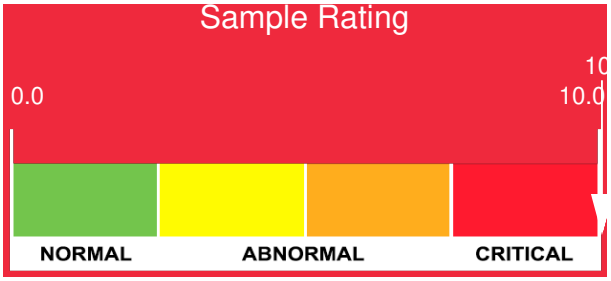
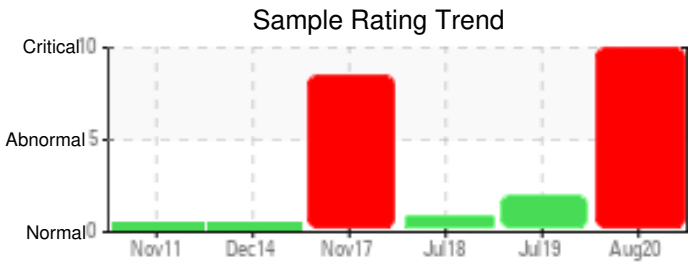




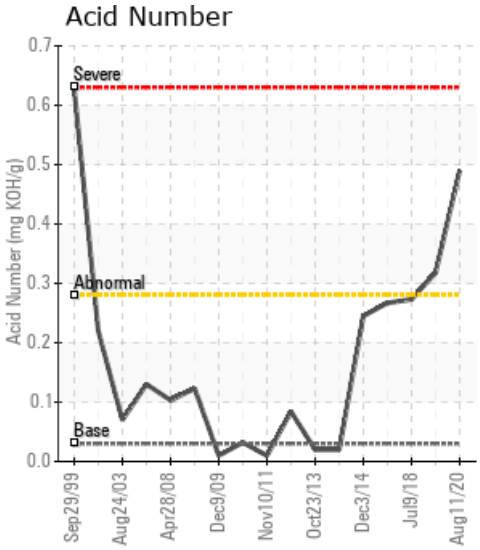
B7 BURNER

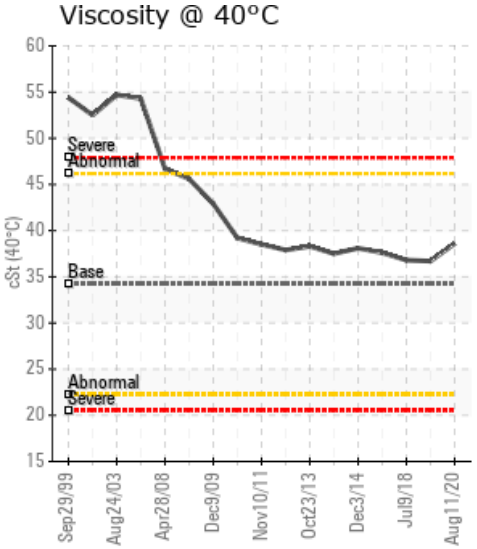
Customer: PTRHTF30052	System Information	Sample Information
I G MACHINES AND FIBER 87 ORENDA RD. BRAMPTON, ON L6W 1V7 Canada Attn: Alan Zhao Tel: (905)457-2880 E-Mail: alan.zhao@iko.com	System Volume: 10000 ltr Bulk Operating Temp: 392F / 200C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make:	Lab No: 02370647 Analyst: Lynn Billings Sample Date: 08/11/20 Received Date: 08/14/20 Completed: 08/19/20 Lynn Billings lynn.billings@petrocanadalsp.com

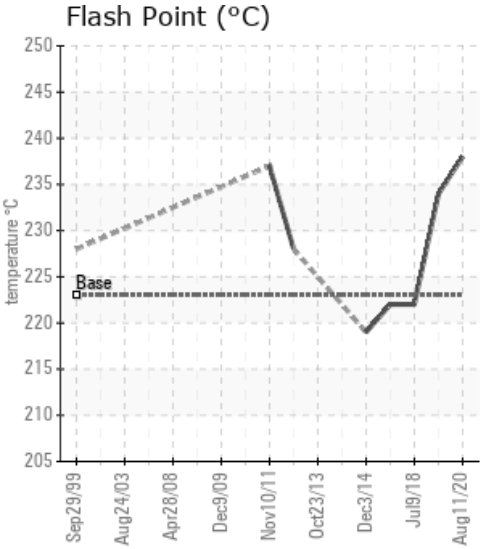
Recommendation: Current sample shows a significant amount of water (0.37%). This high water could be a safety concern (i.e. hot oil gargling and splashing out of the expansion tank). This water will contribute to fluid oxidation (as shown with the increase in acid number and increase in viscosity) as well as the formation of acids (corrosion). The increase in viscosity will reduce the fluid's ability to transfer heat. The Pentane Insolubles have increased from 0.434 to 0.669, which would suggest contamination, corrosion and oil degradation. The fluid does exhibit wear (Fe - 40 ppm) and also shows contamination of Na - 60 ppm, K - 3 ppm with small amounts of Mn, Mg and Ca. These could be from where the water ingression (coolant chemicals)came from or any possible addition of another product (soap?). Please ensure that the sample line is flushed thoroughly, to remove any insolubles (or possibly water) that may have accumulated over time, before the sample is taken. You might want to look at resampling sooner.

Comments: Water contamination levels are severely high. Pentane Insolubles levels are severely high. Sodium ppm levels are severely high. Acid Number (AN) is abnormally high. (GCD) 90% Distillation Point is marginally high.

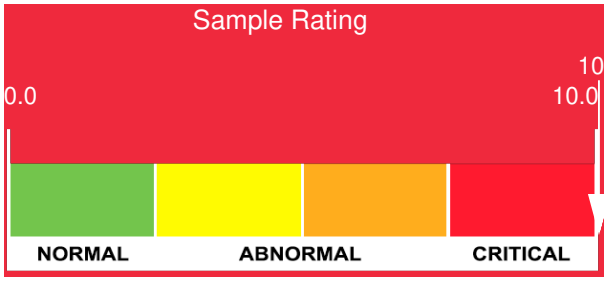
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
08/11/20	08/14/20	2m	PIPING	460 / 238	3678.7	38.6	0.49	0.669	730 / 388	816 / 436	922 / 495	0.32
07/30/19	08/12/19	24m	PIPE	453 / 234	55.9	36.7	0.318	0.434	716 / 380	803 / 429	910 / 488	0.00
07/09/18	07/24/18	10m	BRANCH LINE	432 / 222	42.7	36.8	0.273	0.431	724 / 385	795 / 424	898 / 481	0.00
11/09/17	11/10/17	1m		432 / 222	67.8	37.6	0.267	0.595	707 / 375	784 / 418	872 / 466	0.93
12/03/14	12/03/14	0m		426 / 219	9.3	38.1	0.245	0.070	706 / 374	810 / 432	917 / 492	1.11
Baseline Data				433 / 223		34.2	0.03		720 / 382	817 / 436	900 / 482	1.00

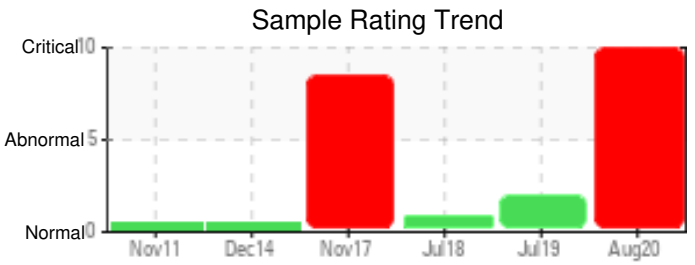






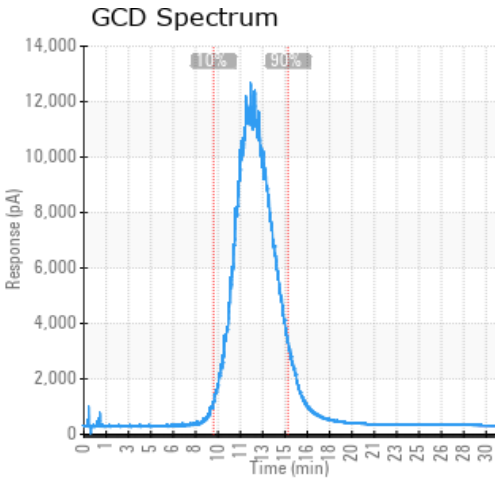
PETRO-CANADA LUBRICANTS

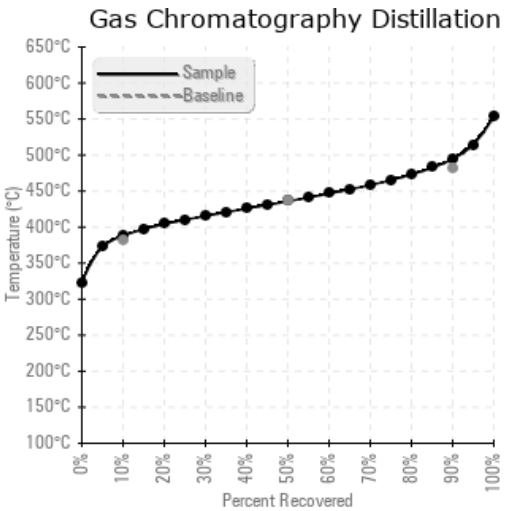


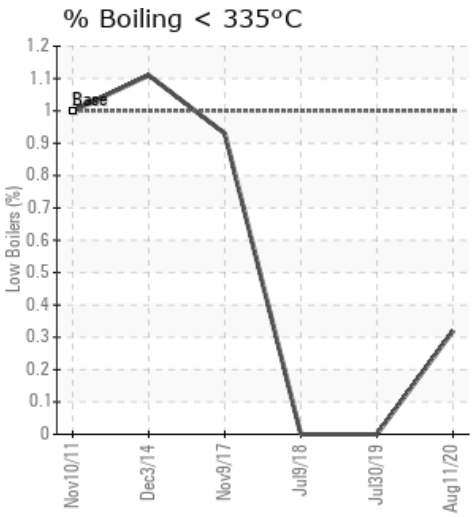


Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
08/11/20	40	0	0	0	0	0	0	0	0	0	0	60	3	0	0	0	2	0	1	1	3	0	0	0
07/30/19	11	0	0	0	1	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	1	0	0	3
07/09/18	15	0	0	0	0	0	0	0	0	0	0	18	0	0	0	0	0	0	0	1	2	0	0	0
11/09/17	37	0	0	0	0	0	0	0	0	0	0	72	3	0	0	0	2	0	0	1	1	0	0	0
12/03/14	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Baseline Data			0	0						0			0	0					0				0	

Elemental anaysis results (above) in parts per million (ppm). [10,000 ppm = 1.0%]







Historical Comments

07/30/19	The acid number is increasing and the pentane insolubles are still high. Thus the fluid appears to have acidic components in the fluid indicative of oxidation, which can create more deposits. To reduce acid number, you could try 'sweetening' the system (partial oil replacement). Suggest checking filters and changing if possible. Filtration systems will help to keep these levels lower. The sodium level still indicates the residual presence of the soap from previous issues. Pentane Insolubles levels are abnormally high. Acid Number (AN) is abnormally high.
07/09/18	Fluid in system has improved from last test. The pentane insoluble are still slightly high and the sodium level has been significantly reduced. Acid number and flash point are relatively stable. Suggest to retest system in 9 months. Pentane Insolubles levels are abnormally high.
11/09/17	This fluid still indicates contamination from the soap that was mistakenly put in the system. (Sodium and Potassium level are abnormal). A discussion with the customer is recommended. Pentane Insolubles levels are severely high. Sodium ppm levels are severely high. (GCD) 90% Distillation Point is abnormally low.
12/03/14	Routine Monitoring - no action required at this time. Resample again in 12 months.