

## EXPERIMENTAL INVESTIGATIONS ON SPIN POWER LOSSES GENERATED IN A PLANETARY GEAR SET

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### ABSTRACT

Planetary gear sets are widely used for to their compact size and high gear ratio. It is of the utmost importance that their efficiency is as high as possible. To achieve this, it is necessary to understand and analyse the sources of energy dissipation. The aim of this study is to determine and investigate the spin losses generated in a planetary gear set, namely the drag and the pocketing losses. The gearbox configuration studied features a rotating ring gear and is oil-jet lubricated. The

analysis is based on experiments carried out on a specific test rig composed of a reduced-scale planetary gear set. On this test rig, gearbox losses are measured under different operating conditions (mainly oil flow rate, oil temperature, rotational speed). A thermal network is used to determine the losses distribution. In this way, each individual energy dissipation is studied and the impact of different operating conditions is highlighted.

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