



Case Study

# Rigid, Quiet or Both? One Stop for Buzz, Squeak and Rattle Testing Design + Build + Test Solution



Quiet vehicle interiors don't happen by accident.

**The Customer**

Our customer is a major Tier 1 automotive parts manufacturer of electromechanical devices. They were design responsible for a complete center console assembly that was in production on a new crossover platform. During routine end-of-line testing, the OEM discovered a buzz, squeak and rattle (BSR) issue that was identified as coming from the center console. On ride-along sessions the clients' engineer was able to confirm the characteristics of the noise as well as its general location.

**The Challenge**

Even though the client was design responsible, they did not have much experience mitigating BSR issues. The original plan for BSR qualification of the console was for the OEM to conduct the qualification during the full vehicle four-poster vibration test near the end of the development program.

Since the vehicle was now in production, the our client took on the responsibility to develop a quick and permanent solution to the issue.

**The Paragon Systems Solution**

The client provided us with the CAD model and GD&T for the console as well as the CTS. We designed and fabricated the BSR fixture and then qualified it both for resonant and noise performance. Not only does a BSR vibration fixture need to be appropriately rigid to transmit energy with a high degree of fidelity, just as importantly it must be quiet enough not to mask any noises that may be produced by the console that is being shaken.

With BSR testing, more so than with typical vibration testing it is critical for the client engineer to be able to experience the noise issues real-time within the test environment.

The semi-anechoic quiet room is large enough to accommodate the quiet shaker and the test assembly while still permitting the client engineer and a support technician to work comfortably.

During a series of test runs in the semi-anechoic quiet room, the client engineer was able to confirm the location of the issue.

A remedy was developed by the client and their solution was BSR qualified both before and after a complete vibration durability test run.

Canada's only independent buzz, squeak and rattle testing facility, equipped with the patented MB Dynamics Energizer quiet shaker.

Capable of vibration testing at noise levels of <35 dBA (<1.5 sone) with multi-channel sound and vibration data acquisition analysis system.



**Tools**

- Solidworks CAD Software
- Manual & CNC Machine Tools
- Semi-anechoic quiet room
- MB Dynamics Energizer Black Quiet Shaker
- Multi-channel 44 kHz data acquisition system