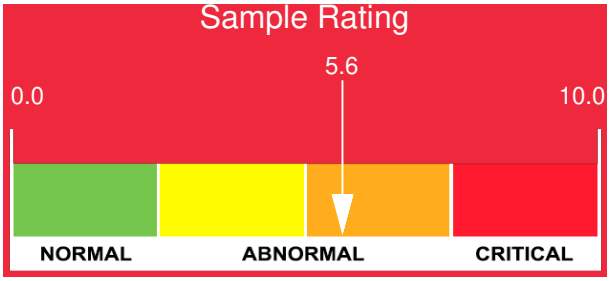
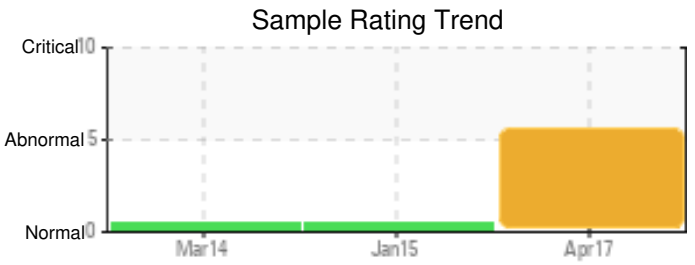




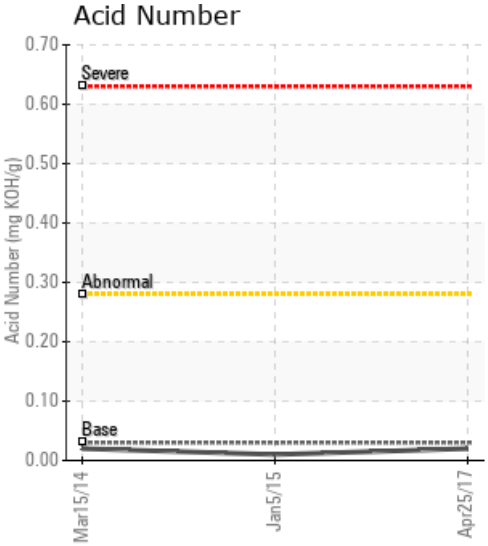
AUTOLIV BOILER #3

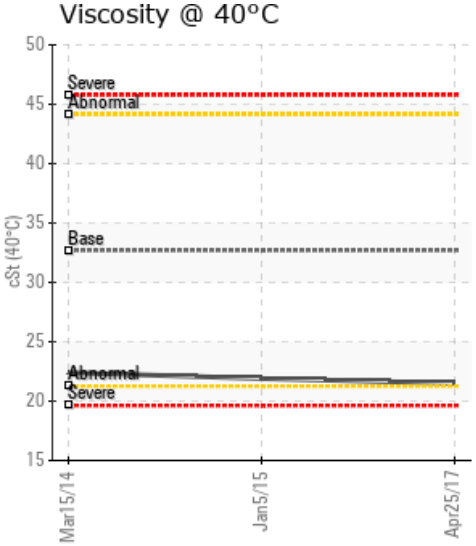
Customer: PTRHTF30004	System Information	Sample Information
AUTOLIV CANADA 20 AUTOLIV DRIVE P.O. BOX 1090 TILBURY, ON N0P 2L0 Canada Attn: Jill Stevenson Tel: (519)682-1083 E-Mail:	System Volume: 4000 ltr Bulk Operating Temp: 518F / 270C Heating Source: Blanket: Fluid: PETRO CANADA CALFLO AF Make: VAPOUR POWER	Lab No: 02147902 Analyst: Behshad Sabah Sample Date: 04/25/17 Received Date: 05/26/17 Completed: 05/30/17 Behshad Sabah behshad.sabah@HFSinclair.com

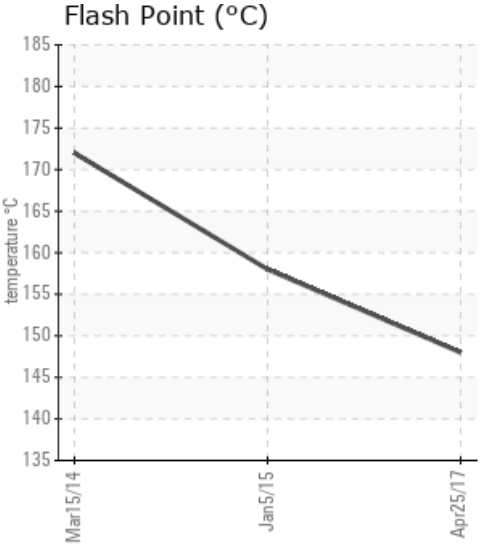
Recommendation: Viscosity of the Calflo AF has been reduced. Possible cracking of the fluid has occurred, or another product has been added. Percent of boilers <335°C is quite high @ 13.90% and 10% point has been reduced to 313.5°C from a typical of 365°C. Flash point has been reduced to 148°C from the normal typical of 217°C. Consider venting system to reduce light boilers. Consider bleeding off some fluid and sweetening with Calflo AF to increase viscosity of fluid. Sulphur and Phosphorus additive levels are not consistent with Calflo AF. Confirm that Calflo AF is being used and topped up.Resample at 3 months after venting to confirm if low boilers have been reduced. Consider bleeding off some fluid and sweetening with Calflo AF to increase flash point and reduce low boilers.

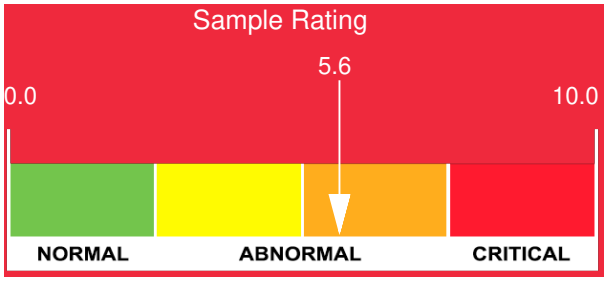
Comments: (GCD) 10% Distillation Point is severely low. COC Flash Point is severely low. (GCD) % < 335°C is abnormally high.

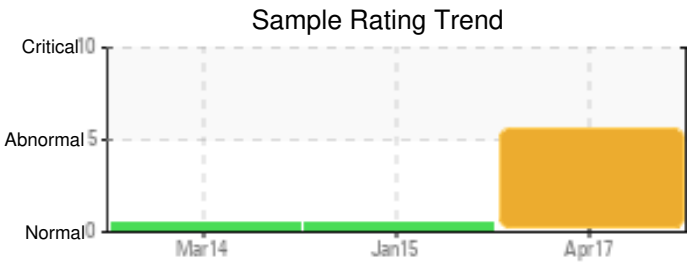
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
04/25/17	05/26/17	7.0y		298 / 148	5.2	21.5	0.02	0.199	596 / 314	775 / 413	891 / 477	13.90
01/05/15	01/13/15	6.0y		316 / 158	39.1	21.9	0.01	0.039	597 / 314	773 / 411	879 / 471	13.86
03/15/14	01/13/15	5.0y		342 / 172	14.0	22.4	0.02	0.063	602 / 317	774 / 412	880 / 471	13.28
Baseline Data				435 / 224		32.7	0.03		693 / 367	790 / 421	887 / 475	2.5







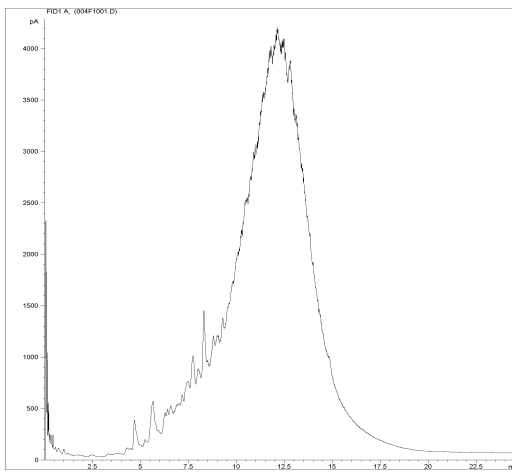


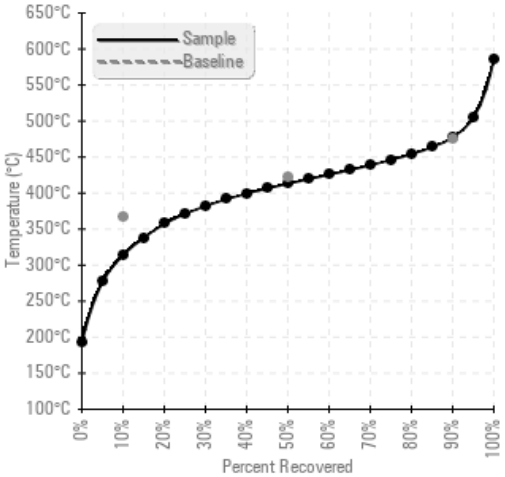


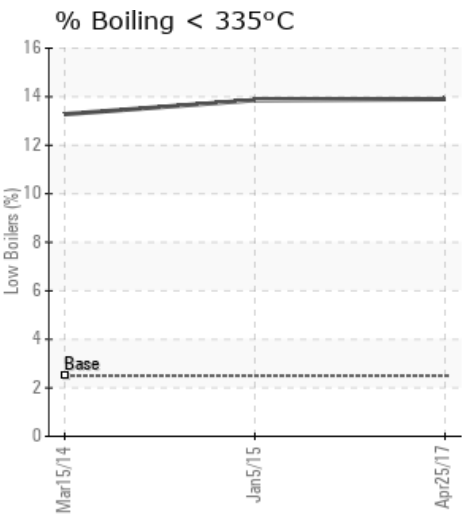
Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
04/25/17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	49	0
01/05/15	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	64	0
03/15/14	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	72	0
Baseline Data			0	0						0			0	0					0				270	

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

GCD Spectrum







Historical Comments

01/05/15	There is an indication of thermal cracking as the oil seems to have abnormall high light ends. If it is possible to vent the light ends out of the system through the expansion tank, then I would suggest that this be done. I would suggest tha we re-sample the oil in this unit. The results are similar to the sample from 1/15/2014 (GCD) 10% Distillation Point is severely low. COC Flash Point is severely low. (GCD) % < 335°C is abnormally high.
03/15/14	There is an indication of thermal cracking as the oil seems to have abnormall high light ends. If it is possible to vent the light ends out of the system through the expansion tank, then I would suggest that this be done. I would suggest tha we re-sample the oil in this unit (GCD) 10% Distillation Point is severely low. (GCD) % < 335°C is abnormally high. COC Flash Point is abnormally low.