

# Reduction of CABIN NOISE





## INTRODUCTION

Around 280 million vehicles were recalled by various auto makers in 2017. Cabin noise contributes to around 37% of such recalls. The general approach by auto makers is not to reduce noise by additional insulation, but rather avoid the creation of any disturbing noise in the design phase through smart engineering.

With increasing pressures to reduce time to market, the ability to identify and trouble shoot before the car hits the manufacturing floor is not just efficient, but rewarding financially. Take the example of a German auto maker who used design thinking methodology and replaced the flat firewall separating the engine compartment from the cabin with a waffle-shaped one that absorbs noise vibrations.

With technology advancements most auto manufacturers are adopting software driven technologies to ensure that the number of recalls are reduced. Let's look at a Japanese auto manufacturer who used Software driven industrial technology to reduce cabin noise.

## THE CUSTOMER

One of the top 10 global auto manufacturers headquartered in Japan.  
Business Scenario:

The auto manufacturer faced customer backlash about the rising decibel levels in their vehicle cabin. They wanted to make design changes on their factory floor without impacting their time to market.

## THE CHALLENGE

Reduce cabin noise level by 5dB to 70Hz and 180Hz by providing an optimized solution with minimal design changes to the vehicle structure. Any changes made to the structure with respect to material property, size and shape etc. will directly affect the production line of the vehicle – thus impacting time to market. Our research showed that the noise level in the car was higher than the desired levels – 64dB at 70Hz and 59dB at 180Hz.

## SOLUTION

AXISCADES studied the noise levels of the passenger car using baseline frequency response analysis and Artificial Intelligence. Studies revealed that a panel near the dashboard was having more participation than others.

Findings were verified using the strain energy diagram and deflection plot. Using design thinking methodology two stiffeners were designed and implanted to reinforce the panel structure thus reducing the vibrations. Delivered Art to Part programs.

## KEY BENEFITS:

Design thinking approach reduced the noise levels by 12 dB to 52dB at 70Hz and 47.5dB at 180Hz - exceeding customer expectations.

## WHY PARTNER WITH AXISCADES?

Integrated solutions offering across design, manufacturing and supply chain.  
Efficient delivery process and quality procedures for regulatory and safety compliance.  
Strong program management practices and capability in terms of technology and scalability.  
Flexible engagement and cost models for offshore and onsite development.  
Reliable eco system for sourcing, prototyping and manufacturing.