



WEAR	<b>NORMAL</b>
CONTAMINATION	<b>NORMAL</b>
FLUID CONDITION	<b>NORMAL</b>

Machine Id  
**BELLEVUE**  
Component  
**Starboard Main Engine**  
Fluid  
**DIESEL ENGINE OIL SAE 15W40 (12 GAL)**

**RECOMMENDATION**

Resample at the next service interval to monitor. Please specify the component make and model with your next sample. Please specify the brand, type, and viscosity of the oil on your next sample.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		<b>MW0048410</b>	MW0057123	MW0048327
Sample Date		Client Info		<b>07 May 2024</b>	15 Mar 2024	04 Dec 2023
Machine Age	hrs	Client Info		<b>12010</b>	11250	9801
Oil Age	hrs	Client Info		<b>750</b>	0	750
Filter Age	hrs	Client Info		<b>750</b>	0	750
Oil Changed		Client Info		<b>Changed</b>	Changed	Changed
Filter Changed		Client Info		<b>Changed</b>	Changed	Changed
Sample Status				<b>NORMAL</b>	NORMAL	ATTENTION

**WEAR**

All component wear rates are normal.

Iron	ppm	ASTM D5185m	>75	<b>14</b>	10	2
Chromium	ppm	ASTM D5185m	>8	<b>&lt;1</b>	0	0
Nickel	ppm	ASTM D5185m	>2	<b>0</b>	0	<1
Titanium	ppm	ASTM D5185m	>3	<b>&lt;1</b>	0	0
Silver	ppm	ASTM D5185m	>2	<b>0</b>	0	0
Aluminum	ppm	ASTM D5185m	>15	<b>1</b>	<1	<1
Lead	ppm	ASTM D5185m	>18	<b>3</b>	2	2
Copper	ppm	ASTM D5185m	>80	<b>2</b>	2	3
Tin	ppm	ASTM D5185m	>14	<b>&lt;1</b>	0	0
Vanadium	ppm	ASTM D5185m		<b>0</b>	0	<1
White Metal	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE

**CONTAMINATION**

There is no indication of any contamination in the oil.

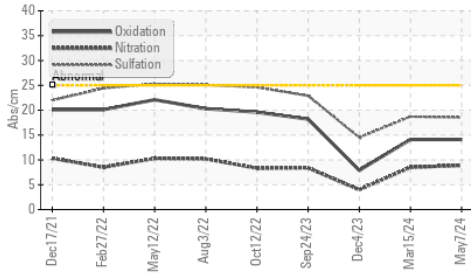
Silicon	ppm	ASTM D5185m	>20	<b>4</b>	3	2
Potassium	ppm	ASTM D5185m	>20	<b>&lt;1</b>	<1	<1
Fuel		WC Method	>4.0	<b>&lt;1.0</b>	<1.0	1.2
Water		WC Method	>0.1	<b>NEG</b>	NEG	NEG
Glycol		WC Method		<b>NEG</b>	NEG	NEG
Soot %	%	*ASTM D7844		<b>0.3</b>	0.3	0.1
Nitration	Abs/cm	*ASTM D7624	>20	<b>8.9</b>	8.5	4.0
Sulfation	Abs/.1mm	*ASTM D7415	>30	<b>18.5</b>	18.7	14.5
Silt	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Debris	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Appearance	scalar	*Visual	NORML	<b>NORML</b>	NORML	NORML
Odor	scalar	*Visual	NORML	<b>NORML</b>	NORML	NORML
Emulsified Water	scalar	*Visual	>0.1	<b>NEG</b>	NEG	NEG

**FLUID CONDITION**

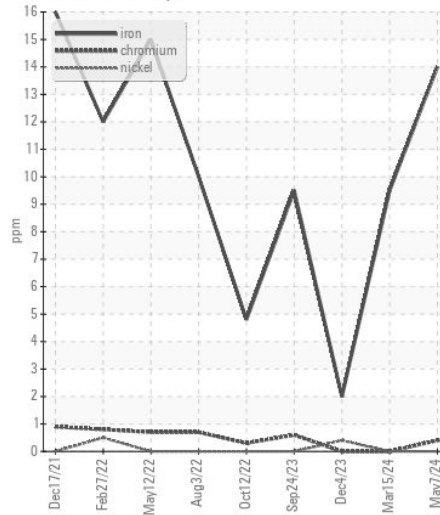
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Sodium	ppm	ASTM D5185m	>158	<b>&lt;1</b>	<1	<1
Boron	ppm	ASTM D5185m	250	<b>20</b>	57	31
Barium	ppm	ASTM D5185m	10	<b>0</b>	0	0
Molybdenum	ppm	ASTM D5185m	100	<b>30</b>	37	28
Manganese	ppm	ASTM D5185m		<b>&lt;1</b>	0	0
Magnesium	ppm	ASTM D5185m	450	<b>406</b>	372	365
Calcium	ppm	ASTM D5185m	3000	<b>1777</b>	2031	517
Phosphorus	ppm	ASTM D5185m	1150	<b>942</b>	929	540
Zinc	ppm	ASTM D5185m	1350	<b>1095</b>	1068	695
Sulfur	ppm	ASTM D5185m	4250	<b>3709</b>	3902	1403
Oxidation	Abs/.1mm	*ASTM D7414	>25	<b>14.1</b>	14.1	7.9
Base Number (BN)	mg KOH/g	ASTM D2896	8.5	<b>7.1</b>	7.7	4.5
Visc @ 100°C	cSt	ASTM D445	14.4	<b>13.0</b>	13.3	9.5

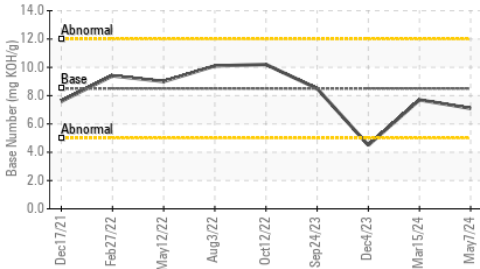
**FT-IR (Direct Trend)**



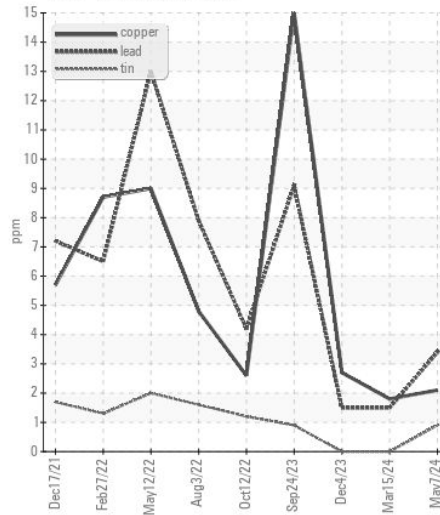
**Ferrous Alloys**



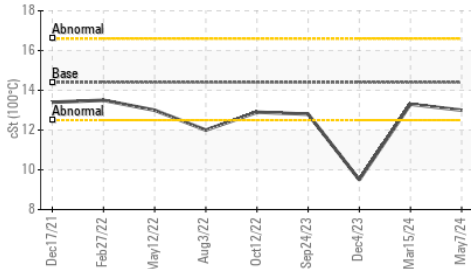
**Base Number**



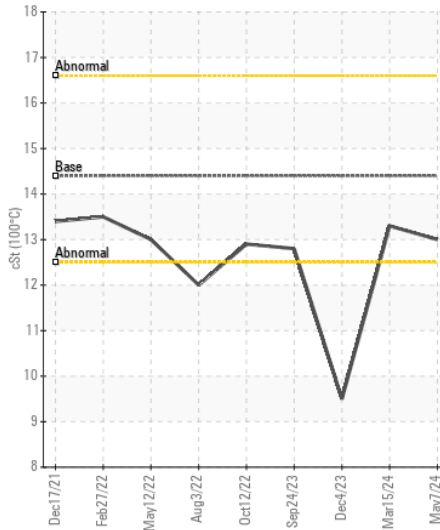
**Non-ferrous Metals**



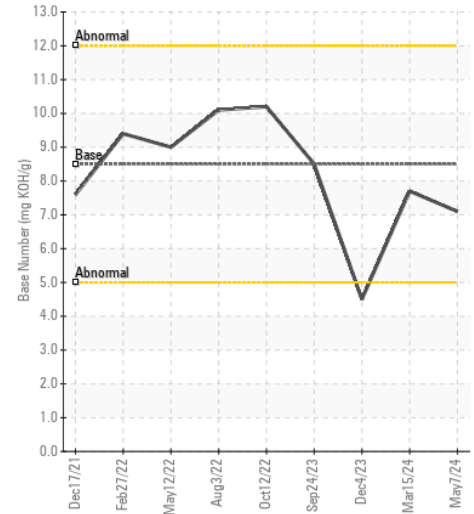
**Viscosity @ 100°C**



**Viscosity @ 100°C**



**Base Number**



Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513  
**Sample No.** : MW0048410  
**Lab Number** : 06187125  
**Unique Number** : 11043877  
**Test Package** : MAR 2

**Received** : 21 May 2024  
**Tested** : 23 May 2024  
**Diagnosed** : 23 May 2024 - Wes Davis

**C & B MARINE**  
 50 E RIVERCENTER BLVD, SUITE 1180  
 COVINGTON, KY  
 US 41011

Contact: DAVID WESTRICH  
 dwestrich@carlislebray.com

T: (812)290-4063  
 F: (859)655-7504

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)