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Comparative tests of steering gear made of composite and aluminum alloy

Andrzej Wróbel¹, Marek Płaczek¹, Andrzej Baier¹, Andrzej Buchacz¹ and Mateusz Czechowski²

¹Silesian University of Technology, Poland

²Nexteer Automotive Poland sp. z o.o., Poland

The industry has played an important role for the development of the Polish economy for centuries. The location of a given industry in a given part of the country depends on such factors as natural resources area, location of sale or a qualified staff. The Upper Silesian Industrial District is the largest industrial district of Poland includes industrial companies in the central-eastern part of the Silesian Voivodship. In this area, the automotive industry and companies closely cooperating with this industry are a very strong branch of industry. An example of such cooperation is Nexteer-the leader in the innovative motion control delivery of electric and hydraulic steering systems, steering columns and driveline systems. The paper presented in this article attempts to replace standard materials of steering columns such as aluminum with new composite materials. The prototype of such a steering column has been done as a part of the research project PBS3/B6/37/2015 (PST-41/RMT2/2015) in cooperation of Nexteer and Institute of Engineering, Processes Automation and Integrated Manufacturing Systems, Faculty of Mechanical Engineering, Silesian University of Technology. The main objective of the research was to compare the noise generated during the work of previously manufactured gears and the new innovative gear housing made of composite. After analyzing the first two prototypes of the transmission, we managed to obtain results comparable to the results of the production version. Subsequent research that will be carried out will be related to thermographic studies of transmission subassemblies and assemblies as well as examination of moments and forces generated during transmission operation.

Biography

Andrzej Wróbel is a Lecturer in the Institute of Engineering Processes Automation and Integrated Manufacturing Systems, Silesian University of Technology. He is a specialist in the design, analysis of mechatronic systems and industrial automation. He is the Head of studies in the field of Automation and Robotics Engineering Processes. He is a Member of the Professional Association in Modern Manufacturing Technologies ModTech Iasi-Romania and International Union of Machine Builders (Donetsk, Ukraine). He is the Manager of Laboratory of Visualization of Mechatronic Systems in the Center of the New Technology of the Silesian Technical University. He is the Editor in Chief of Journal "Selected Engineering Problems". He is an author or a co-author of more than five monographs and chapters in books and more than 70 articles.

andrzej.wrobel@polsl.pl

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