

# Design and Analysis of Leaf Spring Made of Carbon Glass Fibre Composite

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**Abstract:** Leaf springs are mainly used in suspension systems to absorb shock loads in automobiles like light motor vehicles, heavy duty trucks and in rail systems. It carries lateral loads, brake torque, driving torque in addition to shock absorbing. According to the studies made a material with maximum strength and minimum modulus of elasticity in the longitudinal direction is the most suitable material for a leaf spring. The Automobile Industry has great interest for replacement of steel leaf spring with that of composite leaf spring, since the composite materials has high strength to weight ratio, good corrosion resistance.

This work deals with finding a suitable composite material that can be a replacement for conventional steel leaf spring. The stress and displacements have been calculated using theoretically as well as using ANSYS for steel leaf spring and composite leaf spring.

The model is designed in CREO software for the vehicle Mahindra "Model - commander 650 Analysis is done in ANSYS software for different materials (Steel, Kevlar and E- Glass Epoxy).

The static analysis is done to determine the deformation, stress and strain for different materials. A comparative study has been made between steel and composite leaf spring with respect to strength and weight. Transient analysis is done to determine the deformation, stress with respect to time for different materials. Fatigue analysis is done to determine the fatigue life for steel, E glass epoxy and Kevlar leaf spring.

**Keywords:** CATIA, ANSYS

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