Finite element analysis of automotive door hinge

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ABSTRACT
Door hinges and latches are door retention mechanism elements that play an important role in automobiles by holding the door open in the event of a side impact or rollover collision. Hinges are a group of components that are attached to the vehicle's door and frame, are related to one another, and can rotate along the same axis. Latches are mechanical devices that are used to position the door in a closed position relative to the vehicle body while allowing for controlled release. The standard specific conditions for side door latches and hinges installed on cars to reduce the risk of passengers being thrown out of the vehicle as a result of any impact. The objective of this paper is to identify the weakest point and to perform a structural analysis of automotive door hinge. Computer Aided Design (CAD) software is used to build a CAD model of the hinge and lock. The models of such components is meshed, and boundary conditions is defined, using the commercial meshing program. ANSYS is used to analyses the structural behaviour. Based on the results, the component will be further optimized for the future work.

KEYWORDS
Car door hinge; FEA; FEM

ACKNOWLEDGEMENTS

Authors would like to acknowledge the Ministry of Higher Education under Fundamental Research Grant Scheme FRGS/1/2019/TK03/UMP/02/21 (university reference RDU1901151) and Universiti Malaysia Pahang for financial supports.