MODELING AND SIMULATION SAPU ANGIN 7 CAR IN SEPANG CIRCUIT TO OBTAIN DRIVING METHOD WITH MINIMAL FUEL CONSUMPTION

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ABSTRACT

On fuel efficient competition as the Shell Eco-Marathon and Marathon Competition Indonesian Eco driving strategy greatly affect fuel consumption. Driving strategies should also be adjusted to the characteristics of the vehicle and the track characteristics. In order to get a good driving strategy and fuel-efficient, team that join the competition need to build a model that can be used to simulate the race.

In this study a model of Sapu Angin 7 (SA7) mode was developed to represent how fuel efficient driving mode in Sepang circuit. Mode in question is the speed limit when the engine on and the speed limit when the engine off. Modeling and simulation SA7 car and Sepang circuit made with the help of MATLAB SIMULINK software. By identifying variables and relationships between variables on fuel consumption, such as the drag coefficient, the coefficient of rolling resistance, the characteristics of the engine, and the characteristics of the track. To get driving mode with optimum fuel consumption, a simulation run by varying the speed of the car when the engine on and the speed of the car when the engine died. To ensure the true model, the model is used to simulate the car on the track Kenjeran SA8 and Manila. Validation is done by comparing the number of cycles On-Off and the actual fuel consumption with simulation results, and discuss directly with motorists SA8. It was found that the fuel consumption of the simulation results in Kenjeran is 189 km/l and the results of the simulation in Manila is 158 km/l. Error
simulation results are below 1% when compared with the actual fuel consumption is 191 km/l and 151 km/l. There is no difference between cycles On-Off car simulation results with actual conditions. The model can be said to be valid because the model error possessed less than 5%.

By using a model that has been validated, model simulated SA7 car on the track Sepang. From this study it was found that the optimum fuel consumption SA7 owned car is 170 km/l. Engine running four times for crossing the track Sepang, where the car's engine off when the vehicle speed has reached 42 km/h and on when the vehicle speed has reached 25 km/h.

**Key Word :** Vehicle Dynamic, Modeling, Sapu Angin, Simulation