

Design of a retractable chassis for a city vehicle

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Abstract

Parking is becoming a serious problem in Mauritius, especially in the capital and the towns. One solution is to provide cars that can be reduced in size for parking purposes. Such vehicles are termed retractable city vehicles. The aim of this project was to design a retractable chassis for one such vehicle using a linear actuator for the extension and retraction process. An analysis of parking space requirements was carried out and five concepts were generated. The most appropriate one was chosen using the Pugh's selection method. C channel section of ASTM A36 was selected for the chassis frame and Macaulay's method was used for the sizing process. The model was built in Solidworks and a static structural analysis was carried out to determine the maximum stress and deflection of the chassis. Furthermore, a real size prototype was built and tested for maximum deflection and for the force required for extension and retraction under dynamic loading condition. The tests results were compared with the theoretical values from the designing stage of the chassis. All the values were within acceptable limits and a suitable retractable platform was obtained on which a city vehicle body could be adapted.

Keywords (12 font)

city vehicle, small car, chassis, retractable mechanism, linear actuator

Biographies

Yashwantraj Seechurn is a Lecturer in the Mechanical and Production Engineering Department at the University of Mauritius. He earned his BEng. in Mechanical Engineering from University of Mauritius and Masters in Mechanical Engineering from Northumbria University, UK. He has published journal papers and his fields of research activities include Tribology, Structural Technology and Materials. Before joining Academia, he spent 3.5 years working as Design and Analysis Engineer at Advance Steel World Ltd. He is an associate member of IMechE.

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