

# Design and Topological Optimization of Wheel Hub

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**Abstract:** Optimizing automotive components can result in a significant reduction in vehicle weight, greater fuel efficiency and reduced environmental damage. The hub is the vehicle wheel mounting assembly that houses the wheel bearing and supports the terminals. A speed sensor and an ABS sensor are usually connected to the unit via an electrical connection in contemporary automobiles. The function of the wheel hub is to keep the wheel attached to the vehicle while allowing it to rotate freely in the bearing. Since the wheel hub is the only component that really connects the wheels to the vehicle, it is vital to pay special attention to it when optimizing the design. The CATIA software will be used to create a 3D model of the wheel hub. The stress and fatigue life of the wheel hub was calculated using finite element analysis software, then the weight was optimized. ANSYS software will be used to perform static and structural analysis.

**Keywords:** Topological Optimization

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