



# Sound: Hear the Difference

## Research reflects quality of sound

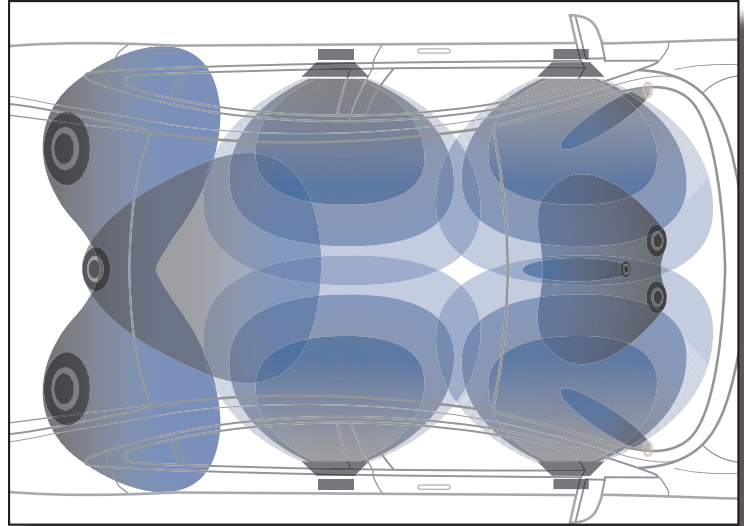
You hear it when you enter a vehicle on the showroom floor and close the door. Or when you activate your turn signal or leave a seat belt unfastened.

## Sound quality is an essential part of vehicle quality

First, sound is informative – it delivers information on functionality, danger and the environment.

Second, sound implies a certain image, such as luxury, sporty or cheap – which has a direct impact on consumers' emotions and thus their perception of quality.

Sound cannot be evaluated on a single dimension. And so, at Ford the principles of psychoacoustics are used, the study of the perception of sound, to research properties such as loudness, sharpness and roughness. Thus, Ford sound engineers can determine which sounds customers prefer, and which evoke the appropriate response in terms of driver action required and quality perceived.



Ford uses the science of psychoacoustics to measure and engineer sound.

## The result?

Ford's wind noise rating is among the best in the industry, according to the U.S. Global Quality Research System (GQRS), due to a team focused on closure systems and their impact on sound quality.

Improvements were achieved by ensuring the fit of parts by moving sheet metal coordination forward in the development process and by using a new inset door to eliminate the path where wind flow typically creates noise.

Ford is changing. Today 70 percent of its vehicles are recommended buys in the reports consumers trust. Ford's focus on sound and its impact on the perception of quality is one important way the company is different – from the Fords of yesteryear as well as from today's leading competitors such as Toyota and Honda.



## A quality sound environment includes:

- Ensuring appropriate character for sounds and the response they evoke. An example is the difference between a courtesy information sound, such as a seat belt chime, and a cross-traffic alert indicating the driver must take immediate action.
- Creating the correct balance between road, engine and wind noise through extensive NVH (noise, vibration and harshness) studies for all new vehicles.
- Minimizing disturbing sound components such as whines, squeaks and rattles.
- Mitigating sensory overload to reduce driver distraction.

These descriptors are not easy to express in engineering terms, but Ford has figured out how to assign metrics to guide design engineers in creating the ideal acoustical and vibrational environment. Ford refers to these metrics as its DNA. Other carmakers may only approximate their parameters for sound quality, but Ford is actually able to measure the sound quality in its vehicles exactly – and replicate it, Ford after Ford.

**“We know what quality sounds like because consumers have told us. They’ve identified the difference between a ‘plastic’ sound versus one that is solid and secure. We know the metrics of each, and we design for consumer preference: ‘Sophisticated, with a subtle decay in duration.’ No, it’s not the description of a fine wine, but actually the sound consumers prefer for a Ford door closing.”**

– Alex Petniunas

Ford sound quality engineer

