Emissions : Mining

PJ Berriman - Underground Mine Cruiser

PJB ran some tests for FTA on their bypass oil and fuel filtration and what improvements, if any, it would have on a Rebuilt KIA 6/247 6 cylinder direct injection diesel engine. The engine had 20 hours running time and had been tuned for emissions not performance.

Fuel and oil samples were taken before and after the tests. Fuel was at an ISO of 18/15 and 0.3% water. After filtering the ISO was at 16/13, a 71% reduction, and the water had been removed. The removal of the water explains the 1.7% rise in NOx that occurred.

Oil tests indicated the ISO before filtration was at 19/16 and after at 16/13, an 88% reduction in particulate contamination.

Wear metals saw reduction in
- Silicon by 27%
- Iron by 51%
- Lead by 8%
- Copper by 23%
- Chromium by 35%
- Sodium by 62%

As wear generates wear this can only improve the engine longevity at this early stage.

Other improvements
- Torque increased 2.2%
- Power increased 2.7%
- Smoke (opacity) reduced 13.3%
- CO reduced 3.4%

Considering that this engine had already been tuned for emissions the addition of FTA filters produced an interesting result.

LUBE TECH

Site	
Unit ID/Name	OAO239RF
Manufacture/Model	Kia
Origin	PJB After
Fuel/Oil Type	Agri MP Plus

Diagnosis:
Very similar to the before sample except the levels are lower due to the extra filtration.
As with the before sample, an oil change is still recommended to rid the system of 'running in' wear.

	Sample Number	**35034**	35033
	Date	**02/07/2002**	01/07/2002
	Total Hours/Km		
	Hours/Km on Oil		
	Oil Changed	**NO**	NO
	Oil Added		
Condition Tests	Fuel Dilution (%)	**<0.5**	<0.5
	WT Solids (%)	**0.5**	0.5
	Volume Water (%)	**ND**	ND
	Water PPM		
	Viscosity @ 40C (cST)	**133**	135
	TAN (mg/KOH/g)		
	TBN (mg/KOH/g)	**8.5**	8.0
	ApH		
	PQ90 Index		
Wear Metals	Aluminum (Al)	**6**	10
	Silicon (Si)	**27**	37
	Tin (Sn)	**1**	2
	Iron (Fe)	**37**	76
	Lead (Pb)	**11**	12
	Copper (Cu)	**30**	39
	Chromium (Cr)	**25**	39
	Sodium (Na)	**18**	48
	Zinc (Zn)	**1200**	1200
	Others		
Cleanliness	ISO4406	**16/13**	19/16
	Gravi-Metric		
	>2 micron	**1340**	11710
	>5 micron	**495**	4331
	>15 micron	**53**	462
	Contamination	**Moderate**	Elevated