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Co-Chairs: Jun Qu, Oak Ridge National Laboratory; Yongping Lei, China Nuclear Power Design Company; Peng He, Harbin Institute of Technology; Yunlong Chang, Shenyang University of Technology

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Simulation on the sealing of aluminum ball joint

Haobin Tian; Xiaohang Liu, Shanghai Second Polytechnic University; Xuelei Li; Jun Feng, Shanghai Huizhong Automotive Manufacturing Corporation

ABSTRACT

Aluminum ball joint is an advanced structure using to connect steering parts with the merits of simple and lighting. Usually it is constructed by steel ball stud, bearing with nylon or POM material, steel housing cover and Aluminum housing. Pull out and push out strengths are the elementary requirements for this structure, and rotating and oscillating torques of ball joint are needed to control at an appropriate scope. For this structure, the ball joint can be sealed through the partly deformation of housing, and which directly determined the push out strength, and changed the torques of ball joint indirectly. In the paper, Finite Element Method(FEM) to simulate ball joint sealing is explored and verified with experiment, and the relations in the seal processes, push out strength and torque are studied using experimental method and FEM. The parameters affected the push out strength and torque are studied and the influence rules are achieved through the experiments and simulation. The analytical model to present the push out strength is established.

KEYWORDS: ball joint, aluminum forming, push out strength, torque