

SIMULATION OF AN INPUT SHAPING SCHEME TECHNIQUE TO INVESTIGATE UNWANTED NOISE AND VIBRATION IN WIPER BLADE

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ABSTRACT

Wiper system in automobile has a potential to generate noises. These noises can be categories into three types namely squeal, chattering and reversal noise. The squeal noise or squeaky noise appears at frequency 1000 Hz, the chattering noise appears at frequency 100 Hz and lastly is the reversal noise appears at 500 Hz. These noises lead to poor visibility and annoying sound to the driver and passengers, respectively. This paper describes a control technique that it is capable to reduce the unwanted noise and vibration level in automobile windshield wiper system. In this research, the derivation of two dimensional mathematical model of wiper system is produced using Newtonian approach and MATLAB/Simulink is used to simulate and analyze the vibration response of the wiper system in time domain and frequency domain. In this simulation, an input shaping scheme has been introduced as the control strategy. The simulation result has been verified by comparing with the result obtained using numerical approach analysis. The result shows that input shaping technique can reduce the vibration level to 25 to 30 percents compare the model with conventional scheme.

KEYWORDS: *Wiper system, input shaping scheme, analytical and numerical approach*

1.0 INTRODUCTION

Recently, the industry of automotive has been growing all over the world. Two components are required to be considered in order to make sure that automobile industry running in smooth conditions. The first component is basic parts such as door, window, seat and etc. The second component is the system such as wiper system, steering system, braking system and etc. Most of car makers spend a lot of money in research and development to reduce the unwanted noise and vibration happen in cars