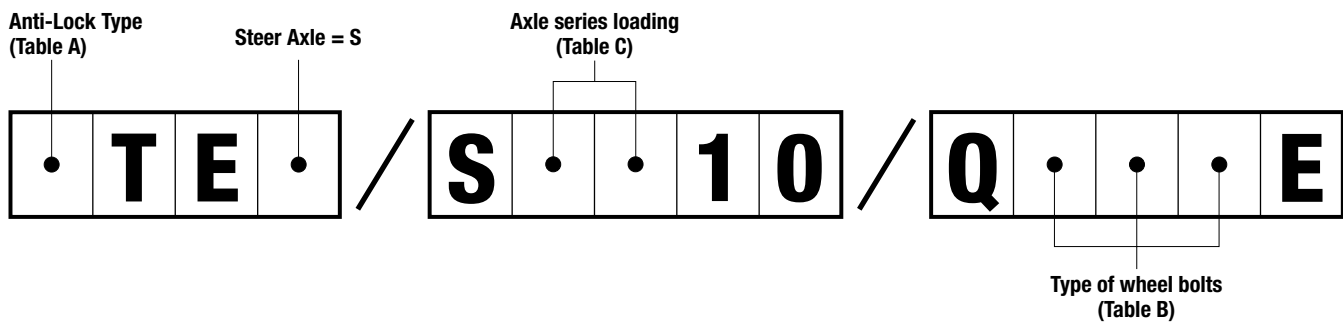


Table 'A'

Axle Letter Code	Exciter Ring Type	Suitable For
A	60t Pressed Steel	Grau MGX2 & MGX2E Bendix MD2 & MD2A
W	100t Solid Ring	Wabco Bosch Grau DGX & MGX100

Table 'C'

Axle Series	Nominal Highway Rating, Kg	Wall Thickness	Max Offset*
90	9300	13mm	460mm
93**	9300	16mm	490mm

The axle ratings shown are for normal highway applications and any special application for installation must be approved by Meritor Design Engineering.

* NB: Offset = $\frac{\text{Track} - \text{spring centres}}{2}$

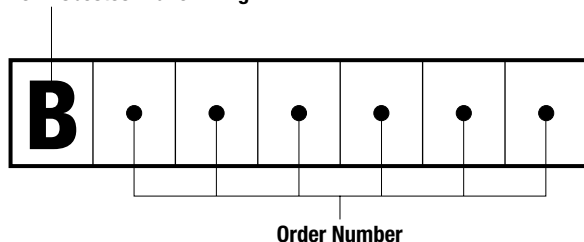
** For use with non Meritor air suspensions

Table 'B'

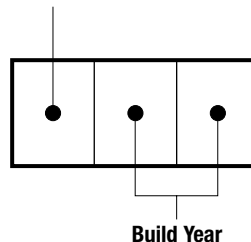
Axle Letter Code	ISO 4107 Wheel Mounting Type
MX	M22 x 1.5p wheel studs for single steel wheels
MXA	M22 x 1.5p wheel studs for single alloy wheels

Identifying the Serial Number

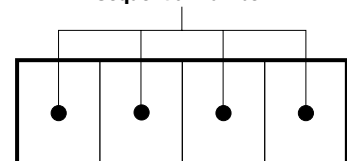
Non Asbestos Brake Lining



Build Month



Sequential Number



TE9000 / 93000 Service

Introduction to the TE9000 & TE9300 Series Axles

The TE9000 & TE9300 series axles are manufactured to the same high standards as the well established TM series axles. In fact, much of the materials and manufacturing processes are common to both axle series. The TE series axle has been designed with low weight and low cost of ownership in mind, and is intended for use in predominantly tri-axle applications, running on super single tyres at combined bogie weights up to 27 tonne. Among many new features incorporated in the TE series axle, two in particular stand out as conferring valuable benefits in service. Firstly, the axles are manufactured with pre-set bearing clearances and require no adjustment. The correct running clearances are obtained by the careful control of manufacturing tolerances and matched bearings. Secondly, the brake drum is outboard mounted and a full brake service can be performed without removing the hub.

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 TE series axles fitted with super single tyres and used in tandem or tri-axle arrangements.

For normal road and RO-RO use at 9 tonne axle weight the TE9000 (13mm wall) beam is authorised for Meritor air and mechanical suspensions only when assembled by Meritor. In all other instances of normal road, RO-RO, and unrestricted tipper use at 9 tonne axle weight using non-Meritor suspensions, air or mechanical, the TE9300 (16mm wall) beam must be used.

For extreme conditions, i.e. narrow frame centres (<1100mm), high centre of gravity (>2000mm) please consult Meritor Applications Engineering.

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 a 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.

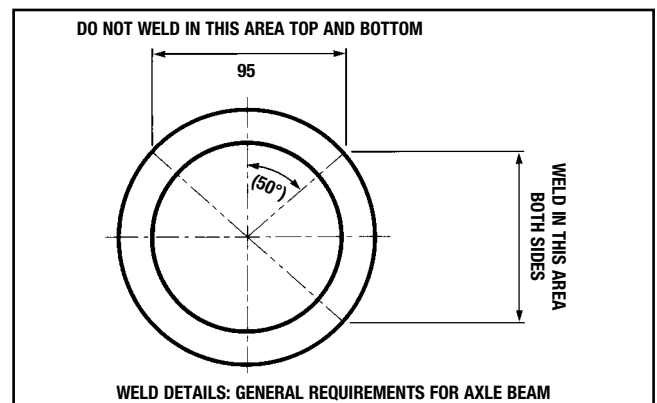
The direction of welding should be as near the horizontal as possible and welding around the corners of brackets or spring seats should be avoided. Separate drawings exist on request from the Meritor Technical Sales Department detailing seat welding procedures for both air and mechanical Meritor suspensions.

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. Descale 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.



TE9000 / 93000 Service

Maintenance Schedule

For suspension service intervals and maintenance procedures refer to the relevant suspension manual.

Specific service intervals must be determined by each fleet operator according to duty and experience. However, the following are minimum requirements.

BEFORE ENTERING SERVICE

Check brake adjustment.
Torque check all wheel nuts.

160 km

Torque check all wheel nuts.

1600 km

Torque check all wheel nuts.

3 MONTHLY

Torque check all wheel nuts.
Check brake adjustment.
Check hub oil level. (Oil filled axles only).
Lubricate camshaft spherical bearings.

ANNUALLY

In addition to the 3 monthly inspection, a major brake overhaul is advised along with a hub/bearing assembly grease examination as described in SECTION 1.

BIENNIALLY OR 300,000 km

In addition to the annual inspection a hub/bearing assembly grease change is required with careful examination of the bearings and journals also described in SECTION 1.

TORQUE RECOMMENDATIONS

Hub cap bolts (grease and oil)	11/15 Nm
Dust cover bolts	50/60 Nm
Spherical bearing bolts (spline end)	50/60 Nm
Spherical bearing bolts (cam head end)	50/60 Nm
Sensor fixing bolts (GRAU)	8/11 Nm
Sensor fixing bolts (WABCO)	25/30 Nm
Axle end nut	150/175 Nm
Brake drum retaining bolts	50/60 Nm
Wheelnut ISO M22 x 1.5 (steel and alloy wheels)	680/750 Nm

HUB & BEARING GREASE FILL VOLUMES

Hub Cavity Fill	325-375 gm
Inner Bearing Fill	40-45 gm
Outer Bearing Fill	32-37 gm
Hub Cap Fill	Nil

RECOMMENDED LUBRICANTS

Hub Bearings:	
Total Multis EP2	Shell Alvania Grease EP(LF)2
Shell Calithia EP2T	Castrol Spheerol EPL2
Texaco Multifak EP2	Mobil Mobilux EP2
BP LS EP2	Fina Marson EPL2
Silkolene G62	SKF LGEP2
Euro Universalfett EP2	GB Lithium EP2
Elf Lithium EP2	

Brake components and camshaft bearings:
Total Extemp

TE9000 / 93000 Service

SECTION 1

Service Procedures

Axle annual service and service after 3 years or 300,000 Km

The following step by step instruction details the essential operations required for these services. The 3 year service is in effect the same as the annual service with additional work on the hub and bearing assembly. Details of these additional procedures can be found in the next section of this manual.

Summary:

1. De-adjust Brake
2. Remove Wheel, Hub and Drum Assembly
3. Remove Brake Shoes
4. Remove Anchor Pins
5. Clean Anchor Pin Bushes, Anchor Bracket and Cam Head
6. Clean Spindle
7. Remove Cam Rollers from Brake Shoes
8. Clean Cam Rollers and Anchor Pins
9. Assemble Anchor Pins
10. Inspect Brake Linings
11. Clean and Assemble Brake Shoes
12. Inspect Brake Springs
13. Inspection of Camshafts and Camshaft Bearings for Play
14. Removal of Camshafts and Camshaft Bearings
15. Replacement of Camshafts and Camshaft Bearings
16. Refit Brake Shoes
17. Grease Camshaft Bearings
18. Inspect Brake Drums
19. Remove Oil Seal
20. Wheel Bearing Inspection and Greasing
 - 20a. Routine Annual Hub Service
 - 20b. 3 Year Major Hub Service
21. Apply Anti-fretting Paste to Spindle
22. Refit Hub, Drum and Wheel Assembly
23. Lubricate Brake Chamber Clevis Pin Assembly
24. Adjust Brakes

To carry out the above procedures in detail continue as follows:

1. DE-ADJUST BRAKE

Using the manual adjustment nut on the slack adjuster fully de-adjust the brake.

2. REMOVE WHEEL, HUB AND DRUM ASSEMBLY

Remove hub cap (fig. 1).

Remove hub cap seal. (Note: If this is an 'O' ring discard it.)

Straighten locking tab on tab washer using hammer and chisel (fig. 2).

Remove axle end nut (55mm A/F), and tab washer (fig. 3).

Install wheel dolly.

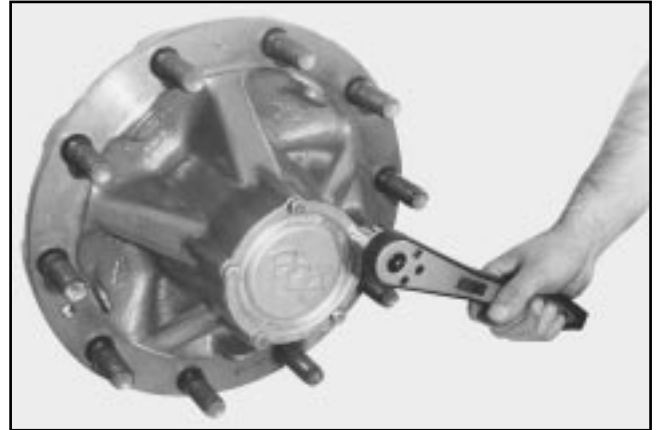


FIG. 1

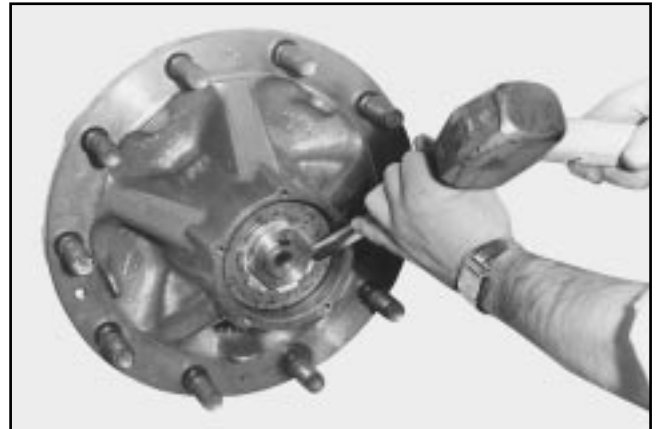


FIG. 2



FIG. 3

TE9000 / 93000 Service

Install hub puller (Meritor part no. 21221512) and dismount hub, drum and wheel assembly (fig. 4).

Remove hub, drum and wheel assembly and plug the inner bearing bore with a clean cloth.



FIG. 4

3. REMOVE BRAKE SHOES

IMPORTANT: If the brake linings do not need to be replaced, mark the brake shoes before removing them to ensure that they will be reassembled to the same brake in the same position.

Release retainer springs using screwdriver or similar tool (fig. 5).

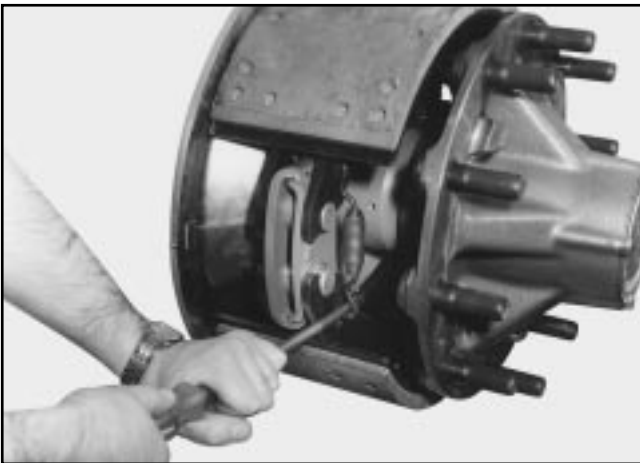


FIG. 5

Free lower brake shoe from anchor pins, lower this end of brake shoe and bring up to side of brake (fig. 6).

Free top brake shoe from anchor pins and lift both brake shoes connected by the brake return spring off the anchor bracket.

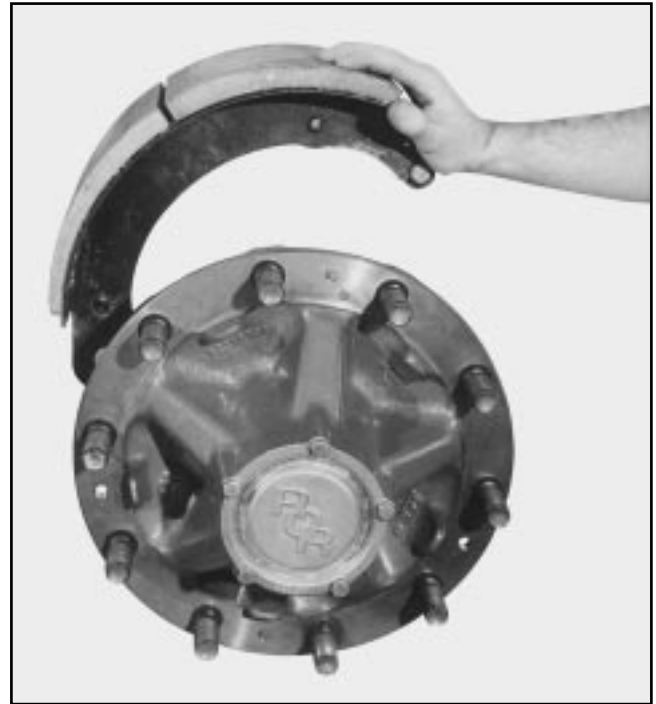


FIG. 6

4. REMOVE ANCHOR PINS

Remove anchor pins from anchor bracket (fig. 7).

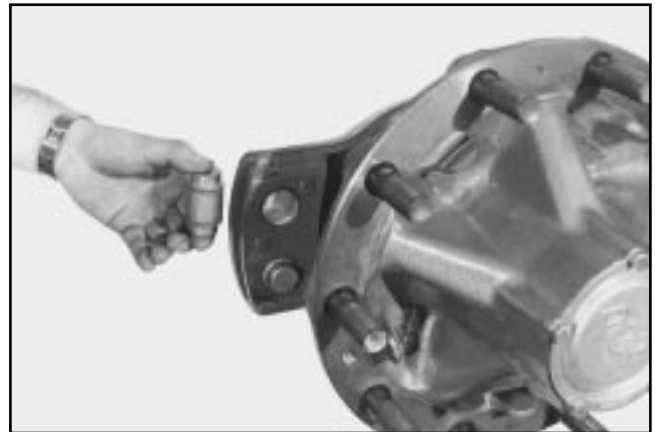


FIG. 7

This should normally be possible without the use of tools, however, on occasion after an excessively long period between services these components may be seized, in this case use a suitable drift and hammer to knock them out.

Remove 'O' rings from anchor pins.

TE9000 / 93000 Service

5. CLEAN ANCHOR PIN BUSHES, ANCHOR BRACKET AND CAM HEAD

Using a wire brush, clean each side of the anchor bracket in the area of anchor pins, clean the bore of the anchor pin bushes, if necessary using emery cloth.

Clean working surfaces of cam head using strip of coarse emery cloth.

Apply a small amount of grease to the bores of the anchor pin bushes and smear a thin coating of grease on both sides of the anchor bracket around the anchor pin bushes.

If the axle is fitted with anti-lock sensors, clean exposed sensor with a cloth and push sensor from rear until it protrudes fully forwards.

6. CLEAN SPINDLE

Check the spindle for damage and remove any fretting/rust on the bearing journals with medium emery cloth strip.

Clean down the oil seal mounting wiping brake dust and rust away from the area immediately behind the seal journal.

Check the oil seal mounting for damage.

Check the spindle thread for damage by fitting the end nut by hand. Provided thread damage is not severe it can be repaired using a 2mm pitch thread file or M36 x 2 die nut (Meritor part no. 21224408). (Note: The thread is not accessible for repair once the hub is mounted.)

7. REMOVE CAM ROLLERS FROM BRAKE SHOES

It is preferable to always renew the cam roller retainer clips when the cam rollers are removed from the brake shoes.

If new cam roller retainer clips are to be used simply prise rollers out of shoes using a strong screwdriver, remove the clips from the cam rollers and discard them (fig. 8).



FIG. 8

However, with care it is possible to reuse the cam roller retainer clips, insert a screwdriver into the hole in brake gusset and carefully press the retaining tab of the cam clip whilst gently pulling the roller, keeping the pressure on the cam roller turn the brake shoe over and repeat on the other side, the cam roller and clip will pull out from shoe. Remove the

clips from the cam rollers and inspect for damage to the retaining tabs, if they have cracked, broken off or failed to spring out the clip it must be replaced.

8. CLEAN CAM ROLLERS AND ANCHOR PINS

The working surfaces of the cam rollers and the anchor pins should be cleaned to remove any build up of compressed debris adhered to the working surfaces. In our experience the quickest and easiest way to do this is to use the wire wheel fitted to one end of a pedestal grinder, available in most workshops.

9. ASSEMBLE ANCHOR PINS

Assemble one 'O' ring to anchor pin and apply grease to anchor pin, install in the anchor bush from the rear pushing pin through sufficiently to fit the second 'O' ring, then push back to central position. Repeat for other anchor pin.

10. INSPECT BRAKE LININGS

Do not disturb the brake lining surface if this shows a normal working surface.

Take care not to contaminate the surface of the brake linings with grease etc.

Clean out compressed debris from rivet holes with screwdriver to avoid possibility of damage to brake drum.

If carrying out the service in winter months and the brake linings are soaked with water it may be necessary to dry these by careful application of heat to evaporate the water.

Brake lining surface may be carefully finished by hand using coarse emery cloth if contaminated by dirt, mud etc., but do not use any form of power tool.

11. CLEAN AND ASSEMBLE BRAKE SHOES

Clean any corrosion from both anchor pin and cam roller pivot areas on brake shoes using emery cloth and a screwdriver.

Apply specified grease to pivots areas on the brake shoes.

Apply specified grease to cam rollers, reassemble cam clips onto rollers and refit cam rollers into shoes making sure retainer tabs locate in the holes in the brake shoe gussets. Wipe excess grease from surface of cam roller that contacts the cam head and make sure cam roller is free to rotate in the brake shoe.

12. INSPECT BRAKE SPRINGS

Check the brake springs for damage, any spring showing signs of coil separation should be replaced.

TE9000 / 93000 Service

13. INSPECTION OF CAMSHAFTS AND CAMSHAFT BEARINGS FOR PLAY

Place a lever between the camshaft and axle beam close to the cam head bearing and lever up and down to detect free play (fig. 9). This should not be more than $\pm 0.5\text{mm}$ at the bush (the amount at the lever will depend on the lever length so discretion and judgement is required).

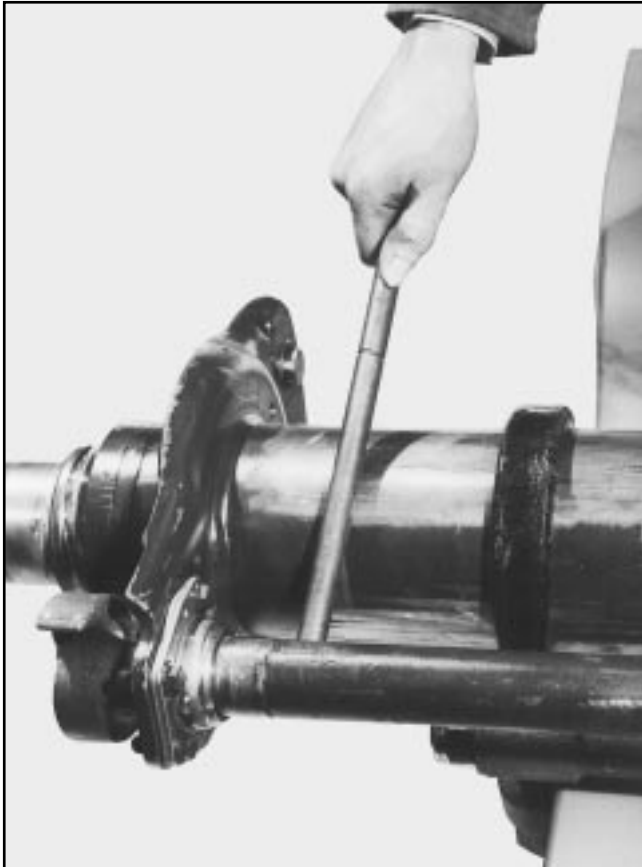


FIG. 9

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

If the play is excessive this suggests wear is present in the bearings or the camshaft journals and both should be replaced as necessary.

14. REMOVAL OF CAMSHAFTS AND CAMSHAFT BEARINGS

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. Unfasten the circlip locating the slack adjuster. Slide the packing washers, rubber boot and slack adjuster off the camshaft.

The camshaft can be removed along with the bearings with the hub assembly in place using the key hole slot in the anchor bracket to allow the cam head to pass through it. To proceed in this manner, unfasten the M10 retaining screws securing the head and spline end bearings to the brackets (figs 11 and 12). Guiding the head pull the cam head backwards through the slot and pull the camshaft and bearings away from the axle (fig. 13).

Unfasten the tie wraps securing the rubber boots.

Slide the spline end bearing and rubber boots off the camshaft and tap the head end bearing along the body of the camshaft. Note it can be difficult to remove the cam head bearing over the paint on the camshaft so some paint may need to be removed using a wire brush.

An alternative method of removal when the hub assembly is not fitted is to tap the camshaft through the bearings, first releasing the tie wraps securing the rubber boots, striking the spline end hard with a soft mallet initially to release the spring clip (fig. 10). The camshaft can then be fully removed from the axle by pulling outwards. Once the camshaft is removed the bearings can be removed from the axle by unfastening the 4 x M10 screws (figs 11 and 12) from each bearing.

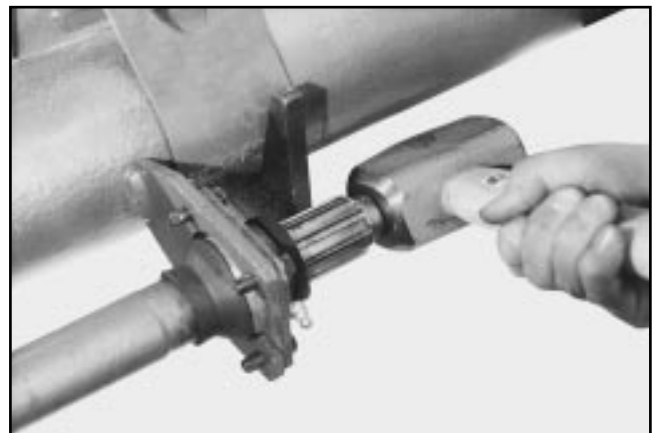


FIG. 10



FIG. 11

TE9000 / 93000 Service



FIG. 12



FIG. 13

15. REPLACEMENT OF THE CAMSHAFTS AND CAMSHAFT BEARINGS

If the camshaft was removed with the hub in place proceed as follows: Apply a coating of grease onto the cam head journal and slide the cam head bearing onto the camshaft and up to the cam head until the spring clip is ready to snap into position (resistance will be felt).

Slide the inner rubber boots and the spline end bearing onto the camshaft. Clean any debris off the locating faces on the anchor and cam brackets and apply a coating of grease onto the spline end camshaft journal. Position the cam head through the anchor bracket key hole slot and slide the spline end bearing through the cam bracket slot. Fasten the bushes in position using the original M10 screws. If there is any sign of thread damage or rust replace the screws with new ones. Do not fully tighten them at this stage.

If the hub has been removed from the axle, clean any debris from the locating faces on the anchor and cam brackets and fasten both bearings in place with the M10 screws. Do not fully tighten at this stage. Pass the camshaft through the head bearing and slide the rubber boots onto the camshaft. Push the spline end through the spline end bearing. A hard tap on the cam head end will be required to locate the spring clip into the camshaft groove.

With the camshaft in position but both bearings not fully tightened, refit the rubber boot slack adjuster packing washers and retaining washer securing with the circlip. **DO NOT TIGHTEN BEARING SECURING SCREWS UNTIL BRAKE SHOES ARE FITTED.**

16. REFIT BRAKE SHOES

If the old linings are to be reused, ensure each shoe is returned to its original position as marked prior to removal.

Either stand both brake shoes on their sides with the cam rollers together and fit the return spring between the roll pins of both brake shoes.

Lift the top brake shoe, the lower shoe will automatically be picked up also.

Place the cam roller of the top shoe in the dwell of the cam head and locate the "D" slots onto the shoulders of the top anchor pin.

Or fit return spring to the roll pin of the top shoe and position the cam roller of the top shoe onto the dwell of the cam head and the "D" slots onto the shoulders of the top anchor pin. Lift the bottom shoe and connect the free end of the return spring to the roll pin.

Then tip the lower brake shoe until the cam roller locates in the lower dwell of the cam head, twist the brake shoe towards its fitted position making sure that the cam roller locates in the dwell of the cam, and locate the "D" slots onto the shoulders of the lower anchor pin. Refit retainer springs, a suitable tool can be made by slotting the blade of a screwdriver.

Ensure brake shoes are sitting correctly on cam head, if necessary correct by aligning the brake shoes at cam roller end.

During the above assembly it is important not to contaminate the surface of the brake linings with grease, remove any slight contamination by wiping with clean absorbent paper.

With the shoes fitted apply the brake by pulling on the slack adjuster several times then in the off position tighten the cam and spline cam bearing securing screws to the specified torque.

TE9000 / 93000 Service

17. GREASE CAMSHAFT BEARINGS

Grease camshaft bearings using grease gun (fig. 14), it is possible to see the grease extrude from the side plates of the camshaft head bearings with the hub and drum removed. Ensure the correct specification of grease is used.

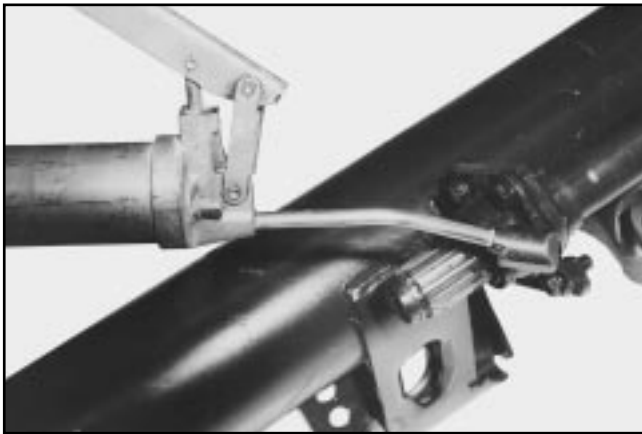


FIG. 14

18. INSPECT BRAKE DRUMS

Clean excess brake dust from brake drum and inspect brake drum bore for surface corrosion, damage and excessive wear.

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 bore shows signs of heat crazing it usually can be reused but if the heat crazing is severe the drum should be replaced.

It is permissible to machine out the brake drum to a maximum of $\varnothing 423\text{mm}$. Oversize cam rollers must be fitted if this is done (21006610A).

19. REMOVE OIL SEAL

If the oil seal is still within the hub remove it with a work shop pri-bar and discard it (fig. 15). Take care not to contaminate the inner bearing and hub cavity.

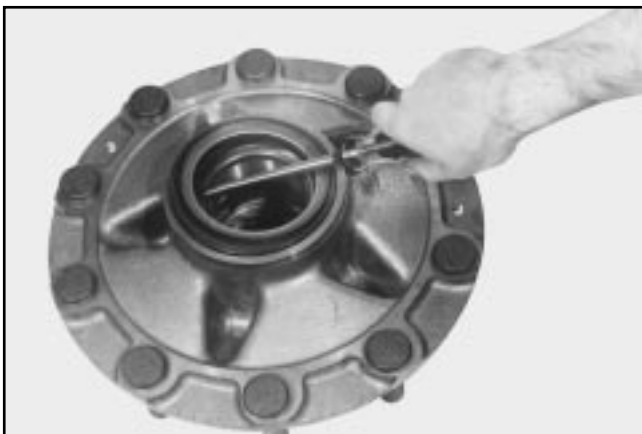


FIG. 15

If the oil seal has remained on the spindle journal lever it off taking great care not to damage the spindle. Clean the area around the oil seal journal as detailed in paragraph 6. Discard the oil seal.

Never reuse an oil seal after the hub has been dismantled from the spindle.

20. WHEEL BEARING INSPECTION AND GREASING

Step 20a describes the routine inspection and service.

Step 20b should be carried out every 300,000 km, or every 3 years or if the grease appears dirty, contaminated or burnt, or if no cavity fill is present.

Refer to grease type and fill volumes specified on page 6.

20a. ROUTINE ANNUAL HUB SERVICE

INNER BEARING:

If the grease within the hub is clean and does not appear or smell burnt there should be no requirement to totally clean down the assembly and re-grease the bearings.

Care must be taken not to contaminate the lubricant during the inspection.

Check the hub cavity and inner bearing for contamination caused when the hub was dismantled from the spindle. Contamination must be removed and if necessary a total clean down and re-lubrication as described in step 20b must be performed.

Remove the inner bearing cone (fig. 16) and check the condition of the grease.



FIG. 16

TE9000 / 93000 Service

Inspect the rollers, bearing cage and raceway for damage and debris.

Re-grease the inner bearing to supplement the grease lost during the removal of the oil seal. Be certain to work the grease deep into the cage and rollers.

Check the raceway for any damage before the inner bearing cone is replaced.

Press the inner bearing fully home into the cup as this helps the location of the oil seal driver.

Fit the oil seal onto the driver (Meritor Part No. 21221510), note that the oil seal cannot be fitted successfully without the correct driving tool.

Make sure the 'oil side' is facing away from the face of the driver with the outer face of the seal fully seated. Failure to seat the seal in this way can cause the seal to be fitted skew.

Locate the nose of the driver into the inner bearing cone and drive the seal home (fig. 18). **Check that the outer most rubber edge of the seal is flush with the face of the hub all round.**

OUTER BEARING:

Remove the retaining clip, washer and outer bearing cone (fig. 17). Similar to the inner bearing, check the condition replacing any grease lost by working grease deep into the bearings rollers and cage.

Check the raceway for damage and the hub cavity fill before replacing the outer bearing.

Fit the retaining washer and clip to hold the cone in place ready for re-mounting the hub.



FIG. 17

20B. 3 YEAR/300,000 KM MAJOR HUB SERVICE

Remove the retaining clip, washer, inner and outer bearing cones (figs 17 and 18) and clean off all grease to inspect the bearings. Do not use water, steam or air jets to clean the bearings.

Wipe clean the hub cavity removing all the old grease and any debris. All surfaces must be totally clean.



FIG. 18

Look carefully for:-

- Cage damage
- Corrosion on the raceways/rollers
- Metallic debris
- Pitting
- Metallic flakes
- Damage to rollers/raceways

Bearings must be replaced if there are any of the above defects. **Small defects will propagate and lead to bearing failure.**

If there are any discoloured bands on the rollers and raceways inspect the bearing very carefully. It can be an indication of some of the defects described above. Treat with extreme caution if the grease smells burnt.

If there is any doubt about the condition of a bearing discard and fit a new one.

Always replace cup and cone together.

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

Check the bearing cups are hand tight within the hub bores. **If a cup is loose the hub must be replaced.**

Following a complete hub and bearing clean down use a 400ml tube of Meritor Hub Grease Blue Lithium EP2 which is sufficient to re-lubricate both the inner and outer bearings and the hub cavity.

TE9000 / 93000 Service

Dry the bearings of any solvent used for cleaning the bearings.

Thoroughly re-pack the inner and outer bearings with grease. Work the grease deep into the rollers with your hands until the cages are solid packed with grease. **Always place greased bearings in a clean area and protect from falling debris.**

Press the inner bearing fully home into the cup. (This helps the location of the oil seal driver.)

Fit the oil seal onto the driver (Meritor Part No. 21221510), note that the oil seal cannot be fitted successfully without the correct driving tool.

Make sure the 'oil side' (written on the rubber) is facing away from the face of the driver, with the outer face of the seal fully seated on the face of the driver. Failure to seat the seal in this way can cause the seal to be fitted skew.

Locate the nose of the driver into the inner bearing cone and drive the seal home (fig. 18). **Check that the outer most rubber edge of the seal is flush with the face of the hub all round.**

Replace the greased outer bearing.

Fit the retaining washer and clip to hold the cone in place until you are ready to remount the hub.

Fill the empty cavity of the hub with the grease left in the 400ml tube. **Do not over fill with extra lubricant.**

21. APPLY ANTI-FRETTING PASTE TO SPINDLE

Apply 'Optimol White Paste T' to both the inner and outer bearing journals, approximately 1-2ml per journal. Smear the paste evenly over the bearing areas and up the inner bearing abutment shoulder (fig. 19).

This paste will reduce wear and ease the removal of the bearing cones during future maintenance.

22. REFIT HUB, DRUM AND WHEEL ASSEMBLY

Using a wheel dolly align hub, drum and wheel assembly with the axle spindle, adjust position and height until brake drum fits over brake linings.

If the outer bearing is removed be certain to place it in a clean area before it is reassembled in the hub.

To mount the hub assembly without the outer bearing, retaining washer and clip in place, push assembly fully onto axle and guard against striking the oil seal on the spindle end, replace the oil seal if any damage occurs.

Fit the outer bearing cone. Fit the outer bearing retaining washer with the writing outer most and fit retainer clip.

If the outer bearing is still in place check alignment and height and align key on retainer washer with key way on spindle end, gently push the assembly fully onto the axle, guard against striking the oil seal on the spindle end, replace the oil seal if any damage occurs.

Carefully examine the tabs and keyway locator for signs of wear or damage, if any doubt exists use a new tab washer. Fit tab washer locating in key way on spindle end, fit axle end nut hand tight and remove wheel dolly.



FIG. 19

Torque axle end nut to 150/175 Nm. Whilst tightening axle end nut rotate wheel several times to seat wheel bearings (fig. 3).

Never torque the final stages of the end nut without rotating the hub. Failure to do this can cause bearing damage and result in the hub not seating properly.

Bend tab washer tab closest to a full flat on the end nut using a suitable tool (Meritor Part No. 21221514).

Check the hub cap mounting face and gasket groove is free of debris and damage, wipe clean the mounting faces.

Fit hub cap gasket (Meritor Part No. 21223797) to the hub cap with the flat face of the seal against the cap. A 'smear' of grease within the external hub cavity and on the back of the hub cap is good practise to prevent corrosion in the event of any moisture ingress.

Fit hub cap and gasket to hub, tighten hub cap screws sequentially observing the compression of the gasket around the fixings, finally torque hub cap screws to 11/15 Nm (fig. 1). Over tightening will split the gasket. Too little pressure on the gasket may not provide an effective seal.

TE9000 / 93000 Service

23. 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.

24. ADJUST BRAKES

MANUAL SLACK ADJUSTERS:

Using the manual adjustment nut on the slack adjuster adjust the brake until the wheel can not be turned by hand. Back off brake until it is just possible to freely turn the wheel without resistance from the brake linings.

AUTOMATIC SLACK ADJUSTERS:

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

TE9000 / 93000 Service

SECTION 2

Additional Procedures

After 3 years or 300,000 km

REMOVAL AND REFITTING OF WHEEL BOLTS

With the hub removed from the axle, support it by placing blocks under the wheel flange. Using the wheel bolt removal tool (21205455) drive out the wheel bolts (fig. 20).



FIG. 20

To replace wheel bolts, turn the hub over, oil seal end upwards, and support the hub on the brake drum aligning the holes in both hub and drum. Using the wheel bolt driving tool (21211274) drive the bolts home in turn (fig. 21).



FIG. 21

FITTING OF THE POLE WHEEL

With the hub 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 up if necessary. Ensure no emery dust or other debris contaminates the bearings or grease.

The pole wheel (21221064) can be fitted hot or cold using the seal driving tool (21221510). 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. 22).

TE9000 / 93000 Service



FIG. 22

FITTING OF THE SENSOR

Assemble the spring bush (21213036) into the sensor mounting block (22221063) (fig. 23). Lightly grease the sensor assembly and push fully into the mounting block. When the hub is refitted the pole wheel will push the sensor back and thus obtain the correct clearance.



FIG. 23

The mounting block is fixed to the beam using a screw (21221521) tightened to 25/35 Nm. During tightening of the screw move the block from side to side so that it is correctly seated and is within $\pm 2.5^\circ$ to the wheel axis. The sensor assembly 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 grommet (21220842).

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 voltage reading should be 400 millivolts and the ratio of max/min should not exceed 2. If either values are not obtained check the installed air gap between the sensor and pole wheel does not exceed 0.7mm and the pole wheel runout does not exceed 0.2mm. If the installation is not correct contact the supplier of the anti-lock equipment for further advice.

REMOVAL AND REFITTING OF DUST COVERS

Normally most service operations can be carried out with dust covers in place. If for any reason they must be replaced unfasten the 4 screws at each wheel end securing the dust cover using an M13 socket (fig. 24) and remove the two halves of each dust cover. When refitting ensure that the halves are pushed together and locating tabs correctly engaged to ensure any gaps are minimised before tightening the screws to 50/60 Nm.

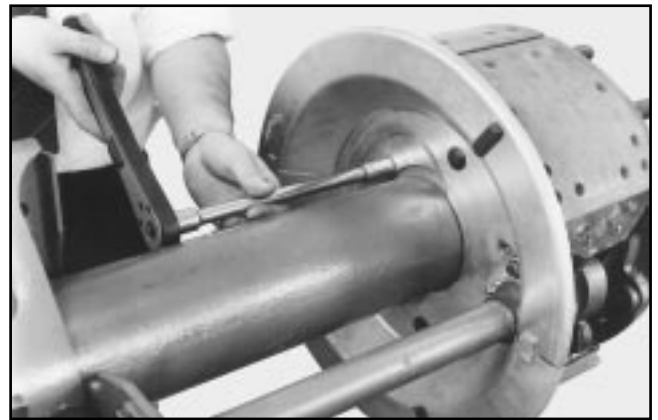


FIG. 24

FITTING OF A HUBODOMETER

The TE axle may be fitted with a hubodometer by using either a special hub cap or additional mounting strap. It is not possible to fit a hubodometer to a standard hub cap and attempting to do so may cause damage to the spindle or the sealing of the hub cavity.

For hubodometer types up to 85mm outside diameter, use special hub cap (21221060).

TE9000 / 93000 Service

The hubodometer is best assembled with the hub cap off the axle. Place the hub cap on a clean, flat surface. Fit the nut to spanner (fig. 25) and using a small amount of grease locate the washer on the nut.



FIG. 25

Position the nut and washer under the mounting hole using the spanner and lower the hubodometer through the hole to engage the thread. Rotate the hubodometer to screw the nut along the mounting stud until hand tight then tighten with the spanner in the normal way. The hub cap and gasket can then be refitted to the axle as described in section 22.

For hubodometer types larger than 85mm outside diameter, use hubodometer mounting plate 21222610.

Fit the hubodometer to the centre hole of the mounting plate. Remove three of the five hub cap fixing screws from the hub end to suit the bracket fixing bolt hole pattern. Offer the hubodometer bracket to the front face of the standard hub cap and replace the three fixing screws as described in section 22.

A range of hubodometers are available to suit various tyre sizes as shown in fig. 26.

Tyre Size	Part Number	
	Kilometres	Miles
15R22.5	21212648	21212649
F20 PILOTE 12.00 x 20	21206207	
18 x 22.5		21021019
16.5 x 22.5	21204639	21021018
11.00 x 20 12.00 x 22.5	21023810	21021016
10.00 x 20 11.00 x 22.5	21022758	21021015
10.00 x 22.5 9.00 x 20	21023732	21021014
8.25 x 20		21021013

FIG. 26

REMOVAL AND REFITTING OF BRAKE DRUM

The brake drum can be separated from the hub after removal of the road wheel as follows. Remove the two countersunk drum retaining screws from the drum flange face using a 10mm Allen key (fig. 27).

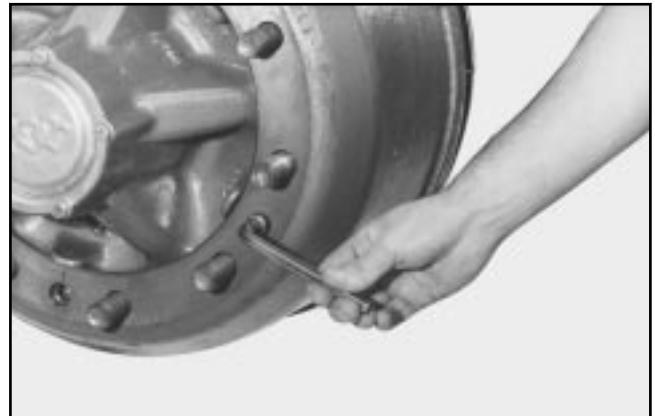


FIG. 27

These screws can then be used to jack the drum free of its locating spigots by refitting them to the two plain tapped holes in the drum flange ensuring they are tightened evenly to prevent the drum tipping (fig. 28).



FIG. 28

The drum can then be lifted clear of the hub.

To refit the brake drum, locate it over the wheel studs ensuring it is correctly orientated to align the two countersunk retaining bolt holes with the tapped holes in the hub. Refit the two retaining screws and tighten to 50/60 Nm ensuring that the drum is fully seated on its locating spigot. Ensure the retaining screw heads are below the surface of the brake drum flange face after tightening.

TE9000 / 93000 Service

REMOVAL AND FITTING OF ANTILOCK EQUIPMENT

All TE axles are provided with a means of fitting antilock equipment. Every hub has a machined spigot to locate the pole wheel and axle beams are plain drilled for self tapping bolt to allow the fitting of the sensor mounting block (fig. 29). It is important that the correct bolt is used.

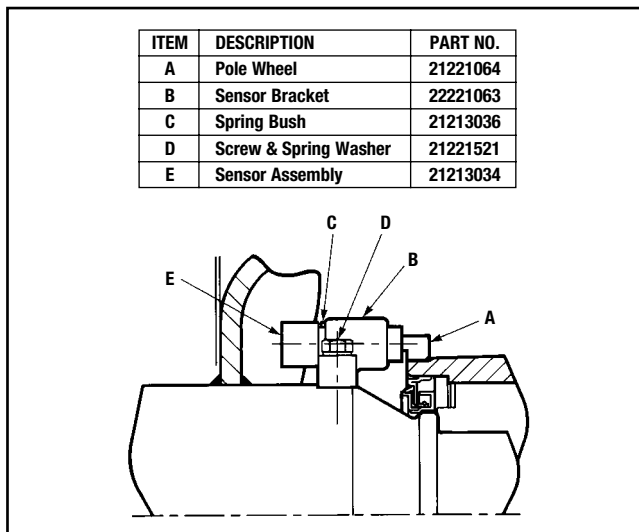


FIG. 29

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 4.42.3

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™