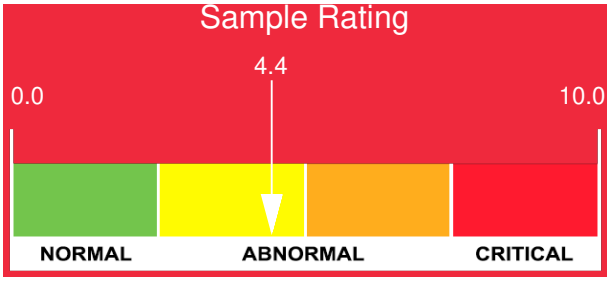
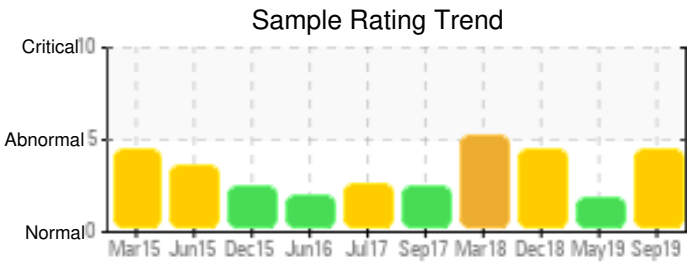




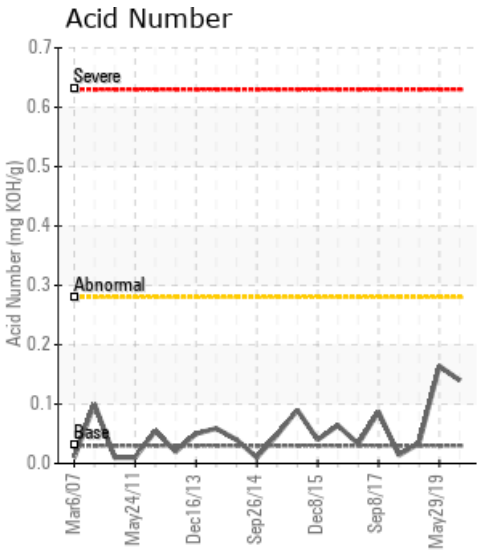
MAIN HOT OIL SYSTEM

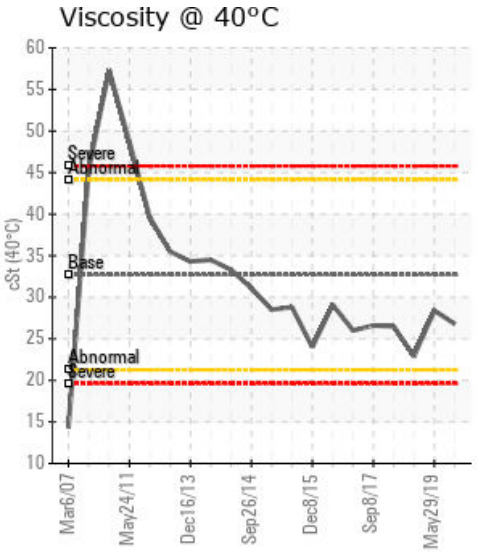
Customer: PTRHTF10068	System Information	Sample Information
Certainteed - Saint Gobain 1077 PLEASANT ST NORWOOD, MA 02062 USA Attn: David Fletcher Tel: (781)551-0656 E-Mail: david.r.fletcher@saint-gobain.com	System Volume: 5000 gal Bulk Operating Temp: 560F / 293C Heating Source: Blanket: Fluid: PETRO CANADA CALFLO AF Make: A.M.KINNEY	Lab No: 02311911 Analyst: Doug Vrooman Sample Date: 09/20/19 Received Date: 10/01/19 Completed: 10/10/19

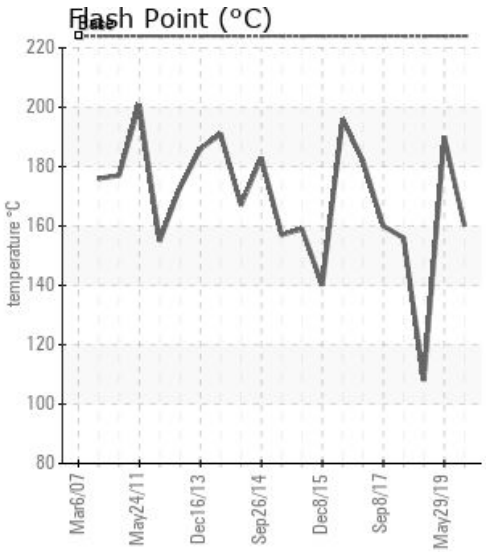
Recommendation: A couple of items stand out on the sample result report.1.Viscosity has dropped a little to 26.8 cSt @ 40°C2.(GCD) % < 335° C is up to 10.153.COC Flash Point is down to 160No asphalt contamination is reported. We would recommend attempting another Venting (boil off) as soon as possible, then resample after a week or so. If you still or unable to vent, I would consider may be draining off 10 to 20% of the volume and sweeten with fresh HTF. It's not a cure, but will get you by if venting isn't happening. I think we should monitor every 3 to 4 months for a while.

Comments: COC Flash Point is severely low. (GCD) % < 335°C is marginally high. (GCD) 10% Distillation Point is marginally low.

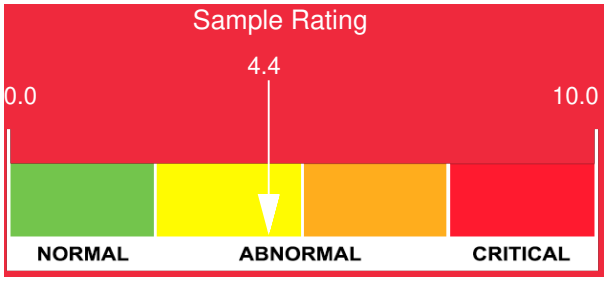
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
09/20/19	10/01/19	6y	FB-69 WINDSEAL	320 / 160	25.5	26.8	0.140	0.108	626 / 330	780 / 415	894 / 479	10.15
05/29/19	06/19/19	5y	FB-69 WINDSEAL SYS	374 / 190	17.2	28.4	0.164	0.035	680 / 360	784 / 418	895 / 479	3.45
12/14/18	01/10/19	5y		226 / 108	6.7	22.9	0.034	0.044	608 / 320	765 / 407	890 / 477	11.99
03/20/18	04/04/18	6y		313 / 156	4.0	26.5	0.014	0.027	622 / 328	781 / 416	914 / 490	10.45
09/08/17	09/22/17	4y		320 / 160	9.5	26.6	0.087	0.081	667 / 353	797 / 425	918 / 492	6.49
07/19/17	08/08/17	3y	FB-69 WINDSEAL SYSTM	360 / 182	10.6	26.0	0.033	0.057	716 / 380	821 / 438	940 / 504	3.80
Baseline Data				435 / 224		32.7	0.03		693 / 367	790 / 421	887 / 475	2.5

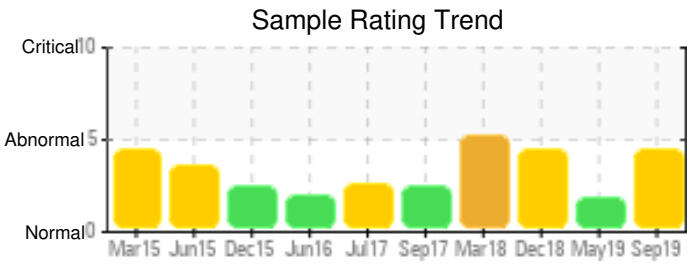






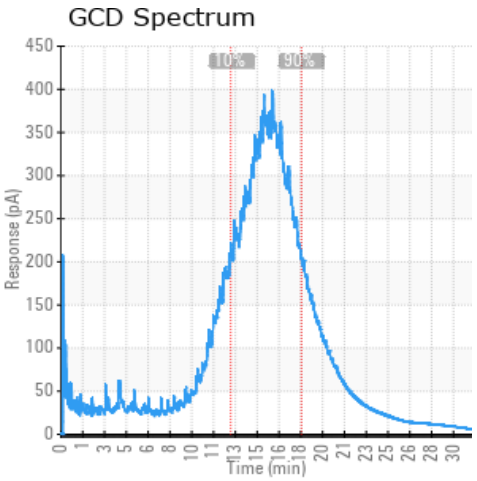
PETRO-CANADA LUBRICANTS

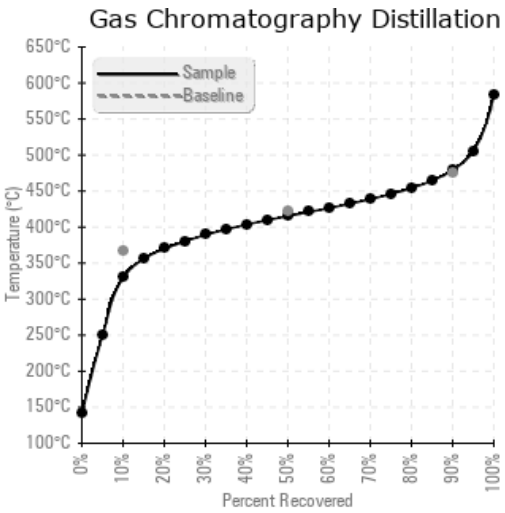


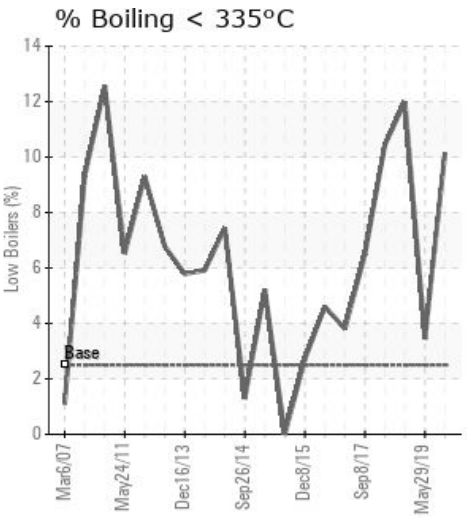


Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
09/20/19	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	0
05/29/19	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	108	0
12/14/18	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0
03/20/18	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0
09/08/17	58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	20	0
07/19/17	42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0
Baseline Data			0	0						0			0	0					0				270	

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







Historical Comments

05/29/19	We noticed a healthy increase in flash point, viscosity and phosphorus, indicating a significant top-up. Properties look much better now. let's monitor now that the challenges put onto this system are now in the past with the new Filler Heater system in operation. COC Flash Point is marginally low.
12/14/18	The viscosity of the oil decreased further. The low boilers increased and the flash point is down considerably from the last sample. This system definitely requires action to reverse this trend and bring back the properties of the oil. We wonder if vented material has been added back into the system by error ? We could do a retest to confirm the results. COC Flash Point is severely low. (GCD) 10% Distillation Point is abnormally low. (GCD) % < 335°C is marginally high.
03/20/18	The viscosity of the oil remains low. Along the lines of what was suggested at the last sampling, we suggest to do more aggressive venting to get the low boilers out and restore the physical properties of the fluid, like the flash point. (GCD) 10% Distillation Point is severely high. (GCD) 50% Distillation Point is severely high. (GCD) 90% Distillation Point is severely high. COC Flash Point is severely low.
09/08/17	The GC results vary widely but the lab committed to using a dedicated GC for this program to increase the predictability and accuracy of GC results. Minus the lower flash point, the properties are consistent with the previous sample where low viscosity is confirmed. We suggest to perform venting of the light ends and replace the fluid lost by adding fresh oil until the expansion tank is 75% full when in operation. No vanadium present so no suspected presence of an asphalt leak. COC Flash Point is severely low. COC Flash Point tested twice (156°C and 160°C). (GCD) 90% Distillation Point is abnormally high.
07/19/17	We brought up some questions for the lab based on questionable GCD results lately. The flash point remains strong but it has decreased since the last sample. Considering the fluid starts at 32 cSt and it is now 26 cSt (19% lower), we suggest to vent the light ends out of the system and the expansion tank and top-up the losses with fresh Calflo to bring back the properties closer to fresh oil. (GCD) 90% Distillation Point is severely high.