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DESIGN AND ANALYSIS OF A STEERING KNUCKLE COMPONENT FOR AN OFF-ROAD VEHICLE

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Abstract:

Steering Knuckle is a non-standard component linking the suspension, steering & braking systems and the wheel hub to the chassis of a vehicle. This study aims to redesign the steering knuckle in order to reduce the weight while retaining a satisfactory safety factor for better performance of the vehicle. A two-step process has been used for the same. First step is modeling the knuckle as per the structural considerations and design constraints set by suspension, steering and brake assemblies & determination of loads acting on the knuckle. The second step is stress analysis using finite element software and design adjustments for reducing weight without compromising on the structural strength. According to the analysis results, material can be added to parts that are subjected to higher stress than the safety factor permits. Material can also be removed from low stress areas, thus, helping to reduce the component weight.

Keywords: *Steering Knuckle, vehicle, design, modeling, analysis*

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