

Vibration Characteristics and Structural Behavior of Three-Wheeler Aluminum - Composite Square Chassis Using FEA and FFT Analyzers

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Abstract: *Change in design of chassis, brings in change in vibration pattern and stress pattern will also change for impact loading conditions. This project to study the vibration characteristics and structural behavior of three-wheeler chassis configurations. To study the vibration aspects, with change in design, modal analysis is done. Front, side and rear impact simulations are carried out to obtain displacement and stress distribution patterns. Three-dimensional CAD model is designed using CATIA V5R20. Finite Element Analysis (FEA) software ANSYS version 19.0 is used to determine the Natural frequencies of three-wheeler chassis. Weight optimization of three-wheeler chassis by using aluminum - composite honeycomb structure. The conceptual design will primarily be manufactured using E-glass fiber and aluminum pipe. Modal analysis of modified three-wheeler composite - aluminum honeycomb chassis will be done using ANSYS workbench. Experimental validation of natural frequency of chassis will be done using FFT analyzer and impact hammer.*

Keywords: Chassis, Vibration Pattern and Stress Pattern, ANSYS, CATIA, etc.

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