

Press Release

Vibracoustic front axle plastic top mount up to 30 percent lighter while maintaining NVH performance

Darmstadt, 17 June 2020 | Vibracoustic front axle plastic top mounts address the global demand of light vehicle manufactures to reduce vehicle weight as well as production costs. At the same time, they combine the performance features of a conventional aluminum/steel top mount while offering high frequency isolation, cost effectiveness and significant weight reduction of up to 30 percent.

Vibracoustic has developed a front axle top mount for MacPherson suspensions, replacing most of the steel or aluminum by plastic. The plastic top mount is up to 20 percent lighter than a comparable aluminum top mount or 30 percent lighter than a comparable steel top mount while still meeting customers' requirements of performance and durability. MacPherson strut suspensions are largely used in small to compact cars and are an efficient concept regarding the cost-performance ratio. Plastic top mounts add to the cost benefit and allow to integrate more features directly in the mount as bearing function or assembly error prevention.

Both, the reduced weight and the integration of features within the product, are highly relevant for electric platforms. The weight reduction contributes to the reduction of the overall vehicle weight and helps reduce CO₂ emissions or increase range in electric vehicles whereas the compact design offers more flexibility and design space. Furthermore, plastic components offer an improved high frequency isolation performance.

One of the key features of the top mount is the overall stiffness since it is responsible for a direct and precise handling and steering feel. The ribbed design of the component body does not only assure the stiffness of the part and optimize the load transfers between the suspension and the car body, but also optimizes the use of material in the production. The Vibracoustic plastic top mount achieves comparable performance and stiffness levels of a conventional steel or aluminum mount.

Another critical factor for the top mount is the structural strength and robustness of the top mount cap as it can experience peak loads of up to a couple of tons, e.g. by driving through a pothole. Especially if the car body is not supporting the cap, it is the only part taking all the vertical loads from the shock absorber. The cap material assures its robustness and capability on carrying heavy loads without breaking. For small to compact vehicles, those requirements are achievable, if enough design space is available for a suitable plastic structure. The vertical design space for the plastic structure can be increased through the integration of a bearing, which can be used to optimize component stiffness and strength.

The bearings are another essential part of the top mount components for MacPherson front axle application, as they need to allow rotation movements of the coil spring while steering. In the Vibracoustic front axle plastic top mount that rotation movements is achieved through a functionally integrated ball bearing. Further development to reduce the complexity for the customers can be achieved by a newly developed sliding bearing. The benefits of plastic top mounts can also be extended to double wishbone suspensions.

With the usage of plastic top mounts in front as well as rear axle applications, Vibracoustic supports light vehicle manufacturers in their effort to reduce component weights without compromising performance criteria like driving comfort or durability. Furthermore, with new developments like the implementation of sliding bearings instead of ball bearings, a more compact design of the top mount can be achieved. Vibracoustic engineers also strive to integrate optimized functions in its components, therewith reducing production complexity, as well as weight and costs while increasing the overall parts stiffness, reliability and ultimately driving comfort for the passengers.

About Vibracoustic

Vibracoustic is a leading global automotive NVH expert, providing customized solutions adding comfort and supporting efficiency, safety and durability. Its expertise along the entire product life cycle and all vehicle systems as well as its broad product range enable

Vibracoustic to solve current and future NVH challenges across all automotive segments. With more than 10,000 employees at 43 production and engineering locations across 19 countries, Vibracoustic serves all major automotive manufacturers. In 2019 Vibracoustic recorded total sales of 2.1 billion €. For more information, see www.vibracoustic.com

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