AN ADJUSTABLE TANK COVER FOR AN ESTABLISHED MOTORCYCLE TEST RIG UTILIZING RIB AND SPINE CHASSIS (RISC™) CONCEPT

MOHAMAD HAFIDZ BIN HAMZAH

(2012268878)

BACHELOR ENGINEERING (HONS) (MECHANICAL)

UNIVERSITI TEKNOLOGI MARA (UiTM)

JULY 2015

" 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 : .....

Mohamad Hafidz Bin Hamzah
UiTM No : 2012268878

ACKNOWLEDGMENT

In the name of Allah, the Most Gracious and the Most Merciful Alhamdulillah, all praises to Allah for the strengths and His blessing in completing this thesis. Special appreciation goes to my supervisor, Prof. Ir. Dr. Hj. Abdul Rahman Bin Omar, for his supervision and constant support. Their invaluable help of constructive comments and suggestions throughout the experimental and thesis works have contributed to the success of this research.

Not forgotten, the author's appreciation to his co-supervisors, En. Helmi Bin Rashid, Muhammad Izzat Nor Bin Ma'arof, and Wan Muhammad Syahmi Bin Wan Fauzi for Their support and knowledge regarding this topic. The acknowledgement also goes to all the technicians and office staffs of Universiti Teknologi MARA (UiTM) for their co-operations. Sincere thanks to all his team members, Shahrool Azree Bin Azlan, Mohd Saiful Arif Bin Bakeri and Muhamad Syamim Bin Zainordin for their kindness and moral support during the author's study. Thanks for the friendship and memories. Last but not least, the author's deepest gratitude goes to his beloved parents, Hamzah Bin Mohd Amin and Faridah Binti Ibrahim for their endless love, prayers and encouragement. To those who indirectly contributed in this research, your kindness means a lot to him. Thank you very much. May Allah Azza Wajalla Bless us forever.

ABSTRACT

Globally, researchers have developed motorcycle simulators/test rigs to assist in motorcycle road accident prevention investigations. The Postura Motergo^{TM} which was developed by the Motorcycle Engineering Technology Lab (METAL) of the Faculty of Mechanical Engineering, Universiti Teknologi MARA (UiTM) is an example of such motorcycle test rigs/simulators. However, the Postura Motergo^{TM} could only replicate one type of motorcycle cockpit design (where the human operator is seated to operate the motorcycle), whereas, from the field survey, it was found that motorcycles come with variable cockpit designs. Hence, the Postura Motergo^{TM} is in need for a design enhancement in order to accurately replicate the variable motorcycles' cockpit designs. The aim of this study is to establish a novel adjustable motorcycle tank cover for the Postura Motergo^{TM}. Literature assessment, field survey, computer aided design (CAD) and design fabrication were the research methods. Upon the fabrication of the new motorcycle tank cover (as proof-of-concept), a patent specification document will be proposed. Questionnaire will be used to validate the near to real riding experience specifically on the adjustable tank cover. As of April 2015, the new tank design is being filed for an intellectual property (IP) protection. Conclusively, the integration of this new motorcycle tank cover on the Postura Motergo^{TM} further enhances the capability of the motorcycle test rig to better replicate various motorcycles cockpit designs. This ensures the test rig's validity, fidelity, while simultaneously elevating users' experience for further future research in motorcycle niche area.

TABLE OF CONTENTS