

## [LSD 14-20-56-23W5] WILDRIVER TRAIN 2 HEAT MEDIUM V-5200-2

**Customer: PTRHTF60089**  
 TOURMALINE OIL  
 14-20-56-23W5  
 Wild River, AB CA  
 Attn: Dallen Baugh  
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 E-Mail: dallen.baugh@tourmalineoil.com

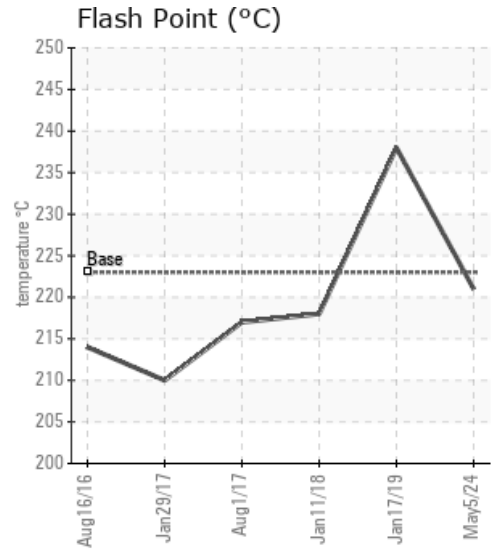
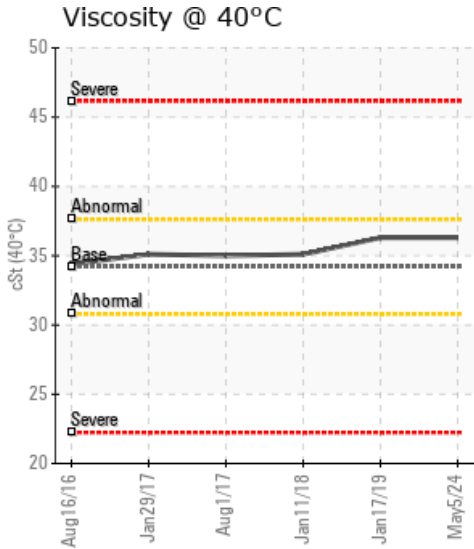
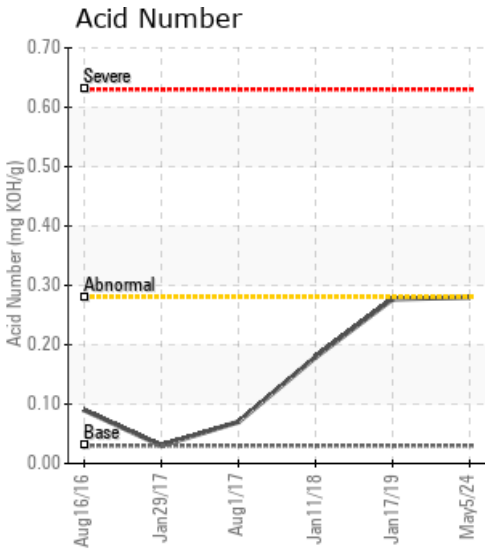
**System Information**  
 System Volume: 29000 ltr  
 Bulk Operating Temp: 446F / 230C  
 Heating Source:  
 Blanket:  
 Fluid: PETRO CANADA PETRO-THERM  
 Make:

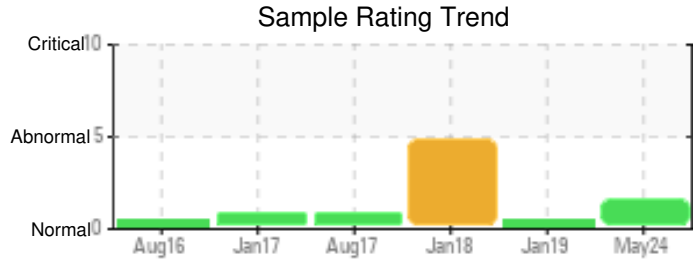
**Sample Information**  
 Lab No: 02644270  
 Analyst: Clinton Buhler  
 Sample Date: 05/05/24  
 Received Date: 06/26/24  
 Completed: 07/12/24  
 Clinton Buhler  
 Clinton.Buhler@HFSinclair.com

Recommendation: Although it has been ~5 years since the last sample, results are fairly consistent since that time. Fe content has increased to 85 ppm and solids content has increased to 0.425%, approaching the warning limit of 0.5%. This indicates solids due to fluid degradation. Mild oxidation appears to be most likely as Acid Number hovers near 0.28 and fluid viscosity is slightly up from new values; elevated 90% GCD temperature supports this. Please ensure that blanket gas remains operational. Please re-sample in 6 months and thoroughly purge sample valve prior to filling sample container. Please sample from pump discharge if possible, rather than from the site glass as the site glass may not be fully representative.

Comments: Pentane Insolubles levels are abnormally high. (GCD) 90% Distillation Point is marginally high.

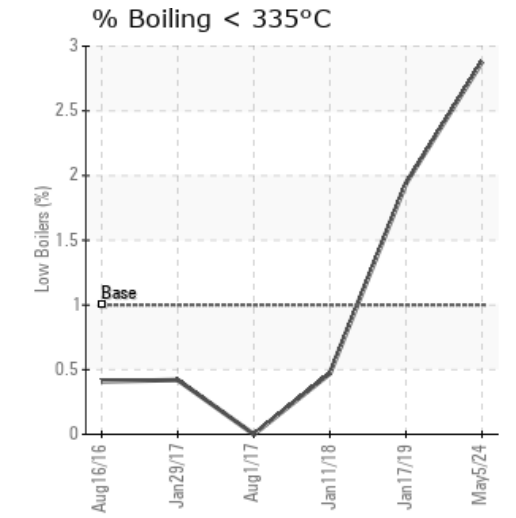
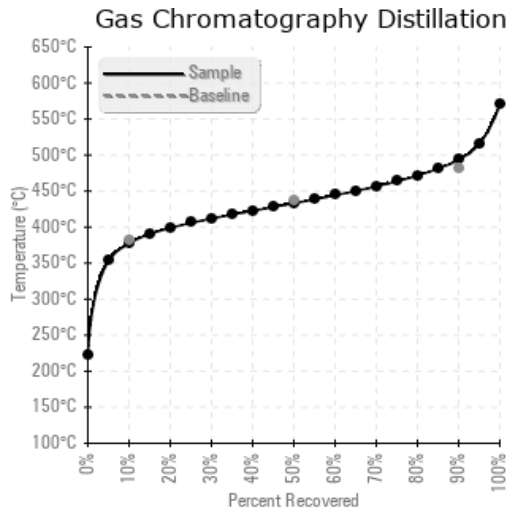
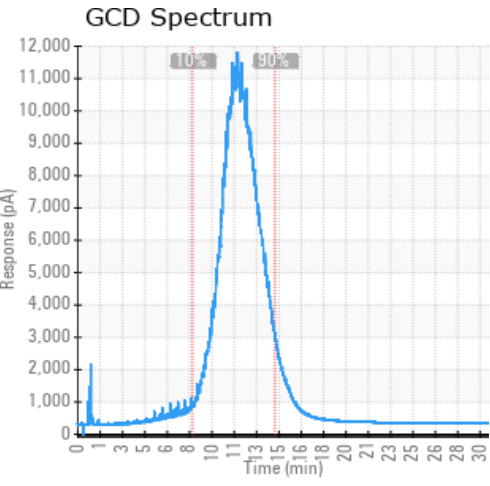
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
05/05/24	06/26/24	0.0y	sightglass vessel	430 / 221	34	36.3	0.28	0.425	711 / 377	812 / 433	920 / 494	2.88
01/17/19	02/01/19	0.0y		460 / 238	109.4	36.3	0.277	0.229	695 / 368	789 / 421	896 / 480	1.94
01/11/18	01/18/18	0.0y		424 / 218	544.7	35.1	0.179	0.120	725 / 385	815 / 435	919 / 493	0.47
08/01/17	08/03/17	0.0y		423 / 217	42.5	35.0	0.070	0.021	730 / 388	813 / 434	923 / 495	0.00
01/29/17	01/30/17	0.0y		410 / 210	21.6	35.1	0.03	0.094	722 / 383	813 / 434	920 / 494	0.42
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	85	0	0	2	0	0	0	0	0	0	0	6	0	0	0	0	2	0	0	0	4	0	0	2
01/17/19	59	0	0	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	1	0	0	0
01/11/18	21	0	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0	4	1	0	0
08/01/17	8	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
01/29/17	14	0	0	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	2	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	
01/17/19	The fluid is in a good condition and suitable for further use. Please re-sample in 12 months.
01/11/18	Please fill in service life of the oil on the analysis request form !The water content is elevated but other than that the oil is in good condition and suitable for further use. It is recommended to boil-off the water to atmosphere, check the source of water and rectify as necessary. Please re-sample in 6 months. Water contamination levels are marginally high. Water contamination levels are marginally high.. ppm Water contamination levels are marginally high. (GCD) 90% Distillation Point is marginally high.
08/01/17	The fluid is in good condition and suitable for further use. The 90% GCD temperature is slightly high. This indicates an acceptable rate of fluid degradation by oxidation. Ensure blanket gas is working properly. Listing the service life of the fluid on the sample label is important when sending in the next sample. Please re-sample in 12 months. (GCD) 90% Distillation Point is marginally high.
01/29/17	The fluid is in a good condition and suitable for further use. An increase in 90% GCD temperature indicates some moderate oxidation. Make sure to keep blanket gas on. Please re-sample in 6 months. (GCD) 90% Distillation Point is marginally high.

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