

PRESS RELEASE



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Ricardo NVH technology creates the ‘right’ sound for sports cars – and EVs too

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- Ricardo’s ‘Realistic Augmentation’ technology allows the optimization of engine sound to enhance market appeal, using software modelling
- Detailed description will be amongst the Ricardo contributions to the conference *The NVH complexity challenge: achieving appealing ‘green’ vehicles, to be hosted in Graz, Austria, on 22-24 June 2016*

The characteristic sound quality of the engine as perceived by the driver, passengers, and other road users, is at the core of the brand image of performance sports cars – and it provides instant feedback to the driver as to the operation of the vehicle. But the advent of increasingly tighter pass-by noise regulations, engine downsizing and the near universal adoption of turbocharging has made the challenge of engineering the optimum acoustic character significantly more difficult. Typical turbochargers cut both intake and exhaust noise by around 15 dB, because the pressure differences across compressor and turbine constitute strong mismatches of acoustic impedance. This situation hinders the delivery of the sporty sound that customers expect from high performance vehicles – in effect separating the musician from the instrument.

The ‘Realistic Augmented Sound by Ricardo’ (RAS-R) technology described in the paper *System for Realistic Augmentation of Sporty Engine Sound Quality* provides a means by which sound quality can be enhanced and perfected through the use of a real-time software based model of the engine, or by sensor based dynamic pressure signals from the intake manifold. The signals measured or generated in software are processed in real-time to create the desired quality and level according to the actual



driving demand on the vehicle, and played back through the cabin loudspeaker system in sync with instantaneous vehicle operation.

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RAS-R is already well proven for the NVH engineering of premium sports cars, and Ricardo is increasingly applying it to the create the desired acoustic brand character of electric vehicles and plug-in hybrids. In these cases, the real-time software based model of the engine is replaced or adapted in order to create acoustics that will be most pleasing and rewarding to drivers and passengers of these new low-carbon vehicle types.

“Whatever vehicle type customers are seeking, sound quality remains a major determinant of most purchasing decisions,” commented Ricardo NVH technical specialist Mathew Maunder. “Automakers have long realized that many purchasers are swayed by softer considerations of the experiential ‘feel’ of the vehicle. And of all of the sensory considerations, the least recognized but the strongest influence may be that of sound. Ricardo’s RAS-R technology enables us to engineer the most attractive acoustic quality and character for any vehicle type, from performance sports cars to the latest electric vehicles and plug-in hybrids.”

Further paper contributions by Ricardo at the same conference include *Piston Design for Optimizing Trade-off of Friction and NVH; Advanced Analysis Techniques for NVH and Sound Quality Improvement; Understanding the Fundamentals of Boxer Engine Behaviour on Sound Quality and Methodology to Study the Impact of the Exhaust System on Vehicle Interior Noise – Identification and Target Setting.*

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NOTES TO EDITORS:

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