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基于变形协调和间隙浮动的双路功率分流系统均载特性分析

Load sharing characteristics analysis of power split system based on deflection compatibility and clearance floating

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中文关键词: [功率分流](#) [变形协调](#) [间隙浮动](#) [力矩平衡](#) [弹性支承](#) [安装误差](#) [均载](#)

英文关键词: [power split](#) [deflection compatibility](#) [clearance floating](#) [moment equilibrium](#) [elastic support](#) [installation error](#) [load sharing](#)

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中文摘要:

针对双路功率分流系统的载荷均匀分布问题,建立了该系统的静力学模型,并根据系统构成功率流动闭环的特点,推导出扭转角变形协调条件,将该条件联立力矩平衡条件和弹性支承条件,计算出了各齿轮副传递的扭矩,得到系统的均载系数.从静力学角度分析了各构件安装误差和均载特性的关系,并分析了间隙浮动对均载特性的影响.结果表明:齿轮2存在安装误差为0.03mm的情况下,间隙量为0.8mm即可满足基本构件浮动,得到均载系数为1.0038,间隙浮动有利于提高均载性能.对比实验和理论分析的结果,同一误差条件下,功率分配分别为53.88%和53.50%,从而验证了该方法的正确性.

英文摘要:

In order to implement the uniform load distribution of the gear train with dual power splitting, a pseudo-static model was built firstly. And then, according to the system power flow closed-loop feature, the torsional angle deformation compatibility conditions were deduced, the moment equilibrium conditions and elastic support conditions was established to calculate each gear pair transmission torque, and finally the system load sharing coefficient was obtained. Next, the relationship of the installation error and system load sharing characteristics was analyzed in the static research, and the floating pinion based on clearance floating played an important role in the system load sharing. The results show that the clearance of 0.8mm could meet the pinion to floating under the influence of the gear 2 with installation error of 0.03mm, obtain the load sharing coefficient of 1.0038, the floating pinion can improve the load sharing characteristics. Through theoretical data compared with the experimental data, in the same error conditions, power distribution is respectively 53.88% and 53.50%, which verifies the correctness of the method proposed.

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