

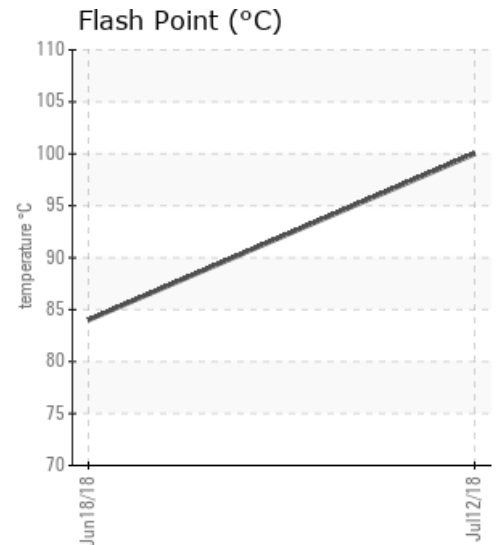
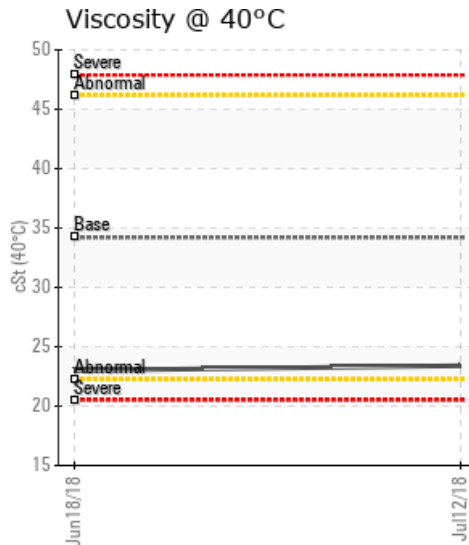
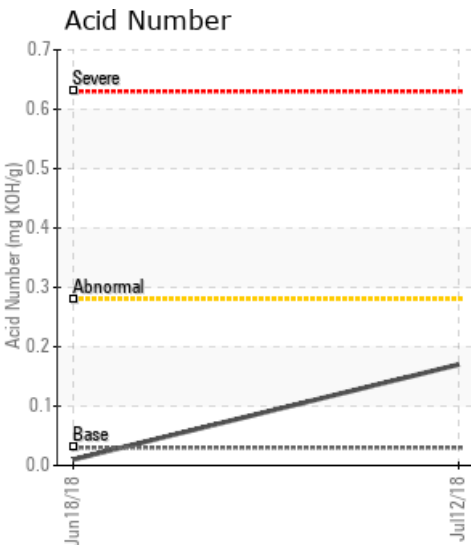
[13-25-80-16-W6M] H-5500-1 - Train 1

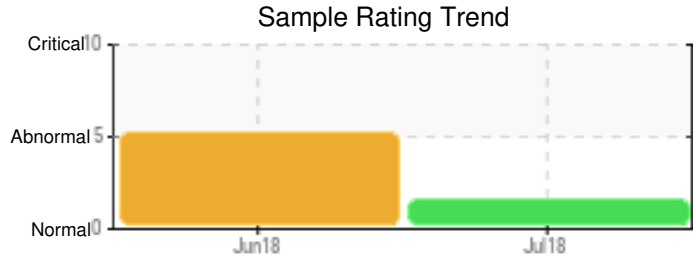
Customer: PTRHTF20156	System Information	Sample Information
TOURMALINE OIL 9920 98a Ave FORT ST. JOHN, BC V1J 1S2 Canada Attn: Brandon Braun Tel: (250)262-5420 E-Mail: Brandon.braun@tourmalineoil.com	System Volume: 40000 ltr Bulk Operating Temp: 464F / 240C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: PROPAK	Lab No: 02227976 Analyst: Bill Quesnel CLS,OMA II,MLA-III,LLA-I Sample Date: 07/12/18 Received Date: 07/13/18 Completed: 08/12/20 Bill Quesnel CLS,OMA II,MLA-III,LLA-I

Recommendation: Sample results indicate that the fluid has a very low flash point (100C). This can be a safety risk. There is some improvement since the last sample in flash point and distillation values, however, AN has increased. If venting has been occurring since the last sample, exposing the fluid to air can increase acidity via oxidation. Consider fluid replacement as the safest method to bring flash point back to acceptable values. Re-sample once fluid has been restored.

Comments: COC Flash Point is severely low.

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	%
07/12/18	07/13/18	5m	PUMP SUCTION	212 / 100	0.6	23.4	0.17	0.135	703 / 373	785 / 418	892 / 478	2.42
06/18/18	06/20/18	5m	13-25-80-16-W6M	183 / 84	27.5	23.0	0.01	0.048	639 / 337	767 / 408	870 / 466	9.23
Baseline Data				433 / 223		34.2	0.03		720 / 382	817 / 436	900 / 482	1.00

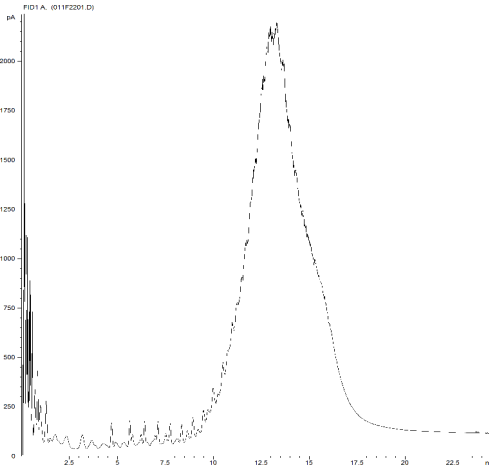




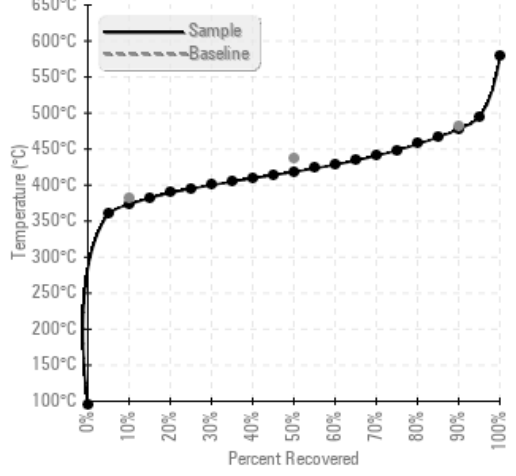
Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
07/12/18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
06/18/18	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2	0
Baseline Data			0	0						0			0	0					0				0	

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

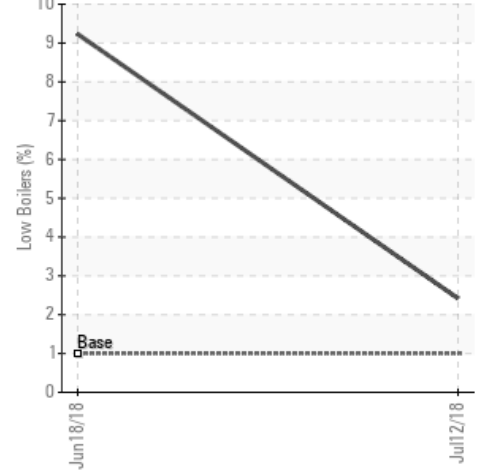
GCD Spectrum



Gas Chromatography Distillation



% Boiling < 335°C



Historical Comments	
06/18/18	Sample results indicate the this heat transfer fluid is not suitable for continued service. Most concerning is the extremely low Flash Point value of 84C. This poses a safety hazard to continue use. Flash point has gone from 210C in the previous sample to 84C, fluid viscosity has gone from 33.4 to 23 cSt and % of fluid boil off < 335C has gone from 1% to more than 9%. Fluid replacement is recommended and mitigation of the source of dilution is required. After the entire system has been cleaned and new fluid has been filled, obtain a sample from the system before start-up. Once system has been in operation at normal temperatures for 24 hours, please obtain a second fluid sample to establish new trend. Please contact Petro-Canada Lubricants for further support

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