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Analytical study regarding topological optimisation of an internal combustion engine cylinder block

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Abstract

The continuous rush for development has led the world of automotive engineering to progress that seemed unimaginable just a few years ago. This research paper examined the impact of a topological optimisation of an internal combustion engine block. Starting with the initial conditions, a constraint and load case scenario was established, after which a FEA simulation was conducted to set the reference values. In the last part of the research paper, test results are head-to-head compared to determine and quantify the improvements. This study aims to reduce the volume of the optimised part and increase its overall rigidity. The topology optimisation process represents a good solution for "what if" scenarios. By varying optimisation constraints, the designers can quickly check if the mass reduction of the analysed part is worth the changes.

Keywords: internal combustion engine blocks, topology optimisation

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