

DESIGN AND DEVELOPMENT OF INNOVATIVE CREEPER BOARD

Undergraduate Thesis
Submitted to the Faculty of the
College of Engineering and Information Technology
Cavite State University
Indang, Cavite

In partial fulfillment
of the requirements for the degree
Bachelor of Science in Industrial Engineering



00077203

*Design and development of innovative
creeper board
620.82 D56 2018
T.7450*

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May 2018

ABSTRACT

DIESTA, REGGIE MAE G. and ROTAIR, ANTONIO JR. C. Design and Development of Innovative Creeper Board. Undergraduate Thesis. Bachelor of Science in Industrial Engineering. Cavite State University, Indang, Cavite. May 2018. Prepared under the supervision of Engr. Willie C. Buclatin.

In a study of auto mechanics' working stances it was found that numerous auto repairs are done under the bonnet and underneath the car. This work requires that mechanics need to work for prolonged periods. Unfortunately, with all these problems afflicting the mechanic, one cannot change the design and layout of the car to aid the cleaning and maintenance activities being done on it. Such a move would be costly and would not totally eliminate the occurrence of underchassis repair work. Automobile mechanics often use a low profile, wheeled platform, known as a "creeper" to position themselves under an automobile in order to perform work on or make repairs to the automobile. Typically, these devices are more or less rectangular.

This study is an applied research. Under this type of research, the researchers combined the use of the descriptive, analytical and social methods of research.

Six Sigma Methodology which is Define, Measure, Analyze, Design, and Verify (DMADV) was employed in this study. The DMADV methodology is a set of tools that helps to design and develop the prototype that could be used by auto mechanics to aid the cleaning and maintenance activities being done under the vehicle.

The auto mechanics in selected automotive shops in Cavite is currently experiencing pain that afflicts to some parts of the body. This is due to the problems

occurring in the existing creeper board they used. In order to advice a solution, we need to consider the innovation, techniques, material, increase the comfort, and convenience in mechanics creeper board. The redesign of creeper board was considered in this study to minimize the mechanics pain in using the innovative creeper board.

Based on the results it was found out that the existing creeper boards used by auto mechanics are commonly slab of wood or ply board with no ball caster, simple creeper with ball caster, piece of carton, rags and newspapers. The problems were identified and categorized into three such as poor ergonomic design, quality of materials, and lack of mechanism. Furthermore, based on the existing creeper board evaluation including proper headrest, backrest, storage of tools, dimension of the creeper and wheels has a significant relationship in the prevalence of musculoskeletal disorders symptoms in terms of severity. The body parts that most affected by these factors were head, neck, shoulder, back and arm. Hence, concept generation and design execution was done by the implementation of Quality Function Deployment (QFD), commonly known as the House of Quality (HOQ), with the aim of design and development of innovative creeper board by bringing improvement or add new features to meet the customer needs. The final output is an innovative creeper board which gives multiple function to the user. Afterwards, validation of the prototype is done and usage is found excellent.

This study suggested the use of innovative creeper board to auto mechanics workers that would lessen the chance of having musculoskeletal disorders as well as its impact to the performance of mechanics.

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