

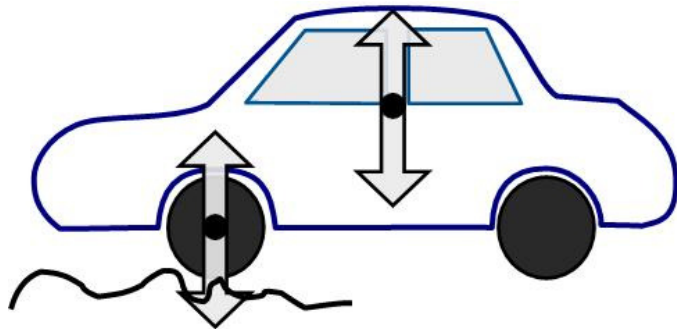
## Cruise on air

**Weinheim, 15<sup>th</sup> June 2009: Vibracoustic Airsprings replace forerunners made of steel and convince through comfort, safety and fuel reduction**

Air suspension systems were installed in Mercedes Benz 300 SEL, Mercedes Benz 600 and Borgward 100 for the first time in the early sixties. Since then, they have been established in the luxury and upper class segment as the apex of driving comfort. But also the middle class segment with standard comfort requirements benefits from the convincing advantages airspring systems offer as compared to coil springs.

Passengers are exposed to various outside forces which affect comfort: Even small irregularities on road surfaces cause (vertical) oscillations of the car wheel.

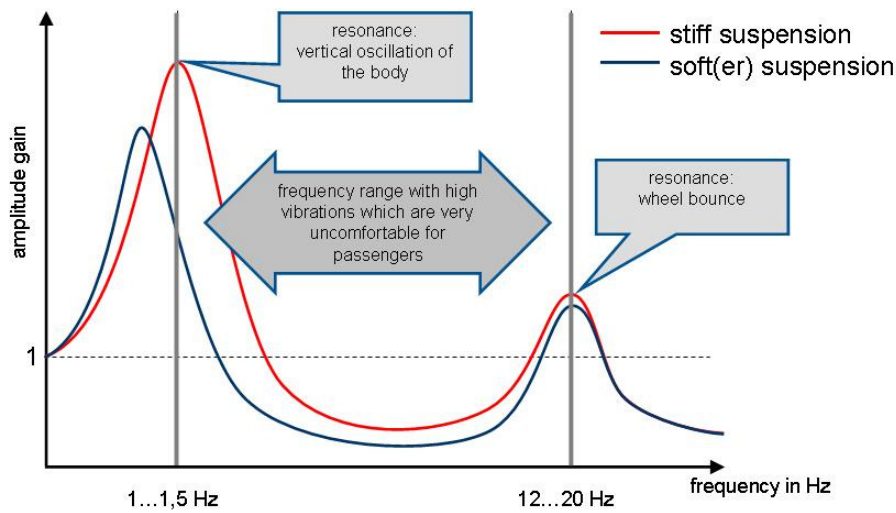
Via the coil spring and shock absorber, vibrations are transferred to the car body. Driving comfort decreases proportionally with increasing vertical forces and accelerations. Noticeable vibration, felt as



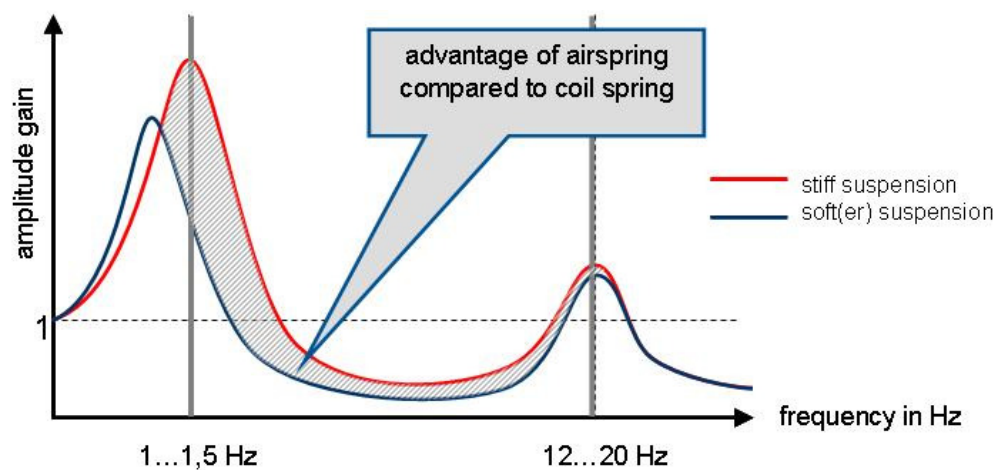
particularly unpleasant and disturbing in the frequency range between 2 and 8 Hz, are very uncomfortable for passengers.

The solution is to shift the resonant frequencies by a soft spring adjustment: the softer, the higher the comfort. But here, coil springs reach their functional limits: The high spring deflexion of a loaded car leads to considerably worse riding qualities and disruptive suspension. Furthermore, a coil spring is always a compromise of weight and chassis characteristics.

Complex design variety is the result, even within variants of a model series such as limousine, station wagon or sport. At the end, the customer pays for this poor solution.



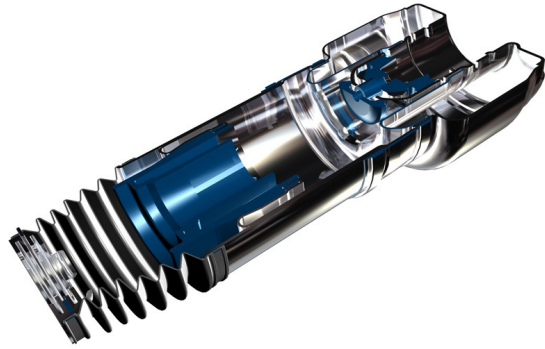
**Softer suspension setting ensures higher comfort**



**Airsprings enable a separation of spring- and load carrying function**

**Airspring systems provide an optimum on comfort**

The vibration control technology specialist Vibracoustic developed an air-based integrated spring and absorber system. An optimal spring adjustment is made possible by separating the suspension and vehicle weight carrying function.



The result is a soft and comfortable suspension with continuously good road handling, irrespective of vehicle load. Through an integrated control, the variable airspring systems can adapt to different chassis characteristics and offer - apart from the damping - still a whole range of useful advantages.

### **Sportive fast and still eco-friendly: Height Control**

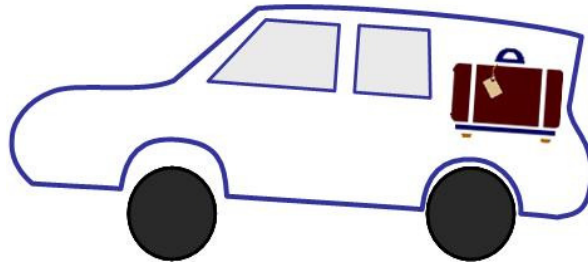
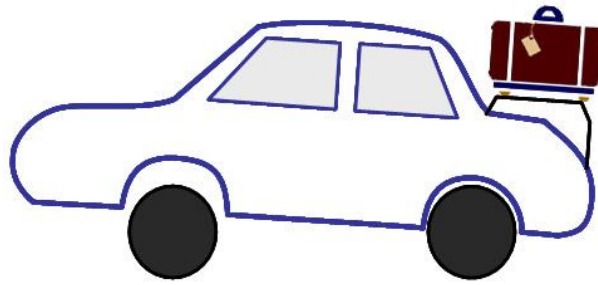
A special characteristic of airspring systems is the vehicle's height control technology. For example, *lifting* the car height makes it easier to get into the car, simplifies the coupling/decoupling of a trailer or affords additional ride height during a cross-country drive.

Lowering the height reduces wind resistance, saves fuel: for example if the air-suspension vehicle automatically lowers itself by 15 mm at a speed of approx. 120 km/h, a reduction of fuel consumption of more than 5% results. The lowered gravity point of the vehicle's mass improves agility and road handling of the car.

Additionally, air suspension systems adjust the spring deflexion automatically for a constant car level. This load-independent spring characteristic of air suspension systems provides a safety advantage versus conventional coil springs.

Particularly for small cars, minivans or station wagons, which - contrary to upper and luxury class vehicles- often carry a load of more than half their dead weight - loading adjustment is recommended

For these applications, Vibracoustic offers a 2-corner air suspension with additional driving comfort. The coil-spring front axle can be accordingly adjusted to the comfortable air suspension of the rear axle. Full deflexion is obtained with two airsprings.



Lifting or lowering the rear axle simplifies the use of trailers and loading the vehicle. Dynamic driving characteristics are maintained on a high level with this solution.

In fact Vibracoustic air suspension systems offer various intelligent incentives, whether the reduction of fuel consumption, increased driving safety, adjustment of vehicle height to road conditions or, last but not least, vibration-free driving comfort.

**Press Contact:**

Silke Benzin  
Vibracoustic GmbH + Co. KG  
Strategisches Marketing  
Tel. +49 (0)6201 80-6876  
Fax +49 (0)6201 88-6876  
silke.benzin@vibracoustic.de

Vibracoustic, a company of the Freudenberg Group, generated a turnover of 840 million € with 32 locations and 5000 employees in 2008. "We convert noise and vibration into sound and comfort". This claim is based on substantial system competence, a comprehensive product and service program and a global network of development and production facilities. Vibracoustic solutions are supplied to all leading automotive manufacturers.