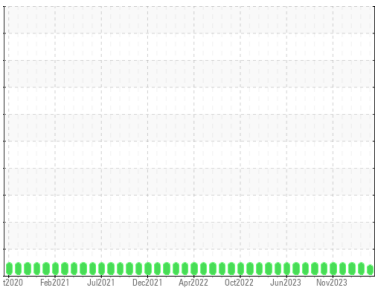
OIL ANALYSIS REPORT

Sample Rating Trend



VISCOSITY

Area
Patoka
Machine Id
[Patoka] Oil - Starboard Main Engine
Component
Starboard Main Engine
Fluid
Main Engine Oil (150 GAL)

DIAGNOSIS

Recommendation
No corrective action is recommended at this time. Resample at the next service interval to monitor. (Customer Sample Comment: J. Harvey)

Wear
All component wear rates are normal.

Contamination
There is no indication of any contamination in the oil.

Fluid Condition
The oil viscosity is higher than normal. The BN result indicates that there is suitable alkalinity remaining in the oil.

SAMPLE INFORMATION		method	limit/base	current	history1	history2
Sample Number		Client Info		**WC0860080**	WC0860087	WC0805566
Sample Date		Client Info		**05 May 2024**	09 Mar 2024	15 Feb 2024
Machine Age	hrs	Client Info		**44859**	43662	0
Oil Age	hrs	Client Info		**7000**	5803	0
Oil Changed		Client Info		**N/A**	N/A	N/A
Sample Status				**MARGINAL**	NORMAL	NORMAL

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

WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>75	**87**	77	54
Chromium	ppm	ASTM D5185m	>8	**2**	1	<1
Nickel	ppm	ASTM D5185m	>2	**<1**	<1	0
Titanium	ppm	ASTM D5185m	>3	**<1**	<1	<1
Silver	ppm	ASTM D5185m	>2	**<1**	<1	0
Aluminum	ppm	ASTM D5185m	>15	**3**	2	1
Lead	ppm	ASTM D5185m	>18	**10**	6	2
Copper	ppm	ASTM D5185m	>80	**63**	36	31
Tin	ppm	ASTM D5185m	>14	**2**	2	<1
Vanadium	ppm	ASTM D5185m		**<1**	<1	0
Cadmium	ppm	ASTM D5185m		**<1**	<1	0

ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m		**8**	9	9
Barium	ppm	ASTM D5185m		**<1**	0	0
Molybdenum	ppm	ASTM D5185m		**71**	71	67
Manganese	ppm	ASTM D5185m		**2**	1	<1
Magnesium	ppm	ASTM D5185m		**1711**	1637	1628
Calcium	ppm	ASTM D5185m		**1272**	1221	1211
Phosphorus	ppm	ASTM D5185m		**1172**	1126	1070
Zinc	ppm	ASTM D5185m		**1426**	1342	1354
Sulfur	ppm	ASTM D5185m		**3159**	2931	2967

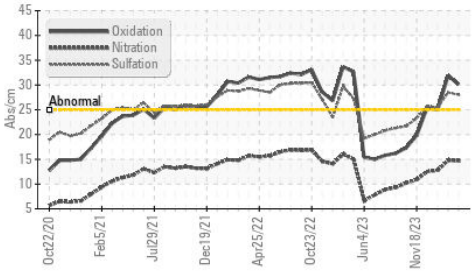
CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>20	**6**	6	6
Sodium	ppm	ASTM D5185m	>75	**12**	15	19
Potassium	ppm	ASTM D5185m	>20	**2**	2	0
Water	%	ASTM D6304	>0.1	**NEG**	NEG	NEG

INFRA-RED		method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844		**1**	0.9	1
Nitration	Abs/cm	*ASTM D7624	>20	**14.7**	14.8	12.8
Sulfation	Abs/.1mm	*ASTM D7415	>30	**28.0**	28.5	25.5

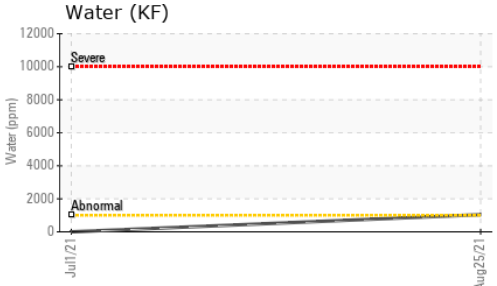
FLUID DEGRADATION		method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414	>25	**30.1**	31.9	25.0
Base Number (BN)	mg KOH/g	ASTM D2896		**10.87**	10.44	9.49

OIL ANALYSIS REPORT

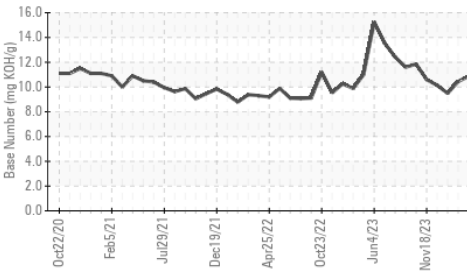
FT-IR (Direct Trend)



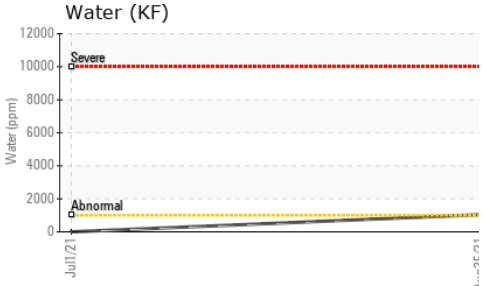
Water (KF)



Base Number



Water (KF)

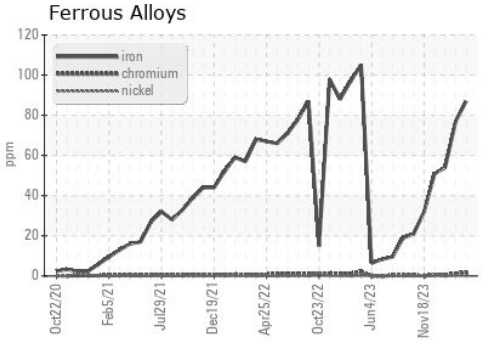


VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Precipitate	scalar	*Visual	NONE	**NONE**	NONE	NONE
Silt	scalar	*Visual	NONE	**NONE**	NONE	NONE
Debris	scalar	*Visual	NONE	**NONE**	NONE	NONE
Sand/Dirt	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

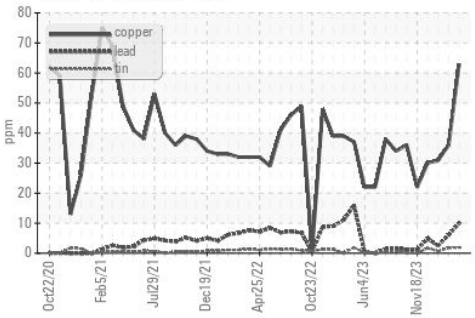
FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445		▲ **16.9**	15.7	14.7

GRAPHS

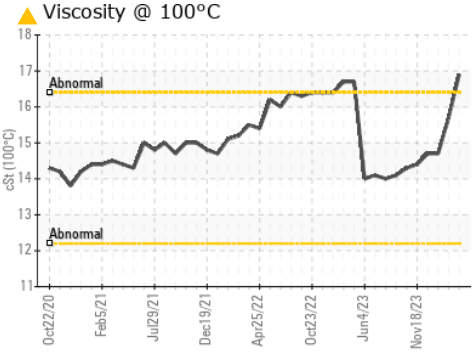
Ferrous Alloys



Non-ferrous Metals



▲ Viscosity @ 100°C



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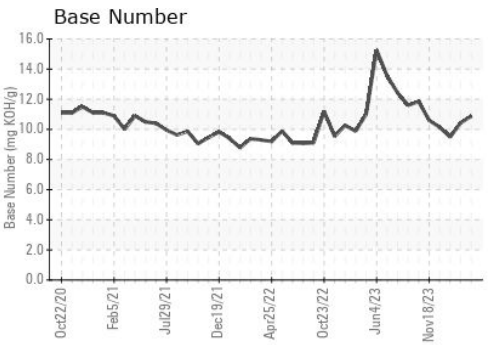

Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0860080 **Received** : 16 May 2024
Lab Number : 06181551 **Tested** : 20 May 2024
Unique Number : 11032877 **Diagnosed** : 20 May 2024 - Jonathan Hester
Test Package : IND 2 (Additional Tests: KF)

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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