Deceleration conscious pressure limiting valve

Introduction

The deceleration conscious pressure limiting valve is non-adjustable and must not be serviced other than for the renewal of valve seals.

If a valve is found to be faulty and renewal of the valve seals does not rectify the problem, it will be necessary to fit as a replacement, a complete deceleration conscious pressure limiting valve.

On cars fitted with an anti-lock braking system, the deceleration conscious pressure limiting valve is mounted on the left-hand side of the car, rearward of the central crossmember.

On cars not fitted with an anti-lock braking system, the valve assembly is mounted at the rear of the brake actuation assembly.

To enable the valve to be identified as a hydraulic system mineral oil component, the body of the valve is coloured green and a green identification tab is fitted to the valve bleed screw.

Under no circumstances should a complete valve assembly or seals for use with conventional brake fluid (i.e. RR363) systems be fitted, as a replacement.

During dismantling and assembly, cleanliness of components is of the utmost importance.

Deceleration conscious pressure limiting valve – To remove

1. Place the car on a ramp.
2. On cars not fitted with an anti-lock braking system, remove the undershield protecting the brake actuation linkage.
3. Depressurize the hydraulic systems as described in Section G3.
4. Disconnect the two pipes from the pressure limiting valve; blank off the pipe ends and valve ports.
5. On cars not fitted with an anti-lock braking system, 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 from the mounting bolts.
6. On cars fitted with an anti-lock braking system, remove the two mounting bolts and withdraw the valve.

Deceleration conscious pressure limiting valve seals – To renew

1. Remove the valve from the car as described under

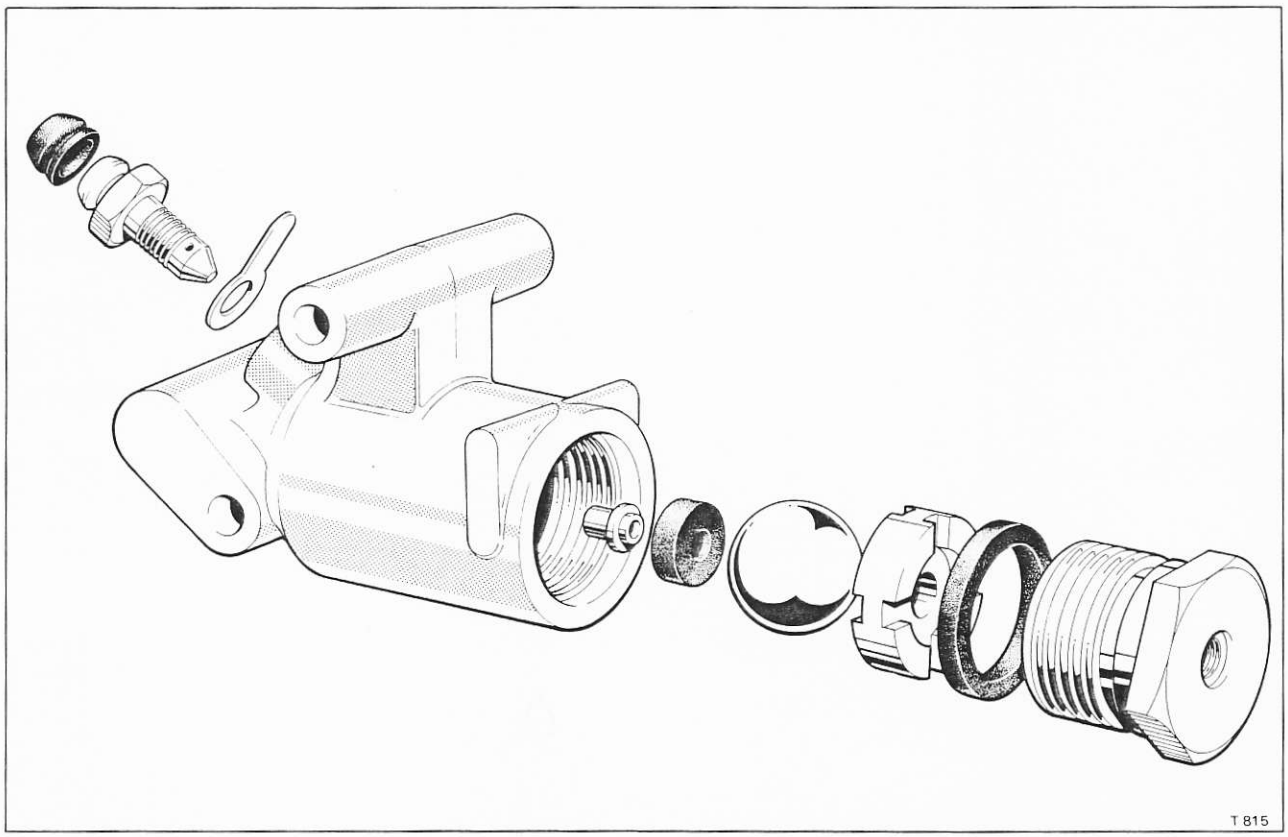

Fig. G10-1 Deceleration conscious pressure limiting valve

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Deceleration conscious pressure limiting valve – To remove.

2. Unscrew the end plug from the valve. Remove the internal components and discard the two valve seals.
3. Thoroughly clean all the components in petroleum ether (120/160°C). Dry with dry compressed air, not with any type of cloth.
4. Ensure that all components are smooth and free from scratches, burrs, etc. Then, assemble the valve assembly using a new valve seal kit.
5. Fit the end plug and torque tighten to between 34 Nm and 47 Nm (3,5 kgf m and 4,8 kgf m; 25 lbf ft and 35 lbf ft).

Deceleration conscious 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 Section G22, prior to the split pins being fitted.
2. On completion the hydraulic system must be bled as described in Section G5.

Brake distribution valves

Introduction

The brake distribution valves fitted to cars with mineral oil hydraulic systems are identical in appearance to those fitted to cars using conventional brake fluid (i.e. RR363). In order to identify valves suitable for use with hydraulic system mineral oil the valve body and end plug are painted green.

Under no circumstances should a distribution valve designed for use with a conventional brake fluid system be fitted as a replacement.

The distribution valves are situated one above the other within the brake actuation linkage assembly. They operate when the footbrake is applied through a linkage and balance lever arrangement (see fig. G12-1).

Both valves are identical in operation but have 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 for the 0,0025 mm (0.0001 in) clearance between the operating valve and its bore, a small hydraulic system mineral oil 'leak-off' is permitted. This leakage is visible and takes the form of a small droplet of mineral oil hanging from the valve base. This is normal.

To determine if a valve is leaking excessively, thus requiring renewal, check that the 'leak-off' does not impair the braking efficiency of the car or cause a noticeable reduction in the level of hydraulic system mineral oil in the reservoir. If these conditions are satisfied the valve should be regarded as serviceable.

Brake distribution valve – To test (on the car)

1. Place the car on a ramp.
2. Remove fuse A6 from fuse panel F2 on the main fuseboard.
3. Depressurize the hydraulic systems as described in Section G3.
4. Remove the undershield from around the brake actuation linkage.
5. Connect pressure gauge RH9727 GMF (ensuring that a length of high pressure pipe is attached) into the high pressure outlet port of the distribution valve (blue or mauve pipe).

Alternatively, connect the gauge to any convenient junction between the valve and the brake calipers it supplies; for example the brake caliper bleed screw points.

Note Pressure gauge RH9727 GMF is capable of reading from zero to 207 bar (zero to 3000 lbf/in²).

6. Start the engine and depress the brake pedal. The brake line pressure shown on the gauge should be proportional to the load applied to the pedal, provided that the accumulators are fully charged. For a 200 N (45 lbf) load on the pedal, the line pressure should be approximately 69 bar (1000 lbf/in²). It should also be possible to achieve a line pressure of 138 bar (2000 lbf/in²) for a pedal pressure of approximately 333N (75 lbf).

When the load on the brake pedal is continuously varied, the brake line pressure should also 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 renewed.

7. If a system internal leakage investigation, as described in Section G9, under Hydraulic accumulators – To test, shows a distribution valve to be the cause of a loss in accumulator pressure the actual leakage can be checked as follows.
8. 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.
9. 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.
10. Start the engine but do not depress the footbrake pedal.
11. Top-up the reservoir continuously to keep the hydraulic system mineral oil level up to the black line on the indicator sight glass.

For the valve to be acceptable the hydraulic system mineral oil leakage should not exceed 25 ml (0.875 fl oz) per half hour with the valve in the 'off' position (i.e. brake pedal not applied) or 50 ml (1.75 fl oz) per minute with the brake pedal depressed and held steady under a load of 200 N (45 lbf). This load is equivalent to a brake line pressure of 69 bar (1000 lbf/in²). If the valve leakage exceeds these figures it must be renewed.

Brake distribution valves – To remove

1. Place the car on a ramp and depressurize the hydraulic systems as described in Section G3.
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.

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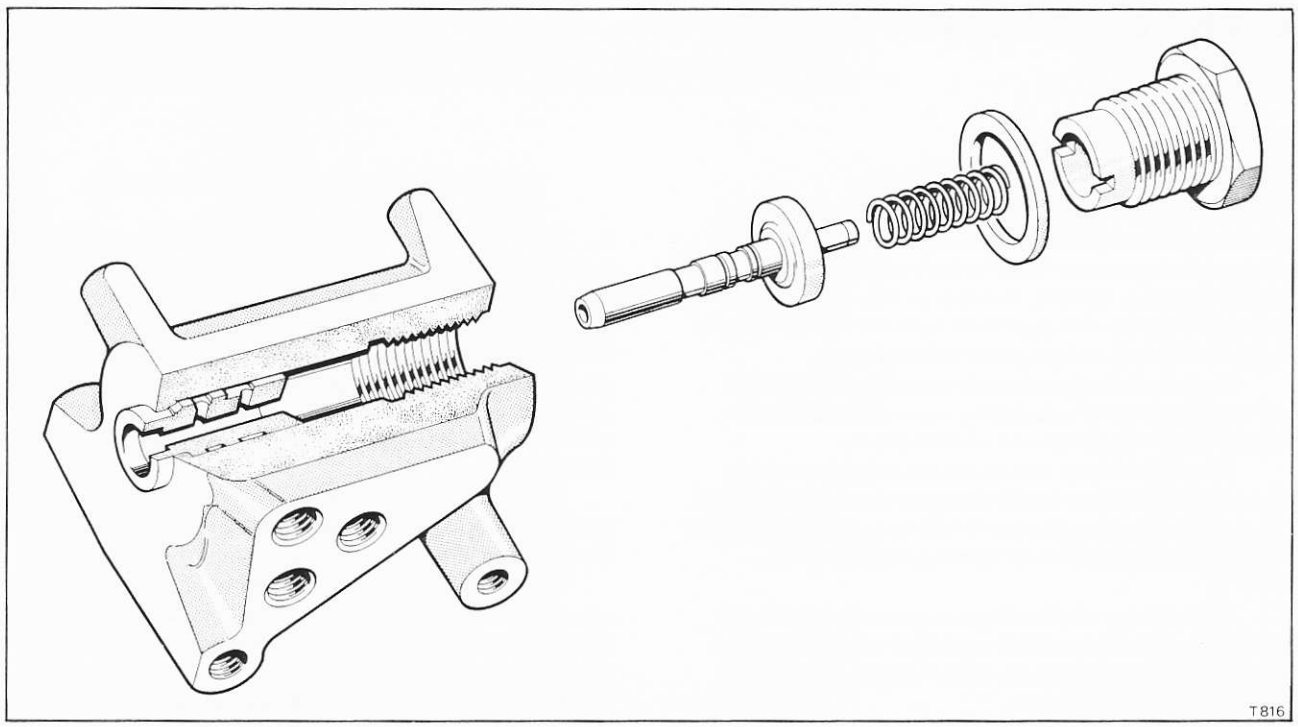

Fig. G11-1 Brake distribution valve

Brake distribution valve – To dismantle
(see fig. G11-1)
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 petroleum ether (120/160°C). Dry with dry compressed air, not with any type of cloth.

Brake distribution 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 hydraulic system mineral oil. 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 petroleum ether (120/160°C). Dry with dry compressed air, not with any type of cloth.

Brake distribution valve – To assemble
1. Lubricate the bore of the valve insert and the valve stem with an approved hydraulic system mineral oil (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 between 82 Nm and 88 Nm (8,3 kgf m and 9,0 kgf m; 60 lbf ft and 65 lbf ft).
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 valve – To fit
Fit the distribution valves by reversing the procedure given for removal noting the following.
1. If a replacement valve is being fitted, remove one of the blanking plugs and allow any hydraulic system mineral oil to drain from the valve. Fit the plug.
2. Torque tighten the mounting bolts and pipe connections in accordance with the figures quoted in Section G22 and Chapter P. Lock the securing bolt tab-washers.
3. On completion, the hydraulic systems must be bled as described in Section G5.