INVESTIGATION OF DRAG ANALYSIS OF FOUR DIFFERENT PROFILES TESTED AT SUBSONIC WIND TUNNEL

A PROJECT IS SUBMITTED TO THE DEPARTMENT OF "MECHANICAL ENGINEERING" IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF BACHELOR OF SCIENCE.

SUBMITTED BY

CAPTAIN SHEHAB BIN SAYEED STUDENT NO.: 201018002

MUNZARIN MORSHED STUDENT NO.: 201018024

FLYING OFFICER SYED ABDULLAH AL MAMUN STUDENT NO.: 200818008

SUPERVISED BY

Wg Cdr GM Jahangir Alam

Instructor Class-A

Department of Mechanical Engineering
Military Institute of Science and Technology (MIST)

Department of Mechanical Engineering,
Military Institute of Science and Technology (MIST)
Mirpur Cantonment, Dhaka-1216, Bangladesh.

DECEMBER 2013

ACKNOWLEDGEMENT

This project and thesis paper is one of the greatest additions to our meager knowledge and experience. We acknowledge the help of the individuals who contributed to the successful completion of the whole work. We would specially like to express our most sincere gratitude to our Supervisor **Wg Cdr GM Jahangir Alam**, Instructor Class-A, Department of Mechanical Engineering, Military Institute of Science and Technology. His active assistance in working out a framework for the paper has helped us to complete the assignment within given time. He advised and guided us in our work and was always very helpful and magnanimous. Without his support and continuous encouragement, probably we would not be able to write an informative and objective report.

We are gratefully acknowledging our deepest gratitude to **Captain Anwarul Haque Chowdhury(E),psc,BN,** Head of the Department, and all the respective **Faculty Members** of **Mechanical Engineering Department** of **MIST** for their extreme support and encouragement.

We are also thankful to the **Mechanical Engineering Department** and **Aeronautical Engineering Department** of **MIST** for giving us the scope to work in the Lab with the machineries and equipment.

We express our heartfelt thanks to Nazmul, Lab Assistant, MIST for helping us to learn the operation of the Wind Tunnel and machineries used by our own hand. We are truly grateful for the assistance.

We will remain ever grateful to all of them, who all helped us to complete this project and writing this thesis paper.

STUDENT'S DECLARATION

We hereby declare that the thesis titled **"INVESTIGATION OF DRAG ANALYSIS OF FOUR DIFFERENT PROFILES TESTED AT SUBSONIC WIND TUNNEL",** is submitted to the Department of Mechanical Engineering for the partial fulfillment of the requirements for Bachelor of Science Degree on Mechanical Engineering (Course Number: ME 400). This is our original work and was not submitted elsewhere for the award of any other degree or diploma or any other publication.

AUTHOR

_____

CAPTAIN SHEHAB BIN SAYEED

STUDENT NO: 201018002

_____

MUNZARIN MORSHED

STUDENT NO: 201018024

_____

FLYING OFFICER SYED ABDULLAH AL MAMUN

STUDENT NO: 200818008

SUPERVISED BY

_____

Wg Cdr GM Jahangir Alam

Instructor Class-A

Department of Mechanical Engineering

Military Institute of Science & Technology (MIST)

ABSTRACT

The amount of drag produced significantly depends on shape. This investigation deals with the drag analysis of four different profiles, which are cylinder, sphere, symmetrical aerofoil (NACA 0015) and cambered aerofoil (NACA 4415), objects of same volume. These four different types of objects has been tested at a sub-sonic wind tunnel and experimental data has been obtained at different Reynolds's Number and angle of attack. The two aerofoils (symmetrical NACA 0015 and cambered NACA 4415) have been tested from -3˚ to 21˚ angles of attack with 3˚ steps and the spherical ball and cylindrical shaped profiles have been tested from at 0˚ to 180˚ angles with 10˚ steps at different Reynolds's Number. All the four objects have been tested at 10m/s, 15m/s, 20m/s, 25m/s and 30m/s velocities respectively. The cambered aerofoil has provided the least drag and the spherical ball has provided the maximum drag among all the profiles. At last, some conclusions have been drawn after analyzing the drag of all the profiles at different Reynolds's Number.