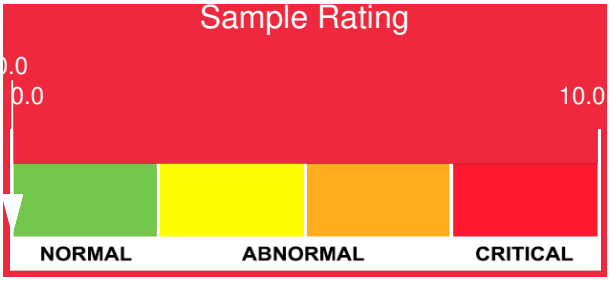
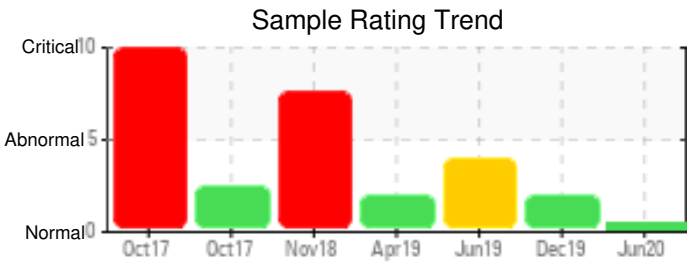




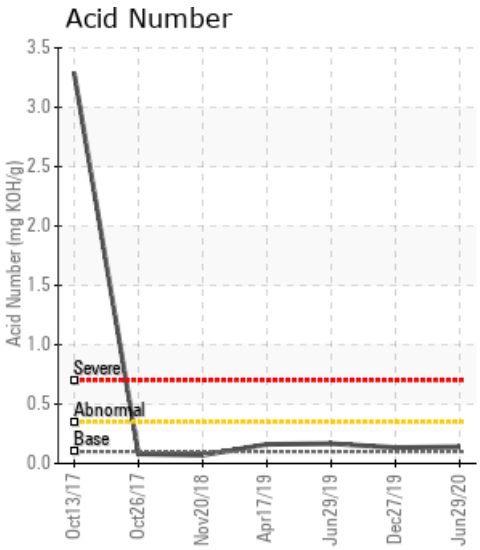
POWDER SLUSH COLD OIL RETURN

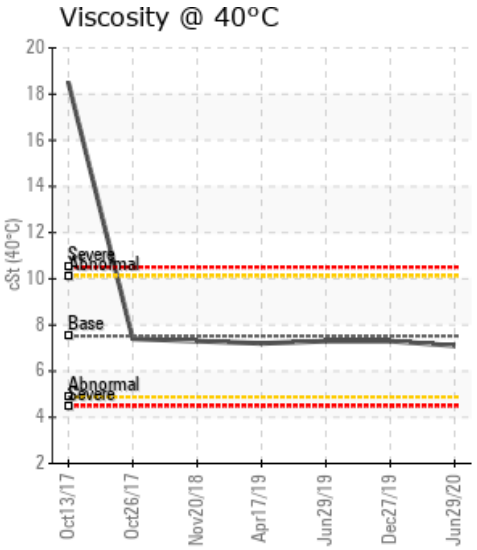
Customer: PTRHTF30023	System Information	Sample Information
INOAC INTERIOR SYSTEMS 575 JAMES STREET SOUTH ST MARYS, ON N4X 1B9 Canada Attn: ANDREW COCKBURN Tel: (519)349-3323 E-Mail: ANDREW.COCKBURN@JCI.COM	System Volume: 14000 ltr Bulk Operating Temp: 500F / 260C Heating Source: Blanket: Fluid: PETRO CANADA CALFLO LT Make: BP&R CONSTRUCTION	Lab No: 02362193 Analyst: Lynn Billings Sample Date: 06/29/20 Received Date: 06/30/20 Completed: 07/08/20 Lynn Billings lynn.billings@petrocanadalsp.com

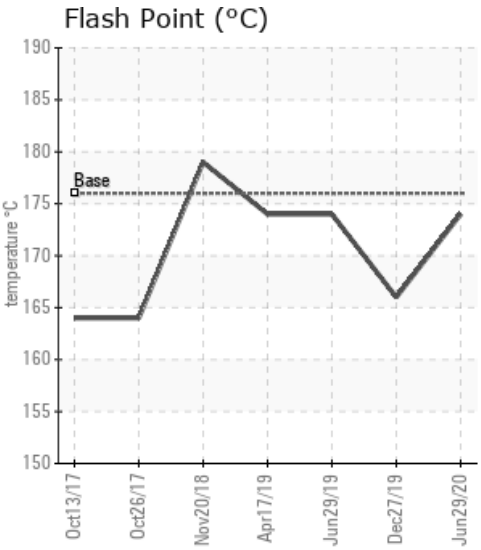
Recommendation: Current analysis of the Cold Oil Return system indicates the oil is suitable for continued use. GCD profile is consistent with Calflo LT. Acid number, viscosity and water are consistent as well. No indication of wear metals indicated either. The flash point has increased slightly. Pentane insolubles have decreased from 0.209 to 0.101. Always ensure that the sample line is flushed thoroughly to remove any insolubles that may have accumulated over time, before the sample is taken. Resample at next interval.

Comments:

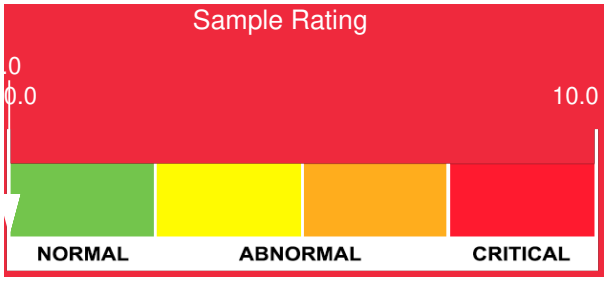
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
06/29/20	06/30/20	0h		345 / 174	19.4	7.1	0.14	0.101	609 / 321	637 / 336	737 / 392	46.59
12/27/19	01/08/20	0h		331 / 166	14.3	7.3	0.134	0.209	607 / 320	637 / 336	730 / 388	47.75
06/29/19	07/08/19	0h		345 / 174	8.7	7.3	0.167	0.033	604 / 318	632 / 334	737 / 392	51.23
04/17/19	04/22/19	0h		345 / 174	8.9	7.2	0.161	0.044	606 / 319	639 / 337	737 / 392	46.45
11/20/18	11/26/18	0h		354 / 179	4.6	7.3	0.07	0.038	539 / 281	579 / 304	660 / 349	78.39
Baseline Data				349 / 176		7.52	0.1		604 / 318	640 / 338	734 / 390	47.0

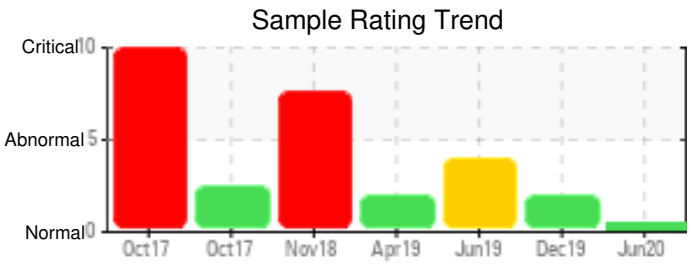






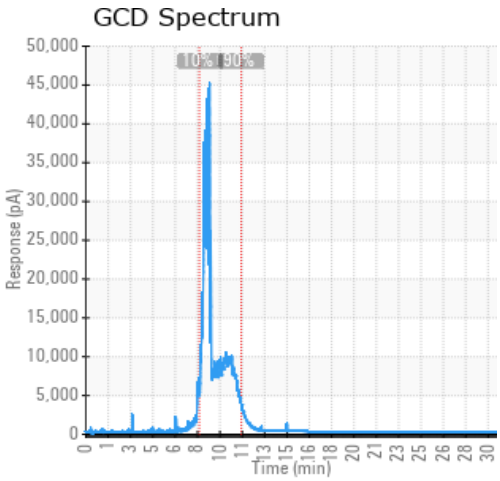
PETRO-CANADA LUBRICANTS

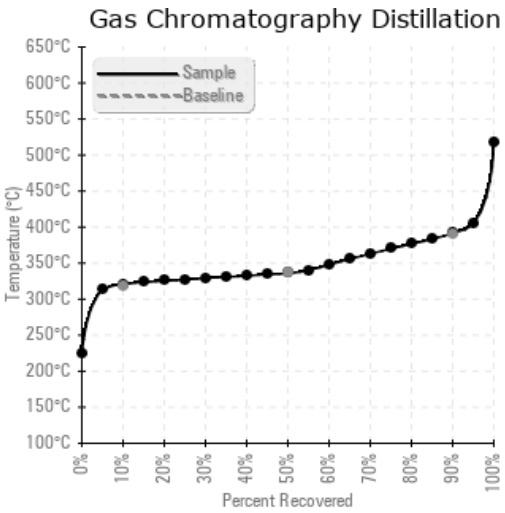


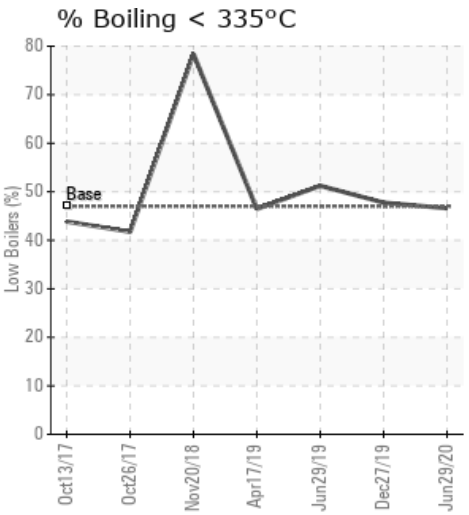


Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
06/29/20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85	0
12/27/19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	79	0
06/29/19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	68	0
04/17/19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	58	0
11/20/18	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65	0
Baseline Data			0	0						0			0	0				0	0				270	

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







Historical Comments

12/27/19	Current analysis of the Cold Oil Return system indicates the oil is suitable for continued use. GCD profile is consistent with Calflo LT. Acid number, Viscosity are consistent. No indication of wear metals. Pentane insoluble have shown an increase from 0.033 to 0.209. Please ensure that sample line is flushed thoroughly, to remove an insolubles that may have accumulated over time, before the sample is taken. Resample at next interval.
06/29/19	GCD indicates a slight increase in the %<335°C compared to the hot side. Difference in the cold side and hot was approx. 2.5%, not a huge difference, and could be due to sampling points. Distillation point at 10%, 50%, and 90% were all typical for Calflo LT. Flash Point was consistent with Calflo LT indicating no significant amount of light ends present to reduce the flash point of the fluid. Acid Number and Viscosity @ 40°C are consistent with Calflo LT. Solids level is consistent and at a low level, 0.033%. Fluid is suitable for continued use. Sample at the next interval.
04/17/19	Cold Oil side sample indicates low boilers have been reduced from the previous 70% value to 46.45, which is much closer to the typical level of approx. 40% for Calflo LT. GCD graph does show some evidence of high boilers due to the cracking of the fluid due to previous operational procedures, which have now been changed. Viscosity, flash, additive and wear metals are typical for this product. Water level remains low a 8.9 ppm. Resample again at 6 months to monitor Calflo LT fluid condition. (GCD) % < 335°C is abnormally high.
11/20/18	Appears to be some low boilers in the system. Flash point is okay but the amount of material <335°C is elevated, 50% point is reduced, with the 90% Distillation point lower than normal.Please vent expansion tank for a day when the unit is at operating temperature, to release low boilers from system.Resample system after venting.All other parameters okay, viscosity is typical for Calflo LT, no water present, no appreciable amount of solids as Pentane insoluble level at 0.038% (GCD) % < 335°C is severely high. (GCD) 90% Distillation Point is severely low. (GCD) 10% Distillation Point is marginally low. (GCD) 50% Distillation Point is marginally low.