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Analysis Over Engine Mount Vibrational

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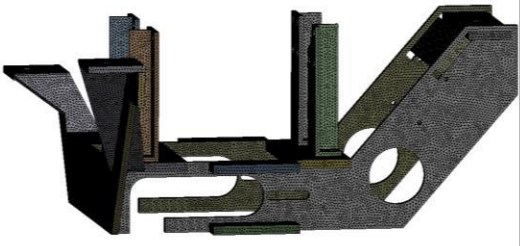
Abstract: *This paper analysis the engine vibration on the engine mount for heavy duty engines, in vehicle chassis mount of engine is major role So, vibration design of engine mount is one of the main items on the phase of vehicle development, the design should be optimized considering various design variables and uncertainties. In the study, design optimization of engine mount for Heavy duty vehicle, that present will model in proE software and execute Model in 10 modules and Harmonic analysis are in ansys bench work, Here we conclude to results change a material of engine mount frame present was steel to aluminum alloy to reduce the weight and cost ratio, then increase the strength of the engine mount.*

Keywords – *vibrational, Motor mount, isolate structure*

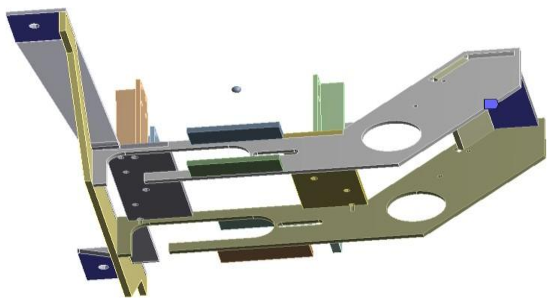
I. INTRODUCTION

The automotive industry obliges producers to give careful consideration to traveler solace and riding quality. Resounding vibration of body boards emerging from lopsided burdens existing in the motor body is increased by frameless or unitary body development. This has constrained architects to guide their consideration regarding the advancement of superb motor mounting gadgets keeping in mind the end goal to guarantee that enhanced solace in riding and hushing might not be balanced by exhausting vibration impacts. In all the Chassis contains a many sub parts they are associated by casings, a sub casing is a basic segment of a vehicle, for example, a car or an air ship, that uses a discrete, isolate structure inside a bigger body-on-casing or unit body to convey certain segments, for example, the motor, drive prepare, or suspension. The sub casing is darted as well as welded to the vehicle. Whenever catapulted, it is in some cases outfitted with elastic bushings or springs to hose vibration.

The foremost motivations behind utilizing an Engine mount, is to spread Engine stacks over a suspension over a monologue body shell, and to disconnect vibration of Engine. It implies a car with its energy prepare contained in a sub outline (motor mount), powers produced by the motor and transmission can be damped enough that they won't bother travelers .A motor mount framework is intended to decrease the transmission of motor vibration to the suspension. Motor mounts are utilized to associate a motor to the casing. They are typically made of elastic and metal. A motor mount must fulfill two basic yet clashing criteria. To begin with, it ought to be hardened and exceptionally damped to control the sit still shake and motor mounting reverberation. Additionally, it must have the capacity to control, similar to a safeguard, the movement coming about because of load conditions, for example, and go on uneven streets. Second, for a little plentifulness excitation over the higher recurrence run, a consistent however softly damped mount is required for vibration detachment and traveler comfort.



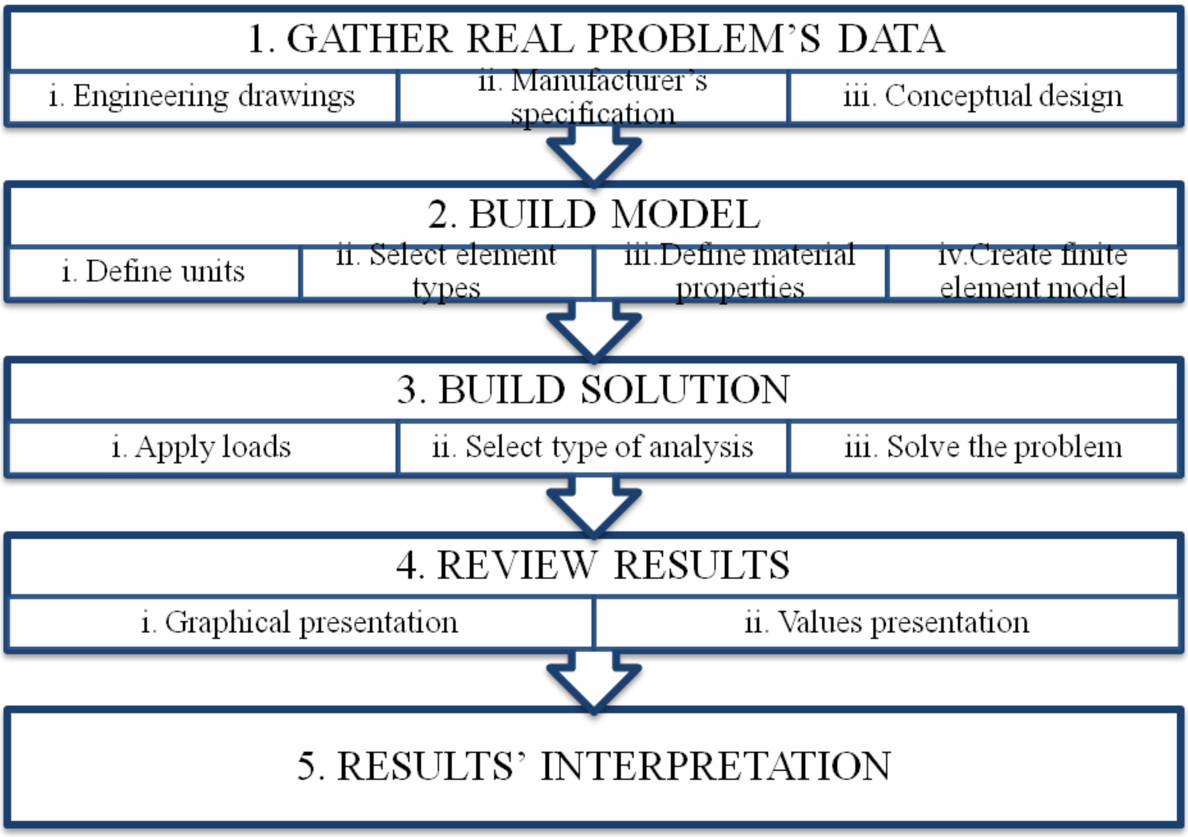
Meshing Model



Fixed Supports Shown In Figure

MESHING SIZE
MIN SIZE 2.00mm
MAX SIZE 4.00mm
MESHING ELEMENT
TETRAHEDRONS
TOTAL NODES
121265
TOTAL ELEMENTS
821498

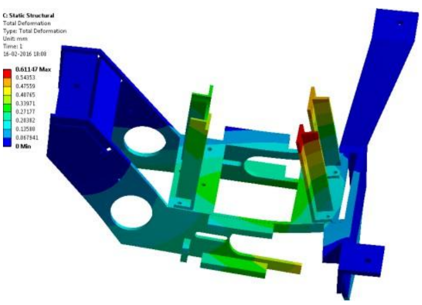
II. PROCEDURE TO PERFORM BY ANSYS



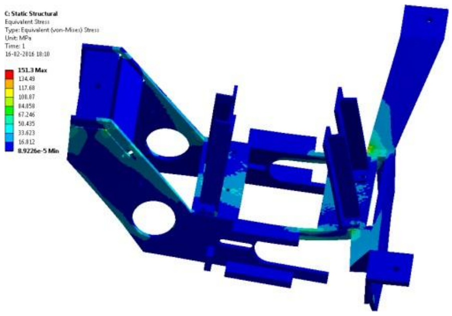
III. RESULTS AND DISCUSSIONS

A. 3.1 STATIC STRUCTURAL ANALYSIS FOR STEEL

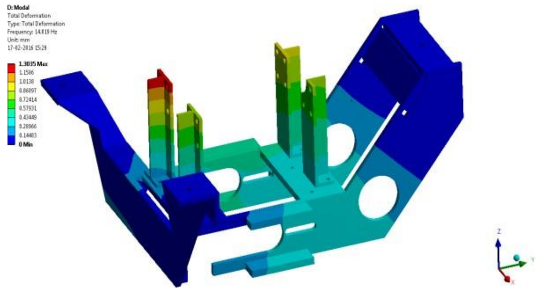
1) 3.1.1 DEFORMATION



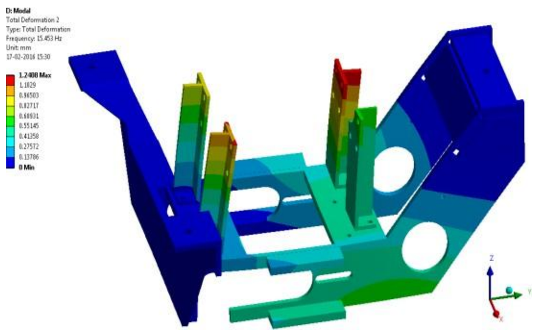
3.1.2 STRESS



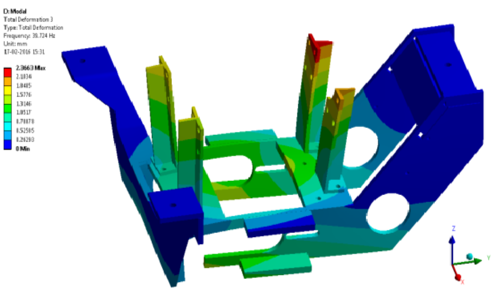
2) 3.2.1 MODE SHAPE 1



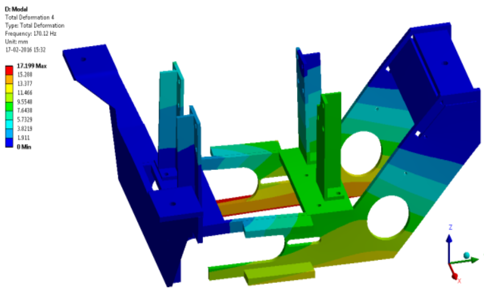
3.2.2 MODE SHAPE 2



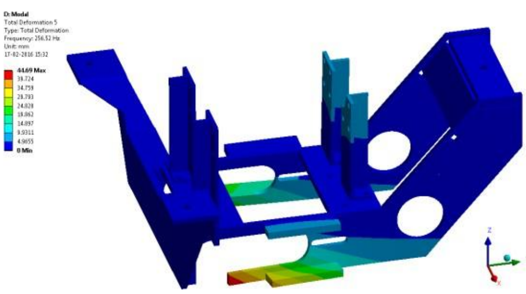
3) 3.2.3 MODE SHAPE 3



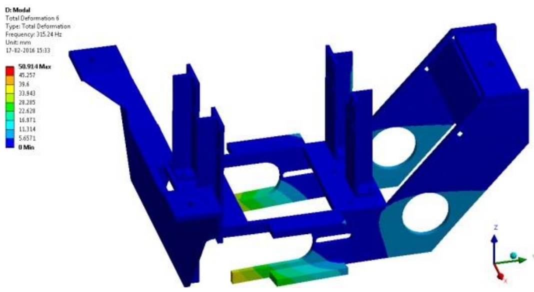
3.2.4 MODE SHAPE 4



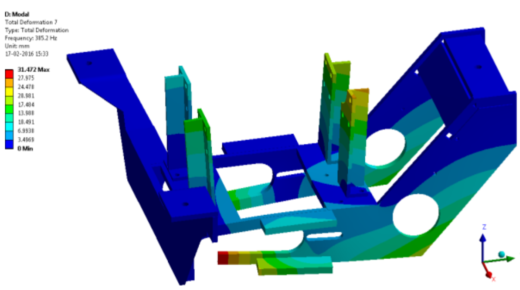
4) 3.2.5 MODE SHAPE 5



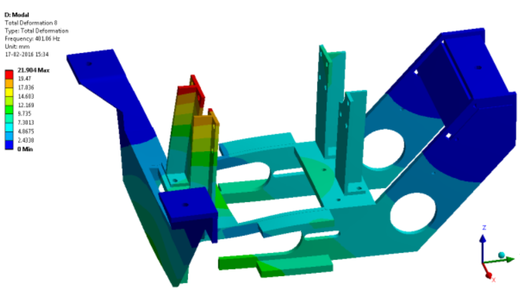
3.2.6 MODE SHAPE 6



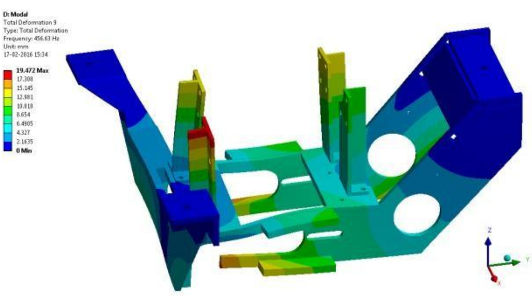
5) 3.2.7 MODE SHAPE 7

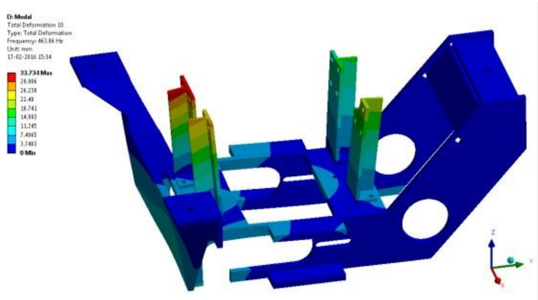


3.2.8 MODE SHAPE 8



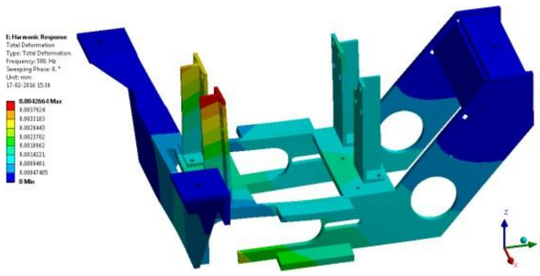
6) *3.2.9 MODE SHAPE 9* *3.2.10 MODE SHAPE 10*

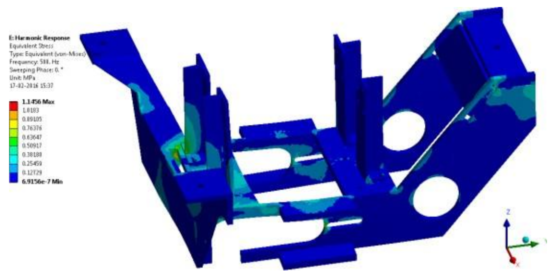




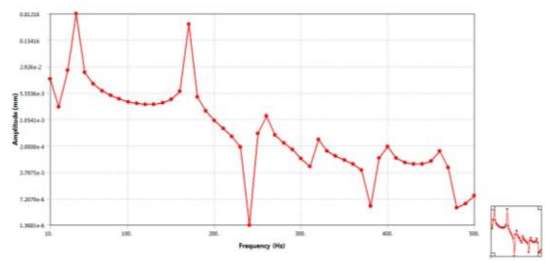
B. 3.3 HARMONIC ANALYSIS FOR STEEL

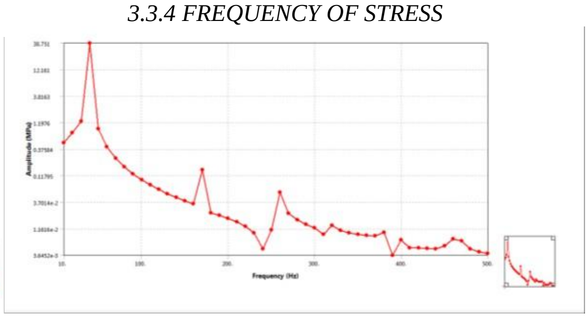
1) *3.3.1 DEFORMATION* *3.3.3 STRESS*





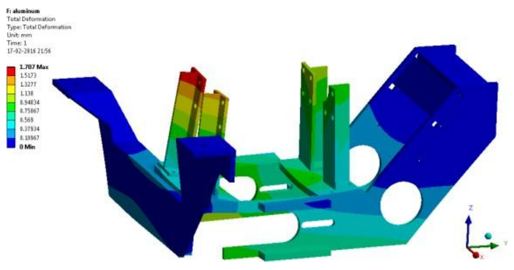
2) *3.3.2 FREQUENCY OF DEFORMATION* *3.3.4 FREQUENCY OF STRESS*

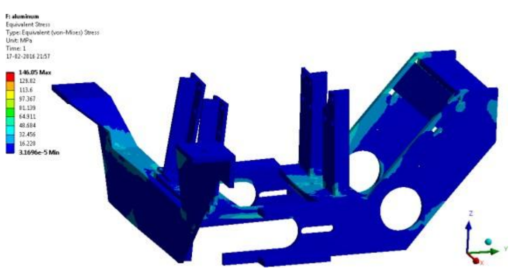




3.4 Static Structural Analysis For Aluminum Alloy

3) *3.4.1 DEFORMATION* *3.4.2 STRESS*

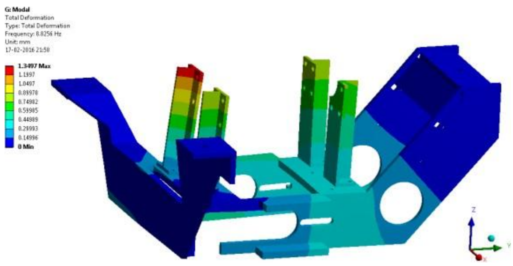




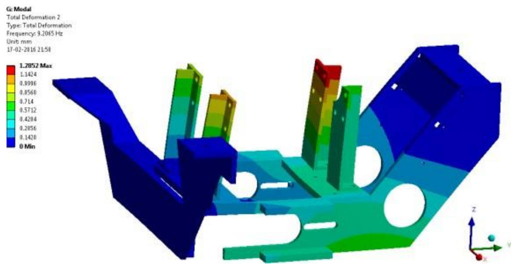
8.5 **4.5MODEL**

Analysis For Aluminum Alloy

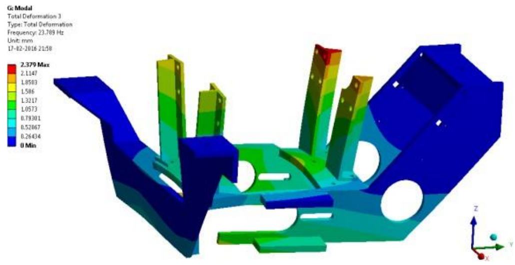
4) 3.5.1 MODE SHAPE 1



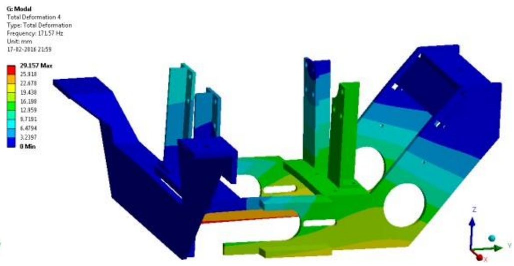
3.5.2 MODE SHAPE 2



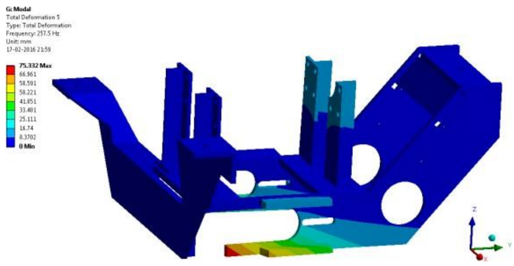
5) 3.5.3 MODE SHAPE 3



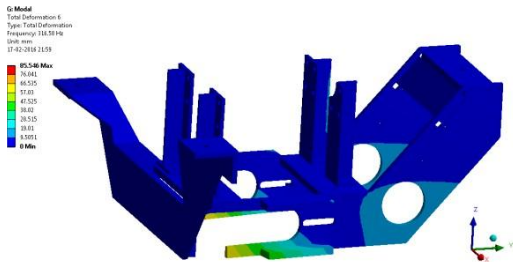
3.5.4 MODE SHAPE 4



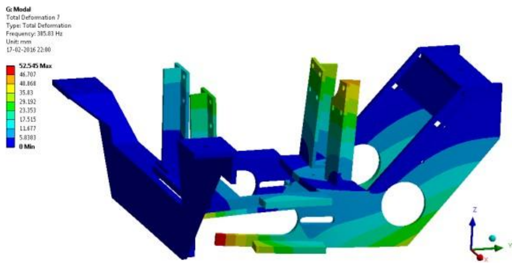
6) 3.5.5 MODE SHAPE 5



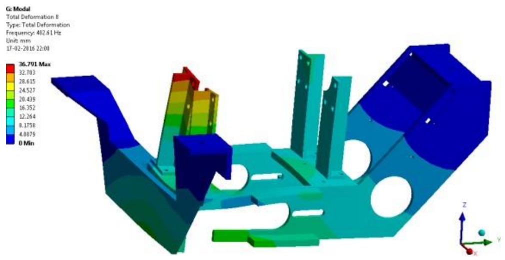
3.5.6 MODE SHAPE 6



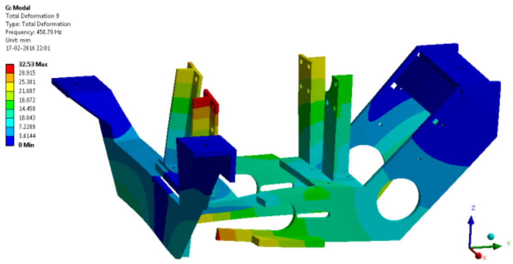
7) 3.5.7 MODE SHAPE 7

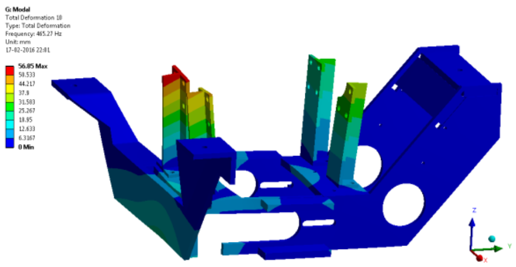


3.5.8 MODE SHAPE 8



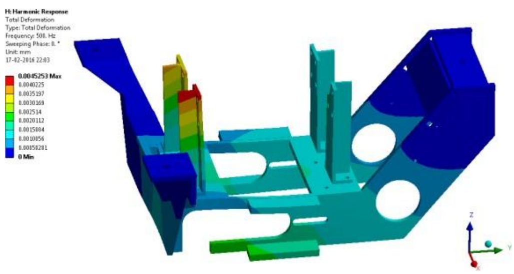
8) 3.5.9 MODE SHAPE 9 *3.5.10 MODE SHAPE 10*

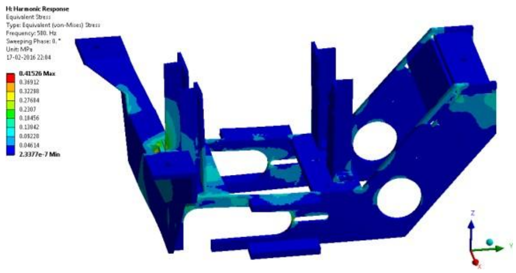




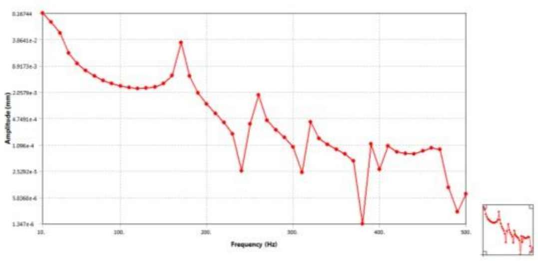
C. 3.6 HARMONIC ANALYSIS FOR ALUMINIUM ALLOY

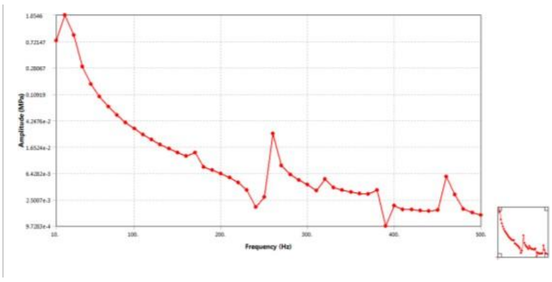
1) 3.6.1 DEFORMATION *3.6.3 STRESS*





2) 3.6.2 FREQUENCY FOR DEFORMATION *3.6.4 FREQUENCY FOR STRESS*





IV. CONCLUSION

In this work, computational modeling and simulation of an available engine mount frame was performed to gain an understanding of the harmonic response on an engine mounts and to evaluate the effectiveness of current market available solutions. Special attention was given to the correct modeling of nonlinear effects on the vibrational behavior of the mount. The experimental harmonic analysis of the mount revealed the presence of two distinct regions in the engine operating frequency in which the mount had an almost constant on mounting area and another where the existence of contact between on engine constrain.

Then, Done a model analysis to finding a natural frequency of a range between a maximum and minimum frequency. Value is 0 to 500 Hz in between the mode shapes 10.

Another type of harmonic analysis for material changed mount that also done same model and harmonic analysis are done; by we are comparing result to find the better model and proposed a aluminum alloy to better model.

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