

STATIC, DYNAMIC AND IMPACT STRESS ANALYSIS OF A BUS BODY STRUCTURE USING FINITE ELEMENT ANALYSIS

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ABSTRACT

The increased speed and weight of modern bus puts the components of a bus body in a highly dynamic load situation. Bus body is the core component in a vehicle. A classic finite element model of the bus body is established that focuses on analyzing the behavior of a bus body during static and dynamic load conditions. A finite element model of a pre-stressed bus body is established for static load conditions. The purpose of this research work is to analyze the structural response of the bus body for static, dynamic, and impact loading conditions. In order to conduct this analysis, Finite element Method is applied and ANSYS (FEM Tool) is used. The finite element model is constructed from the structural data and drawings provided by DELHI TRANSPORT CORPORATION (DTC). The research work determines the structural response under the above said loading by evaluating the maximum deflection and stress pattern. The results are presented in the form of graphs and data along with the three-dimensional model of the bus body.

KEYWORDS: Static Load, Dynamic Load, Bus Body Structure, Pre-Stressed & Finite Element Model

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1. INTRODUCTION

One of the technical innovations of the modern world and of course always allowing room for progress, buses have taken the centre stage in transporting people through long distances with maximum safety, comfort, minimum cost, reduced timing, and through proper adherence of standard rules. For many years, buses have been widely used in India as a successful mean for public transportation within the city as well as from city to city. The buses form the major component of surface transportation in India as buses connect most of the villages. When these buses had been used first, since then not much attention has been paid for the improvement of the body of the buses. These bus body designs have, however, been giving reasonable service, although their efficiency had hardly been evaluated or tested scientifically. In the absence of such evaluation tests, the vehicle designs cannot be termed as optimal designs from operational and maintenance costs point of view as also from structural performance; passenger comfort and other operational requirement point of view. Everyone tried to improve mechanical components such as engine, transmission systems, clutches, gear box, etc. But, bus body structure could not win the hearts of designers. Now, designers are also becoming serious for the design of bus bodies. The damages and human injuries during accidents had been sufficient to draw the attention of designers towards it.

Considering the above deficiencies, scientific evaluation of some of the existing bus body designs is

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