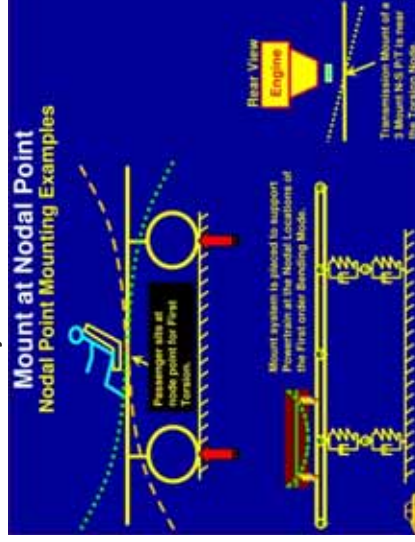


Instructor Background Mark Daly

Mr. Daly is currently working as an NVH consultant and instructor for NVH Experts, Inc. His experience includes more than 20 years in the field of Sound and Vibration. His former positions include Hybrid Electric Vehicle NVH Technical Leader at Ricardo, Inc., NVH Consultant at Roush Industries, Inc. and Vehicle Level Powertrain NVH Technical Specialist at Ford Motor Company. He has developed and presented courses in North America, Europe and Asia. He has been actively involved in most aspects of vehicle related NVH. He has developed the powertrain mount systems for three different Hybrid Electric Vehicles, as well as many gasoline and Diesel powertrains, he developed several successful counter measures for brake roughness and has guided the NVH on several programs from concept to production, he developed an NVH CAE model for powertrain hydro mounts, a simulation for Impact Harshness and a CAE method to eliminate modal truncation errors in component synthesis. He received his Bachelors and Masters degrees in Mechanical Engineering from Wayne State University, MI, USA. His graduate work focused on sound and vibrations. He has received several patents and awards for his work and creativity in the automotive industry.



Who should Attend:

This seminar is designed for engineers (working with passenger, commercial, industrial, and agricultural vehicles) who need to design vehicle components that may influence NVH. Engineers new to the isolation field, as well as managers, marketing personnel, purchasing professionals and others interested in NVH fundamentals will also benefit from this seminar. The material covered on the first day is presented at a level suitable for beginners, but offers the more experienced practitioners new insight into the concepts presented through the illustrations and demonstrations that are included. The second day covers more advanced topics.

Highlights :

- Understand wheel and tire modes and excitations and how they interact with the vehicle system.
- Understand powertrain modes and how they interact with the vehicle system.
- Understand and describe the various engine excitation orders and how they affect NVH.
- Identify isolation caused by NVH issues in existing systems and develop feasible counter measures.
- Understand isolation systems which provide optimal tradeoffs between noise, shake, durability and cost.
- Effectively communicate with suppliers about isolator properties.

Organizers:
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Branch of INDUS USA Inc.

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Indus Integrated Technology Solutions

INDUS INTEGRATED TECHNOLOGY SOLUTIONS PVT. LTD.



Presents Workshop/Seminar
on

The NVH Systems

By

Mr. Mark Daly
NVH Consultant

on

12th & 13th February, 2015
Time : 9am to 5pm



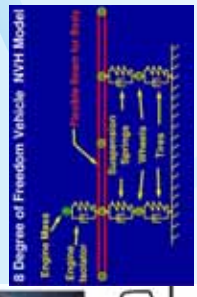
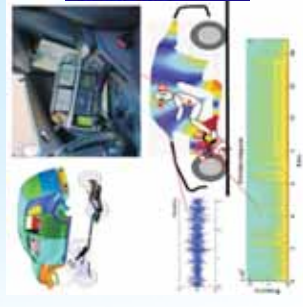
Venue

The Royal Orchid Central

4711, Manipal Centre, Dickenson Road,
Bengaluru - 42. Ph : +91 80 2558 4242

Welcome to Workshop :

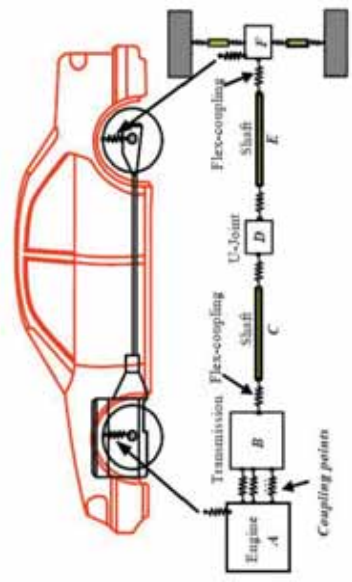
Indus & NVH Experts welcomes you for two day workshop on Chassis NVH which provides training for engineers and management in chassis systems NVH and powertrain isolation. The chassis system plays an enormous role in optimizing occupant comfort as it so strongly influences vehicle vibration, shake and interior noise. This seminar provides an introduction to the fundamental concepts of Chassis NVH. Chassis NVH relates to noise and vibration (NVH) issues generated by the powertrain and the suspension. These noise sources dominate Vehicle NVH and if executed poorly, they will dominate vehicle warranty as well. This presentation will focus on the most important chassis noise sources and the design strategies to minimize them. This two-day seminar will cover vehicle level powertrain, driveline, brake and tire excitations. It will provide design strategies to reduce or eliminate NVH issues in the chassis system. It will also provide real world examples of NVH concerns and the counter-measures used to mitigate them. The chassis system NVH course covers wheel & tire, driveline, and the basics of powertrain NVH. The powertrain isolation course covers the excitations from the powertrain and accessories as well as the advanced mount design strategies. The Mission of NVH Experts is to satisfy the needs of the manufacturing industry by providing Engineering Products, Services & Training to the NVH community.



Course Program Contents :

Day 1

- Principles of NVH
- Definition of NVH
- Example with Countermeasures
- SDOF example with excitation
- Amplifier/Attenuation Effects
- Vehicle System NVH
- Definitions
- Wheel, Brake & Tire NVH
- Wheel Excitations
- Brake Excitations
- Tire Excitations
- Real world example
- Countermeasures
- Driveline NVH
- Excitations
- U-Joints & CV-Joints
- Design recommendations
- Real World Examples
- Engine NVH
- Sources of Excitation
- Strategies of NVH
- FWD, RWD & AWD Examples
- Hybrid NVH Considerations & Examples



Day 2

- Engine NVH Continued
- Intake and Exhaust Systems
- Isolator Behavior
- How Isolator are described
- Frequency, Amplitude, Preload, Temperature and Age Dependencies, etc.
- Typical Isolator Materials: Rubber, Butyl, Multi-Cellular Urethane, Silicon
- Measuring Isolations in the lab
- Measuring Isolation in vehicle
- Isolator Design
- Designing for Installation Robustness
- Designing Brackets
- Tuned Absorbers
- Span/Size
- Isolation Strategies
- Mass Loading
- Modal Decoupling and Modal Alignment
- Number and Placement of Isolators
- Inertial Torque Roll Axis (TRA) and Elastic Torque Roll Axis (Elastic Axis)
- Example
- Other Noise Generating Components Attached to the Body
- High-end isolators
- Air Spring Mounts
- Hydro mounts (Viscous, Tuned, Dual Orifice, and Switchable)
- Active Mounts
- Focalized Mounts and Focalized Systems
- Torsional Vibrators
- Flywheels and Crank Dampers
- Dual Mass Flywheels
- Mechanical Torsional Dampers
- Advanced Torsional Dampers

