Design Method for Automobile Gearbox Module Utilizing Optimization Methods

*Takayuki Yamada[1], Kenta Yamagata[1], Satoru Ishikawa[2],

Kazuhiro Izui[1] and Shinji Nishiwaki[1]

[1]Department of Mechanical Engineering and Science, Graduate School of Engineering, Kyoto University,
C3, Kyoto-daigaku-katsurra, Nishikyo-ku, Kyoto, Japan.
[2]Toyota Motor Corporation, Susono, Shizuoka, Japan.

*Corresponding author: takayuki@me.kyoto-u.ac.jp

This research presents a new design method for an automobile gearbox module that considers module commonality across different products. In the proposed design method, utilizing optimization methods, design variables are automatically designed to maximize the fuel efficiency of the automobiles. Several numerical examples are shown to confirm the validity and utility of the proposed design method.

Keywords: Optimum Design, Automobile Gearbox, Module Commonality, Robust Design, Multiobjective Problem