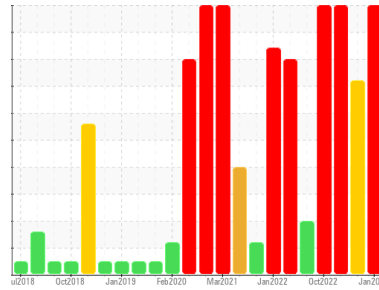




OIL ANALYSIS REPORT

Sample Rating Trend



GLYCOL



Area
GUAY SON [CONHER]
Machine Id
CATERPILLAR NAUTICO 5 - IBACO
Component
Diesel Engine
Fluid
XTRA REV 15W40 (160 LTR)

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 advise that you inspect for the source(s) of wear. We recommend an early resample to monitor this condition.

Wear

The copper level is abnormal. Cylinder, crank, or cam shaft wear is indicated. 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. Fuel content negligible. There is a moderate amount of particulates present in the oil. Elemental level of silicon (Si) above normal indicating ingress of seal material.

Fluid Condition

The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil. The oil is no longer serviceable due to the presence of contaminants.

SAMPLE INFORMATION

	method	limit/base	current	history1	history2
Sample Number	Client Info		KL0013487	KL0012824	KL0011219
Sample Date	Client Info		20 Jan 2024	15 Sep 2023	12 Nov 2022
Machine Age	hrs	Client Info	0	13758	12672
Oil Age	hrs	Client Info	726	20	893
Oil Changed	Client Info		Changed	Not Changd	Not Changd
Sample Status			SEVERE	SEVERE	SEVERE

CONTAMINATION

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

WEAR METALS

	method	limit/base	current	history1	history2	
Iron	ppm	ASTM D5185m	>100	318	18	21
Chromium	ppm	ASTM D5185m	>20	<1	2	1
Nickel	ppm	ASTM D5185m	>2	<1	<1	<1
Titanium	ppm	ASTM D5185m	>2	0	<1	0
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>25	2	<1	1
Lead	ppm	ASTM D5185m	>40	3	4	9
Copper	ppm	ASTM D5185m	>330	336	162	553
Tin	ppm	ASTM D5185m	>15	<1	<1	<1
Vanadium	ppm	ASTM D5185m		0	<1	0
Cadmium	ppm	ASTM D5185m		0	0	0

ADDITIVES

	method	limit/base	current	history1	history2	
Boron	ppm	ASTM D5185m		1	25	9
Barium	ppm	ASTM D5185m		<1	0	0
Molybdenum	ppm	ASTM D5185m		9	69	158
Manganese	ppm	ASTM D5185m		3	<1	<1
Magnesium	ppm	ASTM D5185m		51	12	66
Calcium	ppm	ASTM D5185m		2570	2685	2706
Phosphorus	ppm	ASTM D5185m		1033	1182	1077
Zinc	ppm	ASTM D5185m		1161	1467	1279
Sulfur	ppm	ASTM D5185m		3624	4387	4227

CONTAMINANTS

	method	limit/base	current	history1	history2	
Silicon	ppm	ASTM D5185m	>25	26	14	27
Sodium	ppm	ASTM D5185m		540	114	290
Potassium	ppm	ASTM D5185m	>20	155	349	688
Fuel	%	ASTM D3524	>5	0.7	14.4	6.7
Glycol	%	*ASTM D2982		0.10	NEG	0.10

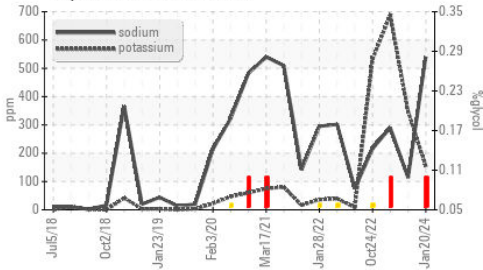
INFRA-RED

	method	limit/base	current	history1	history2	
Soot %	%	*ASTM D7844	>3	0.1	0	0.3
Nitration	Abs/cm	*ASTM D7624	>20	6.8	9.5	11.0
Sulfation	Abs.1mm	*ASTM D7415	>30	16.4	18.1	19.5

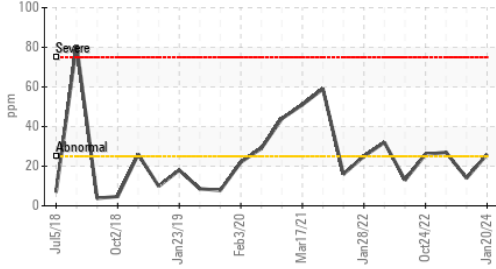


OIL ANALYSIS REPORT

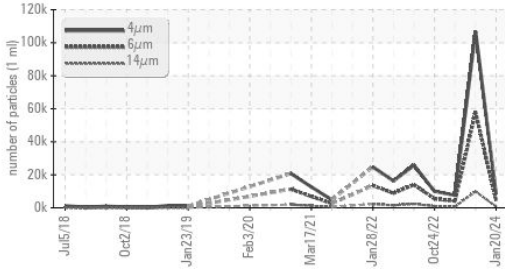
Glycol Contamination



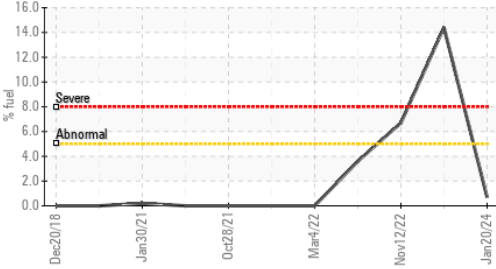
Silicon (ppm)



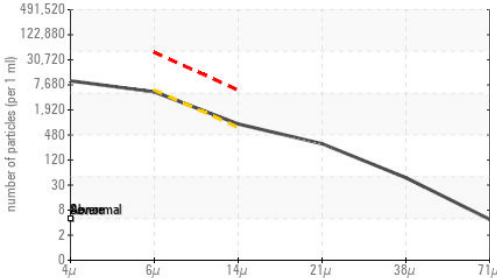
Particle Trend



Fuel Dilution



Particle Count



FLUID CLEANLINESS	method	limit/base	current	history1	history2
Particles >4µm	ASTM D7647		8334	106684	7521
Particles >6µm	ASTM D7647	>5000	4540	▲ 58117	4097
Particles >14µm	ASTM D7647	>640	▲ 773	▲ 9891	▲ 697
Particles >21µm	ASTM D7647	>160	▲ 260	▲ 3332	▲ 235
Particles >38µm	ASTM D7647	>40	40	▲ 514	36
Particles >71µm	ASTM D7647	>10	4	▲ 53	4
Oil Cleanliness	ISO 4406 (c)	>19/16	▲ 19/17	▲ 23/20	▲ 19/17

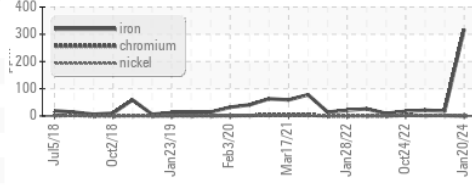
FLUID DEGRADATION	method	limit/base	current	history1	history2
Oxidation	Abs./1mm *ASTM D7414	>25	8.4	9.4	11.5
Base Number (BN)	mg KOH/g ASTM D2896		9.29	9.86	9.52

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

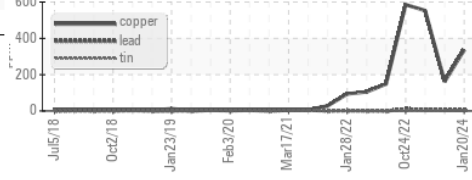
FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt ASTM D445		▲ 11.6	▲ 11.1	▲ 11.1

GRAPHS

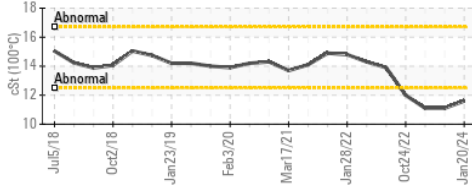
Ferrous Alloys



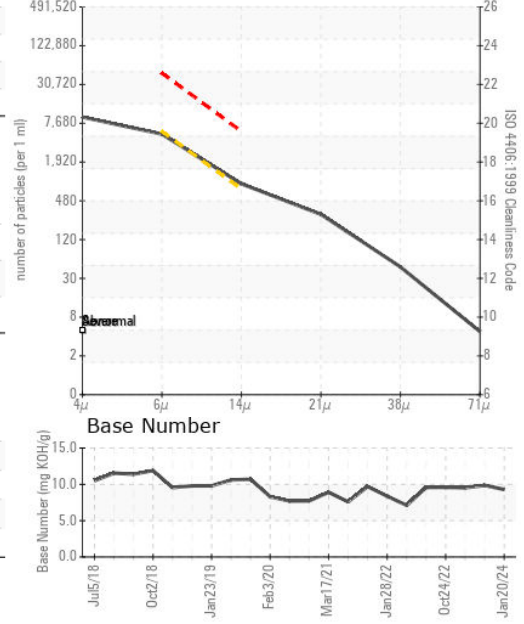
Non-ferrous Metals



Viscosity @ 100°C



Particle Count



Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : KL0013487 **Received** : 30 Jan 2024
Lab Number : **06074988** **Diagnosed** : 02 Feb 2024
Unique Number : 10857079 **Diagnostician** : Jonathan Hester
Test Package : MOB 2 (Additional Tests: Glycol, PercentFuel, PrtCount)

CONOR
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 HERMOSILLO,
 MX 83140
 Contact: EDUARDO GARCIA
 egarcia.comsa@gmail.com
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 F: x:

Certificate L2367
 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)