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A Study on the Influence of Planet Pin Parallelism Error to Load Sharing Factor

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Abstract : In this paper, planet pin parallelism error, which is one of manufacturing error of planet carrier, is employed as a main variable to influence planet load sharing factor. This error is categorize two group: (i) pin parallelism error with rotation on the axis perpendicular to the tangent of base circle of gear(x axis rotation in this paper) (ii) pin parallelism error with rotation on the tangent axis of base circle of gear(y axis rotation in this paper). For this study, the planetary gear system in 1.5MW wind turbine is applied and pure torsional rigid body model of this planetary gear is built using Solidworks and MSC.ADAMS. Based on quantified parallelism error and simulation model, dynamics simulation of planetary gear is carried out to obtain dynamic mesh load results with each type of error and load sharing factor is calculated with mesh load results. Load sharing factor formula and the suggestion for planetary reliability design is proposed with the conclusion of this study.

Keywords : planetary gears, planet load sharing, MSC. ADAMS, parallelism error
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