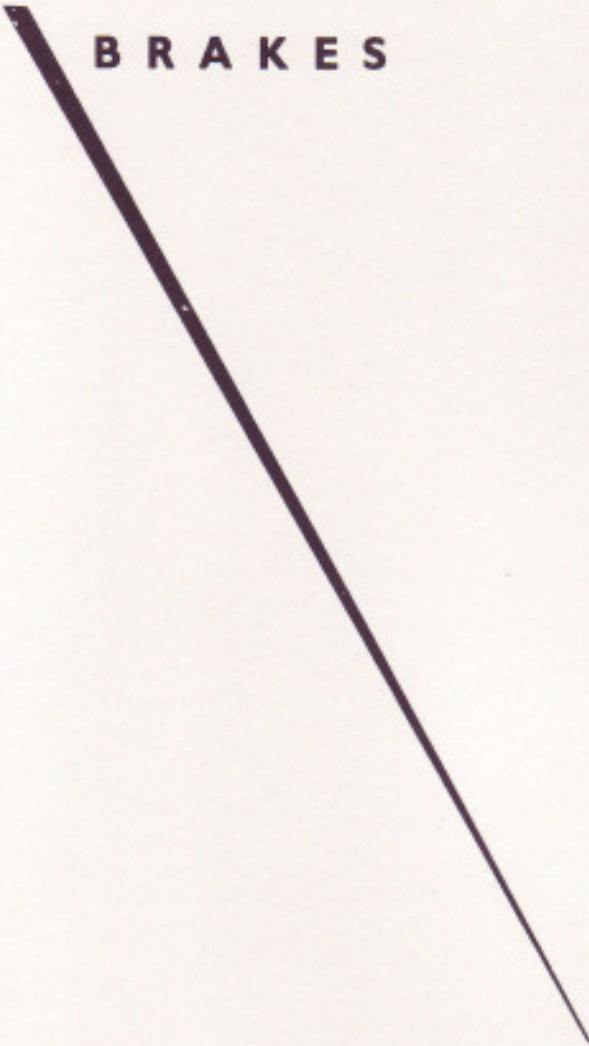




**B R A K E S**







SECTION J.

B R A K E S .

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## THE BRAKING SYSTEM.

### GENERAL DESCRIPTION.

The four wheel braking system, is of the servo assisted type, and comprises a mechanically driven servo motor of the disc-brake type, which is equally effective for either forward or backward movement of the car. Further, even should the servo be out of action, the rod operated rear brakes are still directly coupled to the pedal.

Pressure on the pedal applies the rear brakes direct in the usual manner, and also engages the servo, but the front brakes which are of the hydraulically operated type are actuated entirely by the servo acting through the medium of a balance lever and hydraulic master cylinder.

The servo effect is distributed between the front and rear brakes, a proportion being added therefore to the direct pedal effort in the case of the rear brakes. With the leverages provided, this results in about 55 per cent of the total braking being imposed on the front wheels, which allows for the fact that during braking, the forward momentum of the car imposes a greater weight on the front wheels.

The proportioning of the servo pull to the front and rear brakes respectively is effected by a balancing lever. A separate equaliser is provided for the two rear brakes, which, with the hydraulic operation of the front brakes, ensures even braking on either side of the car.

The hand brake lever operates the rear brakes only, and uses the same linkage as the foot pedal. The same shoes are used for both hand and foot operation.

A diagram of the system is given in Fig.1.

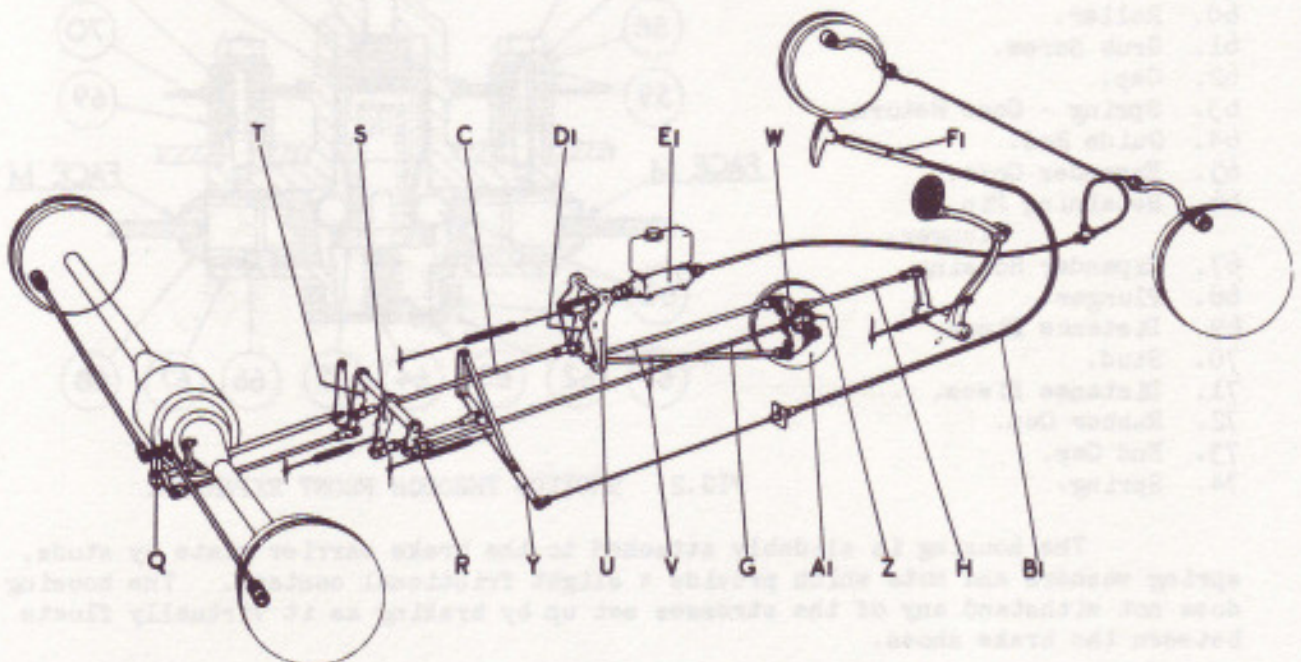


FIG. 1. DIAGRAM OF BRAKING SYSTEM.





A pull rod (H.Fig.1), operated by the pedal, is coupled to a lever (W), on the servo motor shaft, the motor itself (A1) being mounted on the off-side of the gearbox, and driven at approximately one-tenth of the propeller shaft speed.

The lever (W) has inclined cams formed on the face of its boss, these cams engaging through the medium of steel balls, similar cams formed on the boss of another lever (Z). From the latter a rod (G) directly actuates the rear brakes through the medium of the levers (R) and (T), which are pivoted on a bracket bolted to the cross member of the frame, and finally, through the rear equaliser (Q) mounted on a bracket suspended from the rear axle.

The output from the servo is taken by one of the two rods (V), according to whether the car is moving forward or backwards, to the lever (U). This lever carries, in turn, a balance lever (D1), the lower end of which is connected by the rod (C) to the rear brake lever (T), thus augmenting the direct pedal effort, while its upper end is coupled to the master cylinder (E1), which actuates the front brakes.

The front brake shoes are operated by a hydraulic expander unit as shown in Fig.2. The expander cone (65) which is actuated by oil pressure on the rubber cup (72) causes the plungers (68) to move outwards. Hardened steel rollers (60) are interposed between the cone and the plungers to reduce friction to a minimum. The plungers engage directly with the brake shoe webs. On releasing the brake pedal and hence the oil pressure on the rubber cup, the spring (63) returns the expander cone to the "off" position. The whole expander mechanism is enclosed in a cast housing (67).

- 56. Nut.
- 57. Spring Washer.
- 58. Washer.
- 59. Thackeray Washer.
- 60. Roller.
- 61. Grub Screw.
- 62. Cap.
- 63. Spring - Cone Return.
- 64. Guide Rod.
- 65. Expander Cone.
- 66. Retaining Pin - Plunger.
- 67. Expander Housing.
- 68. Plunger.
- 69. Distance Piece.
- 70. Stud.
- 71. Distance Piece.
- 72. Rubber Cup.
- 73. End Cap.
- 74. Spring.

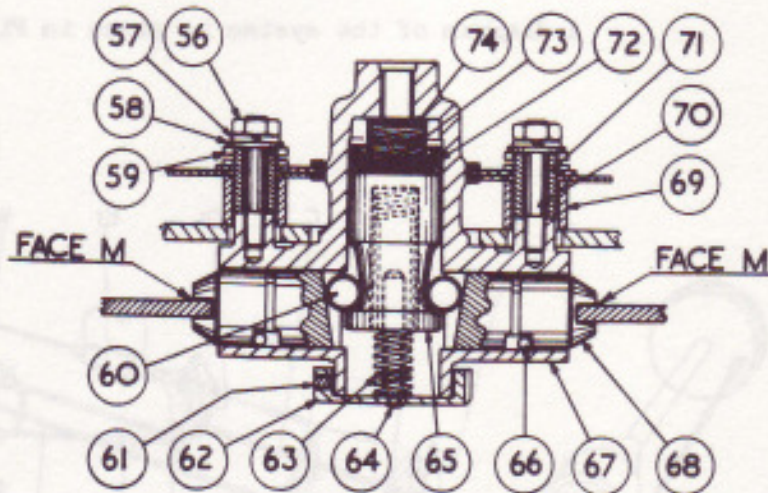


FIG.2. SECTION THROUGH FRONT EXPANDER.

The housing is slidably attached to the brake carrier plate by studs, spring washers and nuts which provide a slight frictional contact. The housing does not withstand any of the stresses set up by braking as it virtually floats between the brake shoes.





The rollers (60) are freely mounted and roll up the grooves in the plunger and down the inclined faces of the cone.

1. Push Rod.
2. Boot.
3. Spring Retainer for Stop.
4. Piston Stop.
5. Piston.
6. Secondary Cup.
7. Washer for Piston.
8. Main Cup.
9. Retainer for Spring.
10. Spring - Piston Return.
11. Valve Body. )
12. Valve Cup. ) Sub-Assy.
13. Valve Washer.)
14. Filler Plug.
15. Gasket for Filler Plug.
16. Cylinder & Tank.
17. Adaptor.
18. Gasket for Adaptor.
19. Core Plug.
20. Gasket for Core Plug.

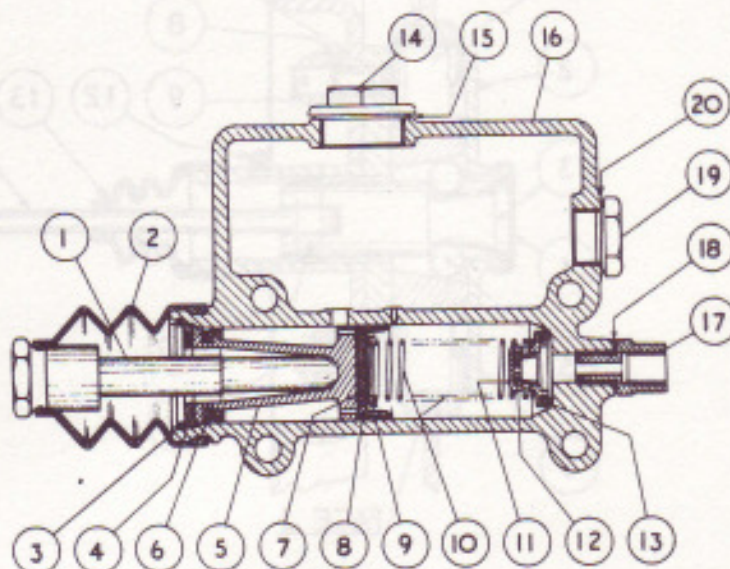


FIG.3. SECTION THROUGH HYDRAULIC MASTER CYLINDER.

The hydraulic master cylinder which is integral with the brake fluid reservoir, is attached to the chassis frame cruciform member at the side of the starter battery. The piston of the master cylinder is operated only by the servo motor, it therefore follows that the front brakes cannot be made to operate when the car is stationary (unless the engine is run with the car in gear and a rear wheel jacked up).

When the piston (5. Fig.3) is propelled along the cylinder by the push rod (1) (connected to the servo motor), fluid is forced through the radial holes in the valve (11) and along the pipe line to operate the front wheel hydraulic expanders. On releasing the brake pedal, the piston returns to its off stop under the influence of the return spring (10) and the front brake shoe pull-off springs. At the same time, fluid flows back past the valve (which is temporarily lifted off its seating) and into the master cylinder, the valve will shut when the spring load on the valve is balanced by the fluid pressure in the pipe line. This has the effect of maintaining a pressure slightly above atmospheric in the pipe line and expander cylinders which prevents the ingress of air.

Reference to the section view Fig.3. will show that two holes are drilled through the base of the reservoir and into the cylinder. When the piston is against its off stop, the small drilling is just forward of the leading edge of the piston main cup (8), thus fluid may flow to or from the reservoir



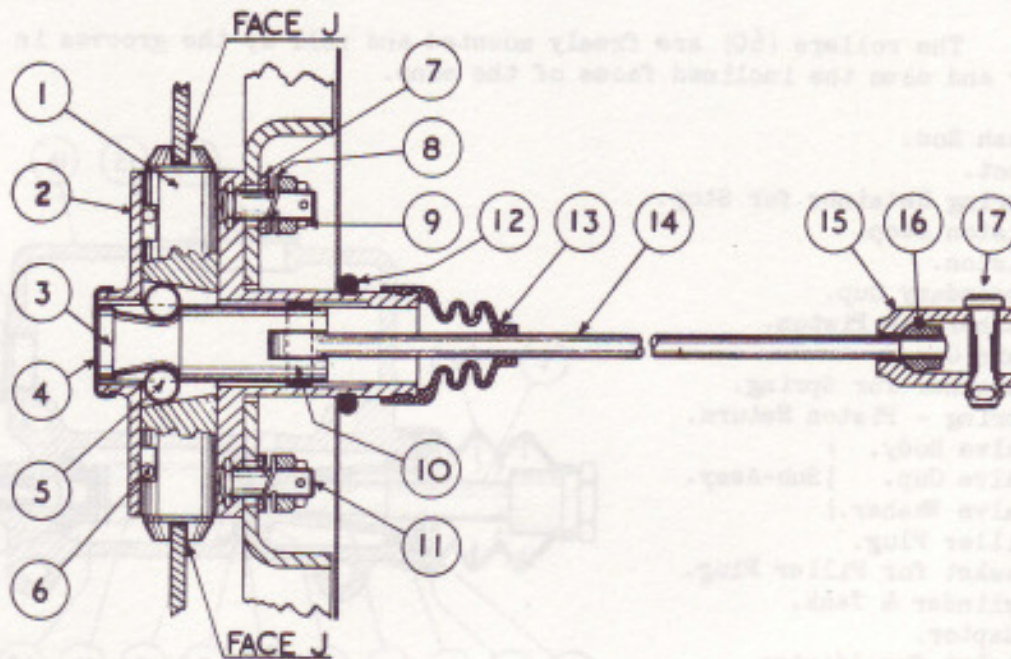


FIG. 4. SECTION THROUGH REAR EXPANDER.

- |                             |                           |
|-----------------------------|---------------------------|
| 1. Plunger.                 | 10. Pin - Cone.           |
| 2. Expander Housing.        | 11. Stud.                 |
| 3. Expander Cone.           | 12. Rubber Washer (Ring). |
| 4. Dust Cap.                | 13. Rubber Dust Cover.    |
| 5. Roller.                  | 14. Brake Rod.            |
| 6. Retaining Pin - Plunger. | 15. Jaw - Brake Rod.      |
| 7. Plain Washer.            | 16. Spherical Nut.        |
| 8. Thackeray Washer.        | 17. Pin - Jaw.            |
| 9. Castellated Nut.         |                           |

to compensate for any expansion, contraction or losses in the system. The larger drilling is in communication with the annular space behind the front face of the piston, which is thereby kept full of fluid and thus provides a seal against the entry of air.

The rear brake shoes are mechanically operated by an expander unit, which is slidably attached to the brake carrier plate. The expander cone (3) Fig.4 which is actuated by the pull rod (14) causes the plungers to move outwards. Hardened steel rollers (5) are interposed between the cone and the plungers to reduce friction to a minimum. The plungers engage directly with the brake shoe webs.

The dashboard hand brake (Pl. Fig.1), is mounted under the fascia board, convenient to the driver's right hand. The ratchet release is so arranged, that should it be inadvertently knocked or pressed, the brakes will not be released. In order to release the brakes, the trigger must be fully depressed and held in this position. The hand brake is then pulled, as if





applying the brakes, and this action frees the ratchet permitting the brakes to be released, provided that the trigger is still held. This device is particularly useful in preventing accidental release of the brakes when the car is parked.

To obtain this action, the trigger is not directly connected to the ratchet pawl, but compresses a spring. This spring, in turn, operates the pawl, but it is only strong enough to move it out of engagement when the load has been removed by pulling on the hand brake.

The hand brake is connected by an enclosed cable (B1), to a horizontal lever (Y), mounted on the frame cruciform which provides the required leverage, and is in turn, coupled to the rear brakes, through the lever (S) and (T) and the rear equaliser. The application and release of the hand brake can be lightened by simultaneous application of the foot brake.

METHOD OF ADJUSTING THE BRAKES

A separate adjustment is provided on each brake carrier plate to compensate for wear of the brake shoe linings, and is the only adjustment provided on the brake system.

It is important to note that an adjustment of any kind should be attempted at any other point. For instance, by altering the length of the brake rods (see sub-section B1.1). There are also carefully dimensioned during erection of the chassis, with a view to guaranteeing at the front and rear spring seats which ensure that in the event of failure of any part of the system of level one pair of wheels will remain available.

The method of adjustment is the same for both front and rear brakes with the exception that a hand screw (B Fig. 2) is provided on the rear brake adjuster, which is a 7/8" B.S.F. open-ended spanner must be used on the upper end of the front brake adjuster screws (A Fig. 2). The rear adjusters are located on the brake carrier plate forward of the axle tubes, and the front adjusters on the brake carrier plate directly below the steering lever pins.





### SERVICE OPERATIONS.

To properly maintain the braking system it should be appreciated that a thorough knowledge of the system, absolute cleanliness and careful workmanship are very important.

Below are given some possible variations in the system and the method of adjustment.

The need for adjustment of the rear brakes will be indicated by excessive travel of the hand brake lever, whereas the front brakes, which are operated by the servo motor only, will not affect the hand brake or pedal travel.

It is unlikely, however, that the front brakes will wear more rapidly than the rear brakes, so, provided that they are adjusted, whenever adjustment of the rear brakes is required, no trouble in this respect need be expected.

Low or inconsistent output from the servo would be indicated by heavy or non-progressive brake pedal action, together with insufficient front braking, in which case the servo would have to be dismantled to ascertain the cause of the trouble. (See sub-section BJ.5.)

A light pedal action, accompanied by defective front braking, resulting in the rear wheels locking, would indicate a fault in the front braking system. An excess of front braking would indicate a fault in the rear brakes.

In the unlikely event of oil reaching either of the rear brakes, the self-seal bearing on the rear axle half shaft will be at fault. Grease catchers are provided for the front hubs, and provided that the recommended grease is used and the quantity limited to  $1\frac{1}{2}$  ozs., in each hub, this should not be able to reach the brake linings.

### METHOD OF ADJUSTING THE BRAKES.

A separate adjustment is provided on each brake carrier plate to compensate for wear of the brake shoe linings, and is the only adjustment provided on the whole system.

It is important to note that no adjustment of any kind should be attempted at any other point, for instance, by altering the lengths of the brake rods. (See sub-section BJ.3). These are all carefully determined during erection of the chassis, with a view to synchronisation of the front and rear safety stops, which ensure that in the event of failure of any part of the system, at least one pair of brakes will remain available.

The method of adjustment is the same for both front and rear brakes, with the exception that a hand wheel (B Fig.6) is provided on the rear brake adjusters, while a  $\frac{1}{2}$ " B.S.F. open-ended spanner must be used on the squared end of the front brake adjuster screws (A Fig.5). The rear adjusters are located on the brake carrier plate forward of the axle tubes, and the front adjusters on the brake carrier plate directly below the steering pivot pins.



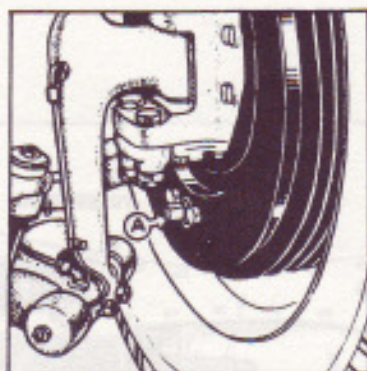


FIG. 5. FRONT BRAKE  
ADJUSTER

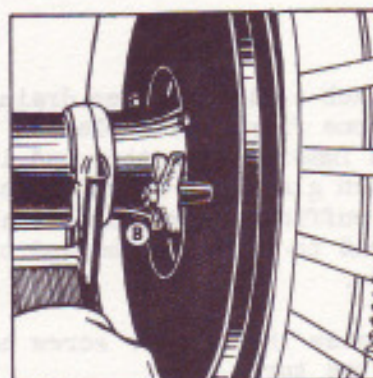


FIG. 6. REAR BRAKE  
ADJUSTER

For each complete turn of the adjuster screw, four "clicks" will be felt, and between each "click" the brake shoes are expanded towards the drum, approximately .014", and then moved back .010", giving an incremental adjustment of .004", and a running clearance of .010".

To adjust the brakes, rotate the adjuster screw in a clockwise direction until considerable resistance is felt. This resistance must be equal for all four brakes, and should the last "click" on any one adjuster screw require noticeably greater force to obtain, the screw should be turned back to the previous "click". This will give the correct brake adjustment.

It is not necessary to jack up the car to adjust the brakes, as the adjusters are so designed to give the correct shoe clearances automatically.

If, after long service, the brake linings require renewal, this will be apparent by the adjuster screws coming to the end of their travel, and will have a solid feel quite distinct from the resistance felt when the brake shoes are correctly adjusted.

Adjustment of the rear brakes takes up both the pedal and hand brake clearance in the same operation.

The servo is of the disc-brake type. An adjustment is provided for the initial setting and wear of the friction surfaces, but once correctly set, no further attention should be required for a considerable period, as very little wear occurs. See Sub-Section BJ.5 "The Servo Motor" for further information.

#### BLEEDING THE HYDRAULIC SYSTEM.

Bleeding, that is to say expelling air from the system, should only be necessary when completely recharging the system with fluid, following the removal of a component or the disconnection of a pipe joint. Under normal conditions, air does not enter the system as a result of brake application.

To bleed the system, proceed as follows:-





(i) Attach a clean rubber drain tube to one front brake bleeder screw, and immerse the other end in a clean glass jar in which there is sufficient hydraulic brake fluid to submerge the end of the tube.

(ii) Release the bleeder screw half to one turn.

(iii) Remove the filler plug (See Fig. 7) which is accessible from underneath the driver's seat, and fill the reservoir which is integral with the master cylinder with the recommended fluid.

(iv) Push the joint (J. Fig. 7) forward until the extended pin (K) abuts against the master cylinder support brackets (L).

(v) Release, pause slightly, and repeat until the reservoir is nearly empty, but taking care not to empty it completely.

(vi) Tighten the bleeder screw and transfer drain tube to the other front brake.

(vii) Re-fill the reservoir and bleed this brake in a similar manner.

(viii) Finally, re-fill the reservoir and replace the filler plug.

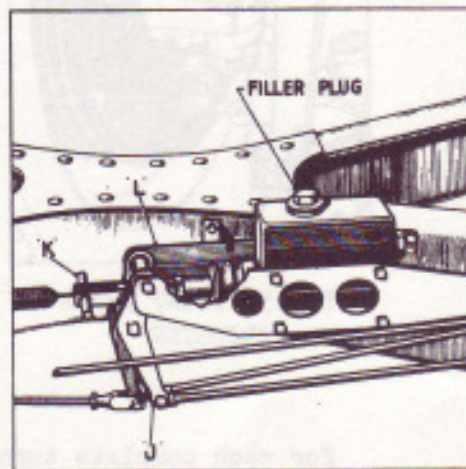


FIG. 7. HYDRAULIC MASTER CYLINDER AND RESERVOIR IN POSITION

#### LUBRICATION.

The need for hand lubrication of various parts of the mechanism has been reduced to a minimum, by the use of self-lubricating bearing bushes at the fulcrum of practically all levers. Engine oil or penetrating oil should be applied every 5,000 miles to all joints and pins of brake rods and connections. The ball bearing cams which actuate the servo are filled with lubricant upon initial build, and require no attention between overhauls of the chassis.





BRAKE SHOE REPLACEMENT.

Sets of pre-finished brake shoes on which new linings have been fitted and ground to size, are available and should always be fitted when the replacement of brake linings is necessary.

When the maximum available adjustment, to compensate for brake lining wear, has been made to the adjusters and the brake linings still do not contact the drums. i.e., if with the adjuster screwed up fully in a clockwise direction, the brake drums can be rotated freely without binding on the brake linings, then the brake shoes need relining.

All eight brake shoes are identical and therefore interchangeable.

To reline the brakes proceed as follows:-

TO REMOVE WHEEL DISCS, WHEELS & BRAKE DRUMS.

- (i) Prior to jacking up the car, remove the four hub caps and wheel discs using the special spanner RF. 3851. All four hub caps have right hand threads.

Slacken back a turn or two the five wheel securing nuts of each wheel using the special wheel brace RF. 3375.

NOTE: When jacking up the front wheels, place jack under and in the centre of the front "pan". Jack up, and then place a suitable block of wood or trestle under each of the lower triangle levers and in line with the coiled spring of the front suspension. Remove the jack.

To jack up the rear wheels, place jack under, and in the centre of the centre casing of the rear axle. Jack up and then place a suitable block of wood or trestle under the centre of each of the rear springs, care being taken not to damage the spring gaiters. Remove the jack.

- (ii) Remove the five wheel securing nuts from each wheel. The wheel securing nuts for the off-side or R.H. wheels have right handed threads and those for the near-side or L.H. have left handed threads.
- (iii) Release the hand brake and slacken off the adjuster screw of the front and rear brake adjusters by turning them in an anti-clockwise direction as far as possible so as to make sure that the brake shoe linings are clear of the drum.
- (iv) Remove from the face of the brake drum the three counter-sunk headed retaining screws, remove the hub extension (on rear hubs only), and then withdraw the drum. Should

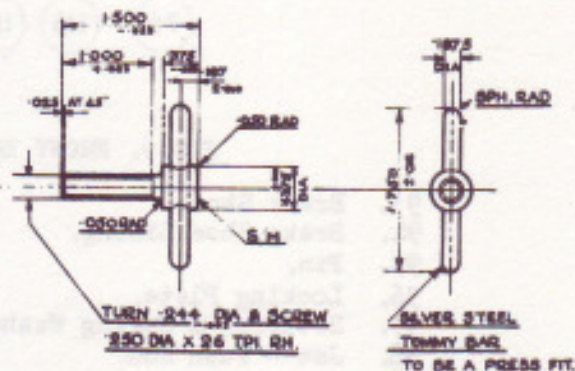


FIG. 8. TOOL FOR EXTRACTING BRAKE DRUMS.





any difficulty be experienced in removing the drum from its spigot by hand alone. it can be removed by using two special extractors made up as shown in Fig. 8, or setscrews of suitable dimensions will suffice. Two .250" dia. (26 T.P.I. - R.H.) threaded holes, diametrically opposite to one another, are provided in the drum for dismantling purposes. Care should be taken not to strip these threads when withdrawing the drums.

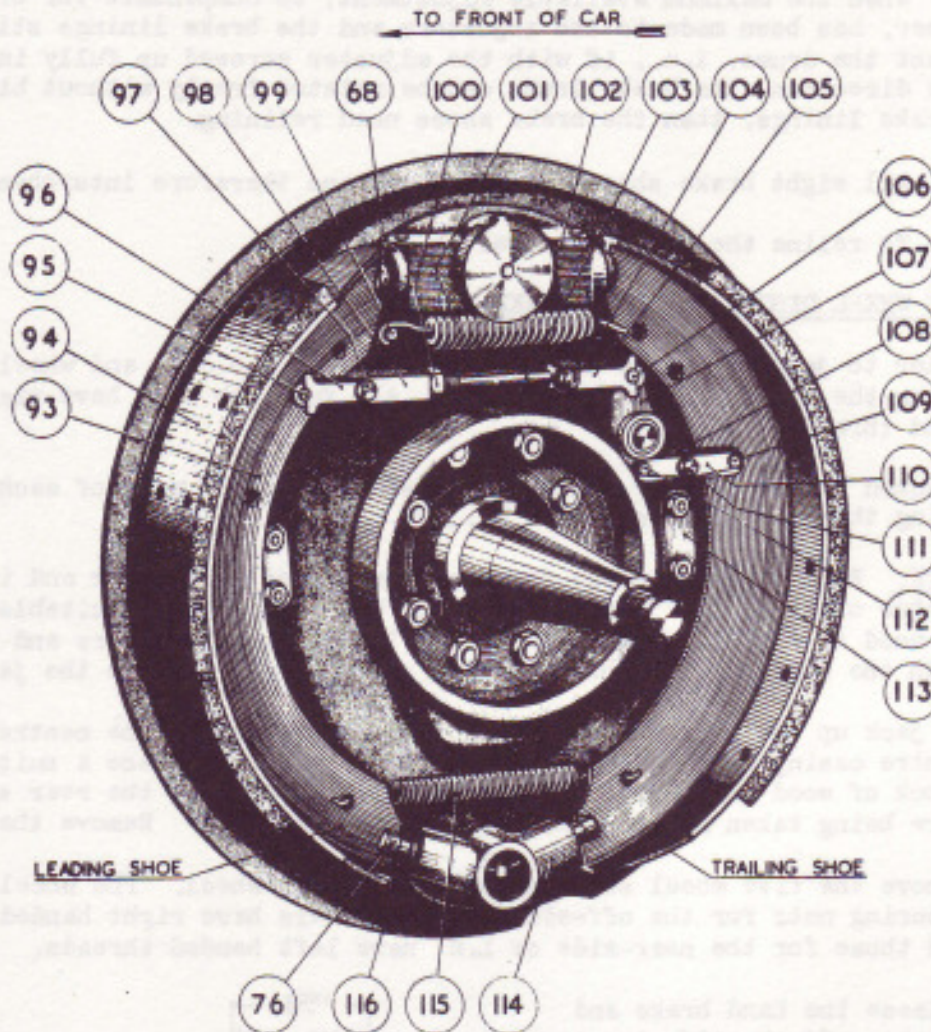


FIG. 9. FRONT BRAKE.

- |                                |                                |
|--------------------------------|--------------------------------|
| 93. Brake Shoe.                | 105. Locking Plate.            |
| 94. Brake Shoe Lining.         | 106. Pin.                      |
| 95. Pin.                       | 107. Fulcrum Lever.            |
| 96. Locking Plate.             | 108. Link.                     |
| 97. Setscrew & Spring Washer.  | 109. Pin.                      |
| 98. Jaw - Push Rod.            | 110. Locking Plate.            |
| 99. Anchor pillar.             | 111. Setscrew & Spring Washer. |
| 68. Plunger.                   | 112. Pin.                      |
| 100. Locknut.                  | 113. Guide - Brake Shoes.      |
| 101. Spring - Brake Shoes.     | 114. Adjuster Unit.            |
| 102. Expander Unit.            | 115. Spring - Brake Shoes.     |
| 103. Push Rod - Brake Shoes.   | 116. Water Excluder.           |
| 104. Setscrew & Spring Washer. | 76. Plunger.                   |





TO REMOVE THE FRONT BRAKE SHOES.

- (i) Remove setscrew and spring washer (111 Fig. 9) and the locking plate (110), the pin (109) can then be removed after easing the load on it caused by the pull-off spring, this will allow the link (108) to fall clear of the shoe.
- (ii) Remove setscrew and spring washer (97), the locking plate (96) and the pin (95), the inter-shoe linkage can now be removed from the fulcrum lever pin.
- (iii) With the aid of a screwdriver resting in a convenient position, prise the leading shoe squarely out of the slot in the plunger (76) of the adjuster unit. This shoe can now be removed completely by disconnecting the pull-off spring (115).
- (iv) The trailing shoe can now be removed, to do this first lift it out of the slot in the adjuster plunger, then from the slot in the plunger of the expander unit.

Do not overstretch the shoe pull-off springs when removing the shoes.

THE FRONT BRAKE SHOE EXPANDERS (HYDRAULIC).

It should not be necessary, when relining the brakes, to remove and dismantle the expanders unless they are not functioning correctly or need overhauling. However, should this be necessary, proceed as follows:-

To remove the hydraulic expanders.

- (i) To remove the hose from the chassis:-

Unscrew the tube nut (A, Fig. 10). Hold the connection (D) with a spanner and unscrew the nut (B) with a second spanner. remove the washer (C) and then withdraw the hose from the bracket.

Unscrew the hose connection (84 Fig.12), complete with the copper gasket (85) from the expander.

- (ii) With the brake shoes removed, remove the two nuts (56 Fig.2 Sub-Section BJ.1), the spring, plain and Thackeray washers, the distance pieces (71) and the stiffener (87 Fig.12), complete with the rubber seal (86). Then withdraw the expander unit from the brake carrier plate leaving the two distance pieces (69) in position between the brake carrier plate and the water excluder (91).

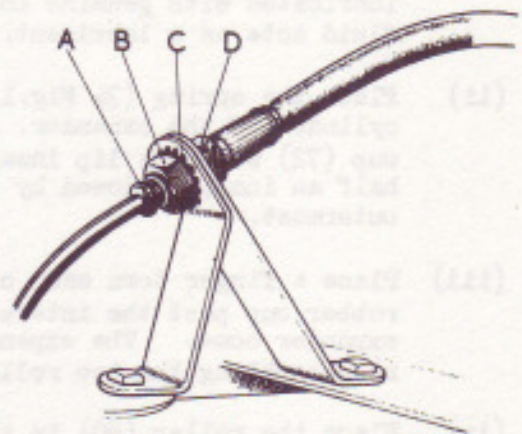


FIG. 10. SHOWING HOW FLEXIBLE HOSE IS ATTACHED TO PIPE-LINE FROM MASTER CYLINDER.





### To dismantle.

- (i) It is preferable when dismantling the internal parts to put them into a metal tray containing clean brake fluid, and to allow them to soak, after which they should be wiped with a clean fluffless cloth. The main casing may be cleaned with any of the usual cleansing liquids to remove mud etc., but all traces of the cleanser must be dried out before re-assembly.
- (ii) Remove the retaining pins (66) which will allow the plungers (68) and the roller (60) to be removed.
- (iii) Remove the grub screw (61) and then with a suitable 'C' spanner remove the threaded cap (62) complete with the spring (63). Care should be taken while unscrewing the cap to prevent it flying off due to the compression of the spring.
- (iv) Remove the expander cone (65), rubber cup (72) and spring (74), complete with the end cap (73).
- (v) Remove the bleeder screw (83 Fig.12), taking care not to loose the steel ball (valve) (82).

The only part that may require replacing is the rubber cup (72).

### To re-assemble.

- (i) It is essential that all parts should be perfectly clean before assembling, therefore, do not handle the internal parts, particularly the rubber cup, with dirty hands or put them down on a dirty bench. Cover the bench where the work is to be done with a sheet of clean paper.  
  
Mineral oil or grease must not be used as this would damage the rubber cup. All parts therefore, including the cup, should be lightly lubricated with genuine Lockheed Brake Fluid prior to assembling. The fluid acts as a lubricant.
- (ii) Place the spring (74 Fig.11) complete with the end cap (73) into the cylinder of the expander, entering the spring first. Enter the rubber cup (72) with the lip inwards into the cylinder for a depth of about half an inch, followed by the expander cone (65) with the hole therein outermost.
- (iii) Place a finger down each of the plunger bores to guide the lip of the rubber cup past the intersection of the bores, while inserting the expander cone. The expander cone must now be kept in position while re-assembling the two rollers and plungers.
- (iv) Place the roller (60) in the deep end of the inclined slot of the plunger (68) and slide them together into one of the plunger bores, with the retaining pin slot in the plunger in line with the corresponding hole in the housing.





- (v) Insert retaining pin (66) from the top of the housing as shown in Fig.11, and then open the split end sufficiently to secure. Fit the other plunger, roller and retaining pin in a similar manner.
- (vi) Place the spring (63) into the hole in the expander cone, then entering the guide rod attached to the cap (62) into the spring, replace the cap and screw up. Lock the cap by fitting and tightening the grub screw (61).
- (vii) Fit the hose assembly (84 Fig.12) to the expander together with a new copper gasket (85). Place the steel ball (82) in position and screw in the bleeder screw (83).

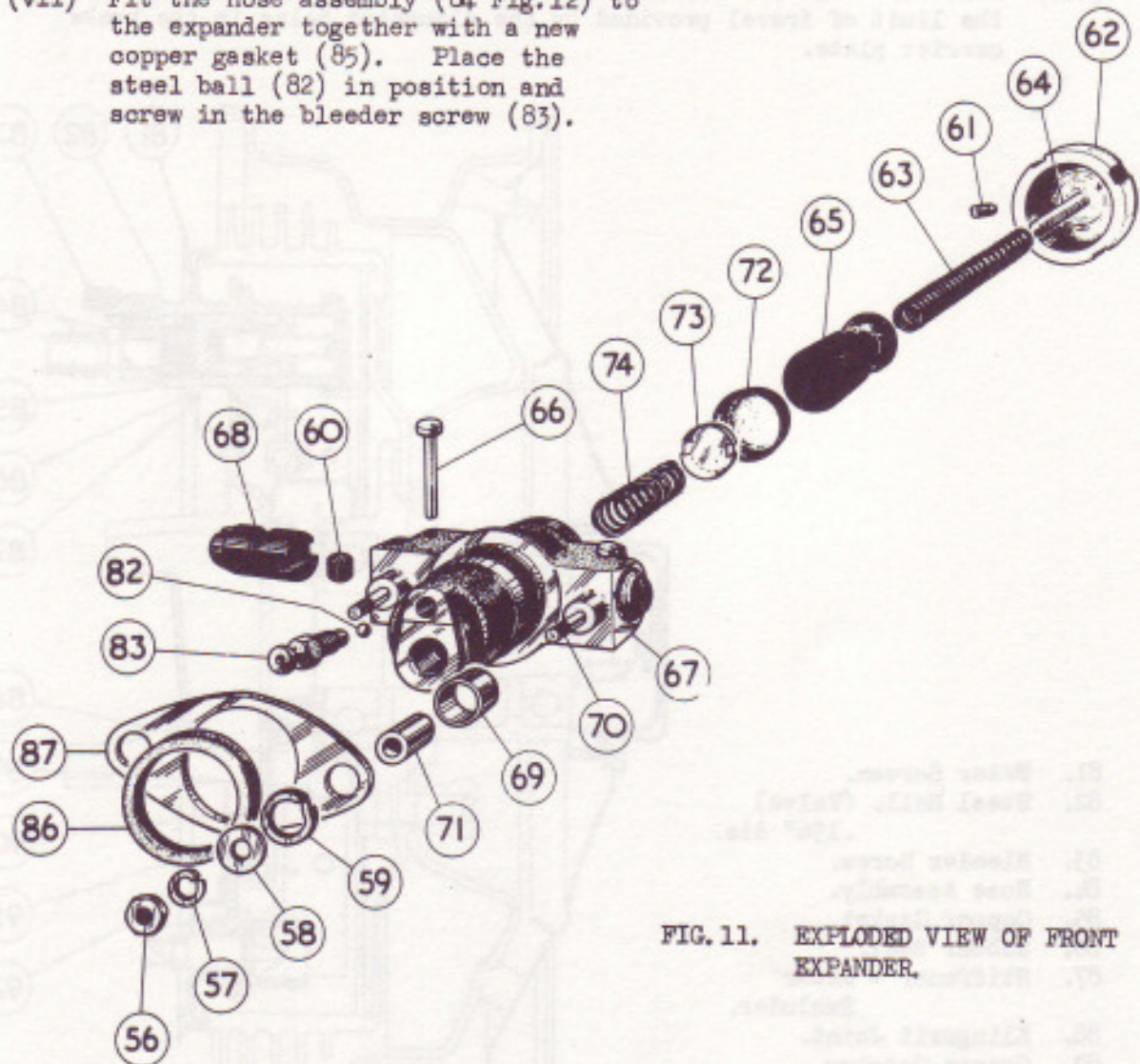


FIG. 11. EXPLODED VIEW OF FRONT EXPANDER.

To Refit.

- (i) Pass the hose assembly through the carrier plate, and offer into position the expander unit with the bleeder screw uppermost, taking care that the two lugs on the expander housing enter the two distance pieces.

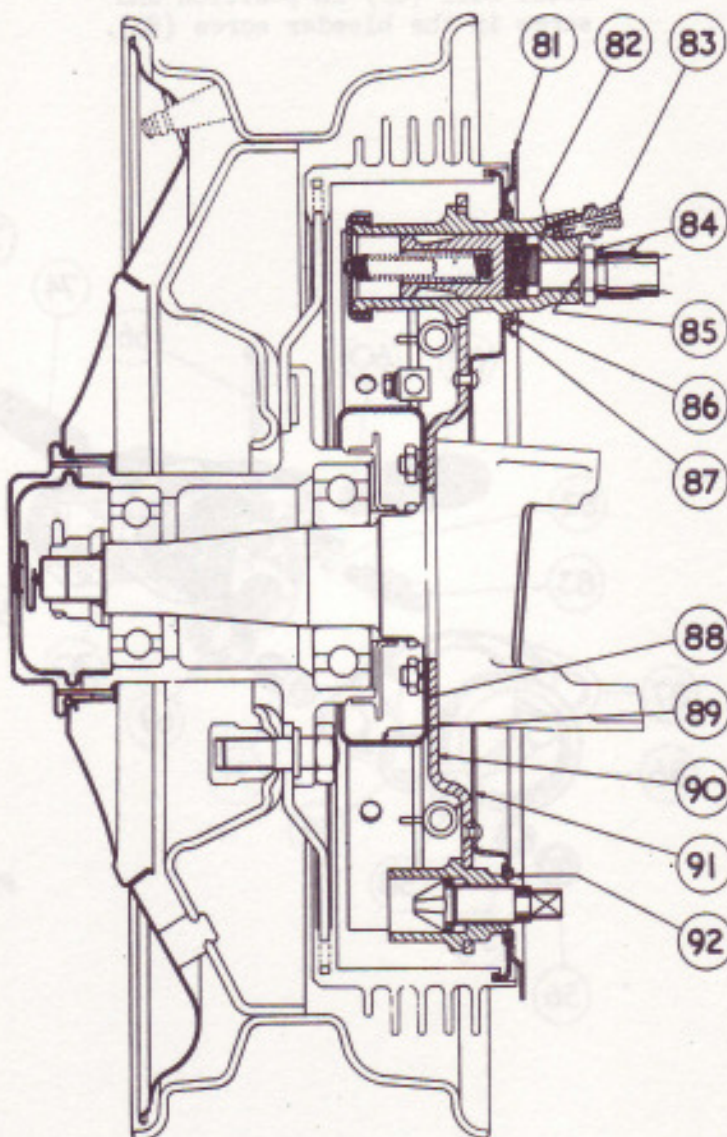




- (ii) Pass the stiffener (87) with the rubber seal (86) - A new seal should be fitted if found necessary - over the hose and bleeder screw into position on the expander housing. While holding the unit with one hand refit the following parts:-

The two distance pieces (71), Thackeray washers (59), plain washers (58) and spring washers (57) and finally secure with the nuts (56).

- (iii) Make sure that the expander unit is free to slide to and fro through the limit of travel provided by the elongated holes in the brake carrier plate.



- 81. Water Screen.
- 82. Steel Ball. (Valve)  
.156" dia.
- 83. Bleeder Screw.
- 84. Hose Assembly.
- 85. Copper Gasket.
- 86. Rubber Seal.
- 87. Stiffener - Water  
Excluder.
- 88. Klingerit Joint.
- 89. Grease Catcher.
- 90. Brake Carrier Plate.
- 91. Water Excluder.
- 92. Rubber Seal.

FIG. 12. SECTION THROUGH FRONT BRAKE.





(v) Re-connect the flexible hose to the pipe line from the master cylinder.

THE FRONT BRAKE ADJUSTERS.

Whenever the front brake shoes are removed for relining, the adjusters should also be removed, dismantled, cleaned and greased.

To remove.

Remove the two setscrews and spring washers (78 & 79 Fig.14). Remove the adjuster unit leaving the two distance pieces (80) in position between the brake carrier plate and the water excluder. Leave the rubber seal (92 Fig.12) in position on the water excluder.

To dismantle.

Withdraw the plungers (76) from the housing and remove the adjuster screw (77), by screwing it inwards. The adjusters are identical.

To re-assemble.

It is essential that all parts should be perfectly clean and laid on a piece of clean paper before re-assembling. The internal parts should be lightly lubricated with hub grease.

Replace the adjuster screw in the housing and then correctly replace the plungers. It is important to note that the plungers are handed and it is possible to assemble them the wrong way round. When assembled the inclined faces 'A' (Fig.14) on the inner ends of the plungers must be parallel when viewed along the axis of the adjuster screw. When the plungers are correctly assembled there are four evenly spaced clicks per turn of the adjuster screw. Should they be incorrectly assembled there will be eight unequally spaced clicks per turn.

- 75. Plunger Housing.
- 76. Plunger.
- 77. Adjuster Screw.
- 78. Setscrew.
- 79. Spring Washer.
- 80. Distance Piece.

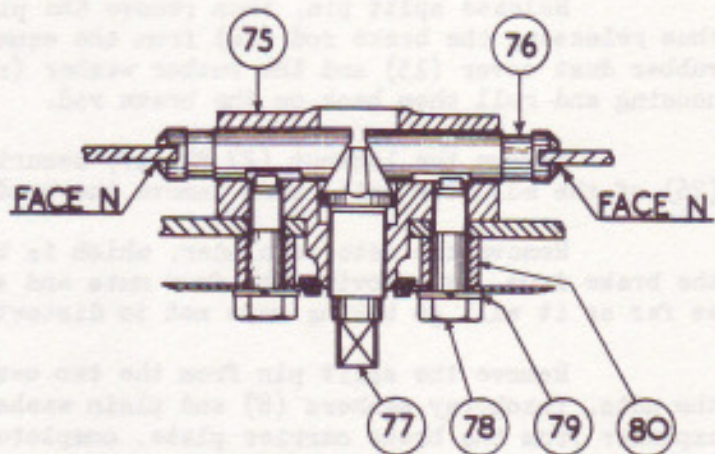


FIG. 13. SECTION THROUGH FRONT ADJUSTER.





### To Refit.

If the rubber seal (92) is in a poor condition, then a new one should be fitted.

Place the adjuster unit in position and secure with the two setscrews and spring washers (78 & 79), taking care that the setscrews pass through the distance pieces (80).

It will be observed upon reference to Fig.13 that the setscrews also locate the plungers and it is important to note that the ends of the setscrews do not nip against the flats on the plungers. This can be checked by slightly rotating the plungers which will indicate the clearance.

### TO REMOVE THE REAR BRAKE SHOES.

The same procedure as described for the front brake should be carried out when removing the rear brake shoes. Refer to Fig.15.

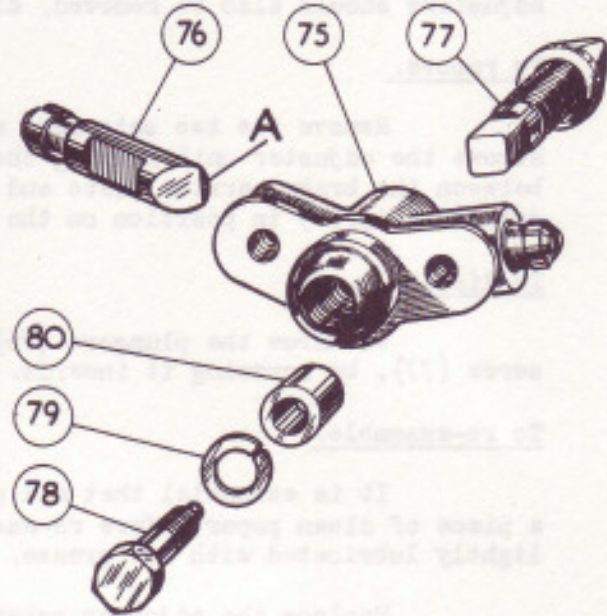


FIG. 14. EXPLODED VIEW OF FRONT ADJUSTER.

### THE REAR BRAKE SHOE EXPANDERS (MECHANICAL).

Whenever the rear brake shoes are removed for relining, the expanders should also be removed, dismantled, cleaned and greased. This also applies to the adjusters.

### To Remove.

Release split pin, then remove the pin from the jaw (15 Fig.16), thus releasing the brake rod (14) from the equaliser lever. Remove the rubber dust cover (13) and the rubber washer (ring) (12) from the expander housing and roll them back on the brake rod.

Remove the locknut (27 Fig.17) securing the hand (adjusting) wheel (26) of the adjuster unit, then remove the hand wheel by unscrewing it.

Remove the water excluder, which is the sheet metal disc covering the brake drum, by removing the four nuts and spring washers and slide it back as far as it will go taking care not to distort it.

Remove the split pin from the two castellated nuts (9) and remove the nuts, Thackeray washers (8) and plain washers (7), and then withdraw the expander from the brake carrier plate, complete with the brake rod.



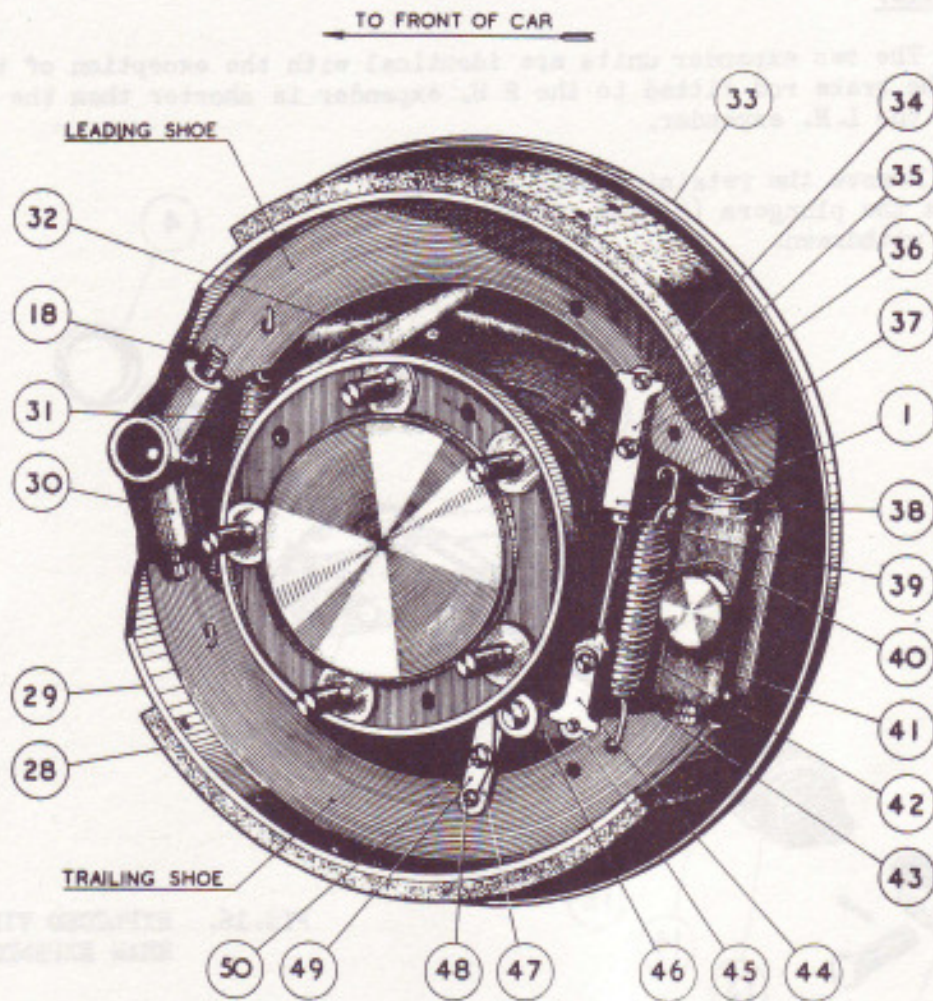


FIG. 15. REAR BRAKE.

- |                               |                               |
|-------------------------------|-------------------------------|
| 28. Brake Shoe Lining.        | 39. Locknut.                  |
| 29. Brake Shoe.               | 40. Spring - Brake Shoes.     |
| 30. Adjuster Unit.            | 41. Expander Unit.            |
| 31. Spring - Brake Shoes.     | 42. Push Rod - Brake Shoes.   |
| 18. Plunger.                  | 43. Setscrew & Spring Washer. |
| 32. Guide - Brake Shoe.       | 44. Locking Plate.            |
| 33. Water Excluder.           | 45. Pin.                      |
| 34. Pin.                      | 46. Fulcrum Lever.            |
| 35. Locking Plate.            | 47. Link.                     |
| 36. Setscrew & Spring Washer. | 48. Pin.                      |
| 37. Anchor Pillar.            | 49. Locking Plate.            |
| 1. Plunger.                   | 50. Setscrew & Spring Washer. |
| 38. Jaw - Push Rod.           |                               |





To dismantle.

The two expander units are identical with the exception of the brake rods. The brake rod fitted to the R H. expander is shorter than the one fitted to the L.H. expander.

Remove the retaining pins (6) which will allow the plungers (1) and the rollers (5) to be withdrawn.

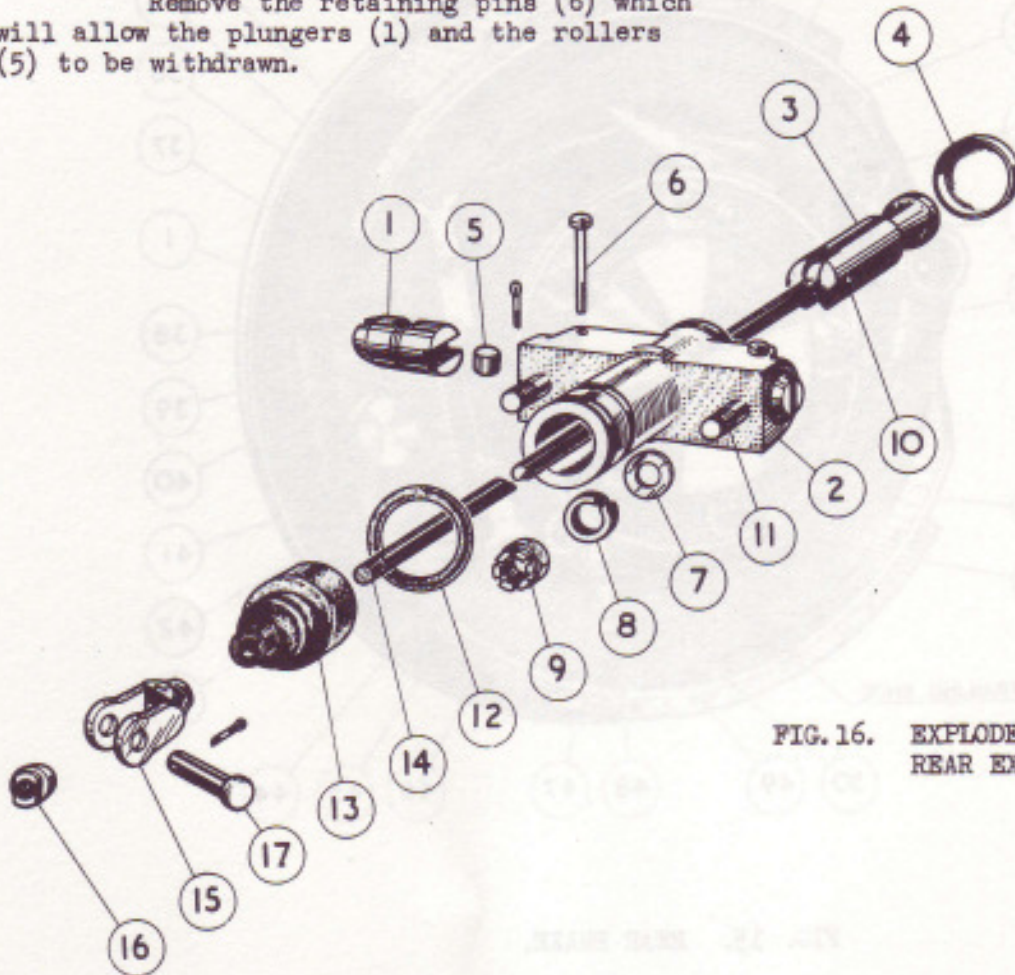


FIG. 16. EXPLODED VIEW OF REAR EXPANDER.

Remove the dust cap (4) by giving the brake rod (14) a light tap on the end; then push the brake rod together with the expander cone (3) through the housing so as to expose the pin (10). Lightly tap out the pin using a suitable punch.

To re-assemble.

It is essential that all parts should be perfectly clean and laid on a piece of clean paper before re-assembling. Lubricate all internal parts with a small quantity of hub grease.