

SECTION MM
THE BRAKING SYSTEM
(Series RME and RMF)

GIRLING HYDRAULIC TYPE

General Description.

Maintenance.

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GENERAL DESCRIPTION

The brakes fitted to the later 1½ litre Riley and Series RMF 2½ litre Riley are of the Girling hydraulic type. The hand brake operates on the rear shoes by independent cable and pull-rod mechanism.

The master cylinder, which is maintained full of fluid from a supply tank mounted on the right-hand side of the engine bulkhead, is connected to the foot pedal by a link and double-ended arm.

The front brakes are of the two-leading-shoe type with each shoe independently operated by separate wheel cylinders. The rear brake-shoes have a single wheel cylinder in each drum to which is connected the hand brake operating mechanism.

Since all brake-shoes are operated through the same hydraulic system, perfect compensation and the maximum braking effort are achieved. The systems on both the series RME and RMF are similar, with the exception that the RME has 10 in. diameter brakes, while the diameter of the RMF brakes is 11 in. In order to diagnose braking faults, see Section M.21.

MAINTENANCE

1. Check, and if necessary top up, the contents of the fluid supply tank which is situated on the engine bulkhead. Only Girling brake fluid is to be used.
2. Occasionally check the unions for leakage and the hoses for wear in the hydraulic part of the system.
3. Oil the link pins and other joints in the mechanical part of the hand-operating system.
4. Make sure that the connection between the master cylinder and the brake pedal is free because it is essential that no binding should exist at this point since the master cylinder piston, after each application of the brake, must be allowed to return unimpeded. There should be ½ in. (12 mm.) of free movement at the pedal before it makes contact with the piston.

Section MM.1

BRAKE-SHOE ADJUSTMENT

When lining wear has reached a point where pedal travel becomes excessive before the brakes come into operation, the brakes must be adjusted.

The front brakes.—The Girling two-leading shoe system used on the front brakes is adjusted as follows :—

The actual adjustments are effected by means of the two hexagon-headed bolts projecting from the backplate on each side of the axle. In order to move the

shoes nearer the drums so that compensation for wear may be obtained, the adjusting bolts must be turned in the direction of rotation of the wheel in the case of the left-hand wheel, and against the direction of rotation in the case of the right-hand wheel. The adjusters in each case must be turned clockwise when viewed from the centre of the car. Turn the bolts until a definite resistance is felt, and then slacken them back to the point where no binding is experienced.

Make sure all nipples are tight, otherwise loss of fluid and, subsequently, braking effort will result.

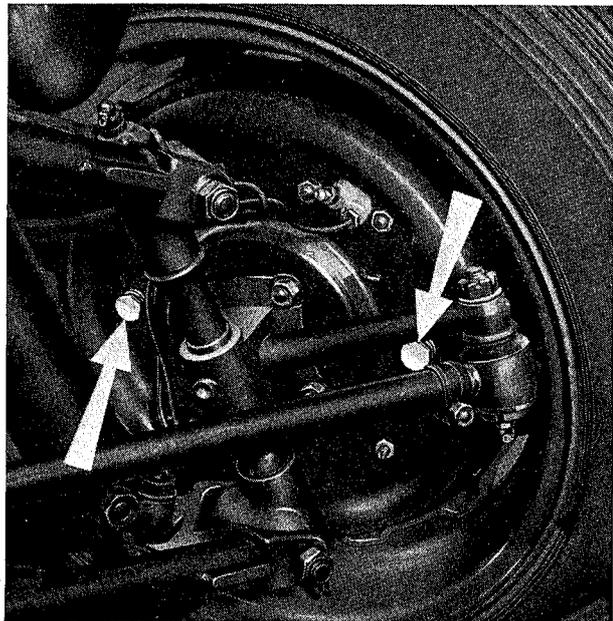


Fig. MM.1.
The front brake adjusters.

Rear brakes.—Screw the square-headed adjuster on each of the rear brake backplates inwards until an appreciable resistance is felt, as opposed to the lesser resistance produced by the locating flats of the adjuster. The brake-shoes will now have expanded against the brake-drums. The adjuster must now be unscrewed to the next nearest flat and the drum checked for binding. If any binding or rubbing is found to exist, the adjuster must be screwed out to the extent of another flat.

Section MM.2

SETTING THE HAND BRAKE MECHANISM

The linkage is carefully set at the factory and should not normally be interfered with unless replacement parts are fitted or a complete overhaul is being made.

When the brake-rods are correctly adjusted and the hand brake is in the off position, the two balance

lever links are exactly parallel to the longitudinal axis of the car, and the balance lever arms which are connected to the brake-rods are also parallel to this axis.

If it is found that the adjustment is incorrect, adjust the brake-shoes as detailed in Section MM.1 and withdraw the split pins and clevis pins from the two fork-ends at the ends of the brake-rods and from the

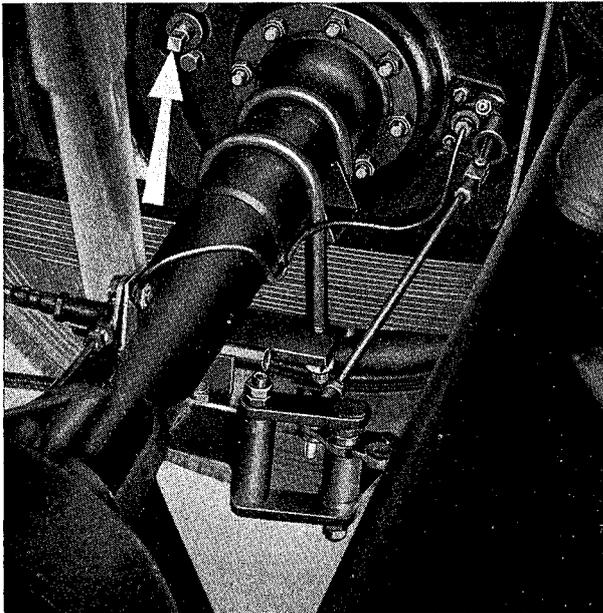


Fig. MM.2.
The rear brake adjuster.

fork-end at the rear end of the hand brake operating cable. Adjust the length of the brake-rods by screwing the fork-ends in or out until, with the balance lever and balance links in the positions described above, the two brake-rod clevis pins will drop into their respective holes. Replace these clevis pins and their split pins. Next, by screwing the operating cable fork-end in or out, adjust the operating cable so that its clevis pin will also drop into position. Refit this clevis pin with its split pin.

Section MM.3

BRAKE PEDAL ADJUSTMENT

The correct amount of free movement in the brake pedal linkage is set during manufacture and normally should need no alteration. However, if the master cylinder, brake pedal or other parts affecting this setting are changed, then readjustment will be necessary.

In order to do this, disconnect the linkage by removing the split pin and clevis pin from one of the brake pedal connecting rod fork-ends. Ensure that

the spring is holding the brake pedal up against its stop. Pull out the master cylinder plunger as far as it will go, and adjust the length of the connecting rod until the clevis pin will go through the appropriate holes without having to move the master cylinder plunger or the brake pedal. Replace the clevis pin and refit its split pin.

Section MM.4

TO BLEED THE SYSTEM (EXPEL AIR)

Bleeding the system is not a routine maintenance job, and should only be necessary when some portion of the hydraulic equipment has been disconnected or the fluid drained off.

Fill the master cylinder with Girling hydraulic brake fluid and keep it at least half-full throughout the operation, otherwise air will be drawn into the pipe lines, necessitating a fresh start.

Each of the rear wheel cylinders are provided with a bleeder screw, as are the upper wheel cylinders on the front wheels. There are thus a total of four bleeder screws.

Attach the bleeder tube to one of the wheel cylinder bleeder screws and allow the free end of the tube to be submerged in a small quantity of fluid in a clean glass jar.

Open the bleeder screw one full turn. Depress the brake pedal quickly, and allow it to return without assistance. Repeat this pumping action with a slight pause before each depression of the pedal.

Watch the flow of fluid into the glass jar, and when air bubbles cease to appear, hold the pedal firmly against the floorboards while the bleeder screw is securely tightened.

Repeat the operation on each wheel.

Note.—Clean fluid bled from the system must be allowed to stand until it is clear of air bubbles before using it again. Dirty fluid must be discarded.

Section MM.5

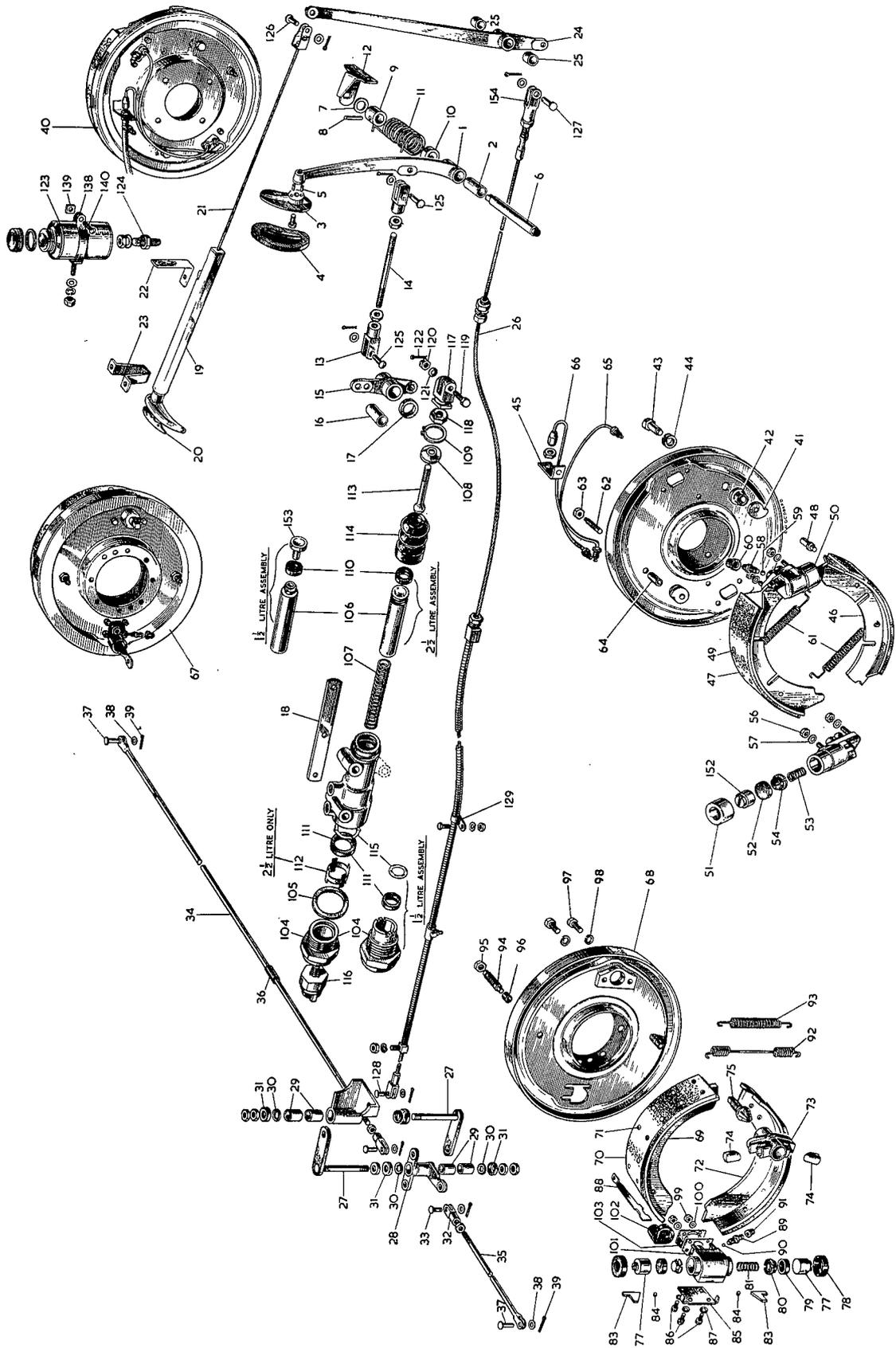
REMOVAL OF THE MASTER CYLINDER

Drain the fluid from the system by disconnecting a pipe line at one of the front brake back plates. Collect the fluid in a clean container by pumping at the brake pedal.

Reconnect the hose pipe. Disconnect the two hose lines on the top of the master cylinder and unlock and remove the nut and bolt at the relay lever.

Disconnect the stop-lamp switch. Take out the two bolts securing the master cylinder to the chassis and remove the cylinder complete with its push-rod.

THE RILEY BRAKE COMPONENTS (Series RME and RMF)



KEY TO THE RILEY BRAKE COMPONENTS (Series RME and RMF)

| No. | Description | No. | Description | No. | Description |
|-----|--|-----|--------------------------------------|------|---|
| 1. | Brake pedal. | 45. | Hose bracket. | 92. | Brake-shoe return spring—cylinder end. |
| 2. | Brake pedal bush. | 46. | Brake-shoe and lining—R/H. | 93. | Brake-shoe return spring—adjuster end. |
| 3. | Brake pedal pad (aluminium). | 47. | Brake-shoe lining. | 94. | Steady post. |
| 4. | Brake pedal pad (rubber). | 48. | Cam post. | 95. | Steady post nut. |
| 5. | Brake pedal pad dowel. | 49. | Rivets. | 96. | Steady post bush (felt). |
| 6. | Brake pedal shaft. | 50. | Wheel cylinder assembly—R/H. | 97. | Adjuster bolt. |
| 7. | Brake pedal shaft washer. | 51. | Dust cover (rubber). | 98. | Adjuster bolt washer. |
| 8. | Brake pedal shaft pin. | 52. | Seal. | 99. | Wheel cylinder self-locking nut. |
| 9. | Brake pedal spacer—long. | 53. | Spring. | 100. | Self-locking nut washer. |
| 10. | Brake pedal spacer—short. | 54. | Air excluder. | 101. | Dust cover plate. |
| 11. | Brake pedal return spring. | 56. | Wheel cylinder nut. | 102. | Dust cover—L/H. |
| 12. | Brake pedal bracket. | 57. | Wheel cylinder spring washer. | 103. | Dust cover retainer plate. |
| 13. | Fork joint. | 58. | Wheel cylinder bleed screw. | 104. | Master cylinder end cap. |
| 14. | Connecting rod. | 59. | Wheel cylinder steel ball. | 105. | Gasket (copper). |
| 15. | Intermediates lever. | 60. | Wheel cylinder dust cap. | 106. | Plunger. |
| 16. | Intermediates lever bush. | 61. | Brake-shoe return spring. | 107. | Return spring plunger. |
| 17. | Intermediates lever spacer. | 62. | Steady post. | 108. | Retaining washer. |
| 18. | Master cylinder strap. | 63. | Nut (A.N.F.). | 109. | Circlip. |
| 19. | Hand brake control lever. | 64. | Bush (etc). | 110. | Recuperating seal. |
| 20. | Hand brake lever trigger. | 65. | Bridge pipe. | 111. | Seal—outer. |
| 21. | Hand brake control lever cable. | 66. | Pipe (front hose to wheel cylinder). | 112. | Seal—spreader. |
| 22. | Hand brake control lever bracket—bottom. | 67. | Rear brake assembly—L/H. | 113. | Push-rod. |
| 23. | Hand brake control lever bracket—top. | 68. | Brake—backplate. | 114. | Boot (rubber). |
| 24. | Intermediates lever. | 69. | Brake-shoe and lining (leading). | 115. | Shim washer. |
| 25. | Intermediates lever bush. | 70. | Brake-shoe lining. | 116. | Stop-light switch. |
| 26. | Hand brake cable. | 71. | Rivets. | 117. | Push-rod jaw. |
| 27. | Rear balance link assembly. | 72. | Brake-shoe and lining (crawling). | 118. | Locknut for jaw. |
| 28. | Balance lever assembly. | 73. | Adjuster unit. | 119. | Bolt. |
| 29. | Balance lever pin bush. | 74. | Tappet—R/H. | 120. | Nut. |
| 30. | Lever balance sealing rubber. | 75. | Wedge. | 121. | Washer. |
| 31. | Sealing rubber cup. | 77. | Piston and dust cap assembly. | 122. | Split pin. |
| 32. | Brake-rod fork joint. | 78. | Boot. | 123. | Supply tank. |
| 33. | Fork joint pin. | 79. | Seal. | 124. | Supply tank outlet adaptor. |
| 34. | Drawlink—L/H. | 80. | Air excluder. | 125. | Clevis pin. |
| 35. | Drawlink—R/H. | 81. | Spring. | 126. | Clevis pin (part of cable). |
| 36. | Drawlink steady rubber—L/H. | 83. | Hand brake mechanism tappet. | 127. | Clevis pin (inter-lever to main cable). |
| 37. | Clevis pin. | 84. | Hand brake mechanism roller. | 128. | Clevis pin (main cable to balance lever). |
| 38. | Clevis pin washer. | 85. | Hand brake mechanism cover-plate. | 129. | Clip (cable to frame). |
| 39. | Split pin. | 86. | Hand brake mechanism screw. | 138. | Supply tank clip. |
| 40. | Front brake assembly—L/H. | 87. | Hand brake mechanism washer. | 139. | Supply tank nut. |
| 41. | Snail cam. | 88. | Hand brake mechanism drawlink. | 140. | Supply tank bolt. |
| 42. | Snail cam bush. | 89. | Wheel cylinder bleed screw. | 152. | Wheel cylinder piston. |
| 43. | Snail cam spindle. | 90. | Wheel cylinder steel ball. | 153. | Retainer seal. |
| 44. | Snail cam spring. | 91. | Wheel cylinder dust cap. | 154. | Hand brake cable fork. |

Section MM.6

DISMANTLING THE MASTER CYLINDER

Pull back the dust-excluding rubber and extract the circlip retaining the push-rod and plunger in the cylinder. Withdraw the push-rod and jaw assembly, together with the rubber boot and retaining washer. On to a clean surface withdraw the plunger and seal assembly (together with the seal retainer, which is a separate item on the 1½ litre models) and the plunger return spring.

Secure the master cylinder in a vice and unscrew the stop-lamp switch. Unscrew the end cap and remove it complete with the copper gasket. Withdraw the outer seal and the shim washer.

Carefully examine all the parts and renew any which are worn or distorted. It is especially important that the seal is renewed if it lacks resilience.

Section MM.7

ASSEMBLING THE MASTER CYLINDER

After washing all parts in clean brake fluid, place the shim washer in position and then the outer seal with its lip away from the shim. Replace and secure the end cap with its copper gasket and insert and tighten the stop-lamp switch.

Replace the plunger return spring, engaging the end over the spigot formed by the stop-lamp switch. Fit the recuperating seal to the plunger, lip edge towards the plunger barrel, and (on 1½ litre models only) replace the seal retainer.

Press the plunger assembly into the cylinder and

insert the push-rod ball and retaining washer. Replace the circlip and seal the cylinder end with the rubber boot.

Section MM.8

REPLACING THE MASTER CYLINDER

Replace the master cylinder on to the chassis, fitting the two bolts. Reconnect the two hose lines on top of the cylinder. Reset the brake pedal adjustment, if necessary, as described in Section MM.3. Reconnect the stop-lamp switch.

Bleed the system as in Section MM.4. Check the system for leaks when the brakes are applied hard.

Section MM.9

REMOVING A FRONT WHEEL CYLINDER

Jack up the front of the car and take off the front wheel. Slacken both brake adjusters and then remove the brake-drum. Lift off both shoes and disconnect the hydraulic pipe line.

Remove the two nuts and washers holding the cylinder to the backplate. The cylinder may now be detached.

Section MM.10

DISMANTLING A FRONT WHEEL CYLINDER

Remove the rubber dust cover (1½ litre models only) and withdraw the piston. Withdraw the piston seal, spring end cover and the spring. Other than the bleed screw and the ball, there are no more components.

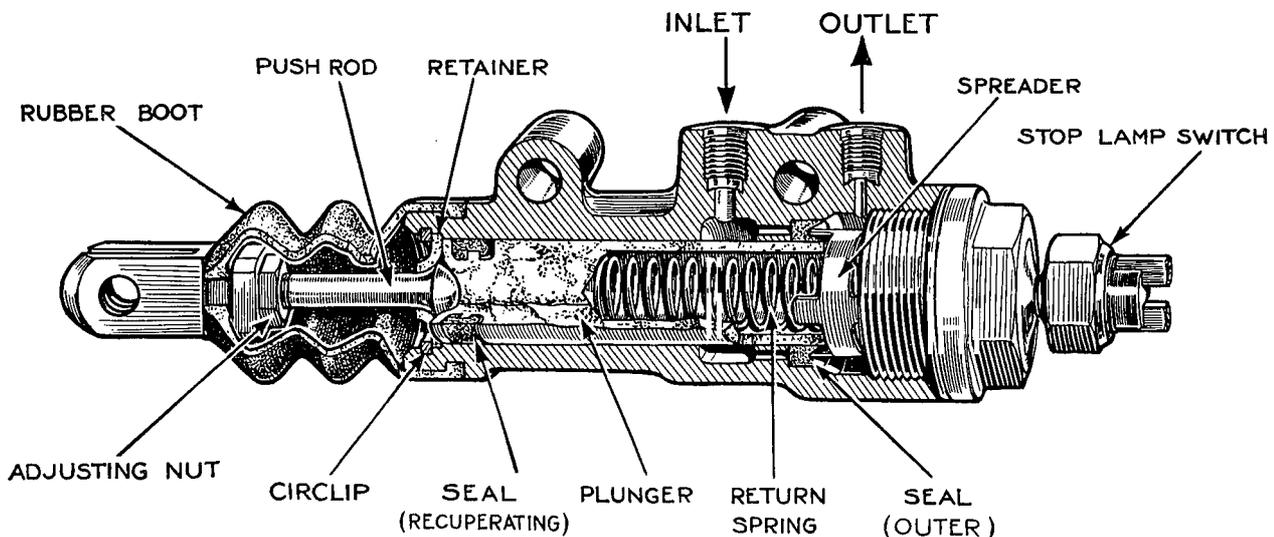
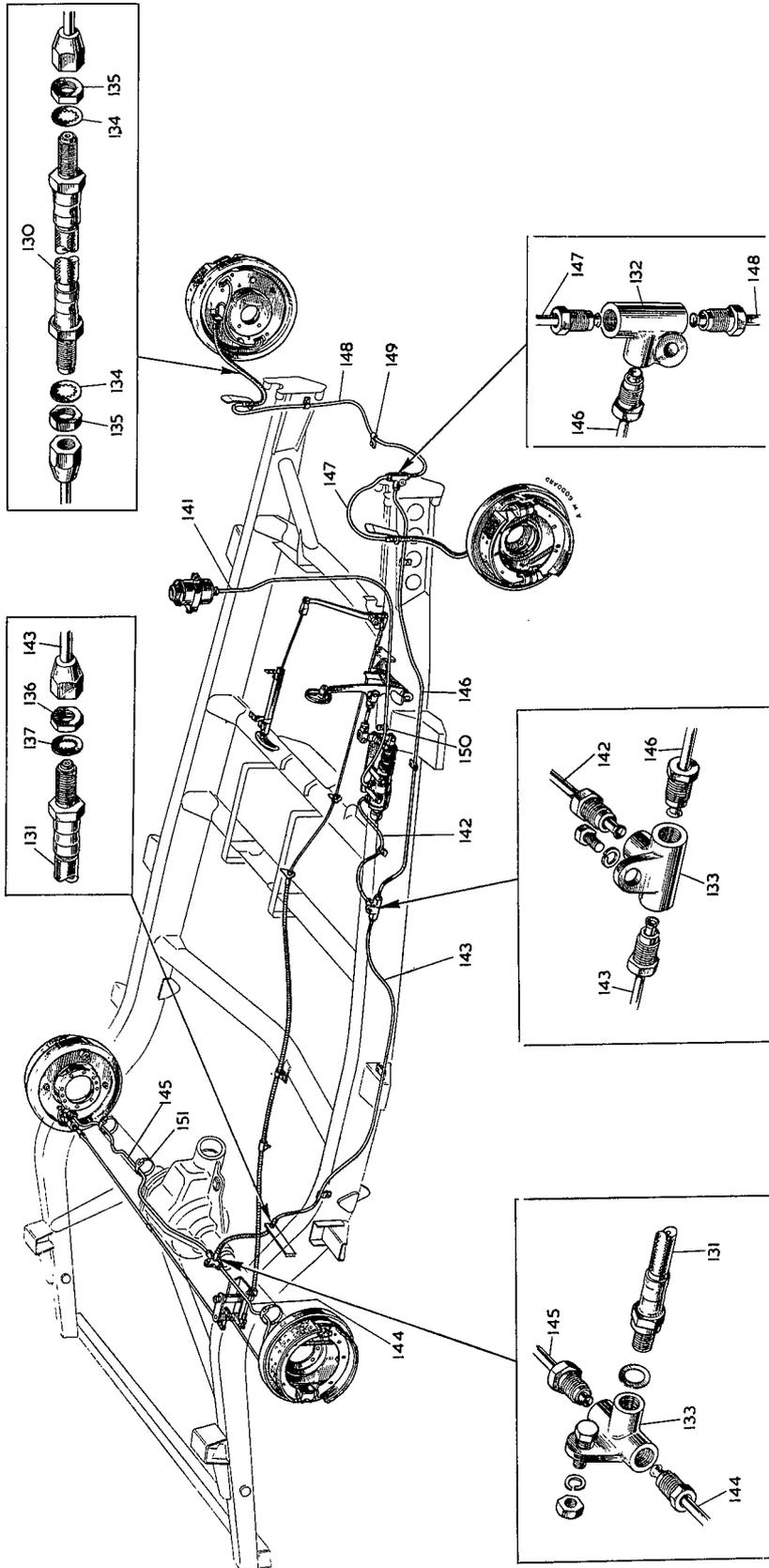


Fig. MM.3.

The master cylinder of the 2½ litre model. The master cylinder on the 1½ litre is similar but is without the separator and the plunger is made in two pieces.

THE RILEY HYDRAULIC BRAKE SYSTEM COMPONENTS

(Series RME and RMF)



- | No. | Description | No. | Description |
|------|--|------|---|
| 130. | High-pressure hose—front. | 146. | Pipe (three-way to front three-way). |
| 131. | High-pressure hose—rear. | 147. | Pipe (front three-way to front hose)—R/H. |
| 132. | Three-way joint—front. | 148. | Pipe (front three-way to front hose)—L/H. |
| 133. | Three-way joint. | 149. | Brake pipe clip. |
| 134. | Bulkhead washer. | 150. | Clip (supply tank pipe to frame). |
| 135. | Bulkhead nut. | 151. | Banjo clip (brake pipes to rear axle). |
| 136. | Bulkhead nut. | | |
| 137. | Lock washer. | | |
| 141. | Pipe (supply tank to master cylinder). | | |
| 142. | Pipe (master cylinder to three-way). | | |
| 143. | Pipe (three-way to front hose). | | |
| 144. | Pipe (rear hose to rear brake)—R/H. | | |
| 145. | Pipe (rear hose to rear brake)—L/H. | | |

Section MM.11

ASSEMBLING A FRONT WHEEL CYLINDER

Clean all parts with Girling hydraulic fluid. Examine the dust cover (1½ litre models only) and piston seal for damage, wear or distortion. Dip all parts in brake fluid and assemble while wet.

Insert the seal spring, spring end cover and piston seal.

After replacing the cylinder on the brake backplate, remember to bleed the brake system as detailed in Section MM.4.

Section MM.12

REMOVAL AND SETTING OF THE FLEXIBLE HOSE

The hose is held at its top end by a locknut which must not be released until the union nut on the metal pipe has been undone. The flexible pipe locknut can then be released and the flexible pipe removed from

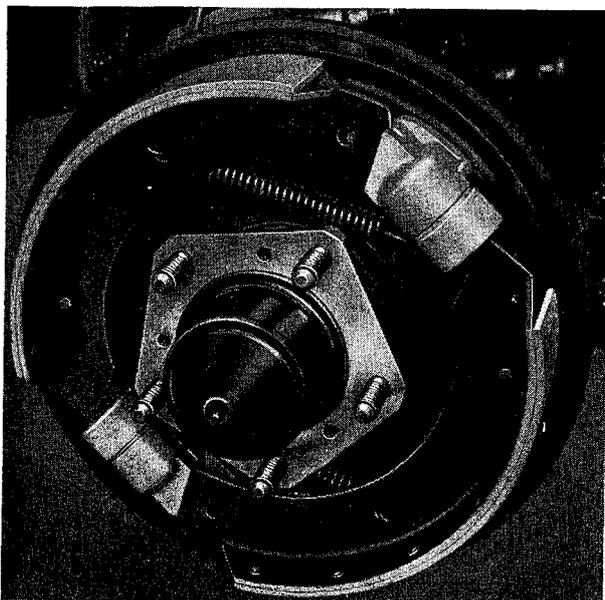


Fig. MM.4.

The front brake assembly with the brake drum removed, showing the disposition of the two wheel cylinders.

the bracket. At the lower end on the front wheels a banjo union attaches the flexible pipe to the lower operating cylinder, and no difficulty is presented in releasing this end. The lower end of the flexible pipe on the rear axle is attached to a union which is connected to both the rear wheel operating cylinders.

It should be noted that the hose support brackets at the front of the car are handed, and if fitted to the wrong side bring the hoses dangerously near the tyre

MM.8

or rim. The fixing holes in the bracket are at an angle which pitches the bracket in or out according to which side of the car it is fitted.

Section MM.13

TO REMOVE THE REAR BRAKE-SHOES

Jack up the car and take off the rear wheel. Remove the brake-drum by taking out the three countersunk retaining screws.

Lever each shoe off in turn, taking care not to stretch the return springs excessively.

Section MM.14

REMOVING A REAR WHEEL CYLINDER

Remove the rear brake-shoes as detailed in Section MM.13. Disconnect the hydraulic brake feed pipe from the wheel cylinder. Brake fluid will flow from the end of the pipe, which must be cleaned and either sealed or allowed to drip into a perfectly clean container.

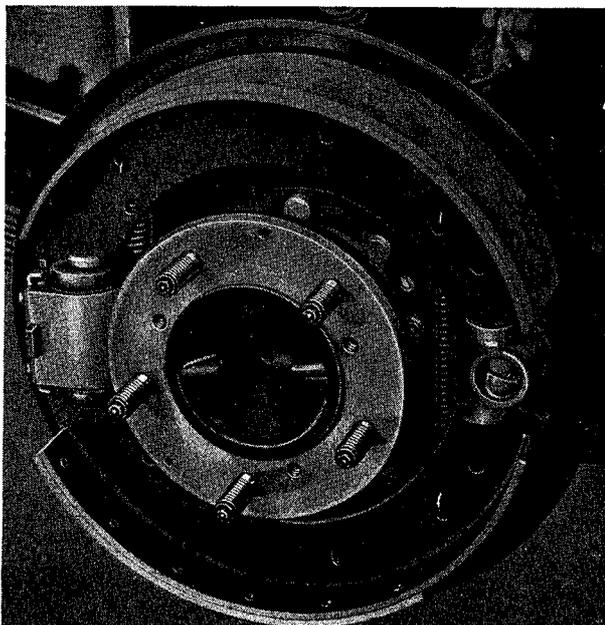


Fig. MM.5.

The rear brake in position with the brake drum removed, showing the single wheel cylinder.

The fluid may then be poured back into the reservoir before bleeding the system after completing the reassembly operations.

Take out the clevis pin and disconnect the pull rod from the draw link of the wheel cylinder. Remove the bleeder nipple and the two nuts and washers securing the wheel cylinder to the brake backplate. Withdraw the dust cover retainer and rubber seal and remove the cylinder.

Section MM.15

DISMANTLING A REAR WHEEL CYLINDER

Take out the four screws securing the cover plate and remove the cover plate, draw link, rollers and tappets, carefully noting their respective positions.

Withdraw the pistons and dust cap from each end of the cylinder and press out the two piston seals, each with a spring end cover, and the spring.

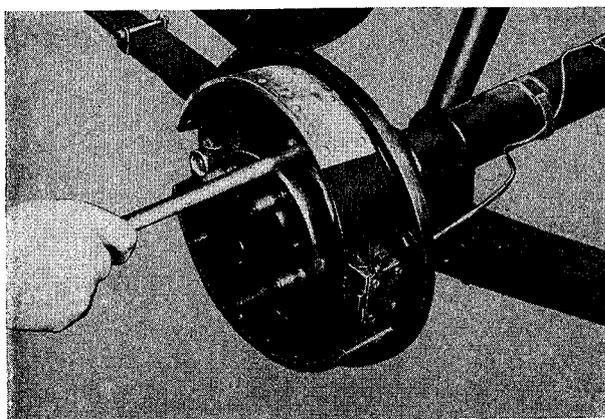


Fig. MM.6.
Removal of a rear brake-shoe.

Section MM.16

ASSEMBLING A REAR WHEEL CYLINDER

Clean the hand brake draw linkage and smear grease over it before reassembling. Replace the draw link with the cut-away side away from the bleeder screw so that it is on the underside when the cylinder is replaced on the brake backplate. Insert the rollers

and then the tappets with the cut-away sides towards the short end of the draw link.

Replace the cover and secure it in position with the four screws.

Wash out the cylinder with Girling hydraulic fluid. Examine the piston seals for damage or wear and renew if necessary. Wash the components in Girling hydraulic fluid and assemble them wet. Insert a piston seal (lip inwards), a spring end cover, the spring, second end cover and the remaining seal (lip inwards). Replace the pistons and dust caps.

After replacing the unit on the brake backplate, remember to bleed the system as detailed in Section MM.4.

Section MM.17

RELINING THE BRAKE-SHOES

When fitting new brake linings the instructions given in Section M.18 must be followed.

Section MM.18

ALTERNATIVE BRAKE FLUID IN COLD CONDITIONS

Girling Brake Fluid should be used for service purposes both at home and abroad, and this fluid has been found to be suitable for use under Arctic conditions.

If, however, an alternative low temperature fluid is required, Wagner 21 can be used, which is a brake fluid widely used in cold climates and Arctic conditions.