

Engine mounts



Brief description

The engine mount principle used on the M57 and M67 engines is basically the same as from the M51TÜ. The damping characteristics of the hydraulic mount are set softer or harder by means of a vacuum. In this way, the vibration transmitted from the engine to the body can be influenced specifically.

Requirements and Objectives

The following requirements and objectives apply to the engine mounts:

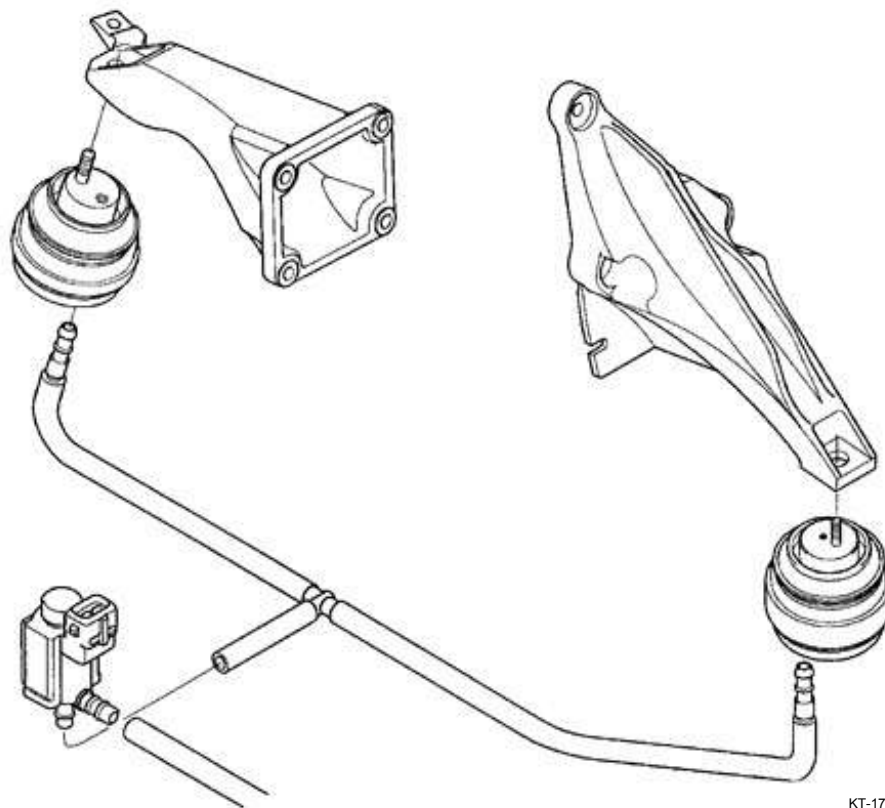
- Requirements
 - Various damping characteristics of the mounts
 - Simple design
 - Rapid response characteristics
- Objectives
 - Comfort at idle speed
 - Isolation of engine vibration
 - Specific reduction in natural resonance of engine caused by uneven road surfaces and shut-down judder.

System structure



The system consists of:

- Two hydraulic mounts with controlled damping characteristics
- One electric changeover valve
- The control unit (DDE)
- Various electrical and pneumatic lines



KT-172

Fig. 32: System layout

Component description

Hydraulic mount



The damping-controlled hydraulic mount consists of:

- One conventional hydraulic mount
- One control unit

The hydraulic mount with controlled damping characteristics operates by way of vacuum.

In the basic setting, no vacuum is applied to the hydraulic mount. Bypass (14) is closed. This is achieved by means of spring (10) pressing a rubber diaphragm against the sealing surface of the nozzle plate.

The hydraulic fluid can only flow back and forth via an annular duct (5) between the upper (17) and lower (15) chamber. The mount acts as a conventional hydraulic mount. The damping characteristics are hard.

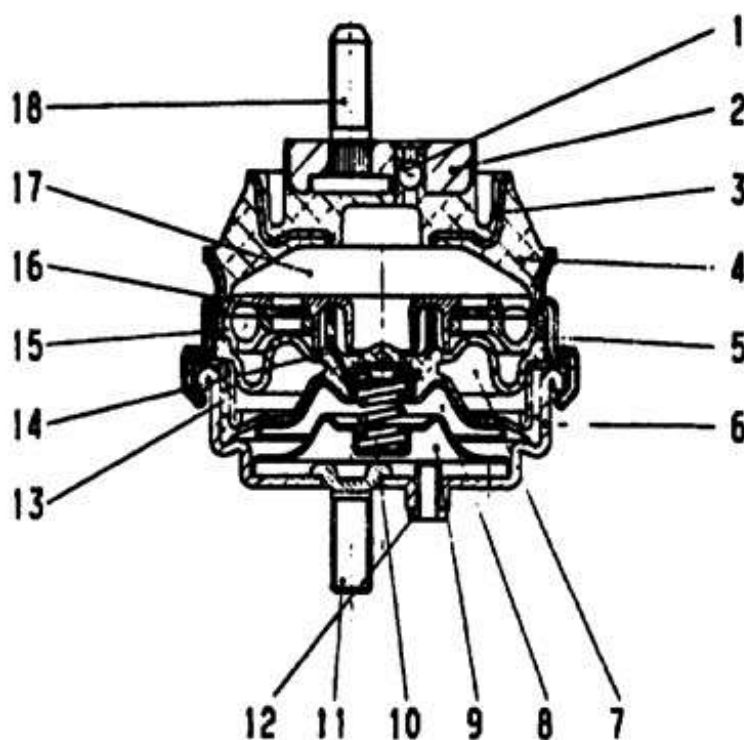


Fig. 33: Damping-controlled engine mount

KT-173

The force exerted by the spring is reduced by applying vacuum to the control unit of the mount (12) so that a bypass now opens permanently. The hydraulic fluid can now flow back and forth via larger cross section between the two chambers. The damping characteristics of the mount are now softer.

a



The damping-controlled engine mount is designed to suit specific types of engine:

M57:

Pin/pin mount

The left and right mounts differ due to the asymmetrical arrangement of the engine mounts. (Spring rate: left 180 N/mm / right 220 N/mm)

M67:

Pin/flange mount

The left and right mounts are inversely symmetrical due to the symmetrical arrangement of the engine mounts. (Spring rate: 350 N/mm)

The left mount features a stop bowl in order to restrict engine movement when taking up torque.



Functional description



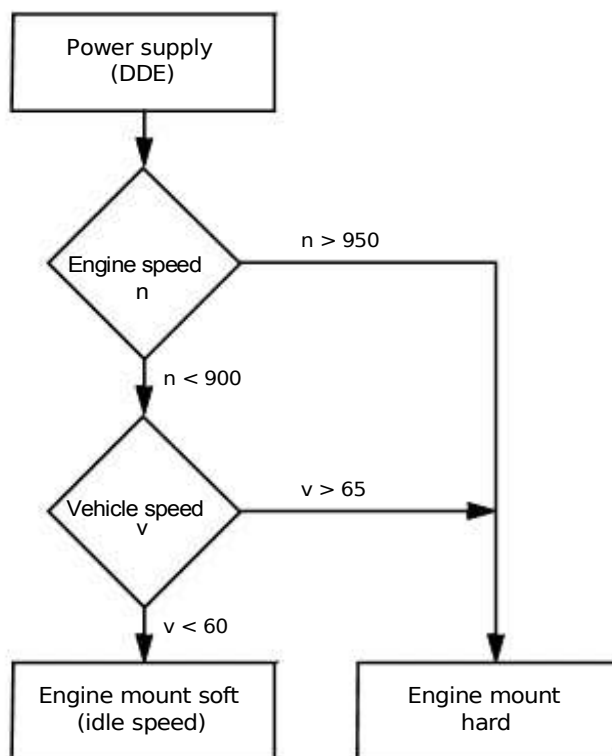
The vacuum necessary to activate the mounts is taken from a distributor in the vacuum line between the vacuum pump and brake booster.

Vacuum is applied simultaneously to both mounts when idling and in the speed range close to idling. As a result, it is possible to change over between hard or soft damping characteristics.

DDE parameters

Activation of the damping-controlled hydraulic mounts by the DDE is based on the following parameters:

	Switching value	Remarks
Engine speed	900 rpm	Hysteresis (+ 50 rpm)
Vehicle speed	60 km/h	Hysteresis (+ 5 km/h)



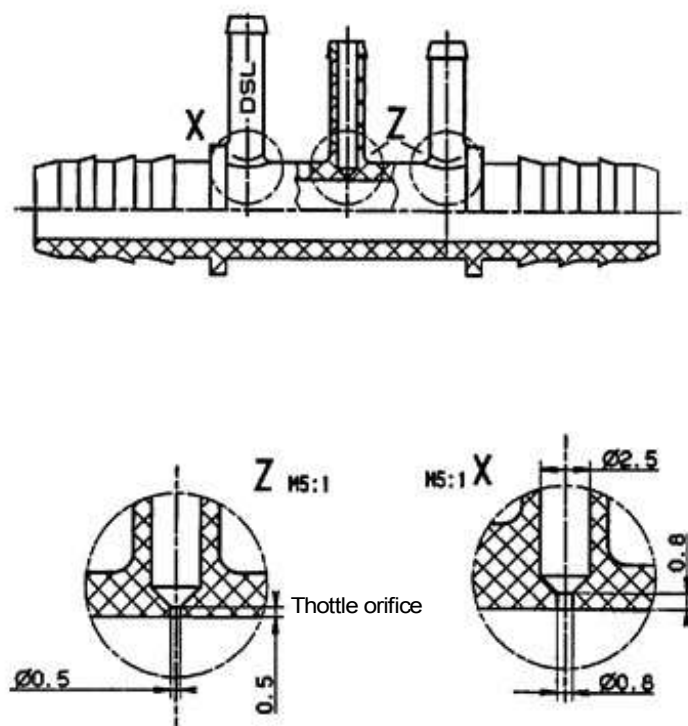
KT-210

Fig. 34: Sequence diagram/activation, damping-controlled hydraulic mount

Vacuum supply



The necessary volumetric flow is taken from the vacuum line between the vacuum pump and brake booster. For this purpose, the vacuum line of the damping-controlled hydraulic mount is connected to the long outlet of the distributor. The connection for the damping-controlled hydraulic mount is calibrated larger ($\varnothing 0.8$) than the connections for the VNT and EGR ($\varnothing 0.5$).



KT-174

Fig. 35: Distributor

The vacuum is within the pressure range from 0.5 to 0.9 bar. It is switched by means of an electric changeover valve.

The vacuum hose between the vacuum line and the electric valve is arranged such that the possibility of rodent damage etc. is excluded with a high degree of probability.