

Analysis of an Adjustable Topside Mechanic's Creeper for Automotive Repair and Maintenance Using Simulation Methods(Book Chapter)

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Abstract:

A mechanic's creeper is synonym in automotive industry especially during maintenance or repair of a vehicle. A topside creeper is the easiest way and more ergonomic to carry on with repair or service work without feeling tired or injuring the body. The application of mechanic's creepers is also expected to increase the quality of service. Currently, the price of creepers is expensive, and the current structure has several problems due to its heavy weight material (heavy-duty steel frame). Furthermore, it is difficult to handle the creeper (assembly and dissemble after usage), and it is hard to store the creeper. Some of products have had many different sizes, heights, weight and are less ergonomic in terms of the design for Asian's mechanics, especially in Malaysia. In this paper, the design and analysis of an ergonomic and adjustable height of topside mechanic's creeper structure was carried out using the SOLIDWORKS 2016 software. The 70, 100, and 130 kg of load were used by referring to some typical weights of Asian's mechanics. Two types of aluminum (Al) profiles were used (40 mm × 40 mm and 60 mm × 60 mm). The larger Al diameters of mechanic's creeper structure indicates ~60% higher strength and a ~55% lower strain compared to the small Al profile diameters. Therefore, the design of the mechanic's creeper structure is expected to be the less expensive and more convenient for automotive mechanics in maintenance and/or repair works. © 2022, The Author(s), under exclusive license to Springer Nature Switzerland AG.

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