Prosig Case Study

Are You Sitting Comfortably?

A Prosig P8000 system is used to measure vibrations at defined points on seats designed for commercial / industrial / agricultural vehicles. The seats are tested on a 3–axis shaker rig while suitably loaded. The DATS Human Response software is then used to check that the seat complies with the relevant standard.
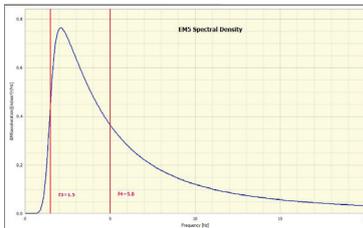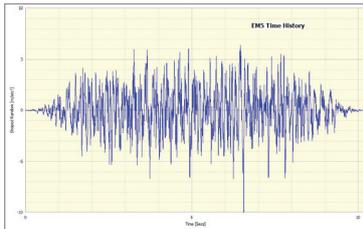
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Are You Sitting Comfortably?

A UK manufacturer of industrial grade suspension seats chose Prosig's P8012 hardware and DATS software because of its comprehensive support for international certification standards.

The company wanted to test the effectiveness of their seats using laboratory test methods prescribed in the relevant international standards (ISO 10326-1, ISO 7096 and EEC 78/764). These standards are specifically aimed at off-road, heavy duty machinery such as earth moving equipment and tractors. The ISO 10326-1 standard is a general test method for a variety of earth-moving vehicles; ISO 7096 is based on this standard but is limited to a specific sub-set of vehicle types; the EEC 78/764 directive applies specifically to seats on wheeled tractors used in agriculture or forestry work.

The ISO 10326-1 standard requires the test laboratory to be able to reproduce random vibration acceleration signals that have similar characteristics to typical field measurements in both the time and frequency domains. The various types of vehicle are categorized into 9 different classes where each class has an associated idealized spectral density function that has to be matched within specified tolerance limits when measured at the base of the seat under test. Similarly, the time domain amplitudes of the same signal must match those of an idealized Gaussian distribution. The ratio of the weighted measured RMS responses of the seat and the base is a quantity known as the Seat Effective Amplitude Transmissibility factor, or S.E.A.T. factor. The random input waveforms for ISO10326 and ISO7096 can be generated in various ways so long as they meet the defined frequency spectra; the corresponding waveforms for EEC 78/764 testing are explicitly defined within the standard and are therefore not open to interpretation.

In order to meet the customer's requirements Prosig supplied a multi-channel data capture system together with a digital-to-analogue output convertor for generating an appropriate drive signal for the hydraulic actuator rig. Prosig's Human Biodynamics software was used to create the frequency spectra specific to the relevant ISO vehicle class and then generate a random time history having the same frequency characteristics.

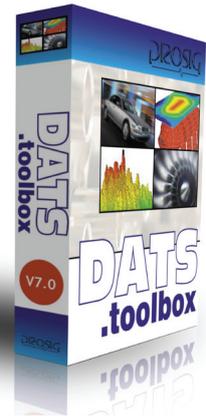## System consists of

P8012
24-bit data acquisition system

1 x P8012 Chassis
4 x 8402 4ch IEPE, Direct

DATS
Analysis software

1 x DATS.toolbox software
1 x DATS Human Response Analysis

Contact Prosig

Prosig Ltd (UK)
Email: sales@prosig.com
Phone: +44 (0)1329 239925

Prosig USA Inc
Email: prosigusa@prosig.com
Phone: +1 248 443 2470

THE BRITISH ASSESSMENT BUREAU
ISO9001
UKAS MANAGEMENT SYSTEMS
4307

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