**Abstract**  
Flat Bed trailers are employed in heavy automobiles to carry tons of loads safely. These trailers have a big role to play as far as the safety of the cargo loaded is concerned. With more and more industrialization the rate at which these trailers are fabricated are increasing. This work has been carried out on one of the major I-Beams carrying a larger load comparatively. The CAD model of the flat bed trailer is initially prepared with the help of existing drawings. It is then followed by implementation of Finite element method in the vibration analysis in SOLID WORKS 2014 SOFTWARE. FEM results led us to the determination of model shapes and deformations in the existing model.