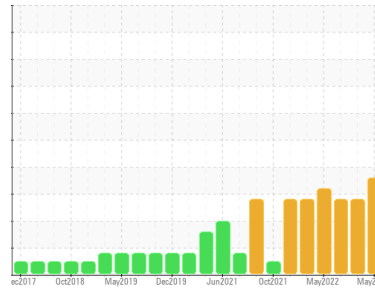




OIL ANALYSIS REPORT

Sample Rating Trend



WATER



Machine Id
MANN'S X6
 Component
Starboard Main Engine
 Fluid
Delvac ESP 5w40 (23 GAL)

DIAGNOSIS

Recommendation

We advise that you check for the source of water entry. Resample at the next service interval to monitor.

Wear

The copper level is abnormal. In the absence of other significant wear metals, suspect copper due to sources other than wear (i.e. cooling core).

Contamination

There is a moderate amount of particulates present in the oil. There is a moderate concentration of water 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		KL0013502	KL0008977	KL0008919
Sample Date	Client Info		01 May 2024	08 Jan 2023	04 Nov 2022
Machine Age	hrs	Client Info	14973	13003	12574
Oil Age	hrs	Client Info	500	429	520
Oil Changed	Client Info		N/A	Changed	Changed
Sample Status			ABNORMAL	ABNORMAL	ABNORMAL

CONTAMINATION

	method	limit/base	current	history1	history2
Fuel	WC Method	>4.0	<1.0	<1.0	<1.0

WEAR METALS

	method	limit/base	current	history1	history2	
Iron	ppm	ASTM D5185m	>75	7	5	5
Chromium	ppm	ASTM D5185m	>8	<1	<1	<1
Nickel	ppm	ASTM D5185m	>2	<1	<1	<1
Titanium	ppm	ASTM D5185m	>3	<1	<1	0
Silver	ppm	ASTM D5185m	>2	<1	0	0
Aluminum	ppm	ASTM D5185m	>15	2	<1	<1
Lead	ppm	ASTM D5185m	>18	<1	3	1
Copper	ppm	ASTM D5185m	>80	▲ 194	▲ 129	▲ 99
Tin	ppm	ASTM D5185m	>14	1	<1	<1
Vanadium	ppm	ASTM D5185m		<1	0	0
Cadmium	ppm	ASTM D5185m		<1	0	0

ADDITIVES

	method	limit/base	current	history1	history2	
Boron	ppm	ASTM D5185m		19	37	35
Barium	ppm	ASTM D5185m		0	0	0
Molybdenum	ppm	ASTM D5185m		63	16	57
Manganese	ppm	ASTM D5185m		<1	<1	<1
Magnesium	ppm	ASTM D5185m		1064	840	1090
Calcium	ppm	ASTM D5185m		887	1415	898
Phosphorus	ppm	ASTM D5185m		974	829	965
Zinc	ppm	ASTM D5185m		1202	1043	1268
Sulfur	ppm	ASTM D5185m		3563	3422	3529

CONTAMINANTS

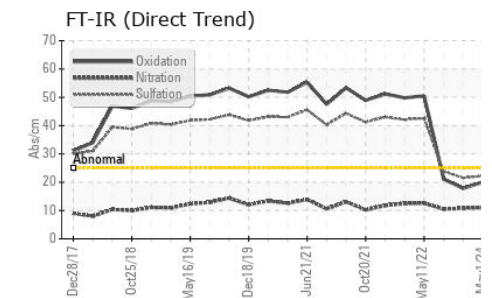
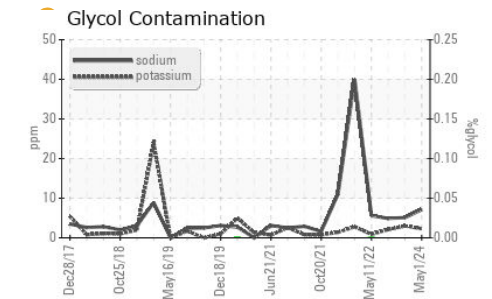
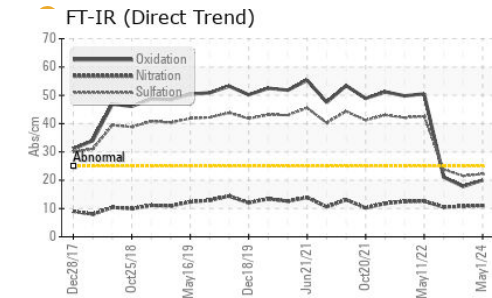
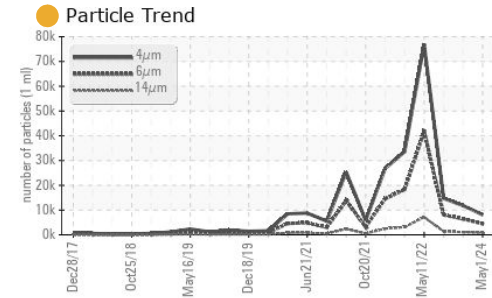
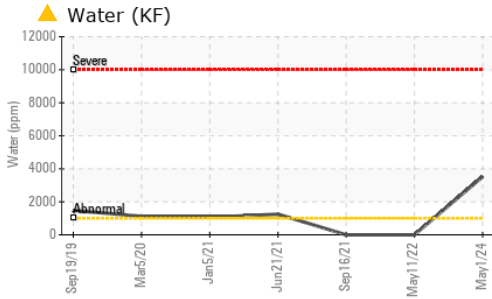
	method	limit/base	current	history1	history2	
Silicon	ppm	ASTM D5185m	>20	4	3	3
Sodium	ppm	ASTM D5185m	>75	7	5	5
Potassium	ppm	ASTM D5185m	>20	2	3	2
Water	%	ASTM D6304	>0.1	▲ 0.352	---	---
ppm Water	ppm	ASTM D6304	>1000	▲ 3520	---	---
Glycol	%	*ASTM D2982		NEG	NEG	NEG

INFRA-RED

	method	limit/base	current	history1	history2	
Soot %	%	*ASTM D7844		0.3	0.2	0.3
Nitration	Abs/cm	*ASTM D7624	>20	11.0	10.8	10.5
Sulfation	Abs/1mm	*ASTM D7415	>30	22.2	21.5	23.8



OIL ANALYSIS REPORT



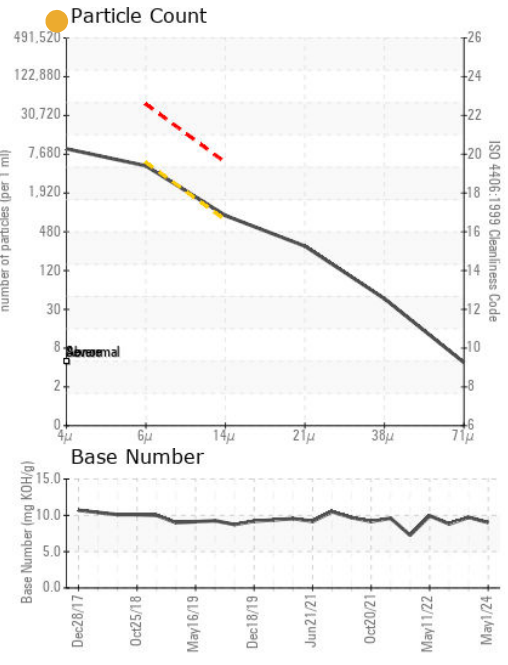
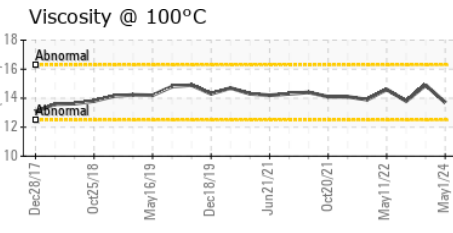
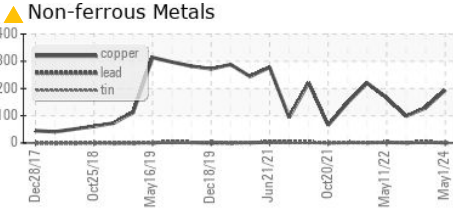
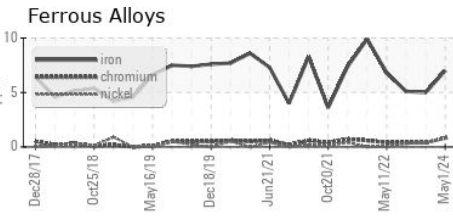
FLUID CLEANLINESS	method	limit/base	current	history1	history2
Particles >4µm	ASTM D7647		8117	11797	14707
Particles >6µm	ASTM D7647	>5000	4422	6426	8012
Particles >14µm	ASTM D7647	>640	753	1094	1363
Particles >21µm	ASTM D7647	>160	253	368	459
Particles >38µm	ASTM D7647	>40	39	57	71
Particles >71µm	ASTM D7647	>10	4	6	7
Oil Cleanliness	ISO 4406 (c)	>19/16	19/17	20/17	20/18

FLUID DEGRADATION	method	limit/base	current	history1	history2
Oxidation	Abs./1mm *ASTM D7414	>25	20.0	17.8	21.1
Base Number (BN)	mg KOH/g ASTM D2896		9.01	9.73	8.81

VISUAL	method	limit/base	current	history1	history2
White Metal	scalar *Visual	NONE	NONE	NONE	LIGHT
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	0.2%	NEG	NEG
Free Water	scalar *Visual		NEG	NEG	NEG

FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt ASTM D445		13.7	14.9	13.8

GRAPHS



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : KL0013502 **Received** : 17 May 2024
Lab Number : **06183444** **Tested** : 22 May 2024
Unique Number : 11034770 **Diagnosed** : 22 May 2024 - Jonathan Hester
Test Package : MOB 2 (Additional Tests: Glycol, KF, PrtCount)

EXPEDITIONS
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 LAHAINA, HI
 US 96761
 Contact: BILL CALDWELL
 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)