PERFORMANCE REPORT ON

MFL

ENGINE TREATMENT

BY THE

UNIVERSITY OF UTAH

ENGINEERING EXPERIMENT STATION

INTRODUCTION

The University of Utah Engineering Experiment Station has conducted test of an oil additive manufactured by Lubri Lon International.

The manufacturer claims that MFL Engine Treatment will reduce friction, wear, engine operating temperature, and oil consumption while increasing lubrication, horsepower, and gas mileage. MFL Engine Treatment is a product which is claimed to permanently bond to bearing surfaces, reducing internal engine friction and thus giving rise to the above effects.

MFL Engine Treatment is added to the crankcase of a normal auto engine during oil change, replacing one quart of oil. The client, Mr. Galanis, recommends replacement every year. The manufacturer is currently alleging life time permanency from one application.

The Experiment Station planned to test specifically for:

1) Internal engine friction
2) Fuel consumption
3) Horsepower
4) Engine wear and oil galley clogging
5) Exhaust emissions

These parameters have been measured both before and after the addition of MFL Engine Treatment to the test engine.

The tests were conducted in three phases. The first phase included 10 hours of testing to determine the normal or baseline operation characteristics of the engine. Phase 2 consisted of running the engine for 50 hours, or the approximate equivalence of 2500 miles, with MFL Engine Treatment added to the crankcase. Finally, Phase 3 and additional 50 hours were put on the engine with fresh oil minus MFL to determine if indeed the wear surfaces had become plated, how quickly and beneficial effects would disappear.

Test comparisons were made with standard high grade motor oil, and no conclusions or comparisons with synthetic oils have been made. The Experiment Station also makes no claims or conclusions about the extended life effects of MFL and suggests that tests on the order of 50, 000 miles be made with a large enough test fleet develop statistically accurate information on the long term effects of the MFL Engine Treatment in a variety of engine.

The Experiment Station also makes no claims or conclusions on the performance of an engine after use extending beyond the time of 5000 miles, while emphasizing that there was no data suggesting any deleterious effects.

TEST EQUIPMENT

The tests were performed on a 1973 Chevrolet 259 Cu. in. 6 cylinder test engine set up in the Mechanical Engineering Department at the University of Utah. Power Output from the engine is taken directly into a General Electric dynamometer which acts as a. variable load and can also be reversed to back drive the motor.

The system is instrumented to measure the following:

Engine RPM
Engine operating time
Oil pressure
Oil temperature
Block water temperature
Manifold Vacuum
Volume of fuel consumed
Dynamometer output load
Dynamometer output power
Internal engine friction

An oil filter adaptor, allowing the measurement of the pressure drop across the oil filter with a differential manometer, was conducted.

Engine temperature is controlled by feeding tap water into a cooling tower. The lack of a convective cooling radiator required the engine to be run at a lower temperature (1600 F) than normal operating temperature (1800 F) to avoid boilovers.

Exhaust emissions were measured on a Beckman Exhaust Analysis System.

TEST PROCEDURE

Tests were conducted to compare engine wear, fuel consumption, output power, and exhaust emissions before and after the addition of MFL Engine Treatment. Tests were also run after MFL was removed form the crankcase to determine wear ability of the MFL.

As a first step, the original oil after approximately 100 hours of use was drained and saved as rough baseline comparison for particulate contaminants.

The engine was then supplied with a new filter (Fram PH3O) and 5 quarts of motor oil (Pennzoil SAE 10—40 HO, SE). The engine was then run for 10 hours at 1500 RPM at a moderate load (15HP). At the end of this time, baseline data on engine performance, internal engine friction and exhaust emissions were taken. Data was taken under light load conditions, which simulate moderate cruising, and heavy load conditions, which approximate load conditions reached during maximal engine effort.

The valve lifters were removed and cleaned, and then carefully weighed on a microbalance. Sections of the lifters were examined by visual and microscopic examination. Photomicrograph pictures were taken at 200x magnification for close examination of bearing surface scoring.

The engine was reassembled and run for 50 hours with MFL added to the crankcase as per manufactures instructions.

Carburetor and ignition timing were touched throughout the experiment. During the first 10 hours of runs with MFL added seven runs were made to determine how the performance varied with time in the introductory period. Thereafter tests were run at 10 hour intervals.

At 50 hours with MFL, the oil was again sampled and drained. The lifters were removed and examined as before. A light section microscope was used in an unsuccessful attempt to measure the thickness of the coating.

The engine was again reassembled and run For an additional 50 hours with a fresh charge of motor oil without MFL to determine the lasting effects of the additive. At the end of this time the previous tests were repeated.

ENGINE FRICTION LOSSES

(HORSEPOWER)

RMP	BASELINE 0 Hours	MFL 50 Hours	PERCENT Decrease	LONGTERM 100 Hours	PERCENT Decrease
750	5.42	4.83	10.9%	5.07	6.5%
1000	7.80	7.14	8.4%	7.00	10.2
1250	10.54	9.18	12.9	8.74	17.1
1500	14.05	11.17	20.4	11.42	18.7
		AVG. =	13.1%	AVG.=	12.6%

TABLE 1

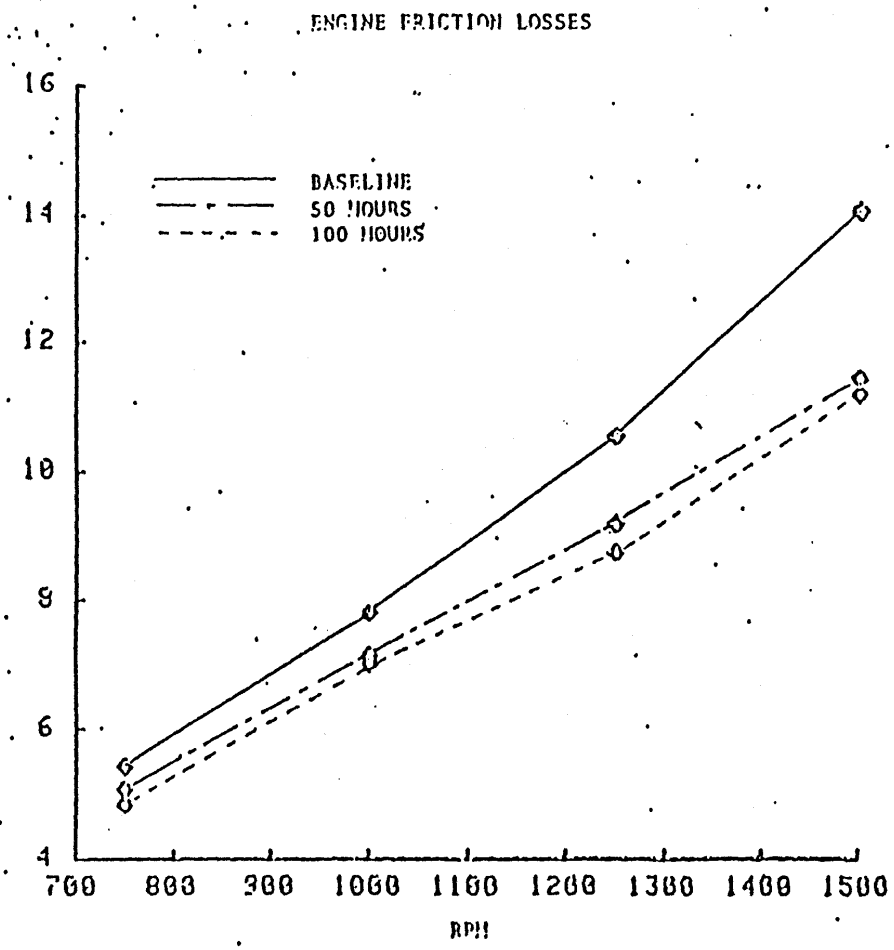
ENGINE FRICTION LOSSES
16
14
12
10
8
6
4
BASELINE
50 HOURS
100 HOURS
700
800
900
1000
1100
1200
1300
1400
1500
RPM

FIGURE 1.

RPM	BASELINE 0 Hours	MFL 50 Hours	PERCENT Increase	LONGTERM 100 Hours	PERCENT Increase
		OUTPUT HORSEPOWER			
		LIGHT LOADING			
1000	3.1	4.0	22.5%	3.3	6.1%
1500	5.8	7.7	24.6	7.2	19.4
2000	9.5	10.9	10.5	11.7	18.8
2500	13.6	14.1	3.5	16.0	26.1
3000	21.4	21.6	.9	23.2	7.8
			AVG.= 12.4		AVG.= 15.6
		HEAVY LOADING			
1000	7.8	8.8	11.4	10.3	24.3
1500	20.6	20.1	-2.5	20.2	-2.0
2000	34.7	37.1	8.1	36.0	3.6
2500	49.1	50.7	3.2	53.9	8.9
2750	57.4	61.4	6.5	60.8	5.6
			AVG.= 5.3%		AVG.= 8.1

TABLE 2

HORSEPOWER AS A FUNCTION OF TIME

RPM	MFL 10 Hours	MFL 20 Hours	MFL 30 Hours	MFL 40 Hours	MFL 50 Hours
1000	3.2	3.5	3.7	3.5	4.0
1500	6.5	5.9	6.4	7.5	7.7
2000	10.5	10.3	11.5	11.2	10.9
2500	14.5	17.8	17.4	18.0	14.1
3000	20.3	23.7	22.0	21.6	21.6

TABLE 3

SPECIFIC FUEL CONSUMPTION

GAL/HP/HR

RPM	BASELINE 0 Hours	MFL 50 Hours	PERCENT Increase	LONGTERM 100 Hours	PERCENT Increase
			LIGHT LOADING		
1000	.32	.26	18.8%	.25	21.9%
1500	.26	.21	19.2%	.20	23.0%
2000	.20	.18	10.0%	.17	15.0%
2500	.19	.18	5.2%	.16	15.8%
3000	.17	.16	5.8%	.15	11.8%
			AVG.= 11.8%		AVG.= 17.5%
			HEAVY LOADING		
1000	.16	.13	18.8%	.13	18.8%
1500	.11	.12	-9.1%	.12	-9.1%
2000	.11	.10	9.1%	.12	-9.1%
2500	.11	.11	0%	.11	0%
2750	.12	.12	0%	.12	0%
			AVG.= 3.8%		AVG.= +.1%

TABLE 4

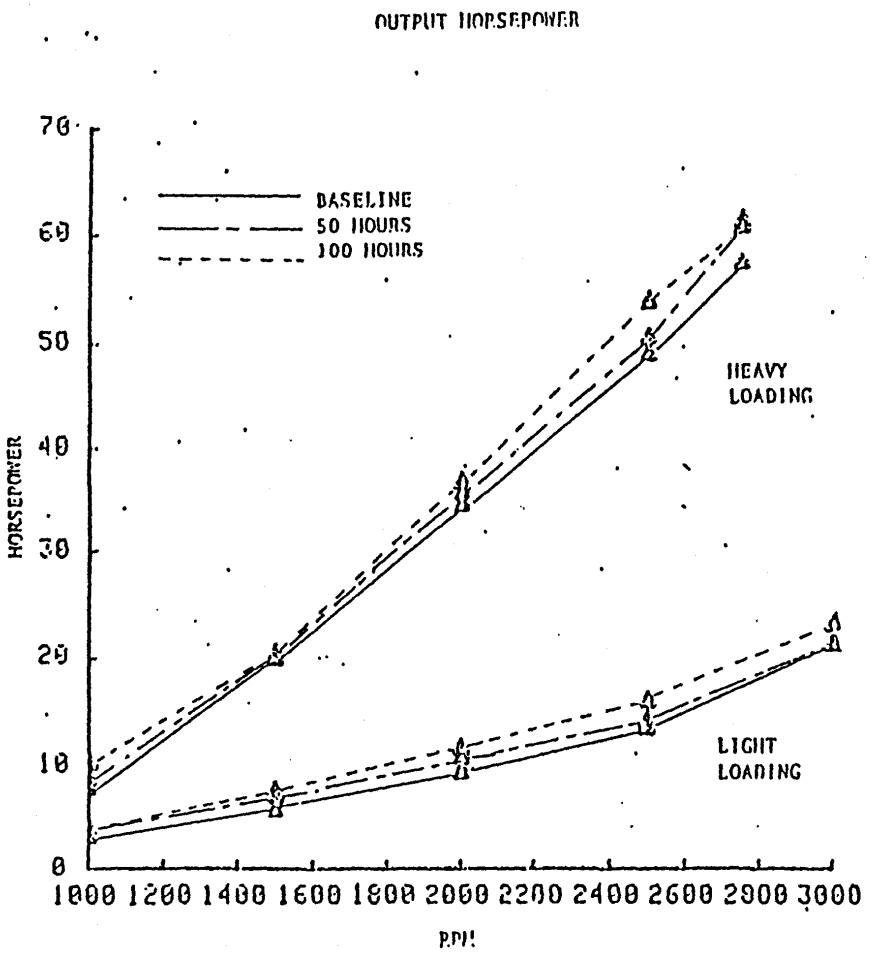
OUTPUT HORSEPOWER
70
60
50
40
30
20
10
0
HORSEPOWER
BASELINE
50 HOURS
100 HOURS
HEAVY LOADING
LIGHT LOADING
1000 1200 1400 1600 1800 2000 2200 2400 2600 2800 3000
RPM

FIGURE 2