FINAL PROJECT

STABILITY ANALYSIS OF DAIHATSU XENIA 1.3 Xi M/T WHEN TURNING TO SUPPORT SMART DRIVING PROGRAM

RESEARCH PAPER

Submitted as a Partial Fulfillment of the Requirements for Getting the Bachelor Degree of Engineering in Mechanical Engineering Department

Arranged by:
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APPROVAL

The research paper entitled "**STABILITY ANALYSIS OF DAIHATSU XENIA 1.3 Xi M/T WHEN TURNING TO SUPPORT SMART DRIVING PROGRAM**",has been agreed by supervisor and authorized by the Director of International Program as partial fulfillment of the requirements for getting the Bachelor Degree of Engineering in Mechanical Engineering Department of Muhammadiyah University of Surakarta.

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TESTIMONY

With this, I state that there is no plagiarism of the previous works which have been made to get bachelor degree of university and as long as the writer knows that there is also no work or opinion that ever been composed or published by other people, except referred written in this research paper mentioned in bibliography.

Hence, if it is proved that there is mistake in the writer's statements I will be wholly responsible.

Surakarta, February 2012

The writer

Nur Muhammad Hawari

D 200 080 209

MOTTO

[5] For indeed, with hardship [will] be ease, [6] Indeed, with hardship [will be] ease (QS Al-Insyirah: 5-6)

Let there arise out of you a group of people inviting to all that is good (Islam), enjoining Al-Ma'ruf and forbidding Al-Munkar. And it is they who are the successful. (QS Ali Imran:104)

Allah burdens not a person beyond his scope. He gets reward for that (good) which he has earned, and he is punished for that (evil) which he has earned. (QS Al-Baqarah:286)

The best person is the person who is the most beneficial for others. (Narrated by Bukhori)

Many People say that the intelligence that make the great scientist. They are mistaken, it is the character. (Albert Einstein)

There is a way to make it better, find it. (Thomas A. Edison)

DEDICATION

This research paper is dedicated to:

Allah SWT,
Thanks for the best everything that You have given for me and thanks for Your love that always make me to never give up to do the best.
I believe that You will always give me the best for everything.

My beloved Mom and Dad,
Thanks for your prayer, love and support.
You always give me happiness but often I made you disappointed.
I am sorry and I promise to give you the best in the future.

My Sibling (AzisIndraImawan),
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Thanks for your love, support, spirit, attention and care.
You make my burden lighter.

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All my friends,
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13. All students of International program of Automotive Department, thanks a lot for the support, hope we can the best engineer.
14. Those who can not to be mentioned one by one for every helping in accomplishing this research paper. Thanks a lot for all.

The writer realizes that this research paper is far from being perfect, so the writer sincerelywelcomes any constructive comment, criticism, and suggestion from anyone. Finally, he hopes that this research paper would help the other researchers and driver who are interested in studying translation and enrich the reader, also driver of car knowledge.

WassalamualaikumWr. Wb.

Surakarta, February 2012
The writer

Nur Muhammad Hawari

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ABSTRACT

NUR MUHAMMAD HAWARI. D 200 080 209. STABILITY ANALYSIS OF DAIHATSU XENIA 1.3 Xi M/T WHEN TURNING TO SUPPORT SMART DRIVING PROGRAM.
MUHAMMADIYAH UNIVERSITY OF SURAKARTA. 2012.

The premise of this research is to estimate the speed of vehicles when turning in certain radius of road, indirectly will support smart driving because the driver can be estimate how fast the vehicle should be run when turning. When vehicles turning arose centrifugal force and moment in the wheel, it can make slip angle in the wheel. The magnitude effect of slip angle wheel decided the stability movement in vehicles. Generally the greater influence of slip angle wheel will disturb the stability of vehicles. On other slip parameter, the most important consider stability is roll axis movement in a vehicle, which condition of occurrence if one in front or rear wheel lift.

This research used Daihatsu Xenia 1.3 Xi M/T, the type passenger car. Collected all the data, the writer use two different weight: total weight vehicle (1570 Kg) and Curb vehicle with driver (1100 Kg). Analysisdoneby knowingthe critical speed ofthe vehicle ever in toppling and skidding but withthe sameradius of road which in radius 15 m, 50 m, 110 m, 370 m, 600 m and on the dry and wet condition of asphalt track. for coefficient grip of dry and wet of asphalt track has taken by dry: 0.8 and wet: 0.45.

From the calculation and comparison of the critical speed when toppling at 1570 Kg and 1100 Kg vehicles, showed that weight of vehicles has influenced to vehicles begin toppling ever in same radius on the road. The critical speed when skidding for wet and dry condition in different weight (1570 Kg; 1100 Kg) was same for the velocity begin skidding ever in same radius, they had no influenced from weight of vehicle. The most influenced for skidding come from coefficient of grip and radius of road.

Keywords: Stability, Smart driving, critical speed when toppling and skidding.