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Design and Modification of Shock Absorber Bracket in Engine Frame Assembly

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Abstract: Sheet metal forming process are widely used in different industries for producing complicated sheet metal part at minimum number of operation at low price. Using different types of die for sheet metal operation like blanking, bending, piercing, punching, etc. its help to increase the reputability and productivity. In automobile industries, there are many part are manufactured by using sheet metal forming process. Hence we need to find out the different stresses and failure criterion by using the FEM.

Keywords: Appe PIAGGIO, press work, sheet metal forming process, shock absorber bracket, welding.

I. INTRODUCTION

This paper is based on “Design And Development of Shock Absorber Bracket In Engine Frame Assembly” for Piaggio Ape, this is an industry based project. The problem was discussed the previous design of shock absorber bracket is less efficient due to three different parts are joined to each other by using CO2 welding, spot welding and different types of press operation. Due to various method the manufacturing cost of product is high and cycle time for production is more and more space is required. During this project, various causes was identified and solution by using collected data from the industry the simple die is used to making this part by using single sheet metal forming operation.

In this project we have need to design the simple die for producing the bracket by using the press machine and find out the stresses and load carrying capacity of the component.

II. LITERATURE REVIEW

Rajdipsinh G Vaghela, et al.^[1] Press machine continuously works underneath impact load condition attributable to continuous impact load, Frame of press machine continuously expertise continuous tensile stress. Press machine continuous deals with stress and since of that often structural failure downside happens in machine.

Vivek D. Barhate, et al.^[2] This Paper Conclude that, Progressive die was a cheap thanks to type metal give up appropriate of characteristic together with strength, ductility, and wear resistance. This analysis deals with the 2 stage progressive die had been designed for the saddle plate producing. Compound die was additionally used for producing this plate however its style was a lot of difficult and economically high costly.

S. Kumar, et al.^[3] the present investigation contributes towards automating the planning method of progressive die mistreatment KBS approach. The output of system modules includes the kind and dimensions of major parts of progressive die like die block, die gages, stripper, stripper plate, punches, punch plate, back plate, die-set and fasteners. Recommendations imparted by the system for choice of progressive die parts were found to be affordable and extremely the same as those truly employed in sheet industries.

Matsushita muneo et al.^[4] conclude from this paper was to modify effective application of varied kinds of high performance, high lastingness steel sheets to automobile bodies, it had been necessary not solely to understand high performance within the material properties of the steel sheets themselves however conjointly to develop connected manufacturing technologies like forming technologies, welding technologies, etc. Among these, the authors introduced samples of new spot fastening technologies for motor vehicle body assembly developed by JFE Steel.

Manoj Raut, et al.^[5] This experiment was supported the improvement of spot fastening method parameters to seek out the utmost tensile shear strength of the spot welded joint.. The Taguchi technique of L18 orthogonal array has accustomed perform the experiment. All the specimens area unit spot welded victimisation the taguchi style of experiment. The experimental results show that the fastening parameters area unit the necessary factors for the strength of the welded joint which can increase or decrease the strength of the fastening joint.

Y. B. Chen, et al.^[6]In this paper, the authors attachment characteristics of CO₂ optical maser-TIG hybrid attachment are investigated in details through varied the energy ratios between laser and arc. And at a similar time, the result of distance from ray of light to conductor, periodic optical maser combined with TIG arc and completely different hybrid manners on hybrid attachment characteristics have additionally been analysed. Some conclusions are often given as following: There square measure 2 mechanisms in CO₂ laser-TIG arc hybrid attachment process: deep penetration attachment and warmth physical phenomenon attachment.

III.CONSTRUCTION AND WORKING

In shock absorber bracket, bracket is assembled by three parts like LH part ,RH part and z-bracket. But due to assembling the parts by welding, there are cost of product and time required for manufacturing the tool is more. Hence we modify this bracket in single sheet metal. Due to this modification, cycle time for production and cost of tool will be reduced. Also life of product will be more. For manufacturing this modified shock absorber bracket ,we will design the die and punch.



Fig.1 – shock absorber bracket

IV.CONCLUSIONS

In this project we can produced a more efficient deign and modify shock absorber bracket for reducing the cycle time and various cost of production .this tool can reduce the electricity consumption and also improved life of tool,also because of eliminating the many operations on press and welding, tool becomes cost effective.

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