DESIGN AN ERGONOMIC MOTORCYCLE TEST RIG BASED ON MOTORCYCLIST RIDING POSTURE CLASSIFICATION (RIPOC) SYSTEM

MUHAMMAD HAFIZUDIN BIN KAMAL
(2010811348)

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Faculty of Mechanical Engineering
Universiti Teknologi MARA (UiTM)

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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. "

Signed : .....

Date : 18/07/14.....

Muhammad Hafizudin Bin Kamal

UiTM No : 2010811348

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ABSTRACT

Motorcycle is as a globally popular mode of transportation. Even so, due to this, the statistics of motorcycle road accidents are globally alarming. Many researches have sorted into various perspectives in combating this global phenomenon such as identifying the factors that causes motorcycle accidents. Through this project, another effort to reduce motorcycle accident was performed. An ergonomic motorcycle test rig called *Postura Motergo* was established in order to help researchers to study motorcyclists' riding postures which were identified as one of the key factors that lead to road accidents. The test rig was exclusively designed based on the Riding Posture Classification (RIPOC) System (Ma'arof and Ahmad, 2012). Unlike any current motorcycle simulators that only provide a single riding posture based on what type of motorcycle used, the *Postura Motergo* could replicate any possible riding postures for motorcycling. This is possible through the unique adjustable features of the seat, handle bars and foot pegs of the test rig. Via the *Postura Motergo,* the need to prepare various motorcycles to study different riding postures is now overcame. State-of-the-art CATIA V5R20 software was extensively used in modeling the design, whilst, the fabrication works were done in-house at the Machine Workshop, Faculty of Mechanical Engineering, Universiti Teknologi MARA Shah Alam. The completed test rig is stationed at the Motorcycle Engineering Test Lab (METAL) to be used for any motorcycle related research – especially for ergonomics. A patent has been filed for Intellectual Property Rights (IPR) on the test rig's design and the adjustable features. Holding two Chapters in Books in International Ergonomics Conferences and winning a bronze medal in the Invention, Innovation and Design Exposition 2014 (IIDEX2014), the *Postura Motergo* is now officially established and will become a new revolutionary motorcycle test rig for many researchers.

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