EURO FuelSaver S.r.l. **SUPER TECH®**

+ energy + economy + ecology

REFER BOOK

Hong Kong
Reference

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The present Refer Book doesn't contain the integral version
of the documents but only a summary describing the obtained results.
Whoever would wish to receive the integral version,
shall send a request to the General Management.

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P.IVA 05558901004 - Capitale sociale interamente versato € 102.328

HONG KONG

Date	Institute/Company	Test		Results		Attached
		Labor.	Road	Gas emis reduction	Consump Reduc	Documentation
21/01/05	**HONG KONG**					

EXPERT TESTING REPORT ON THE PERFORMANCE OF A SUPER TECH FUEL SAVING DEVICE ON A EURO 2 DIESEL VEHICLE

Prepared for

SKYMART STRATEGY CHINA LTD.

By

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Signature : 

Date : 21 January 2005

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Performance testing of A Super Tech fuel saving device on a Euro II diesel lorry

1. Introduction

This report was prepared according to the test conducted on a Super Tech fuel saving device (The Device) which was claimed to be able to reduce the fuel consumption of diesel engines. The study was commissioned by Skymart Strategy Ltd. (The Client). The main objective of this independent study was to compare the performance of a Euro II diesel vehicle before and after the installation of the Device.

The tests were conducted on 13 January 2005 in Dah Chong Hong (DCH) Motor Services Centre at Ap Lei Chau. An Isuzu NPR Turbo 5.5 tonnes lorry with cylinder capacity 4.8 litres (The Vehicle) was used for the test using ultra low sulphur diesel (ULSD) as its fuel throughout the test. The Supertech fuel saving device was installed after the baseline test. To facilitate the installation of the Device and for simulating the movement of the fuel tank in normal driving condition, an external fuel tank was used for the test in which the fuel saving device was installed. After completion of the baseline test, the fuel saving device was installed into the external fuel tank according to the installation guidelines of the device and the test was conducted similar to the baseline case. Each of the test was repeated to check the repeatability of the test result.

Photo 1 shows the tested vehicle on the chassis dynamometer while Photo 2 shows the fuel saving device installed inside the external fuel tank.

Three types of measurement were conducted for the baseline as well as for the test with the Device installed as follows:

A. Smoke opacity test
   To test the smoke density of The Vehicle under a diesel lug down test adopted by the HK EPD.

B. Maximum power determination
   To determine the maximum power of The Vehicle.

C. Fuel economy measurement

   To determine the fuel economy of The Vehicle running at 70 km/h at 30% rated engine power. According to previous studies, the maximum engine power of a full loaded vehicle running at a speed of 50 km/h was less than 20% rated engine power. Therefore,

the preset testing speed and engine power can reflected the actual situation of a full loaded vehicle running at high speed mode.

2. Test vehicle

Brand: Isuzu NPR Turbo lorry
Year of Manufacture: 2000
Engine Capacity: 4.8 litres
Rated engine power: 98kW @ 2800 rpm
Maximum attainable engine speed: 3550 rpm
GVW: 5.5t
Mileage: 128600 km

3. Fuel saving device

The Super Tech Mod C fuel saving device, provided by the Client, was used for the test. The photo of the Device can be seen in Photo 2.

4. Instrumentation

The following instruments were used during the measurement:

- Clayton Industries ECCT 500108 Chassis Dynamometer: for carrying out the lug down test;
- SPX Dieseltune DX230 opacity meter: for real time measurement of smoke opacity of the exhaust gases;
- Kouda Model FC-9500 flow meter for fuel consumption measurement (error < 1%).
- A locally produced stainless steel fuel tank with a capacity of about 120 litres.

5. Methodology

i. A fuel consumption meter is first installed to the fuel line of the Vehicle to record the accumulated fuel flow during the test. Total fuel consumption within a fixed time period is determined with the Vehicle set to run on a constant speed of 70 km/h with the preset engine power of 29.4 kW (30% rated engine power).

ii. The fuel economy measurement is repeated to check for the repeatability of the test data.

iii. The maximum power and opacity of the Vehicle are then determined under a lug down test which consists of the 100%, 90% and 80% speed at maximum engine power.

iv. After completion of the above baseline test, the fuel saving device is installed into the external fuel tank according to the installation instruction. To simulate the real situation of a vehicle running on the road, the fuel tank was triggered by an external mechanism so that it will move to-and-fro continuously at a frequency of 0.5 Hz.

v. The fuel economy and the lug down tests as mentioned in Steps (i) to (iii) above are repeated 1 hour after the installation of the device in the triggered fuel tank.

6. Testing results

The results of the lug down test are shown in Table 1a and Table 1b for the baseline and the case with the Device installed respectively. The average maximum power for the baseline and the case with the Device installed were both found to be 76.5 kW, while the average maximum smoke opacities were 0 HSU and 0.5 HSU respectively. However, this small change in opacity is within the experimental uncertainty and therefore can be considered as insignificant variation.

Table 1a. Opacity and maximum engine power – Baseline.

	Baseline (1)	Baseline (2)	Average
Maximum power (kW)	77	76	76.5
Maximum smoke opacity (HSU)	0	0	0

Table 1b. Opacity and maximum engine power – With the Device.

	Device (1)	Device (2)	Average
Maximum power (kW)	77	76	76.5
Maximum smoke opacity (HSU)	1	0	0.5

The results of the fuel economy test are shown in Table 2a and Table 2b for the baseline and the case with the Device installed respectively. The average fuel economy for the baseline and for the case with the Device installed are 5.71 km/litre and 5.92 km/litre respectively.

Table 2a Fuel economy – Baseline

	Baseline (1)	Baseline (2)	Overall Average
Total distance travelled (km)	2.33	2.33	
Fuel economy (km/litre)	5.71, 5.66, 5.77, 5.82	5.71, 5.66, 5.71, 5.66	
Average fuel economy (km/litre)	5.74	5.68	5.71

Table 2b Fuel economy – With the Device.

	Device (1)	Device (2)	Overall Average
Total distance travelled (km)	2.33	2.33	
Fuel economy (km/litre)	5.82, 5.94, 5.82, 6.20	5.77, 5.94, 6.13, 5.77	
Average fuel economy (km/litre)	5.94	5.90	5.92

A comparison of the maximum power, smoke opacity and fuel economy of the baseline and the case with the Device installed is shown in Table 3. The result indicates that there is no significant change in the maximum power and smoke opacity after the installation of the device. However, an improvement of about 3.7% in fuel economy is observed after installing the device.

Fuel Economy

Table 3. Comparison between the baseline and the Device.

	Difference		
	Maximum power	Smoke opacity	Fuel economy
Device installed	Insignificant	Insignificant	+3.7%

7. Conclusions

(i) The performance of a Super Tech fuel saver (Mod C) has been determined under a chassis dynamometer of the Dah Chong Hong (Motor Services) Ltd. at Apleichau, Aberdeen, Hong Kong.

(ii) Fuel economy, maximum engine power and smoke opacity have been measured with the fuel saver installed and compared with the baseline case. A 5.5 tons Euro II lorry was used for the test with ULSD as its fuel. The fuel saving device (Super Tech Mod C) was installed in a separate fuel tank which was triggered to-and-fro during the test to simulate the movement of the vehicular fuel tank under driving condition.

(iii) Each of the test was repeated and the result of the two tests differed only by less than 0.5% from the mean value. This indicates the high repeatability of the testing results which are also reliable.

(iv) The results indicate that there is a 3.7% improvement in fuel economy of the vehicle after installing the device. However, no significant change in the maximum engine power and smoke opacity can be detected for the test vehicle.

Certified by: _____ Date: 21 January 2005

Dr. Dennis Y.C. Leung

Photo 1 Testing vehicle in the chassis dynamometer with the external fuel tank (on the right).

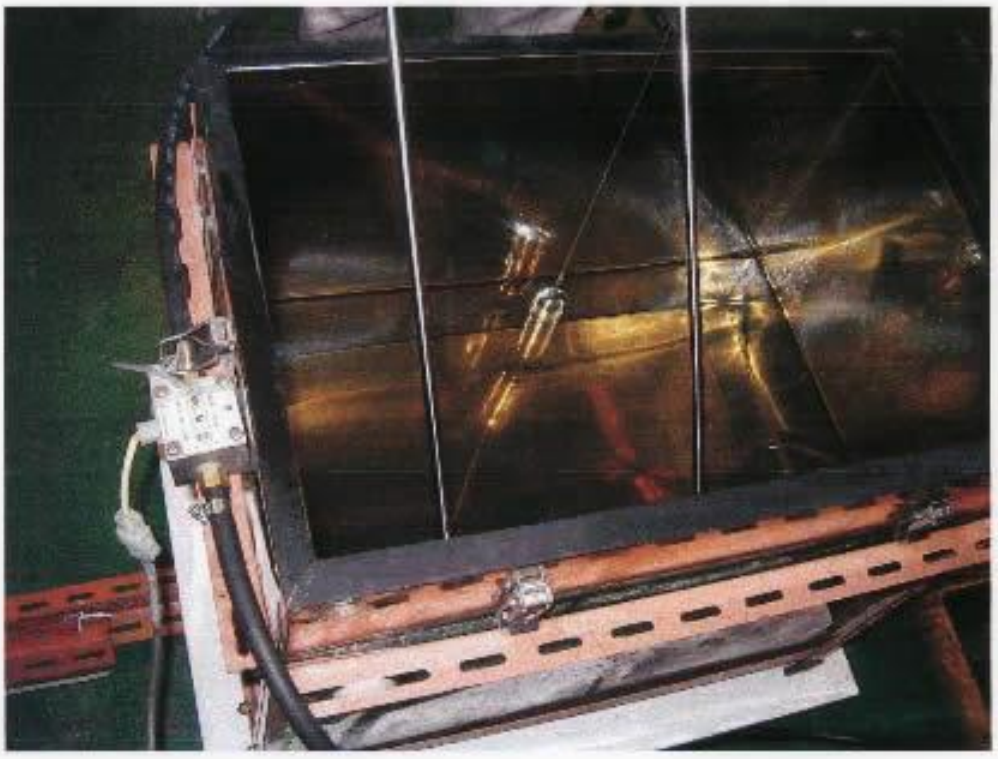

Photo 2 The fuel saving device installed inside the external fuel tank.