A test procedure to investigate lubricant-surface combinations for high-performance racing transmissions [abstract]

This item was submitted to Loughborough University’s Institutional Repository by the/an author.


Additional Information:

- This is a conference abstract.

Metadata Record: https://dspace.lboro.ac.uk/2134/34861

Version: Accepted for publication

Rights: This work is made available according to the conditions of the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0) licence. Full details of this licence are available at: https://creativecommons.org/licenses/by-nc-nd/4.0/

Please cite the published version.
A test procedure to investigate lubricant-surface combinations for high-performance racing transmissions

Edward Humphrey*, Nick Morris, Ramin Rahmani, Homer Rahnejat, Greg Rapson

Wolfson School of Mechanical, Manufacturing and Electrical Engineering
Loughborough University
Loughborough
Leicestershire
LE113TU

*Corresponding author: e.w.humphrey@lboro.ac.uk

The high performance automotive transmission is a refined subsystem capable of transmitting high power and torque. During the past century significant improvements in efficiency and reliability have been achieved. The lubricant-surface system still however provides an area with significant potential improvement. The extreme operating conditions determine that the lubricant which services the mixed thermo-elastohydrodynamic conjunction operates at the limit of its capability. Failure of the diminished bulk lubricant film gives ever greater importance to the surface active lubricant additives. The synergy of the mechanical components and lubricant determines an optimal system which can only be achieved if the pair is developed in tandem. This study will focus on developing understanding through representative tribometry, surface chemistry analysis and atomic force microscopy. This forms the basis for a detailed test protocol to study the salient parameters affecting the system. The aim is to use this procedure to benchmark lubricant additive packages and surface combinations for improvements in operational stability and efficiency.