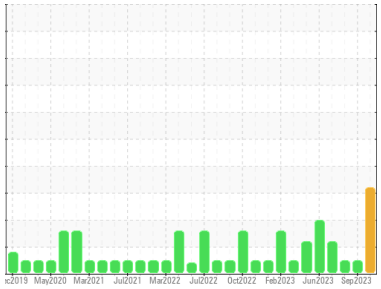
OIL ANALYSIS REPORT

Area
RIG 1
Machine Id
CATERPILLAR 3512 R1-G-02-NKL
Component
Diesel Engine
Fluid
CHEVRON 15W40 (--- GAL)

Sample Rating Trend



FUEL

DIAGNOSIS

Recommendation
We advise that you check the fuel injection system. Resample at the next service interval to monitor.

Wear
All component wear rates are normal.

Contamination
There is a moderate amount of particulates present in the oil. Light fuel dilution occurring.

Fluid Condition
Fuel is present in the oil and is lowering the viscosity. 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		**KL0013125**	KL0012901	KL0012536
Sample Date		Client Info		**03 Nov 2023**	29 Sep 2023	25 Aug 2023
Machine Age	days	Client Info		**45233**	45196	45161
Oil Age	days	Client Info		**0**	0	0
Oil Changed		Client Info		**N/A**	N/A	N/A
Sample Status				**ABNORMAL**	NORMAL	NORMAL

CONTAMINATION		method	limit/base	current	history1	history2
Water		WC Method	>0.2	**NEG**	NEG	NEG
Glycol		WC Method		**NEG**	NEG	NEG

WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	**3**	6	7
Chromium	ppm	ASTM D5185m	>20	**0**	0	0
Nickel	ppm	ASTM D5185m	>2	**0**	<1	0
Titanium	ppm	ASTM D5185m	>2	**0**	0	<1
Silver	ppm	ASTM D5185m	>2	**0**	0	0
Aluminum	ppm	ASTM D5185m	>25	**4**	0	<1
Lead	ppm	ASTM D5185m	>40	**0**	<1	<1
Copper	ppm	ASTM D5185m	>330	**<1**	<1	3
Tin	ppm	ASTM D5185m	>15	**<1**	<1	<1
Vanadium	ppm	ASTM D5185m		**0**	0	<1
Cadmium	ppm	ASTM D5185m		**0**	0	<1

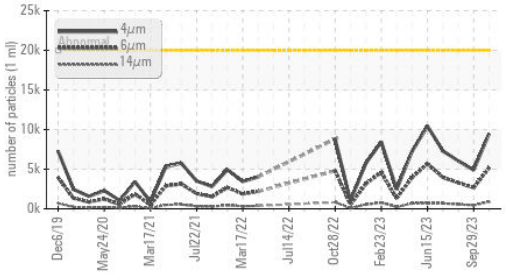
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m		**322**	428	363
Barium	ppm	ASTM D5185m		**0**	3	0
Molybdenum	ppm	ASTM D5185m		**124**	143	121
Manganese	ppm	ASTM D5185m		**<1**	<1	<1
Magnesium	ppm	ASTM D5185m		**662**	654	660
Calcium	ppm	ASTM D5185m		**1481**	1495	1523
Phosphorus	ppm	ASTM D5185m		**693**	742	663
Zinc	ppm	ASTM D5185m		**820**	845	795
Sulfur	ppm	ASTM D5185m		**2425**	3027	2935

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>25	**7**	8	8
Sodium	ppm	ASTM D5185m	>50	**1**	0	4
Potassium	ppm	ASTM D5185m	>20	**0**	1	1
Fuel	%	ASTM D3524	>5	▲ **4.5**	<1.0	<1.0

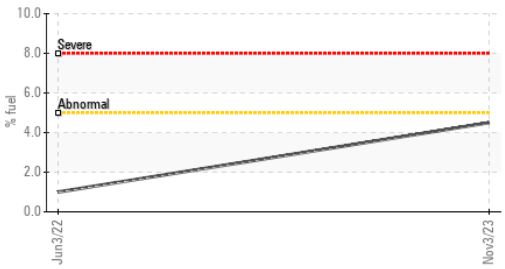
INFRA-RED		method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844	>3	**0.2**	0.1	0.1
Nitration	Abs/cm	*ASTM D7624	>20	**7.4**	4.7	5.5
Sulfation	Abs/.1mm	*ASTM D7415	>30	**23.7**	22.1	22.7

OIL ANALYSIS REPORT

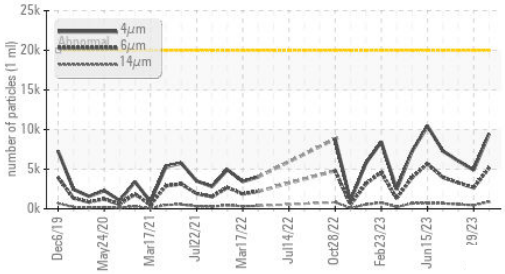
Particle Trend



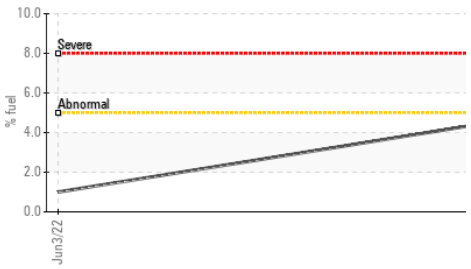
Fuel Dilution



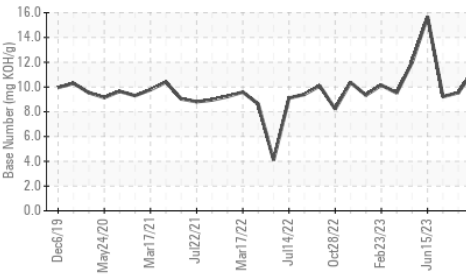
Particle Trend



Fuel Dilution



Base Number



FLUID CLEANLINESS		method	limit/base	current	history1	history2
Particles >4µm		ASTM D7647	>20000	**9474**	4889	6038
Particles >6µm		ASTM D7647	>5000	▲ **5161**	2663	3289
Particles >14µm		ASTM D7647	>640	▲ **878**	453	560
Particles >21µm		ASTM D7647	>160	▲ **296**	153	189
Particles >38µm		ASTM D7647	>40	▲ **46**	24	29
Particles >71µm		ASTM D7647	>10	**5**	2	3
Oil Cleanliness		ISO 4406 (c)	>21/19/16	▲ **20/20/17**	19/19/16	20/19/16

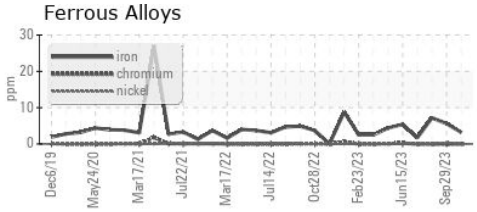
FLUID DEGRADATION		method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414	>25	**17.4**	15.1	15.6
Base Number (BN)	mg KOH/g	ASTM D2896		**9.01**	11.32	9.54

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

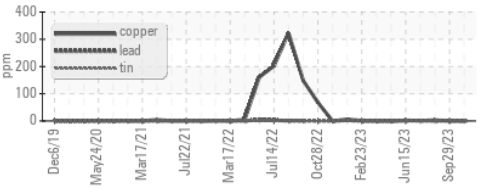
FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	14.4	▲ **12.0**	13.9	13.3

GRAPHS

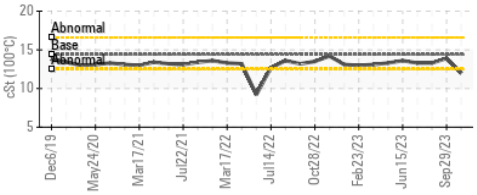
Ferrous Alloys



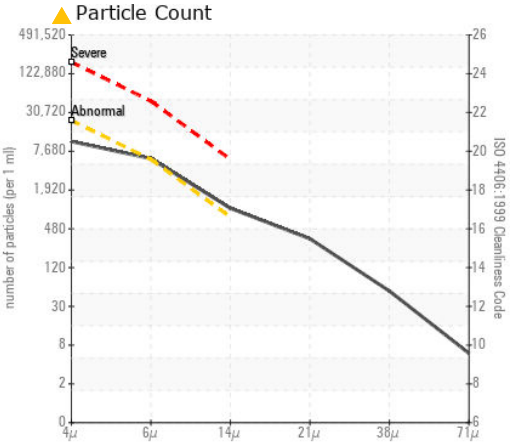
Non-ferrous Metals



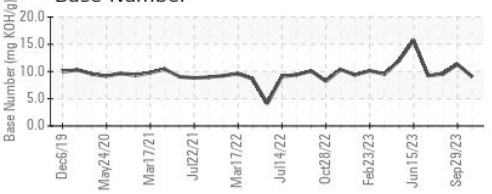
Viscosity @ 100°C



Particle Count



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : KL0013125 **Received** : 16 Nov 2023
Lab Number : 06010280 **Diagnosed** : 22 Nov 2023
Unique Number : 10749424 **Diagnostician** : Don Baldridge
Test Package : MOB 2 (Additional Tests: FuelDilution, PercentFuel, PrtCount)

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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