



OIL ANALYSIS REPORT

WEAR	NORMAL
CONTAMINATION	ATTENTION
FLUID CONDITION	NORMAL



Area
RIG 2
Machine Id
CATERPILLAR 3512 R2-G-01-NKL
Component
Diesel Engine
Fluid
CHEVRON 15W40 (--- GAL)

RECOMMENDATION

No corrective action is recommended at this time. Resample at the next service interval to monitor.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		KL0013833	KL0014052	KL0013112
Sample Date		Client Info		29 Jan 2024	25 Dec 2023	17 Nov 2023
Machine Age	days	Client Info		0	45290	45427
Oil Age	days	Client Info		0	0	0
Filter Age	days	Client Info		0	0	0
Oil Changed		Client Info		N/A	N/A	N/A
Filter Changed		Client Info		N/A	N/A	N/A
Sample Status				ATTENTION	ATTENTION	ATTENTION

WEAR

All component wear rates are normal.

Iron	ppm	ASTM D5185m	>100	4	4	2
Chromium	ppm	ASTM D5185m	>20	0	<1	0
Nickel	ppm	ASTM D5185m	>2	0	<1	0
Titanium	ppm	ASTM D5185m	>2	<1	<1	0
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>25	3	3	2
Lead	ppm	ASTM D5185m	>40	<1	<1	0
Copper	ppm	ASTM D5185m	>330	<1	1	<1
Tin	ppm	ASTM D5185m	>15	0	<1	0
Vanadium	ppm	ASTM D5185m		<1	0	<1
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE

CONTAMINATION

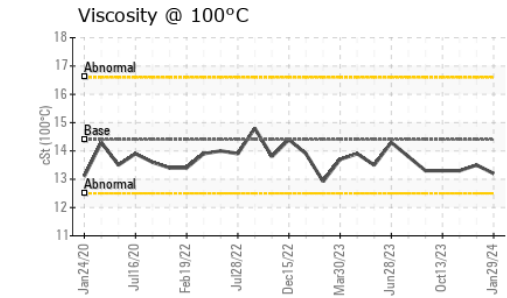
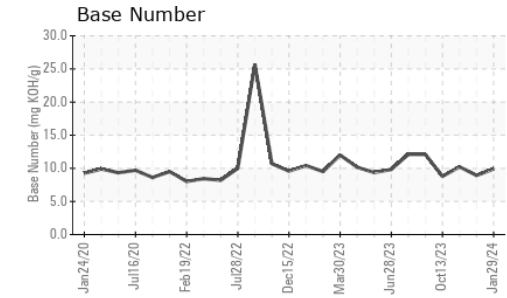
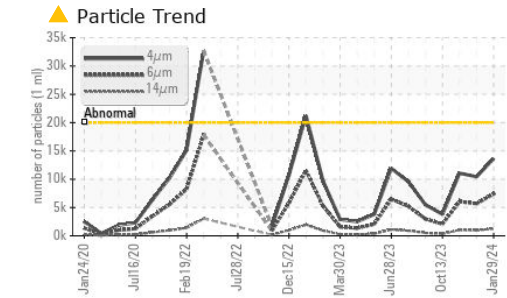
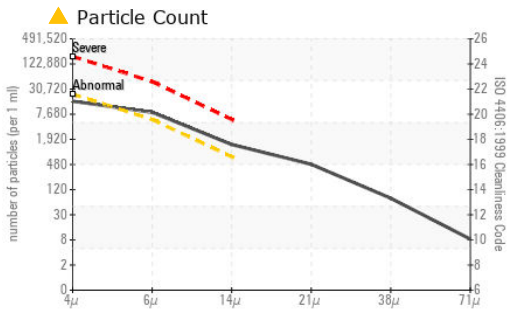
There is a moderate amount of particulates present in the oil.

Silicon	ppm	ASTM D5185m	>25	6	21	24
Potassium	ppm	ASTM D5185m	>20	0	2	0
Fuel		WC Method	>5	<1.0	<1.0	<1.0
Water		WC Method	>0.2	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
Soot %	%	*ASTM D7844	>3	0.1	0.2	0.2
Nitration	Abs/cm	*ASTM D7624	>20	6.8	7.6	7.4
Sulfation	Abs/.1mm	*ASTM D7415	>30	23.9	23.9	23.7
Particles >4µm		ASTM D7647	>20000	13641	10431	11066
Particles >6µm		ASTM D7647	>5000	▲ 7431	▲ 5682	▲ 6028
Particles >14µm		ASTM D7647	>640	▲ 1265	▲ 967	▲ 1026
Particles >21µm		ASTM D7647	>160	▲ 426	▲ 326	▲ 346
Particles >38µm		ASTM D7647	>40	▲ 66	▲ 50	▲ 53
Particles >71µm		ASTM D7647	>10	7	5	5
Oil Cleanliness		ISO 4406 (c)	>21/19/16	▲ 21/20/17	▲ 21/20/17	▲ 21/20/17
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

FLUID CONDITION

The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Sodium	ppm	ASTM D5185m	>50	<1	0	1
Boron	ppm	ASTM D5185m		352	352	333
Barium	ppm	ASTM D5185m		0	0	0
Molybdenum	ppm	ASTM D5185m		131	124	129
Manganese	ppm	ASTM D5185m		<1	<1	0
Magnesium	ppm	ASTM D5185m		707	659	693
Calcium	ppm	ASTM D5185m		1554	1492	1564
Phosphorus	ppm	ASTM D5185m		738	742	731
Zinc	ppm	ASTM D5185m		872	819	882
Sulfur	ppm	ASTM D5185m		2572	2799	2431
Oxidation	Abs/.1mm	*ASTM D7414	>25	17.4	18.0	17.7
Base Number (BN)	mg KOH/g	ASTM D2896		9.90	8.93	10.22
Visc @ 100°C	cSt	ASTM D445	14.4	13.2	13.5	13.3



Certificate L2367

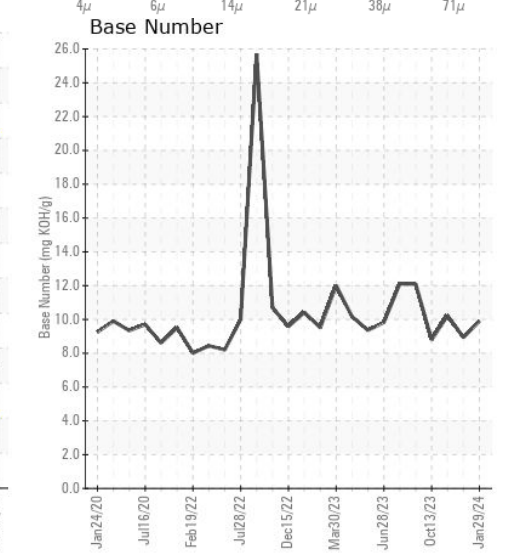
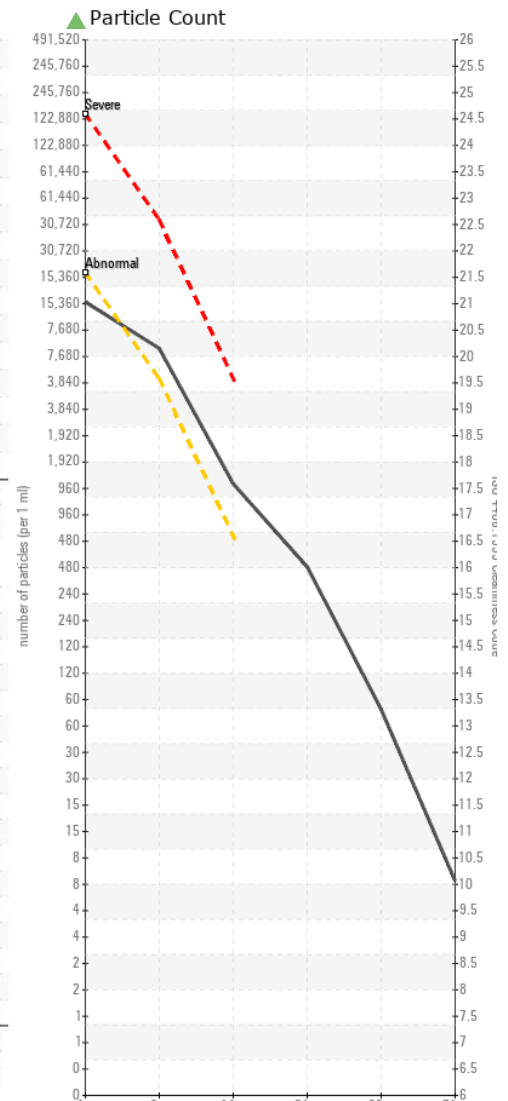
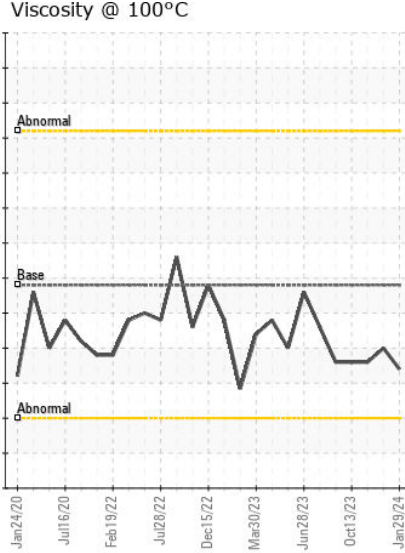
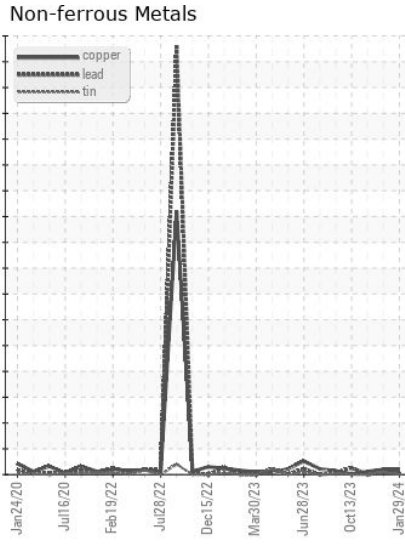
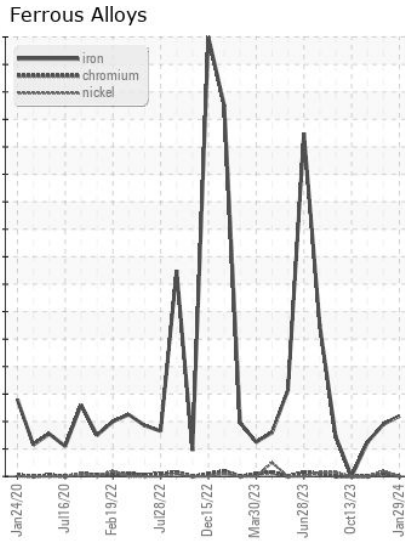
Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : KL0013833
Lab Number : 06083129
Unique Number : 10870574
Test Package : MOB 2 (Additional Tests: PrtCount)

Received : 07 Feb 2024
Tested : 08 Feb 2024
Diagnosed : 09 Feb 2024 - Sean Felton

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)



CITADEL DRILLING
 7550 W 120
 ODESSA, TX
 US 79763
 Contact: MIKE COMBDEN
 mcombden@citadelldrilling.com
 T: (780)955-5509
 F: