



OIL ANALYSIS REPORT

WEAR	NORMAL
CONTAMINATION	NORMAL
FLUID CONDITION	NORMAL



Area
RIG 5
Machine Id
CATERPILLAR 3512 R5-G-02 NKL
Component
Diesel Engine
Fluid
{not provided} (--- GAL)

RECOMMENDATION

Resample at the next service interval to monitor.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		KL0014248	KL0013865	KL0013842
Sample Date		Client Info		10 May 2024	20 Mar 2024	16 Feb 2024
Machine Age	days	Client Info		45412	45326	45338
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				NORMAL	NORMAL	NORMAL

WEAR

All component wear rates are normal.

Iron	ppm	ASTM D5185m	>100	3	4	0
Chromium	ppm	ASTM D5185m	>20	<1	0	<1
Nickel	ppm	ASTM D5185m	>2	<1	0	0
Titanium	ppm	ASTM D5185m	>2	11	<1	<1
Silver	ppm	ASTM D5185m	>2	1	0	0
Aluminum	ppm	ASTM D5185m	>25	3	3	4
Lead	ppm	ASTM D5185m	>40	<1	0	<1
Copper	ppm	ASTM D5185m	>330	1	<1	<1
Tin	ppm	ASTM D5185m	>15	<1	0	<1
Vanadium	ppm	ASTM D5185m		<1	0	0
White Metal	scalar	*Visual	NONE	NONE	MODER	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE

CONTAMINATION

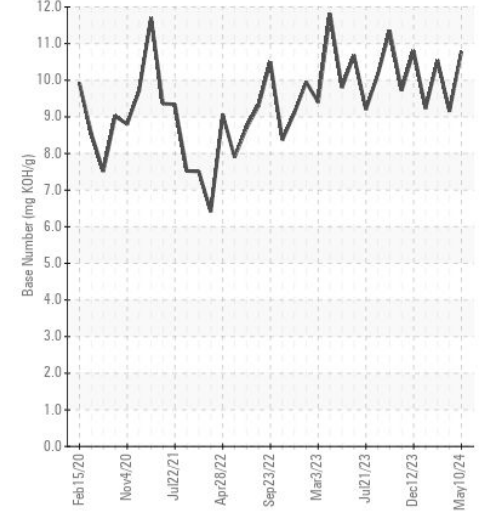
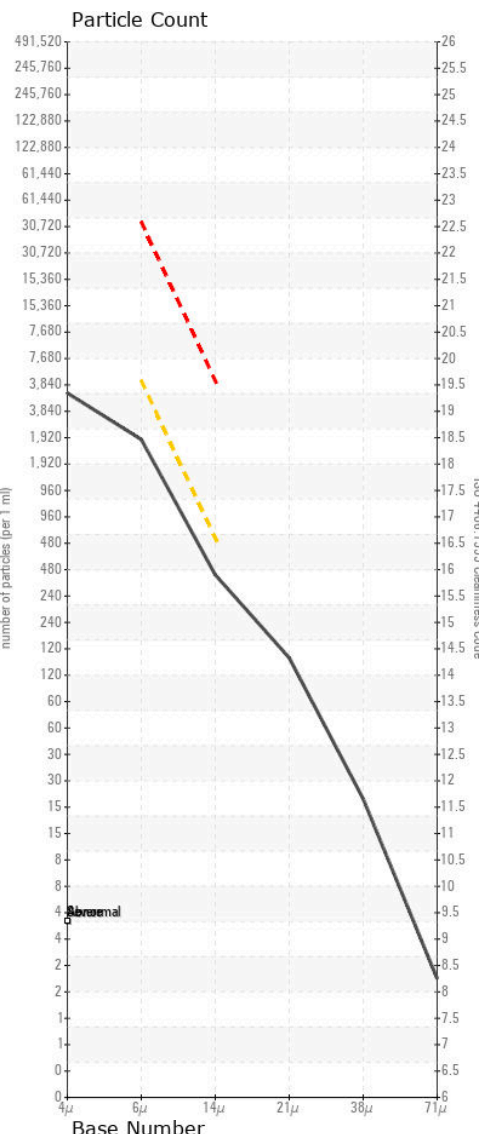
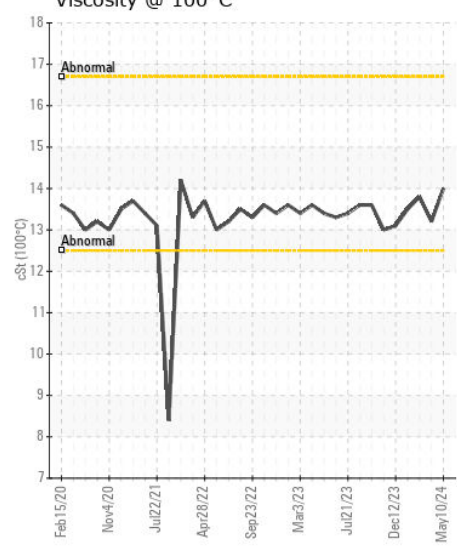
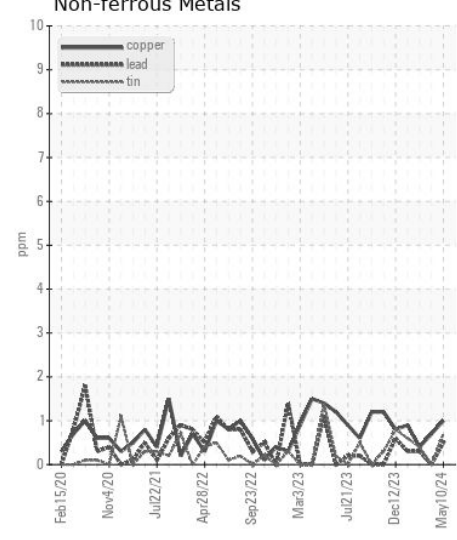
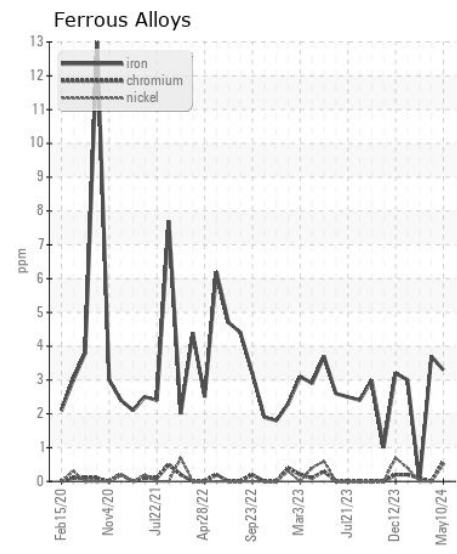
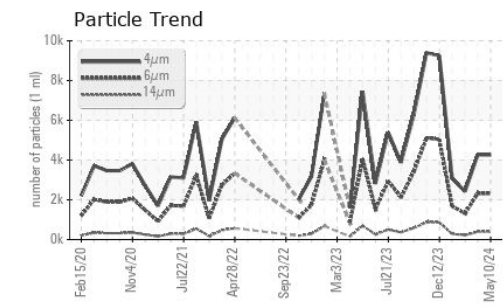
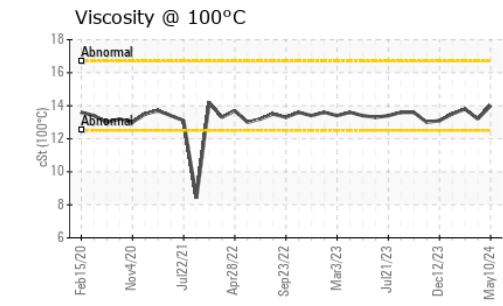
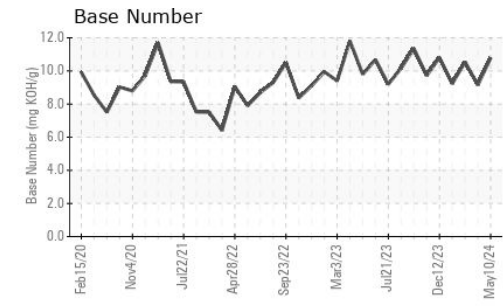
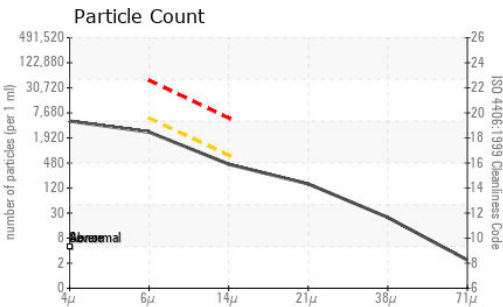
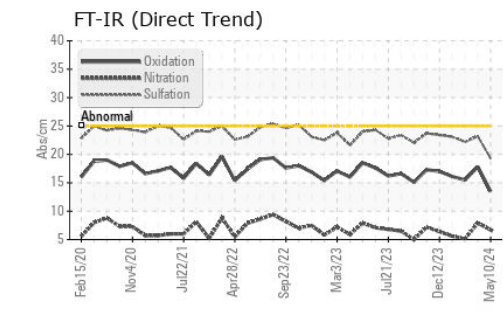
There is no indication of any contamination in the oil. The amount and size of particulates present in the system are acceptable.

Silicon	ppm	ASTM D5185m	>25	6	8	5
Potassium	ppm	ASTM D5185m	>20	4	2	2
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	0.1
Nitration	Abs/cm	*ASTM D7624	>20	6.7	7.9	5.1
Sulfation	Abs/.1mm	*ASTM D7415	>30	19.3	23.2	22.2
Particles >4µm		ASTM D7647		4254	4263	2418
Particles >6µm		ASTM D7647	>5000	2317	2322	1317
Particles >14µm		ASTM D7647	>640	394	395	224
Particles >21µm		ASTM D7647	>160	133	133	76
Particles >38µm		ASTM D7647	>40	21	21	12
Particles >71µm		ASTM D7647	>10	2	2	1
Oil Cleanliness		ISO 4406 (c)	>19/16	18/16	18/16	18/15
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		3	0	<1
Boron	ppm	ASTM D5185m		215	372	319
Barium	ppm	ASTM D5185m		<1	0	0
Molybdenum	ppm	ASTM D5185m		64	120	108
Manganese	ppm	ASTM D5185m		<1	0	<1
Magnesium	ppm	ASTM D5185m		737	657	666
Calcium	ppm	ASTM D5185m		1520	1592	1454
Phosphorus	ppm	ASTM D5185m		696	808	688
Zinc	ppm	ASTM D5185m		848	856	837
Sulfur	ppm	ASTM D5185m		3138	2836	2492
Oxidation	Abs/.1mm	*ASTM D7414	>25	13.5	17.8	15.5
Base Number (BN)	mg KOH/g	ASTM D2896		10.78	9.15	10.54
Visc @ 100°C	cSt	ASTM D445		14.0	13.2	13.8



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : KL0014248
Lab Number : 06191202
Unique Number : 11047954
Test Package : MOB 2 (Additional Tests: PrtCount)

Received : 24 May 2024
Tested : 30 May 2024
Diagnosed : 30 May 2024 - Angela Borella

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

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)