**Dynamic Performance Analysis of a Four Ton Automobile Chassis.**

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------------------------------------------------------------------------------------------------------------------**ABSTRACT**

In the present work an effort is made to investigate the dynamic response of a four Ton truck Chassis due to road undulations. The effects of forcing frequencies due to engine as well as road condition are significant at high speeds of an engine. Numerical analysis is employed on the original dimensions of the Chassis of heavy truck made of structural steel. The analysis is extended to fiber reinforced composites and a combination of structural steel and composite. A new mathematical model is proposed as a 2D beam element with consistent mass matrix solved for mode shapes using determinant based method. However the natural frequencies for composites are obtained from the effective stiffness value derived from Lamination theory. The study involves the change in dimensions, addition of cross members to the chassis at maximum deflection, change of materials of the chassis.Further,under the conditions of base excitation, applying engine harmonic load on the cross members, rolling and pitching conditions, the dynamic response of the chassis are determined. The results show that Fiber reinforced composites have low natural frequencies with 80% weight reduction in comparison to structural steel resulting in increase in pay load ,life of wheels and other mounting elements on chassis.

***Keywords*:** Chassis, Layered Beam Element, Base Excitation, Harmonic Engine load.

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