

工作油温升对液粘传动调速启动的影响 Effect of Working Oil Temperature Rise on Hydro-viscous Drive Speed Regulating Start

孟庆睿 侯友夫

中国矿业大学

关键词: 液粘传动 调速启动 温升 修正瞬态雷诺方程 有限元法

摘要: 采用有限元法联立求解修正瞬态雷诺方程、热能量方程及润滑油粘温方程,对调速启动过程进行了数值模拟研究,讨论了启动过程中工作油温升对液粘传动调速启动的影响。结果表明,流入摩擦片工作油温度为30℃时,流经摩擦片后温度约升高20℃,它所引起的油膜承载力下降9%;而流入摩擦片工作油温度由30℃升至50℃时,即使不考虑流经摩擦片的温升,油膜承载力也将下降32%。这样易引起油膜承载力低于比例溢流阀死区对应压力,导致摩擦片直接接合,不能取得理想的调速启动效果。调速启动实验验证了理论分析的正确性。To reveal the effect of working oil temperature rise on hydro-viscous drive speed regulating start, by using finite element method, the modified transient Reynolds equation, energy equation and temperature-viscosity equation were solved simultaneously to simulate the startup process. The results showed that the oil film temperature rise caused by the friction pair approximately was 20℃ when inlet temperature of the working oil was 30℃, the decrease of oil film load capacity was about 9%. If inlet temperature of the working oil rised from 30℃ to 50℃, the oil film load capacity decreased by 32% even if the temperature rise caused by the friction pair was neglected. It could make oil film load capacity lower than the dead zone pressure of the proportional pressure valve used in the control system, thus the friction discs were engaged directly and could not get a perfect speed regulating start. The results were verified by experiments.

[查看全文](#) (请使用Adobe Acrobat 6.0版本浏览) [返回首页](#)

[引用本文](#)