Section G6

Hydraulic pumps

Before commencing any operations on the hydraulic pumps the car wings should be suitable protected with wing covers.

Hydraulic pump housing sealing rings - To renew
If brake fluid leakage occurs from a brake pump housing it is possible to renew the two sealing rings with the pump(s) in position using the following procedure.
1. Depressurise the hydraulic systems as described in Section G2.
2. Ensure that the pump(s) and the surrounding area is thoroughly clean.
3. Compress the rubber hose section of the hydraulic pump low pressure inlet pipe to prevent fluid flow. Remove the hose at the centre connection worm-drive clip. Suitably blank the hose end or allow the fluid to drain into a clean container.

Note
When work is being carried out on the rear hydraulic pump the ignition distributor should be removed as described in Chapter M.

On cars fitted with an exhaust emission control system the three way connector and check valve must be removed from above the front hydraulic pump (see Section U2).
4. Disconnect the high pressure outlet and low pressure inlet pipes from the hydraulic pump.
5. Remove the circlip from the top of the pump and draw the outer housing upwards and off the pump.
6. Discard the two old sealing rings; fit new ones lubricated with clean brake fluid of the approved type.
7. Fit the pump outer housing, aligning the port with the inlet pipe. Press the housing firmly into position then fit the circlip.
8. Prime the pump with approved brake fluid, connect the low pressure feed and high pressure outlet pipes to the pump, also connect the low pressure hose from the reservoir.
9. Top-up the reservoir with approved fluid (see Chapter D) and bleed the hydraulic systems as described in Section G4.

Hydraulic pumps - To remove
1. Carry out Operations 1 to 5 inclusive of Hydraulic pump housing sealing rings - To renew.
2. Using special box spanner (RH 8428) unscrew and remove the pump from its pedestal on the tappet chest cover; blank off the pedestal against the ingress of dirt.

Note
The pump cannot be removed using the top adapter as a spannering point.

Hydraulic pump - To dismantle
When two pumps are being dismantled the components from each pump must not be interchanged.
1. Remove the adapter from the top of the pump and withdraw the non-return valve assembly from the bore.

Gentle use of a small screwdriver may be necessary to assist removal of the chamfered washer; if the washer has spread it should be discarded and a new one fitted on assembly.
2. Remove the inlet valve ring, spacer ring and conical valve spring.
3. From the lower end of the pump remove the circlip and withdraw the plunger and spring collar; collect the spring.

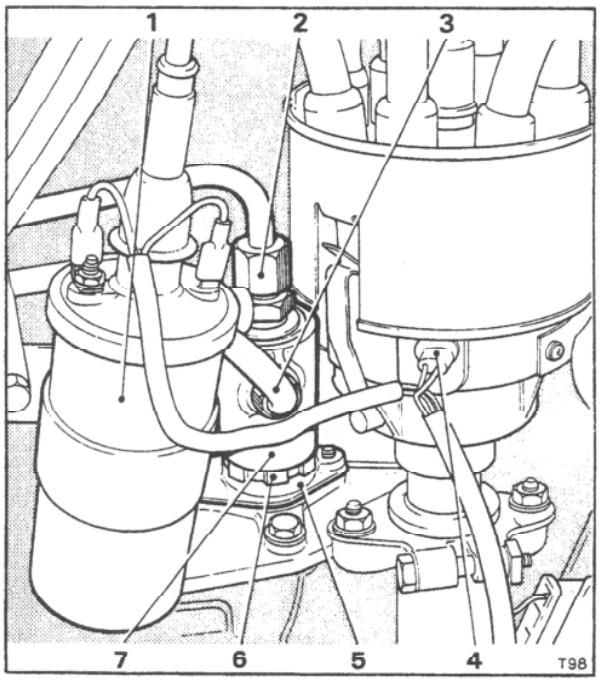

Fig. G8 **Rear hydraulic pump**
1 Ignition coil
2 High pressure outlet pipe
3 Low pressure inlet pipe
4 Ignition distributor
5 Pump mounting pedestal
6 Hydraulic pump spanner point
7 Pump outer housing

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4. Carefully withdraw the plunger barrel from the pump body.

Note

The barrel and plunger are a matched ground component and pieces are not interchangeable with pieces from other assemblies.

5. Remove and discard the three 'O' rings from the pump body.
6. To dismantle the non-return valve assembly, remove the circlip, push out the valve from the outer body and collect the spring, end stop and valve.

Hydraulic pump components - To clean and inspect

Important

Ensure that all components are absolutely clean.

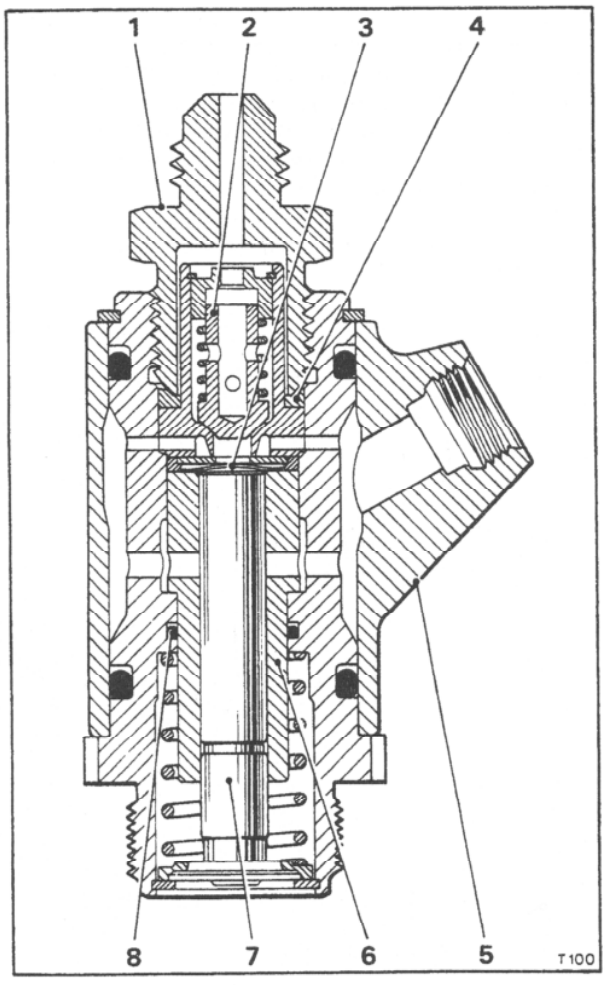

Fig. G9 Hydraulic pump - Sectional view

1 Adapter - high pressure outlet
2 Non-return valve
3 Inlet valve
4 Chamfered ring
5 Outer housing
6 Pump barrel
7 Plunger
8 Sealing ring

Tapped holes require special attention to ensure that they are free from foreign matter and slivers of thread which might break off during assembly and become entrapped in the hydraulic system. One method of achieving this is to screw slave adapters or setscrews down the threads before thoroughly cleaning the components in methylated spirits and drying with dry compressed air, **not cloth.**

It is important that the seating of the valves is correct and that the finely machined barrel and plunger are not scored or damaged.

Under normal circumstances after a thorough cleaning, and the introduction of a new set of sealing rings, the only parts that might need renewal are the small coil springs.

Hydraulic pump - To assemble

When assembling a hydraulic brake pump reference should be made to Figure G9.

1. Lubricate all parts including sealing rings with approved brake fluid (see Chapter D) prior to fitting in their respective positions.
2. Fit the small 'O' ring into position in the centre bore of the pump body.
3. Insert the plunger barrel into the pump body, pressing it through the sealing ring until it abuts the shoulder.
4. Insert and locate the spacer; fit the valve spring (crowned face towards inlet valve) and the inlet valve into position adjacent to the barrel head. Ensure that the seating face of the valve is free from damage marks otherwise the efficiency of the pump will be reduced.
5. Assemble the non-return valve, reversing the procedure given for its dismantling. Ensure that the valve is fully seated and the circlip correctly located in its groove. The end stop should be drawn upward to abut the circlip.
6. Fit the non-return valve assembly larger diameter leading into the pump body bore to abut the inlet valve ring.
7. Fit the chamfered sealing ring, small bore diameter leading into the pump body bore, to abut the shoulder of the non-return valve.
8. Fit the adapter to the top of the pump body, torque tightening to the figures quoted in Chapter P. Blank off the union.
9. Fit the coil spring into the lower end of the pump body.
10. Fit the spring collar to the barrel plunger and carefully insert the plunger into the bore of the barrel.
11. Depress the plunger against the spring sufficiently to enable the circlip to be fitted in its location.
12. Fit the two 'O' rings to the outside of the pump body. The pump is now ready for fitting to the engine.

Hydraulic pump - To fit and set

Prior to fitting the pump to the engine tappet cover flange, ensure that the shim washer fitted between the pump mounting flange and tappet cover is of the

correct thickness. For checking procedure refer to Chapter E Engine.

To fit the hydraulic pump, reverse the procedure for removal noting the following points.

1. The hydraulic pump and pipe connections should be torque tightened in accordance with the figures quoted in Chapter P. The pump should only be tightened using special box spanner (RH 8428), the top adapter should never be used as a spannering point.
2. Bleed the hydraulic systems as described in Section G4. Check all disturbed pipe connections for leaks.

Hydraulic pumps - To test (on the car)

1. Depressurise the system as described in Section G2.
2. Place a length of bleed tube onto the bleed screw of the accumulator pressurised by the pump to be tested; place and secure the other end of the tube in a clean measuring vessel, then open the bleed screw.
3. Ensure the appropriate reservoir compartment is full and start the engine.
4. Fluid should flow from the bleed tube in a series of spurts, coinciding with each revolution of the camshaft. The rate of flow should be approximately 250 ml. or just under ½ pint per minute at an engine speed of 1 000 r.p.m.
5. If fluid does not flow or the pumped quantity is below requirements the pump should be removed and overhauled.

Section G7

Hydraulic accumulators

The hydraulic accumulators are mounted on the sides of 'A' bank (No.1 Hydraulic system) and 'B' bank (No.2 Hydraulic system) of the engine crankcase. Each accumulator consists of a sphere containing high pressure nitrogen gas with a control valve assembly mounted to the top of the sphere (see Fig. G12).

Hydraulic accumulator - To remove

The hydraulic accumulator must be removed from underneath the car.

1. Depressurise the hydraulic systems as described in Section G2.
2. Unscrew the worm drive clip on the fluid return hose, (see Figs.G10 and G11) clamp the hose to prevent fluid flow and withdraw it off the connecting pipe. Blank off the hose to prevent loss of fluid.
3. Disconnect the high pressure inlet and outlet pipes from the accumulator and blank off both pipes and connections.
4. Remove the setscrews and nut securing the retaining plate to the engine sump flange and the accumulator, collect the distance pieces and remove the plate.
5. Support the accumulator, remove the setscrews securing the accumulator to the engine crankcase, collect the distance pieces, then carefully remove the accumulator from the engine.

Hydraulic accumulator sphere and valve housing - To separate

1. Slacken the charging valve cap and allow any gas that may be escaping from the sphere to be discharged.
2. Remove the cap and discard the sealing ring. Collect the warning plate and sealing washer.
3. Unscrew the sphere from the valve housing.

Note

When using the hexagon machined on the sphere adjacent to the charging valve for spannering it is important that both halves of the sphere rotate as a unit when being unscrewed from the valve housing.

In the unlikely event of the lower half unscrewing from the upper half the operation must be stopped and the large hexagon on the upper half of the sphere used to separate the sphere from the valve housing. **Under no circumstances should the halves of the sphere be allowed to become separated with the sphere in a charged state.**

Hydraulic accumulator sphere - To discharge and dismantle

1. Carefully remove the valve cap and collect the sealing washers if not previously removed.
2. Depressurise the sphere by fitting the discharging adapter (RH 8235) to the base of the sphere and carefully screwing the adapter onto the sphere sufficiently to lift the one way valve from its seat.

This allows the nitrogen gas to escape slowly. It is not advisable to open the valve too wide or too quickly in order to quickly discharge the nitrogen gas from the sphere.

When the sphere is completely discharged remove the adapter.

3. Secure the sphere in holding tool (RH 8145) and using special pin spanner (RH 8144), remove the clamping ring in order to separate the halves of the sphere.

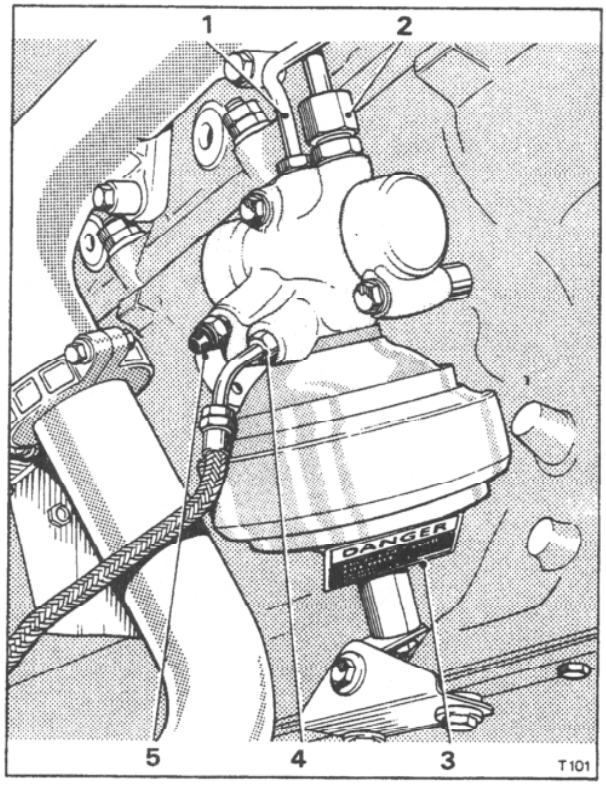

Fig. G10 Front hydraulic accumulator

1 Low pressure return to reservoir
2 High pressure inlet from pump
3 Warning plate
4 High pressure outlet to upper distribution valve
5 Bleed screw

4. Remove and discard the diaphragm.
5. In order to dismantle the one-way valve at the base of the sphere lower half, remove the circlip, washer, small spring and valve ball.

Hydraulic accumulator sphere - To assemble
Assemble the sphere by reversing the dismantling procedure noting the following points.
1. Examine the one-way valve seating and return spring. Renew the return spring if necessary.
2. Lightly tap a new steel ball onto the valve seat, then fit the spring, washer and circlip. The washer counterbore being the seating location for the spring.
3. Lightly smear the buttress threads of the clamping ring with Molytone 'C' grease or its equivalent.
4. Lay the new diaphragm in the upper half of the sphere after first wetting the uppermost face with recommended brake fluid, then fit the sphere lower half and clamping ring.

When tightening the sphere clamping ring, use a suitable torque spanner attached to special pin spanner (RH 8144) and torque tighten to the figure quoted in Chapter P.

It is essential that when tightening, the lower half of the sphere is not allowed to rotate otherwise damage to the diaphragm may result.

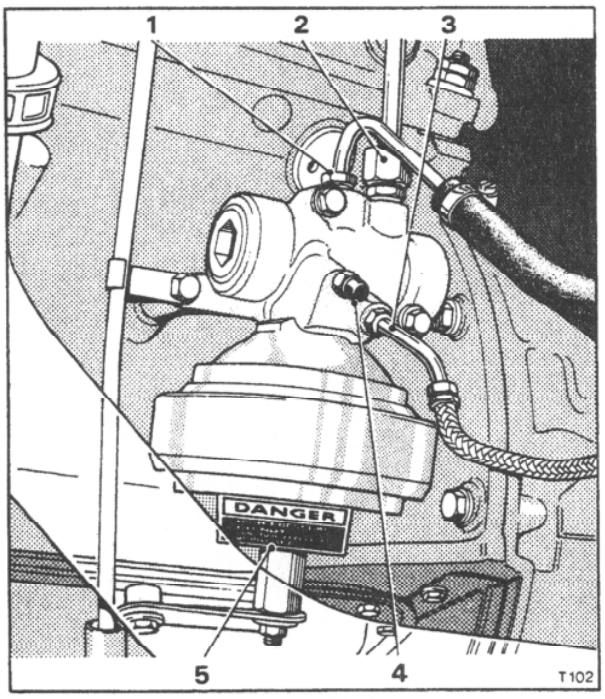

Fig. G11 Rear hydraulic accumulator
1 Low pressure return to reservoir
2 High pressure inlet from pump
3 High pressure outlet to lower distribution valve and levelling valves
4 Bleed screw
5 Warning plate

Hydraulic accumulator sphere - To charge
It should be noted that the utmost care must be taken when charging the accumulator spheres and consequently the accumulator should always be removed from the engine.

In order to control the flow of nitrogen gas from the cylinder a gauge and regulator capable of regulating to a pressure of 105 kg/sq.cm. (1500 lb/sq.in.) should be used. Connecting hoses and end fittings must be capable of withstanding a gas pressure of 281,23 kg/sq.cm. (4000 lb/sq.in.)

Before commencing to charge the accumulator sphere it should be placed in a section of the workshop away from other personnel, then surrounded by a safety shield consisting of a quantity of sand filled bags.

1. Before fitting the regulator to the nitrogen cylinder the cylinder control valve should be opened fractionally in order that the nitrogen discharged will remove any dust or grit which may be present on the cylinder valve seating.
2. Fit the regulator and high pressure connecting pipes to the nitrogen cylinder.
3. Fit the charging adapter (RH 7808) to the one-way valve at the base of the sphere.
4. Open the regulator valve sufficiently to discharge any dust and grit from the high pressure pipes.
5. Connect the high pressure pipe to the valve adapter.
6. Open the nitrogen cylinder control valve. Slowly open the regulator valve and allow the gas pressure to build up until the gauge shows a reading of 70,3 kg/sq.cm. (1 000 lb/sq.in.).
7. Close the nitrogen cylinder valve and observe the gauge; if the gauge reading does not remain steady at 70,3 kg/sq.cm. (1 000 lb/sq.in.) there is a leak either from the sphere or from the high pressure pipe connection.
8. If the pressure is maintained, remove the connecting pipe and charging adapter from the sphere.
9. Fit the warning plate, washer and charging valve cap together with a new sealing ring. Torque tighten the cap to the figure quoted in Chapter P.

Note
The valve cap should be fitted as quickly as possible after charging the sphere to provide a secondary seal as the ball valve alone may not be a completely effective seal.

10. With the fluid ports in the upper half of the sphere suitably blanked, immerse the lower half of the sphere in water until the level is above the clamping ring and check for leakage around the clamping ring and valve cap. If leakage is evident from around the clamping ring then the diaphragm is faulty, presumed damaged on assembly and must be renewed.

If leakage is observed from the charging valve cap the 'O' ring should be renewed, but the sphere must be re-charged to 70,31 kg/sq.cm. (1 000 lb/sq.in.) before the cap is refitted. The submerge test

must then be carried out again.
11. After a successful submerged test, the sphere should be thoroughly dried with dry compressed air, particular attention should be paid to the fluid ports which should be blanked off while awaiting fitting to the valve assembly.
12. A check of the accumulator pressure may be taken when the accumulator is fitted to the engine by using the hydraulic system pressure gauge rig (RH 7938) as described under the heading, Hydraulic accumulator - To test.

Hydraulic accumulator valve housing - To dismantle
1. Separate the hydraulic accumulator sphere from the valve housing as described earlier.
2. Remove the end plug from the valve housing, by using a 25,4 mm.A/F (1.00 in. A/F) Allen key or a length of hexagon bar inserted into the plug, then slacken with a suitable spanner.
3. Using a 0.250 in. U.N.F. setscrew screwed into the threaded hole of the valve sealing plug, withdraw the plug from the valve housing and discard the sealing ring.
4. Remove the sealing disc, non-return valve and the return spring from the smaller bore of the bobbin (see Fig. G12).
5. Remove the valve bobbin by gently tapping the valve housing on a piece of wood. Remove and discard the three sealing rings leaving the P.T.F.E. seal in position.
6. Remove the piston from the centre bore of the bobbin, remove and discard the combined Fluon and rubber sealing ring.
7. Remove the regulator valve, spring and adjusting washers from the valve housing.

Hydraulic accumulator valve - To inspect
1. Thoroughly wash all the components, including the valve housing in methylated spirits. Dry, using clean compressed air. Never use cloths to dry components.
2. Inspect the ball seat in the bobbin and the ball of the regulator valve for wear and ingrained dirt. Any dirt should be removed and the parts washed again in methylated spirits. Worn parts should be renewed.
3. Burnish the ball seat of the bobbin, by holding the ball on to the seat and rotating the regulator valve by hand or lightly tap a 3,96 mm. (0.156 in.) diameter ball onto the ball seat, to form a leakproof spherical seat on the bobbin.
4. Inspect all parts, renewing those which may be worn or damaged.

Hydraulic accumulator valve housing - To assemble
Assemble the valve by reversing the procedure for dismantling noting the following points.
1. Lubricate all internal parts with clean brake fluid of the approved type (see Chapter D).
2. Fit new sealing rings to the bobbin, piston and sealing plug.
The anti-extrusion washer must be fitted to the flanged side of the end 'O' ring groove on the bobbin (see Fig. G12).
3. It may be necessary to lightly tap the piston into the bore of the bobbin due to the interference fit of the new seal. This trims the seal and any particles produced must be removed. The piston must then be extracted from the bore, cleaned and fitted again using only finger pressure.
4. After assembling the non-return valve, spring, sealing disc and end plug into the bobbin, check that the non-return valve operates freely in its bore and is returned to its seat by the spring load.
5. Torque tighten the end plug and pipe adapters in accordance with the torque figures quoted in Chapter P.

Hydraulic accumulator sphere and valve housing - To fit
1. Fit a new 'O' ring to the top of the accumulator sphere and screw the sphere into the valve housing. Using the hexagon at the top of the sphere, torque tighten the sphere to the valve housing to the torque figure quoted in Chapter P.
Note
Do not use the charging valve cap as a spannering point.
2. Fit the accumulator to the engine reversing the procedure given for removal. Blanks should only be removed immediately prior to connecting the pipes.
3. All setscrews and pipe connections must be torque tightened in accordance with the figures quoted in Chapter P.
4. After fitting, top-up the fluid reservoir and test the accumulator(s) as described in Hydraulic accumulator - To test. With the engine running all joints and unions which have been disturbed must be leak free prior to tests being carried out.
5. Bleed the system(s) as described in Section G4.

Hydraulic accumulators - To test
1. Depressurise the systems as described in Section G2.
2. Remove the bleed screw from the accumulator. Connect a length of high pressure pipe, fitted with a bleed screw connection and a zero kg/sq.cm. to 210 kg/sq.cm. (zero lb/sq.in. to 3 000 lb/sq.in.) pressure gauge (RH 7938) to the bleed screw outlet of the accumulator.
3. Start the engine. The gauge needle should immediately jump to 70,31 kg/sq.cm. (1 000 lb/sq.in.) which is the nitrogen pressure in the accumulator sphere; then rise slowly to between 168 kg/sq.cm. and 182 kg/sq.cm. (2 400 lb/sq.in. and 2 600 lb/sq.in.). At this pressure the accumulator control valve should operate and the pump should cease to charge the accumulator.
4. After the cut off pressure has been reached note the pressure to which the gauge settles. This settling takes up to one minute and the pressure should not be more than 10,5 kg/sq.cm. (150 lb/sq.in.) below the cut off pressure. The pressure should then remain steady unless the brake pedal

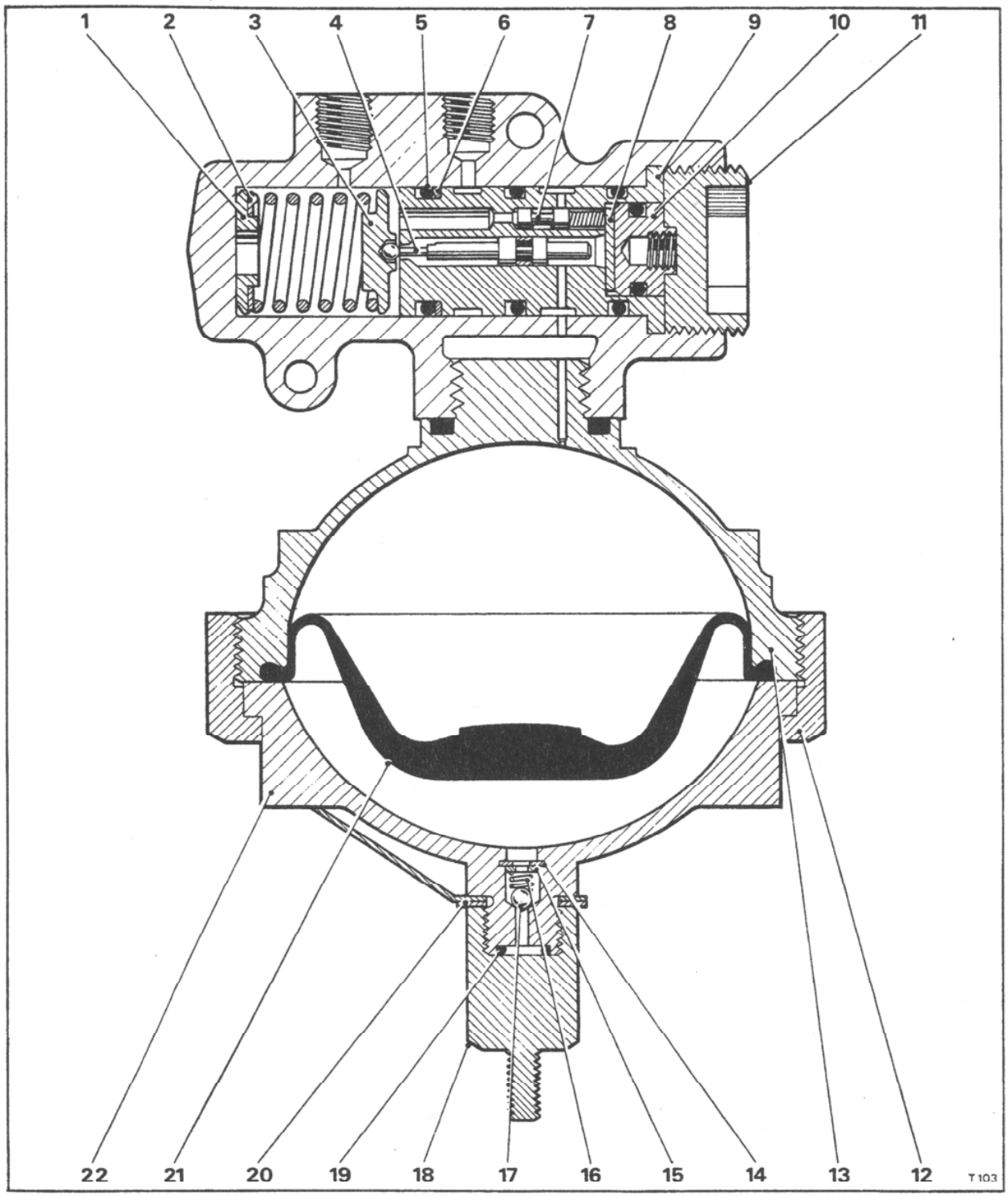

Fig. G12 Hydraulic accumulator

1 Seating washer
2 Adjusting washer(s)
3 Regulator valve
4 Piston and sealing ring
5 Bobbin sealing rings
6 Fluon washer
7 Non-return valve
8 Sealing disc
9 Valve bobbin
10 Valve sealing plug
11 End plug
12 Clamping ring
13 Sphere upper half
14 Circlip
15 Washer
16 Spring
17 Ball
18 Charging valve cap
19 Sealing ring
20 Washer and warning plate
21 Diaphragm
22 Sphere lower half

is operated, the height control is actuated or the accumulator bleed screw opened.

5. Fit a bleed pipe to the gauge connecting pipe bleed screw, open the bleed screw, thus allowing the pressure gauge reading to fall. When the pressure has fallen to between 126,55 kg/sq.cm. and 133,58 kg/sq.cm. (1,850 lb/sq.in. and 1 900 lb/sq.in.) the accumulator control valve should allow the pump to cut in again and charge the accumulator back to 175,77 kg/sq.cm. (2 500 lb/sq.in.).

If the above requirements are met the accumulator is operating correctly.

6. If, on first starting the engine, the pressure gauge needle fluctuates violently, rapidly climbs to 175,77 kg/sq.cm. (2 500 lb/sq.in.) and then immediately falls to zero when the brake pedal is depressed, this indicates a complete loss of nitrogen pressure from the accumulator sphere.

This could be caused by a leaking charging cap or a failure of the diaphragm in the sphere.

7. If when the engine is started, the gauge needle jumps to a pressure less than the accumulator nitrogen pressure of 70,31 kg/sq.cm. (1 000 lb/sq.in.) this indicates a partial loss of nitrogen pressure from the sphere. When the above condition exists the sphere must be further charged.

If, on starting the engine, the pressure gauge correctly jumps to 70,31 kg/sq.cm. (1 000 lb/sq.in.) but then fails to attain between 168 kg/sq.cm. and 182 kg/sq.cm. (2 400 lb/sq.in. and 2 600 lb/sq.in.) this could be due to the accumulator controlling at a low pressure or leakage. Should the gauge needle rise to a pressure below 168 kg/sq.cm. (2 400 lb/sq.in.) and then remain steady the accumulator valve is controlling at too low a pressure. If leakage is suspected the valve assembly should be overhauled or renewed. To adjust the accumulator controlling pressure, partly dismantle the valve housing assembly; fit sufficient adjusting washers behind the regulating spring to obtain a pressure of between 168 kg/sq.cm. and 182 kg/sq.cm. (2 400 lb/sq.in. and 2 600 lb/sq.in.). Adjusting washers are available in a range from between 0,127 mm. and 1,22 mm. (0.005 in. and 0.045 in.). If the regulator spring is renewed, fully compress the new spring several times before fitting in order to reduce initial spring pressure variation.

If observation of the gauge shows that the pump is still pumping (needle fluctuating with the pump pulses) without giving a rise in pressure then there is a leak equal to the pump flow at that pressure. Pump 'cut out' indicated by the change of audible note of the pump can be heard if the end of the engine dipstick is placed on top of the pump and used as a hearing aid.

To verify an accumulator internal leak, depressurise the systems, remove the hose connection and blank off the high pressure outlet from the accumulator. Repeat the test. If the symptoms persist then the accumulator valve body has an internal leak and the valve assembly should be overhauled. If however, the gauge now behaves correctly and the pumps can be heard to 'cut-out' the leakage is occuring downstream and further checks will be necessary in order to isolate the faulty item.

The component isolating procedure necessary to locate the fault consists of depressurising the systems then removing or blanking off the pressure feed to the various components in turn and repeating the test procedure.

The pressure feeds to the components can be readily identified from the colour coding chart (see Section G3) and the symptoms for determining whether units are functioning correctly are given under the applicable test procedures within the respective sections.

Note

When a unit has been blanked off, before removing the blank the systems must be depressurised either by continuous system operation with the engine switched off or by bleeding the appropriate accumulator until it is depressurised.

If when the engine is started, the gauge works correctly and the accumulator controls at between 168 kg/sq.cm. and 182 kg/sq.cm. (2 400 lb/sq.in. and 2 600 lb/sq.in.) but then the pressure drops steadily without brake or height control actuation, until the accumulator allows the pump to cut in again at between 130 kg/sq.cm. and 133,6 kg/sq.cm. (1 850 lb/sq.in. and 1 900 lb/sq.in.) a leak in the system is indicated and the component checking procedure should be carried out to determine the location.

After tests have been carried out involving blanking off components all blanks should be removed and components reconnected. The systems should then be bled in accordance with the information given in Section G4.

Section G8

Deceleration conscious pressure limiting valve

Introduction

The pressure limiting valve is non-adjustable and should not require servicing other than renewing the valve seals at the recommended mileage. Refer to Service Schedule Manual publication number T.S.D. 4117 for this information.

If a valve is found to be faulty, usually indicated by premature rear brake locking, it should be removed from the car and overhauled.

Pressure limiting valve - To remove

1. Place the car on a ramp and remove the undershield protecting the brake actuation linkage.
2. Depressurise the hydraulic systems as described in Section G2.
3. Disconnect the two pipes from the pressure limiting valve; blank off the pipe ends and valve ports.
4. Remove the split pins and nuts from the two valve mounting bolts; withdraw the bolts and remove the valve and distance pieces.

On left-hand drive cars the angular end plate must be removed to enable the valve and distance pieces to be removed from the mounting bolts.

Pressure limiting valve seals - To renew (see Fig. G13)

1. Remove the pressure limiting valve as described previously.
2. Remove the end plug and sealing washer from the valve body. Invert the valve and remove the spacer and ball.
3. Remove the insert and rubber seal from the bottom of the valve bore. Fit a new seal on the insert.
4. Fit the insert and seal, then the ball, spacer and end plug. Ensure that a new seal is fitted to the end plug.
5. Torque tighten the end plug to the figure quoted in Chapter P.

Pressure limiting valve - To fit

To fit the pressure limiting valve reverse the procedure given for removal noting the following.

1. All nuts must be torque tightened in accordance with the figures quoted in Chapter P prior to the split pins being fitted.
2. On completion the hydraulic systems must be bled as described in Section G4.

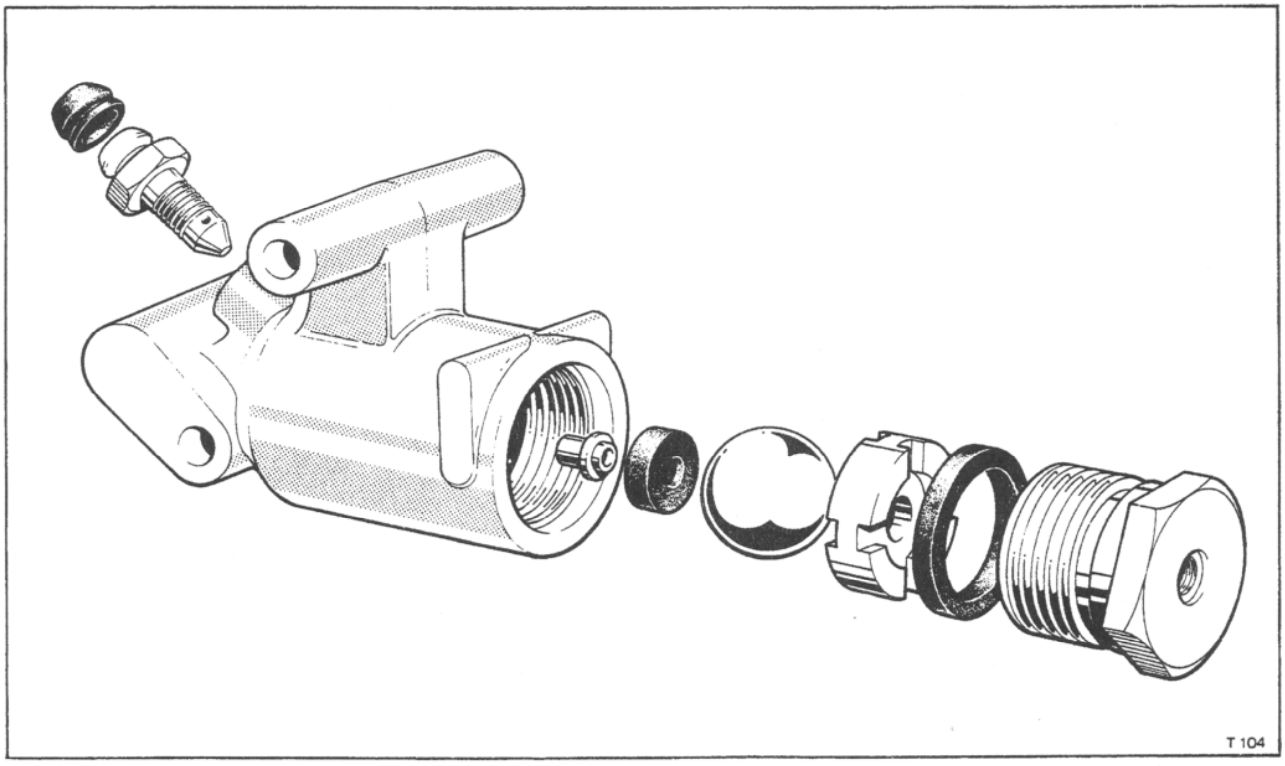

Fig. G13 Deceleration conscious pressure limiting valve

Section G9

Brake distribution valves

Introduction

The brake distribution valves are situated one above the other within the brake actuation linkage assembly and are operated through linkage and a balance lever arrangement when the foot brake is applied (see Fig. G15).

The distribution valves are identical in operation but are not interchangeable due to differing mounting points and pipe arrangements. Corresponding valves on right-hand and left-hand drive cars are identical.

Complete distribution valve assemblies are available as service exchange units. Only the rubber end cover, return spring and end plug sealing washer are available as separate items. The remaining working parts are subject to very fine limits and are therefore selectively assembled by the manufacturer.

Note

The design of the valve is such that to provide adequate lubrication to the 0,0025 mm. (0.0001 in.) clearance between the operating valve and its bore a small fluid 'leak-off' is permitted. This leakage is visible and takes the form of a small droplet of fluid hanging from the valve base. This is normal.

When deciding whether a valve is leaking excessively, in order to warrant renewal or overhaul; if the fluid 'leak-off' does not impair the braking efficiency of the car or cause a noticeable drop in fluid level in the reservoir, then the valves should be regarded as satisfactory.

Brake distribution valves - To test (on the car)

1. Place the car on a ramp. Isolate the gearchange selector and depressurise the systems as described in Section G2.

2. Remove the undershield from around the brake actuation linkage.

3. Connect a zero kg/sq.cm. to 210 kg/sq.cm. (zero lb/sq.in. to 3 000 lb/sq.in.) pressure gauge with a length of high pressure pipe attached, into the high pressure outlet port of the distribution valve (blue or mauve pipe) or into any convenient junction between the valve and the brake calipers it supplies. The brake caliper bleed screw ports may be used if desired.

4. Start the engine then depress the brake pedal. The brake line pressure shown on the gauge should be proportional to the load applied to the pedal provided the accummulators are fully charged. For a 20,4 kg. (45 lb.) load on the pedal, the line pressure should be approximately 70,31 kg/sq.cm. (1 000 lb/sq.in.), It should also be possible to achieve a line pressure of 140,62 kg/sq.cm. (2 000 lb/sq.in.) for a pedal pressure of approximately 34,0 kg. (75 lb.).

When the brake pedal load is varied continuously, the brake line pressure should vary accordingly, without any marked lag or jerkiness.

If the above effort/pressures are not obtainable or actuation shows marked lag or jerkiness on the gauge, the distribution valve may be considered faulty and must be overhauled or renewed.

5. If a system internal leakage investigation, as described under Hydraulic accumulator - To test, show a distribution valve to be the cause of a loss of accumulator pressure the actual leakage can be checked as follows.

6. Disconnect the low pressure return line from the distribution valve port (black or white pipe). Blank the end of the pipe to prevent drainage of the reservoir.

7. Insert a union and a length of pipe into the distribution valve low pressure return port and place the open end of the pipe into a clean container.

8. Start the engine but do not depress the brake pedal.

9. Top-up the reservoir continuously to prevent the hydraulic fluid from falling below the 'minimum' level mark.

For the valve to be acceptable the fluid leakage should not exceed 25 ml. per half hour with the valve in the 'off' position (ie. brake pedal not applied) or 50 ml. per minute with the brake pedal depressed and held steady under a load of 20,41 kg. (45 lb.) which is equivalent to a brake line pressure of 70,31 kg/sq.cm. (1 000 lb/sq.in.). If the valve leakage exceeds these figures it must be overhauled or renewed.

Brake distribution valves - To remove

1. Place the car on a ramp and depressurise the hydraulic systems as described in Section G2.

2. Remove the undershield from around the brake actuation linkage.

3. Remove the pipes from each valve. Blank off the pipe ends and valve ports.

4. Unlock and remove the securing bolts from each valve, draw the rubber boot seal off the valve. Taking care not to bend the valve actuation push rod, move each valve forward and downward, out of the actuation linkage assembly.

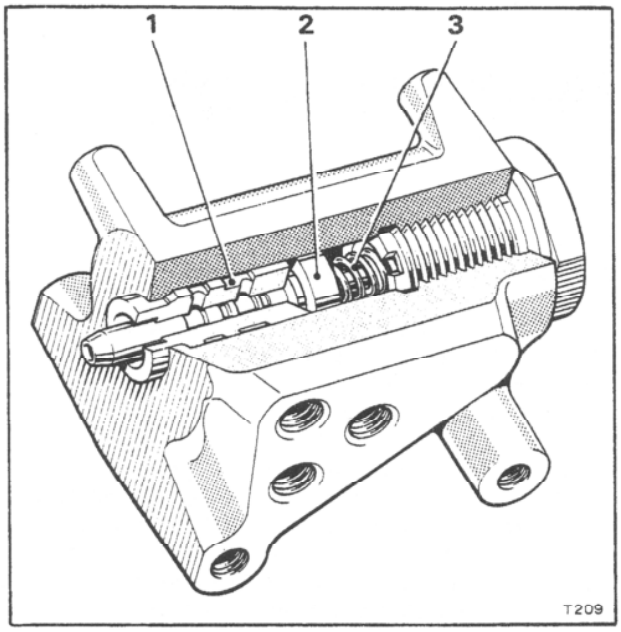

Fig. G14 Distribution valve
1 Valve insert
2 Valve stem
3 Return spring

Brake distribution valve - To dismantle (see Fig. G14)
1. Remove the end plug and sealing washer; collect the return spring.
2. Carefully remove the valve stem. Extreme care should be taken to ensure that the valve stem and its operating bore do not become scratched or damaged.
3. Carefully wash all parts in methylated spirits and dry with clean, dry compressed air.

Brake distrubition valve - To inspect
1. Carefully examine the fine limit bore of the valve insert and the outside diameter of the valve stem. Each surface should be smooth and free from scratches.
2. Lubricate the bore of the valve insert and the valve stem with clean brake fluid. Carefully fit the valve stem into the valve insert bore and check for any axial wear. There should only be sufficient clearance to allow the valve stem to slide freely in the bore, the stem and bore having a clearance of 0,0025 mm. (0.0001 in.).
3. Wash the parts in methylated spirits and dry with clean, dry compressed air.

Brake distribution valves - To assemble
1. Lubricate the bore of the valve insert and the valve stem with approved brake fluid (see Chapter D).
2. Carefully insert the valve stem into the valve insert bore until fully seated. Fit a new return spring.
3. Fit a new sealing washer to the end plug. Fit and torque tighten the plug to the figure quoted in Chapter P.
4. Ensure that the inward and return movement of the valve stem is smooth and does not bind or stick at any point along its travel.

Brake distribution valves - To fit
Fit the distribution valves by reversing the procedure given for removal noting the following points.
1. If a replacement valve is being fitted, remove one of the blanking plugs and allow any fluid to drain from the valve. Re-fit the plug.
2. Torque tighten the mounting bolts and pipe connections in accordance with the figures quoted in Chapter P. Lock the securing bolt tab washers.
3. On completion the hydraulic systems must be bled as described in Section G4.

Section G10

Brake actuation linkage assembly

Introduction

The brake actuation linkage assembly is mounted just rearward of the toe-board. On right-hand drive cars the assembly is positioned just inboard of the body sill. On left-hand drive cars the assembly is fitted adjacent to the inner side of the body longeron.

The assembly houses the distribution valves, deceleration conscious pressure limiting valve and the stop lamp switch; the assembly being the same for both right and left-hand drive cars.

Brake actuation linkage assembly - To remove

1. Place the car on a ramp; depressurise the hydraulic systems as described in Section G2.
2. Disconnect the battery.
3. Remove the undershield from around the linkage assembly.
4. Disconnect the Lucar connections, then remove the brake stop lamp switch and mounting bracket.
5. Remove the brake pedal pinch bolt from the upper end of the brake pedal lever and ease the pedal stem out of the lever. Collect the rubber seal.
6. Disconnect the pipes from the distribution valves and deceleration conscious pressure limiting valve. Blank off all exposed pipe ends and valve ports.

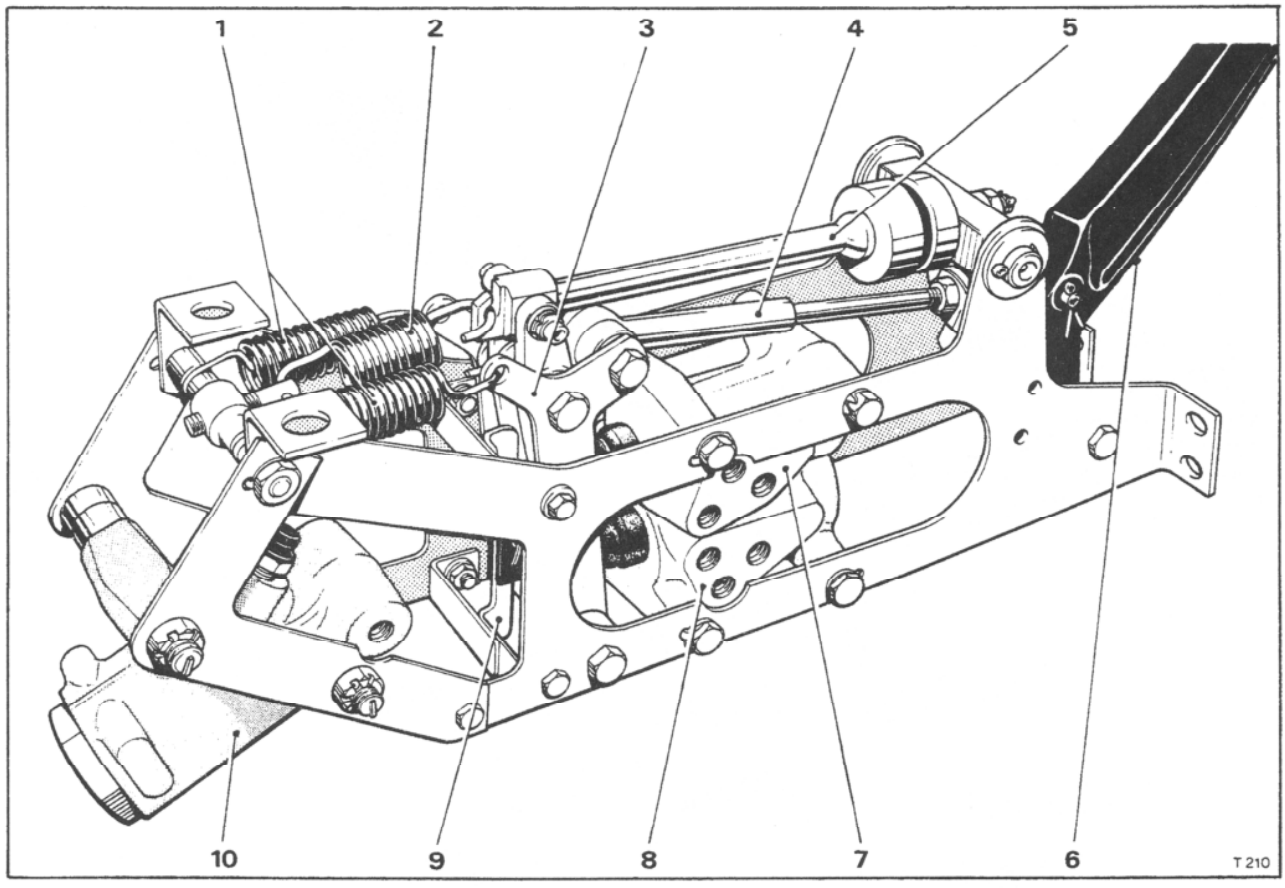

Fig. G15 Brake actuation linkage assembly

1 Return springs
2 Pedal 'feel' spring
3 Balance lever assembly
4 Brake actuation rod
5 Pedal 'feel' rod
6 Brake pedal lever
7 Upper distribution valve (System 1)
8 Lower distribution valve (System 2)
9 'Off' stop bracket
10 Deceleration conscious pressure limiting valve

7. On right-hand drive cars disconnect the petrol pipe clip from the linkage side mounting bracket.
8. Remove the setscrews (right-hand drive cars) or bolt and nuts (left-hand drive cars) securing the linkage assembly side plates at the forward end. Support the linkage assembly and remove the two rear securing setscrews. Lower the assembly from the car.

On left-hand drive cars, the brake pedal lever must be withdrawn from the rubber sealing boot when lowering the actuation linkage from the car.

Important

Under no circumstances should the brake actuation assembly be allowed to hang from the brake pedal, supported by the actuation rod,as this may result in the rod being bent.

Brake actuation linkage - To dismantle

Prior to dismantling the linkage note should be taken of the relative positions of the distance pieces and bolt directions (see Figs. G15 and G16.).

1. Remove the brake actuation linkage from the car as described previously.
2. Remove the split pin and clevis pin from the operating rod pivot on the brake pedal lever.
3. Remove the three springs from the rear of the linkage.

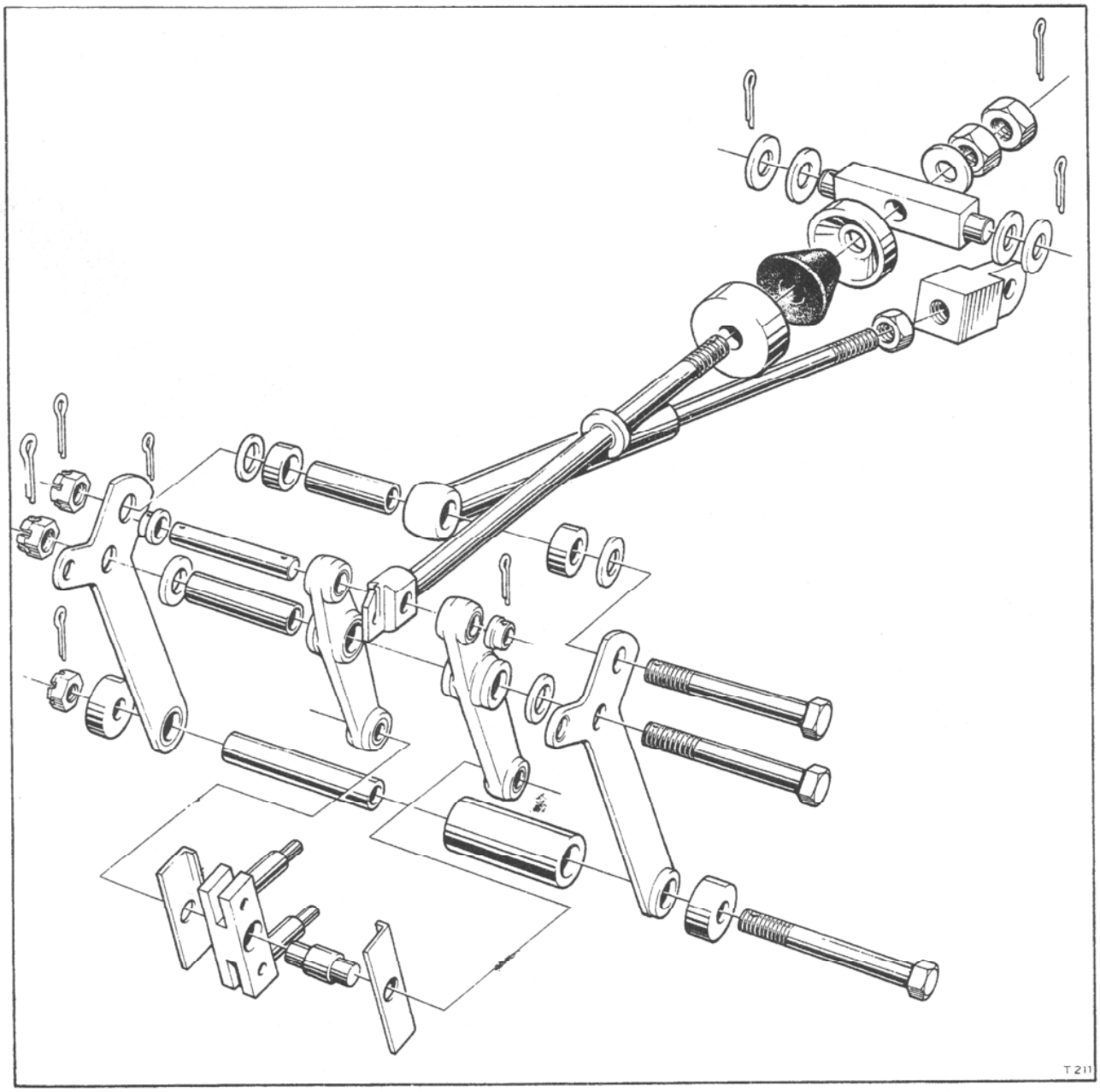

Fig. G16 Brake actuation linkage balance lever assembly

4. Remove the split pin and nuts from the end of the pedal 'feel' rod.
5. Remove the 'off' stop bracket from behind the balance levers.
6. Remove the pivot bolt from the lower end of the balance levers. Ease the levers rearward and carefully withdraw the balance lever push rods from the distribution valves. Remove the distance pieces and pivot tube from the lower end of the balance levers.
7. Lift the levers clear of the side plates and withdraw the 'feel' rod from its retaining bar. Collect the conical rubber and abutment cups.
8. Remove the split pin from one side of the 'feel' rod pivot pin; withdraw the pin and collect the collar.
9. Remove the two bolts retaining the pivot arms to the balance levers. Noting their positions collect the washers, distance pieces and pivot tubes.
10. Remove the balance levers from each side of the distribution valve push rod equalising block, collect the pin retaining plates.

Note
The levers and pivot pins are clearance fits and are easily removed.

Brake linkage assembly bushes and pivot pins - To renew
1. Remove and dismantle the brake linkage as described previously.
2. Carefully press the bushes requiring renewal out of their locations and fit new bushes. The bush bores are machined to final size, therefore no reaming or boring is necessary.
3. Any pivot pins that are worn or damaged must be renewed.

Brake actuation linkage - To assemble
Assemble the linkage by reversing the dismantling procedure noting the following points.
1. Clean all components prior to assembly. Lightly lubricate the linkage pivots, the protruding parts of the distribution valve stems and the push rod location bores with Molytone 'C' grease.
2. All bolts and nuts must be torque tightened to the figures quoted in Chapter P before split pins are fitted and tab washers secured.
3. The linkage should operate freely when located between the assembly side mounting plates. All levers must be absolutely free to move with negligible friction on their pivots. Distance tubes must be similarly free in the Oilite bushes.

Note
All bolts should be fitted in the directions shown in Figure G15 in order that certain individual items may be removed without removing the complete assembly from the car.

Brake actuation linkage - To adjust
Adjustment of the actuation linkage should be carried out in the following sequence.
(a) Distribution valve push rod clearance.
(b) Rubber 'feel' cone setting.
(c) Main 'feel' spring setting.
(d) Brake pedal height setting.

Note
Adjustments 'a', 'b' and 'c' can be carried out with

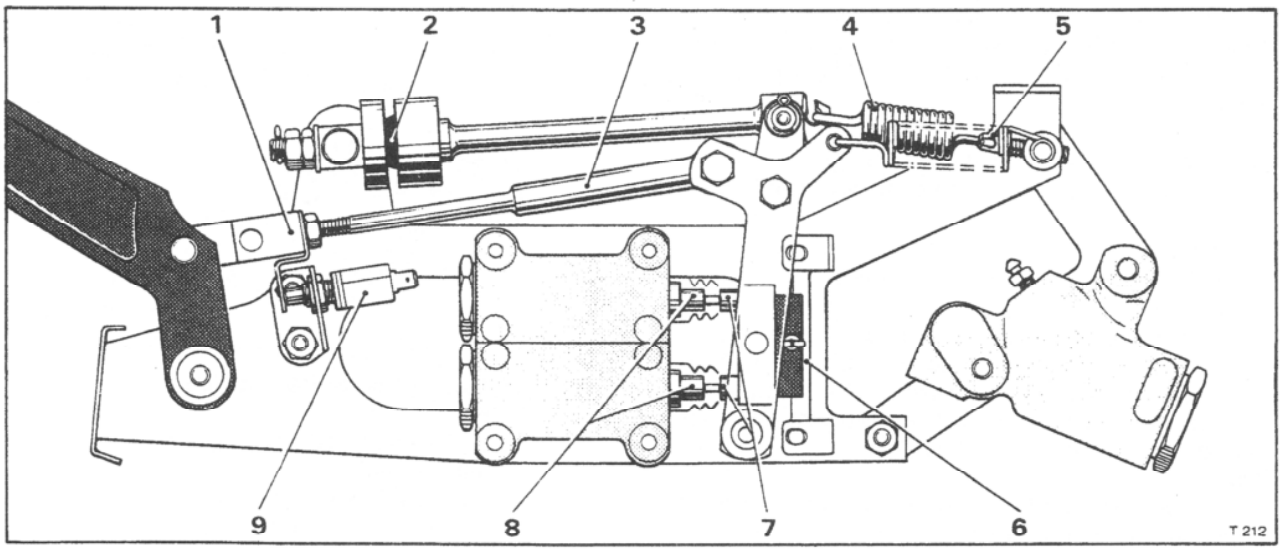

Fig. G17 Brake actuation linkage adjustment points
1 Brake pedal lever adjustment block
2 Rubber 'feel' cone
3 Brake actuation operating rod
4 Main 'feel' spring
5 'Feel' spring adjustment screw
6 Off stop bracket
7 Balance lever push rods
8 Distribution valve stems
9 Brake stop lamp switch

the actuation linkage assembly removed from the car.

Distribution valve push rods - To set (see Fig. G17)
1. Slacken and unscrew the brake 'feel' rod adjusting nuts until clearance is obtained between the feel rod mounting block and the rubber cone seat.
2. Remove the 'feel' and return springs.
3. Slacken the four bolts securing the 'off' stop bracket to the actuation linkage side plate.
4. Slide the 'off' stop bracket forward on the elongated holes until a clearance of up to 0,254 m.m. (0.010 in.) is obtained between the balance lever push rods and the distribution valve stems; with no preload being applied to the valve stems. Ensure that the setting is equal on each valve, then tighten the bracket securing bolts.

Note
It will be necessary to draw back the two rubber dust covers on the distribution valves in order to check the push rod to distribution valve stem clearance.

Rubber 'feel' cone - To set (see Fig. G17)
1. Fit the two return springs to the linkage assembly. At this point the two abutment cups and the rubber 'feel' cone should be loose and free to slide on the shaft.
2. Tighten the adjusting nut until the clearance between the abutment cups and the rubber cone has been removed, without a preload being applied to the rubber cone.
3. Securely tighten the lock-nut onto the adjusting nut, then depress and release the brake pedal several times to ensure that the cone is seated correctly. Recheck the cone setting. Ensure that a security split pin is fitted to the end of the shaft.

Main 'feel' spring - To set (see Fig. G17)
1. Ensure that the actuation assembly remains in the 'off' position.
2. Fit one end of the 'feel' spring into the adjusting screw fitted in the centre of the spring anchor rod.
3. Rotate the spring and screw half a turn at a time in the direction required until the spring can be fitted into the 'feel' rod hook, with no clearance between the spring and hook, ensure that there is no spring preload.

Note
It is necessary to stretch the spring over the hook to obtain the correct position where clearance is determined.

4. Remove the spring from the hook and rotate the spring and screw 1½ turns clockwise, when viewed from the brake pedal end of the assembly (ie. effectively tensioning the spring). Fit the spring onto the hook.

Note
It is essential to follow both of the previous setting instructions accurately as deviations will completely alter the subjective feel and accepability of brake control.

Clearance between the rubber 'feel' cone and its abutments will cause a spongy, long travel pedal feel at low decelerations; any preload on this rubber will cause jerky initial braking under these conditions.

Inadequate preload on the rear tension spring will produce unwanted free travel at the pedal followed by jerky initial braking; too much preload on this spring will give jerky initial braking followed by a period of 'spongy' pedal travel.

Brake pedal height setting (see Figs. G18 and G19)
This setting can only be carried out with the actuation linkage assembly fitted to the car.
1. Locate the setting gauge into the brake pedal stem hole in the end of the pedal lever (see Fig. G18). Raise the pedal lever until the gauge touches the underside of the toe-board seal housing.
2. Adjust the block on the lever operating rod until the hole in the block aligns with the hole in the pedal lever.

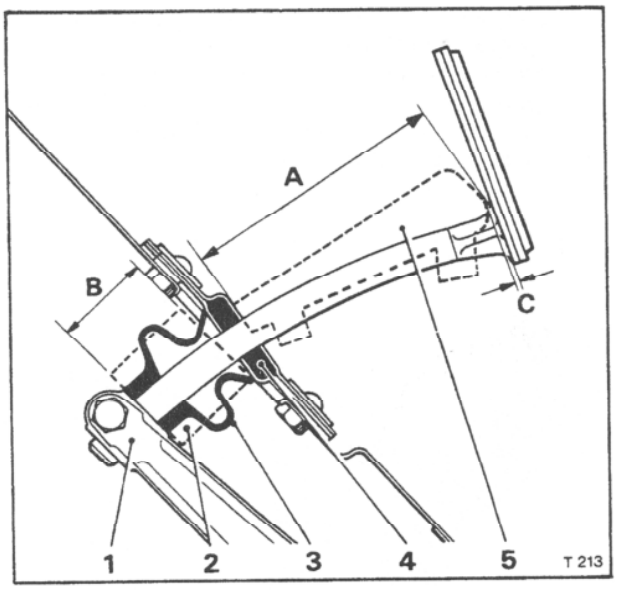

Fig. G18 Brake pedal height settings
1 Brake lever
2 Brake lever setting gauge
3 Rubber seal
4 Toe-board seal and housing
5 Pedal height checking template
A 99,06 mm. to 98,30 mm. (3.90 in. to 3.870 in.)
B 38,10 mm. to 37,97 mm. (1.50 in. to 1.495 in.)
C 0,38 mm. to 5,08 mm. (0.015 in. to 0.20 in.)

Note
Shortening the rod length reduces the gap between the pedal lever and seal plate, half a revolution of the block being equal to approximately 3,17 mm. (0.125 in.) of pedal lever movement.

3. Remove the setting gauge from the brake lever. Connect the rod to the lever by inserting the clevis pin. Fit the split pin.
4. Fit the rubber seal between the brake pedal lever and toe-board seal plate.

On left-hand drive cars slide the convoluted rubber seal over and down the brake pedal lever; fit the two retaining screws and washers. Ensure that the seal does not prevent the lever and linkage returning to the fully 'off' position.

5. Insert the brake pedal through the toe-board felt and rubber seals into the hole in the brake pedal lever.
6. Fit and tighten the pinch bolt to secure the brake pedal lever.
7. Check that the rubber seal does not prevent the actuation linkage returning to the 'off' position and that the brake pedal does not foul the seal housing at any point along its travel.
8. Fit the brake stop lamp switch and adjust the setting as described under Brake stop lamps switch - To adjust.

Brake pedal height - To check
1. Place the checking template as shown in Figure G18 between the underside of the brake pedal and the upper surface of the pedal seal housing with the two lugs of the gauge located under the pedal stem. Rest the flat base of the template on the seal housing. Ensure that both carpet and underlay are removed from the housing surface.
2. If the clearance between the top of the template and the underside of the pedal is less than 0.38 mm. (0.015 in.) or more than 5,08 mm. (0.20 in.) adjust the length of the pedal lever rod as described in Brake pedal height setting.

Brake pedal lever - To remove
1. Place the car on a ramp and remove the undershield from around the brake actuation linkage.
2. Disconnect the battery.
3. Disconnect the Lucar connections and remove the stop lamp switch.
4. Remove the brake pedal stem pinch bolt from the top of the pedal lever and withdraw the stem out of the lever. Collect the rubber seal from the pedal stem.
5. Remove the split pin and clevis pin from the operating rod pivot on the pedal lever.
6. Remove the bolt and nut from the pedal lever pivot. Remove the lever and collect the pivot tube. On left-hand cars it is necessary to withdraw the lever from the convoluted rubber seal during final removal.

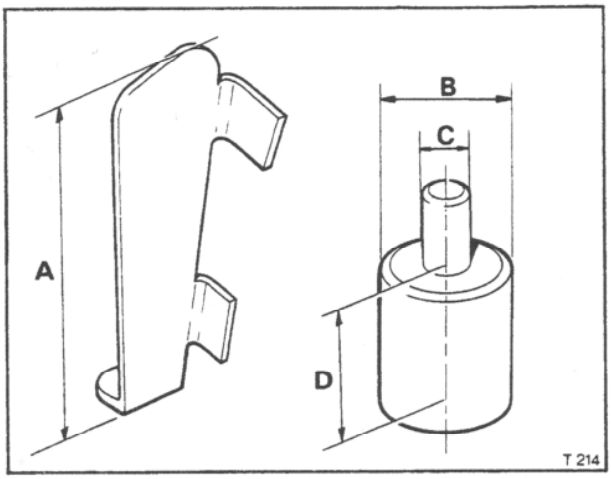

Fig. G19 Brake pedal setting gauge and checking template
- A 99,06 mm. to 98,30 mm. (3.90 in. to 3.870 in.)
- B 34,92 mm. to 34,29 mm. (1.375 in. to 1.350 in.)
- C 12,50 mm. to 12,44 mm. (0.492 in. to 0.490 in.)
- D 38,10 mm. to 37,97 mm. (1.50 in. to 1.495 in.)

Brake pedal lever - To fit
To fit the brake pedal lever reverse the procedure given for removal noting the following points.
1. All nuts must be torque tightened to the figures quoted in Chapter P.
2. The pedal lever and the stop lamp switch must be checked for correct operation and adjusted if necessary as described under the appropriate headings in this section.

Brake stop lamp switch - To adjust
With all other adjustments to the brake actuation linkage and brake pedal completed, set the brake stop lamp switch as follows.
1. Slacken the nuts retaining the stop lamp switch to the switch mounting bracket.
2. Switch on the ignition.
3. Adjust the switch position until the stop lamps are illuminated during the initial movement of the footbrake pedal; between 3,2 mm. and 9,5 mm. (0.125 in. and 0.375 in.) of brake travel.
4. Tighten the retaining nuts and again check the stop lamps for operation.
5. Switch off the ignition.

Section G11

Solenoid and Restrictor valves

Introduction

The height control solenoid valve and both the high pressure and low pressure restrictor valves are situated on the rear face of the rear suspension crossmember.

A complete solenoid valve can be obtained as a service exchange item or the valve dismantled and overhauled as follows.

Solenoid valve - To remove

1. Depressurise the hydraulic systems as described in Section G2.
2. Disconnect the battery.
3. Remove the Lucar connections from the solenoid valve.
4. Disconnect the three hydraulic pipes and blank off the pipe ends and solenoid valve ports.
5. Remove the two setscrews securing the solenoid valve to the rear suspension crossmember. Remove the solenoid valve.

Solenoid valve - To dismantle (refer to Fig. G20)

1. Remove the retaining clips from the protective rubber cover. Remove the cover to expose the solenoid end face.
2. Unlock the tab washer and remove the nut; discard the tabwasher.
3. Remove the flux plate, carefully withdrawing the two cables from the plate.
4. Note the position of the sealing ring situated immediately behind the flux plate to facilitate assembly (see Fig. G22). Remove and discard the sealing ring.
5. Carefully withdraw the coil from the housing.
6. Remove the spacer.
7. Remove the housing from the solenoid body; remove and discard the sealing ring.
8. From the opposite end of the solenoid valve, remove the lock-nuts then unscrew and remove the valve seat. Remove and discard the sealing ring.
9. Remove the bobbin assembly from the main bore of the solenoid valve. Collect the shims which are situated between the faces of the bobbin and cone valve.
10. Remove the cone valve body from the main bore of the solenoid valve; remove and discard the sealing ring.
11. Remove the cone valve from the body and collect the return spring.
12. Wash all non-electrical parts in methylated spirits and dry with clean dry compressed air, not cloth. Wipe clean the electrical components.
13. Inspect the components for any signs of wear and damage, renew as necessary. Check that the two valves are seating correctly.
14. Check the insulation resistance of the coil. The resistance between either lead and the coil measured at 250 volts DC must not be less than 2 megohms. Renew the coil if necessary.

Note

If leakage is suspected from the joint seal between the solenoid body and extension, the sub-assembly should be renewed. No attempt should be made to correct the fault.

Solenoid valve - To assemble (refer to Figs. G21 and G22)

Assemble the solenoid valve by reversing the dismantling procedure noting the following points.

1. It is essential that all parts are thoroughly cleaned before assembly.
2. Fit the sealing ring to the main valve body. Lightly lubricate the sealing ring with Molytone 'C' grease then slide the outer casing into position.
3. Lubricate the non-electrical components and sealing rings with approved brake fluid (see Chapter D). Note the position of the sealing ring situated between the coil and the flux plate. This ring must be left dry, then cut and suitably positioned to clear the electrical wiring (see Fig. G22).
4. Assemble the bobbin, cone valve and cone valve body without the return spring. Selectively fit shims to point Y shown in Figure G21 until a gap of between 0,20 mm. and 0,28 mm. (0.008 in. and 0.011 in.) is obtained at point Z with the cone valve fully seated. Carefully remove the cone valve body and fit the cone valve return spring prior to fitting the assembly into the main body bore.
5. Set the gap X between the opposing faces of the valve and bobbin assembly and the valve seat to between 0,508 mm. and 0,635 mm. (0.020 in. and 0.025 in.). To obtain this setting, energise the solenoid; push the valve seat fitted with a new sealing ring into the bore of the body assembly; screw in the adjusting sleeve until the valve seat touches the nylon seat of the bobbin.

Checking with a dial test indicator or depth micrometer screw out the adjusting sleeve between 0,508 mm. and 0,635 mm. (0.020 in. and 0.025 in.). Fit and tighten the large lock-nut ensuring that the adjusting sleeve is not rotated.

De-energise the solenoid. This pushes the valve seat against its stop on the adjusting screw. Fit

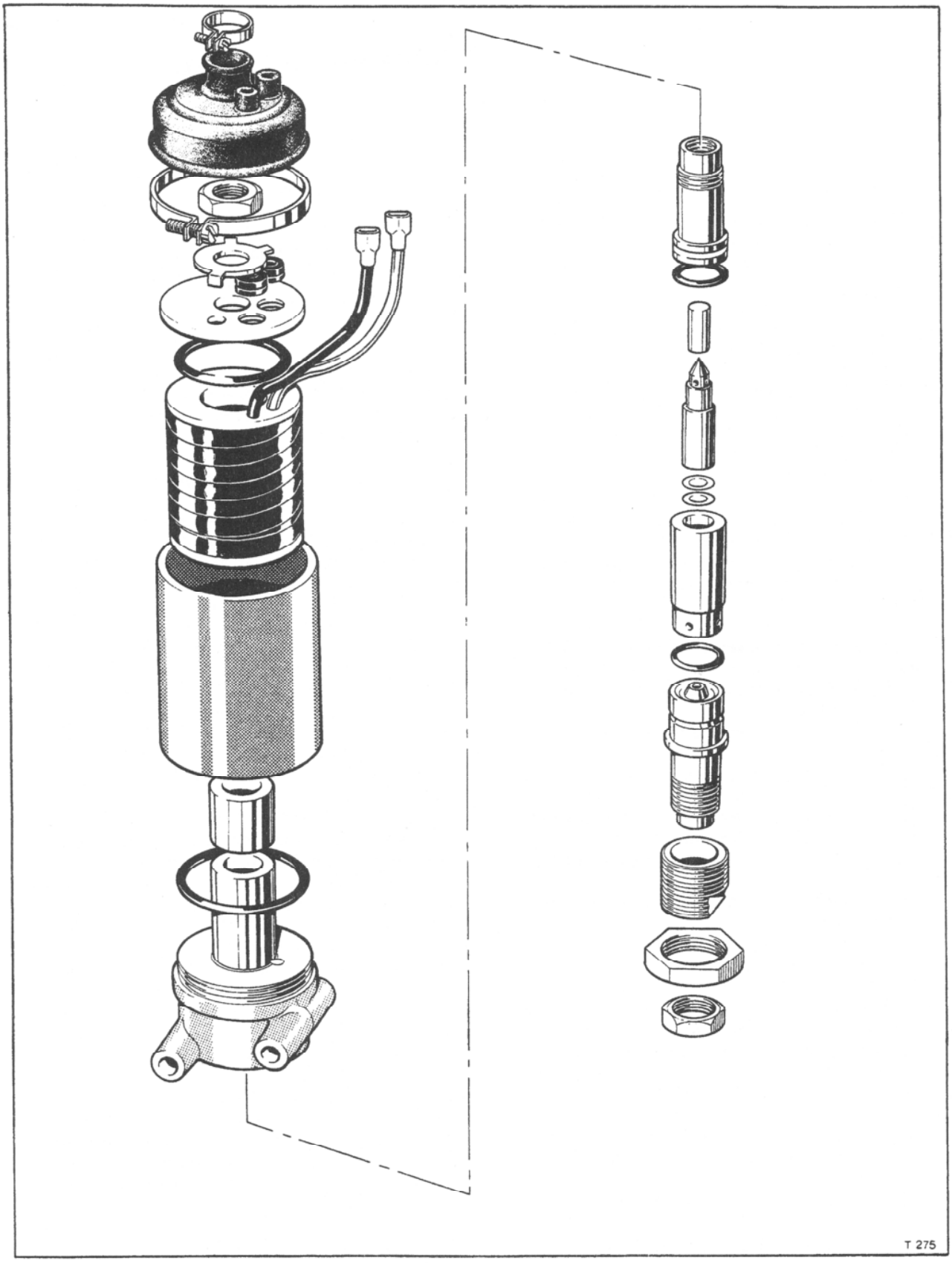

Fig. G20 Height control solenoid valve

and tighten the lock-nut to the valve seat. To avoid damage to the sealing ring ensure that the valve seat does not rotate in the housing.

Note

It is important all the lock-nuts are tightened in the above order and in accordance with the torque figures quoted in Chapter P.

6. Ensure that the solenoid protective rubber cover is clean and in good condition before fitting, renew if necessary.
7. Fit blanking plugs to each port of the valve until the valve is fitted to the car.

Solenoid valve - To fit

Fit the solenoid valve by reversing the procedure given for its removal noting the following points.

1. Torque tighten the setscrews and pipe connections in accordance with the figures quoted in Chapter P.
2. After fitting, bleed the hydraulic system as described in Section G4.

Solenoid valve - To test

If either 'slow' or 'fast' height control is not available the solenoid valve may be checked for correct operation on the car as follows.

1. Run the engine to fully charge the hydraulic systems. Stop the engine but leave the ignition switched on.
2. Disconnect one of the electrical connections from the solenoid valve. This disconnection should cause a light audible click from the solenoid valve. If this is not apparent the valve or electrical circuit is faulty.

If during this valve disconnection test a 'hissing' noise is evident when the electrical

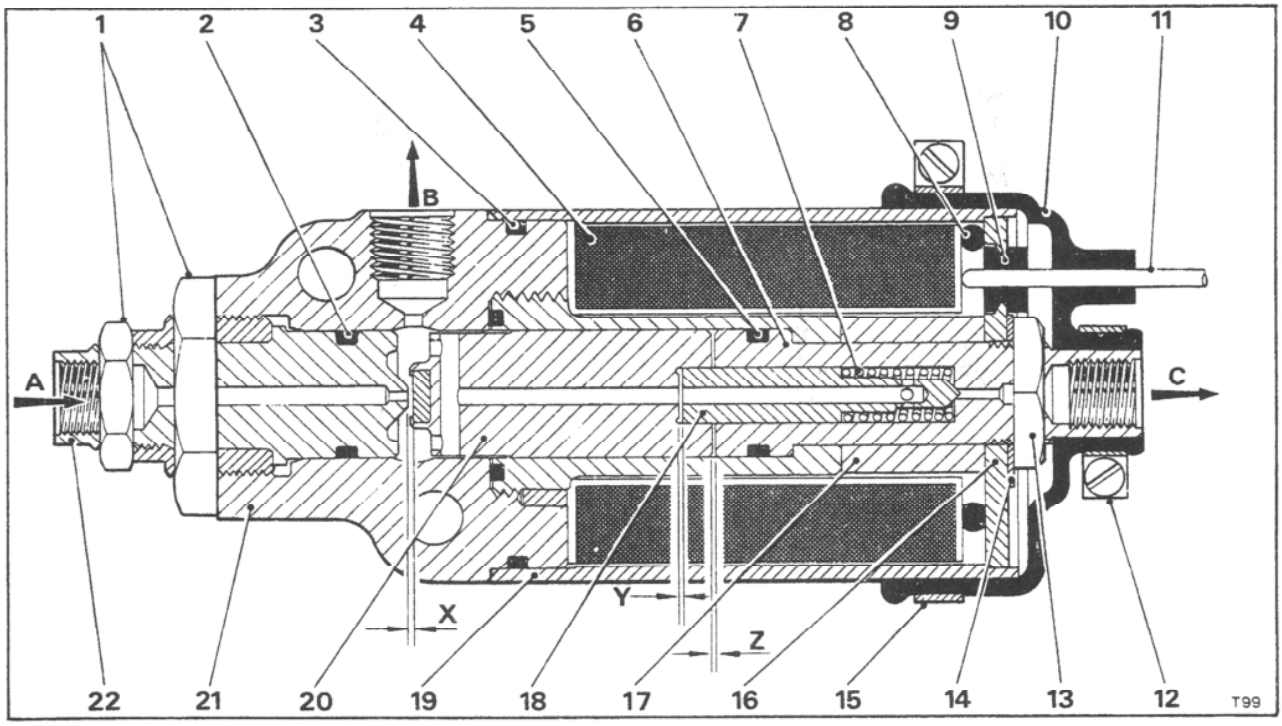

Fig. G21 Height control solenoid valve

1 Locknuts
2 Valve seat sealing ring
3 Coil housing sealing ring
4 Coil
5 Cone valve body sealing ring
6 Cone valve body
7 Return spring
8 Sealing ring (see Fig. 22)
9 Grommet
10 Protective cover
11 Lucar connector lead
12 Retaining clip
13 Lock nut
14 Tabwasher
15 Retaining clip
16 Flux plate
17 Spacer
18 Cone valve
19 Coil housing
20 Bobbin
21 Body and extension assembly
22 Valve seat
A High pressure inlet
B Connection to height control valves
C Low pressure return to reservoir
X Gap 0,50 mm. to 0,63 mm. (0.020 in. to 0.025 in.)
Y Shims - suitable thickness to obtain gap Z
Z 0,20 mm. to 0,28 mm. (0.008 in. to 0.011 in.)

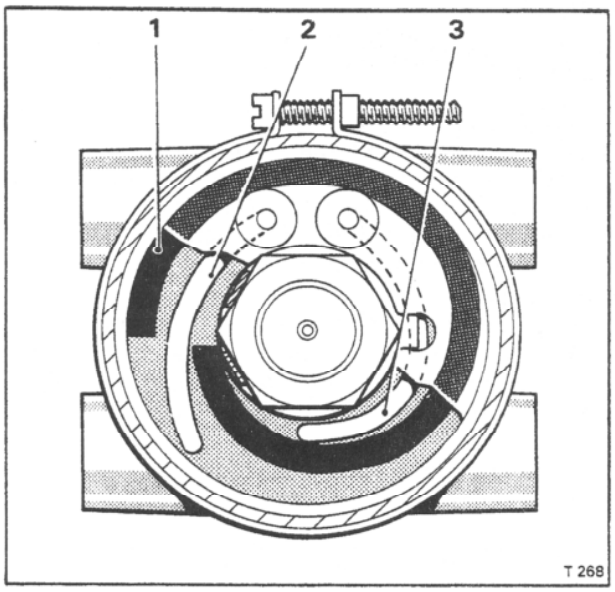

Fig. G22 Height control solenoid valve sealing ring position
1 Sealing ring (cut and positioned)
2 Lucar connector lead
3 Lucar connector lead

connection is disconnected a faulty high pressure valve seat is indicated and the solenoid valve must be overhauled or renewed.

3. Check the electrical circuit by removing the two electrical connections from the solenoid valve and connecting a jumper lead and lamp across the two leads. When the ignition is switched on the lamp should illuminate if the electrical circuit is operating correctly.

4. Remove the jumper lead and lamp and connect it between the solenoid valve terminal and one of the disconnected wires; connect the other wire to the solenoid. If the lamp illuminates when the ignition is switched on, the windings are sound. If the windings are faulty the solenoid valve must be overhauled or renewed.

5. If it has been determined that the solenoid valve is operating correctly but 'fast' height control is still not operating, the solenoid valve restrictors should be checked for blockage as described under Solenoid valve restrictor - To dismantle.

If however it is evident that a leak is occuring in the system, to determine whether the solenoid valve is the cause proceed as follows.

6. Depressurise the systems.

7. Disconnect the solenoid return pipe from the solenoid valve (white line) and blank off the pipe. Insert a union and a length of pipe into the solenoid port and place the open end of the pipe into a clean container.

8. With the solenoid valve electrical leads disconnected (solenoid de-energised) start the engine and charge the hydraulic systems. The valve should hold the pressure internally with no leakage from the return pipe port.

9. Connect the electrical leads to the solenoid valve (solenoid energised) and again check that the valve holds internal pressure. A maximum leakage of 10 ml. from the return pipe port is permissible.

10. If the solenoid is then de-energised, with pressure applied to the inlet port, fluid should flow from the return port for a few seconds then cease. It should be noted however that if fluid does not flow from the port, the cause may be due to there being an easier fluid leak path elsewhere in the system or that the restrictor valves are blocked.

Solenoid valve restrictor - To remove

The two solenoid valve restrictors are incorporated into the high pressure (orange) pipe line and low pressure (white) pipe line respectively. They are both mounted on the rear suspension crossmember.

1. Depressurise the systems as described in Section G2.

2. Disconnect the hydraulic pipes from the restrictor and blank off the pipe ends.

3. Remove the setscrew securing the restrictor to the crossmember. Remove the restrictor.

Solenoid valve restrictor - To dismantle (refer to Fig. G23)

1. Remove the union plug from the restrictor body.

2. Invert the restrictor valve body and collect the sealing ring, restrictor plate, restrictor roller and end plates.

3. Thoroughly clean all components with methylated spirits and dry with clean compressed air.

Solenoid valve restrictor - To assemble

Assemble the restrictor by reversing the dismantling procedure noting the following points.

1. All parts must be thoroughly cleaned before assembly.

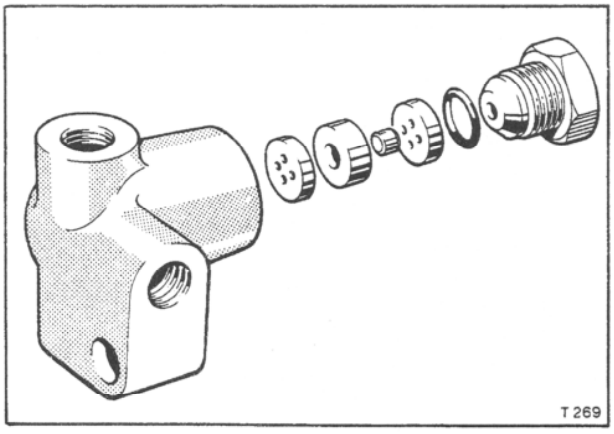

Fig. G23 Solenoid restrictor valve (high and low pressure pipe lines)

2. Ensure that the restrictor roller moves freely in the restrictor plate bore prior to fitting into the valve body.
3. Lightly smear the threads of the union plug with Molytone 'C' grease prior to fitting.
4. Torque tighten the union plug in accordance with the figure quoted in Chapter P.

Solenoid restrictor valve - To fit

Fit the solenoid restrictor valve by reversing the procedure given for removal noting the following points.

1. Torque tighten the valve securing setscrew and pipe connections in accordance with the figures quoted in Chapter P.
2. After fitting, bleed the hydraulic system as described in Section G4.