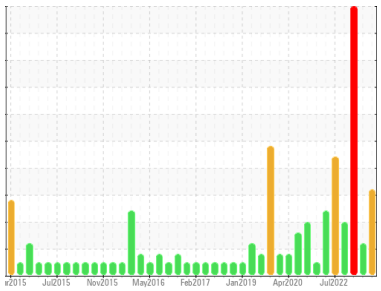
OIL ANALYSIS REPORT

Sample Rating Trend



FUEL

Machine Id
CATAMARAN X4
Component
Port Main Engine
Fluid
CHEVRON DELO 400 LE 15W40 (--- QTS)

DIAGNOSIS

Recommendation
We advise that you check the fuel injection system. 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 moderate amount of particulates present in the oil. There is a moderate amount of fuel present in the oil.

Fluid Condition
The BN result indicates that there is suitable alkalinity remaining in the oil. Fuel is present in the oil and is lowering the viscosity.

SAMPLE INFORMATION		method	limit/base	current	history1	history2
Sample Number		Client Info		**KL0013495**	KL0012668	KL0008921
Sample Date		Client Info		**11 Jun 2024**	11 Jul 2023	13 Dec 2022
Machine Age	hrs	Client Info		**11919**	18702	18702
Oil Age	hrs	Client Info		**258**	294	311
Oil Changed		Client Info		**Changed**	Changed	Changed
Sample Status				**ABNORMAL**	ATTENTION	SEVERE

CONTAMINATION		method	limit/base	current	history1	history2
Water		WC Method	>0.1	**NEG**	NEG	NEG
Glycol		WC Method		**NEG**	0.0	▲ 0.10

WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>75	**59**	47	▲ 175
Chromium	ppm	ASTM D5185m	>8	**1**	2	▲ 11
Nickel	ppm	ASTM D5185m	>2	**<1**	<1	▲ 8
Titanium	ppm	ASTM D5185m	>3	**0**	<1	<1
Silver	ppm	ASTM D5185m	>2	**0**	0	0
Aluminum	ppm	ASTM D5185m	>15	**2**	4	▲ 60
Lead	ppm	ASTM D5185m	>18	**4**	3	10
Copper	ppm	ASTM D5185m	>80	**41**	46	64
Tin	ppm	ASTM D5185m	>14	**3**	2	2
Vanadium	ppm	ASTM D5185m		**0**	<1	<1
Cadmium	ppm	ASTM D5185m		**0**	0	<1

ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m		**20**	19	59
Barium	ppm	ASTM D5185m		**0**	0	0
Molybdenum	ppm	ASTM D5185m		**4**	<1	2
Manganese	ppm	ASTM D5185m		**2**	1	2
Magnesium	ppm	ASTM D5185m		**717**	763	1373
Calcium	ppm	ASTM D5185m		**1226**	1360	1282
Phosphorus	ppm	ASTM D5185m	1200	**718**	664	548
Zinc	ppm	ASTM D5185m	1300	**783**	805	714
Sulfur	ppm	ASTM D5185m	3200	**3075**	3162	3559

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>20	**9**	9	10
Sodium	ppm	ASTM D5185m	>75	**7**	● 160	● 4924
Potassium	ppm	ASTM D5185m	>20	**4**	10	▲ 250
Fuel	%	ASTM D3524	>4.0	▲ **4.8**	<1.0	<1.0

INFRA-RED		method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844		**1.9**	2.2	4.8
Nitration	Abs/cm	*ASTM D7624	>20	**9.9**	10.9	65.7
Sulfation	Abs/.1mm	*ASTM D7415	>30	**22.2**	22.2	0.0

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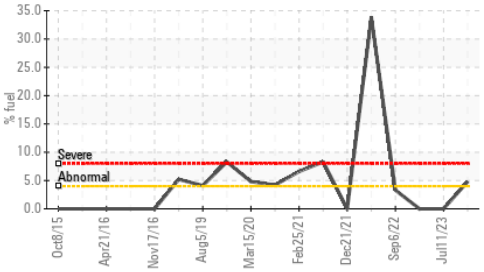
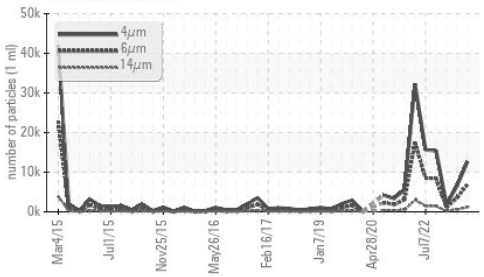
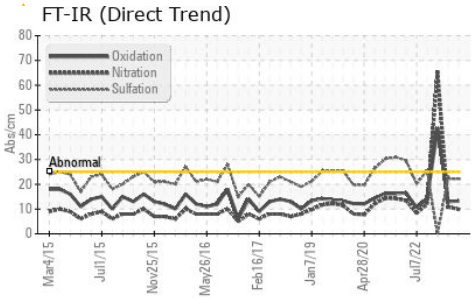
Fuel Dilution



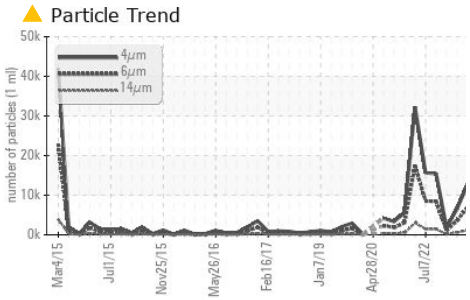
Particle Trend



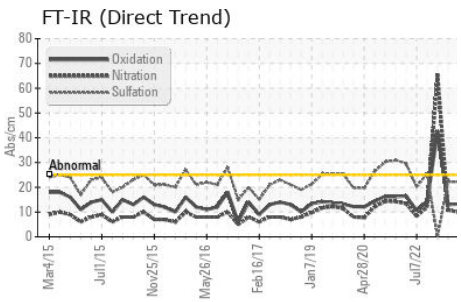
FT-IR (Direct Trend)



Particle Trend



FT-IR (Direct Trend)



FLUID CLEANLINESS		method	limit/base	current	history1	history2
Particles >4µm		ASTM D7647		**12675**	6568	1860
Particles >6µm		ASTM D7647	>5000	**6905**	3578	1013
Particles >14µm		ASTM D7647	>640	**1175**	609	172
Particles >21µm		ASTM D7647	>160	**396**	205	58
Particles >38µm		ASTM D7647	>40	**61**	32	9
Particles >71µm		ASTM D7647	>10	**6**	3	1
Oil Cleanliness		ISO 4406 (c)	>19/16	**20/17**	19/16	17/15

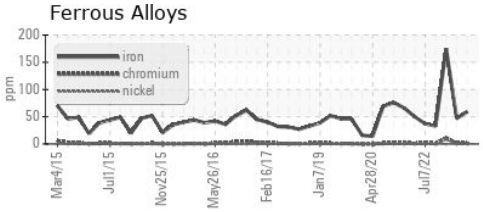
FLUID DEGRADATION		method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414	>25	**13.2**	13.0	42.8
Base Number (BN)	mg KOH/g	ASTM D2896	9.6	**5.7**	8.29	6.84

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

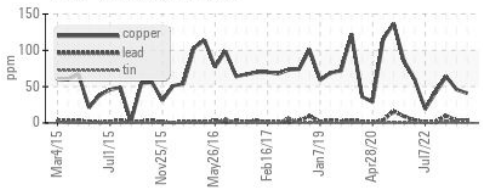
FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.7	**11.9**	12.8	15.3

GRAPHS

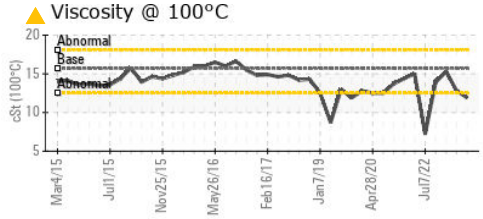
Ferrous Alloys



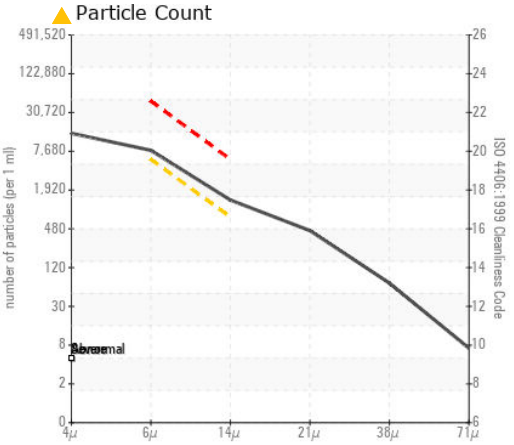
Non-ferrous Metals



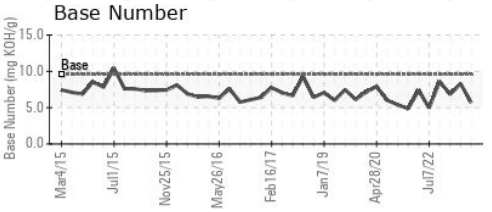
Viscosity @ 100°C



Particle Count



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : KL0013495 **Received** : 17 Jun 2024
Lab Number : 06212754 **Tested** : 20 Jun 2024
Unique Number : 11085618 **Diagnosed** : 20 Jun 2024 - Sean Felton
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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