REVERSE ENGINEERING OF AIRCRAFT WING BY USING HONEYCOMB STRUCTURE

A Project report submitted in partial fulfillment of the requirements for award of

Degree of

BACHELOR OF TECHNOLOGY

IN

MECHANICAL ENGINEERING

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CERTIFICATE

This is to certify that project work is entitled "REVERSE ENGINEERING OF AIRCRAFT WING BY USING HONEYCOMB STRUCTURE " is a bonafide record done by **K.BALASAI KRISHNA (14811A0347), M.D.S.MANI KUMAR (14811A0364), K.UMA MAHESH (14811A0358), A.S.GANESH (14811A0333)** students of final year **B.Tech** in the Department of **Mechanical Engineering**, Avanti Institute of Engineering and Technology, Visakhapatnam. This work was done for the fulfillment of the requirements of the award of **Bachelor of Technology** during the year 2017-2018.

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ABSTRACT

For aerodynamic reasons the wing contours in the chord wise direction must be maintained without appreciable distortion. Therefore, to hold the skin stringer wing surface to contour shape and also to limit the length of the stringers to an efficient column compressive length, internal supporting units are required.

In the current report, a complete stress analysis for a wings subjected to different kinds of loading is introduced. Two methodologies for the design of the wing are presented. The first method is designing the wings as a shear resistant plate girder that will not buckle nor yield under the applied loads. This method is used for the design of the lightly loaded ribs where the web stiffeners are omitted and instead a series of standard flanged lightening holes are introduced.

The second method presents a methodology for the design of a wing subjected to moderate to heavy loads (bulkheads). The second method is based on the incomplete diagonal tension theory. Designing wingssubjected to heavy loads to act as a shear resistant plate girder will produce a very massive structure. Instead the thickness of the rib will be reduced to the limit to keep it within the elastic deformations limit but with less buckling resistibility where the rib is forced to be under incomplete diagonal tension field stresses. Uprights are introduced to the wing to support wing buckling. A complete stress analysis for the wings as well as web uprights is presented. The analysis procedure is based on theoretical evidence as well as empirical formulations.