INTERNATIONAL JOURNAL OF ADVANCE RESEARCH, IDEAS AND INNOVATIONS IN TECHNOLOGY

ISSN: 2454-132X
Impact Factor: 6.078

(Volume 8, Issue 1 - V8I1-1335)
Available online at: https://www.ijariit.com

Analysis of vehicle body

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ABSTRACT

The software technology is growing at a large scale, which make things like CFD Testing, Air Drag simulation very easy, time saving, and pocket friendly. The industry has given us such a good piece of technologies such as ansys, autodesk fusion 360 etc, which should be put to good and innovative ideas to execute. They should also be used to make some modification in present day things to get a better understanding on how the thing would work in real life with some software modifications. The project focuses on less air drag for better aerodynamics and better fuel efficiency. In the old age, industry was not aware of such technology would ever exist, to design a certain part in software and play simulation to get best results to save manufacturing cost and time which highly reduces the flaw detection in real life. By doing modification in a car which was not able to succeed in the market could put this technology of simulation testing to best use. Computer simulation is need for the hour and is the future!

Keywords: *Analysis of Vehicle Body, Automobile*

1. INTRODUCTION

Aerodynamics is the science of moving air and its impact on solid bodies placed in the flow field as an obstacle. Being a sub-field, most of the equations from fluid dynamics apply to aerodynamics as well, including all the governing equations, turbulence, boundary layer theory, and ideal gas assumptions.

Aerodynamic is a really important aspect of todays car industry as it decides the performance, efficiency and fuel economy at a very large scale. And this technology should grow to the best possible innovation to make the best cars industries ever had. There is a lot to do in aerodynamic technology, and with the use of computer software this technology can be explored to its core without the need of huge labour, prototypes and failure.

2. PROBLEM STATEMENT

Aerodynamic plays a very important role in the field of comfort, performance and efficiency. Aerodynamics is the aspect that affects the life an drag force acting on the body of the vehicle. This technology can be improved by the help of Computational Fluid Dynamics or CFD Testing which helps to understand the flow of air across the body of a vehicle.

- For the purpose of this project we selected a car which was not a huge success in the market and requires an upgrade
- Maruti Suzuki Kizashi is the car we choose to work on
- Then the first step would be to design the body in Autodesk fusion 360
- Then the body needs to be put under virtual simulation which flows around the car body and calculates the drag coefficient and lift coefficient values
- After the results, research would be done to improve the vehicle body which will give better results than the previous test

3. OBJECTIVE

- First we stimulate the car body to check the flow of aerodynamic and to get the accurate value of drag and drag coefficient.
- The main focus would be to improve the car body from the previous version for less drag force and to increase its fuel economy at a very good scale

4. RESULT DISCUSSION

If the body modification is successfully complete we can reduce the drag force sufficiently and boost the fuel economy. For a full-size truck, a change in a drag coefficient of 0.01 is approximately equal to an improvement in fuel economy of 0.1 mpg on the combined city/highway driving cycle. Suzuki Kizashi has a CD of 0.30 and we aim to take it by 0.28 by body modification. We have also mentioned some of our plans by showing some working images of car on how the body modification must be commenced.

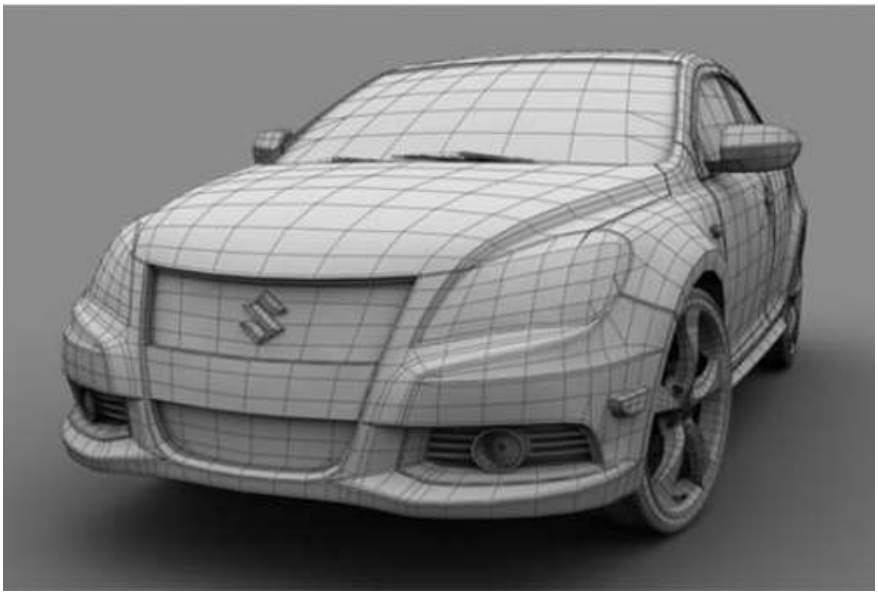

Figure 1.1

Forces acting on the vehicle

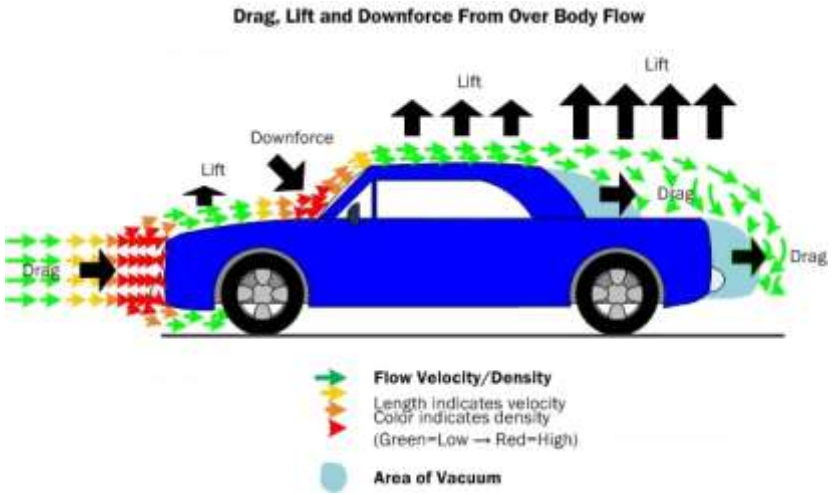

Figure 2.1

5. CONCLUSION

To increase the performance of the vehicle by the reduction of drag force by doing modification in the external body of the vehicle. All this will lead to the best driving experience in the field of performance, Fuel economy, comfort & stability of the vehicle

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