

Finite element model updating of riveted joints of simplified model aircraft structure

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ABSTRACT

Thin metal sheets are widely used to fabricate a various type of aerospace structures because of its flexibility and easily to form into any type shapes of structure. The riveted joint has turn out to be one of the popular joint types in jointing the aerospace structures because they can be easily be disassembled, maintained and inspected. In this paper, thin metal sheet components are assembled together via riveted joints to form a simplified model of aerospace structure. However, to model the jointed structure that are attached together via the mechanical joints such as riveted joint are very difficult due to local effects. Understandably that the dynamic characteristic of the jointed structure can be significantly affected by these joints due to local effects at the mating areas of the riveted joints such as surface contact, clamping force and slips. A few types of element connectors that available in MSC NASTRAN/PATRAN have investigated in order to presented as the rivet joints. Thus, the results obtained in term of natural frequencies and mode shapes are then contrasted with experimental counterpart in order to investigate the acceptance level of accuracy between element connectors that are used in modelling the rivet joints of the riveted joints structure. The reconciliation method via finiteelement model updating is used to minimise the discrepancy of the initial finite element model of the riveted jointed structure as close as experimental data and their results are discussed.

KEYWORDS:

Thin metal sheets; Fabricate; ircraft structure