Vibracoustic

Press Release

Vibracoustic develops decoupling solutions for electric vehicles

Darmstadt, 23 February 2022 | Vibracoustic, a leading global automotive noise, vibration and harshness (NVH) expert, is developing a range of decoupling solutions for auxiliary components in electric vehicles (EVs). Automotive manufacturers are facing a range of new NVH challenges as auxiliary systems – like coolers, pumps and compressors – are not belt-driven in e-mobility applications.

EVs may no longer use internal combustion engines, but they still require various auxiliary systems like cooling for batteries, motors and the cabin or to support the braking system. Decoupling of these systems has become an increasingly important focus for vehicle manufacturers, as the noise and vibration that they generate is no longer masked by the internal combustion engine. In addition, these auxiliary systems are no longer positionally constrained by the location of the engine, meaning that they could be packaged differently within the chassis, leading to a host of new NVH issues. With their 'holistic system' approach to vehicle NVH, Vibracoustic's engineers are developing mounting solutions to safely decouple auxiliary components from coolers and pumps to compressors to increase durability as well as the overall driving comfort.

These decoupling solutions take into account wider vehicle NVH considerations and include the option for single or double isolation layers. A double isolated bracket was used for a vacuum pump for the braking system of a standard C-segment vehicle to eliminate unwanted noises of the braking system. While these NVH issues had no impact on the performance of the vehicle's braking system, many customers would perceive this as a safety-critical issue or attribute it to poor build quality.

Similarly, Vibracoustic engineers have developed decoupling solutions for eCompressors – electronically-powered compressors that are used in EVs for requirements such as air conditioning and battery cooling. By analyzing the excitations, the engineers were able to develop a specifically tuned mounting concept, which, in combination with optimized brackets, is combined into a mounting assembly and producedwith cost efficiency in mind. This eliminates the vibrations and noise generated inside the compressor and thus minimizes the vibration level for particularly sensitive conditions, such as during high-voltage fast charging. The engineering team achieved these objectives through exhaustive simulation and testing, determining the optimum component geometry and ideal rubber compound for maximum effectiveness and service life.

Dr. Jörg Böcking, CTO at Vibracoustic, commented: "As OEMs embrace electrification and battery electric vehicles, the industry is facing new and evolving NVH challenges. With decreased powertrain excitation, far greater emphasis and attention are being placed on noises and vibrations generated by the vehicle. Failing to address these issues or meet the increased NVH standards of EVs can significantly reduce driver comfort and impact consumer perceptions. Our engineers have drawn from their extensive NVH expertise to develop new decoupling solutions for auxiliary systems that meet the requirements and ambitions of OEMs in this fast-moving transition period."

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 around 10,000 employees at 41 production and engineering locations across 18 countries, Vibracoustic serves all major automotive manufacturers. In 2020 Vibracoustic recorded total sales of 1.8 billion €. For more information, see www.vibracoustic.com

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Vacuum pump decoupling with double isolation layers (left) and eCompressor decoupling with single isolation layer (right)