MAR II WEAR CHECK

OIL ANALYSIS REPORT

WEAR	ABNORMAL
CONTAMINATION	NORMAL
FLUID CONDITION	NORMAL

Machine Id
ENDEAVOR
Component
Starboard Main Engine
Fluid
TITAN 15W40 (--- QTS)

RECOMMENDATION

No corrective action is recommended at this time. 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). All other component wear rates are normal.

CONTAMINATION

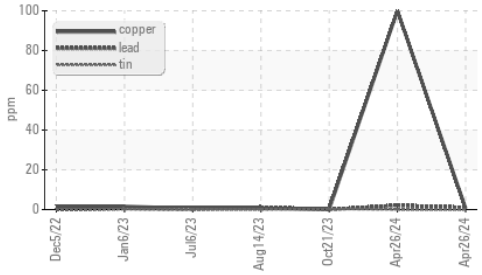
There is no indication of any contamination in the oil.

FLUID CONDITION

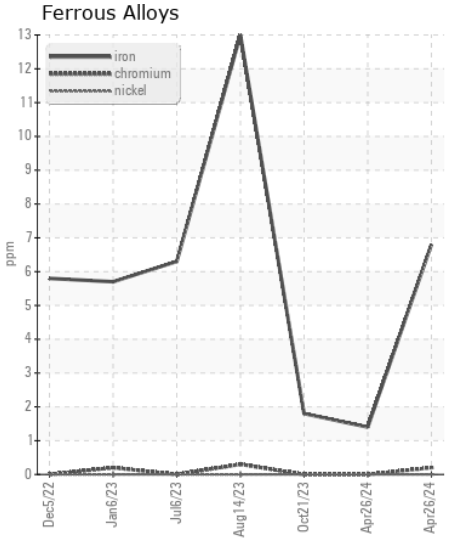
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		WC0834572	WC0834574	WC0847412
Sample Date		Client Info		26 Apr 2024	26 Apr 2024	21 Oct 2023
Machine Age	hrs	Client Info		15564	17446	16254
Oil Age	hrs	Client Info		72	286	94
Filter Age	hrs	Client Info		72	286	94
Oil Changed		Client Info		Not Changd	Not Changd	Not Changd
Filter Changed		Client Info		Not Changd	Not Changd	Not Changd
Sample Status				ABNORMAL	NORMAL	NORMAL
Iron	ppm	ASTM D5185m	>75	1	7	2
Chromium	ppm	ASTM D5185m	>8	0	<1	0
Nickel	ppm	ASTM D5185m	>2	0	0	0
Titanium	ppm	ASTM D5185m	>3	<1	<1	2
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>15	<1	1	1
Lead	ppm	ASTM D5185m	>18	2	1	0
Copper	ppm	ASTM D5185m	>80	▲ 100	<1	<1
Tin	ppm	ASTM D5185m	>14	0	0	<1
Vanadium	ppm	ASTM D5185m		0	0	<1
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Silicon	ppm	ASTM D5185m	>20	4	4	6
Potassium	ppm	ASTM D5185m	>20	1	3	3
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
Soot %	%	*ASTM D7844		0.1	0.1	0
Nitration	Abs/cm	*ASTM D7624	>20	5.6	7.0	6.3
Sulfation	Abs/.1mm	*ASTM D7415	>30	15.8	17.5	17.1
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
Sodium	ppm	ASTM D5185m	>75	<1	1	<1
Boron	ppm	ASTM D5185m		15	23	68
Barium	ppm	ASTM D5185m		0	0	0
Molybdenum	ppm	ASTM D5185m		4	8	19
Manganese	ppm	ASTM D5185m		<1	<1	<1
Magnesium	ppm	ASTM D5185m		46	92	167
Calcium	ppm	ASTM D5185m		2370	2444	2119
Phosphorus	ppm	ASTM D5185m		970	967	974
Zinc	ppm	ASTM D5185m		1137	1152	1183
Sulfur	ppm	ASTM D5185m		4536	4360	3851
Oxidation	Abs/.1mm	*ASTM D7414	>25	9.3	11.1	11.3
Base Number (BN)	mg KOH/g	ASTM D2896		7.5	7.3	7.6
Visc @ 100°C	cSt	ASTM D445		13.8	13.0	13.13

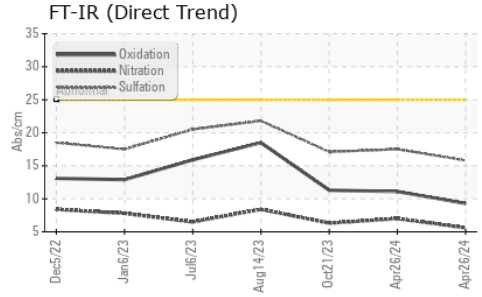
Non-ferrous Metals



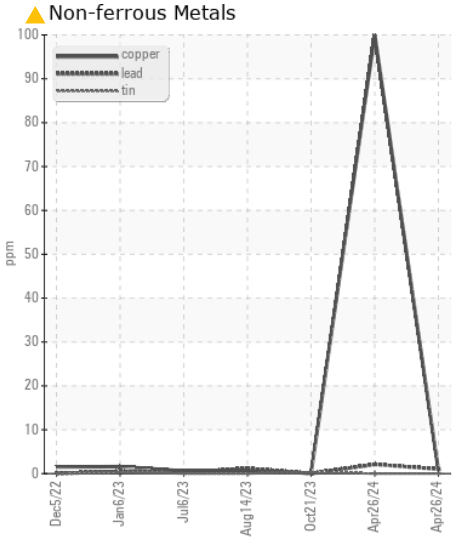
Ferrous Alloys



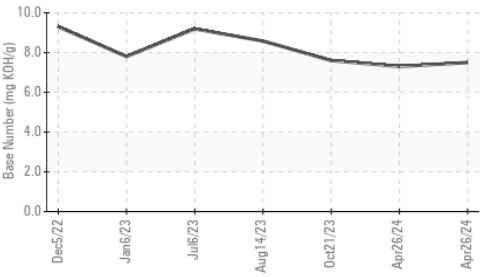
FT-IR (Direct Trend)



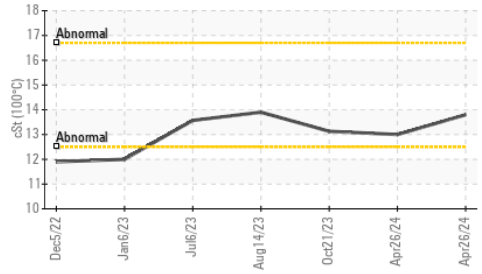
Non-ferrous Metals



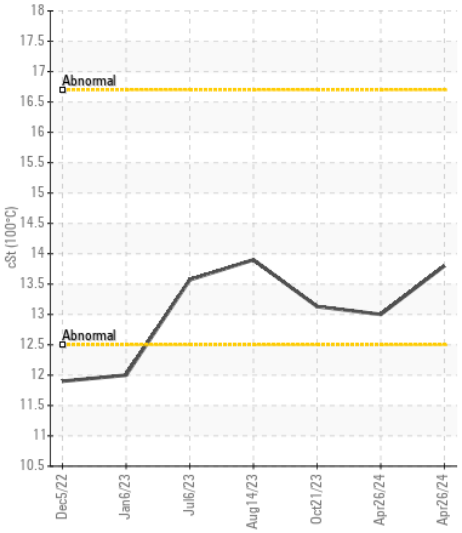
Base Number



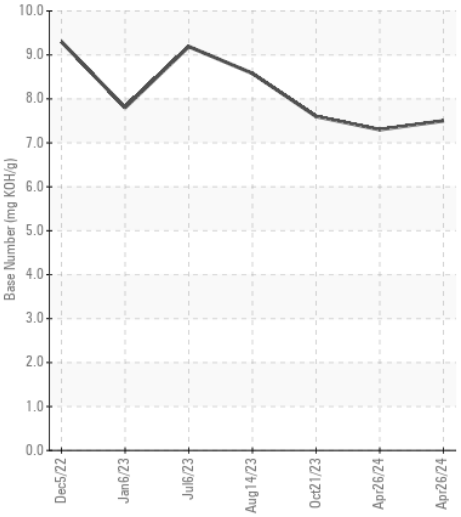
Viscosity @ 100°C



Viscosity @ 100°C



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0834572
Lab Number : 06176946
Unique Number : 11022999
Test Package : MAR 2

Received : 13 May 2024
Tested : 14 May 2024
Diagnosed : 14 May 2024 - Don Baldridge

CITY EXPERIENCES - SEAWARD EXPLORER
2825 5TH AVENUE
SAN DIEGO, CA
US 92103
Contact: PETER CHARBONNET

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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