



University of Banja Luka
Faculty of Mechanical Engineering
26th - 28th May 2011

DEMI 2011

*10th Anniversary International conference
on accomplishments in
Electrical and Mechanical Engineering and
Information Technology*

PROCEEDINGS

ZBORNİK RADOVA

BANJA LUKA, May 2011.



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**PROCEEDINGS OF THE 10th ANNIVERSARY INTERNATIONAL CONFERENCE ON
ACCOMPLISHMENTS IN ELECTRICAL AND MECHANICAL ENGINEERING AND
INFORMATION TECHNOLOGY**

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NVH INVESTIGATION OF POWER STEERING SYSTEM HYDRAULIC PUMP

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Summary: Paper presents a method for analyzing the noise and vibration problem caused by hydraulic pump of a vehicle power steering system. The method is based on experimental research and coherent analysis of observed system. Measurements are performed order to determine dominant excitation of hydraulic system in different operating conditions. Pump number of revolution was constant and was varied. Pressure of oil in hydraulic system is varied too. A method of assessment and determination of dominant NVH pump excitation is presented. Experimental results are input and output data in coherent analysis. Results showed that number of measuring channels can be reduced, especially in high frequency domain. Obtained results can be used in experiment design.

Key words: vehicle, steering system, hydraulic pump, NVH, noise, vibration, coherent analysis

1. INTRODUCTION

Contemporary vehicles are faced with undesirable fluid borne, structure borne and airborne noise. Fluid borne noise is typically generated in the fluid reservoir or in the hydraulic lines and could propagate through the mounting brackets. Structure borne noise transmitted to the driver via body structure through the pump mount, engine mounts, lines and system mounting brackets. Moan is the structure borne noise. Moan frequency is driven by natural frequency and harmonics of the pump rotational Vane Passing Frequencies or Blade Pass Frequency, depending on type of the pump [2, 4, 9, 10].

The noise generated by pump of power steering systems is an example of this kind of problem. Vane pumps are used in the majority of steering systems in automotive applications. These pumps generate noise due the vane passing frequency. Basically, the hydraulic pump noise can be classified as moan or whine, regarding the operating condition [2, 4, 5, 6].

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