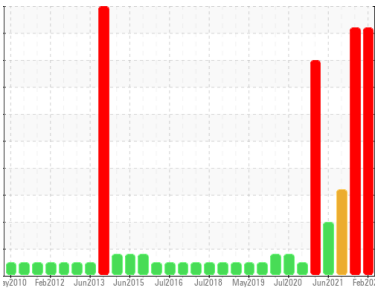
OIL ANALYSIS REPORT

Sample Rating Trend



GLYCOL

Machine Id
CATERPILLAR 980G 126 (S/N 2KR02779)
Component
Diesel Engine
Fluid
SHELL 15W40 (9 GAL)

DIAGNOSIS

Recommendation
We advise that you check for the source of the coolant leak. Check for low coolant level. Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

Wear
The copper level is abnormal. In the absence of other significant wear metals, suspect copper due to sources other than wear (i.e. cooling core).

Contamination
Sodium and/or potassium levels are high. Test for glycol is positive.

Fluid Condition
The BN result indicates that there is suitable alkalinity remaining in the oil.

SAMPLE INFORMATION		method	limit/base	current	history1	history2
Sample Number		Client Info		**RW0005012**	RW0004405	RW0003678
Sample Date		Client Info		**22 Feb 2024**	27 Mar 2023	01 Oct 2022
Machine Age	hrs	Client Info		**1156**	24187	24145
Oil Age	hrs	Client Info		**472**	289	295
Oil Changed		Client Info		**Changed**	Changed	Changed
Sample Status				**SEVERE**	SEVERE	ABNORMAL

CONTAMINATION		method	limit/base	current	history1	history2
Fuel		WC Method	>5	**<1.0**	<1.0	<1.0
Water		WC Method	>0.2	**NEG**	NEG	NEG

WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>80	**38**	41	30
Chromium	ppm	ASTM D5185m	>4	**0**	<1	<1
Nickel	ppm	ASTM D5185m	>4	**0**	0	0
Titanium	ppm	ASTM D5185m	>2	**0**	0	0
Silver	ppm	ASTM D5185m	>2	**0**	0	0
Aluminum	ppm	ASTM D5185m	>10	**1**	2	2
Lead	ppm	ASTM D5185m	>15	**3**	8	12
Copper	ppm	ASTM D5185m	>230	▲ **344**	▲ 498	▲ 780
Tin	ppm	ASTM D5185m	>4	**0**	<1	0
Antimony	ppm	ASTM D5185m		**---**	---	---
Vanadium	ppm	ASTM D5185m		**0**	0	0
Cadmium	ppm	ASTM D5185m		**0**	0	0

ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m		**31**	2	8
Barium	ppm	ASTM D5185m		**<1**	0	0
Molybdenum	ppm	ASTM D5185m		**217**	285	182
Manganese	ppm	ASTM D5185m		**0**	<1	<1
Magnesium	ppm	ASTM D5185m		**888**	782	402
Calcium	ppm	ASTM D5185m		**1126**	1088	1659
Phosphorus	ppm	ASTM D5185m		**1083**	954	1023
Zinc	ppm	ASTM D5185m		**1251**	1160	1142
Sulfur	ppm	ASTM D5185m		**3743**	3153	3853

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>25	**15**	16	6
Sodium	ppm	ASTM D5185m	>150	▲ **1328**	▲ 2164	▲ 1085
Potassium	ppm	ASTM D5185m	>20	▲ **102**	▲ 166	▲ 37
Glycol	%	*ASTM D2982		▲ **0.10**	▲ 0.20	NEG

INFRA-RED		method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844	>3	**1.8**	1.4	1.9
Nitration	Abs/cm	*ASTM D7624	>20	**14.8**	15.7	14.8
Sulfation	Abs/.1mm	*ASTM D7415	>30	**22.1**	20.9	24.5

FLUID DEGRADATION		method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414	>25	**14.5**	15.1	17.1
Base Number (BN)	mg KOH/g	ASTM D2896		**11.45**	15.31	11.4

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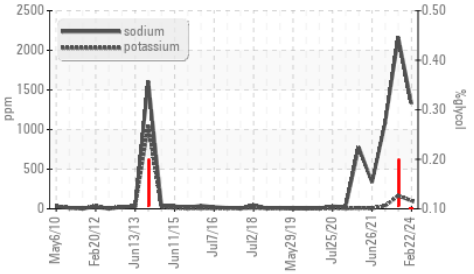
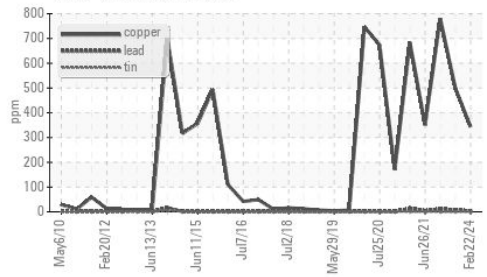
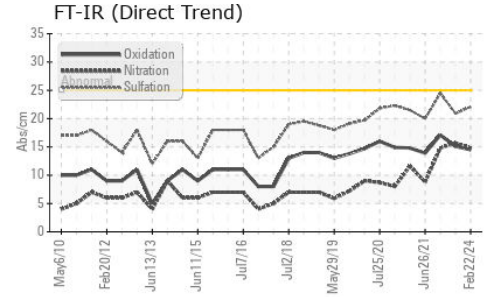
Glycol Contamination



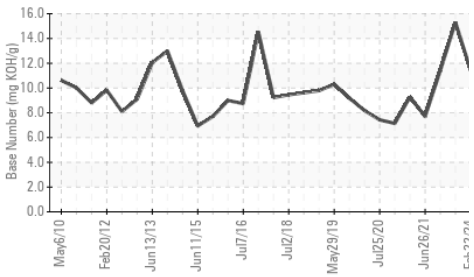
Non-ferrous Metals



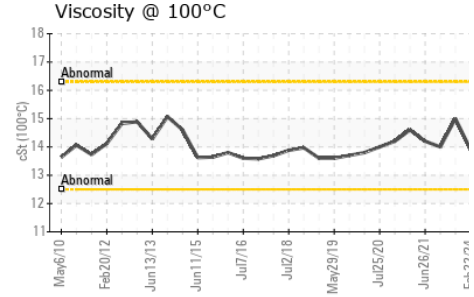
FT-IR (Direct Trend)



Base Number



Viscosity @ 100°C

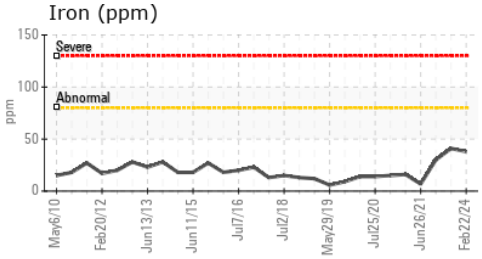


VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Precipitate	scalar	*Visual	NONE	**NONE**	NONE	NONE
Silt	scalar	*Visual	NONE	**NONE**	NONE	NONE
Debris	scalar	*Visual	NONE	**NONE**	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	**NONE**	NONE	NONE
Appearance	scalar	*Visual	NORML	**NORML**	NORML	NORML
Odor	scalar	*Visual	NORML	**NORML**	NORML	NORML
Emulsified Water	scalar	*Visual	>0.2	**NEG**	NEG	NEG
Free Water	scalar	*Visual		**NEG**	NEG	NEG

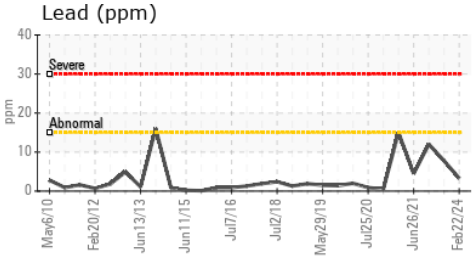
FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445		**13.9**	15.0	14.0

GRAPHS

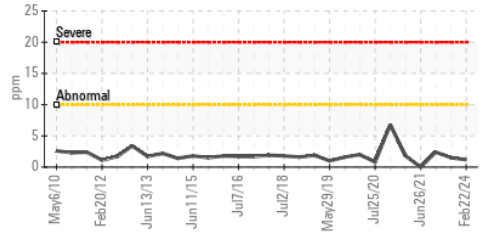
Iron (ppm)



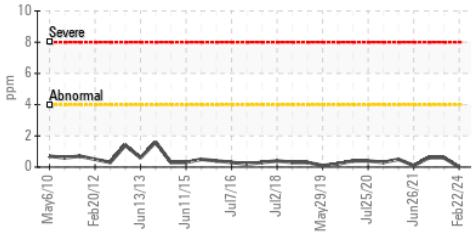
Lead (ppm)



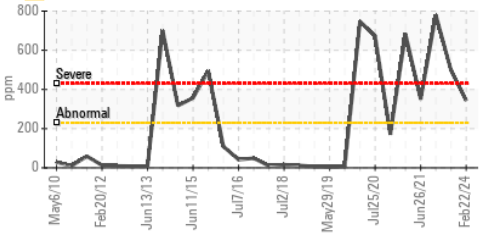
Aluminum (ppm)



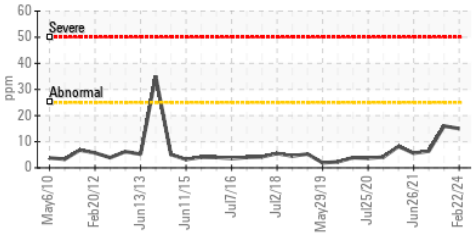
Chromium (ppm)



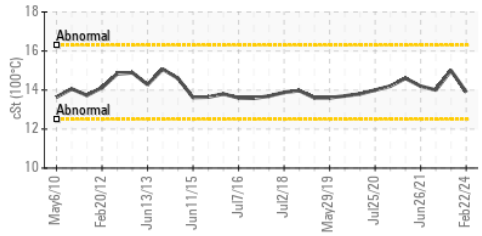
Copper (ppm)



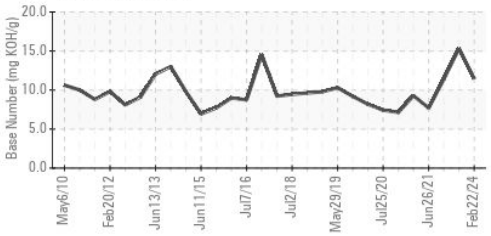
Silicon (ppm)



Viscosity @ 100°C



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : RW0005012
Lab Number : 06146737
Unique Number : 10976815
Test Package : MOB 2

Received : 11 Apr 2024
Tested : 16 Apr 2024
Diagnosed : 16 Apr 2024 - Jonathan Hester

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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)