

[15-12-50-21W5] TOURMALINE BANSHEE 5500-1

Customer: PTRHTF60079
 Tourmaline
 15-12-50-21W5
 Edson, AB T7E 1R8 CA
 Attn: Justin Thebeau
 Tel:
 E-Mail:
 justin.thebeau@tourmalineoil.com

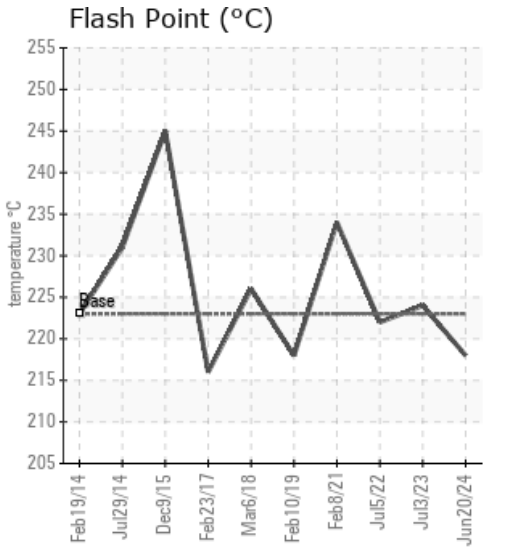
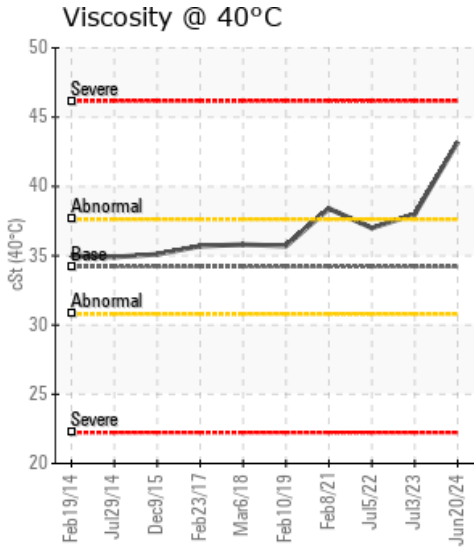
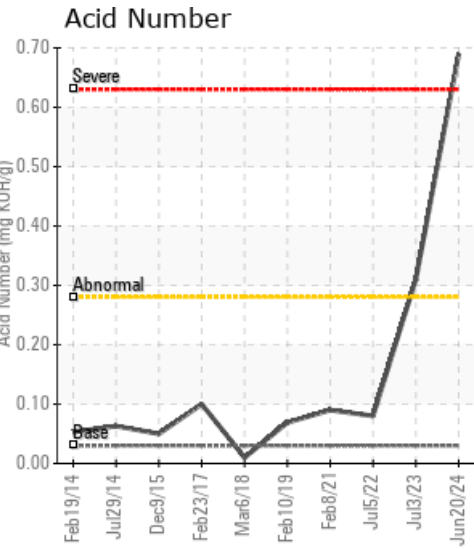
System Information
 System Volume: 20000 ltr
 Bulk Operating Temp: 482F / 250C
 Heating Source:
 Blanket:
 Fluid: PETRO CANADA PETRO-THERM
 Make: RUSHTON

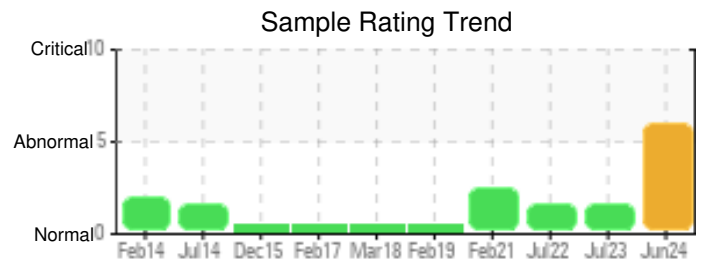
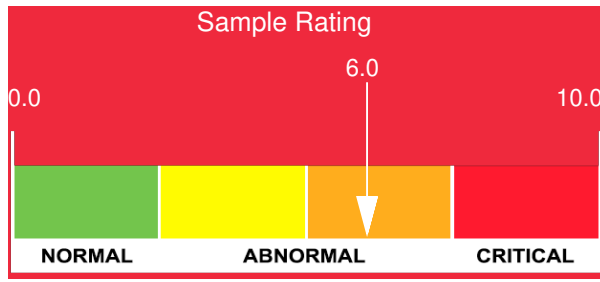
Sample Information
 Lab No: 02646497
 Analyst: Clinton Buhler
 Sample Date: 06/20/24
 Received Date: 07/08/24
 Completed: 07/18/24
 Clinton Buhler
 Clinton.Buhler@HFSinclair.com

Recommendation: Sample results indicate elevated oxidation based on elevated Acid Number and 90% GCD temperature and fluid viscosity. Solids content has risen to nearly 1%, indicating ongoing system fouling: solids usually form from both fluid oxidation and thermal degradation. It is advise to make plans for future fluid change out. Sweetening of the system (50% replacement) is recommended if a full change out and system cleaning is impractical in the near term. Please ensure blanket gas is operation in the expansion tank. Please re-sample within 3 months.

Comments: Pentane Insolubles levels are severely high. Acid Number (AN) is severely high. Visc @ 40°C is abnormally high. (GCD) 90% Distillation Point is marginally high.

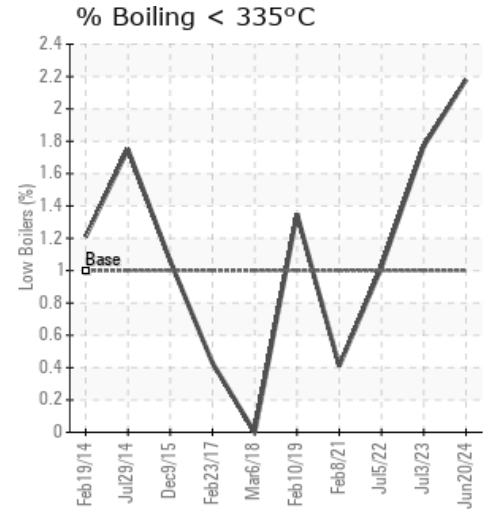
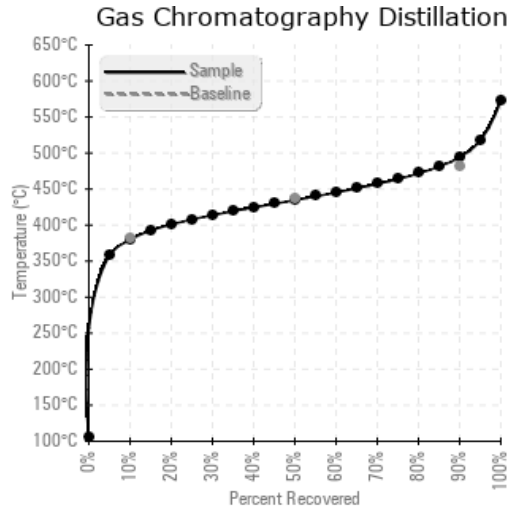
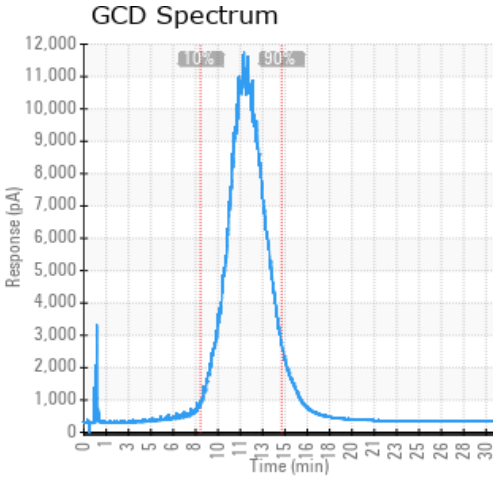
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
06/20/24	07/08/24	1.0y		424 / 218	166	43.2	0.69	0.965	716 / 380	814 / 435	921 / 494	2.18
07/03/23	09/26/23	0.0y	Pump discharge	435 / 224	21.1	38.0	0.31	0.202	716 / 380	811 / 433	917 / 492	1.77
07/05/22	07/19/22	0.0y	discharge	432 / 222	14.0	37.0	0.08	0.655	719 / 382	812 / 433	913 / 489	1.02
02/08/21	03/02/21	12.0y	Pump Discharge	453 / 234	9.0	38.4	0.09	0.931	723 / 384	815 / 435	918 / 492	0.41
02/10/19	02/19/19	0.0y	15-12-50-21WS	424 / 218	12.6	35.7	0.069	0.064	702 / 372	799 / 426	914 / 490	1.35
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
06/20/24	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07/03/23	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07/05/22	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02/08/21	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02/10/19	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 analysis results (above) in parts per million (ppm). [10,000 ppm = 1.0%]



Historical Comments

07/03/23	Acid number and viscosity are up slightly, confirm blanket gas is functioning properly and oxygen is not able to enter the system as oxidation could be the cause of the increases. Resample in 6 months. Acid Number (AN) is abnormally high. Visc @ 40°C is abnormally high.
07/05/22	Fluid is in good condition overall but the Pentane insolubles (solids) are still on the higher side. Levels have slightly decreased from last year, if filtration was used solid levels are still above the recommended limit of 0.5%. Ensure proper sampling procedures are followed and the sample point is purged adequately to get an accurate representative system sample. Resample in 6 months to see if the solids continue to drop. Please include time on oil when filling out the analysis request form. Pentane Insolubles levels are severely high.
02/08/21	The fluid is in very good condition, however the solids content is really high. It's possible that this could have been from an inadequate purge of the sample point during sampling. Anything over 0.5% solids content is concerning though and consideration should be given to filtering the fluid. Pentane Insolubles levels are severely high.
02/10/19	The fluid is in good condition and suitable for further use. Please re-sample in 12 months. When filling in the analysis request form please enter fluid service life.

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