

Training Simulators Extend Laboratory Testing Techniques for WBV Analysis

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Introduction

Human testing has always been a needed way to provide information on the effects of vehicle vibration, however, the manner of testing has not reflected the real situations of driver's hands on a steering wheel and a seat with back support and driving tasks. The typical system have used a standard sinusoidal excitation rather than the typical types of road – truck excitations

The new truck driver training simulators provide the combination of road roughness, speed effects, cab environment and individual tasks. The system has a full six axis simulation potential. The simulators have the protection of the individual by a combination of two ways for the individual to stop the motion as well as an operator with visual capability who can stop the testing. The closed simulator, shown in Figure 1, has the potential for providing motion during the operation.



Figure 1 Mark III Truck Simulator

Plan Objectives

The current project is to evaluate the levels and distribution available from a standard truck driver training simulator. The simulator has a combination of regular routs and “rough” routs.

The system will be operated with a combination of triaxial seat pads and floor accelerometers for comparison to the date collected from the trucks in Europe

Results

Comparisons of the truck testing data will be provided as part of the planning for future research activity. Initial testing has been done on the vibration exposure for the operator of the simulator when the roads are “rough”. The actual rms weighted value for vertical acceleration was 0.254 m/s^2 . The 1/3 Octave spectrum shown in Figure 2 is from driver’s seat in England. This seat showed significant loading in the 4 Hz. band. The simulator does have some loading in this area, but it is much lower.

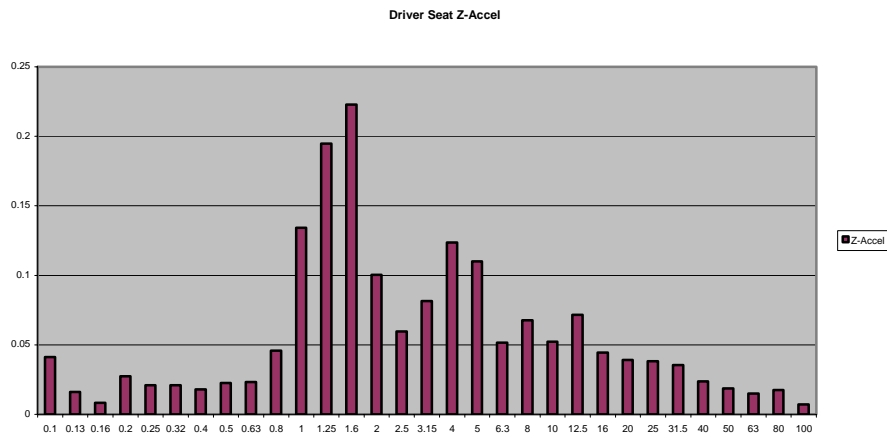


Figure 2 Driver’s Seat 1/3 Octave Z –Axis Acceleration

For testing purposes, the values in the 4 – 8 Hz region may need to be increased to the normal band level.