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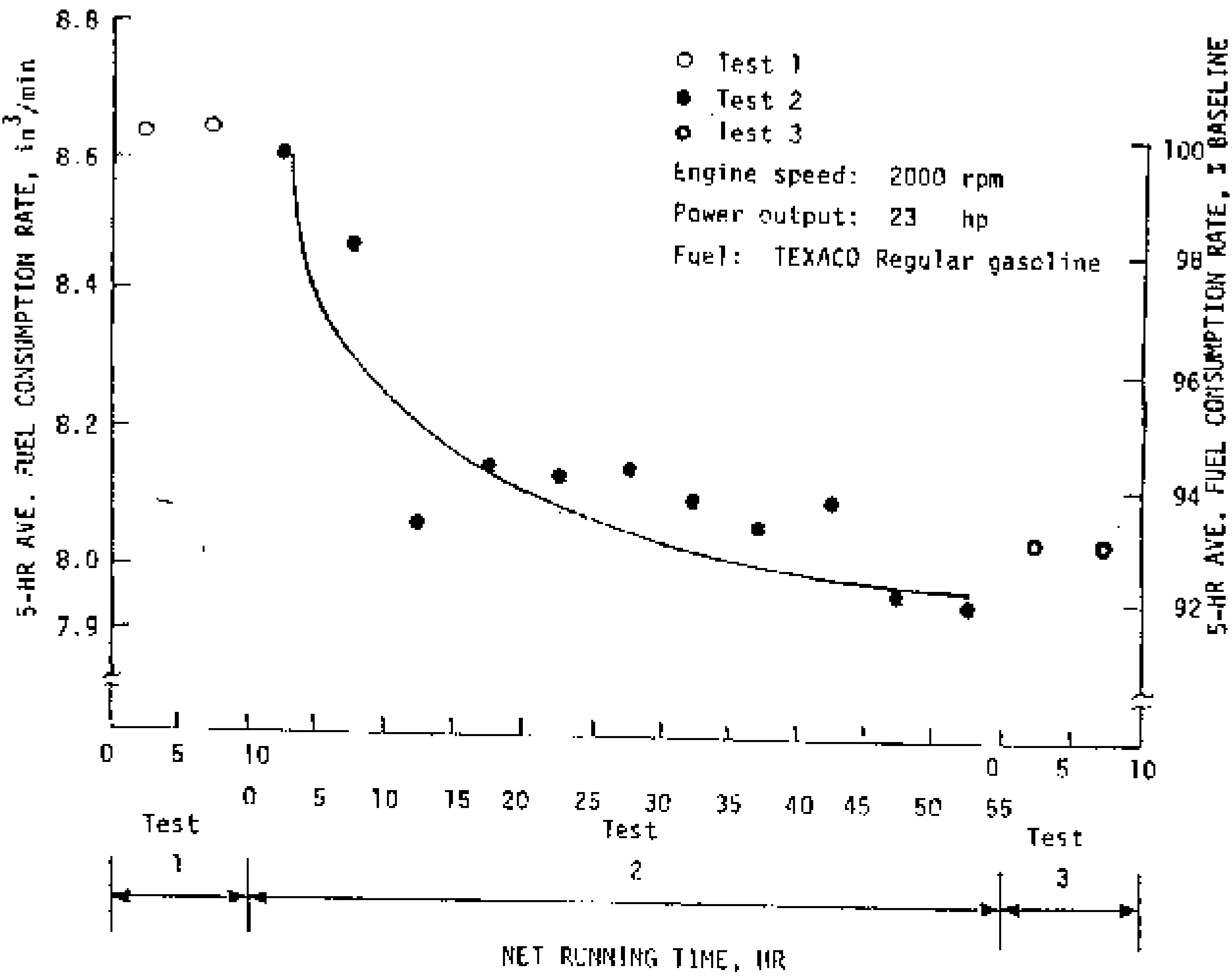

Test No. 1: Baseline (10 hours)
2: NRG Engine Treatment added (55 hours)
3: Standart oil after treatment run (10 hours)

Figure 2. Fuel consumption rate of a 1976 Potentiac V6 engine under three different conditions.

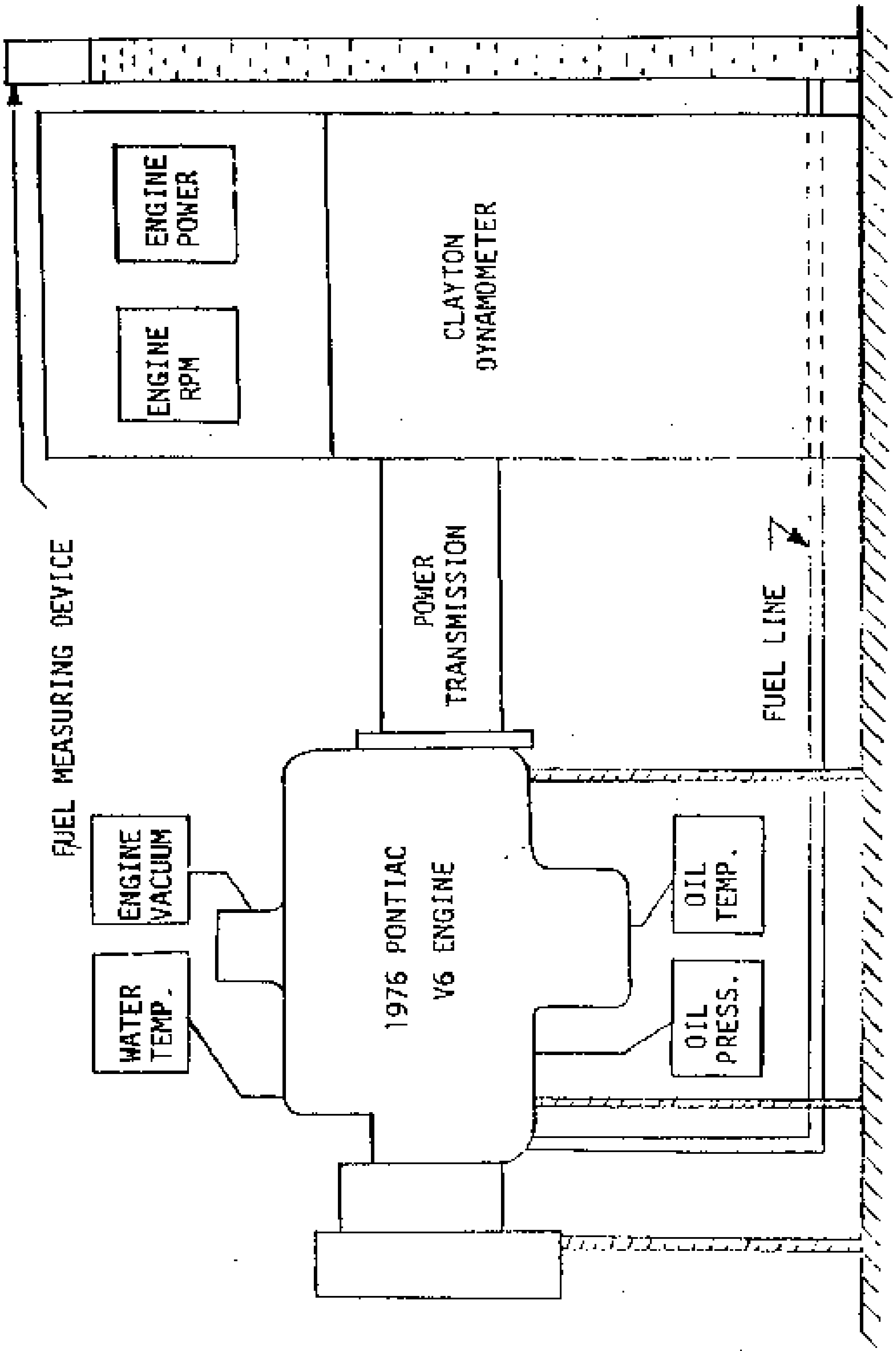

Figure 1. Schematic diagram of experimental unit.

TABLE 1: Operating conditions of a 1976 Pontiac V6 engine under three different conditions.

Engine speed: 2000 rpm
Power output: 23 hp
Carb. vacuum: 15 in Hg

5-hr ave. fuel consumption, in /min *2*

Test No *1*	ave.	st. deviation	oil temperature F	oil pressure PSI	water temperature F
1	8.63	0.03	180	40	212
	8.64	0.02	180	40	211
2	8.60	0.04	170	40	212
	8.47	0.15	170	40	210
	8.06	0.06	170	40	210
	8.14	0.04	170	40	210
	8.13	0.04	170	40	210
	8.14	0.03	170	40	210
	8.09	0.09	160	40	209
	8.06	0.09	160	40	209
	8.09	0.06	160	40	209
	7.97	0.07	160	40	209
	7.95	0.04	160	40	209
3	8.03	0.06	160	40	209
	8.05	0.07	160	40	209

1 Test No. 1: Baseline (10 hrs)
2: NRG Engine Treatment added (55 hrs)
3: Standard oil after treatment run (10 hrs)

2 TEXACO regular gasoline.

3 Laboratory temperature: 82 +/- 2 F

CONCLUSIONS

1. NRG Engine Treatment was found to have a significant effect on the engine fuel consumption. A break-in period was needed before a minimal fuel consumption rate could be reached.
2. It was shown, in this study, that the oil treatment could cause a reduction in fuel consumption rate as much as 8%.
3. The oil temperature during engine operation seemed to be affected by the oil treatment. The use of treated lubricant resulted in a lower oil temperature.
4. The effect of the oil treatment on the engine operation remained effective, for the period tested, even after the treated lubricant was replaced by the regular oil.

During each test, the fuel consumption and the readings of pressure gauges and thermometers were recorded every half an hour. Three samples of crankcase lubricant, one after each test, were collected and delivered to NRG - INTERNATIONAL.

RESULTS AND DISCUSSION

The average fuel consumption rate in in^3/min was calculated for every five hour period and listed in Table 1. The table also shows the average oil temperature, oil pressure and water temperature during the same time period. The carburetor vacuum was found to be 15 in Hg in all the tests.
It was shown that there was a significant decrease in the oil temperature when the additive treated lubricant was used (Test 2). Furthermore, another decrease in the oil temperature was noted after about 30 hour run with the treated oil. No significant change in both oil pressure and water temperature was found throughout the tests.
The five-hour average fuel consumption rates for three tests, both in in^3/min and % baseline, were plotted versus the net running time in hours in Figure 2. In Test 2, the fuel consumption rate decreased, but with a decreasing rate, with the increase in the net running time and finally reached a minimum. The engine consumed fuel, during the last five hours in this test, at a rate 8% less compared to the fuel consumption rate found in the baseline test. The results obtained from Test 3 showed that the fuel consumption rate tend to remain about the same even after the treated lubricant was replaced by the regular oil.

OBJECTIVES

The objectives of this study were:

1. To investigate the effect of NRG Engine Treatment on the engine fuel consumption.
2. To monitor the engine operating temperatures (lubricant and coolant) under different conditions.

EXPERIMENTAL APPARATUS AND PROCEDURES

A schematic diagram of the experimental unit is shown in Figure 1. A 1976 Pontiac V6-231 engine was operated with and without the engine oil additive during a series of tests. The engine speed and its power output were controlled and monitored by a 200 horsepower absorption type dynamometer. Pressure gauges and thermometers were placed at appropriate locations to meter the engine's operating pressures and temperatures. The measurement of fuel consumption rate was accomplished by measuring the change of gasoline level in the fuel measuring device during a fixed period of time. TEXACO regular gasoline was used throughout this study.

The engine was run at 2000 RPM and 23 horsepower output under three different conditions:

1. Baseline test: 10 hour run with regular crankcase oil (Valvoline 30 W was used in this study).
2. Additive treated test: 55 hour run with additive treated lubricant (1 quart of NRG plus 4 quart of regular oil).
3. Post treatment test: 10 hour run after the lubricant and additive was replaced by regular oil in the crankcase.

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TESTING A CRANKCASE LUBRICANT ADDITIVE ON AN INTERNAL COMBUSTION ENGINE

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Energy conservation is an immediate source of energy that can be utilized to relieve the critical dependence of the nation on foreign oil supplies. Awareness of the need for conserving energy has resulted in a wide range of activities by organizations and individuals to produce ways and means for achieving significant energy savings. Among these varied activities of energy conservation, one of the most common objectives is that of developing and implementing fuel saving devices for internal combustion engines.

As a result of a request made by an organization known as the NRG INTERNATIONAL Corporation of Houston, Texas, a crankcase lubricant additive was tested on an internal combustion engine located at the College of Technology, University of Houston Central Campus, Houston, Texas. The additive, NRG Engine Treatment, has been developed by the corporation for the purpose of effecting significant energy savings in fuel consumption, reduction of friction, and reduction in rate of wear in internal combustion engines and mechanical pumps. The study reported in this paper was designed to supply the information about the effects of the additive on engine operating conditions.

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OIL SAMPLES TAKEN DURING TREATMENT

This is an addendum to the University of Houston report evaluation NRG 1540 P as a metal treatment for internal combustion engines.

Ten oil samples were taken from the crankcase and oil filter at varying and specified time intervals during testing — eight from the crankcase and two from the oil filter. A detailed oil analysis was performed by Analysts Service Inc., Houston, Texas. The samples were indexed as follows:

* 1. 10 hours run using a high detergent Valvoline 30 wt oil -- from crankcase.
* 2. 10 hours run using Valvoline 15W40 -- from crankcase.
* 3. 10 hours run using Valvoline 15W40 -- from oil filter.
4. 10 hours run using 80% Valvoline 15W40, 20% NRG 1540 P -- from crankcase.
5. 20 hours run using 80% Valvoline 15W40, 20% NRG 1540 P -- from crankcase.
6. 30 hours run using 80% Valvoline 15W40, 20% NRG 1540 P -- from crankcase.
7. 40 hours run using 80% Valvoline 15W40, 20% NRG 1540 P – from crankcase.
8. 50 hours run using 80% Valvoline 15W40, 20% NRG 1540 P – from crankcase.
9. 50 hours run using 80% Valvoline 15W40, 20% NRG 1540 P -- from oil filter.
* 10. 10 hours run using Valvoline 15W40.

* Oil and filter changed before running this test segment.

Sample	Iron PPM
1	208
2	57
3	53
4	15
5	21
6	25
7	29
8	31
9	31
10	14

SUMMARY: The above data shows that the NRG Engine Treatment reduces the Iron Content 75% - directly related to engine wear - compare samples #2 and #10.

COMMENT: The iron content during the Treatment stage increased **from 15 PPM @ 10 hours to 31 PPM @ 50 hours**. This is to be expected since the NRG Treatment would be removing some of the old engine varnish (which would have iron particles attached to it from previous wear). Even at the 31 PPM level the iron content was 49% below that prior to treatment with NRG.

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