

DESIGN OF SPROCKET AND CHAIN TRANSMISSION FOR PROTOTYPE-CLASS ENERGY-EFFICIENT VEHICLE

Name : Brian Daniel Gultom
Nim : 2103221222
Supervisor : Reinaldi Teguh Setyawan, S.T., M.T.

ABSTRACT

The increasing global energy demand and the limited availability of fossil fuel reserves have driven the development of energy-efficient technologies, particularly in the transportation sector. The Indonesia Energy-Efficient Car Contest (KMHE) serves as a strategic platform to encourage student innovation in creating efficient and environmentally friendly vehicles. This study aims to design and evaluate a sprocket and chain transmission system for an energy-efficient vehicle in the Prototype category. The research stages include problem identification, literature review, system design using CAD software, component selection and preparation, system fabrication, and vehicle performance testing. The designed system utilizes a SHOC-type MPD engine with a capacity of 97.1 cc, a 428H-type chain, and a sprocket combination of 14T and 36T. Testing was conducted on a flat track, recording travel time and engine speed (RPM) as the basis for calculating vehicle speed and acceleration. The test results show that the transmission system effectively supports the vehicle's performance, achieving a maximum speed of 16.88 m/s (60.77 km/h) and a maximum acceleration of 2.01 m/s². These findings confirm that the designed transmission system functions properly and meets the performance targets for the Prototype category vehicle.

Keywords: *transmission, sprocket, chain, energy-efficient vehicle, prototype, speed, acceleration.*