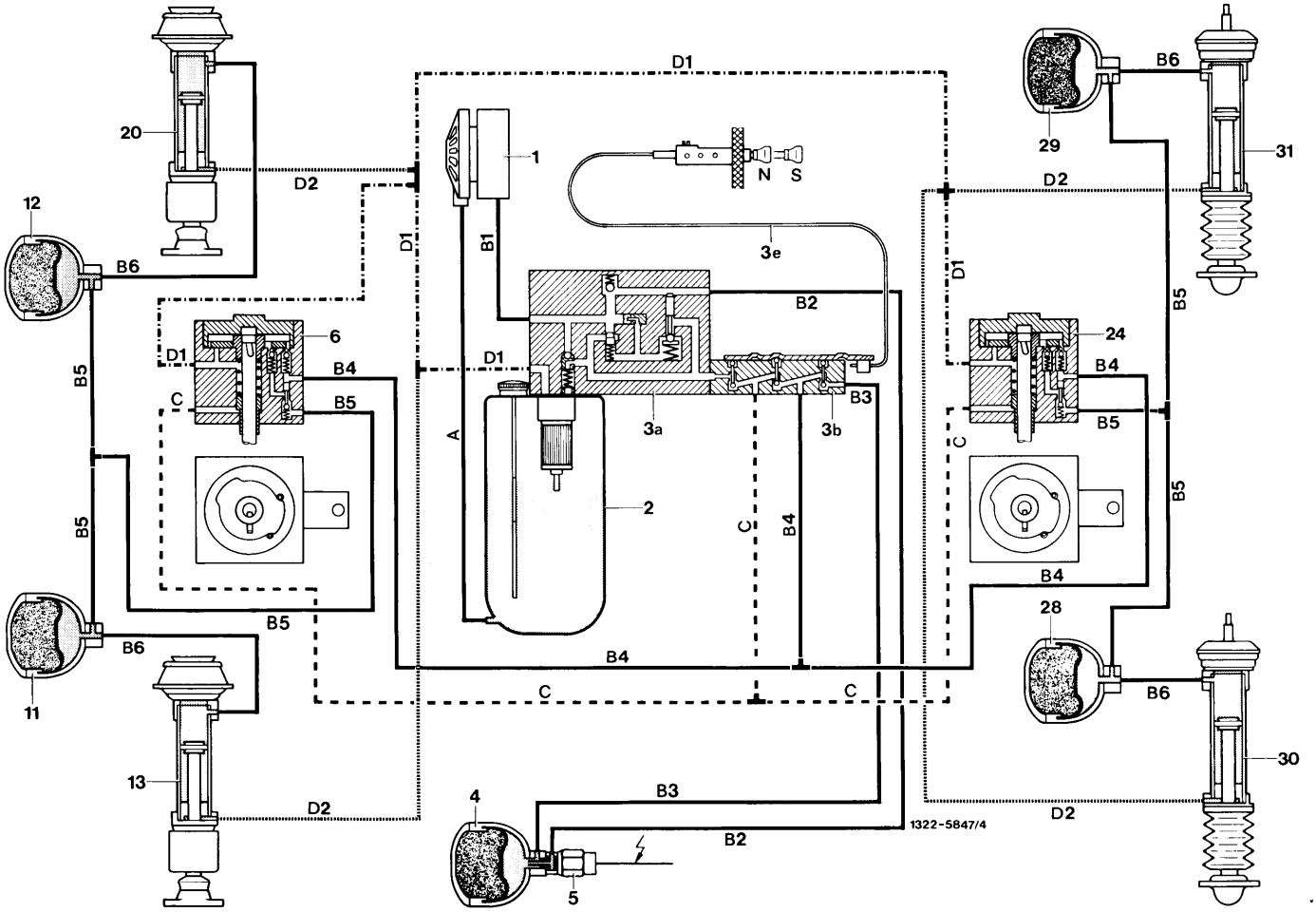
## MERCEDES-BENZ 6.9

### DESCRIPTION

The hydropneumatic suspension is a gas pressure suspension system with hydraulic level control. The vehicle load is supported by four struts, which also serve as shock absorbers. Suspension is accomplished by the compression and decompression of the gas cushion in the pressure reservoirs. To regulate the vehicle level, the oil volume in the suspension struts is increased or reduced by means of a hydraulic system. The hydraulic system is comprised of; oil pump, pressure regulator, main pressure reservoir and oil reservoir. The pressure regulator and level selector valve are combined into one valve unit.

### OPERATION

The hydraulic oil pump delivers oil from the oil reservoir to the main pressure reservoir via pressure regulator of valve unit. When the maximum oil pressure is reached, the pressure regulator revereses the oil flow. If the main oil pressure drops to the minimum, pressure regulator will reverse the flow and oil will be pumped into the main pressure reservoir until maximum pressure is again reached. If vehicle level drops due to increased load, levelling valve will open. Oil flowing into suspension struts will lift vehicle until normal level is reached. If load is reduced, levelling valve will permit oil to flow from suspension




1 — Hydraulic Oil Pump
2 — Hydraulic Oil Reservoir
3 — Valve Unit
3a — Pressure Regulator of Valve Unit
3b — Level Selector Valve of Valve Unit
3e — Control Knob
4 — Main Pressure Reservoir
5 — Electir Pressure Switch
6 — Levelling Valve, Front Axle
11 — Pressure Reservoir, Left Front
12 — Pressure Reservoir, Right Front
13 — Suspension Strut, Left Front
20 — Suspension Strut, Right Front
23 — Warning Light
24 — Levelling Valve, Rear
28 — Pressure Reservoir, Left Rear
29 — Pressure Reservoir, Right Rear
30 — Suspension Strut, Left Rear
31 — Suspension Strut, Right Rear
A — Suction Line
B1 — Pressure Line
B2 — Pressure Line, Regulator Valve to Main Pressure Reservoir
B3 — Pressure Line, Main Pressure to Selector Valve
B4 — Pressure Line, Selector Valve to Levelling Valve
B5 — Pressure Line, Levelling Valve to Pressure Reservoir
B6 — Pressure Line, Pressure Reservoir to Suspension Struts
C — Control Pressure Line
D1 — Return Line, Levelling Valve to Pressure Regulator
D2 — Return Line

***Fig. 1 Mercedes-Benz Hydropneumatic Suspension System***

## MERCEDES-BENZ 6.9 (Cont.)

struts until vehicle is back to normal level. The oil flowing from struts, is returned to oil reservoir after going through a filter.

NOTE – *When towing vehicle equipped with Hydropneumatic Suspension, instrument panel switch must be placed in "S" (Detent) position.*

### REMOVAL & INSTALLATION

#### FRONT SHOCK ABSORBERS

**Removal** – Move switch on instrument panel to the normal position. Jack up front of vehicle and remove front wheel. Separate high-pressure hose and leak hose from lines in wheel housing. Loosen upper shock attaching bolt. Remove lower attaching bolt and remove shock.

**Inspection** – Check high-pressure hose, leak oil hose rubber mount and ball joint. Replace if required.

**Installation** – Install in reverse of removal procedure.

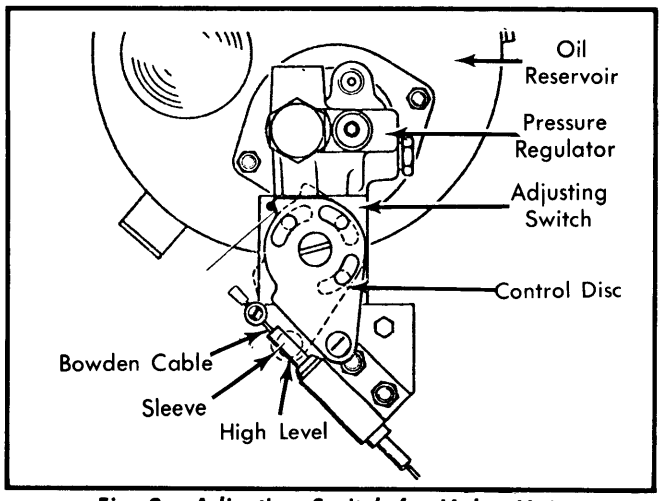



*Fig. 2 Adjusting Switch for Valve Unit*

#### REAR SHOCK ABSORBERS

**Removal** – Remove rear seat and back rest, remove rear trunk cover. Loosen nut on upper shock mount, remove washer and rubber ring. Jack up rear of vehicle. Remove high-pressure hose on reservoir and disconnect leak oil hose from line. Loosen lower attaching bolt and remove rear shock.

**Inspection** – Check high-pressure hose, leak oil hose rubber mount and ball joint. Replace if required.

**Installation** – 1) Insert shock into dome on frame floor. Mount lower attaching bolt, install upper attaching bolt, do not tighten. Align high-pressure hose and leak hose, by turning shock.

2) Lower vehicle, tighten upper attaching bolt and replace cover. Install rear seat and back rest. Check oil level in system and correct.

#### FRONT PRESSURE RESERVOIR

**Removal** – 1) Move switch on instrument panel to normal postion. Jack up front of vehicle. Remove left wheel, disconnect pressure lines on pressure reservoir. Loosen pressure reservoir and remove.

2) Remove battery and battery frame, from right side of vehicle. Disconnect pressure line from pressure reservoir. Remove reservoir.

**Installation** – Install in reverse of removal procedure.

NOTE – *When vehicle is lowered, the lever of the level controller will move into "filling postion". Since the capacity of the central reservoir is not enough for filling the suspension components, keep the engine operating.*

#### REAR PRESSURE RESERVOIR

**Removal** – With switch in normal position, jack up rear of vehicle. Disconnect pressure lines from reservoir. Remove reservoir.

**Installation** – Install in reverse of removal procedure.

#### CENTRAL RESERVOIR

**Removal** – 1) Disconnect puller for adjusting switch upon removal of locking ring and move disc of adjusting switch into assembly position. Jack up vehicle at front and remove left front wheel.

2) Disconnect pressure lines from central reservoir. Disconnect cable plug connection on front end. Pull cable with plug and rubber sleeve into wheel house. Loosen reservoir at front end and remove. Unscrew electrical pressure switch from central reservoir, while marking position of ring fitting.

**Installation** – Install in reverse of removal procedure.

#### OIL PUMP

**Removal** – Disconnect suction and pressure lines from pump. Loosen attaching bolts and remove pump.

**Inspection** – Check driver and clutch components replace as required.

**Installation** – Install in reverse of removal procedure.

#### VALVE UNIT

**Removal** – Disconnect puller for adjusting switch. Move control disc into position M (assembly). Loosen clip for puller, while applying counterhold at holder by using a hex socket wrench. Disconnect pressure lines from valve unit. Loosen attaching bolts of pressure regulator to oil reservoir and remove valve unit.

**Installation** – Install in reverse of removal procedure. noting the following: Install new sealing rings for sealing pressure regulator to oil reservoir.

#### FRONT STABILIZER BAR

**Removal** – 1) Move adjusting switch on instrument panel (suspension valve switch) to "S" (Detent) position. This will lock in suspension pressure and hold it when vehicle is raised off ground.

2) Raise vehicle, with jacks placed under outer edges of lower control arms. Remove front wheels.

## MERCEDES-BENZ 6.9 (Cont.)

**3)** Loosen Allen screw on clamping piece of stabilizer bar-to-control arm. Remove large hex bolt from end of stabilizer bar. Remove 2 remaining hex bolts on clamping piece and remove clamping piece.

**4)** Remove master cylinder, booster, air cleaner, Climate Control (A/C) regulating valve, heater hoses and pipes, as required to gain clearance for stabilizer bar removal. Discharge A/C system and disconnect A/C lines and oil pressure line. Pull vacuum line of master vacuum system from pipe. Remove regulating linkage.

**5)** Detach connecting rod on lever of level controller (loosen hex nut while counterholding ball pin with 10 mm open-end wrench).

NOTE – *Do not pull ball pin out of socket.*

**6)** Remove stabilizer bar brackets. Mark rubber insulating mounts for reinstallation in proper position and on proper side. Remove stabilizer bar end covers from wheel wells. Remove stabilizer bar.

**7)** If necessary, remove actuating linkage for level controller at this time: detach clamping nuts and bracket from stabilizer bar. When reattaching, be sure lever of connecting shaft is against stabilizer bar.

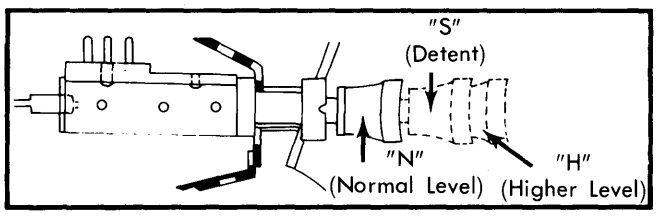



***Fig. 3 Showing Positions of Level Controller Switch on Instrument Panel***

**Installation – 1)** Position stabilizer bar in vehicle. Attach stabilizer clamping pieces on ends with sleeves flush to bar. Attach support of upper control arm to stabilizer bar, tightening large end bolt as far as possible.

**2)** Install end covers to wheel wells. Position rubber bushings with splits rearward and install mounting brackets.

**3)** Attach connecting rod toward level controller. Install regulating linkage, water hoses and pipes. Connect vacuum hoses, A/C hoses and oil pressure line.

**4)** Install regulating valve for Climate Control (A/C) system. Install air cleaner, master cylinder and booster. Mount front wheels and lower vehicle to ground.

**5)** Completely tighten stabilizer-to-control arm support bolts and bracket mounting bolts.

**6)** Move suspension control switch to "NORMAL LEVEL" position. Recharge A/C system. Check and adjust vehicle level.

### REAR STABILIZER BAR

**Removal – 1)** Move adjusting switch to "S" (Detent) position. This will hold vehicle at normal riding level after it has been raised off ground.

**2)** Remove expanding bolts of wheel carrier support, on both sides. Detach connecting rod from lever of level controller by unscrewing hex nut while counterholding ballpin with 10 mm open-end wrench.

NOTE – *Do not pull ball pin from socket.*

**3)** Raise vehicle and remove right rear wheel. Remove rubber rings of rear axle suspension. Slightly lower and support exhaust pipe to allow additional clearance.

**4)** Unscrew hex bolts of stabilizer bar brackets. Pull stabilizer bar out toward right side. Remove actuation lever of level controller from stabilizer bar, if necessary.

**Installation – 1)** Attach level controller lever to stabilizer bar, making sure lever rests against bar.

**2)** Install rubber insulators on stabilizer bar with splits facing upward. Attach stabilizer bar mounting brackets. Reconnect exhaust pipe to original position.

**3)** Lower vehicle to ground. Connect stabilizer bar to wheel carriers, but do not fully tighten expanding bolts.

NOTE – *Be sure bolt contact surfaces are clean and grease-free.*

**4)** Attach connecting rod of level controller. Move level control switch, on instrument panel, to "N" (normal level) position. Check and adjust vehicle level. Fully tighten expanding bolts after all adjustments are complete.

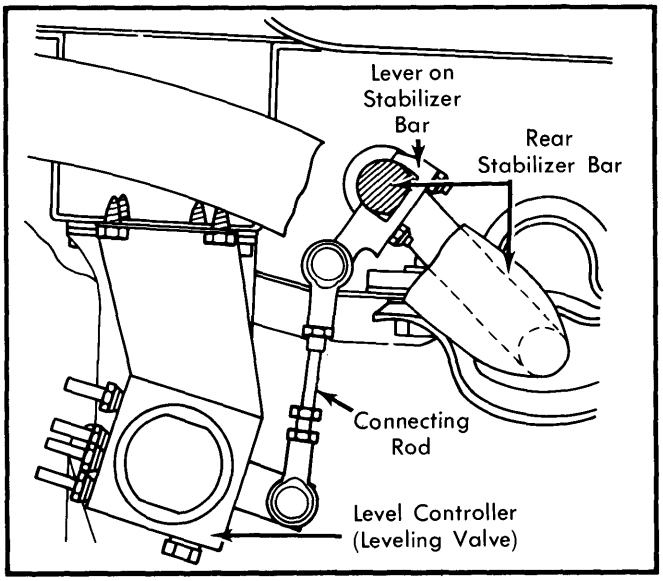



***Fig. 4 Location of Hydropneumatic Level Controller Components on Rear Stabilizer Bar***

**System Capacity**

| Application | Pints (liters) |
|---|---|
| Total System Oil Capacity | 12.3 (5.8) |
| Filling Capacity (On Dipstick) | |
| Maximum | 7.6 (3.6) |
| Minimum | 5.5 (2.6) |