

Structural Durability Analysis of Powertrain Mounting Bracket

Sameer Kolte¹, David Neihguk¹, Abhinav Prasad¹

¹Mahindra and Mahindra Ltd., Vehicle Integration COE, Mahindra Research Valley, Mahindra World City, Chengalpattu, Tamil Nadu, India

Abstract

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Structural analysis is performed to check durability of specified part for a given load and support conditions. For the component to be safe structurally, in any domain, the stresses generated should not exceed the yield strength of the material. However, considering possibility of fatigue failure, the component is optimized such that stresses generated do not exceed the endurance strength of the material.

The engine mount bracket is subjected to loads primarily due to weight of the powertrain, the unbalanced torque. In this analysis, COMSOL's Structural Mechanics module is used. The CAD model is imported from CATIA® V5R21. Tetrahedron is selected as the meshing element. The material is selected from COMSOL's 'built in materials'. The bracket is subjected to different load conditions like 3-2-1g weights, 3g downwards +unbalanced torque etc., and is optimized so that stresses generated and deflection of the bracket is within permissible limit. Effect of bolt preloads is also considered.

The results of the analysis are compared with Hypermesh® results and are found to be in good correlation.

Figures used in the abstract

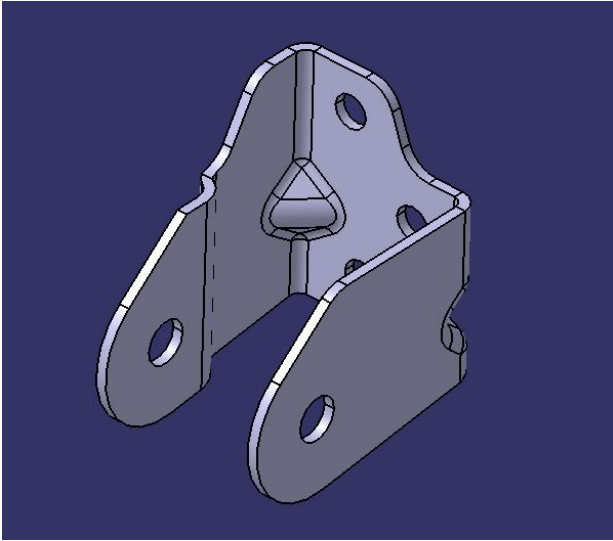


Figure 1: Bracket to be analysed