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the future of forging

Forging technologies in new mobility

Development of a Compact e-Axle for Heavy Duty Trucks, E-mobility forgings at Commercial Vehicles and New Generation Automated Forging line concept

Authors: Dr. Rolf Döbereiner, Product Line Manager Commercial Vehicles, AVL List GmbH, Graz, Austria and Gürbüz Güzey, Director, Engineering- Investments-Quality, Parsan / Omtas

Speaker: Dr. Rolf Döbereiner and Gürbüz Güzey

Rolf Döbereiner

Gürbüz Güzey

Dr. Rolf Döbereiner is a Mechanical Engineer with a PhD in vehicle transmission technology from the Technical University of Munich. With 25 years of experience in commercial vehicle and powertrain technologies, he currently holds the position of Global Product Line Manager for Commercial Vehicles, Electrification and ADAS/AD at AVL List GmbH in Graz, Austria.

Gürbüz Güzey is a Mechanical Engineer with a MSc. in Mechatronics. With 30 years of experience in Forging and Metal Forming Business and Technology he currently holds the position of Engineering Director of Parsan and Omtas and is responsible for Engineering, Investments, R&D, New Projects, and Quality.

Abstract

Heavy goods transport is one of the main levers in reducing carbon footprint in the upcoming years. The EU parliament just decided that in 2023 CO_2 fleet emissions have to be by 45% lower than in 2019. Thus, European OEMs are launching battery electric (BEV) and fuel cell electric (FCEV) trucks to the market. As the market demand in terms of durability is quite high (e.g. lifetime of the vehicle of 1.5 million kilometers in long haulage application), and especially semi-tractors, that are holding the greatest market share in haulage applications, don't offer too much packaging space for the electric powertrain, there is the need for high power density. The presentation shows aspects in the development of an electric axle for heavy duty trucks. Starting with the market demands and e-axle types it will be outlined how to achieve highest durability, efficiency at most compact design. As well of utmost importance is to optimize production and assembly. As an example, the common development of Parsan and AVL will be shown.

The new mobility and e-axle driven trucks will reduce the usage of the forgings at the commercial vehicles. ICE and the propeller shafts will be eliminated increasing total weight of the e-trucks will

bring the lightweight requirements. The front axle will be kept almost same and there are several forgings at the e-axles including the gear blanks, hypoid sets, rear axle shafts etc. Each of the parts and components need to be analyzed in detail for the future to design the metallic parts with optimum weight to meet the required durability of the vehicles. On the other hand, the transition period of the forgings from ICE to e-mobility and uncertainties of the future technologies are requiring the flexible, efficient, and sustainable new generation forging line investments. E-truck and e-axle forgings, and new generation automated forging line concept of Omtas/Parsan will be summarized at the second part of the presentation.