MODELING AND DYNAMIC ANALYSIS (DISSIPATED ENERGY) AT VERTICAL MOVEMENT BETWEEN BOGIE SUSPENSION AND WAGON TRAIN SUSPENSION

Name: YOHANES DHANI KRISTIANTO
NRP: 2108100626
Department: Mechanical Engineering of FTI-ITS
Academic Advisor: Ir. Yunarko Triwinarno. M.T *
Dr.Eng Harus L. G., ST., M.Eng **

ABSTRACT

Still much unused energy (waste) of the vehicle has been the basis in an effort to harvest that wasted energy, the way in which among others, the kinetic energy recovery system (KERS) and the thermal energy recovery system (TERS). But the vibrational motion of the vehicle is still a potential energy source to use. Therefore in this assignment will work to modeling and analyze the potential that can be raised at the vertical movement between the bogie suspension and the wagon train suspension.

In this final assignment will be modeled in the ¼ model and simulated with Simulink program than vertical movements were analyzed. Modeling will include the response of the vibration that occurs between the wagon train suspension and bogie suspension. While the analysis will derive a formula before it was brought into the Simulink program to study the response of the motion displacement, velocity and acceleration are then used to calculate how much potential energy that can be raised.

After modeling and analysis of simulated into the Simulink program generated a response rate of movement between the wagon train suspension and bogie either on bump
excitation with amplitude of 5 cm with both the sinusoidal with a variation of the amplitude of 5 cm and 10 cm on the variation speed of 50 km/hour and 100 km/hour. The potential energy is awakened divided into two, the average power is capable of at least 48.742 watts and for an average of the maximum that can awakened by 4188.037 watts.

**Key words:** energy awakened, suspension, vibration, vertical motion of the suspension.