



MONTHLY WEBINAR

MAY 19TH, 2022

SOUND & VIBRATION TECHNOLOGY



About Vibration Research

VIBRATION RESEARCH

Established 1995

John Van Baren President/CEO

Phil Van Baren Senior VP Product Development



WORLDWIDE LOCATIONS VIBRATIONRESEARCH.COM/CONTACT

SALES & SUPPORT OFFICES

China Shanghai - Suzhou - Xi'an

Europe (Eastern) Blansko, Czech Republic

Europe (Western) Foritztal, Germany

India Hyderabad, Telangana

United Kingdom (England) Fordingbridge, Hampshire

USA (Headquarters) Jenison, Michigan

REPRESENTATIVES

Australia	Estonia	Italy	Mexico	Romania	South Africa
Brazil	Finland	Japan	New Zealand	Serbia	Sweden
Bulgaria	France	Korea	Norway	Singapore	Switzerland
Canada	Hungary	Latvia	Philippines	Slovenia	Thailand
Croatia	Indonesia	Lithuania	Poland	Slovakia	Turkey
Denmark	Israel	Malaysia	Portugal	Spain	Ukraine











VR CUSTOMERS







COLLABORATION

CAPABLE & COMPETENT

ACCOUNTABLE & RESPONSIBLE

STRONG & DRIVEN WORK ETHIC

DO THE RIGHT THING

INNOVATION







ALWAYS INNOVATING.





VIBRATION RESEARCH PRODUCTS



ObserVR1000[®] VR9500 & VR10500 Electrodynamic Shakers



VIBRATIONVIEW SOFTWARE



idof



Sine



Random



Shock



Sine-on-Random



Sine-on-Sine



Random-on-Random



STAG



Shock Response Spectrum



User Defined Transient



Transient Capture



Field Data Replication





VIBRATION TESTING

AUTOMOTIVE INDUSTRY

JORDAN VAN BAREN | DOMESTIC SALES MANAGER

SOUND & VIBRATION TECHNOLOGY





EVOLUTION







AUTOMOTIVE COMPANIES













Many auto manufacturers, as well as the tier 1 suppliers, do vibration testing because:

- there is a testing standard
- they better their products for market
- products last longer

Whole vehicle to component



TYPES OF SHAKERS

ELECTRODYNAMIC

higher frequencies, lower displacement

SERVO-HYDRAULIC

lower frequencies, higher displacement





TRANSDUCERS

TYPES:

- accelerometers
 - IEPE and charge
- strain gauges
- pressure transducers
- voltage
- laser vibrometer
- thermocouple





TYPES OF TESTS

OTHER SHAKER SETUPS

Buzz, squeak and rattle testing for interior noise

Multi-axis testing for both simultaneous and for one-axis sequentially.









AUTOMOTIVE INDUSTRY

TESTING STANDARDS:

- MIL-STD-810H
- SAE J1211
- GMW3172
- ASTM Series
- EV Standards
 - SAE J2464
 - IEC 62660





VIBRATIONVIEW TEST MODULES

SINE

One frequency at a time. Good for finding a specific resonant frequency.

RANDOM

Excite many frequencies at one time. Also good for randomized and realistic testing.

SHOCK

Large shock events replicated. Known as drop or bump tests.

FIELD DATA REPLICATION (FDR)

Replicate the data exactly as it was recorded.

FATIGUE DAMAGE SPECTRUM (FDS)

Create a Random profile based on fatigue recorded in the real world.





Spectrum



FORD SPECIFICATION

Enter profile into VibrationVIEW (VV)

New release is available on our website at VibrationResearch.com

All the tests we run today can be done in the simulation mode of the VV software.

Use VV also to make sure you can run a test in your system limits.

Use VV to analyze data and create reports.

Classification		Vibration Method	Acceleration Frequence (m/s²) (Hz)	Frequency (Hz)	Sweep Type	Time Per Sweep (Minutes)	Number of Sweeps Per Axis	Number of Axes	Total	
Number	Description								Sweeps	Duration
1	Mild On Body Away From Suspension Attachment Points		10mm-p-p Displacement Ilmited 44.1(4.5g's) 19.6(2g's) 4.9(0.5g's)	5 - 15 15 - 25 25 - 100 100 - 200	Log	20	18	3	54	18.0 (hrs)
		5	10mm-p-p Displacement limited 58.9(6g's) 14.7(1.5g's)	5 - 17.3 17.3 - 100 100 - 200	Log	20	18	3	54	18.0 (hrs)
Ш	Moderate On Non-Rigid or Cantilevered Body Attachments, Panels, etc.	A	10mm-p-p Displacement limited 58.9(6g's) 29.4(3g's) 19.6 (2g's)	5 - 17.3 17.3 - 50 50 - 100 100 - 200	Log	20	18	3	54	18.0 (hrs)
		5	10mm-p-p Displacement limited 88.3(9g's) 68.6(7g's) 44.1(4.5g's)	5 - 21.1 21.1 - 50 50 - 100 100 - 200	Log	20	18	3	54	18.0 (hrs)





TEST CONDITION B

Amplitude:

0.06 in pk-pk or 15Gpk whichever is less

Frequency range:

10Hz to 2,000Hz

Sweep time and duration

 The entire frequency range of 10Hz to 2kHz and return to 10Hz shall be traversed in 20 minutes. The cycle shall be performed 12 times > total of 4 hours per axis.











COPY AND PASTE

BREAKPOINT TABLE

Frequency	Amplitude	Slope
10Hz	0.05	0
100Hz	0.05	-7.048
110Hz	0.04	0
310Hz	0.04	2.553
500Hz	0.06	0
1,060Hz	0.06	-23.38
1,100Hz	0.045	







CREATING THE PSD

- convert the combined and weighted FDS into a PSD
- create a damage equivalent test to all combine waveforms







ASK THE EXPERTS

ELITE ELECTRONIC ENGINEERING > ERIC LINDBERG

- type of sensors
- channel count on a vibe test
- "shake and bake" testing



EliteTest.com @elite-electronic-engineering-inc



ASK THE EXPERTS

MGA RESEARCH CO. > DAVE MORONI

- common and unique tests
- common testing issues



mgaresearch.com @mga-research-co.



COMPREHENSIVE SUPPORT

CUSTOMER SUPPORT IS KEY

DEMONSTRATION MODE

UPGRADES & SUPPORT AGREEMENT

CALIBRATION

TRAINING & EDUCATION



···· 🔊 💮 💮



ANY QUESTIONS?

+1.616.669.3028 vrsales@VibrationResearch.com support@vibrationresearch.com 1294 Chicago Dr | Jenison, MI 49428 USA

VibrationResearch.com



