Press Release

Vibracoustic addresses electric drive unit NVH issues with new elastic ring gear

Darmstadt, 20 April 2022 | Vibracoustic, a leading global automotive noise, vibration and harshness (NVH) expert, has developed an elastic ring gear to help mitigate electric drive unit (EDU) excitations in electric vehicles (EVs) planetary gearboxes. With vehicle manufacturers confronting new NVH challenges in their EV programs, Vibracoustic is already developing a range of industry-leading solutions.

While most manufacturers have effectively decoupled and isolated their EDUs, there are still excitations causing noticeable NVH issues. Common among current EV production models are high-frequency excitations like torque ripple, caused by e-motors and vibrations that are transmitted into the gearbox housing.

Vibracoustic's engineering team developed a solution to these challenges for planetary gearboxes by adding a vibration isolation between the housing and the ring gear. Through extensive simulation and material evaluation, they designed a tunable rubber ring gear that offers multi-directional decoupling (radial, axial and torsional) to significantly reduce the transmission of vibrations. Extensive finite element analysis (FEA) also concluded that Vibracoustic's elastic ring gear delivers a wide range of sound-pressure reductions. The elastic ring gear therewith offers high frequency NVH optimization for electric drive systems with planetary gearboxes an can even make addition acoustic encapsulations obsolete due to its wide frequency working range.

Dr. Jörg Böcking, CTO at Vibracoustic, commented: "While electric vehicle powertrains may be substantially different to their internal combustion predecessors, managing excitations in EV propulsion systems is still very much an integral part of 'whole vehicle' NVH mitigation. As a global NVH leader, our engineers are proactively developing leading-edge NVH technologies to solve emerging industry challenges – particularly around electrification. One example for that is the new elastic ring gear which will help OEMs to further mitigate the transmission of high-frequency noises and vibrations from electric drives to significantly improve driver experience and comfort."

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 2021 Vibracoustic recorded total sales of 2.0 billion €. For more information, see www.vibracoustic.com

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