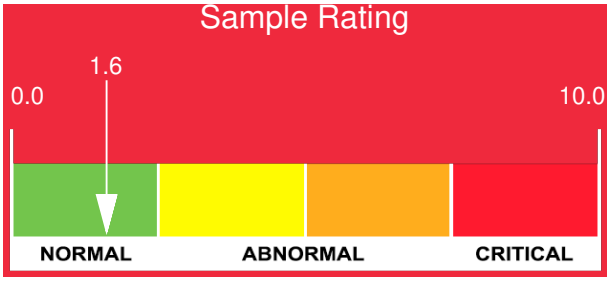
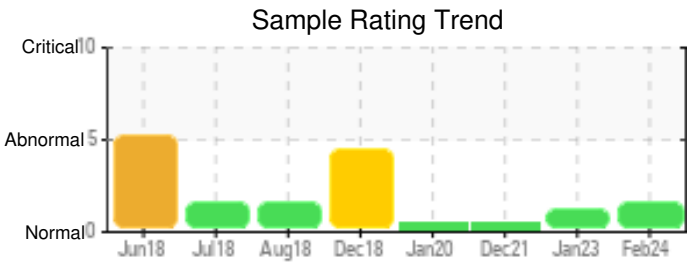




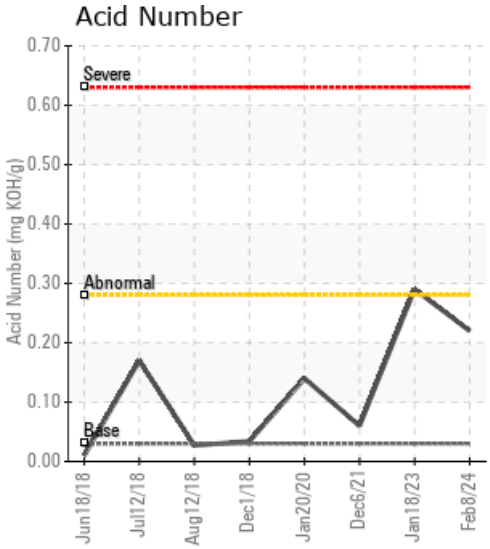
[13-25-80-16-W6M] H-5500-1 - Train 1

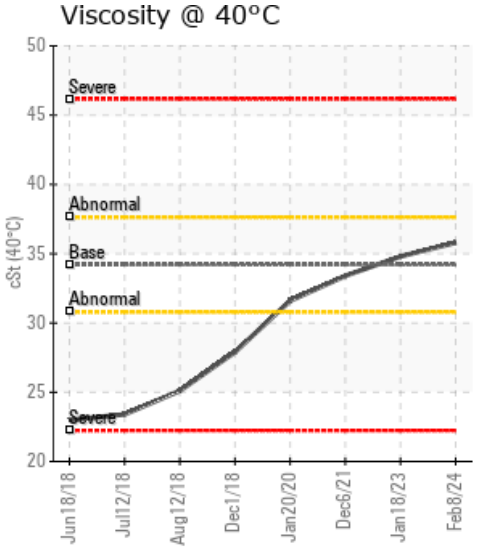
Customer: PTRHTF20156	System Information	Sample Information
TOURMALINE OIL 9920 98a Ave FORT ST. JOHN, BC V1J 1S2 CA Attn: Dorman Poole Tel: E-Mail: dorman.poole@tourmalineoil.com	System Volume: 70000 ltr Bulk Operating Temp: 464F / 240C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: RUSHTON HEAT MEDIUM	Lab No: 02619428 Analyst: Clinton Buhler Sample Date: 02/08/24 Received Date: 03/01/24 Completed: 03/06/24 Clinton Buhler Clinton.Buhler@HFSinclair.com

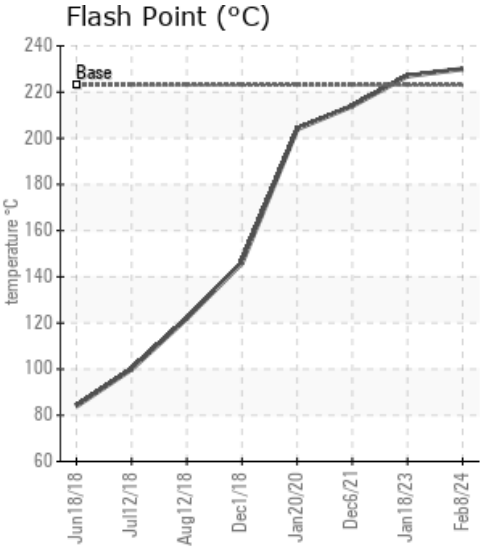
Recommendation: Sample results indicate the fluid is in suitable condition for continued service. Solids content has increased to 0.441% from 0.259% which can be associated with fluid degradation and/or contamination in the system. 90% GCD temperature is up slightly and viscosity has slowly trended up over the last several years. Acid Number is basically flat but still above new. Combined, these may point towards low levels of fluid oxidation. Please re-sample in 6 months and ensure expansion tank blanket gas remains functional. (carefully purge sample valve before drawing sample).

Comments:

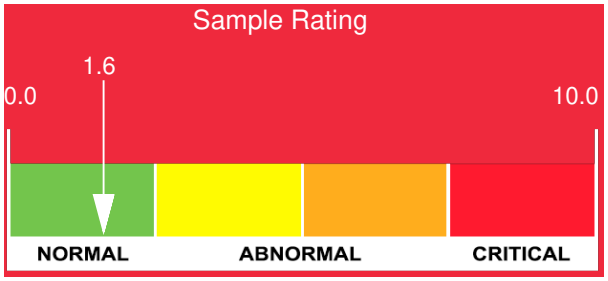
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
02/08/24	03/01/24	0.0m		446 / 230	16	35.8	0.22	0.441	712 / 378	809 / 432	924 / 495	1.86
01/18/23	01/26/23	120.0m	heat loop	441 / 227	16.9	34.8	0.29	0.259	711 / 377	812 / 434	912 / 489	3.12
12/06/21	03/10/22	8.0m	expansion tank	417 / 214	14.3	33.4	0.06	0.135	714 / 379	810 / 432	914 / 490	2.02
01/20/20	05/13/20	0.0m	DISCHARGE	399 / 204	28.7	31.6	0.14	0.170	707 / 375	808 / 431	909 / 487	3.05
12/01/18	12/18/18	0.0m		295 / 146	12.1	27.9	0.034	0.117	659 / 348	794 / 423	902 / 483	7.83
Baseline Data				433 / 223		34.2	0.03		720 / 382	817 / 436	900 / 482	1.00

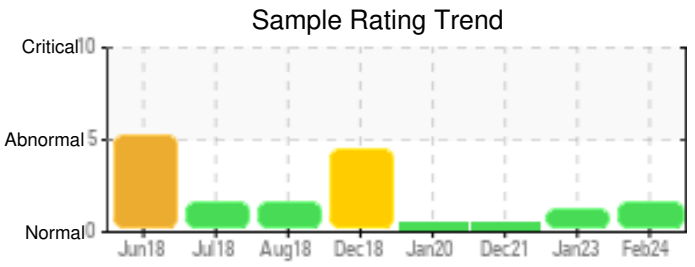






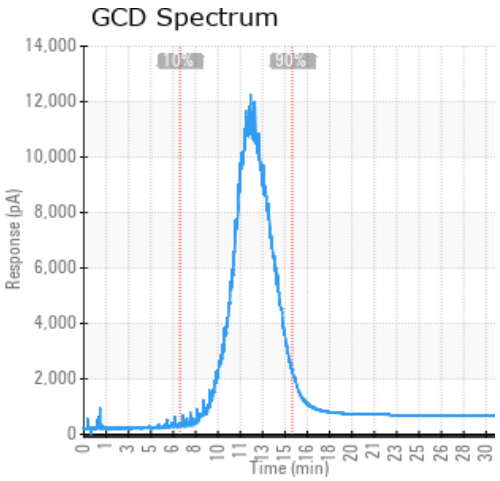
PETRO-CANADA LUBRICANTS

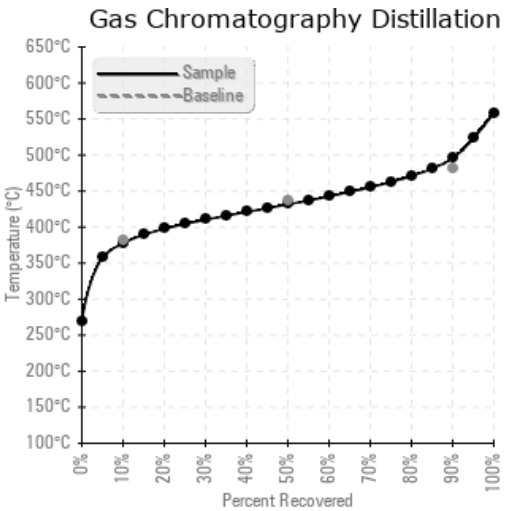


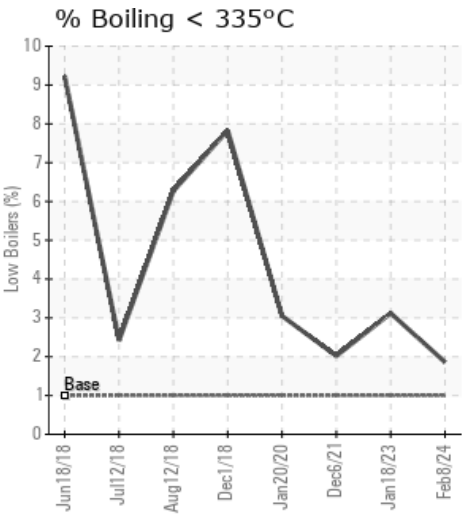


Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
02/08/24	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0
01/18/23	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12/06/21	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	5	0
01/20/20	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
12/01/18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
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

01/18/23	Sample results indicate the fluid is fit for continued service. Acid Number has increased which usually is from fluid oxidation. Please ensure blanket gas is operational and re-sample in 6 months Acid Number (AN) is abnormally high.
12/06/21	sample results indicate that the fluid is in suitable condition for continued service.Please re-sample in 12 months
01/20/20	Sample results would appear to indicate that the fluid is suitable for continued service. As part of continued good maintenance practices, vent off low boiling vapors regularly (see %<335 reduction since last sample; new fluid is 1%).Please resample in 6 months and please ensure that time on fluid is recorded at next sample.
12/01/18	The fluid is in a reasonable condition and suitable for further use but there are indications of either thermal degradation, blanket gas ingress or, considering previous analysis results, indications of an internal process fluid leak. Viscosity, Flash Point and GCD 10% temperature are low. % boil-off below 335 degrees C is high. If an internal process fluid leak is suspect this has to be corrected. In any case it is recommended to vent off the low boiler vapors (light ends) to atmosphere. Please resample in 6 months. COC Flash Point is severely low. (GCD) % < 335°C is marginally high. (GCD) 10% Distillation Point is marginally low.