

# PLANT 111

**Customer: PTRHTF10017**  
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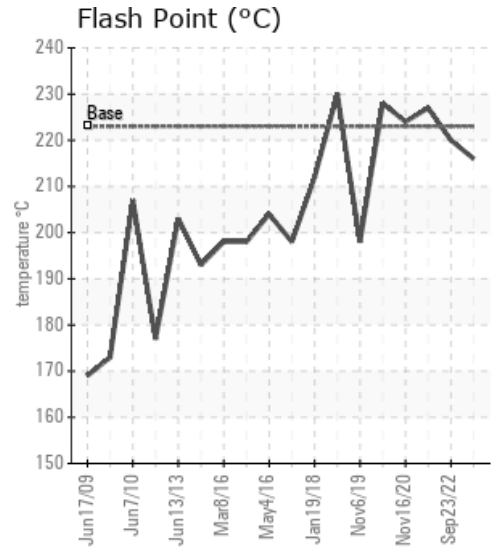
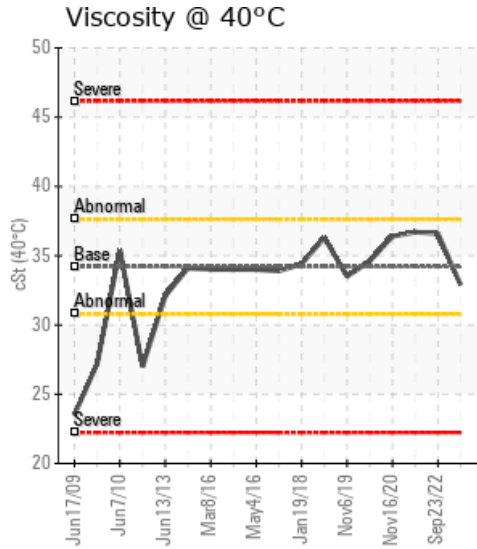
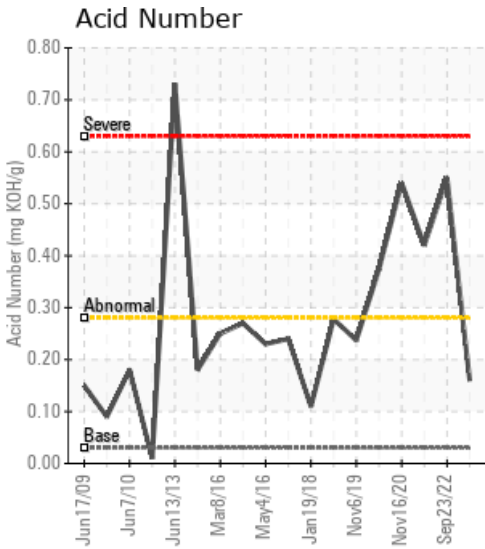
**System Information**  
 System Volume: 330 gal  
 Bulk Operating Temp: 340F / 171C  
 Heating Source:  
 Blanket:  
 Fluid: PETRO CANADA PETRO-THERM  
 Make: HIWAY HEAT

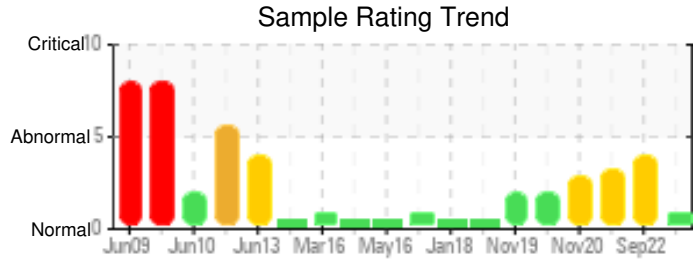
**Sample Information**  
 Lab No: 02603357  
 Analyst: Ron LeBlanc  
 Sample Date: 11/01/23  
 Received Date: 12/14/23  
 Completed: 12/27/23  
 Ron LeBlanc  
 Ronald.LeBlancSr@HFSinclair.com

Recommendation: Initial Boiling Point has been fluctuating significantly which might indicate a breaking down of the oil over time or possible process contaminants entering the system. Pentane insolubles have decreased significantly since last sample. Was a bypass sock filter or filtration installed recently. GCD 90% Distillation Point has been fluctuating over several samples. This could be due to the initial boiling point dropping significantly. Resample the oil in 3 months and be sure to purge at least a gallon from system before capturing the sample.

Comments: (GCD) 90% Distillation Point is marginally high.

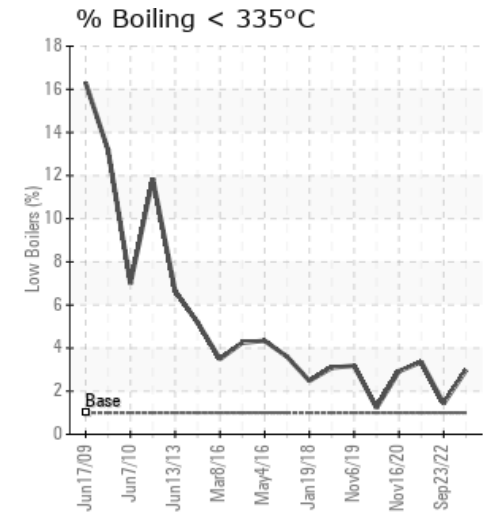
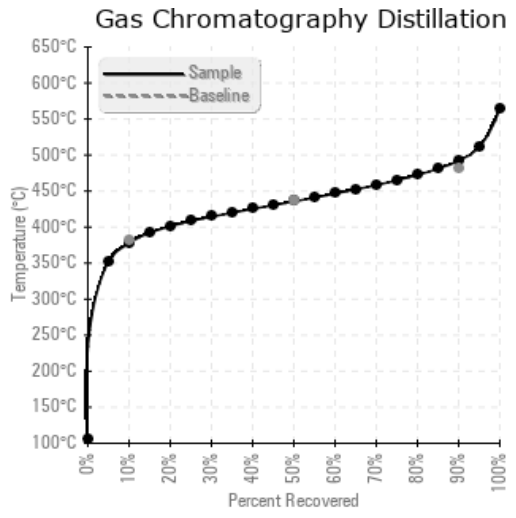
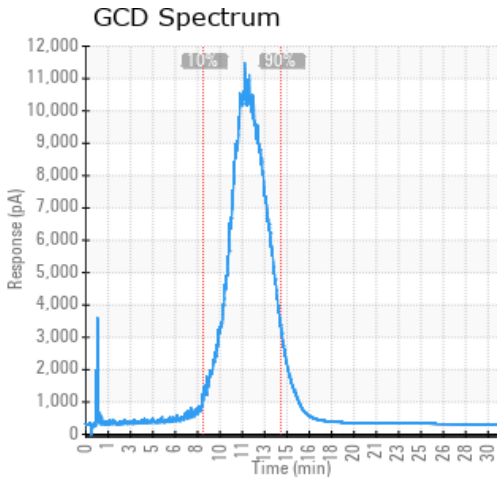
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
11/01/23	12/14/23	9.0m	INLET OF FILTER	421 / 216	42	32.9	0.16	0.240	712 / 378	816 / 436	918 / 492	2.98
09/23/22	10/03/22	0.0m	PUMP	428 / 220	11.7	36.6	0.55	1.14	722 / 383	812 / 434	913 / 490	1.43
03/08/22	03/25/22	13.0m		441 / 227	54.1	36.7	0.42	0.085	690 / 366	787 / 419	935 / 502	3.36
11/16/20	11/27/20	12.0m	Filter Inlet	435 / 224	123.4	36.4	0.54	0.672	699 / 371	791 / 422	901 / 483	2.92
01/16/20	01/27/20	9.0m	FILTER	442 / 228	15.7	34.6	0.374	0.194	715 / 379	811 / 433	921 / 494	1.23
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	
11/01/23	13	0	0	0	0	0	0	0	0	0	1	13	0	0	0	0	0	0	0	0	0	0	0	0	0
09/23/22	75	0	0	0	0	0	1	0	0	0	3	25	0	0	0	0	0	0	0	0	0	0	0	0	1
03/08/22	100	0	0	0	1	0	0	0	0	0	4	22	0	0	0	0	0	0	0	0	0	0	0	0	2
11/16/20	53	0	0	0	1	0	0	0	0	0	6	9	0	0	0	0	0	0	0	0	0	0	0	0	2
01/16/20	12	0	0	0	0	0	0	0	0	0	7	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	
09/23/22	The sodium content has been rising over the last two samples. This can indicate water in the oil. The Acid Number is elevated which is causing pentane insolubles to rise indicating oxidation and thermal degradation. Sample at next normal interval and we can access if the oil is reaching end of life. Pentane Insolubles levels are severely high. Acid Number (AN) is abnormally high. Sodium ppm levels are abnormally high.
03/08/22	GCD 90% is elevated. AN is elevated. Viscosity has increased indicating oxidation. Consider adding 5 to 10% new oil. Resample in 3 months. Acid Number (AN) is abnormally high. Sodium ppm levels are abnormally high. (GCD) 90% Distillation Point is abnormally high.
11/16/20	Acid Number is high along with Pentane Insolubles. This can indicate contamination from oxidation of the fluid. If the system has a strainer or filter: inspect them. Pentane Insolubles levels are severely high. Acid Number (AN) is abnormally high.
01/16/20	(GCD) 90% Distillation Point is marginally high in this latest sample and it has lowered from previous sample. The Acid Number is elevated. The age of the oil should be reported. Adding some fresh oil can lower the AN. Acid Number (AN) is abnormally high. (GCD) 90% Distillation Point is marginally high.

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