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**VEHICLE AS A SAFETY FACTOR
OF THE TRANSPORTATION ACTIVITY**

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**VEHICLE AS A SAFETY FACTOR OF
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MVM2014-034

Jovanka Lukić¹
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Dragan Taranović⁴

HUMAN BODY TRANSMISSIBILITY RESPONSE TO VERTICAL WHOLE BODY VIBRATION: ANTHROPOMETRICS EFFECTS – CASE STUDY SERBIA

ABSTRACT: The biodynamic response of human body exposed to vertical random whole body vibration in term of seat to head transmissibility function (STHT) is investigated in this study. The STHT response of 30 male human subjects exposed to three levels of the vertical random vibration (0.55, 1.75 and 2.25 m/s² RMS) was measured in two sitting conditions (K – without seat backrest inclination, S – with seat backrest inclination) in the 0.3-30 Hz frequency range. The body mass revealed strong effect on the male STHT responses. The primary resonance frequency of heavier subjects was lower than that of the lighter subjects, while the peak magnitude was higher for the heavier subjects.

KEYWORDS: whole body vibration, Seat to Head Transmissibility Function (STHT), vertical vibration, body mass

INTRODUCTION

The influence of vertical, broadband, random, vibrations on the human body was examined through the seat-to-head transmissibility function (STHT). The biodynamic human response to whole body vibration (WBV) can be characterized using four biodynamic response functions. The driving point mechanical impedance (DPMI), apparent mass (APMS) and transfer mechanical impedance (TMI) are biodynamic functions often used to describe "to the body" biodynamic functions. The seat-to-head transmissibility function (STHT) describes the vibration transmitted through the body, [2].

The number of papers considering STHT is small in comparison with the number of papers considering DPMI. In this paper, the investigation of human body response to broadband random vibration was performed using STHT and these investigations were focused on vertical directional excitation.

From the synthesis of reported data on transmission of seat vibration to the head, it has been shown that seat-to-head vibration transmissibility is most significantly affected by the sitting posture, particularly the backrest contact. The study proposed different ranges of seat-to-head vibration transmissibility for back supported and back unsupported sitting postures. Apart from the sitting posture, the transmission of seat vibration may also be affected

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