

How do you provide the best possible sound?

A recording studio in your car

- / **SEAT's Car Audio team relies on techniques and tools used in concert halls to produce the best sound in your car**
- / **Developing the sound system begins in the early design stages of a model**
- / **The position of the speakers or the design of the grilles have an influence on sound quality**

Martorell, 30/05/2018.– On extended trips with the family, daily commutes to and from work or in traffic jams in big cities. Your car is a favourite place for listening to music, and at the same time, one of the most difficult for getting good sound. The question is how to make the passenger compartment feel like a real concert hall? Below is a list of the key aspects of this feat of engineering:

-From the initial development stages: Unlike a few decades ago, the Car Audio and Infotainment team at SEAT gets involved as soon as development on a new model begins. **“Our goal is to arrange all the elements that make up the sound system in the vehicle so that it delivers the best possible sound”**, explains José Luis Álvarez, an engineer in the Infotainment department.

-Up to 10 strategically located speakers: Their location and orientation is one of the most important aspects for sound engineers to consider. Depending on the model, there could be between six and ten speakers that deliver bass, mid-range and treble tones. Their definitive position must take into account design as well as safety aspects. But **“the design of the grilles, and of course, the layout of the passenger compartment”**, also affect sound quality, adds Adrián Mateo, a Car Audio Acoustics engineer at SEAT.

-The quietest room: The anechoic chamber is a soundproof room designed to absorb any sound wave, and is where the sound quality of speakers is tested. Further testing is performed in the electronics lab to validate the radio and amplifiers. These are just two of multiple tests performed on the entire sound system so that no other element, such as dust, humidity or vibrations, affects the sound quality.

-The ‘stage effect’: **“We want all the occupants of the car to feel as if they were attending a concert, for example”**, points out José Luis. Although not all speakers are located in the front of the car, it’s his job to create that effect. His work consists in using techniques and tools found in concert halls or recording studios. One of these is equalisation, which precisely optimises bass, mid and treble tones. These tests are carried out with different audio sources: radio channel, mp3 or mobile phone, for example. They also use different musical genres, ranging from hip-hop and jazz to instrumental and vocal compositions, to ensure the best possible sound quality all the time.



-Final adjustments, on the road: This same kind of testing is performed while the vehicle is moving on the road so that the engine, among other factors, does not interfere in the sound quality. To ensure this, engineers make their final adjustments while sitting at the wheel, and once again equalise the sound coming from the speakers. **“Our ultimate goal is to obtain the most natural sound possible”**, concludes Adrián Mateo.

SEAT is the only company that designs, develops, manufactures and markets cars in Spain. A member of the Volkswagen Group, the multinational has its headquarters in Martorell (Barcelona), exporting 80% of its vehicles, and is present in over 80 countries through a network of 1,700 dealerships. In 2017, SEAT achieved worldwide sales of nearly 470,000 vehicles.

The SEAT Group employs close to 14,700 professionals at its three production centres – Barcelona, El Prat de Llobregat and Martorell, where it manufactures the highly successful Ibiza, Leon and Arona. Additionally, the company produces the Ateca and the Toledo in the Czech Republic, the Alhambra in Portugal and the Mii in Slovakia.

The multinational has a Technical Centre, which operates as a knowledge hub that brings together 1,000 engineers who are focussed on developing innovation for Spain’s largest industrial investor in R&D. SEAT already features the latest connectivity technology in its vehicle range and is currently engaged in the company’s global digitalisation process to promote the mobility of the future.

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