

Evaluation of Analube
Synthetic Lubricant

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Technology Assessment and Evaluation Branch
Emission Control Technology Division
Office of Mobile Source Air Pollution Control
Environmental Protection Agency

Background

The Environmental Lubricants Company of New Britain, Connecticut, contacted the Office of Air and Water Programs to request a laboratory and engineering evaluation of their polyglycol base synthetic lubricant. Supplied with the request was a test report indicating significant reductions of exhaust emissions and fuel economy improvement. A confirmatory test program was conducted by the Technology Assessment and Evaluation Branch of the Emission Control Technology Division.

Description

Analube is a synthetic lubricant formulated from a polyglycol base with a molybdenum compound for lubricity. This synthetic lubricant is marketed as a replacement for the normal hydrocarbon motor oils. There was no cost information provided by the manufacturer.

Test Program

A 1971 Ford Galaxie 500 equipped with a 351 CID engine from the EPA fleet was used for the test. Six tests were conducted, two with a standard 10W-40 motor oil for baseline, three with a fill of Analube, and one more with 10W-40 motor oil to re-establish baseline. Each series of tests was preceded by a drain and oil filter change. Prior to the Analube emission tests, a short, manufacturer requested, preconditioning route was driven. All testing was performed in accordance with the 1975 Federal Test Procedure as outlined in the November 15, 1972, Federal Register.

All tests were conducted using the standard dynamometer inertia loading of 4500 pounds and Indolene Clear as the test fuel.

Test Results

The test results are presented in the Appendix of this report. These results are summarized below:

Summary of Emission Results % Change from Baseline

	<u>Analube</u>
HC	0 change
CO	20% increase
CO ₂	4% decrease
NO _x	0 change
Fuel Economy	3.6% improvement

Conclusions

1. The test results do not indicate significant reductions in exhaust emission levels with the use of the Analube synthetic lubricant.

2. The apparent fuel economy improvement is not considered significant as the percentage improvement is well within the ECTD measured test-to-test variability.

TABLE I
Analube Synthetic Oil Test Results

Baseline (10W-40 Hydrocarbon base oil)

<u>Date</u>	<u>HC</u>	<u>CO</u>	<u>CO₂</u>	<u>NOx</u>	<u>'75 MPG</u>
4-26	2.11	15.7	757.38	3.09	11.2
4-29	2.11	18.7	761.38	3.05	11.0
Average	2.11	17.2	759.38	3.07	11.1

Analube Synthetic Oil

<u>Date</u>	<u>HC</u>	<u>CO</u>	<u>CO₂</u>	<u>NOx</u>	<u>'75 MPG</u>
5-7	2.09	19.6	732.61	3.08	11.4
5-8	2.10	20.7	737.53	3.20	11.3
5-9	2.11	21.8	711.47	2.94	11.8
Average	2.10	20.7	727.20	3.07	11.5

% Change from Baseline	0	+20.4	-4.2	0	+3.6
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Retest of Baseline Oil

<u>Date</u>	<u>HC</u>	<u>CO</u>	<u>CO₂</u>	<u>NOx</u>	<u>'75 MPG</u>
5-21	2.16	19.6	754.00	*	11.2

* NOx measurement: in error due to instrument malfunction