

A CONTRIBUTION TO THE INVESTIGATION OF THE TRANSMISSION OF FORE AND AFT VIBRATION THROUGH THE HUMAN BODY

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Abstract

Understanding the behavior of human body under the influence of vibration is of great importance for the optimal motor vehicles systems design. Therefore, great efforts are being done in order to discover as many information about the influence of vibration on human body as possible. So far the references show that the major scientific attention has been paid on vertical vibration, although intensive research has been performed lately on the other sorts of excitation. In this paper there are shown the results of the investigation of behavior of human body, in seated position, under the influence of random fore and aft vibration. The investigation is performed by use of an electro-hydraulic simulator, on a group of 30 healthy male occupants.

Experiments are performed in order to give results to improve human body modeling in driving conditions. Excitation amplitudes (1,75 and 2,25 m/s² R.M.S.) and seat backrest conditions (with and without inclination) were varied. Experimental results were compared to results obtained in similar conditions in order to verify test procedure. Data results were analyzed, so partial coherent and transfer functions analysis have been performed and results will be given in detail.

The results obtained have shown that the human body under the influence of random excitations behaves as a non-linear system and its response depends on spatial position.

Keywords

Human, fore and aft vibration, partial coherence function, transfer functions