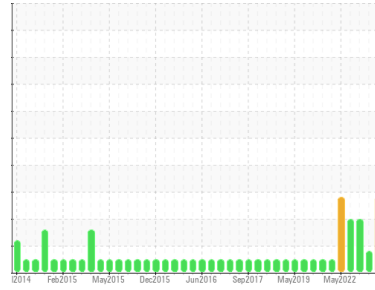




OIL ANALYSIS REPORT

Sample Rating Trend



WEAR



Machine Id

CATAMARAN X4

Component

Starboard Main Engine

Fluid

CHEVRON DELO 400 LE 15W40 (--- QTS)

DIAGNOSIS

Recommendation

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

Wear

The iron level is abnormal. All other component wear rates are normal.

Contamination

There is a high amount of particulates present in the oil. Elevated aluminum (Al) and/or lead (Pb) and potassium (K) levels in your metals analysis are likely a result of solder flux release into the lubricant and is common on new equipment/components.

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		KL0013494	KL0012669	KL0008922
Sample Date	Client Info		11 Jun 2024	11 Jul 2023	13 Dec 2022
Machine Age	hrs	Client Info	10338	18702	18702
Oil Age	hrs	Client Info	258	294	311
Oil Changed	Client Info		Changed	Changed	Changed
Sample Status			ABNORMAL	MARGINAL	ATTENTION

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

WEAR METALS

	method	limit/base	current	history1	history2	
Iron	ppm	ASTM D5185m	>75	▲ 123	34	31
Chromium	ppm	ASTM D5185m	>8	2	<1	1
Nickel	ppm	ASTM D5185m	>2	1	<1	0
Titanium	ppm	ASTM D5185m	>3	0	<1	0
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>15	8	2	3
Lead	ppm	ASTM D5185m	>18	1	4	2
Copper	ppm	ASTM D5185m	>80	45	▲ 107	64
Tin	ppm	ASTM D5185m	>14	<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		22	23	18
Barium	ppm	ASTM D5185m		0	0	0
Molybdenum	ppm	ASTM D5185m		22	1	3
Manganese	ppm	ASTM D5185m		2	<1	<1
Magnesium	ppm	ASTM D5185m		858	794	649
Calcium	ppm	ASTM D5185m		1253	1467	1348
Phosphorus	ppm	ASTM D5185m	1200	858	715	658
Zinc	ppm	ASTM D5185m	1300	982	883	805
Sulfur	ppm	ASTM D5185m	3200	3347	3298	2878

CONTAMINANTS

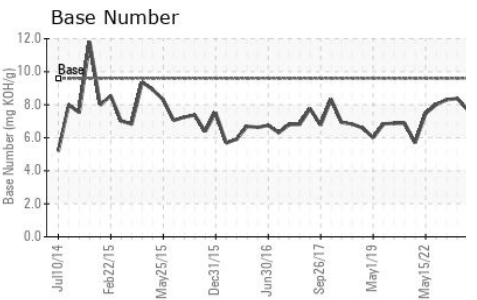
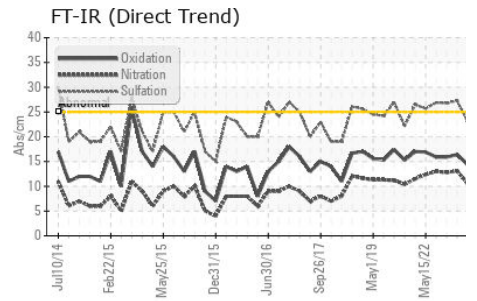
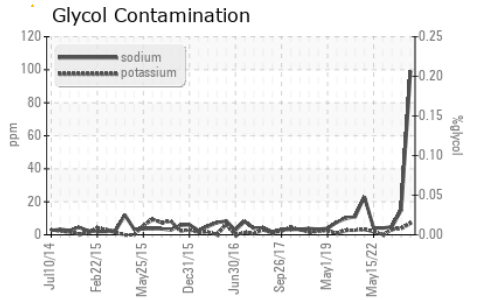
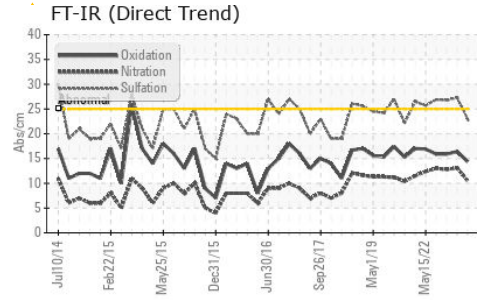
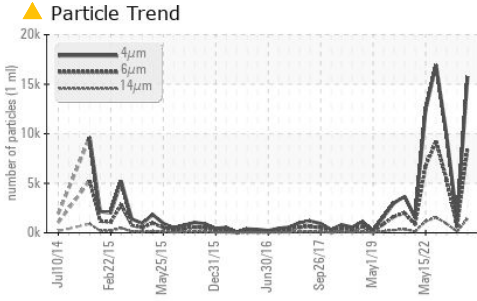
	method	limit/base	current	history1	history2	
Silicon	ppm	ASTM D5185m	>20	6	4	5
Sodium	ppm	ASTM D5185m	>75	99	15	5
Potassium	ppm	ASTM D5185m	>20	7	4	3
Glycol	%	*ASTM D2982		NEG	NEG	NEG

INFRA-RED

	method	limit/base	current	history1	history2	
Soot %	%	*ASTM D7844		2.5	4.2	3.3
Nitration	Abs/cm	*ASTM D7624	>20	10.5	13.1	12.8
Sulfation	Abs./1mm	*ASTM D7415	>30	23.0	27.3	26.8



OIL ANALYSIS REPORT



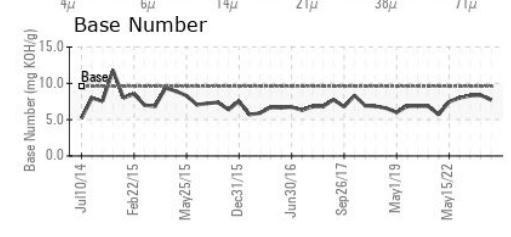
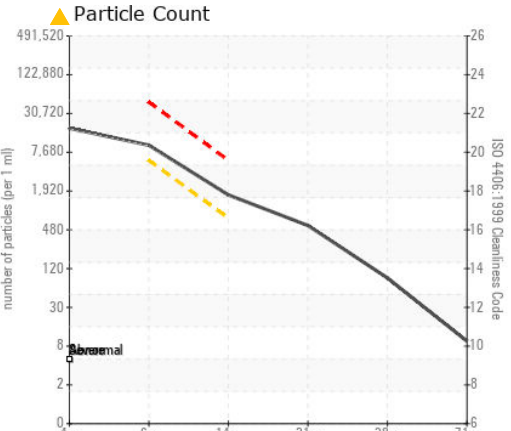
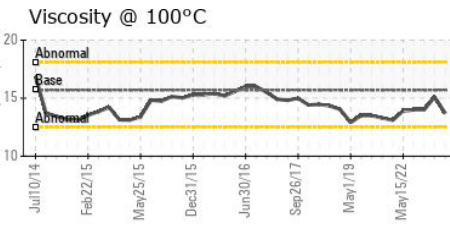
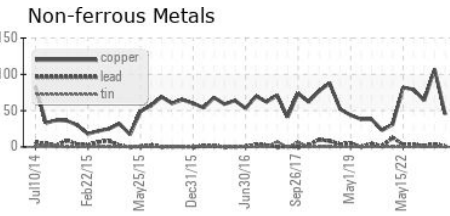
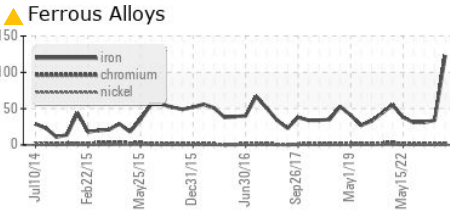
FLUID CLEANLINESS	method	limit/base	current	history1	history2
Particles >4µm	ASTM D7647		15764	1314	9861
Particles >6µm	ASTM D7647	>5000	8588	716	5372
Particles >14µm	ASTM D7647	>640	1461	122	914
Particles >21µm	ASTM D7647	>160	492	41	308
Particles >38µm	ASTM D7647	>40	76	6	48
Particles >71µm	ASTM D7647	>10	8	1	5
Oil Cleanliness	ISO 4406 (c)	>19/16	20/18	17/14	20/17

FLUID DEGRADATION	method	limit/base	current	history1	history2
Oxidation	Abs./1mm	*ASTM D7414 >25	14.4	16.4	15.9
Base Number (BN)	mg KOH/g	ASTM D2896 9.6	7.7	8.38	8.30

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	13.7	15.1	14.0

GRAPHS



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : KL0013494
Lab Number : 06212765
Unique Number : 11085629
Test Package : MOB 2 (Additional Tests: Glycol, PrtCount)

EXPEDITIONS
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 LAHAINA, HI
 US 96761
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 bill@go-lanai.com
 T: (800)695-2624
 F: (808)661-0544

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)