TEST ON MICSA 926 TEFLON ENGINE CONDITIONER

Reason for test - The product had been used in a haulers MT80568, MT80638 and a bus MT70109

Both were on Wearcheck oil analysis and both showed decreased wear particulars. On the bus an impending engine failure was apparently saved and a reduction in fuel consumption averaging 9% achieved according to depot records.

Due to the uncertain trial conditions of the above it was decided to carry out a controlled test on a dynamometer to verify the practical results.

Conditions of Test

The engine test with Teflon was carried out at 24 hours notice due to pressure of work and the availability of an engine. The engine was not really suitable since it was worn out and had been drawn from repairable stock for tests on engine protection devices. As a result, it had overheated repeatedly due to faulty sensors and was in bad shape as can be seen from the compression tests.

Equipment

The Froude dynamometer at Langlaagte Automotive workshops test bay was used. The unit is a spare and its heat-exchanger for the engine cooling water was not properly functional and operated on a total loss system from the mains. No flow-rate measuring device was available which caused a problem during the experiment.

The fuel metering system was out for repairs.

Temperature gauges for water "in" and "out" of the engine were functional as was the exhaust thermocouple and engine rev. counter.

The torque readings were taken in terms of the weights added and the scale reading. The dynamometer had a step type throttle.

The engine tested was a Büssing S 12 DA type B which is a turbocharged engine. No. 9012

The crankcase breathers were blanked off and a hole drilled in the filler cap with an attachment for a water manometer to measure blow-by.

It was noted on start-up that the engine was noisy and smoking noticeably, even when hot and at constant load.

Prior to the test the oil was changed and as no new filter was available, the old one was removed and the casing replaced.

Procedure

The engine was run until it reached a constant operating temperature at 118 kW. Two litres of fuel were measured by burette and as the level of fuel reached the narrowest part of the funnel fixed to the fuel inlet, the stop-watch was activated and some of the fuel poured in. Similarly, when the 1st of the two litre quantity reached the same point, the stop-watch was stopped. This indicated kWh obtained from two litres of fuel and any increase in time at constant power would be a measure of improved fuel consumption. All other readings were taken during the test which lasted approximately 3 minutes in each case.

Blow-by readings were also taken at idle. Since the tests were commenced at 11h30 and continued to 6 pm, the ambient temperature can be considered constant - air being drawn through the workshop building.

Before treatment with MICSA 926

Only one run was done due to lack of time.

Blow-by	-	idle ---------- 600 RPM	4 cm H_2O
	-	1 800 RPM UNDER LOAD	8 cm H_2O
Exhaust temp. at test load			422°C
Water from engine			85°C
Water to engine			56°C
Time to use 2 000 ml fuel (+- 2 ml)			3 min 6 sec.

Compression test

Cylinder 1	-	200 p.s.i.
2	-	200 p.s.i.
4	-	200 p.s.i.

Engine noisy and exhaust smoking blue. At this stage it was lunchtime and the engine was shut down. The cooling water was also inadvertently shut off as well.

After treatment

The engine was run for 2 hours before the first test was attempted just before the final staff went home. The next test was done an hour thereafter and the final one at 19h00. The engine was then shut-down and the next morning it was heated up before taking compression readings on the cylinders.

RESULTS		TEST 1	TEST 2	TEST 3
RPM		1 800	1 800	1 800
Dyna load (15 lbs. + 2,3 scale)		17,3	17,3	17,3
Water from engine thermostat.	°C	85	90	95
Water to engine	°C	36	60	28
Blow-by : 600 RPM	cm	-	-	2
1 800 RPM	cm	6,4	7,0	7,0
Time to use 2 ℓ fuel		3 min 22 sec.	3 min. 11 sec.	3 min. sec.
Exhaust temp.	°C	-	-	509

Compression test Cylinder 1 - 246 psi
Cylinder 2 - 243 psi
Cylinder 4 - 243 psi

NO SMOKE - ENGINE NOTICEABLY QUIETER AT IDLE.

Discussion of results

1) The dynamometer was worn as was the engine and it was difficult to maintain the same power output in all cases.

2) No definite conclusion can be drawn from the change in water temperature since the flow rate through the heat exchanger was not constant.

3) Blow-by was read on an ordinary water manometer and is not more than 5mm out. The reduction in blow-by was significant.

4) A quartz stop-watch was used for timing. An error of +- 1 ml. may be expected in the fuel measuring procedure.

SUMMARY OF TEST RESULTS USING MICSA 926

THE PRODUCT MICSA 962

Micsa 926 is a concentrated liquid preparation consisting of P.T.F.E. (Teflon) particles in suspension. It is introduced into the engine oil and then carried to the working parts of the engine which is subjected to heat and pressure. The P.T.F.E. links together under the influence of heat and forms a network - Polymer which makes a protective film. The Polymerised layer of P.T.F.E. has a low co-efficient of friction and high resistance to heat conductivity.

P.T.F.E. is chemically inert and after Polumerisation the layer is not affected by oil or detergents and can operate between temperatures of - 100°C and 290°C.

Please note: Micsa 926 is not an oil conditioner - the oil is used as a transport medium to carry P.T.F.E. to the working parts of the engine.

TEST NUMBER 1

On 06.01.82 a Perkins 4.236 U engine in Tapping truck number 18 was treated with one litre of Micsa 926. On 14.06.83 the engine was removed because of apparent loss of power and age. The engine was dismantled and the following wear was measured on the various components.

CRANK SHAFT			
No. 1 BIG END JOURNAL	-0	No. 1 MAIN BEARING JOURNAL	0,005 inch
No. 2 BIG END JOURNAL	-0	No. 2 MAIN BEARING JOURNAL	0,005 inch
No. 3 BIG END JOURNAL	-0	No. 3 MAIN BEARING JOURNAL	0,005 inch
No. 4 BIG END JOURNAL	0,001 inch	No. 4 MAIN BEARING JOURNAL	0,005 inch
		No. 5 MAIN BEARING JOURNAL	0,005 inch
CAMSHAFT	0		
CYLINDER WALL	0,003 inch taper		
PISTONS	0,002 inch out of round		

The engine was in use for 75 weeks or the equivalent of 6000 hours.
The average life of a Tapping truck engine is 40 weeks or 4200 hours.
(Cause of low power was faulty fuel injection).

TEST NUMBER 2

A Ford 5000 engine was removed from a crust breaker because of excessive blow by. The engine was put on the dynomometer and the performance was measured and recorded. The engine was stopped and the engine oil and oil filter was renewed and treated with a half litre of Micsa 926. After running the engine for 60 minutes at 70% full load the following was noted :-

COMPRESSION	-	INCREASED
BLOW BY	-	DECREASED
OIL TEMPERATURE	-	DECREASED
EXHAUST TEMPERATURE	-	INCREASED
COOLING WATER OUTLET TEMPERATURE	-	DECREASED
OIL PRESSURE	-	INCREASED
FUEL CONSUMPTION	-	DECREASED BY 3,7%

Exhaust smoke changed from black to a light grey smoke.

The engine was operated for a period without cooling water. After 12 minutes the engine showed signs of seizing up. The engine was then operated with cooling water but without engine lubricating oil. After 4 minutes the engine seized up. The engine was dismantled and inspected for damage. The piston rings lost hardness because of excessive heat. The crankshaft had very little damage and could be repaired by machining as well as the other engine components.

TEST NUMBER 3

Another Ford 5000 engine was treated with one litre of Micsa 926. The results after treatment were more or less the same except that the fuel consumption was decreased by 8,5%. The engine was again operated without engine lubricating oil. After 4 minutes the engine seized up. The engine was again started after lubricating oil was filled up. The engine was dismantled and on inspection of the components there showed no damage caused by lack of lubrication.