



# TOGA® - FLUID TEST REPORT

ACCOUNT/LOCATION NUMBERS

COMPANY NAME TOGA Demo Report		LOCATION			
LOCATION ADDRESS (No., Street, City, State, Zip) One State Street, Hartford, CT 06102					
UNIT DESIGNATION #3 TARO 40XLSAE40	SERIAL NUMBER 6957/1	EQUIPMENT TYPE ICE, Diesel	MANUFACTURER	YEAR BUILT 1987	

### SAMPLE REPORT ORDER DETAILS

SAMPLED BY		PCB LEVEL (ppm) N/A		OIL PRESERVATION METHOD				
COOLING METHOD	OIL VOLUME GALS	VOLTAGE KV	PRI 12.5	SEC	TER	CAPACITY 5.2	SEC	TER
CONDITION CODE 3	SCHEDULED NEXT SAMPLE DATE 12/14/2010	SCHEDULED TESTS						

#### REVIEWER COMMENTS

The 40 XL SAE 40 fluid is an high level of alkalinity fluid for engine with a maximum sulfur level of 5% in the fuel. The viscosity is about 0.5% above the OEM expected result of 134.9 cSt which is satisfactory. Other aging parameters like the base number appear satisfactory. The RFS results that are not reported are Zinc 384 ppm, Phosphorus 225 ppm, Barium at 1 ppm, calcium at 8830 ppm, Magnesium at 68 ppm, and Vanadium at 106 ppm. Sodium and water may indicate coolant leak. The Vanadium source could be from the fuel but some valves have vanadium. An analysis of the diesel fuel would eliminate that possible source. Several wear products like iron, nickel and lead show be an alert but a good trend has not been developed. The FTIR results are typical of a diesel engine lube oil with the exception of the nitration. Nitration is caused by oil degradation in a reduced oxygen environment and results in nitrogenous by-products. These compounds contain acidic precursors that may combine with water to form nitrous acids in the lubricant. We expect nitration to be less that 14. The nitration is stable but it causes oil thickening and indicates fuel system problems like fuel to air ratio. The dissolved moisture content is elevated at .44% and it could indicate coolant leak or from salt water. The contamination levels are elevated but stable. The elevated nitration level and spectroscopy contaminates should be investigated because of potential for equipment damage. The next scheduled samples for 3/14/2011 are LubeScreen, FTIR

#### CLIENT COMMENTS

### CURRENT & PREVIOUS SAMPLE REPORT RESULTS

Report Order ID	99988	95676	95513		
Sample Date	12/14/2010	09/03/2010	03/21/2010		
Sample Received Date	12/15/2010	09/08/2010	03/24/2010		
Sample Processed Date	12/17/2010	09/14/2010			
Gas Pressure, psig:					
Max. Temp. by Indicator (°F)			0		
Temp. at Time of Sample,(°F)			0		
Ambient Temperature (°F)			0		
Hours Of Operation	0	0	0		

### SCREEN RESULTS

Specific Gravity					
Color			Black		
Viscosity@40 C (°C)	135.6	146.2	139.2		
Viscosity@100 C (°C)					
Viscosity Index					
TAN(mgKOH/g)					
TBN(mgKOH/g)	27.8	29.7	27.6		
Dissolved Moisture (ppm)	4350	5792	6254		
Flash Point (°F)					
Fire Point (°F)					
Insolubles (%)					
Carbon Residue (%)					
Chloride (ppm)					
Inhibitor (%)					
Oxidation Stability					
PCB (ppm)					



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UNIT DESIGNATION	SERIAL NUMBER	EQUIPMENT TYPE	MANUFACTURER	YEAR BUILT
#3 TARO 40XLSAE40	6957/1	ICE, Diesel		1987

### RFS COARSE SPECTROMETRIC RESULTS (in ppm)

Element	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Iron	37	37	20			
Chromium	2	2	2			
Lead	4	3	1			
Copper	4	3	3			
Tin	0	0	0			
Aluminum	5	6	5			
Nickel	39	43	33			
Silver	0	0	0			
Molybdenum	1	0	0			
Titanium	0	0	0			
Silicon	26	21	11			
Boron	32	18	7			
Sodium	390	323	302			

### FT-IR RESULTS

Parameter	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Oxidation (Abs)	8					
Sulfation (Abs)						
Nitration (Abs)	18	18	18			
Water FTIR (%)						
Fuel Dilution (%)						
Glycol (%)	0	0	0			
Soot (Abs)	0.03	0.08	0.03			
Zinc Depletion (Abs)						