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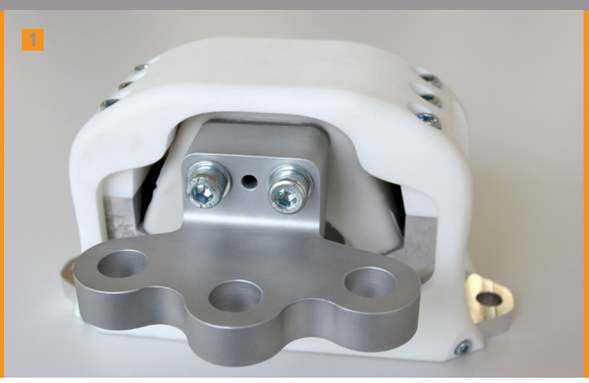

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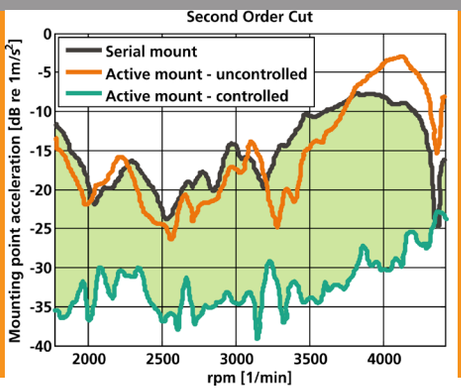

1 Active engine mount in polyamide housing
2 Reductions of the car body accelerations (second engine order)

DEVELOPMENT AND TEST OF AN ACTIVE ENGINE MOUNT

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In vehicles, engines cause vibrations that are transferred from the mounts and the adjacent structures to the interior where they typically result in unwanted sound emissions. Current developments in the automotive industry such as three-cylinder engines and the use of cylinder deactivation are leading to an increase in vibration levels that passive systems can no longer compensate for. The implementation of active systems is a promising approach to improve vibration comfort and the acoustic impression. In vehicles the loads acting on the mounts can be divided into dynamic and static or quasi-static components. The quasi-static components consist of the engine-mass as well as the driving torque. These loads may exceed the dynamic loads, which are most significant in terms of driving comfort and primarily result from the combustion process as well as inertia forces, by orders of magnitude. However, the static loads do not have any effect on the vibration of the car body. Existing active mounting systems often utilize a serial arrangement of an actuator and a passive elastic coupling element. However, such a serial arrangement of the actuator with the suspension spring carries the disadvantage that the actuator is fully exposed to the static loads. This usually results in both, an unnecessarily large actuator and high power requirement. A smart arrangement of the suspension components that divides the loads into two separate paths has been developed and successfully tested in a real vehicle. The decoupling from the static loads is realized by means of a serial arrangement of the actuator and a viscous damper.

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