

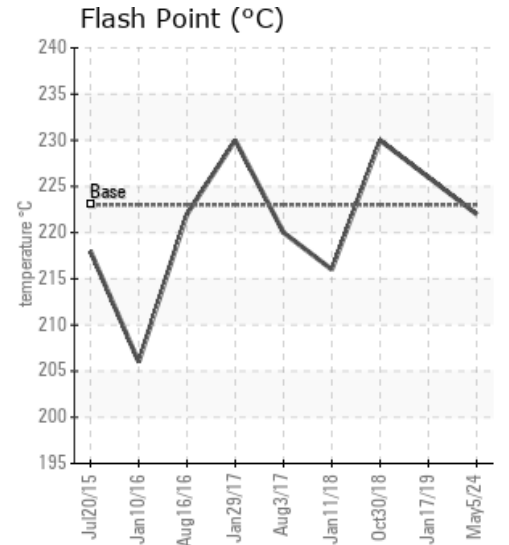
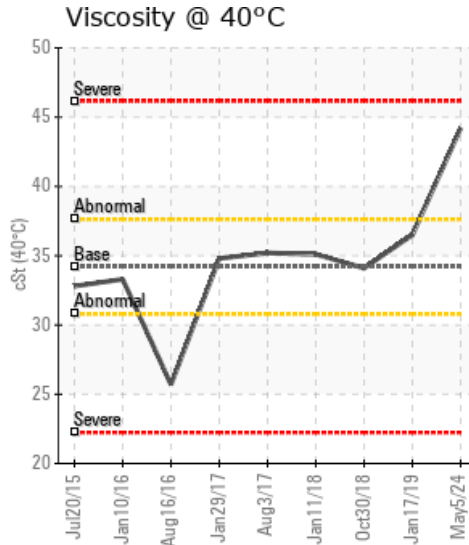
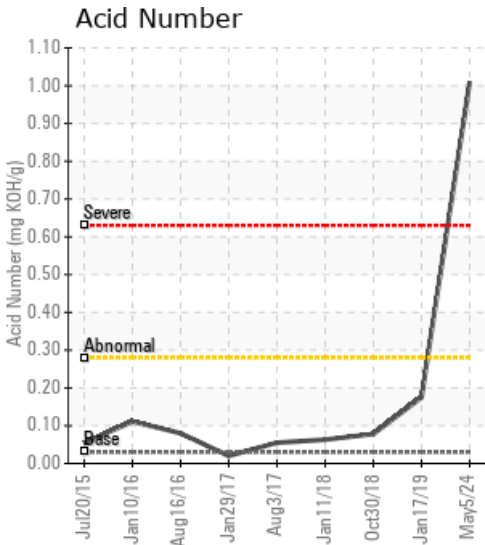
[LSD 14-20-56-23W5] WILDRIVER TRAIN 3 HEAT MEDIUM V-5200-3

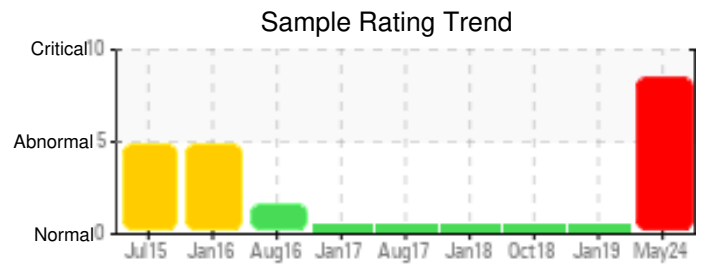
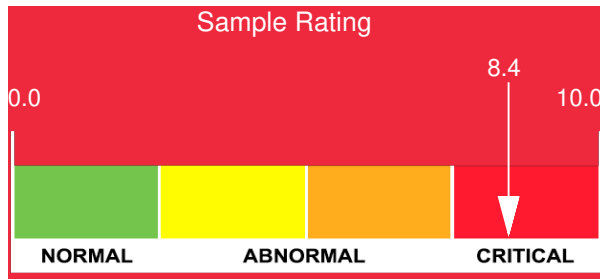
Customer: PTRHTF60089	System Information	Sample Information
TOURMALINE OIL 14-20-56-23W5 Wild River, AB CA Attn: Dallen Baugh Tel: (403)598-1628 E-Mail: dallen.baugh@tourmalineoil.com	System Volume: 29000 ltr Bulk Operating Temp: 446F / 230C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make:	Lab No: 02644271 Analyst: Clinton Buhler Sample Date: 05/05/24 Received Date: 06/26/24 Completed: 07/18/24 Clinton Buhler Clinton.Buhler@HFSinclair.com

Recommendation: Sample results suggest ongoing fluid oxidation based on the elevated Acid Number of 1 and elevated fluid viscosity of 44.2 cSt. Along with these, iron content has jumped to 191 ppm. Please ensure sweet blanket gas is operational in the expansion tank. It is understood sample was taken from vessel site glass- this is not recommended as it may not be fully representative of system condition. Please re-sample from hot, turbulent area such as pump discharge within the next 3 months. It is advised to make plans to either sweeten system (temporary option) or to perform fluid change out.

Comments: PQ levels are severe. Iron ppm levels are abnormal. Acid Number (AN) is severely high. Visc @ 40°C is abnormally high.

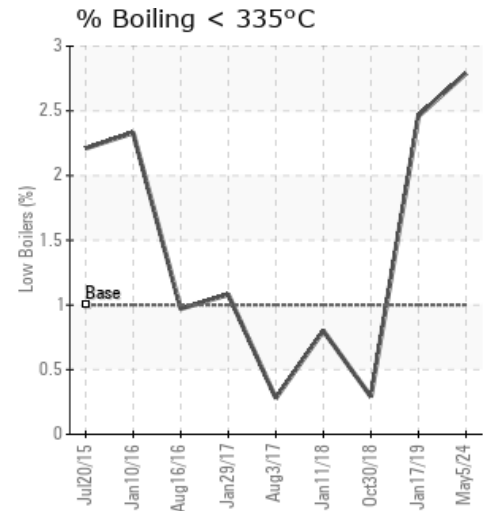
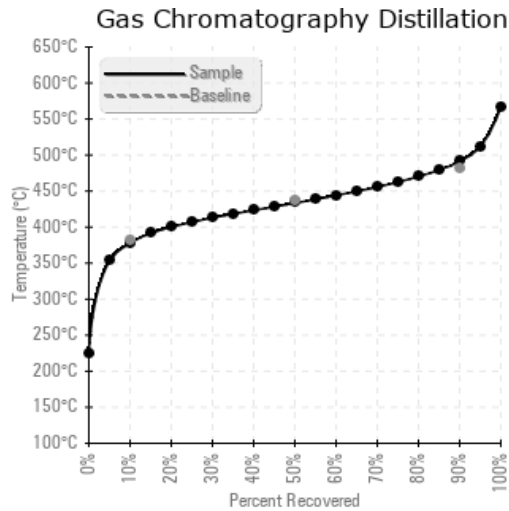
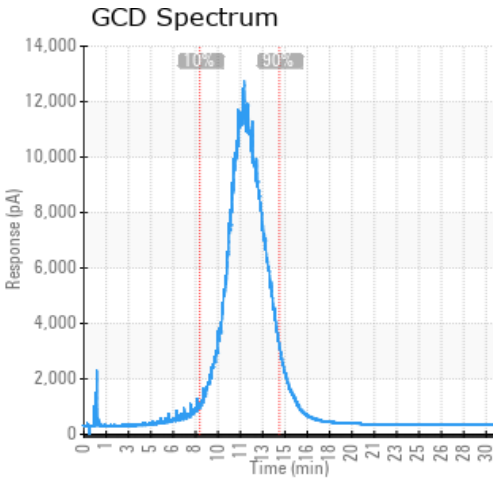
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
05/05/24	06/26/24	0.0y	sightglass off vessel	432 / 222	76	44.2	1.01	0.378	712 / 378	812 / 433	916 / 491	2.79
01/17/19	02/01/19	0.0y		439 / 226	115.9	36.5	0.175	0.077	691 / 366	784 / 418	889 / 476	2.46
10/30/18	11/05/18	0.0y		446 / 230	68.6	34.1	0.078	0.054	721 / 383	812 / 434	912 / 489	0.29
01/11/18	01/18/18	0.0y		421 / 216	6.7	35.1	0.063	0.068	697 / 370	784 / 418	890 / 476	0.80
08/03/17	08/03/17	0.0y		428 / 220	84.4	35.2	0.055	0.029	724 / 384	809 / 432	910 / 488	0.28
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
05/05/24	191	0	0	2	0	0	0	0	0	0	0	3	0	0	0	0	5	0	0	0	2	0	1	0
01/17/19	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
10/30/18	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
01/11/18	4	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0
08/03/17	7	0	0	0	0	1	0	0	0	0	0	12	0	0	0	0	0	0	0	0	3	1	0	0
Baseline Data			0	0						0			0	0					0				0	

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



Historical Comments

01/17/19	The fluid is in good condition and suitable for further use. Low boiler vapor content has increased to 2.46%. At this level it is not a problem and can be lowered by venting. Please re-sample in 6 months.
10/30/18	The fluid is in good condition and suitable for further use. Please re-sample in 12 months.
01/11/18	It is important for getting value out of the analysis to list system volume and fluid service life. The diagnosis of analysis results takes these parameters into consideration. This has been requested several times in the past. Perhaps we should do a training to familiarize the operating personnel with the basics. The fluid is in excellent condition and suitable for further use. Please re-sample in 6 months.
08/03/17	The fluid is in excellent condition. Listing the service life of the fluid on the sample label when sending in the next sample is important. Please re-sample in 12 months.

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