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Contact Force Distribution Among Pins of Trochoid Transmissions

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Trochoid transmissions are widely used in industry. There are three types defined by field of application: cycloid speed reducers, trochoid pumps, and linear motion trochoid drive. Cycloid speed reducer is a statically indeterminable system. Therefore it is required using a deformation equation while analyzing force distribution. Besides significant influence on contact force is caused by machining tolerances. In the paper the clear mathematical models of cycloidal speed reducer with account machining tolerances, methods for gap and contact force distribution determination and computer-aided modeling results on these approach basis are presented. The simple practical design equation for backlash calculation, expressing relationship between drive parameters (eccentricity, gear ratio, transmission angle), machining tolerance and backlash has been developed. The three-dimensional model of the new linear motion trochoid drive has been presented.

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