



WEAR	NORMAL
CONTAMINATION	NORMAL
FLUID CONDITION	NORMAL

Machine Id
BRANDI ANN
Component
Starboard Main Engine
Fluid
DIESEL ENGINE OIL SAE 15W40 (22 GAL)

RECOMMENDATION

Resample at the next service interval to monitor.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		MW0071323	MW0047985	MW0048211
Sample Date		Client Info		23 May 2024	18 Mar 2024	19 Jan 2024
Machine Age	hrs	Client Info		21937	20821	19744
Oil Age	hrs	Client Info		1116	1077	834
Filter Age	hrs	Client Info		1116	1077	834
Oil Changed		Client Info		Changed	Changed	Changed
Filter Changed		Client Info		Changed	Changed	Changed
Sample Status				NORMAL	NORMAL	NORMAL

WEAR

All component wear rates are normal.

Iron	ppm	ASTM D5185m	>75	4	4	5
Chromium	ppm	ASTM D5185m	>8	0	<1	<1
Nickel	ppm	ASTM D5185m	>2	0	0	0
Titanium	ppm	ASTM D5185m	>3	2	<1	0
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>15	3	3	3
Lead	ppm	ASTM D5185m	>18	<1	<1	1
Copper	ppm	ASTM D5185m	>80	1	1	0
Tin	ppm	ASTM D5185m	>14	<1	<1	0
Vanadium	ppm	ASTM D5185m		0	<1	0
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE

CONTAMINATION

There is no indication of any contamination in the oil.

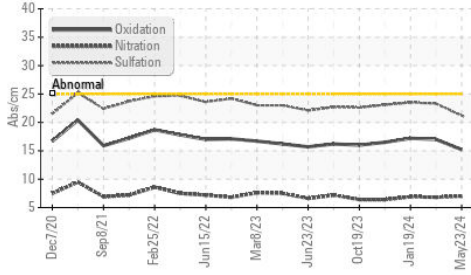
Silicon	ppm	ASTM D5185m	>20	4	5	5
Potassium	ppm	ASTM D5185m	>20	33	2	<1
Fuel		WC Method	>4.0	<1.0	<1.0	<1.0
Water		WC Method	>0.1	NEG	NEG	NEG
Glycol	%	*ASTM D2982		NEG	NEG	NEG
Soot %	%	*ASTM D7844		0.3	0.3	0.2
Nitration	Abs/cm	*ASTM D7624	>20	7.0	6.8	6.9
Sulfation	Abs/.1mm	*ASTM D7415	>30	21.2	23.3	23.5
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

FLUID CONDITION

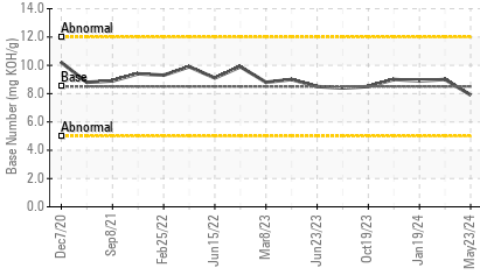
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Sodium	ppm	ASTM D5185m	>158	25	0	<1
Boron	ppm	ASTM D5185m	250	335	341	343
Barium	ppm	ASTM D5185m	10	0	2	2
Molybdenum	ppm	ASTM D5185m	100	93	144	134
Manganese	ppm	ASTM D5185m		<1	<1	0
Magnesium	ppm	ASTM D5185m	450	535	659	667
Calcium	ppm	ASTM D5185m	3000	1602	1618	1442
Phosphorus	ppm	ASTM D5185m	1150	1029	708	681
Zinc	ppm	ASTM D5185m	1350	1212	854	861
Sulfur	ppm	ASTM D5185m	4250	3866	2591	2433
Oxidation	Abs/.1mm	*ASTM D7414	>25	15.2	17.0	17.2
Base Number (BN)	mg KOH/g	ASTM D2896	8.5	7.9	9.0	8.9
Visc @ 100°C	cSt	ASTM D445	14.4	13.2	13.2	13.2

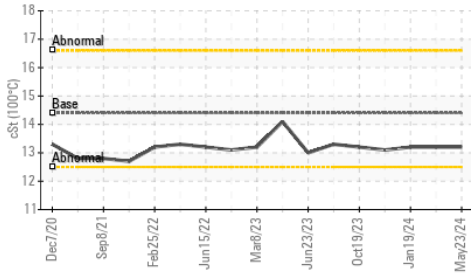
FT-IR (Direct Trend)



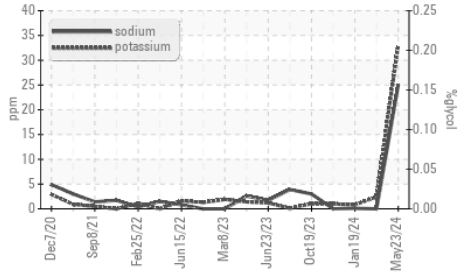
Base Number



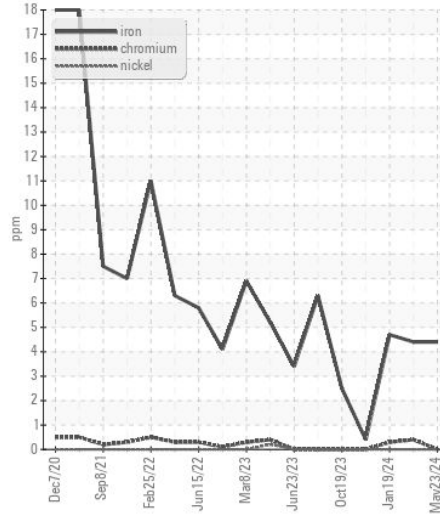
Viscosity @ 100°C



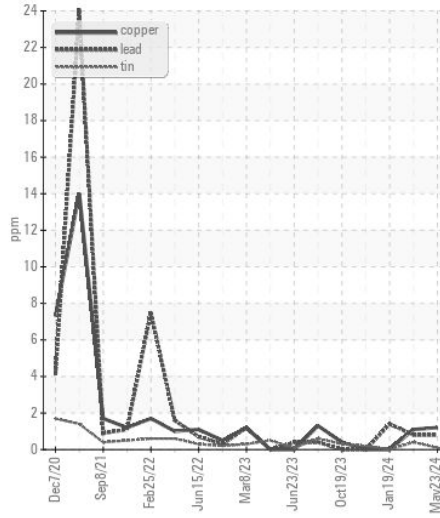
Glycol Contamination



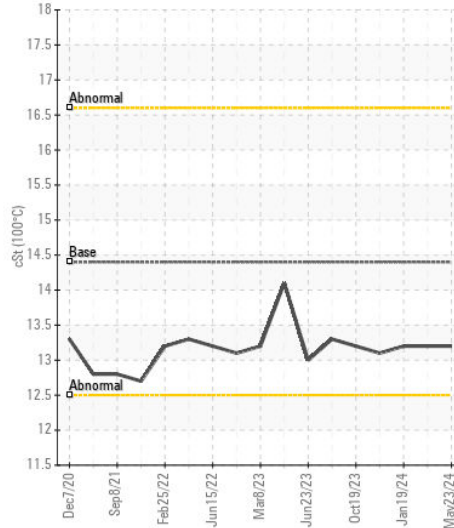
Ferrous Alloys



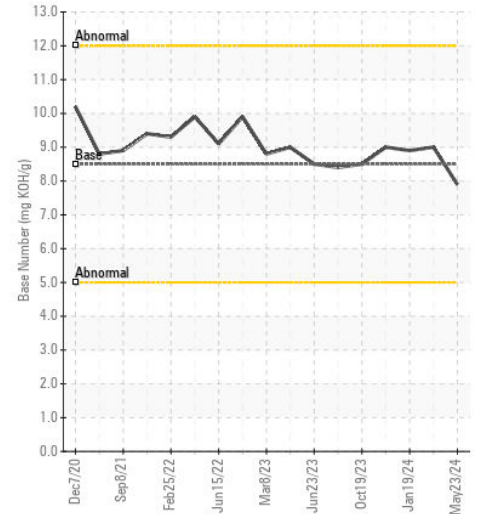
Non-ferrous Metals



Viscosity @ 100°C



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : MW0071323 **Received** : 17 Jun 2024
Lab Number : 06211340 **Tested** : 19 Jun 2024
Unique Number : 11084204 **Diagnosed** : 19 Jun 2024 - Don Baldrige
Test Package : MAR 2 (Additional Tests: Glycol)

ARTCO - ADM AG SERVICES & OIL SEEDS
 2505 BLUFF ROAD
 MT VERNON, IN
 US 47620
 Contact: JOE FLOYD
 joseph.floyd@adm.com

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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