CALCULATION OF SPLASHING LOSSES IN AN SPUR GEARBOX WITH SPH-METHOD

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Most CFD simulation programs are based on a grid-based method. My bachelor's thesis, supervised by Dr. Karl Reisinger, aimed to investigate how accurate splashing losses with the grid-free SPH-Method can be predicted. The total losses are made up of power-dependent (bearing and gearing losses) and power-independent losses (bearing, seal and splashing losses). This paper will show the results of an oil flow simulation with a fully functional Renault Twizy spur gearbox and with the differential as standalone part at different speeds, temperatures and oil levels. The occurring splashing losses, caused by these three different factors were compared. The Simulations were done with the Software PreonLab by AVL, and the Smoothed-Particles-Hydrodynamics-Method. Transmission and the individual parts were designed in CATIA V5 and embedded in PreonLab. To verify and compare the simulation results, testbed measurements were done on a transmission testbed at the University of Applied Sciences.

Keywords: SPH-Method, Gearbox, PreonLab, CFD, Losses