ENHANCEMENT OF THE POSTURA MOTERGO™ TEST RIG'S DYNAMICS

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" I declared that this thesis is the result of my own work except the ideas and summaries which I have clarified their sources. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any degree. "

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ABSTRACT

Motorcycle road accidents have become a serious global issue. In enabling scientific studies on motorcycling to be performed within a controlled laboratory setting the Postura Motergo^{TM} motorcycle simulator was established by a group of researcher from the Motorcycle Engineering Technology Lab (METAL) of the Faculty of Mechanical Engineering, Universiti Teknologi MARA (UiTM) Shah Alam, Malaysia. However, the main issue concerning this motorcycle simulator was its limited dynamic behaviour which is its degrees of freedom (DoF). Prior to the study, this motorcycle simulator used a simple spring and two rotational shafts to replicate movement. Due to its design limitation, the Postura Motergo^{TM} was exclusive to only one static positioning with very minimal roll axis. Hence, in establishing an improved dynamic characteristic, the degrees of freedom for the dynamic movement of the Postura Motergo^{TM} requires redesigning. The aim of this study was to enhance the Postura Motergo™'s dynamics movement features by integrating additional DoF into the simulator setup. For this study, the selected DoF integrated were roll, pitch and steering angle. In achieving this objective, the equipment that provides the capability in replicating these DoF were surveyed and procured. As procurement was completed, modifications were made onto the Postura Motergo^{TM} in enabling for the integration of the procured equipment. A survey study was conducted via questionnaire in acquiring feedbacks from users with respect to the newly integrated DoF. Conclusively, by enhancing the dynamics characteristics of the Postura Motergo^{TM}, greater near-to-real motorcycling conditions could be simulated in a controlled laboratory setting, thus, giving better stability, balance and motion cues. Therefore, users' experience during laboratory assessment could be elevated, consequently, a more accurate assessment could be achieved.

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