



Tackling noise pollution

Tuning car engines

Melissa Berry

Precision technology has dramatically altered the driving experience. But vehicles today are not simply quieter. Manufacturers can play with the resonance and pitch of car noise, as if they were tuning a musical instrument.

At MIRA, the motor industry research association, manufacturer's commission experts, to analyse and refine the engine vibration tyre and wind noise, and engine noise as it's heard by the driver. A dummy head with microphones placed at ear level, is connected to a computer, which test the various frequencies of the engine.

John Parsons, MIRA

The basic process is to quantify the source of the various noises in the vehicle, and to understand how that noise is transmitted through the vehicle, either through the air, or through the structure, and then how that noise is experienced by the people inside the vehicle. We can then make design changes to the vehicle, to effectively reduce the noise inside the car.

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Each manufacturer wants its car to sound unique. On this computer screen frequencies can be enhanced or reduced to change the sound of the car.

Paul Delderfield, MIRA

In general for a car, what most people like to hear is, a noise that gradually increases in level with speed, it gives some feedback to the driver of what the engine's doing, and also, to have some strong dominant orders in the engine noise is not necessarily a bad thing. What's often undesirable is, to have big peaks in the characteristic. If you've got a noise that goes up suddenly, then comes down again, that can be quite annoying. Also any discrete tones, either resonance's or discrete frequencies that are generated by components, that are there all the time can be very annoying.

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So MIRA can help the manufacturer create the ideal quiet car, but there are some environmental trade offs.

John Parsons, MIRA

Solutions to noise and vibration problems, will often add weight to the vehicle and cost. So there's a direct penalty there for the manufacturer.