

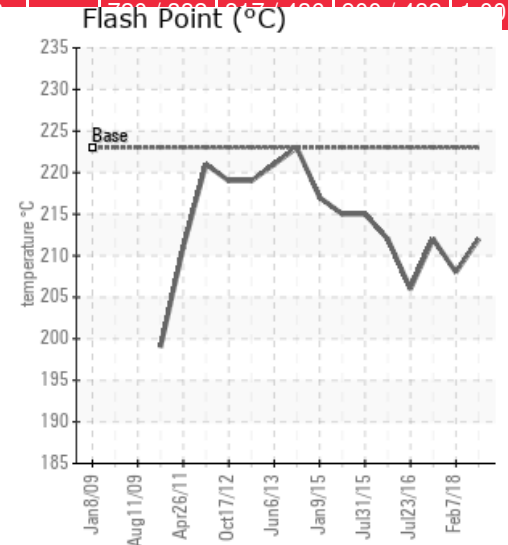
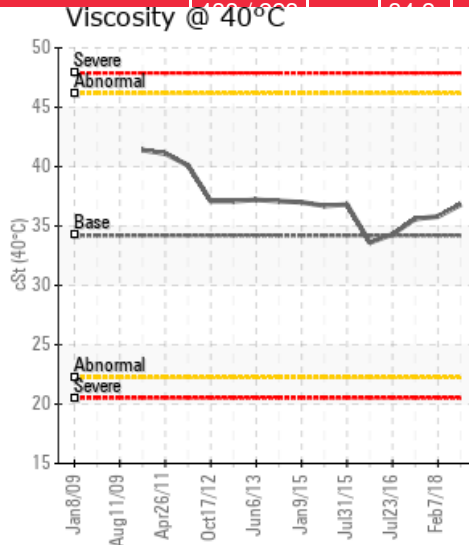
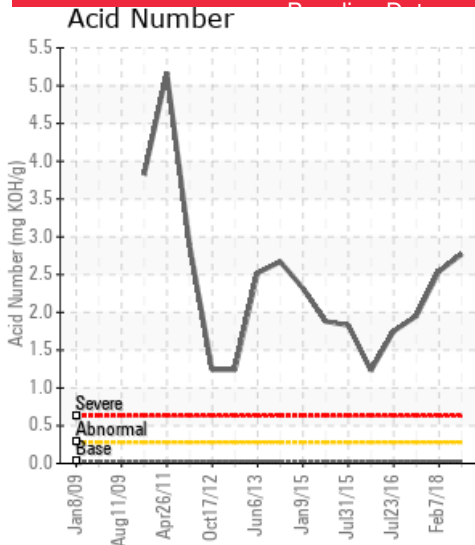
HOT WAX AREA

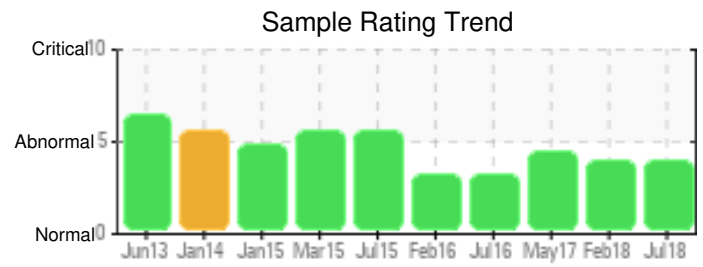
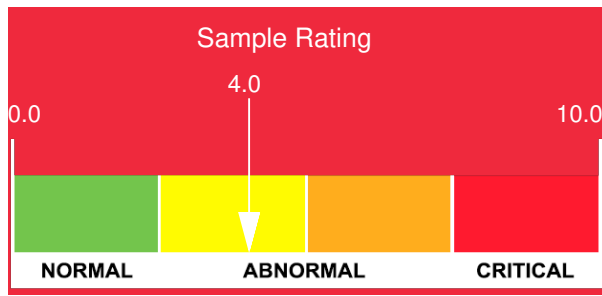
Customer: PTRHTF10102	System Information	Sample Information
METALSA INCORPORATED 301 BILL BRYAN BLVD HOPKINSVILLE, KY 42240 USA Attn: CHRIS HIGGINS Tel: (270)305-1347 E-Mail: chiggins@kimbrooil.com	System Volume: 4000 gal Bulk Operating Temp: 240F / 116C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make:	Lab No: 02231626 Analyst: Joe Goecke Sample Date: 07/31/18 Received Date: 08/01/18 Completed: 08/03/18 To discuss this report contact Joe Goecke at (859)543-0092

Recommendation: This sample is very clean and looks to be in very good condition with the only exception being the high acid number which is difficult to explain unless some acidic material was added and is always high. The remaining properties of this look like new oil. Very little water, great flash point and viscosity and no light ends forming. No action needed a time.

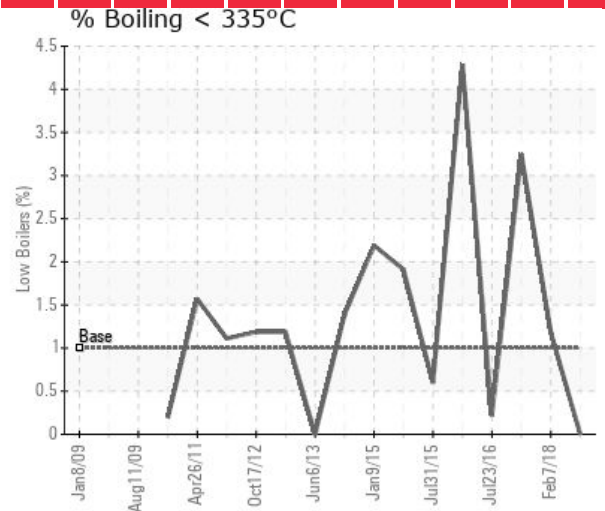
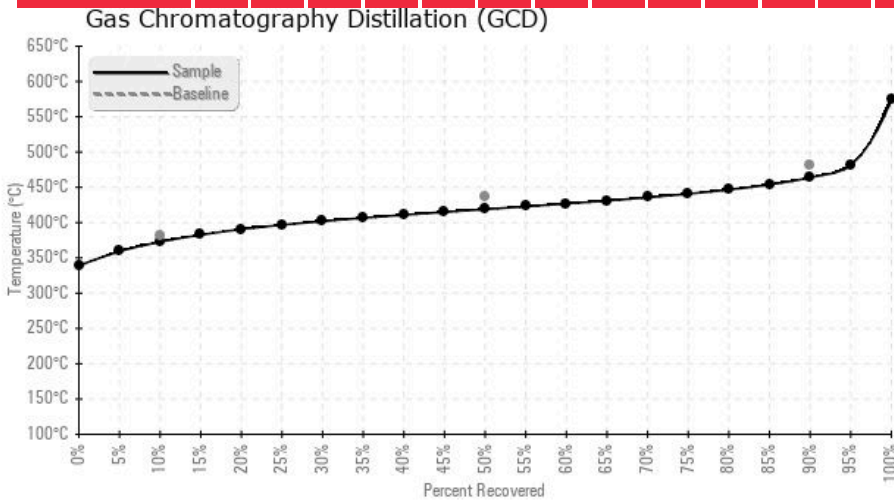
Comments: Acid Number (AN) is severely high. (GCD) 90% Distillation Point is abnormally low.

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	%
07/31/18	08/01/18	0y		414 / 212	39.8	36.8	2.77	0.236	703 / 373	786 / 419	867 / 464	0.00
02/07/18	02/08/18	0y		406 / 208	19.4	35.8	2.54	0.435	694 / 368	788 / 420	884 / 474	1.18
05/19/17	05/25/17	0y		414 / 212	33.7	35.6	1.95	0.642	695 / 368	810 / 432	918 / 492	3.25
07/23/16	07/25/16	0y	EXPANSION TANK	403 / 206	30.0	34.3	1.75	0.358	697 / 369	797 / 425	900 / 482	0.22
02/19/16	03/01/16	0y		414 / 212	16.3	33.6	1.23	0.384	681 / 361	806 / 430	916 / 491	4.29
07/31/15	08/11/15	0y		419 / 215	155.4	36.8	1.83	1.18	718 / 381	818 / 437	919 / 493	0.60
03/19/15	03/30/15	0y	EXPUSION TANK	419 / 215	79.3	36.7	1.88	1.12	700 / 371	804 / 429	919 / 493	1.91





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
07/31/18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02/07/18	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
05/19/17	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	1
07/23/16	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0
02/19/16	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1
07/31/15	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	6	0	2	3
03/19/15	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	8	0	3	4
Elemental analysis results (above) in parts per million (ppm). [10,000 ppm = 1.0%]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Historical Comments

02/07/18	Acid number is very high at 2.54, not sure what is causing this but appears to be a constant issue and may be from an environmental contaminant similar to the pentane insoluble being high. Major characteristics of Flash Point, viscosity and low boilers are in very good condition as is metal wear and water. Continue to use product and resample at next regular interval. Pentane Insolubles levels are abnormally high. Acid Number (AN) is severely high.
05/19/17	Oil looks like there is some contamination possibly left over from cleaning. Acid number is high as well. could be residual from old oil or other product used. Flash point, viscosity, and low boilers look very good. Suggest resampling in 6 months to see how contaminants look. Pentane Insolubles levels are severely high. Acid Number (AN) is severely high. (GCD) 90% Distillation Point is marginally high.
07/23/16	Sample results look ok. Flash point is a little low but ok. Acid number is still better than previous 2 samples but getting higher. Suggest consider change in 6 months or after next sample results. Acid Number (AN) is severely high.
02/19/16	This current sample looks to be in very good condition for this unit and fluid. No action is needed suitable for further use and resample at next interval. Acid Number is higher than normal but lower than typical for this system. Flash point and viscosity also indicate fluid is in good condition. Acid Number (AN) is severely high.
07/31/15	Continue to Monitor fluid as in past. Water level has doubled since last sample, flash, TAN and Viscosity all similar to last sample, although the TAN is high it is better than last. All other info ok. Would still try and clean system to remove traces of Wax. Pentane Insolubles levels are severely high. Acid Number (AN) is severely high. (GCD) 90% Distillation Point is marginally high.
03/19/15	System continues to show age but is not much different than last sample. Flash point is decreasing indicating light ends increasing as also seen in chart. Still recommend some partial change out to lower pentane insolubles and acid number. Pentane Insolubles levels are severely high. Acid Number (AN) is severely high. (GCD) 90% Distillation Point is marginally high.

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