![Petro-Canada Lubricants]

Sample Rating

0.0 1.6 10.0

NORMAL   ABNORMAL   CRITICAL

Sample Rating Trend

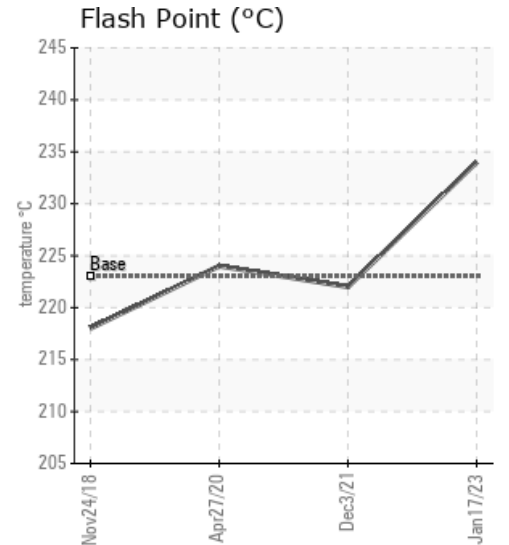Critical 10
Abnormal 5
Normal 0

Nov18   Apr20   Dec21   Jan23

[2-11-080-16W6M] H5500-1 Train 2
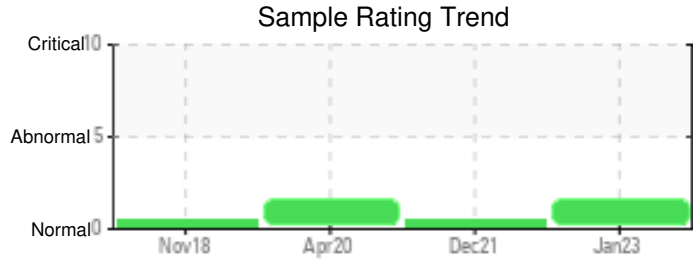
Customer: PTRHTF20156	System Information	Sample Information
TOURMALINE OIL 9920 98a Ave FORT ST. JOHN, BC V1J 1S2 Canada Attn: Brandon Braun Tel: (250)262-5420 E-Mail: Brandon.braun@tourmalineoil.com	System Volume: 0 ltr Bulk Operating Temp: 345F / 174C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: PETROTECH	Lab No: 02535798 Analyst: Clinton Buhler Sample Date: 01/17/23 Received Date: 01/26/23 Completed: 01/27/23 Clinton Buhler Clinton.Buhler@HFSinclair.com

Recommendation: Sample results indicate the fluid is in suitable condition for continued service. Please vent off water as steam through the expansion tank if safe to do so. Water can cause premature fluid degradation. Please re-sample in 12 months

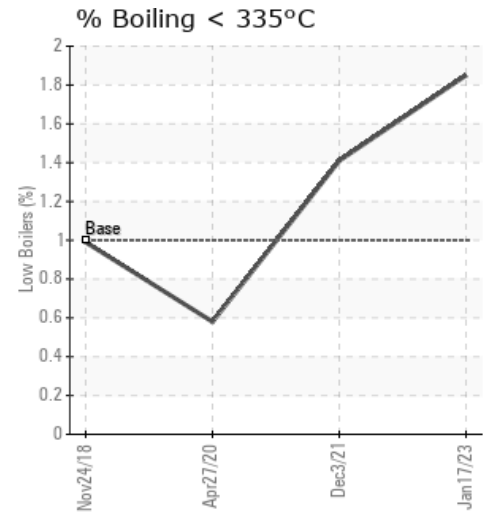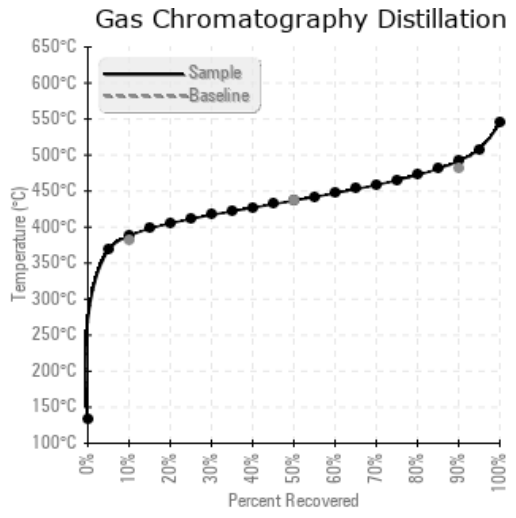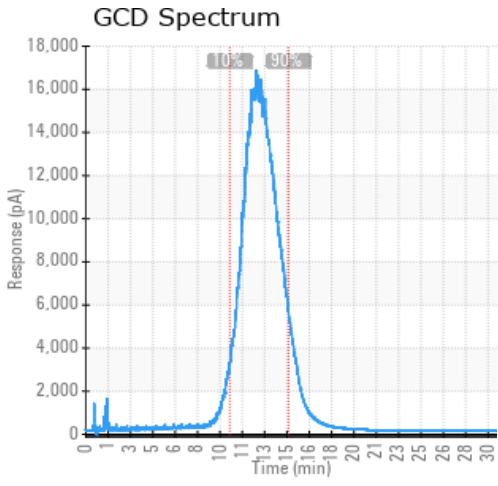Comments: Water contamination levels are abnormally high. ppm Water contamination levels are abnormally high.

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	%
01/17/23	01/26/23	0.0m	HIGH POINT BLEED INL	453 / 234	706.9	33.5	0.02	0.070	730 / 388	818 / 437	917 / 492	1.85
12/03/21	03/10/22	3.0m	Exp tank disch line	432 / 222	150.8	33.9	0.01	0.056	727 / 386	813 / 434	913 / 490	1.41
04/27/20	04/29/20	17.0m	EXPANSION TANK SUCTI	435 / 224	722.6	33.7	0.02	0.060	731 / 389	814 / 434	913 / 489	0.58
11/24/18	12/18/18	2.5m		424 / 218	123.3	33.4	0.01	0.044	720 / 382	807 / 431	910 / 488	0.99
Baseline Data				433 / 223		34.2	0.03		720 / 382	817 / 436	900 / 482	1.00

Acid Number

Viscosity @ 40°C

Flash Point (°C)

Sample Rating

0.0 1.6 10.0

NORMAL ABNORMAL CRITICAL

Sample Rating Trend
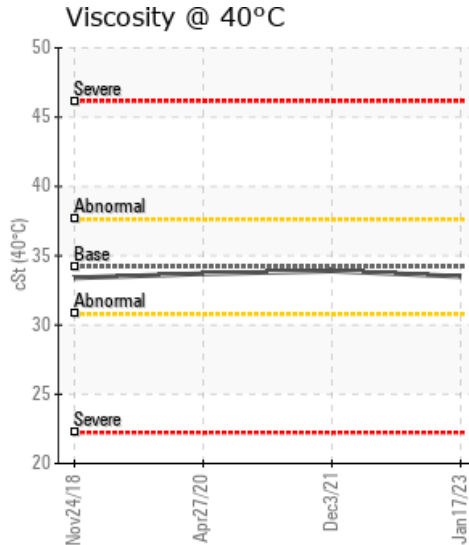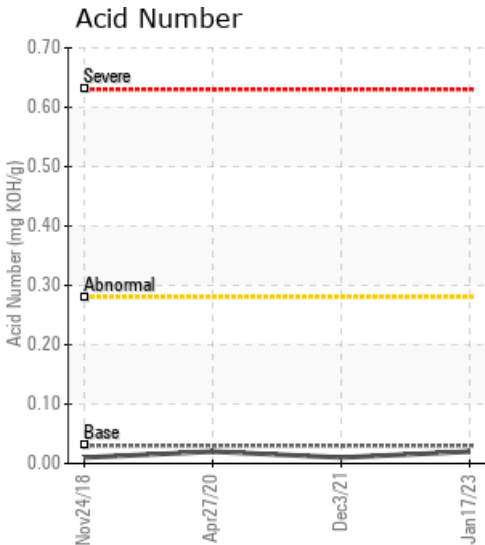
Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
01/17/23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12/03/21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04/27/20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/24/18	0	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%]

GCD Spectrum

Gas Chromatography Distillation

% Boiling < 335°C

Historical Comments

12/03/21	Sample results indicate that the fluid is in suitable condition for continued service. Please re-sample in 12 months
04/27/20	Sample results indicate that the heat transfer fluid is suitable for continued service. However, there is 722ppm of water in the sample. this could indicate that the sample point and hardware may not have been purged thoroughly prior to taking the sample or, if a representative sample, indicates water contamination. Carefully vent off steam from system to get rid of the water. Re-sample in 6 months after water has been safely vented from the system. Water contamination levels are abnormally high. ppm Water contamination levels are abnormally high.
11/24/18	The fluid is in excellent condition and suitable for further use. Please re-sample in 6 months.