



**SIMULATION OF QUICK GEAR SHIFTER (QGS)
SYSTEM ON A SINGLE-SEATED OPEN WHEEL
VEHICLE USING MATLAB (SIMULINK)**

**MUHAMAD HAZIQ BIN JAMALUDIN
(2013891574)**

**BACHELOR OF MECHANICAL ENGINEERING
(MANUFACTURING) (HONS)
UNIVERSITI TEKNOLOGI MARA (UiTM)**

JANUARY 2017

“I hereby declare that this thesis is based on my original work except for the quotations and citations, which have been acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at UiTM or other institutions.”

Signed :

Date :

Muhamad Haziq bin Jamaludin

UiTM ID: 2013891574

"I declared that I read this thesis and in my point of view this thesis is qualified in term of scope and quality for the purpose of awarding the Bachelor of Mechanical Engineering (Manufacturing)(Hons.)"

Signed:

Date:

Supervisor

Dzullijah Ibrahim

Faculty of Mechanical Engineering
Universiti Teknologi MARA (UiTM)
13500 Permatang Pauh
Pulau Pinang.

Signed:

Date:

Co-Supervisor

Muhammad Arif Ab Hamid Pahmi
Faculty of Mechanical Engineering
Universiti Teknologi MARA (UiTM)
13500 Permatang Pauh
Pulau Pinang.

ACKNOWLEDGEMENT

In the name of Allah the most gracious and most merciful, I was able to write my thesis and complete my final year project. Thanks to Allah for His blessing and guidelines that always help me by giving me a good health, strength and spirit of never give up. Without His help, I was not able to accomplish my final year project. I would like to give credit to my beloved project supervisor, Mrs Dzulijah binti Ibrahim for giving me her precious knowledge, guidelines, moral support and advice throughout the completion of this project. She never gives up on me while I have my problem. Special thanks to my favourite co-supervisor, Mr Muhammad Arif bin Ab Hamid Pahmi, for sharing me his knowledge especially in the automotive field. My heartfelt gratitude to my family, especially to my beloved mother and father who always give me full support in terms of moral, financial and advice to achieve my goal. Without them, I might not be able to complete my final project. Last but not least I would like to thank all my friends especially my amazing housemates for being incredible supporters that I ever had and always cheer me up when I am down and thanks for those who helped me directly or indirectly involved or contributed to this project. May Allah give you the best reward for those kindnesses that I am unable to afford to repay throughout complete my final year project.

ABSTRACT

Operating a single seated open wheel vehicles designed for racing event require high engineering skills, driving skills and good teamwork. However, time is wasted when the driver has to use the clutch to upshift gear. Improving the external transmission system of single seated race car leads to higher chance of winning the race. Currently, Quickshifter™ available in the market for this purpose is designed for use on superbikes only. In this project, Quickshifter™ is referred to when modifying the transmission system to be fitted in a single seated race car. The new system is called Quick Gear Shifter (QGS), which allows the gear to upshift without using a clutch. Ignition cut-off and synchronize time are the crucial parameters to make the QGS works. The QGS system was designed and simulated using Matlab™ software. The system was tested and analysed based on the output of the simulation. The result shows that the system is working with 100 milliseconds ignition cut-off time. The ignition cut-off time for the modified transmission system was improved in terms of speed and acceleration.