

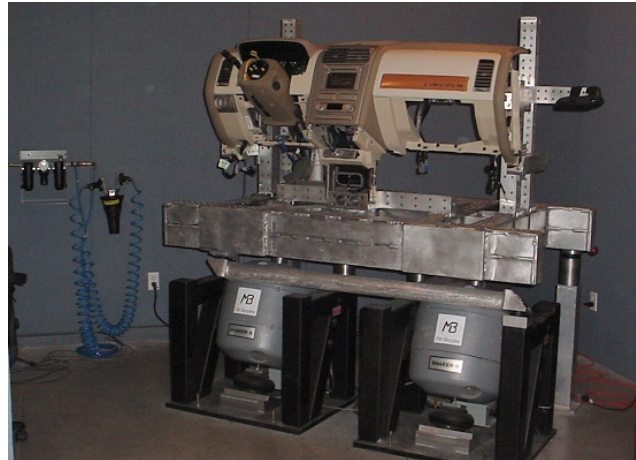
## **CASE HISTORY: Production Verification of the Ford Edge/Lincoln MKX Instrument Panel**

Squeaks and rattles (S&Rs or BSRs) have significantly contributed to warranty costs in the past and are primary indicators of quality and customer satisfaction. The instrument panel has been one of the largest sources of these warranty costs due to its proximity to the driver and its increasingly complicated design/layout.

In the past OEMs relied upon vehicle level testing to find instrument panel (IP) noises. However, root causing S&Rs in IPs is difficult during vehicle level testing. The best way to troubleshoot and understand these root causes is to test the IP before it is assembled into the vehicle. At this module level, validating interim and permanent corrective actions to address the noises is also relatively quick and easy.

**THE NEED:** A quantitative S&R detection process for pre-production and production IPs that will reduce S&R issues compared to historical programs.

**THE DELIVERABLES:** 1) quiet vibration equipment that recreates road vibration at IP connect points without contributing contaminating noises from test equipment; 2) a Quiet Room inside the IP assembly hall to create a "quiet enough" environment to measure and find S&Rs; 3) experienced and skilled manpower to operate the S&R detection equipment; 4) documentary proof that: IP connect point vibration conforms to in-vehicle motions, fixture dimensions conform to CAD, and Gage R&R of acoustic measurements meet minimum requirements; and, 5) a disciplined Six Sigma Issue Tracking Process that feeds back results and counter-measures to design (for future DFMEA and S&R Prevention), to suppliers for quality issues, and to assembly for continuous improvement.



**THE RESULTS:** 1) There was a 150% improvement in IP S&R issues found and fixed in this 2007MY program vs. a comparable 2005MY vehicle program. 2) Over 30 unique issues were identified during Production Verification. 3) Over 200 IPs were tested, 3 months before to 3 months after launch. 4) A durability and several supplier assembly issues were found which would probably not have been found under normal practices. 5) Lessons Learned identify improvements needed during Design Verification and many other aspects of the development program. 6) Ford is considering how to apply broadly these methods in future programs.