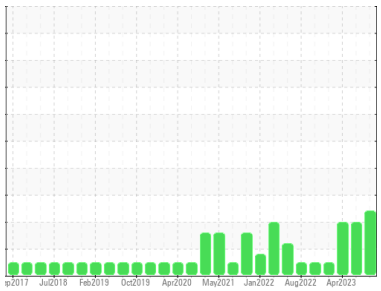
OIL ANALYSIS REPORT

Sample Rating Trend



ISO

Machine Id
NORTHERN LIGHTS X6
Component
Starboard Genset
Fluid
CHEVRON DELO 400 MULTIGRADE 15W40 (5 QTS)

DIAGNOSIS

Recommendation
Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.

Wear
All component wear rates are normal.

Contamination
There is a high amount of particulates present in the oil.

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.

SAMPLE INFORMATION		method	limit/base	current	history1	history2
Sample Number		Client Info		**KL0013497**	KL0013493	KL0008982
Sample Date		Client Info		**27 May 2024**	30 Apr 2024	20 Apr 2023
Machine Age	hrs	Client Info		**15067**	13668	11827
Oil Age	hrs	Client Info		**250**	270	448
Oil Changed		Client Info		**Changed**	Changed	Changed
Sample Status				**ABNORMAL**	ATTENTION	ABNORMAL

CONTAMINATION		method	limit/base	current	history1	history2
Fuel		WC Method	>4.0	**<1.0**	<1.0	<1.0
Water		WC Method	>0.1	**NEG**	NEG	NEG
Glycol		WC Method		**NEG**	NEG	NEG

WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>50	**5**	9	14
Chromium	ppm	ASTM D5185m	>4	**0**	<1	<1
Nickel	ppm	ASTM D5185m	>2	**<1**	<1	0
Titanium	ppm	ASTM D5185m		**0**	<1	0
Silver	ppm	ASTM D5185m	>5	**0**	<1	0
Aluminum	ppm	ASTM D5185m	>12	**2**	2	2
Lead	ppm	ASTM D5185m	>17	**0**	<1	0
Copper	ppm	ASTM D5185m	>70	**<1**	4	<1
Tin	ppm	ASTM D5185m	>15	**0**	<1	<1
Vanadium	ppm	ASTM D5185m		**0**	<1	0
Cadmium	ppm	ASTM D5185m		**0**	<1	0

ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m		**20**	63	33
Barium	ppm	ASTM D5185m		**0**	0	0
Molybdenum	ppm	ASTM D5185m		**2**	6	<1
Manganese	ppm	ASTM D5185m		**<1**	<1	<1
Magnesium	ppm	ASTM D5185m		**320**	792	819
Calcium	ppm	ASTM D5185m		**2050**	1397	1474
Phosphorus	ppm	ASTM D5185m	1360	**880**	781	745
Zinc	ppm	ASTM D5185m	1480	**1027**	911	911
Sulfur	ppm	ASTM D5185m		**4031**	3389	3648

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>25	**4**	6	6
Sodium	ppm	ASTM D5185m		**2**	2	3
Potassium	ppm	ASTM D5185m	>20	**4**	5	3

INFRA-RED		method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844		**0.3**	0.5	0.9
Nitration	Abs/cm	*ASTM D7624	>20	**7.6**	9.0	10.6
Sulfation	Abs/.1mm	*ASTM D7415	>30	**17.3**	19.0	21.1

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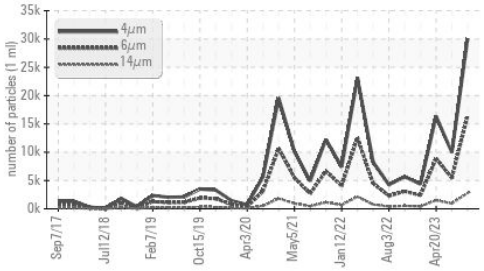
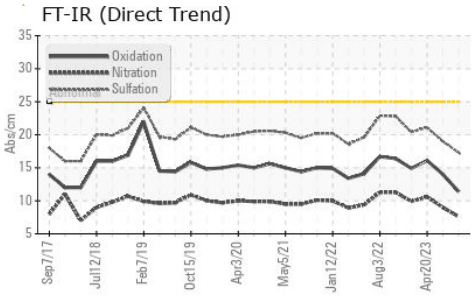
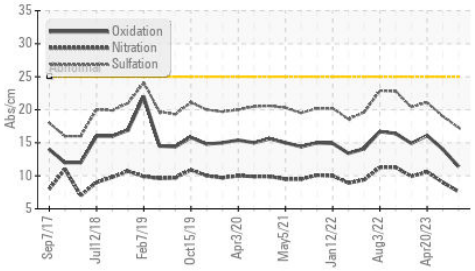
Particle Trend



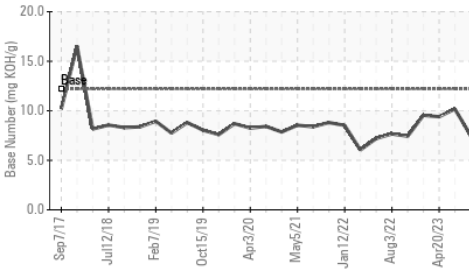
FT-IR (Direct Trend)



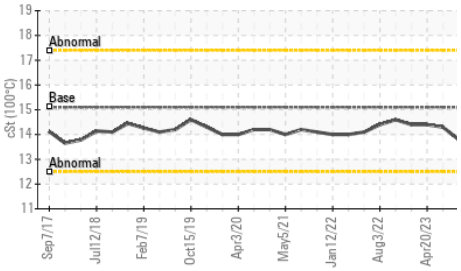
FT-IR (Direct Trend)



Base Number



Viscosity @ 100°C



FLUID CLEANLINESS		method	limit/base	current	history1	history2
Particles >4µm		ASTM D7647		**30040**	9978	16321
Particles >6µm		ASTM D7647	>5000	▲ **16365**	● 5436	▲ 8891
Particles >14µm		ASTM D7647	>640	▲ **2785**	● 925	▲ 1513
Particles >21µm		ASTM D7647	>160	▲ **938**	● 312	▲ 510
Particles >38µm		ASTM D7647	>40	▲ **145**	● 48	▲ 79
Particles >71µm		ASTM D7647	>10	● **15**	5	8
Oil Cleanliness		ISO 4406 (c)	>19/16	▲ **21/19**	● 20/17	▲ 20/18

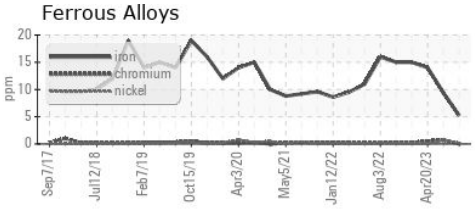
FLUID DEGRADATION		method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414	>25	**11.4**	14.0	16.1
Base Number (BN)	mg KOH/g	ASTM D2896	12.2	**7.5**	10.18	9.40

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	>0.1	**NEG**	NEG	NEG
Free Water	scalar	*Visual		**NEG**	NEG	NEG

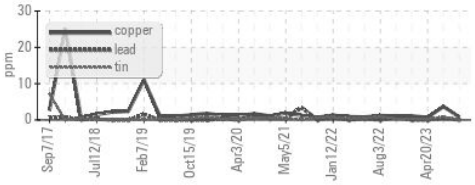
FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.1	**13.8**	14.3	14.4

GRAPHS

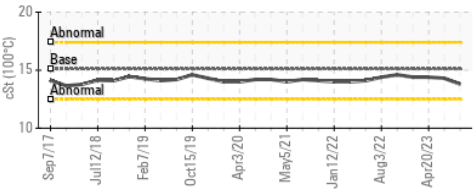
Ferrous Alloys



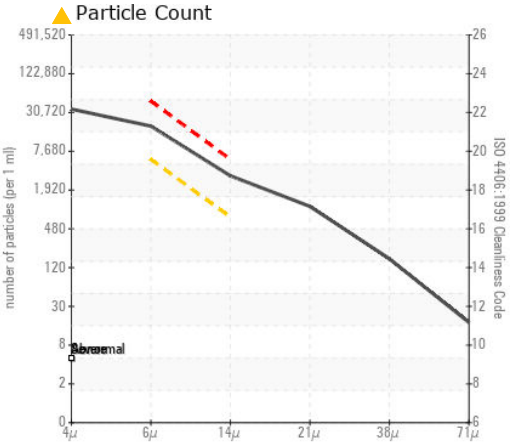
Non-ferrous Metals



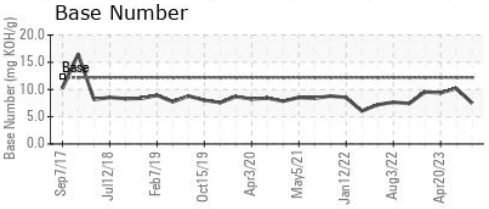
Viscosity @ 100°C



Particle Count



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : KL0013497
Lab Number : 06212762
Unique Number : 11085626
Test Package : MOB 2 (Additional Tests: PrtCount)

Received : 17 Jun 2024
Tested : 19 Jun 2024
Diagnosed : 19 Jun 2024 - Angela Borella

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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