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DESCRIPTION

The fitting of invalid equipment makes possible hand operation of the clutch, brakes and throttle. The location of the various units in this system as well as their connections are shown in Fig. 1 and Fig. 2. Controls for the clutch and brake systems operate through two valves which are fitted on the steering column. These valves are connected through two hoses to two vacuum-hydraulic servo cylinders which are fitted under the front seats. One of these, the hydraulic cylinder of which is connected to a pressure cylinder fitted in the place of the clutch push rod by means of an oil line, is used to disengage the clutch. The other is used for braking, which is made possible by connecting its hydraulic cylinder in series with the master cylinder and brake contact of the car.

In order to obtain clutch disengagement at the same time as the brakes are applied, there is a

valve fitted between the valves for the clutch and the brakes. When the brake lever is operated the vacuum servos for both the brakes and the clutch come into operation since the plunger in this intermediate valve moves to the left. If only the clutch lever is operated the valve plunger moves to the right and only the vacuum servo for the clutch comes into operation.

The vacuum servo system is fitted with a vacuum tank in order to maintain as steady a vacuum level as possible and to provide the necessary "volume" required for the operation of the controls. The system is also fitted with a vacuum meter on the lower edge of the instrument panel.

The throttle lever operates the throttle flap in the carburettor through a shaft and a system of levers and push-rods.

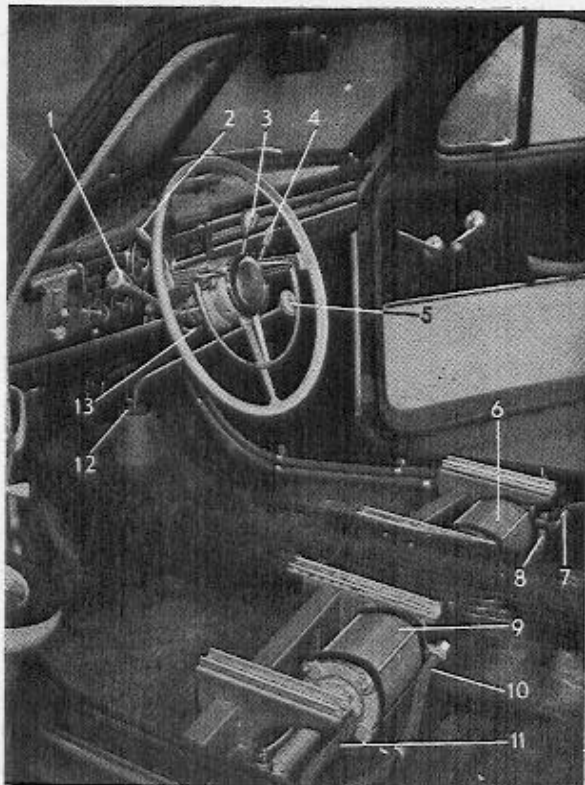


Fig. 1. Location of control levers.

1. Clutch disengagement lever
2. Traffic indicator lever
3. Brake lever
4. Throttle control
5. Gear change lever
6. Vacuum-hydraulic servo for clutch disengagement
7. Hose to vacuum tank
8. Hose to valve
9. Vacuum-hydraulic servo for brakes
10. Hose to valve
11. Hose to vacuum tank
12. Chain for connection to throttle automatic return
13. Vacuum meter

DIRECTION FOR FITTING

Fitting of the invalid equipment consists of the following procedure:

1. Vacuum servo cylinders.
2. Valves and control levers.
3. Throttle.
4. Pressure cylinder for clutch disengagement.
5. Vacuum system.
6. Oil pressure lines for the clutch disengagement servo.
7. Oil pressure lines for the brake servo.
8. Bleeding of oil lines.
9. Fitting of hand brake to the right of the steering column.

1. Vacuum servo cylinders

Fit both the servo cylinders, the brake cylinder under the left seat and the clutch disengagement cylinder under the right seat. These cylinders should be fitted as far forward as possible under the seats. They are held in position by means of tension bands which are screwed to the floor plate as shown in Fig. 3. The holes in the floor plate for these screws should be 4 mm ($\frac{5}{32}$ ").

Ensure that the bleeding screw (22, Fig. 24) (e, Fig. 3) is turned upwards and that both the hose connections are to the rear as shown in the illustration.

The desired position for the bleeding screw may be obtained by loosening the nut (18, Fig. 24) on the oil cylinder (19) and turning the whole oil cylinder. Re-tighten the nut thoroughly.

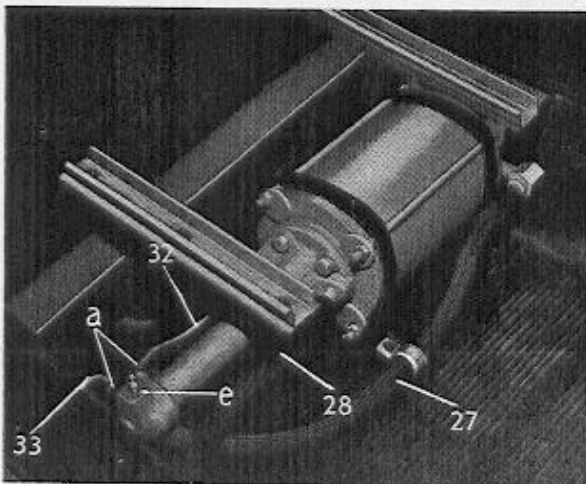


Fig. 3

Due to the confined space, connections to the oil lines, consisting of screws, two copper washers and two-way junctions, should be attached to the cylinders before they are installed in the car.

Valves and levers

Fitting is shown in Fig. 4. If only part of the complete equipment is to be fitted then study the relevant parts of the illustration.

If the control levers are to be attached to the left-hand side of the steering wheel, then the traffic indicator lever must be moved. Another type of lever may be used and fitted on the instrument panel or the existing lever housing may be loosened, turned through 45° in a clockwise direction and then screwed tight again. In this case, the flange pin on the automatic return must also be moved correspondingly.

If the direction of operation of the valves is to be reversed, see under "Valves" on Page 15.

If the levers are to be mounted on the right-hand side of the steering wheel then the gear-change lever must be shortened by 20 mm (rather less than one inch).

1. Drill four holes with thread M6 \times 1,0 ($\frac{15}{64}$ " \times $\frac{3}{64}$ " in the left- and right-hand sides of the housing below the steering wheel at a point 48 mm ($1\frac{7}{8}$ " below its upper surface, which are symmetrically arranged two and two so that they may be used for the lever retainers (6 and 14).
2. Attach the lever retainers with screws (2 and 10).
3. Attach the lever arm (18) with its bolt, curved washer, spring washer and nut to the bracket (21). Drive in the pin (34).
4. Place the fibre washer (19), the bracket (21) with lever, pin and return spring (20) on the shaft (1). Slide the shaft over the lever (4). Then attach the flange (32) to the shaft (4) and attach the rubber bushing (30).
5. Connect together the parts assembled in 3 and 4 above with the valve (29) marked "B" (brake) which is stamped on the upper side of the flange ring.
6. Fit the flange (25) on the lever (15) for clutch disengagement and fit the rubber bushing (26). Connect the flange to the valve (28) marked "K" (clutch) which is stamped on the flange upper side.

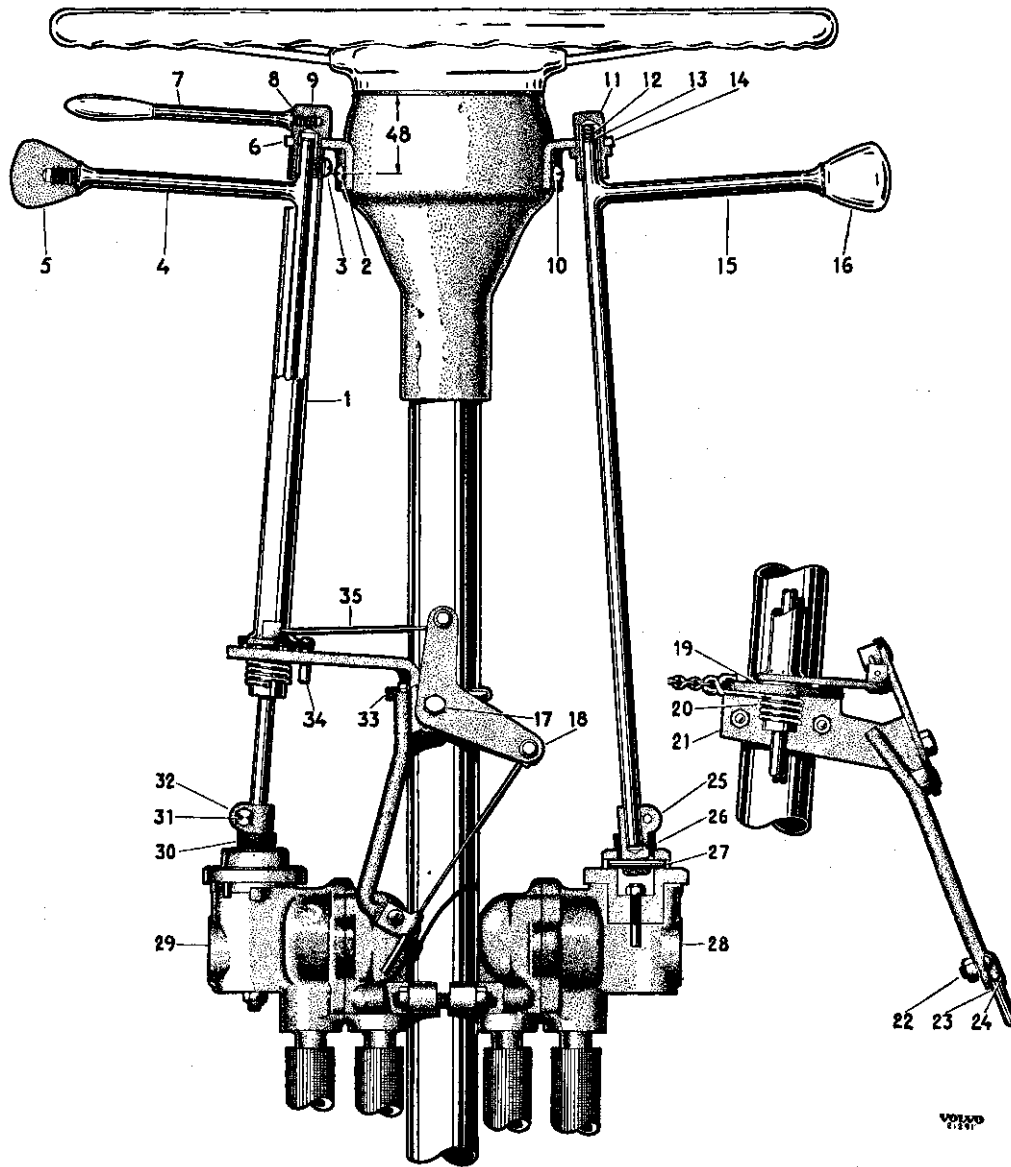


Fig. 4. Levers and valves.

- | | | |
|------------------------------|---|---------------------------------------|
| 1. Shaft | 14. Lever retainer | 24. Clamp |
| 2. Screw and spring washer | 15. Clutch disengagement lever | 25. Flange |
| 3. Screw and spring washer | 16. Knob | 26. Rubber bushing |
| 4. Brake lever | 17. Screw, curved washer, spring washer and nut | 27. Pin |
| 5. Knob | 21. Bracket | 28. Valve for clutch disengagement |
| 6. Retainer for lever | 18. Lever arm | 29. Brake valve |
| 7. Throttle lever | 19. Fibre washer | 30. Rubber bushing |
| 8. Washer | 20. Return spring | 31. Screw |
| 9. Bearing retainer | 22. Screw with nut and spring washer | 32. Flange |
| 10. Screw with spring washer | 23. Sheath for wire | 33. U-bolt with nut and spring washer |
| 11. Bearing retainer | | 34. Pin |
| 12. Spring | | 35. Wire |
| 13. Washer | | |

7. Assemble both the levers, the shaft, and both valves around the steering column. Fit the levers in position with the bearing retainers (9 and 11) on the lever retainers (6 and 14)

and the valves on the steering column. Make sure that the small spring (12) is compressed sufficiently to prevent rattling in the bearing retainer (11).

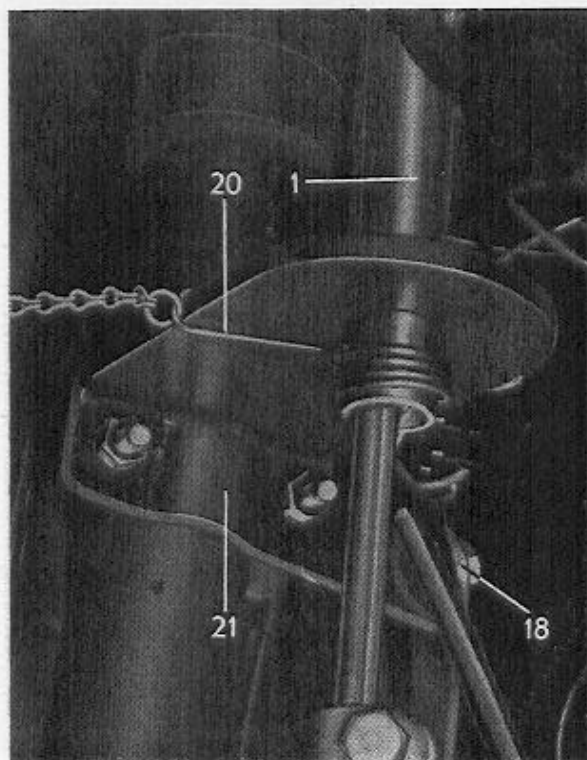


Fig. 5.

8. Screw the shaft (1) into position onto the bearing retainer (9) with the screws (3).
9. Press the fibre washer (19) and the bracket (21) upwards so that they cradle the shaft axially. Then screw the bracket into position on the steering column as shown in Fig. 5.
10. Screw the knobs (5 and 16) onto the levers and the throttle lever (7) and fit the washer on the bearing retainer (9).

When installation is completed, adjust the levers for fingertip operation. Do not, however, make their operation so light that they fall out of position through the vibration of the car when driving. Adjustment is carried out by means of the nut (8, Fig. 25) which is then secured with a lock nut.

3. Throttle control

1. Fit the bracket (1, Fig. 6), which serves as a limiting stop for the throttle control, on the starting motor upper attachment bolt (3). The washer on this bolt is first removed.
2. Substitute the push rod included in the invalid equipment (2) for the original.
3. Enlarge the hole in the throttle lever to a diameter of 5,6 mm ($7/32''$) and fit a wire retain-

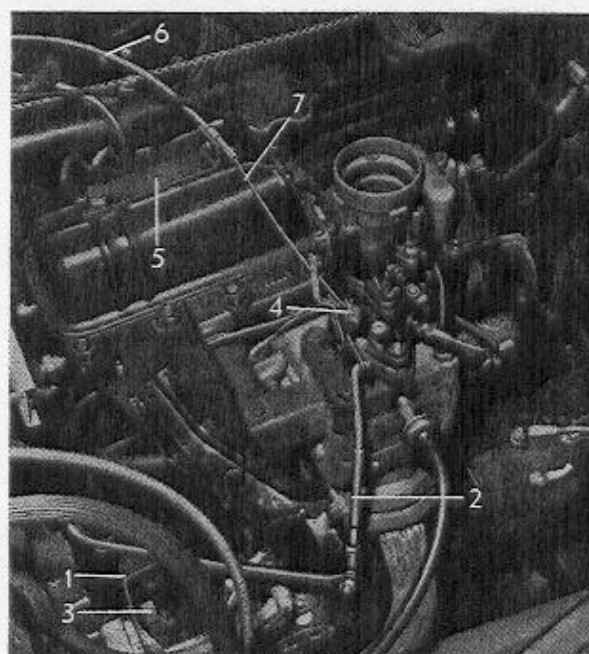


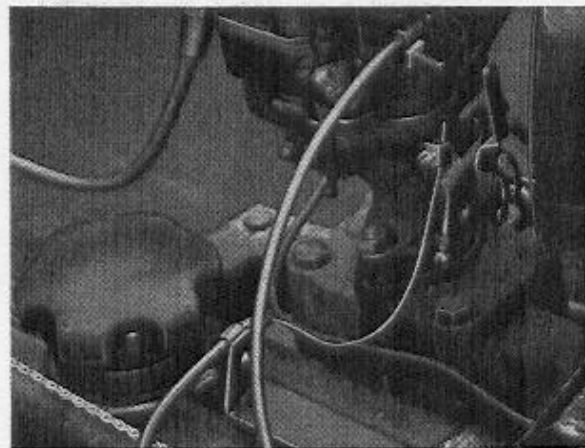
Fig. 6.

- ner (4). This is pushed into the hole, a washer is fitted on the inside and the retainer is riveted into position. These fitting instructions are concerned with a Carter carburettor. If, however, a Zenith carburettor is fitted then the lever arm should be replaced by that included in the equipment.
4. Attach the support (5) for the throttle wire onto the valve housing by means of the rear bolt on the housing.
5. Fit a flexible protector sheath and take this in the flattest curve possible between the above-named support (5) and the clamp (24, Fig. 4) on the bracket. This sheath is taken, if possible through the same hole as the choke control. The sheath is attached by means of clamps, screws and spring washers.
6. Thread the wire (7) through the sheath and attach it to the lever arm on the carburettor and the lever arm (18, Fig. 4) on the steering column. This wire should be free of the sheath between the support on the valve housing and the wire retainer on the carburettor lever arm as shown in Fig. 6. When the accelerator pedal is used the wire should be bent downwards and used as a return spring for the throttle flap. If a small kink is made in the centre of the free part of the wire, it may be bent downwards in the available space. The position of the wire in both cases is shown in Fig. 7 and Fig. 8.



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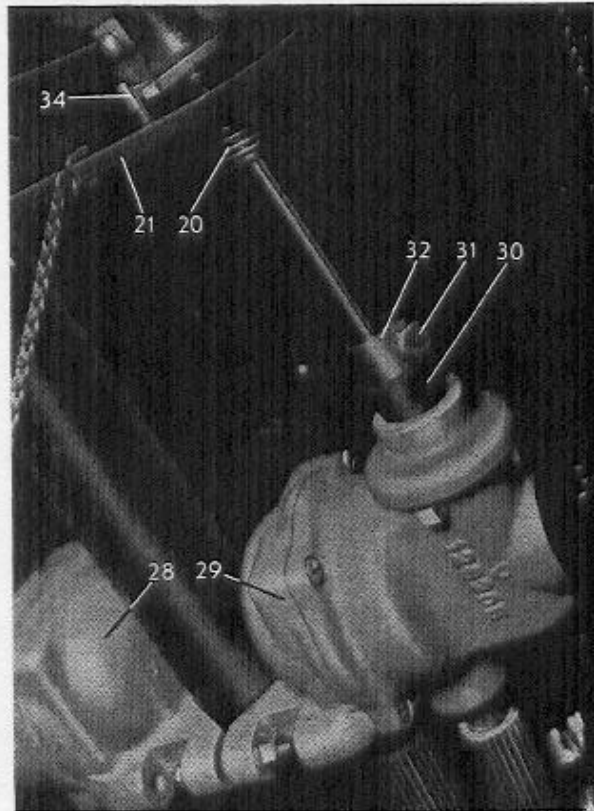
Fig. 7.



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Fig. 8.

7. In order to ensure automatic return of the throttle, there is a return spring (20, Fig. 4) mounted on the shaft. This is arranged so that the spring may easily be hooked and unhooked by means of the chain. Fit the spring to the shaft and hook on the chain and ring as shown in Fig. 9.
8. The throttle control is adjusted as follows: Hook on the return spring as in Fig. 9, and adjust the set screw on the foot accelerator limiting stop (1, Fig. 6) so that there is no play whatsoever on the pedal. Stretch the wire (7) so that its spring tension closes the throttle flap entirely. The curve of the wire should be as flat as possible so as to avoid to much play on the hand throttle control. When the return spring is disconnected, it should be possible to turn the throttle flap into any position.

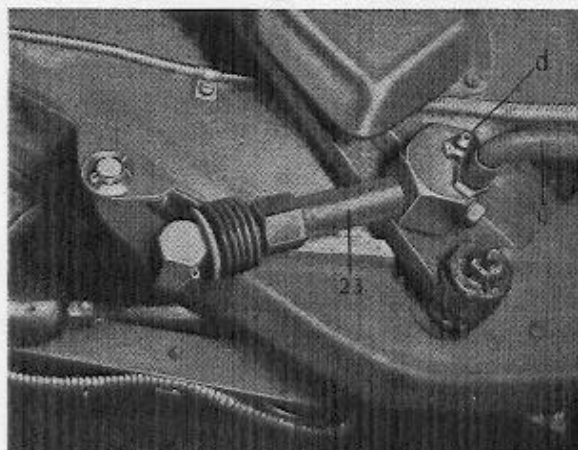


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Fig. 9.

4. Pressure cylinder for the clutch

1. Remove the push rod between the clutch pedal and the clutch control intermediary shaft.
2. In place of the push rod, fit the pressure cylinder shown in Fig. 10. The cylinder is held in position with cotter pins. It is



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Fig. 10.

necessary to fashion a recess in the mud shield cross member to accommodate the pressure tank.

5. The vacuum system

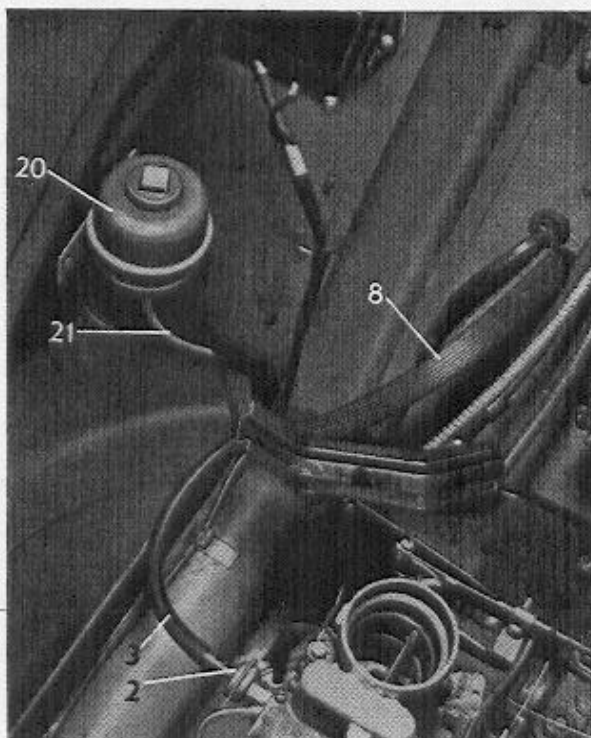
The connection of the vacuum system is as shown in Fig. 2 and according to the following instructions.

If the car is to be equipped with only one vacuum-operated control then the intermediary valve becomes superfluous (15). In this case, the hose is taken from the valve directly to the servo cylinder in used.

Hoses should be connected in curves that are as flat as possible in order that they do not kink when under load.

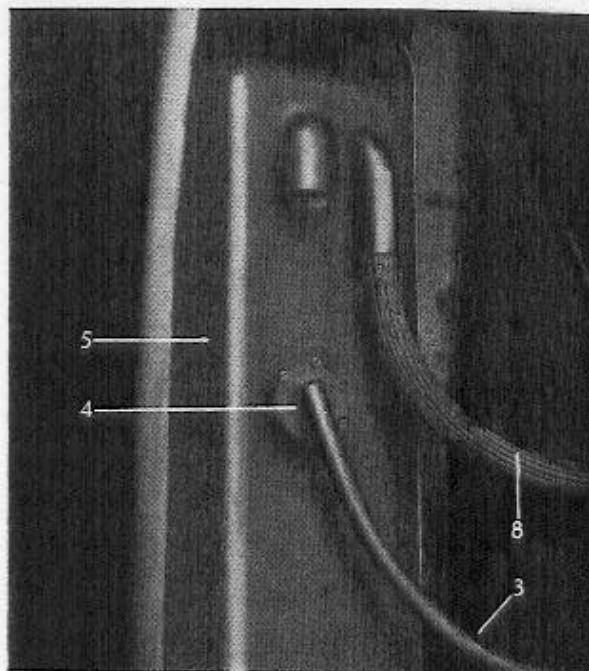
In order to ensure that hoses grip correctly and may be forced easily over the end of the pipes, talc powder should be used on both the pipe and the hose. The hoses should be slid over the end of the pipes so far that there is no risk of them sliding off again.

1. Remove the plug in the engine intake manifold and fit the filter (2) in its place (see Fig. 11 and Fig. 6).
2. Fit the vacuum tank (5, Fig 12) under the right front mudguard behind the wheel.



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Fig. 11.



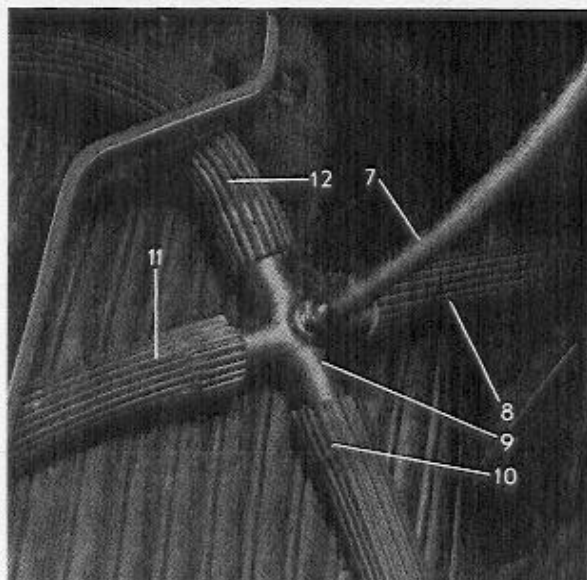
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Fig. 12.

If the car is to be fitted with a vacuum tank for the windscreen wipers then it should be fitted under the left front mudguard.

For instructions concerning fitting of the vacuum tank, see "Vacuum tank" in Part 14, "Accessories".

3. Screw the non-return valve (4) into the threaded hole in the vacuum tank.



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Fig. 13.

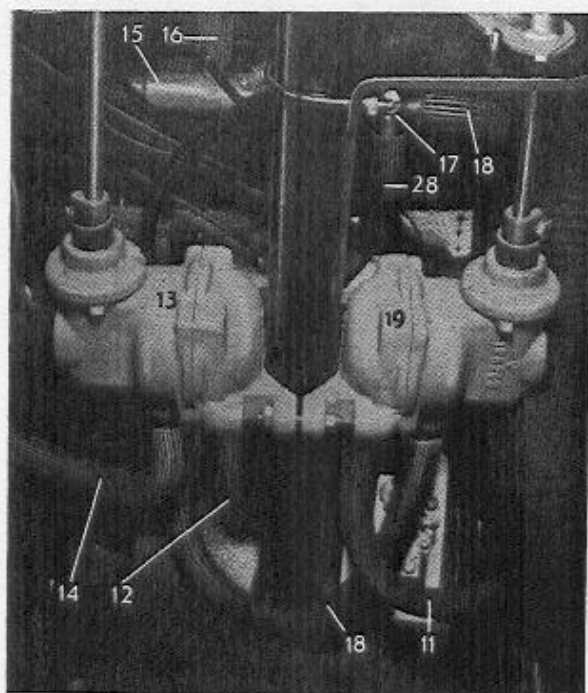


Fig. 14.

4. Connect the synthetic rubber hose (3) between the filter and the non-return valve.
5. Lead a rubber hose (8) from the thicker vacuum tank pipe under the wheel housing plate as shown in Fig. 11. This is taken through the mounting plate through a hole with diameter of 20 mm ($\frac{25}{32}$ ") to a four-way junction (9, Fig. 13) which is attached to the support between the tunnel and the accumulator holder. Screw a nipple into the junction.

If only one vacuum control is to be fitted, the four-way junction is replaced by a three-way junction.

6. Lead the hoses (11 and 12, Fig. 13) from the junction to the valves on the steering wheel pillar as shown in Fig. 14.
7. Lead a hose (18, Fig. 14) in as few curves as possible from the brake valve to a point high up on the mounting plate where a T-joint (17, Fig. 15), with a plug and valve (15), is fitted. The valve should be fitted so that its greatest movement is horizontal. See also Fig. 14.
8. Lead a hose (28, Fig. 15) from the T-joint (17) along the mounting panel and side wall to the floor and then to the brake servo cylinder (29) where it is connected as shown in Fig. 2.

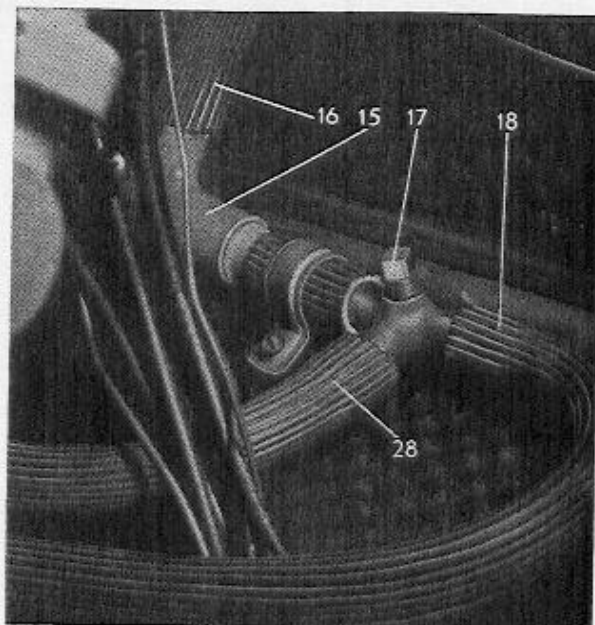


Fig. 15.

9. Lead a hose (14) from the clutch disengagement valve (13) to the other connector on the valve (15) as shown in Fig. 2 and Fig 14.
10. From the central connector of the valve, a hose (16) is lead as shown in Fig. 14 and Fig. 15 to the right hand side of the car and over the floor to the clutch disengagement servo cylinder where it is connected as shown in Fig. 2.
11. A hose (10) is taken from the junction (9) the same way as mentioned in 10 above and connected to both the servo cylinders by means of a T-joint (25) which is fitted with a plug. See Fig. 2. The hose link between both the servo cylinders (27) is shown in Fig. 16.

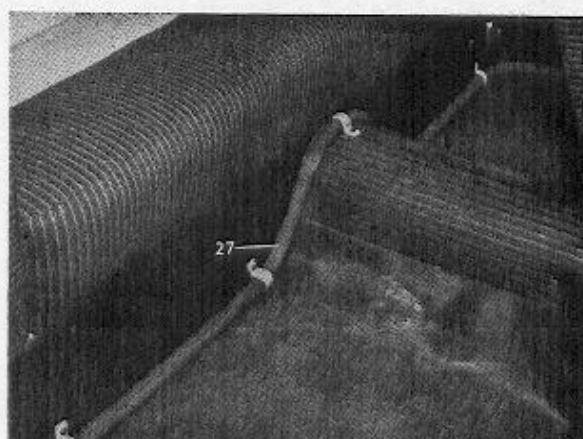


Fig. 16.

12. Fit the vacuum meter (6) under the instrument panel by attaching the bracket with screws. Drill holes with a diameter of 3,5 mm ($9/64$ "") for the screws. See Fig. 22. Connect the hose (7).

6. Oil pressure lines for the servo cylinder for clutch disengagement

Cones in the pipe ends are joined in the usual way with the special tools for the job and are secured by means of nuts at the pipe unions which have been threaded onto the pipes before the union is effected.

Each of the two connections on the pressure cylinder units on the servo cylinders consists of a two-way junction of which one is fitted with a plug. The junction is tightened with a bolt and two washers in such a position that the pipe union nuts are easily accessible.

These pressure lines are attached by means of clamps and screws. The diameter of the holes for the screw is 3,5 mm ($9/64$ "").

1. Instal the oil reserve container (20) as shown in Fig. 11. The diameter of the holes for the attaching screws is 4 mm ($5/32$ "").
2. Drill two holes of 16 mm ($5/8$ "") diameter in the floor beside the pressure cylinder for the clutch servo. Compare with Fig. 3.
3. Lead a copper pipe with intermediate hose (21) from the oil container (20) down between the mounting board and the wheel housing plate, under the floor and through the inner of the two holes drilled in the

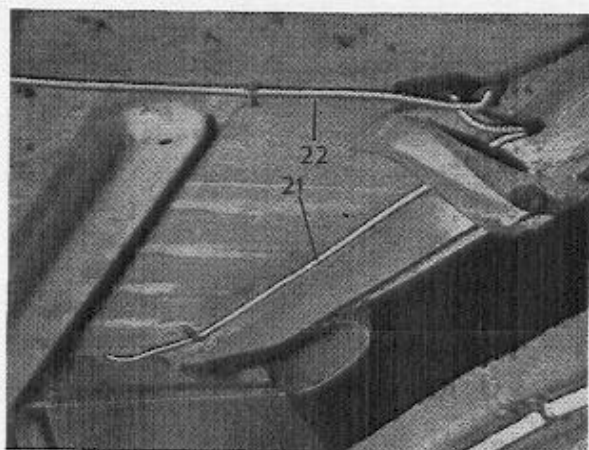


Fig. 17.



Fig. 18.

floor. See Fig. 11 and Fig. 17. Thread a rubber bushing onto the pipe and then connect to the pressure cylinder nearest the vacuum chamber. Press the rubber seal into position in the hole.

4. Lead a copper pipe in a metal hose (22) from the connection in the end of the cylinder, through the other hole in the floor and then under the floor to a bracket (b) which is screwed to the lower body reinforcement as shown in Figs. 17, 18 and 19. The rubber bushings are fitted as in 3 above.

Connect the oil pressure hose (c) between the bracket and the pressure cylinder (23) as shown in Fig. 18 and Fig. 10.

7. Oil pressure lines for the brake servo cylinder

Pipe lines are attached and joined as already mentioned under "Oil pressure lines for the servo cylinder for clutch disengagement" above.

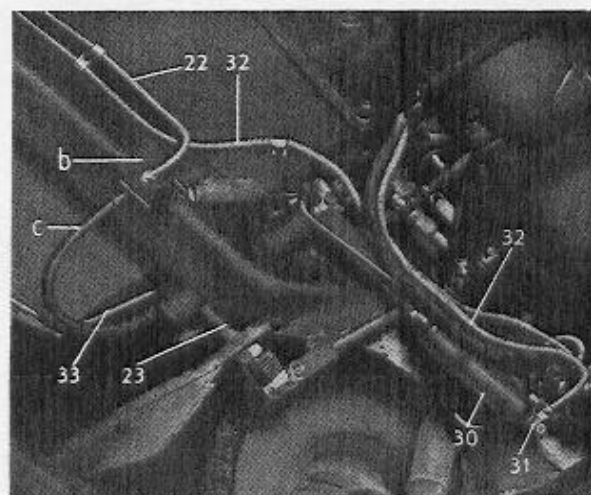


Fig. 19.

1. Remove the connection between the master cylinder (30) and the brake contact and replace it with a two-way junction (31) which is attached by means of a bolt and seal washers. One of the outlets is sealed with a plug. See Fig. 19.
2. Drill two holes through the floor (a, Fig. 3) with a diameter of 16 mm ($\frac{5}{8}$ ").
3. Lead a copper pipe in a metal hose (32) from the two-way junction (31) along the plate behind the master cylinder, under the floor and then through the inner hole (a Fig. 3). Thread a rubber bushing on the pipe which is then attached to the inner connector on the hydraulic cylinder. Push the rubber seal into position in the hole.
4. Lead a pipe in a metal hose (33) from the connector in the end of the hydraulic cylinder, through the other hole in the floor and then under the floor, see Fig. 20, to a point in front of the master cylinder where it is connected to the three-way junction to the brake contact (34) which has been loosened from the cylinder. See Figs. 3, 20 and 21.



Fig. 20.

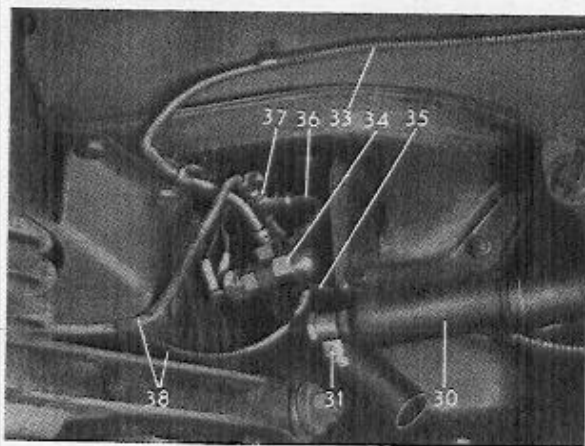


Fig. 21.

Rubber bushings are applied as in 3 above.

The three-way junction with the brake contact consists of the junction which was earlier fitted to the master cylinder, its bolt and copper washers together with a bottom nut. The brake contact is screwed into the bolt in the usual way after which the cables are connected up.

5. Connect the brake line (35) from the rear wheel cylinders to the junction (34), see Fig. 21.
6. Connect the pipe (36) between the junction (34) and the T-joint (37). Then connect the brake lines (38) from the front wheel cylinders to the T-joint.

8. Bleeding of oil lines

Use only best quality brake fluid which satisfies the demands for SAE 70 R1 (HD quality) when topping-up the servo system for the brakes and clutch disengagement.

Oil system on the clutch disengagement servo

1. Open the bleeding screw on the servo cylinder and pour brake fluid into the container (20). Since the oil pressure chamber lies in a horizontal plane all the air is bled out if the right-hand side of the car is jacked up slightly. When fluid commences to run out of the bleeding screw, let it run for a short time before tightening the screw.
2. Open the bleeding screw (d, Fig. 10) on the pressure cylinder (23). When fluid starts to run out of the screw, allow it to run for a short time before tightening the screw, in order to ensure that there are no bubbles left in the pipes. Ensure that there is sufficient brake fluid in the container during this bleeding process otherwise there is a risk of more air coming into the system.
3. Opened the first-mentioned bleeding screw again and check that there is no air present.
4. Tighten both screws thoroughly. In order to make the bleeding process more rapid by applying a compressed air nozzle to one of the air circulation holes in the top of the container (20). Pressure in the whole system is thus increased and fluid forced through the pipe lines, thus accelerating the bleeding process.

Oil system to the brake servo

1. Screw off the top of the master cylinder (30) and fill the container with brake fluid.
2. Loosen the bleeding screw on the servo cylinder (e, Fig. 3) and jack up the left-hand side of the car slightly.
3. Pump slowly with the brake pedal and make sure that there is sufficient brake fluid in the main cylinder container. Brake fluid must be added at regular intervals. When fluid begins to run out of the screw, let it run for a short time before closing the screw.
4. Open the bleeding screw on the left front wheel and continue to pump the brake pedal until the fluid running out is entirely free from bubbles. Then tighten the screw.
5. Continue bleeding of the brake lines to the right front wheel, left rear wheel and right rear wheel in that order. Check and fill fluid at regular intervals in the master cylinder container. If the amount of fluid in the container is allowed to sink too much then there is a chance of air coming into the system.

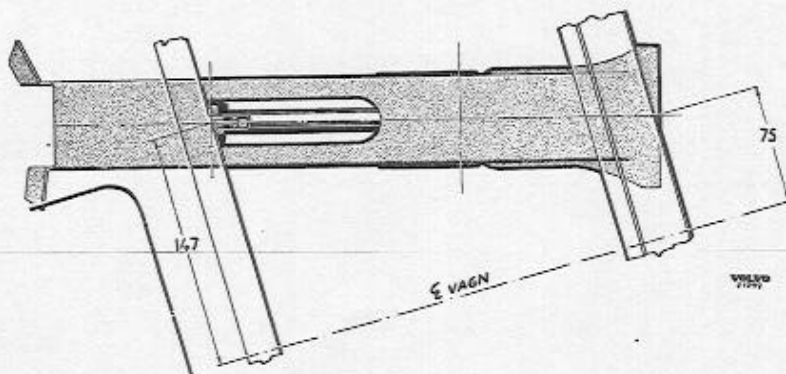
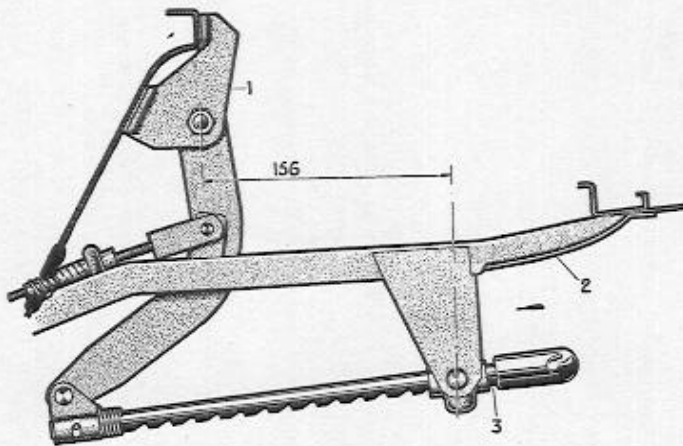


Fig. 23.

CL-vagn = centre line of car.

9. Fitting of hand brake to the right of the steering wheel

If so desired, the hand brake lever may be moved to the right of the steering wheel for operation by the right hand. See Fig. 22.

1. Fit the bracket (2) for the pull rod (3) and the support (1) as shown in Fig. 23. Diameter of screw holes is 3,5 mm ($\frac{9}{64}$ ").
2. Loosen the hand brake ratchet housing and lever system and attach them in their new position
3. Lead the hand brake wire to the right of the engine. Drill a hole in the mounting board in line with the new position of the pull rod of the same diameter as the original hole for the wire.
4. Adjust the hand brake in the normal way. See Service Manual, Part 7.

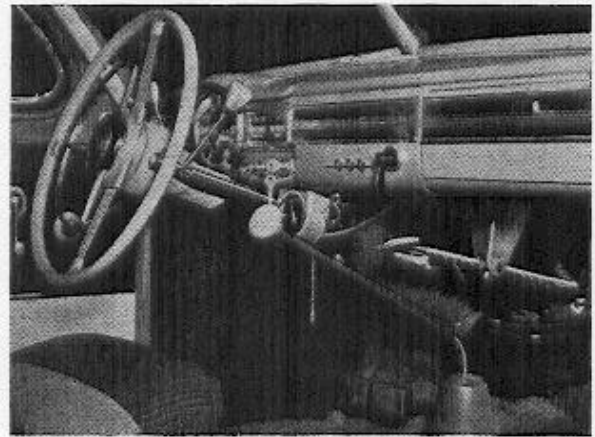


Fig. 22.

SUPPLEMENT

Directions for fitting the new clutch vacuum valve

Installation is carried out as shown in the accompanying sketch. The clutch valve is fitted in the same way as earlier. Lower down on the steering column, an attachment 89875 is fitted with the help of a U-bolt 89390 and nuts 10433. A hole is drilled in the mounting panel for the Bowden cable (sheath 88783, wire 55192, rubber bushing 40136).

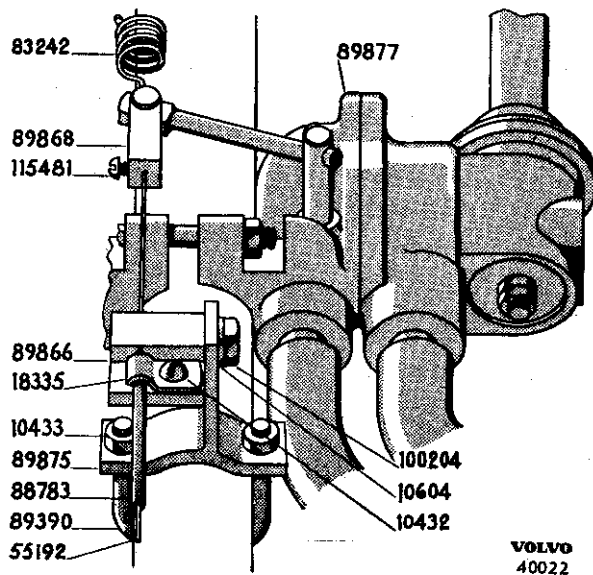
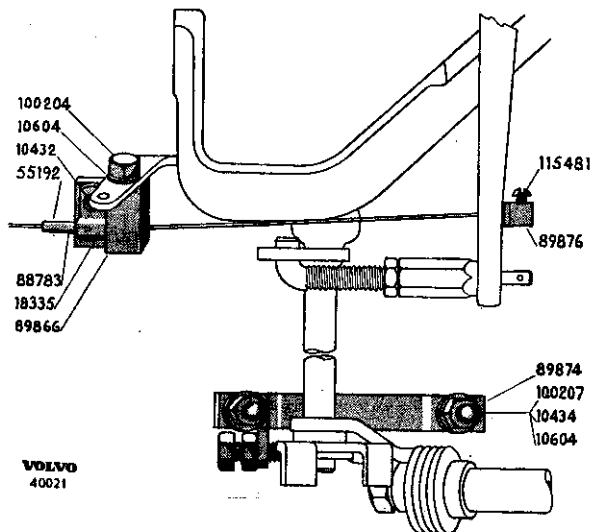
The return spring for the de-clutching yoke is removed and a hole with a diameter of 8.5 mm is drilled in the spring bracket to attach the retainer 89866 with bolt 100204 and spring washer 10603. The same retainer 89866 is fitted in the same way on attachment 89875 after which the sheath 88783 for the Bowden cable is placed in a flat curve between these and is attached in position with clamp 18335, screw 14023, nut 10432 and spring washer 10602.

The cable 55192 is then introduced into the sheath and is attached to the de-clutching yoke by means of retainer 89876 and screw 115481. The

other end of the cable is attached to yoke 89868 with screw 115481. The yoke is attached to the valve lever with the cotter bolt from the declutching yoke. The cotter bolt is held by the return spring 83242 which is then stretched and attached in a suitable position. The length of the cable is then adjusted so that when the clutch pedal is in its upper position the lever should be near its upper position (see sketch).

The cable retainer and attachment should be adjusted so that the cable runs smoothly and does not chafe against any sharp edges. Lubricate the cable with grease.

In order to prevent the cable from breaking when double operation is carried out, i. e. the clutch is disengaged by means of both the hand lever and, the foot pedal, the clutch control intermediary shaft is fitted with a limiting stop, bracket 89874. This is fitted with bolt 100207, nut 10434 and spring washer 10604 in the forward frame member so that the adjuster screw comes into contact with the intermediary shaft lever in the position where the clutch is disengaged (pedal depressed).



REPAIR INSTRUCTIONS

Servo cylinder

Disassembly

1. Loosen the four bolts (10, Fig. 24) and remove the plunger rod (9), the guide (11) and the end seal ring (8).
2. Take out the washer (12) and the spring (13).
3. Loosen the lock nut (18) and separate the oil pressure cylinder (19) from the tube (23). This should be done carefully in order to avoid damage to the washer (16) by the spring (17). Remove washer, spring and packing washer (14). Ensure that the seal (15) is not damaged. The end unit (21) on the pressure cylinder should not be unscrewed in order to avoid the leakage which

could occur if the washer (20) were damaged.

4. The vacuum cylinder is dismantled by unscrewing the nuts (3) on the end plate (1). The end plate should be loosened carefully so that the seal ring (2) is not damaged. Take out the plunger (5), with plunger rod (9) and spring (7).
5. Loosen, if required, the plunger gasket (4) and felt ring from the plunger by removing the screws (6).
6. Clean all parts thoroughly. Those parts, however, which come into direct contact with the brake fluid may only be cleaned with alcohol. Other parts are cleaned with solvent.

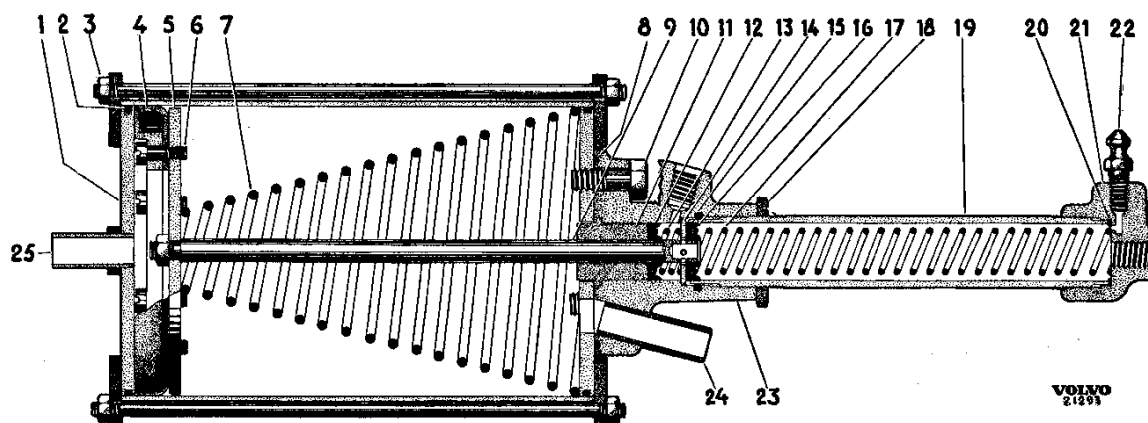


Fig. 24. Servo cylinder.

- | | | |
|----------------------------------|----------------------------|--|
| 1. End plate | 10. Screw and fibre washer | 19. Oil pressure cylinder |
| 2. Seal ring | 11. Guide | 20. Washer |
| 3. Nut | 12. Washer | 21. Pressure cylinder end unit |
| 4. Plunger gasket with felt ring | 13. Spring | 22. Bleeding screw |
| 5. Plunger | 14. Packing washer | 23. Pipe support for oil pressure cylinder |
| 6. Screw | 15. Seal ring | 24. Connector for vacuum tank hose |
| 7. Plunger spring | 16. Washer | 25. Connector for valve hose |
| 8. Seal ring | 17. Spring | |
| 9. Plunger rod | 18. Lock nut | |

Assembly

The servo cylinder is assembled after inspection and the replacement of damaged parts. Assembly is carried out in the reverse order to that employed in disassembly.

Before the plunger, gasket and felt ring are fitted, they should be allowed to lie for some time in oil (Bendix Vacuum Cylinder Oil or similar) so that the gasket and the felt ring are soaked. Smear the inside of the cylinder with the same oil.

Care should be taken when fitting the washer (16) in the oil pressure cylinder. This washer should be pressed down into the pressure cylinder while the pipe support (23) is screwed on. When assembly is completed all joints to the vacuum cylinder are sealed with sealing compound e. g. "Holdfast".

After assembly the system is bled as described under "Bleeding of oil lines" on Page 10.

Lubrication

Before re-fitting the servo cylinder add 30 cm³ (1/2 Imp. pint) Bendix Vacuum Cylinder Oil or similar oil to the vacuum cylinder. This filling takes place through the connector which points away from the pressure cylinder.

The vacuum cylinder should be lubricated each 20000 km (12400 miles) or at least once a year. Add the quantity and type of oil as mentioned above.

Valves

Disassembly

1. Unscrew the nut (8) and lift up the flange head carefully (3) so that the filter (6) is not damaged. Remove the spring washer (7). See Fig. 25.
2. Remove the four screws (1) and separate the valve head (10) from the valve housing (9).
3. Remove the spring (11) which regulates the air pressure to the vacuum cylinders and take out the diaphragm (12).
4. Lift out the plunger (2) with the valve plate and spring.
5. Wash the rubber parts in alcohol and other parts in clean petrol or solvent.

Assembly

Inspect carefully and replace damaged or worn parts. Check the spring (11) which regulates the air pressure to the vacuum cylinder. It should agree with the following specifications:

Spring for brake valve (marked "B")

Length unloaded 20,3—20,7 mm
(51/64"—13/16")

Loaded with 5 kg (11 lbs.) 14,8—15,2 mm
(37/64"—19/32")

Spring for clutch valve (marked "K")

Length unloaded 18,3—18,7 mm
(23/32"—47/64")

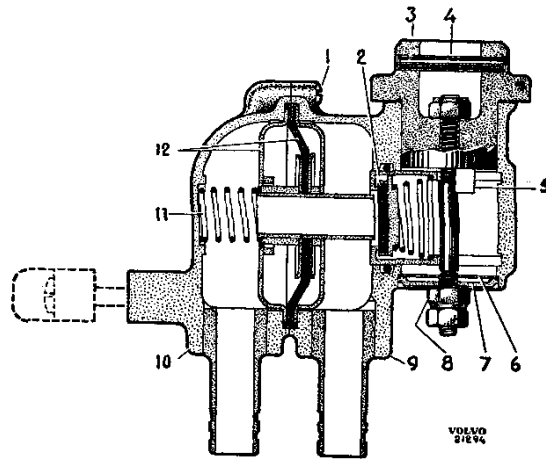


Fig. 25. Valve.

- | | |
|--|------------------|
| 1. Screw | 8. Nut |
| 2. Plunger with valve plate and spring | 7. Spring washer |
| 3. Flange head | 9. Valve housing |
| 4. Flange head pin | 10. Valve cover |
| 5. Flange pin | 11. Spring |
| 6. Filter | 12. Diaphragm |

Loaded with 5 kg (11 lbs.) 10,8—11,2 mm
(27/64"—7/16")

The valve is assembled in the reverse order. Smear the internal parts with a suitable grease e. g. Bosch Ft lv5.

The direction of operation of the valve may be reversed, if so desired by moving the flange pin (5) to the diametrically opposite hole in the flange head (3).

When the valve is installed, it should be adjusted so that it may be operated by finger-tip control. Adjustment is carried out by means of the nut (8) on the underside of the valve which is then secured by a lock nut. Ensure that the lever is not so easily adjusted that it falls out of position due to the vibration of the car during driving.

Pressure cylinder

The pressure cylinder for clutch disengagement may be disassembled after it has been loosened from the clutch pedal and lever by screwing off the head and bleeding screw.

Parts may be cleaned only with alcohol.

Smear the cylinder, plunger and gasket with brake fluid when reassembling.

Bleed the system thoroughly as mentioned in "Bleeding of oil lines" for the clutch disengagement servo on Page 10.

TRACING FAULTS

Cause	Remedy
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The clutch disengagement does not function properly

Clutch servo

The vacuum value is too low due to leakage etc. (normal vacuum 0,65—0,75 kg/cm² (9,3—10,7 p.s.i.).

Air in the oil lines.

Not enough brake fluid in the hydraulic system.

Faulty servo cylinder.

Valves

Faulty valve, due to damaged diaphragm, valve plate or springs.

Check the vacuum system for leakage. Smear the leak with sealing compound e. g. "Holdfast".

Bleed the clutch servo oil lines. See under "Bleeding of oil lines" on Page 10.

Add brake fluid and bleed the system.

Test to see if the clutch pedal disengages the engine. Disassemble the servo cylinder and check the springs and gaskets.

Dismantle the servo cylinder and check springs parts if required.

Brakes do not operate or else operate only partly

Brake servo

Vacuum value too low through leakage etc. (normal vacuum 0,65—0,75 kg/cm²=9,3—10,7 p.s.i.).

Air in the oil lines.

Not enough brake fluid in the hydraulic system.

Faulty servo cylinder.

Valves

Faulty valves through damaged diaphragm, valve plate or springs.

Check vacuum system for leakage. Smear the leak with sealing compound e.g. "Holdfast".

Bleed the brake servo oil lines. See under "Bleeding of oil lines" on Page 10.

Add brake fluid and bleed the system.

Test to see if the brake pedal operates properly. Dismantle the servo cylinder and check spring and gaskets.

Dismantle valve. Check and replace damaged parts.