

Section G12

Height control valves

Introduction

The height control valves are situated on the outer ends of the rear suspension crossmember and are operated by pivoting links attached to each trailing arm.

Due to the valves containing fine limits and machine matched parts, only certain components are available as individual items. Service replacements for the complete assembly are available if required. Details of the available items are shown in the current parts list.

Height control valves - To remove

1. Place the car on a ramp and depressurise the hydraulic systems as described in Section G2.
2. Remove the flexible and steel pipes from the rear of the height control valve.

Note

All pipe ends, valve ports and junction block ports must have blanks fitted as they are disconnected.

3. **Left-hand height control valve.** Disconnect the two pipes entering the front of the valve at the two three-way junction connectors mounted on the rear face of the rear suspension crossmember (see Fig. G24).

Right-hand height control valve. Disconnect the two pipes entering the front of the valve at the four-way junction connector mounted on the side of the height control valve mounting bracket (see Fig. G25).

4. Slacken the lock-nut and unscrew the adjusting screw from the bottom ball joint of the valve actuation link; disengage the joint.

5. Remove the valve mounting bolts and nuts. Remove the valve, actuation rod and two pipes as a complete assembly.

Height control valves - To dismantle (see Fig. G26)

1. Correlate the position of the operating arm relative to the operating shaft to facilitate assembly. Remove the clamping bolt and operating arm from the shaft.

2. Remove the ram supply adapter complete with washer, sealing ring, nylon valve stop and return spring from the valve; discard the sealing ring.

3. Remove the inlet adapter complete with washer and sealing ring; discard the sealing ring.

4. Remove the return spring and inlet valve from the bore.

5. Remove the nuts and washers securing the halves of the valve together. Carefully separate the halves and discard the sealing rings.

6. Collect the exposed plunger return spring and withdraw the sleeve valve from its bore.

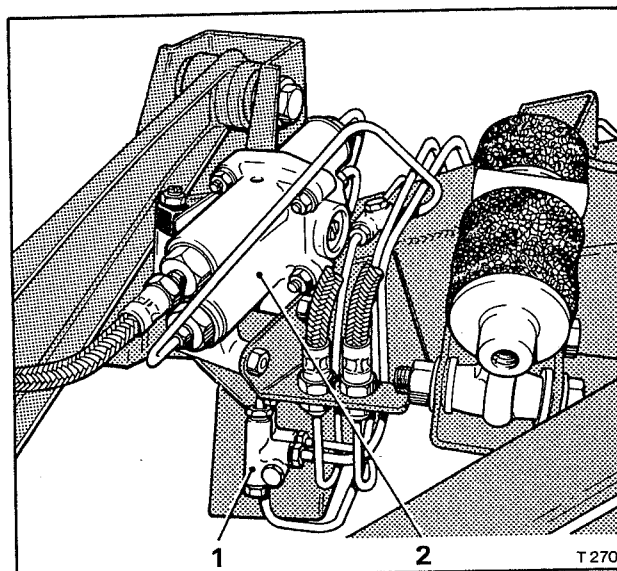


Fig. G24 Left-hand height control valve in position

- 1 Three-way connectors
- 2 Height control valve

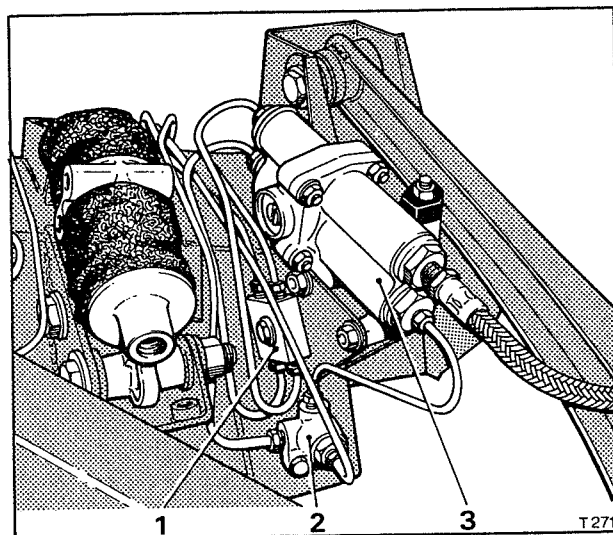
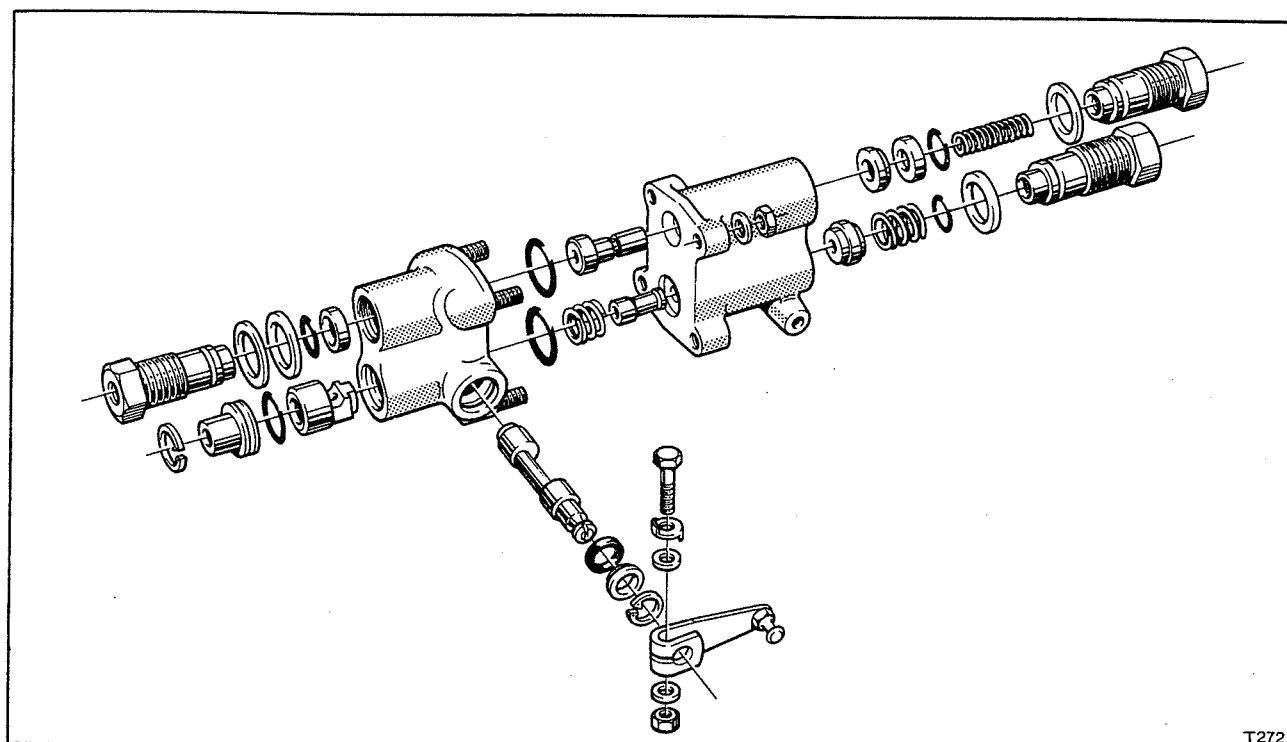


Fig. G25 Right-hand height control valve in position

- 1 Four-way junction connector
- 2 High pressure restrictor
- 3 Height control valve

7. Carefully remove the restrictor valve assembly from the upper bore and collect the spring seating from inside the upper bore of the housing.

8. Remove the solenoid line adapter complete with



T272

Fig. G26 Height control valve (left-hand shown)

washer, adjusting washers (when fitted) and nylon valve stop; discard the sealing ring.

9. Remove the circlip retaining the fluid return adapter; remove the adapter and discard the sealing ring.

10. Rotate the operating shaft to allow the shaft eccentric to clear the plunger groove; push the plunger out of its bore.

11. Remove the circlips retaining the operating shaft in its bore, remove the stepped washers and press out the shaft. Remove and discard the sealing rings.

12. Thoroughly clean all parts of the valve assembly with methylated spirits and dry with clean compressed air.

13. Inspect all parts for wear and damage. Ensure that the sleeve valve and restrictor valve operate smoothly in their bores without excess radial clearance. Also ensure that the end face of the sleeve valve and the adjacent valve and plunger faces are smooth and free from burrs and damage.

Height control valve - To assemble (see Fig. G27)

Ensure that all parts to be used in the assembly are scrupulously clean.

1. Insert the operating shaft into position in the housing bearing bores; smear the bearings with Molytone 'C' grease. Note that the position of the shaft determines whether the valve assembly is for use on the right-hand or left-hand side of the car.

2. Fit a seal lightly smeared with Molytone 'C' grease to one end of the operating shaft. Ease the seal into its recess using a thin blunt instrument,

taking care not to cut the seal.

3. Fit a seal retaining washer over the shaft and locate it in its recess. Pushing gently on the washer, fit the circlip.

4. Fit a seal, retaining washer and circlip to the opposite end of the shaft by repeating Operations 2 and 3.

5. Lightly smear the outside bearing surface and transverse slot of the plunger with Molytone 'C' grease. Insert the plunger into its bore ensuring that it moves freely. Allow the nose of the plunger to pass the operating shaft then rotate the shaft 180° to locate the plunger into position. Leave the plunger in this position.

6. Fit a sealing ring lubricated with brake fluid onto the fluid return adapter. Insert the adapter into the bore behind the plunger then fit the retaining circlip.

7. Fit a sealing ring lubricated with brake fluid onto the threaded adapter removed from the solenoid connection of the valve body; ensuring that the nylon valve stop is in position. Lubricate the adapter threads with Molytone 'C' grease.

8. Fit the large washer and any adjusting washers that were previously fitted onto the adapter then fit and tighten the adapter into the casing.

9. Lubricate the restrictor valve and sleeve valve with recommended brake fluid (see Chapter D), and insert them into their respective bores ensuring that they move freely.

10. Fit a sealing ring into each groove in the centre joint face of the valve casing and fit the return

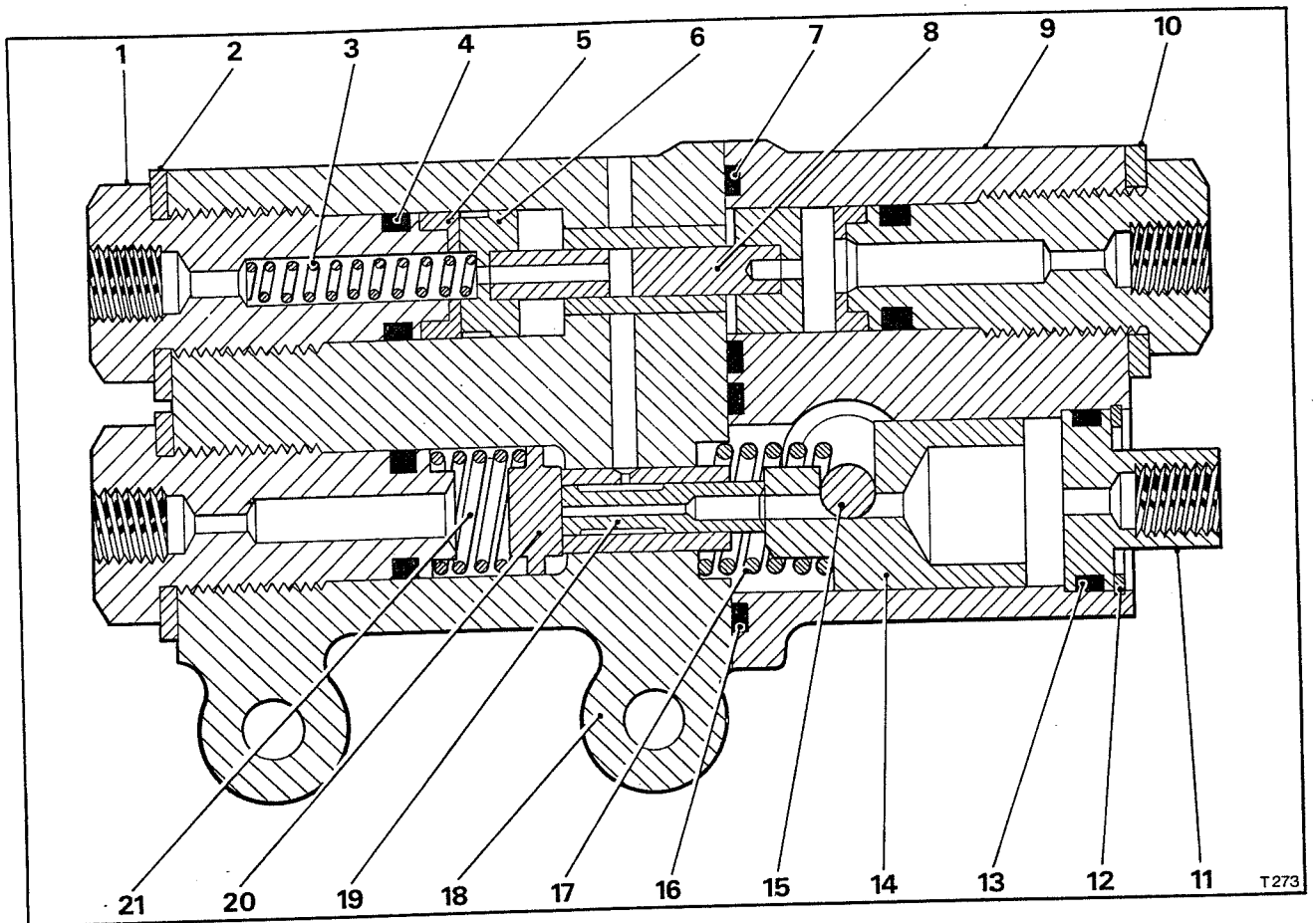


Fig. G27 Height control valve

- | | |
|--|---------------------|
| 1 Adapter (3) | 12 Circlip |
| 2 Washer (3) | 13 Sealing ring |
| 3 Return spring | 14 Plunger |
| 4 Sealing ring (3) | 15 Operating shaft |
| 5 Nylon valve stop (2) | 16 Sealing ring |
| 6 Return spring seat | 17 Spring |
| 7 Sealing ring | 18 Housing |
| 8 Sleeve valve | 19 Restrictor valve |
| 9 Housing | 20 Inlet valve |
| 10 Washer (plus adjusting washers if fitted) | 21 Spring |
| 11 Fluid return adapter | |

spring over the nose of the plunger.

11. Carefully secure the valve housing and casing together using the four nuts and washers.

12. Fit a sealing ring lubricated with brake fluid to the two remaining adapters then lightly smear the threads with Molytone 'C' grease. One adapter should be fitted with a nylon valve stop.

13. Carefully insert a straight length of clean 1.59 mm. (0.062 in.) diameter wire approximately 15 cm. (6 in.) long through the adapter fitted with the nylon stop. Thread the return spring onto the wire and into the adapter bore. Locate the spring seat on the wire to abut the spring.

14. Locate the large washer on the adapter then carefully locate the end of the wire in the restrictor valve bore. Slide the parts down the wire into their correct positions then screw and tighten the adapter

into position in the housing and withdraw the wire.

15. Fit the nylon inlet/exhaust valve in the following manner. Rest the valve on a short length of clean aluminium bar of approximately 12.7 mm.

(0.50 in.) diameter. Invert the height control valve assembly and feed the bar and valve carefully into the housing bore. Upturn the valve assembly and withdraw the bar.

16. Fit the return spring, locate the large washer on the adapter then fit and tighten the adapter into the bore.

17. Fit blanking plugs to the exposed ports of the valve to prevent the ingress of dirt.

18. Fit the operating lever onto the operating shaft; align the correlation marks made prior to removal and fit the clamping bolt. Torque tighten the bolt to the figure quoted in Chapter P.

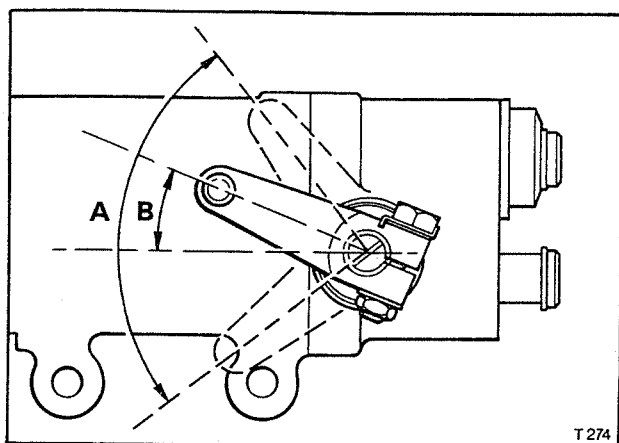


Fig. G28 Height control valve operating arm position and range

- A Approximate operating range without internal disengagement
- B 22° to 20° from horizontal position (see Operation 18 of Height control valve - To assemble.)

If the operating lever and shaft have not been correlated the correct position for the operating lever on the shaft should be determined as follows.

Fit the operating arm onto the shaft but do not tighten the clamping bolt.

Using a length of rod approximately 2,54 mm. (0.10 in.) diameter inserted through the inlet port adapter, push and retain the nylon inlet valve on its seat.

Carefully rotate the operating shaft in a clockwise direction until internal contact between the plunger and sleeve valve is felt.

Position the operating arm as shown in Figure G28 and tighten the clamp bolt.

Note

The operating shaft should only be rotated within the range shown in Figure G28. Further rotation will cause the shaft to disengage from the plunger. If disengagement occurs a thin rod should be inserted through the return port adapter and the plunger carefully pushed down the bore while the operating shaft is slowly rotated to re-engage in the plunger.

Height control valve - To fit

To fit a height control valve, reverse the procedure given for its removal, noting the following points.

1. The operating link joints must be lubricated with Rocol MTS 1000 grease or equivalent and then adjusted to give complete freedom of movement without free play.
2. All setscrews, nuts and pipe connections should be torque tightened in accordance with the figures quoted in Chapter P.
3. After fitting a height control valve, the hydraulic system must be bled as described in Section G4 and the height control valves 'set' to give the correct car levelled height.

Levelled height - To set

If the height control valves are removed from the car, on their replacement the levelled height must be checked and adjusted as necessary.

Note

Before any attempt is made to set the levelled height it is important that the car suspension height is correct. For details of the checking procedure reference should be made to Chapter H.

1. Weight the car with four occupants, or weights to a total of approximately 272 kg. (600 lb.) equally disposed between the front and rear seats. The fuel tank should contain 45 litres (10 Imp. gal. 12 US gal.) of fuel and all accessories, spare wheel and tools must be fitted in their respective locations.
 2. Ensure the gearchange selector is in the 'P' Park position then remove the gearchange thermal cut-out from the fuse board.
 3. Start the engine and allow the system to fully pressurise.
 4. Check the levelled height by measuring the height 'A' (see Fig. G29) from the level surface on which the car stands, to the centre line of the rear-most bottom bolt which secures the forged bracket of the rear suspension crossmember to the body sill. Measure height 'B' from the level surface to the centre line of the rearmost bottom bolt which secures the rear hub assembly to the trailing arm. The difference between these two heights should be between 19,05 mm. and 25,4 mm. (0.750 in. and 1.0 in.). The maximum permissible difference in height between each side of the car being 4,76 mm. (0.187 in.).
- On cars destined for USA and Canada with the exception of the Camargue a 12,50 mm. (0.50 in.) thick aluminium ring and second flexible seating washer are fitted to meet the statutory condition of car height.

In this case the difference between dimensions 'A' and 'B' should be between 3,80 mm. and 10,16 mm. (0.150 in. and 0.40 in.).

It is necessary to take two measurements at each point. Before taking the first measurement the

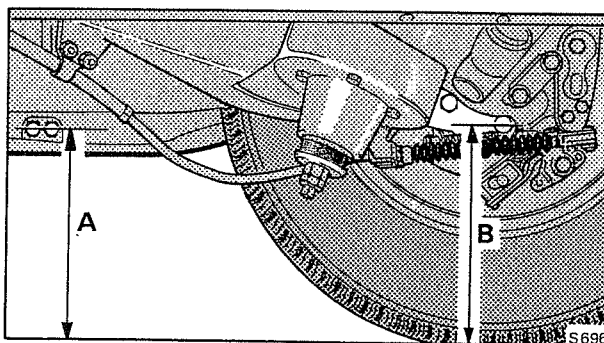


Fig. G29 Levelled height setting measurement positions

- A Ground to centre line of body bracket setscrew
- B Ground to centre line of axle yoke setscrew

car should be lifted approximately 5,08 cm. (2.0 in.) above its static position, then lowered gently and the measurements noted. The car should then be depressed approximately 5,08 mm. (2.0 in.) below its static position and allowed to rise before the second measurements are taken.

The average of the two measurements taken at points 'A' and 'B' should then be used when calculating the levelled height.

5. The levelled height is adjusted by altering the position of the control link bottom ball pivot in the elongated attachment hole on the trailing arm.

Raising the ball pivot will increase the car levelled height, lowering the ball pivot will decrease the height.

It should be noted that although only one levelling valve may have been disconnected, both sides of the car must be checked for correct levelled height setting, as alteration to one side will affect the other.

Height control valves - To test (on the car)

The height control valves can be isolated and checked for operation on the car as follows.

1. Depressurise the hydraulic systems as described in Section G2 and isolate the gear-change by removing the thermal cut-out.

2. Remove the feed pipe (orange line) from one of the height control valves at the three-way junction on the rear crossmember and blank off the pipe end. Fit a blank capable of withstanding full hydraulic pressure to the three-way junction.

3. Start and run the engine at approximately 1000 r.p.m. If the height control valve on the opposite side of the car to the isolated valve was not operating before but now operates correctly then the isolated valve or its associated height control ram is faulty.

4. Stop the engine, depressurise the systems and reconnect the height control valve feed.

5. A further check can be made by removing the height control valve return pipe (white line) from the junction on the rear suspension crossmember. Blank off the junction and insert the end of the pipe into a clean container.

6. Disconnect the height control valve operating arm and link from its pivot on the suspension then push the operating arm upwards. Run the engine at approximately 1000 r.p.m.

Fluid should not flow from the pipe, if it does, the height control valve is faulty and should be overhauled or renewed.

7. Pull the control lever down so as to lower the car levelled height.

Fluid contained in the ram(s) should now flow into the container and then stop when the ram(s) are completely exhausted. If the flow does not stop then the height control valve has a faulty valve seat.

8. If the valve is working correctly, depressurise the systems and reconnect the height control valve return pipe.