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1. DESCRIPTION

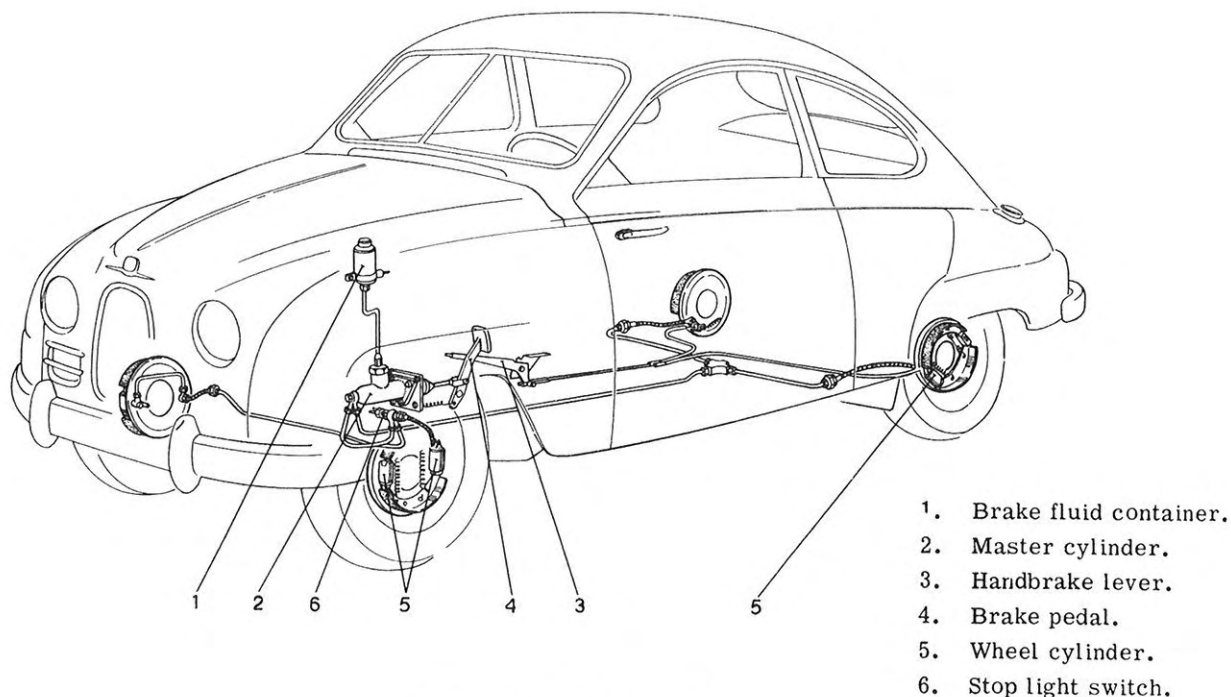


Fig. 1. Brake system

The Saab 93 is fitted with a hydraulic footbrake which acts on all four wheels, and a mechanical handbrake which acts on the rear.

The layout of the brake system is shown in Fig. 1.

1.1. Footbrake

When the brake pedal is depressed, the motion is transmitted through a push rod to the master cy-

linder piston, and the fluid in the brake system transmits the pressure to the wheel cylinders. Each front wheel brake has two cylinders, see Fig. 2, each one acting on one brake shoe. When braking, the cylinder plungers move in the direction of the wheel rotation (car moving forward) and press the brake shoes against the brake drums.

The rear wheel brakes have one cylinder each, see Fig. 3, which is fitted in a slot in the brake shield.

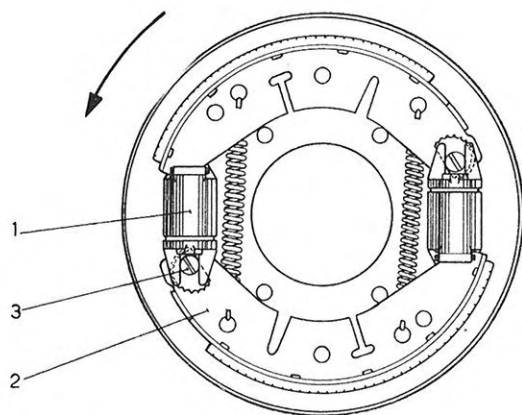


Fig. 2. Front wheel brake

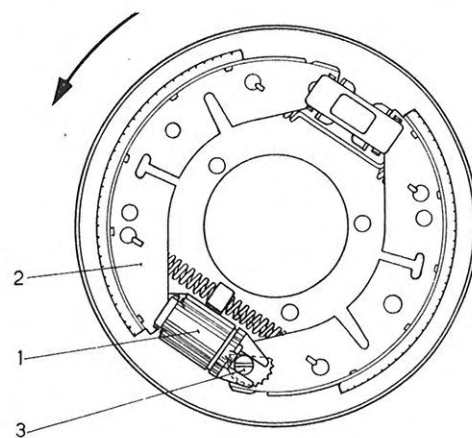
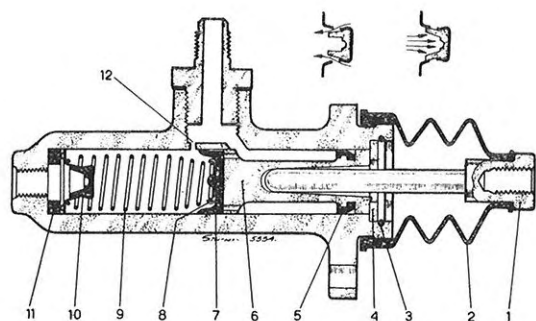


Fig. 3. Rear wheel brake

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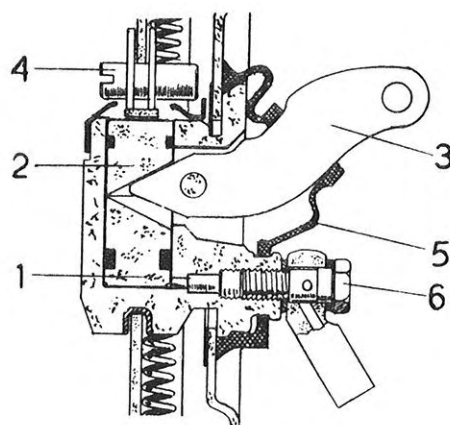
When the brakes are applied the plunger moves in the direction of the wheel rotation (car moving forward) and presses one of the brake shoes against the brake drum. At the same time, the cylinder is displaced in the opposite direction, pressing the other brake shoe against the drum.

The master cylinder, which is shown in Fig. 4, consists of a cylinder housing with a piston. At one end of the cylinder housing there is a valve 10, which is acted upon by a spring 9. The valve prevents the return of the brake fluid which is pumped out into the lines when the system is bled. It is so designed that a certain fluid pressure is always maintained in the brake lines. When the pedal is released after a normal application of the brakes, the valve is opened by the fluid which flows back to the master cylinder. The pressure in the lines then falls until the spring 9 closes the valve 10 and a pressure corresponding to the spring pressure remains in the lines. In the master cylinder there is an opening 12 which connects the cylinder with the fluid container so as to keep the system charged with fluid. This opening also permits the brake fluid to expand when the temperature varies and it is important that this opening is not blocked by impurities or by the piston not returning sufficiently after braking.



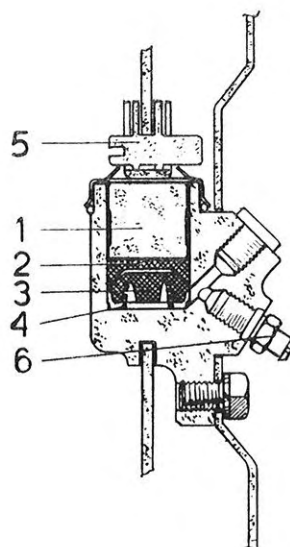
- | | |
|-------------------|--------------------|
| 1. Push rod | 7. Piston cup |
| 2. Rubber bellows | 8. Spring retainer |
| 3. Snap ring | 9. Spring |
| 4. Washer | 10. Valve |
| 5. Rubber ring | 11. Seal ring |
| 6. Piston | 12. Opening |

Fig. 4. Master cylinder.



1. Plunger
2. Cup
3. Cup filler
4. Spring
5. Adjusting device
6. Bleeder screw

Fig. 5. Rear wheel cylinder.



1. Inner plunger
2. Outer plunger
3. Lever
4. Adjusting device
5. Rubber seal
6. Banjo connection

Fig. 6. Front wheel cylinder.

Wheel cylinders.

The rear wheel cylinders, Fig. 5, contain an outer and an inner plunger. The inner plunger, 1, is acted upon by the brake fluid, and the outer one, 2, is actuated by the handbrake lever 3. Both plungers are fitted with rubber cups.

The front wheel cylinders, Fig. 6, contain a single plunger 1 with a rubber cup 2, a spring 4 and a cup filler 3. The fluid pressure forces the plunger out against the brake shoe.

The brake fluid container, which is located on the left-hand side of the radiator frame front, is connected to the master cylinder by a pipe and keeps the system charged with brake fluid.

1.2. Handbrake

The handbrake lever is located between the front seats. Its motion is transmitted by steel cables in spiral sheaths to the levers of the rear wheel cylinders, see Figs. 3, 1. and 5.

2. TECHNICAL DATA

Brakes	Lockheed	Brake fluid	SAE 70R1 (Lockheed No. 33 or equivalent)
Type	two-leading shoe, hydraulic		
Front wheel cylinder, bore diameter	16/16"		
Rear wheel cylinder, bore diameter	3/4"		
Master cylinder diameter	7/8"		
Brake shoes, size	8" x 1 1/2"		
Brake linings, size	1 1/2" x 3/16"	Clearance between master cylinder piston and push rod, min.	0.8 mm. (0.03 in.)
Brake lines	Bundy tubes	Same clearance measured at tip of brake pedal, see Fig. 9	5-10 mm. (0.2-0.4 in.)
Fluid container/master cylinder	5/16"		
Other lines	3/16"		

3. WORK ON CAR

3.1. Adjustment of footbrake

If the effectivity of the brakes is gradually reduced during a period of driving, this is usually a sign that the brake linings are worn. When the pedal is depressed for normal braking, at least 1/3 of its travel should remain, see Fig. 7.

3.1.1. Adjustment of brake shoes

1. If possible, the car should be hoisted up in a safe manner so that all four wheels are free. Make sure that the jack is correctly placed, see Chapter 1, "General". Normal wear of the brakes can usually be adjusted without removing the wheels.

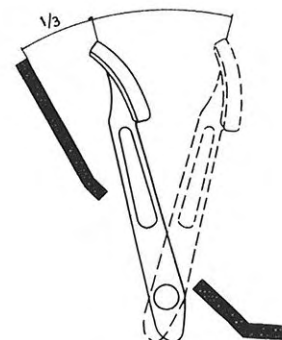


Fig. 7. Brake pedal travel

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2. Release the handbrake and check that the levers inside brake shields return properly. If the brake cables run stiffly in their sheaths, the brake levers must be returned by hand. For lubrication of the handbrake cables, see point 3.2.

3. Remove the hub cap, screw out one wheel bolt and turn the wheel until the bolt hole is opposite one of the adjusting screws. The location of the adjusting device is shown in Figs. 2 and 3. Note that each front wheel brake has two adjusting devices, whereas the rear wheel brakes have only one.

4. Turn the adjusting screw to the right with a screwdriver until the brakes drag. Then back it off one or more notches until the wheel again rotates freely. Repeat this procedure with each adjusting device. The construction of the adjusting device is shown in Fig. 8.

5. Screw in and tighten the wheel bolts. Fit the hub caps and lower the car.

3.1.2. Adjustment of brake pedal

As shown in Fig. 9, there should be a clearance between the master cylinder piston 1 and the push rod 2 when the pedal is in the free position. This clearance is necessary for complete return of the piston after application of the brakes. The clearance should be at least 0.8 mm. (0.03 in.) which is 5-10 mm. (0.2 - 0.4 in.) measured at the tip of the pedal. The pedal play is adjusted as follows.

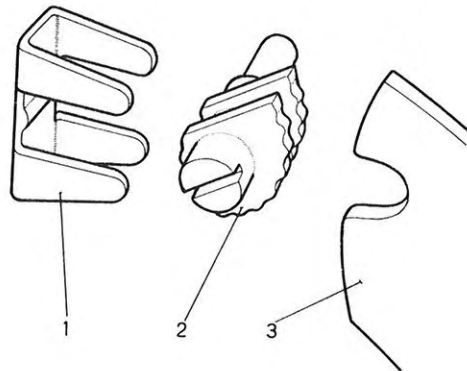
1. Fold aside rubber mat at pedals.
2. Loosen left-hand part of pedal board.
3. Lean the freed part of the pedal board against the left-hand inner wall so that the dimmer switch cables need not be disconnected.
4. Loosen lock nut 3, see Fig. 9.
5. Turn the hexagonal part of the push rod until the play at the tip of the pedal is correct.
6. Tighten lock nut.
7. Replace pedal board and rubber mat.

3.1.3. Replacement of parts in master cylinder

The master cylinder can be inspected and parts in it replaced without removing it from the car.

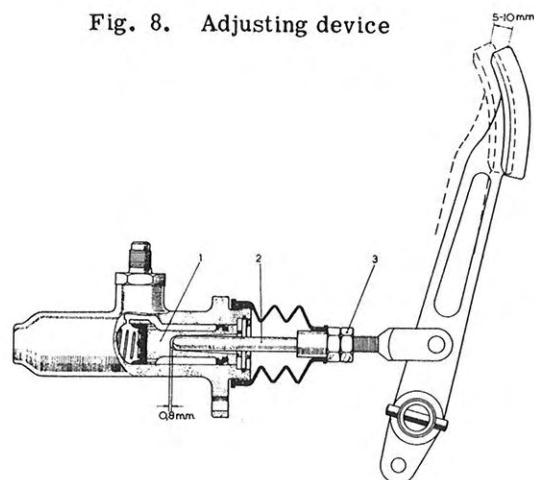
3.1.3.1. Dismantling.

1. Plug the fluid container filler opening.
2. Fold aside the mat and detach the pedal board.
3. Open a bleeder screw to reduce the excess pressure in the brake lines.
4. Loosen lock nut 3, Fig. 9, and unscrew push rod 2.
5. Remove snap ring 3, Fig. 4, and washer 4.
6. Remove piston 6, on which the seal ring 5 is fitted.
7. Take out piston cup 7 and washer between cup and piston.
8. Pull out spring 9, valve 10 and retainer.



1. Driver
2. Eccentric
3. Brake shoe

Fig. 8. Adjusting device



1. Piston
2. Push rod
3. Lock nut

Fig. 9. Brake pedal play.

9. Seal ring 11 can be removed with a suitable hook.

10. Wash all parts in alcohol. Be sure that the rubber parts do not come into contact with grease oil or gasoline.

3.1.3.2. Checking.

1. Check that bore is free from scratches
2. Check all rubber parts.
3. Check that the piston runs freely in cylinder.
4. Replace damaged parts.

3.1.3.3. Assembly.

Lubricate master cylinder bore and all other parts with brake fluid and observe 100 % cleanliness during assembly.

1. Push in seal ring 11, fig. 4. (See also Fig. 17.).
2. Fit valve 10 with valve cup on the spring, fit spring retainer and slide the assembly into the cylinder.
3. Slide in piston cup 7 with piston 6. Do not forget the washer between the cup and the piston. Check that seal ring 5 is correctly fitted in the piston.
4. Insert washer 4 and fit snap ring 3.
5. Assemble rubber bellows 2 and push rod 1. Slide push rod into plunger and fit bellows onto cylinder flange.
6. Screw push rod together.
7. Remove plug from fluid container and bleed the brake system, see 3.1.5.
8. Adjust pedal free play according to 3.1.2. and tighten the lock nut.
9. Fit pedal board and replace rubber mat.

3.1.4. Charging with brake fluid

Always keep the brake fluid container well filled.

When filling with brake fluid make sure that the vent holes in the cover are not clogged.

If brake fluid consumption is found to be abnormal, inspect all lines, connections and cylinders for leaks.

Always use Lockheed original or similar brake fluid of type SAE 70R1.

Poor brake fluids can damage the rubber parts of the brake system and may even be non-lubricating and cause rusting. They may also become too viscous at low temperatures or have an insufficiently high boiling point, thus producing vapour in the cylinder and lines.

If inferior brake fluid has got into the system, take the following steps immediately:

1. Drain the brake system.
2. Remove and dismantle the master and wheel cylinders.
3. Flush out the system with alcohol.
4. Replace all rubber parts.
5. Assemble and install the cylinders.
6. Top up with recommended brake fluid.

3.1.5. Bleeding of brake system

The brake system must be bled whenever a pipe or hose connection has been opened, or whenever it is suspected that air has entered the system. A sure sign of air in the system is that the brake pedal feels springy, or that braking power is obtained only after several hard depressions of the pedal.

To bleed the brake system of air, proceed as follows:

This work is facilitated if the car is jacked up.

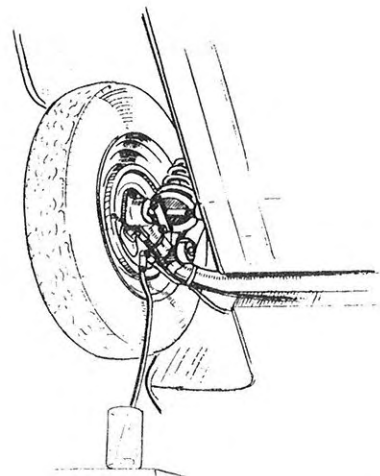


Fig. 10. Bleeding of rear wheel brake

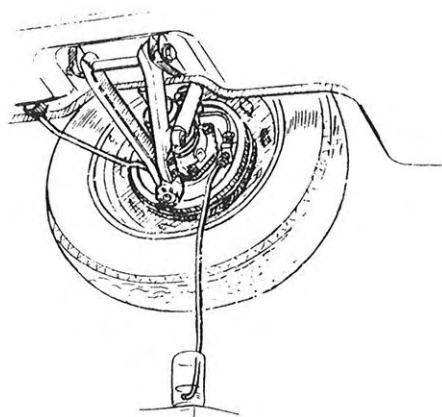


Fig. 11. Bleeding of front wheel brake

1. Make sure that the fluid container is well filled and that the vent holes in its cover are not blocked.
2. Attach a hose of suitable size to the bleeder screw on the left-hand rear brake, see Figs. 10 and 11.

In cars with serial numbers to 32700 there is also a bleeder screw for the right-hand rear brake, which should be bled first.

3. Put the other end of the hose into a clean glass vessel containing brake fluid.
4. Loosen the bleeder screw.
5. Have an assistant pump the brake pedal with long, even strokes until the fluid emerging from the hose is free from air bubbles. Be sure to keep the end of the hose under the fluid level in the glass vessel.
6. Close the bleeder screw in the middle of a downward stroke while the pedal is fully depressed, then remove the hose.
7. Bleed all brakes in the following order:
(Right rear) Left rear, right front, left front.
8. Inspect all the bleeder screws and top up fluid container. Never pour the withdrawn fluid back into the container.

3.2. Adjustment and lubrication of handbrake

Adjustment.

If the handbrake lever play requires adjustment, as may be the case after a long period of service or after removal of the lever, the footbrake should

first be adjusted. See 3.1.1. If the handbrake still requires to be adjusted, this can be done with adjusting nuts 1, Fig. 12, which are accessible under the lever. Proceed as follows.

1. Jack up rear end of car so that both rear wheels are free of the ground.
2. Remove the right-hand front seat and release the handbrake.
3. Tighten the left-hand adjusting nut so that the brake shoes drag. Tighten the nuts with a suitable socket wrench.
4. Loosen the nut until the wheel rotates freely - then back it off one more turn.
5. Repeat this adjustment on right-hand side.
6. Test by applying handbrake hard and then releasing it. The wheels should rotate freely when the lever is moved up two steps from the released position.
7. Check that both wheels have equal braking power.

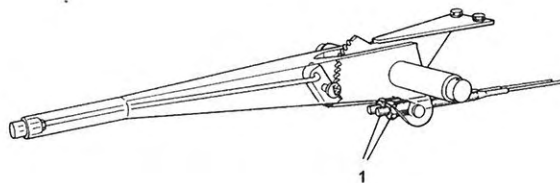


Fig. 12. Handbrake lever with adjusting nuts.

Lubrication of handbrake cables.

If the wheels do not rotate freely when the lever is released, this may be due to the cables running stiffly in their sheaths. The cables must then be lubricated and if this does not help, they must be freed. Proceed as follows.

1. Remove one front seat and fold aside the floor mat.
2. Screw off the adjusting nut under the handbrake lever.
3. Remove the pivot which connects the cable to the rear wheel brake lever.
4. Pull out the cable backwards as far as possible.
5. Clean the cable from rust or old grease.

6. Oil or grease the cable with cold-resistant lubricant and pull it back and forth through the sheath as far as possible. Repeat this until the

cable runs easily.

7. Connect the brake cable at both ends and adjust the handbrake.

4. INSPECTION WORK

4.1. Brakes

4.1.1. *Replacement of brake linings and brake shoes*

Clean the undersides of the fenders to protect the bearings from dirt.

4.1.1.1. Removal of brake drum.

1. Jack up car.
2. Remove wheel.
3. Remove brake drum using puller Saab 92-3, see Fig. 13. Release handbrake and check that the brake shoes do not drag before the drum is pulled off.

4. Inspect the linings on all brake shoes. If they are worn down, unevenly worn or soaked with grease, the linings and possibly also the brake shoes must be replaced. The two linings in the front wheel brake wear at much the same rate, whereas in the rear brake, the front linings have a longer life than the rear ones. Thus it may be sufficient to replace only the two rear linings of the rear brakes. In the front wheel brakes, all linings should be changed together.

Never change brake linings on one side only.

4.1.1.2. Removal of brake shoes.

1. Make sure that the brake plungers are held in place in the wheel cylinders during work. They can be secured with a wire or a clamp.

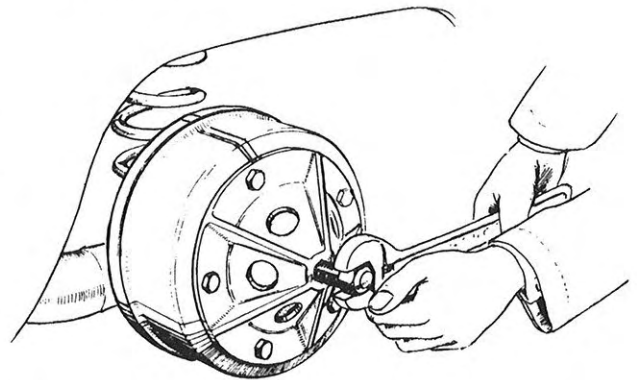


Fig. 13. Wheel puller, Saab tool 92-3

2. Lift the brake shoe from the wheel cylinder with a screwdriver or the like.
3. Remove the adjuster, see Fig. 14.
4. Lift out the brake shoes and unhook the springs.

4.1.1.2. Replacement of brake linings.

1. Remove the old brake linings.
2. Wash the shoes in gasoline or kerosene and blow them clean.
3. Place the new linings on the shoes and attach them with two rivets in the middle.
4. Attach the other rivets successively working from the middle towards the ends. Use only Saab-recommended or Saab original brake linings.

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4.1.1.4. Installation of brake shoes.

1. Hook on spring between shoes.
2. Put one shoe in place.
3. Lift the other brake shoe into position.
4. Remove the wire or clamp used to hold the wheel cylinder plunger in position, and insert the adjuster, see Fig. 8.

When installing the brake shoes, set the adjusting device to zero, that is, with the straight side of the eccentric against the driver. See Fig. 8.

5. Adjust the shoes so that they lie concentric with the brake shield.
6. Fit the wheel hub. See Chapter 8. "Wheels and hubs", point 3.3.2.

Before the brakes are to be adjusted after replacement of brake linings, or whenever a brake drum has been removed, it is essential to center the brake shoes in the drum by depressing the brake pedal.

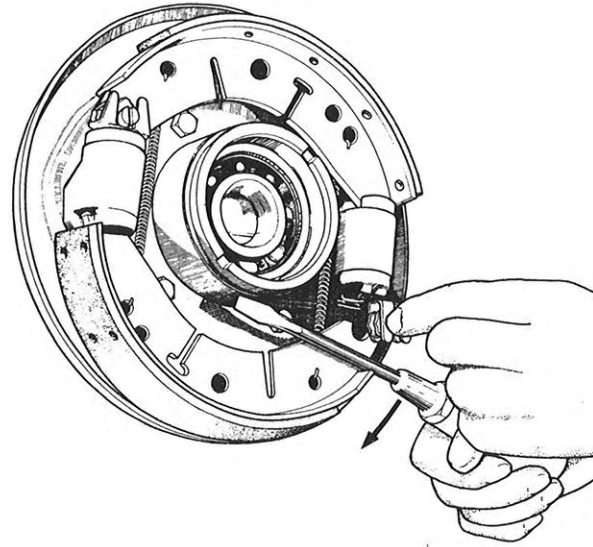


Fig. 14. Removal of brake shoes.

4.2. Wheel cylinders

4.2.1. Removal of front wheel cylinder

1. Jack up car and remove wheel, brake drum and brake shoes. See 4.1.1.1. and 4.1.1.2.
2. Disconnect brake hose from wheel cylinder.
3. Disconnect brake line between cylinders.
4. Remove cylinder by unscrewing the screws inside the brake shield.

4.2.2. Removal of rear wheel cylinder

1. Remove wheel, brake drum and brake shoes, see 4.1.1.1. and 4.1.1.2.
2. Disconnect return spring and cable from cylinder lever.
3. Disconnect brake line at the banjo connection inside the brake shield.
4. Remove rubber seal and brake cylinder.

4.2.3. Dismantling of front wheel cylinder

Fig. 15 shows a dismantled cylinder.

Pull out the plunger and remove the cup 2, thus releasing the cup filler 3 and spring 4.

4.2.4. Dismantling of rear wheel cylinder

Fig 16 shows a dismantled rear cylinder.

Remove the outer plunger 6 and the pivot pin 3, thus releasing the lever 1. The inner plunger 5 with ring seal can then be removed.

4.2.5. Inspection of parts in wheel cylinder

1. Clean the parts in alcohol.

Note that the rubber seals must not come into contact with gasoline or oil.

2. Check that the rubber parts are undamaged. If unsuitable brake fluid is used, the rubber parts may swell and they must then be replaced by new ones.

3. If the rubber seal for the rear wheel cylinder inside the brake shield is damaged, fit a new one.

4.2.6. Assembly of wheel cylinder

Observe absolute cleanliness when assembling wheel cylinders.

1. Lubricate cylinder bores, seals and plungers with brake fluid before assembling.
2. A front wheel cylinder should be assembled as shown in Fig. 15 and a rear wheel cylinder as shown in Fig. 16. Make sure that the cup filler in the front wheel cylinder is inserted correctly, the larger end should face the cup.

1. Plunger
2. Plunger cup
3. Cup filler
4. Spring
5. Cylinder housing
6. Rubber ring
7. Adjusting device

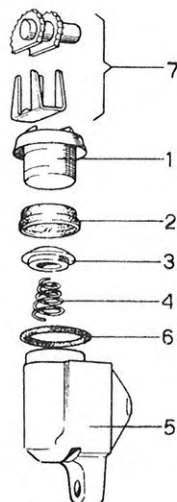
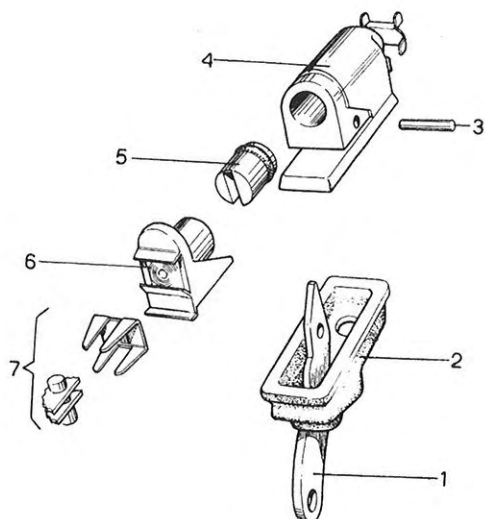


Fig. 15. Front wheel cylinder



1. Lever
2. Rubber seal
3. Pivot pin
4. Inner plunger with rubber ring
5. Outer plunger
6. Adjusting device

Fig. 16. Rear wheel cylinder

3. Grease the pivot pin 3, Fig. 16, lightly.

Note: The grease must not come into contact with any of the rubber components. Lockheed special grease "Rubber Loube" or similar lubricant should preferably be used.

4.2.7. Installation of front wheel cylinder

1. Attach cylinder to brake shield with screws. Don't forget the spring washers.
2. Connect the brake line between the cylinders.
3. Connect the brake hose. Don't forget the copper gasket at the connection and make sure that it is undamaged. Preferably use a new gasket but a gasket which has become hard can be annealed and used again.
4. Install brake shoes, brake drum and wheel, see 4.1.1.4. When fitting the brake drum, be sure that the woodruff keys are still in position in the shaft slots.

4.2.8. Installation of rear wheel cylinder

1. Install cylinder and fit the rubber seal behind the brake shield as shown in Fig. 5.
2. Attach the brake line banjo connection. Don't forget the copper gaskets.
3. Connect the handbrake cable to the lever, and lock the pivot pin by attaching the closed loop of the return spring to it. See Fig. 21.
4. Install brake shoes, brake drum and wheel, see 4.1.1.4. Be sure not to damage the shaft seal.

Don't forget to bleed the system whenever any brake line or wheel cylinder has been removed, see 3.1.5.

4.3. Master cylinder

4.3.1. Removal

1. Drain fluid container with a syphon or disconnect the pipe and plug the outlet.
2. Disconnect the pipe 16, Fig. 17, from the master cylinder.
3. Disconnect the banjo connection 17.
4. Fold away the floor mat, loosen the left-hand part of the pedal board and lean it against the wheel housing wall.
5. Detach the push rod after loosening the lock nut.
6. Remove the three bolts which hold the master cylinder to the firewall. They are accessible from the engine compartment.
7. Remove the master cylinder.

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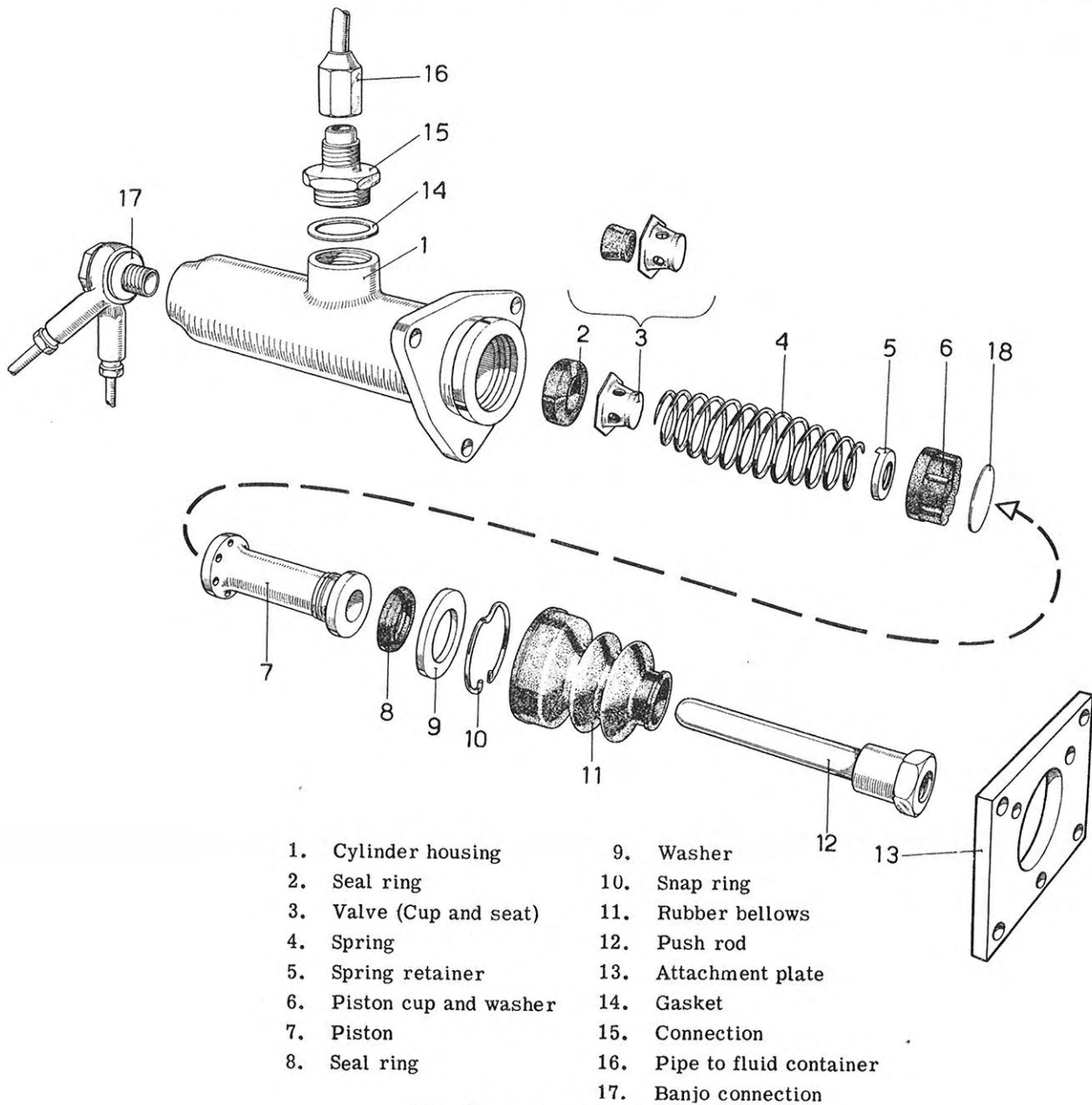


Fig. 17. Master cylinder

4.3.2. Dismantling of master cylinder

1. Remove rubber bellows 11 and push rod 12, Fig. 17.
2. Remove snap ring 10 and washer 9.
3. Remove piston 7 with seal ring 8.
4. Insert a wooden stick or the like through the outlet hole and push out cup 6 with washer, spring 4, spring retainer 5 and valve 3

4.3.3. Inspection of master cylinder parts

1. Clean all parts thoroughly in alcohol. Make sure that they do not come into contact with gasoline or oil.

Make sure that the openings in piston 7 and the fluid opening 12, Fig. 4, in the cylinder housing are clean. Use a wire of about 0.5 mm. (0.02 in.) diameter.

2. Check that the cylinder bore is not scratched.
3. Inspect the cup 6, Fig. 17, the two seal rings, 2 and 8 and the valve cup 3. Replace them if they are damaged in the slightest degree. If the rubber components are swollen, then unsuitable brake fluid has been used, or they have come into contact with gasoline or oil.
4. Check that the piston runs easily in the cylinder.

4.3.4. Assembly of master cylinder

Observe absolute cleanliness when assembling the master cylinder.

It is vital that all parts are correctly mounted, and the master cylinder should therefore be assembled in the following order:

1. Lubricate the cylinder bore with brake fluid.
2. Check with a wire of about 0.5 mm. (0.02 in.) diameter that the fluid opening 12, Fig. 4, is not clogged.
3. Screw on connection 15 with gasket 14. Replace gasket if damaged.
4. Dip seal ring 2, Fig. 17, in brake fluid and place it in the cylinder housing, see also Fig. 4.
5. Dip the valve cup 3 in brake fluid and place it in the seat.
6. Attach valve 3 to spring 4 and fit spring retainer 5 to the other end of spring. Insert this unit into cylinder with valve inwards.
7. Dip cup 6 in brake fluid and insert it into the cylinder with the collar facing inwards.
8. Dip rubber seal 8 in brake fluid and force it onto the piston. Check that it is correctly positioned, see Fig. 4.
9. Insert piston 7, Fig. 17, into cylinder with the push rod opening outwards. Don't forget the washer between piston and cup.
10. Fit washer 9 and lock with snap ring 10.
11. Fit rubber bellows 11 on push rod 12. Insert push rod into piston and force bellows over cylinder flange.

4.3.5. Installation

1. Cover the openings with clean rags, not cotton waste, to prevent foreign matters from entering the cylinder during installation.
2. Attach the master cylinder to the firewall by the three retaining screws.
3. Connect the push rod to the brake pedal.
4. Connect the pipe 16 from fluid container and screw on banjo connection.
5. Remove plug from fluid container (if such one is used), and top up with brake fluid, see 3.1.4.

6. Bleed the brake system, see 3.1.5.

7. Adjust the brake pedal play, see 3.1.2.

4.4. Fluid container and brake lines

4.4.1. Fluid container

The fluid container is fixed to the left-hand side of the radiator frame by a clamp. It is connected to the master cylinder by means of a 5/16 in. double-wall steel tube, bundy tube, which should be fitted so that it runs down towards the master cylinder preventing the occurrence of air-locks.

When inspecting fluid level, check that the vent holes in the container cover are not blocked.

4.4.2. Brake lines

The brake lines are of 3/16 in. bundy tube. They all have flared ends and are fitted with adaptors which must be slid onto the tubes before the ends are flared. It is important that the tubes should be correctly flared so that the connections do not leak. See Fig. 18.

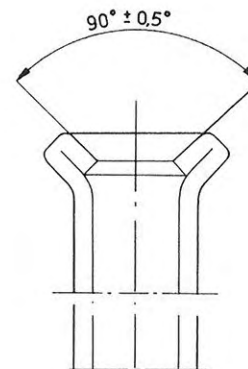


Fig. 18. Flaring of bundy tube

4.4.3. Brake hoses

The rubber hoses which connect the brake lines to wheel cylinders are of different lengths at front and rear and must not be confused. The length of the front hoses is 12 in. and that of the rear hoses 15.5 in.

In the interests of safety it is vital that the tubes, hoses and connections of the brake system should be kept in perfect condition. Check the hoses at regular intervals for damage due to flying gravel or chafing. The tubes must also be installed in the

car so that they cannot chafe against anything. They are attached to the body by sheet metal clamps and are fitted with rubber grommets where they pass through sheet metal walls, see Fig. 19. The rubber grommets are slit up and can be fitted to tubes after flaring and installation.

Check that the lines and handbrake cables through the sloping wall under the rear seat are correctly installed so that the handbrake cables and the back of the rear seat do not chafe against the tubes.

All pipe and hose connecting must be tightened so that they do not leak and check that their copper gaskets are undamaged. Copper gaskets which have become hard so that they do not seal properly can, however, be annealed and used again. Replace damaged gaskets.

Pipe lines must fit well at both ends and at the clamps. Never stretch a too short pipe with the adapter or bend it after it is screwed into position. The stresses produced in both cases may cause leakage, pipe fracture or stripping of the threads.

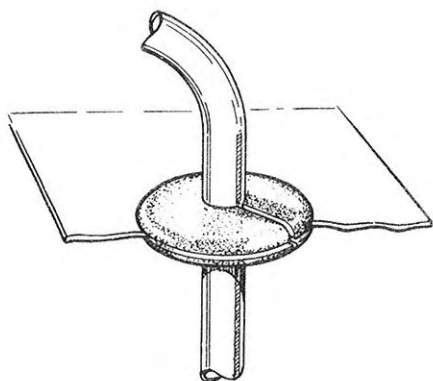


Fig. 19. Rubber grommet

4.5. Handbrake

The handbrake installation is shown in Fig. 20.

4.5.1. Handbrake cables

The handbrake cables 3, Fig. 20, consist of steel cables 19 in protective sheaths 27, which pass through a short tube under the rear seat and through holes in the double sloping walls behind the back of the rear seat. At the rear one of these walls, the cables are fitted with sturdy rubber

grommets 29. The cable sheaths are clamped to the rear axle and the cables are connected to the wheel cylinder brake levers by means of clevis end pieces and pivot pin. A return spring is fitted between the clevis piece and the cable sheath and another return spring is fitted between the pivot pin and a bracket on the back of the brake shield. See Fig. 21.

4.5.1.1. Removal of handbrake cable.

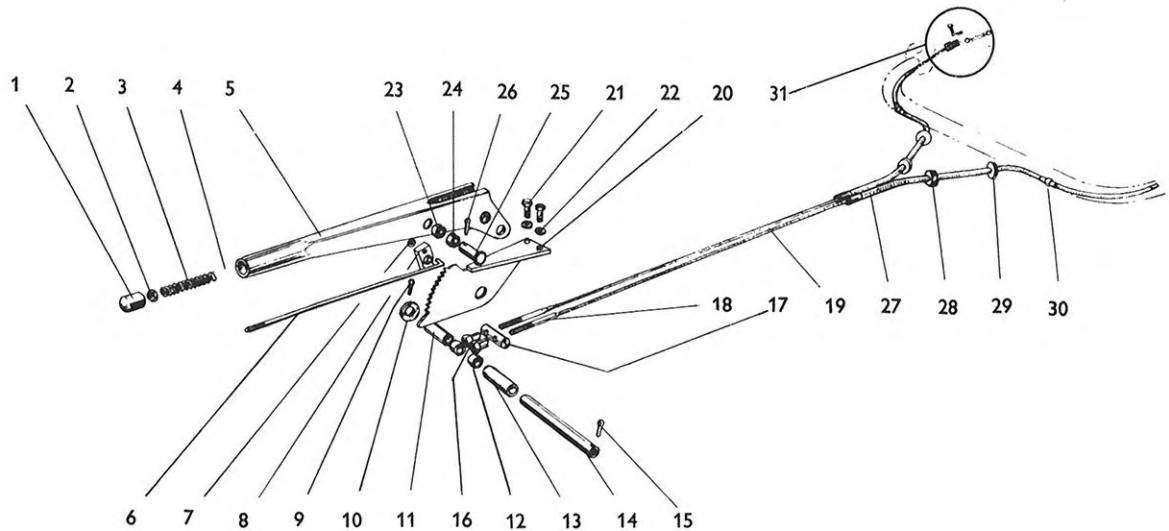
1. Remove one front seat and the rear seat cushions. Jack up the car.
2. Remove the rear wheel.
3. Unscrew adjusting nut 16, Fig. 20, under handbrake lever.
4. Pull cable sheath loose from tube under rear seat.
5. Loosen clamps which hold cable sheath to rear axle.
6. Detach the return spring and remove the pivot pin 3, Fig. 21, which holds the clevis end piece to the brake lever.
7. Free rubber grommet 29, Fig. 20, from sloping wall.
8. Pull out complete brake cable with sheath backwards.

4.5.1.2. Inspection of handbrake cable.

1. Inspect cable by sliding sheath from one end to the other.
2. Replace brake cable if it is damaged or worn.
3. Lubricate cable with cold-resistant grease, see Chapter 15, "Lubrication". Pull the cable back and forth in the sheath and lubricate until it runs freely.
4. Check that the return springs 4 and 6, Fig. 21, are undamaged. Replace damaged springs. The spring 6 is easy to unhook and the spring 4 can be "screwed" off the cable and a new one fitted in the same way. Note that the closed loop of the spring 6 must be fixed in the pivot pin.
5. Replace the rubber grommet 29, Fig. 20, if it is damaged.

4.5.1.3. Installation of handbrake cable.

1. If the rubber grommet has been removed, slip it onto the cable.



- | | |
|------------------------|-------------------------|
| 1. Push button | 17. Shaft |
| 2. Lock nut | 18. Threaded end pieces |
| 3. Spring | 19. Brake cables |
| 4. Washer | 20. Ratchet sector |
| 5. Handbrake lever | 21. Bolt |
| 6. Pawl rod | 22. Lock washer |
| 7. Washer | 23. Spacer |
| 8. Pawl | 24. Spacer |
| 9. Cotter pin | 25. Pivot pin |
| 10. Spring washer | 26. Cotter pin |
| 11. Spacer, right hand | 27. Cable sheath |
| 12. Spacer | 28. Rubber spacer |
| 13. Spacer, left-hand | 29. Grommet |
| 14. Shaft | 30. Lubricator |
| 15. Cotter pin | 31. See Fig. 21 |
| 16. Adjusting nuts | |

Fig. 20. Handbrake

2. Insert the cable with the threaded end piece first through the sloping wall and forward through the tube under the rear seat to the handbrake lever. Don't forget to fit the rubber spacer 28, see Fig. 20.

3. Connect the cable to the handbrake lever with the adjusting nut 16.

4. Connect clevis end piece 2, Fig. 21, to brake lever of wheel cylinder and lock pivot pin with the closed loop of return spring 6.

5. Fit the rubber grommet to the sloping wall and attach the cable sheath to the rear axle by two clamps.

Note: Make sure that the cable sheath does not lie against the brake line.

6. Fit the wheel and lower the car.

7. Replace rear seat cushions and front seats. Adjust handbrake as described in 3.2.

4.5.2. Handbrake lever

The handbrake lever and its components are shown in Fig. 20.

4.5.2.1. Removal.

1. Remove one or both front seats.

2. Unscrew adjusting nuts 16, Fig. 20.

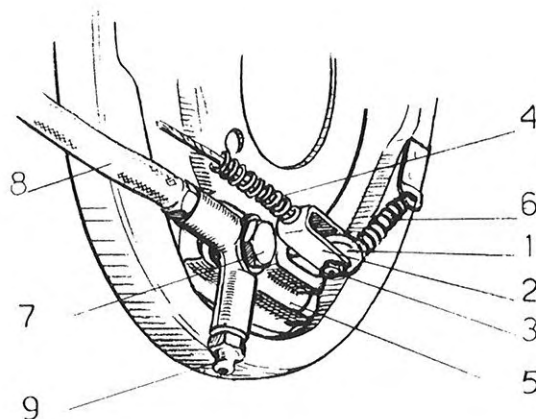
3. Unscrew bolts 21 in ratchet sector 20.
4. Remove cotter pin 9 and pull out shaft 14. Lay aside washer and spacers.
5. Lift out lever 5 with pawl.

4.5.2.2. Dismantling of handbrake lever.

1. Remove cotter pin 26 and pivot 25, Fig. 20.
2. Push out pawl rod 6 towards handle.
3. Loosen lock nut 2. Remove push button 1, lock nut, spring 3 and washer 4.
4. Remove pawl rod 6 and pawl 8.

4.5.2.3. Installation of handbrake lever.

1. Check that spring, pawl and ratchet sector are undamaged.
2. Install pawl and rod in lever. The push button should project about 10 mm. outside the handle when the pawl is in engagement with the ratchet.
3. Check this before installing by assembling lever ratchet sector and shaft. The assembly of the brake lever is facilitated if a separate assembly shaft is used.
4. Fit all parts on the assembly shaft as shown in Fig. 20. Note that the cupped spring washer 10 must be fitted on the same side of the lever as the shorter spacer 11 and with the convex side facing the lever.
5. Place the assembly between the brackets in the car.
6. Push the ordinary shaft 14 into position, at the



1. Brake lever
2. Clevis end piece
3. Pivot pin
4. Return spring
5. Rubber seal
6. Return spring
7. Banjo connection
8. Brake hose
9. Bleeder screw

Fig. 21. Back of rear brake shield, left-hand

same time removing the assembly shaft. Lock shaft with cotter pins 9 and 15.

7. Connect brake cables to brake lever.
8. Adjust handbrake as described in 3.2. and replace front seats.