

UNIVERSITI TEKNOLOGI MARA

**DEGRADATION AND WEAR
ANALYSIS OF AUTOMATIC
TRANSMISSION FLUID (ATF) OF 1.3L
AUTOMATIC TRANSMISSION (AT)
VEHICLE**

SYAZUAN BIN ABDUL LATIP

Thesis submitted in fulfillment
of the requirements for the degree of
Master of Science

Faculty of Mechanical Engineering

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledged as reference work. This thesis has not been submitted to any other academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

Name of student : Syazuan Bin Abdul Latip

Student I.D No : 2008584021

Programme : Master of Science

Faculty : Faculty of Mechanical Engineering

Thesis Title : Degradation and Wear Analysis of Automatic
Transmission Fluid (ATF) of 1.3L Automatic
Transmission (AT) Vehicle

Signature of student :

Date : July 2014

ABSTRACT

Ascending number of vehicles around the globe leads to higher rates of growth in demand for oil. In the context of Malaysia, this growth expected to be more rapid in years to come which may contribute to depletion of oil resources. In order to conserve and sustain oil resources, there is a need to extend the use of ATF in automotive vehicles. The aim of this study is to investigate the quality and effectiveness of the extended oil in performing its intended purposes of providing sufficient protection to the AT system and most importantly assurance of minimal occurrence of wear within the system. Oil analysis approach has been deployed in order to attain understanding of wear behavior in automatic transmission (AT) system analyzed at two different mission profiles. This approach may be common in engine oil analysis as suggested in literatures. Nevertheless, the deployment of the oil analysis technique to investigate wear behavior in transmission system has not been fully explored. This becomes the impetus of the study. Based on the analysis done, it was noted that ATF degradation was insignificant even though the ATF samples were used beyond the recommended period and tested at a continuous high speed value of 3,000 rpm. Besides, the depletion of vital anti-wear property, namely ZDDP was minimal and hence did not affect the quality of the ATF. Based on the qualitative analysis, the ATF samples were found to have acceptable key additives level, insignificant contaminants and normal wear mode. In general, this study suggests that the use of ATF might be extended beyond the existing recommended period. However, future studies need to be conducted to further understand the potential of using ATF beyond the recommended period.

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