MACKENZIE ISLAND CRUISES

EVALUATION OF FTC COMUBUSTION CATALYST AS A MEANS OF REDUCING EXHAUST SMOKE

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Executive Summary

The FTC/FPC Combustion Catalyst manufactured and marketed by Fuel Technology have proven in laboratory and field trials to significantly improve the combustion of internal combustion engines. This improved combustion results in fuel efficiency gains of **3%** to **8%** reduced soot contaminants in engine oil and reduced exhaust smoke.

Following discussions with Hugh and Sean MacKenzie it was agreed to conduct Bosch smoke tests on the island cruiser boat "*Seabreeze*".

Background

FTC/FPC Combustion Catalyst is the only fuel chemical yet proven by the world's leading testing authority, SouthWest Research Institute (SwRI), Texas, USA, to improve fuel efficiency by promoting a faster and more complete combustion. SwRI also determined that FTC does not alter the physical or chemical properties of diesel fuel.

SwRI also determined, using the Caterpillar IG2 Test (ASTM 509A) that there are no detrimental effects that could cause increased wear or deposits following FTC treatment of fuel.

These findings have been verified by countless field studies in diverse applications which have confirmed efficiency benefits of 3% to 8%.

Maintenance Benefits documented include reduced oil wear metal profiles and reduced soot. Combustion and exhaust spaces become essentially free of any hard carbon with continuous catalyst use.

FTC's action in producing a better combustion is to promote a faster and more complete burn releasing the fuel's energy more efficiently. That is a larger portion of the fuel burn occurs when the piston is closer to the top dead centre.

Procedure

Due to restraints in accurately measuring fuel consumption on the island cruiser "*Seabreeze*" and the fact that excessive exhaust smoke was visible, it was agreed Bosch smoke tests would be conducted. This test method entails drawing 1/3 L sample of exhaust gases through a filter paper via a Bosch suction pump. The filter paper is then evaluated via a Bosch infrared evaluator where a digital number between "0" (perfectly clean) and 9.9 (black) is assigned.

Each engine in turn was run at 900 rpm astern at time of exhaust smoke sampling.

A period of eight weeks or approximately 200 engine hours was used as a conditioning period between untreated and treated tests. Fuel was manually treated at time of refuelling during this period.

Results

Table 1 displays the Bosch assigned number for each exhaust on both port and starboard engines.

Table 1

Exhaust Bosch Smoke Tests

Engine/Exhaust	**Untreated**	**Treated**	**% Change**
Starboard engine/port exhaust	3.5	2.3	- 34%
Starboard engine/starboard exhaust	3.4	2.6	- 23%
Port engine/port exhaust	4.1	4.4	+ 7.3%
Port engine/starboard exhaust	4.8	4.0	- 17%
AVERAGE	**3.95**	**3.32**	**- 16%**

Conclusion

This carefully controlled engineering test procedure provides clear evidence of improved combustion with an average of **16%** less smoke following FTC treatment of fuel.

The starboard engine resulted in a **29%** average reduction in exhaust smoke. The Portside engine resulted in a **6%** average reduction with the portside exhaust slightly deteriorating. This may be due to a mechanical fault or a longer conditioning period may be required to fully clean combustion spaces.

This improved combustion will translate to a fuel efficiency gain expected to be in the region of **5%** to **8%.**