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

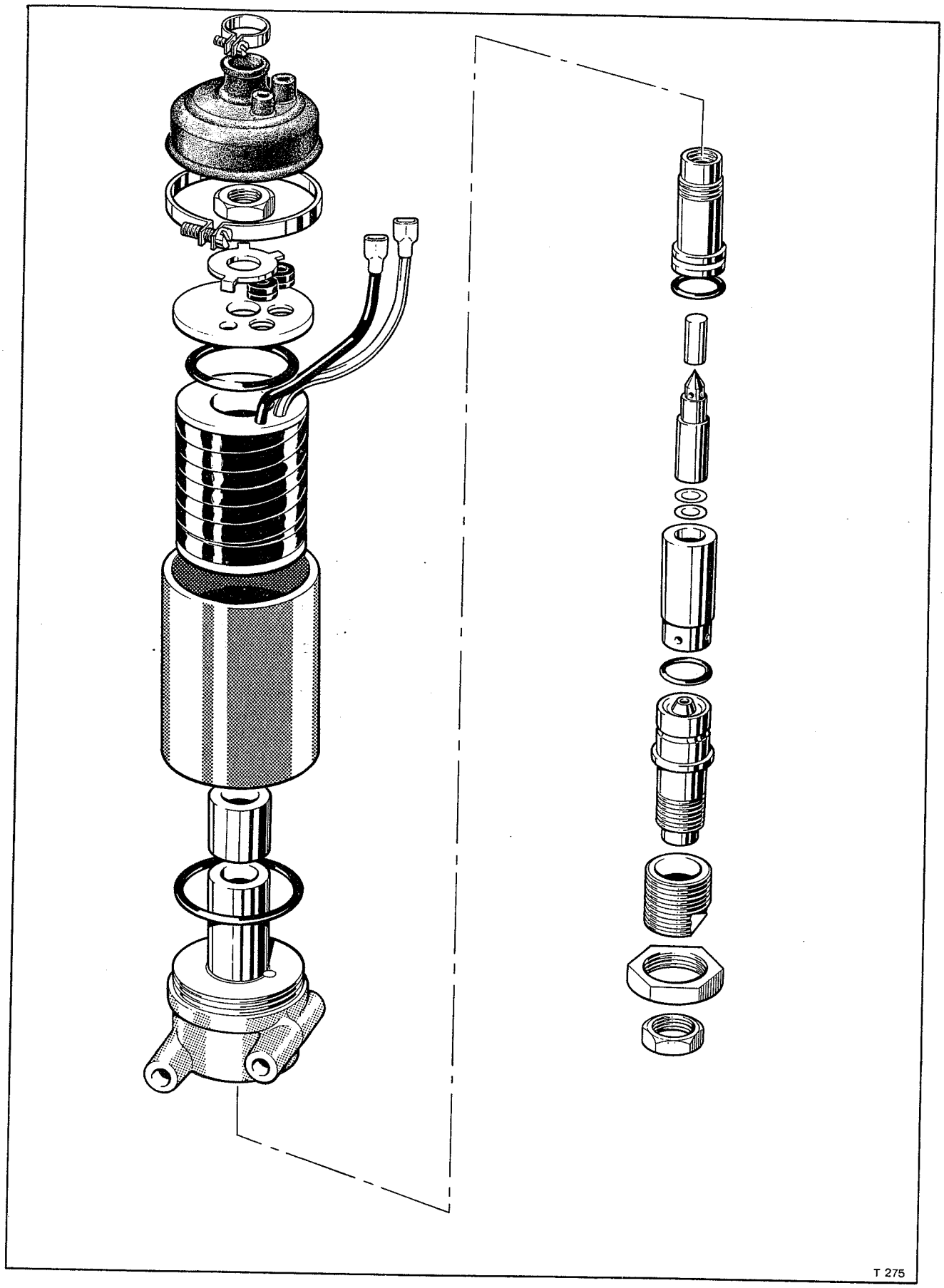

Fig. G20 Height control solenoid valve

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

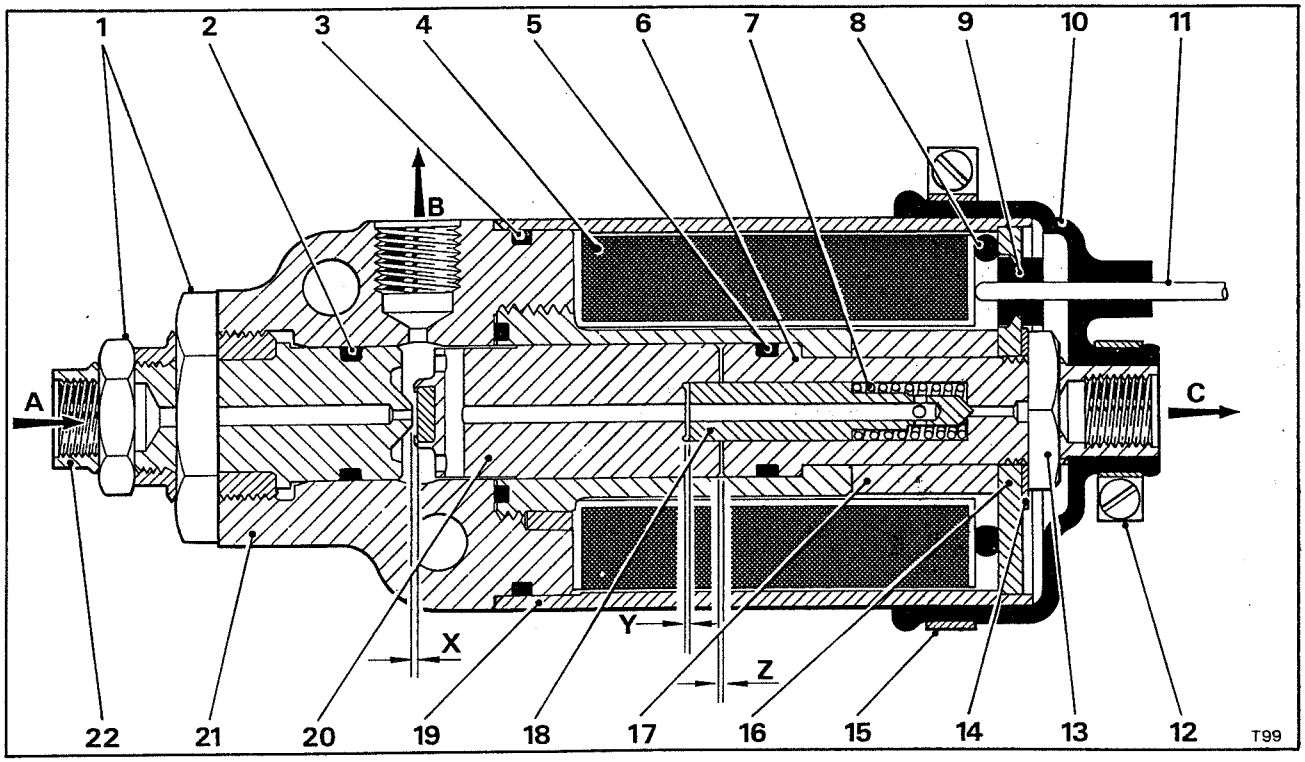

Fig. G21 Height control solenoid valve

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.)

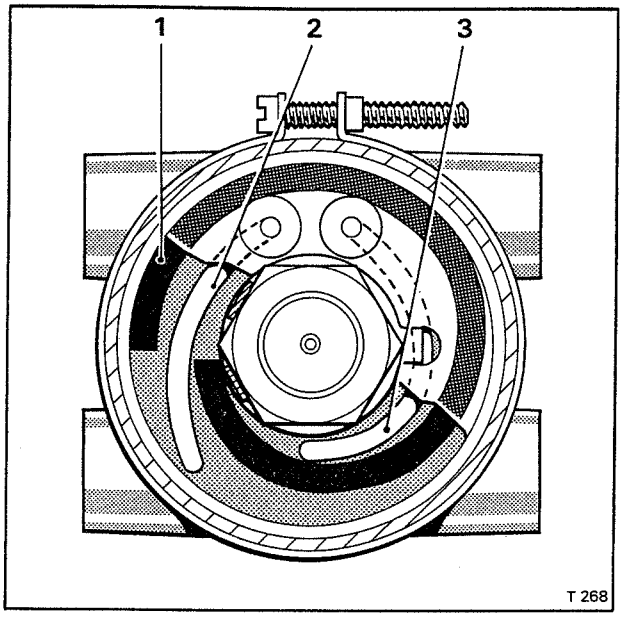

Fig. G22 Height control solenoid valve sealing ring position
1 Sealing ring (cut and positioned)
2 Lucar connector lead
3 Lucar connector lead

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.

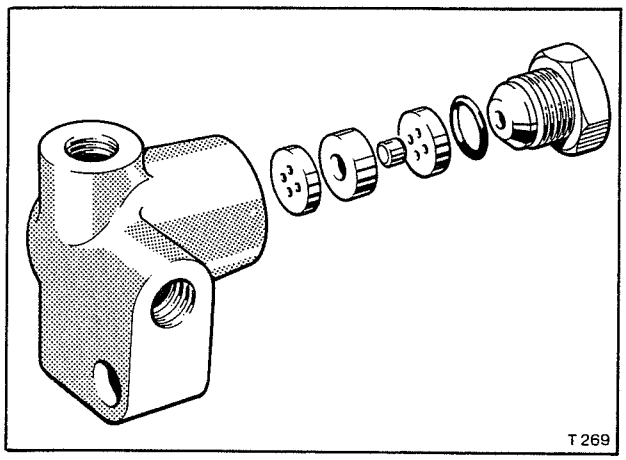

Fig. G23 Solenoid restrictor valve (high and low pressure pipe lines)

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.