Vibracoustic

Press Release

Vibracoustic hydro leveling technology provides innovative, low-cost active suspension system

Darmstadt, 2 August 2022 | Vibracoustic, a leading global automotive noise, vibration and harshness (NVH) expert, has developed a cost-effective ride height and suspension leveling system that allows car manufactures to experience height leveling benefits of an air suspension with significantly less complexity and costs.

With air suspension applications growing in popularity among electric vehicles (EV) and at the same time, electric vehicles becoming more affordable, car manufacturers are facing new NVH challenges. One example is the significant demand for a more simple and affordable leveling system – to make this premium feature available for smaller vehicle segments. Vibracoustic has developed an all-new hydro leveling system that brings the benefits of ride height adjustability to new market segments. The patent-pending hydro leveling system can be tailored to front or rear-axle applications and is a cost-effective solution for ride height adjustability of lower segment cars including smaller EVs. Furthermore, it can also help increase the energy efficiency of EVs and therewith allow a smaller battery pack while maintaining the same range.

The fully operational prototype of a hydro leveling system delivers 40 mm of travel at wheel but can be adjusted for each vehicle. When used as rear-axle application it can compensate for trunk loading, deliver improved comfort, and maintain ground clearance for fully loaded vehicles, adjust the angle of stall for improved battery cooling of EVs, or provide a more comfortable loading / unloading position. Applied to both, front and rear-axle, it can additionally adjust ground clearance for speed bumps and driveways or lower the vehicle for high-speed driving to reduce drag and increase range

Currently, air springs and complex actuators are the only established automotive leveling solutions. While extremely effective, they are typically too complex and costly to fit to non-luxury or smaller vehicles. The hydro leveling will enable car manufacturers to include single or dual-axle variable ride height systems at significantly lower cost, backed by the rigorous engineering and testing processes of a global leader in NVH and air spring systems. Vibracoustic is already discussing upcoming applications with several car manufacturers, including all-new EV models.

How it works

The core of the hydro leveling system is a hydraulic actuator. The design of the actuator is based on the air spring technology and deep knowledge on rubber to metal components of Vibracoustic. The hydro leveling system is controlled by a dedicated electronic control unit (ECU) including software developed by Vibracoustic. It incorporates height sensors and a powerpack (pump, tank, valves). The system offers a leveling speed of 10 mm per second in two-corner applications, operating when the vehicle is static. As a next-generation suspension system, the hydro leveling prototype system has been thoroughly tested for durability and functionality while integrated into a popular European C-segment vehicle. Leveraging its 'whole system' approach to product development, the Vibracoustic engineering team was able to ensure excellent NVH performance.

Testing highlighted that the hydro leveling system in a C-segment vehicle substantially improved ride and comfort metrics of a loaded vehicle. Tested under rough road conditions of different amplitudes and frequencies, the system offered large comfort improvements at low frequencies of up to 15 Hz due to significant reductions in road-induced excitations.

Frank Müller, CEO of Vibracoustic, commented: "With our new hydro leveling system, we provide a simple and cost-efficient solution for smaller, affordable EVs while still offering essential benefits of more complex air suspensions. Therewith, we make premium-level features available for smaller vehicle segments. The hydro leveling system will

perfectly complement our industry-leading air spring portfolio and increase driving comfort for an even wider range of vehicles."

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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