PERFORMANCE MODELLING AND SIMULATION OF SAPU ANGIN I WITH PE-M 40 MILLER CYCLED ENGINE USING MATLAB SIMULINK

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Abstract
Sapu Angin I is vehicle designed to race the furthest distance with least amount of fuel. Nevertheless, Sapu Angin I still has several problems, some of which are vehicle design, track information and condition, driving behaviour, and engine efficiency that is not maximum yet. This vehicle used four strokes internal combustion engine named Paijo Experiment 40 cc (PE-X 40) with Otto cycle as a prime mover. The engine was less efficient because it only could get 232 km per litre of gasoline. Miller cycle is considered to be used in Paijo Experiment 40 cc to get better result. Miller cycle has higher efficiency because of its higher expansion ratio than compression ratio. Then, Miller cycled engine in Sapu Angin will be named Paijo Experiment Miller 40 cc (PE-M 40).

In this research, Miller cycled PE-M 40 gasoline engine evaluation is done by simulating the vehicle system model using Matlab Simulink software. This model contains of driver, vehicle, and environment model.

By the simulation of vehicle model, the fuel consumption of Miller cycled engine of Sapu Angin I is able to be predicted and the most optimum driving mode having higher fuel consumption can be determined.

Key words: Sapu Angin I, PE-M 40 engine, Miller cycle, model simulation, vehicle dynamics