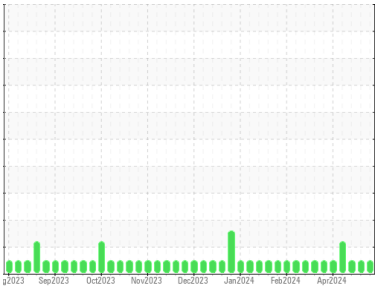
OIL ANALYSIS REPORT

Machine Id
CATERPILLAR GM01 - DA LUBRICANT BLUE FLAME HB-5 SAE 40 (S/N LGS00177)
Component
Biogas Engine
Fluid
D-A Lubricant Blue Flame HB-5 40W (140 GAL)

Sample Rating Trend



NORMAL

DIAGNOSIS

Recommendation
Resample at the next service interval to monitor.

Wear
All component wear rates are normal.

Contamination
There is no indication of any contamination in the oil.

Fluid Condition
The BN result indicates that there is suitable alkalinity remaining in the oil. The AN level is acceptable for this fluid. The condition of the oil is acceptable for the time in service.

SAMPLE INFORMATION		method	limit/base	current	history1	history2
Sample Number		Client Info		**WC0897511**	WC0880160	WC0880159
Sample Date		Client Info		**15 Apr 2024**	15 Apr 2024	08 Apr 2024
Machine Age	hrs	Client Info		**79397**	79397	79234
Oil Age	hrs	Client Info		**2626**	164	1
Oil Changed		Client Info		**Not Changd**	Not Changd	Changed
Sample Status				**NORMAL**	NORMAL	NORMAL

CONTAMINATION		method	limit/base	current	history1	history2
Fuel		WC Method	>4.0	**<1.0**	<1.0	<1.0
Water		WC Method	>0.1	**NEG**	NEG	NEG
Glycol		WC Method		**NEG**	NEG	NEG

WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>45	**3**	5	<1
Chromium	ppm	ASTM D5185m	>2	**0**	0	0
Nickel	ppm	ASTM D5185m	>2	**0**	<1	0
Titanium	ppm	ASTM D5185m		**0**	1	<1
Silver	ppm	ASTM D5185m	>5	**0**	0	0
Aluminum	ppm	ASTM D5185m	>10	**<1**	2	<1
Lead	ppm	ASTM D5185m	>5	**0**	0	0
Copper	ppm	ASTM D5185m	>14	**<1**	7	0
Tin	ppm	ASTM D5185m	>13	**0**	1	<1
Vanadium	ppm	ASTM D5185m		**<1**	0	0
Cadmium	ppm	ASTM D5185m		**0**	0	0

ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m		**6**	4	4
Barium	ppm	ASTM D5185m		**0**	0	0
Molybdenum	ppm	ASTM D5185m		**3**	2	1
Manganese	ppm	ASTM D5185m		**0**	1	<1
Magnesium	ppm	ASTM D5185m		**16**	15	11
Calcium	ppm	ASTM D5185m		**1532**	1770	1662
Phosphorus	ppm	ASTM D5185m		**324**	319	282
Zinc	ppm	ASTM D5185m		**370**	383	347
Sulfur	ppm	ASTM D5185m		**3702**	4443	2534

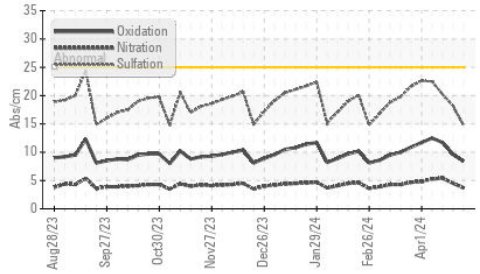
CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>200	**4**	68	24
Sodium	ppm	ASTM D5185m		**<1**	3	2
Potassium	ppm	ASTM D5185m	>20	**0**	1	0

INFRA-RED		method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844		**0**	0	0
Nitration	Abs/cm	*ASTM D7624	>20	**3.7**	4.5	5.4
Sulfation	Abs/.1mm	*ASTM D7415	>30	**14.7**	18.2	20.2

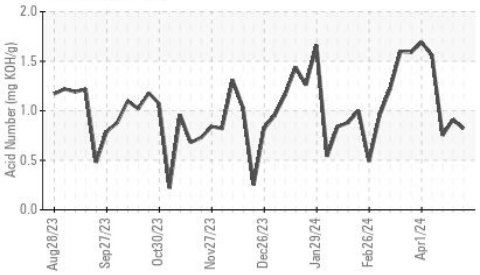
FLUID DEGRADATION		method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414	>25	**8.4**	9.6	11.7
Acid Number (AN)	mg KOH/g	ASTM D8045		**0.82**	0.91	0.752
Base Number (BN)	mg KOH/g	ASTM D2896		**4.84**	3.94	5.81

OIL ANALYSIS REPORT

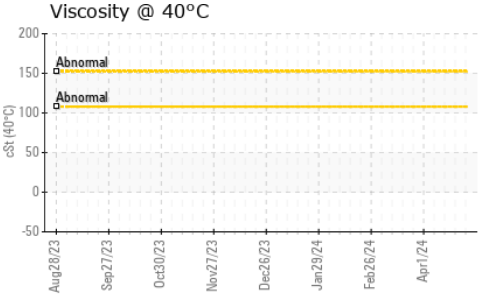
FT-IR (Direct Trend)



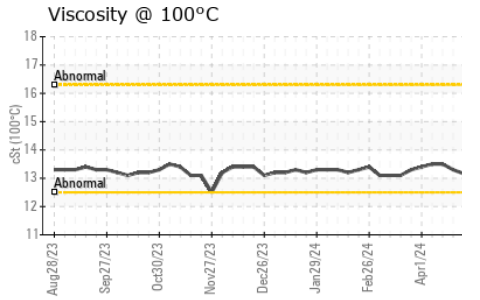
Acid Number



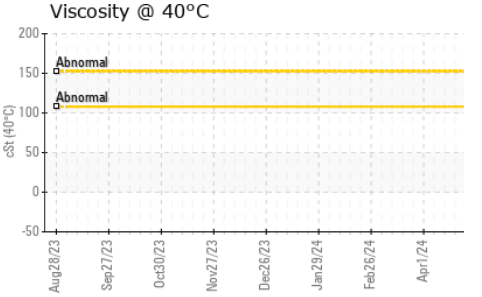
Viscosity @ 40°C



Viscosity @ 100°C



Viscosity @ 40°C

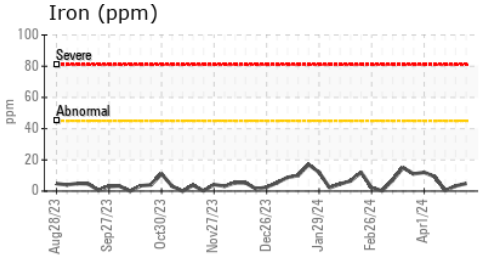


VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Precipitate	scalar	*Visual	NONE	**NONE**	NONE	NONE
Silt	scalar	*Visual	NONE	**NONE**	NONE	NONE
Debris	scalar	*Visual	NONE	**NONE**	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	**NONE**	NONE	NONE
Appearance	scalar	*Visual	NORML	**NORML**	NORML	NORML
Odor	scalar	*Visual	NORML	**NORML**	NORML	NORML
Emulsified Water	scalar	*Visual	>0.1	**NEG**	NEG	NEG
Free Water	scalar	*Visual		**NEG**	NEG	NEG

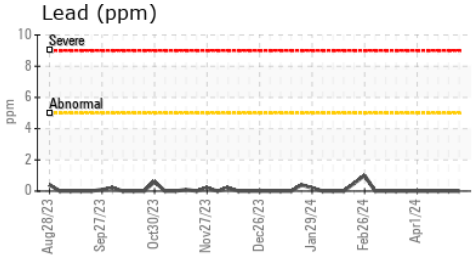
FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445		**13.16**	13.3	13.5

GRAPHS

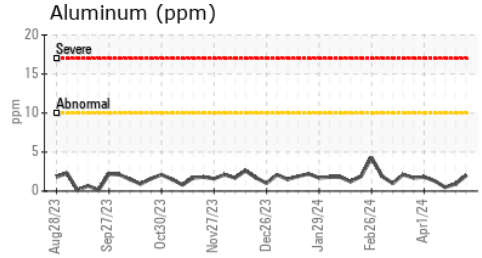
Iron (ppm)



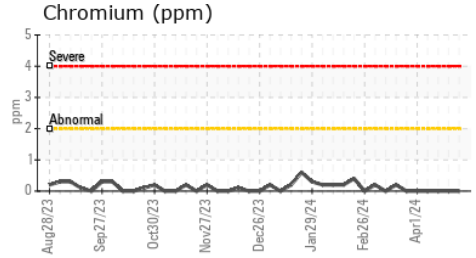
Lead (ppm)



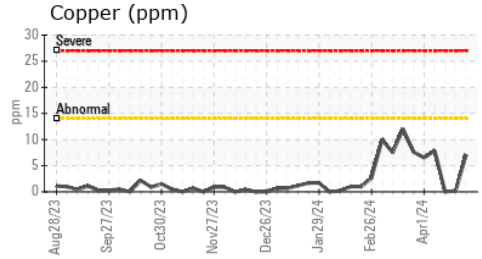
Aluminum (ppm)



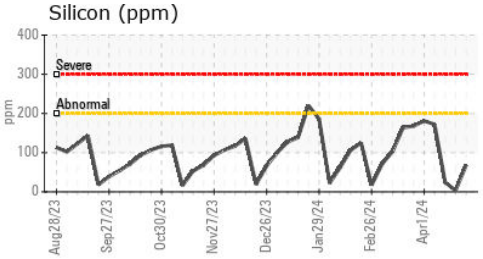
Chromium (ppm)



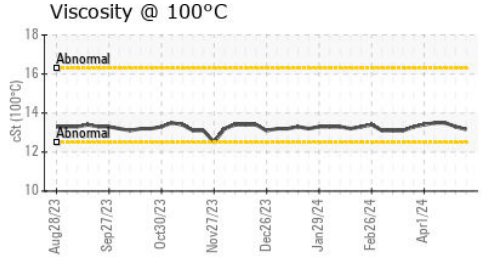
Copper (ppm)



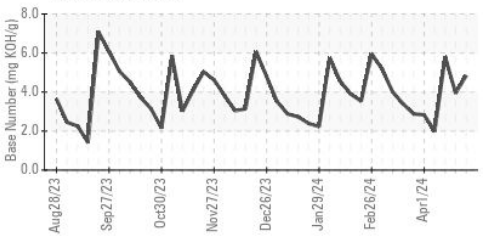
Silicon (ppm)



Viscosity @ 100°C



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0897511 **Received** : 16 Apr 2024
Lab Number : 06150714 **Tested** : 23 Apr 2024
Unique Number : 10980792 **Diagnosed** : 23 Apr 2024 - Jonathan Hester
Test Package : MOB 1 (Additional Tests: KV40, TBN)

To discuss this sample report, contact Customer Service at 1-800-237-1369.
** - Denotes test methods that are outside of the ISO 17025 scope of accreditation.*
Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

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