MAR II

WEAR CHECK Inland Marine Oil Analysis Program

OIL ANALYSIS REPORT

WEAR	NORMAL
CONTAMINATION	ABNORMAL
FLUID CONDITION	NORMAL

Machine Id
BROMLEY
Component
Starboard Main Engine
Fluid
CHEVRON DELO 400 MULTIGRADE 15W40 (18 GAL)

RECOMMENDATION

The oil change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

WEAR

All component wear rates are normal.

CONTAMINATION

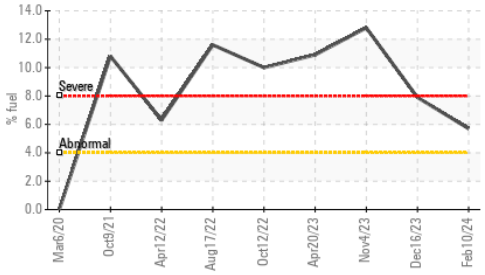
There is a moderate amount of fuel present in the oil. Tests confirm the presence of fuel in the oil.

FLUID CONDITION

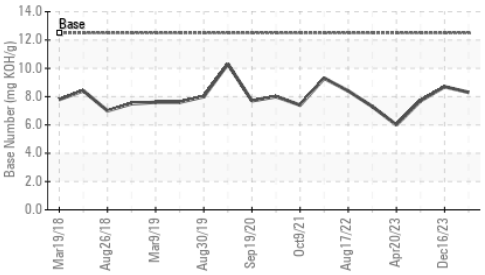
The BN result indicates that there is suitable alkalinity remaining in the oil. The oil is no longer serviceable due to the presence of contaminants.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		MW0057110	MW0062712	MW0045711
Sample Date		Client Info		10 Feb 2024	16 Dec 2023	04 Nov 2023
Machine Age	hrs	Client Info		20687	19641	18987
Oil Age	hrs	Client Info		750	1000	1000
Filter Age	hrs	Client Info		750	1000	1000
Oil Changed		Client Info		Changed	Changed	Changed
Filter Changed		Client Info		Changed	Changed	Changed
Sample Status				ABNORMAL	ABNORMAL	SEVERE
Iron	ppm	ASTM D5185m	>75	8	4	10
Chromium	ppm	ASTM D5185m	>8	<1	<1	<1
Nickel	ppm	ASTM D5185m	>2	0	0	<1
Titanium	ppm	ASTM D5185m	>3	0	0	0
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>15	1	2	3
Lead	ppm	ASTM D5185m	>18	2	1	15
Copper	ppm	ASTM D5185m	>80	2	3	3
Tin	ppm	ASTM D5185m	>14	<1	0	1
Vanadium	ppm	ASTM D5185m		0	0	0
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Silicon	ppm	ASTM D5185m	>20	4	4	5
Potassium	ppm	ASTM D5185m	>20	0	<1	2
Fuel	%	ASTM D3524	>4.0	▲ 5.7	▲ 7.9	⬢ 12.8
Water		WC Method	>0.1	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
Soot %	%	*ASTM D7844		0.3	0.3	0.5
Nitration	Abs/cm	*ASTM D7624	>20	8.3	7.7	8.6
Sulfation	Abs/.1mm	*ASTM D7415	>30	20.7	21.3	23.0
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	2	3	0
Boron	ppm	ASTM D5185m	151	70	155	219
Barium	ppm	ASTM D5185m	0.4	0	<1	0
Molybdenum	ppm	ASTM D5185m	250	51	75	97
Manganese	ppm	ASTM D5185m		<1	<1	<1
Magnesium	ppm	ASTM D5185m	0	516	571	539
Calcium	ppm	ASTM D5185m	2046	1354	1375	1336
Phosphorus	ppm	ASTM D5185m	1043	965	892	642
Zinc	ppm	ASTM D5185m	943	1132	1023	777
Sulfur	ppm	ASTM D5185m	5012	2864	2674	2132
Oxidation	Abs/.1mm	*ASTM D7414	>25	17.2	17.0	18.1
Base Number (BN)	mg KOH/g	ASTM D2896	12.5	8.3	8.7	7.7
Visc @ 100°C	cSt	ASTM D445	14.4	11.9	▲ 11.4	▲ 10.3

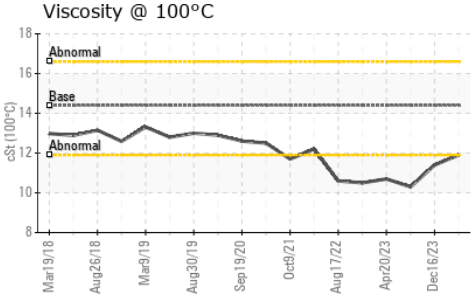
Fuel Dilution



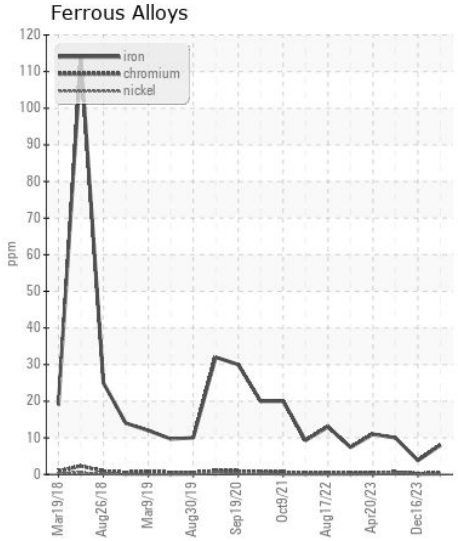
Base Number



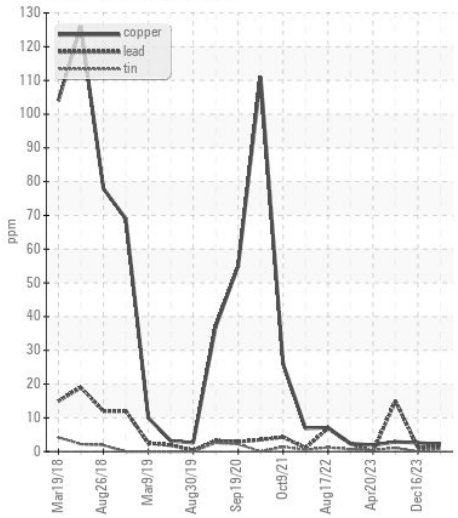
Viscosity @ 100°C



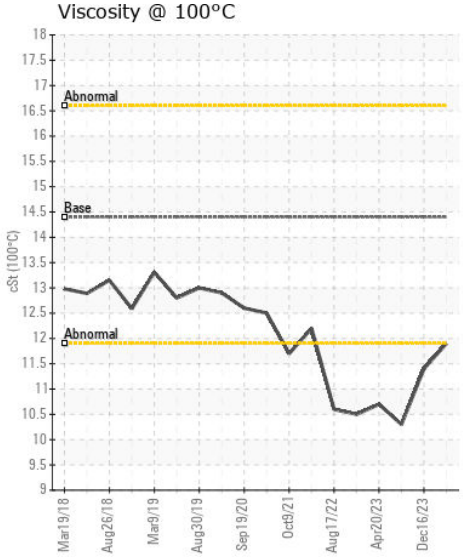
Ferrous Alloys



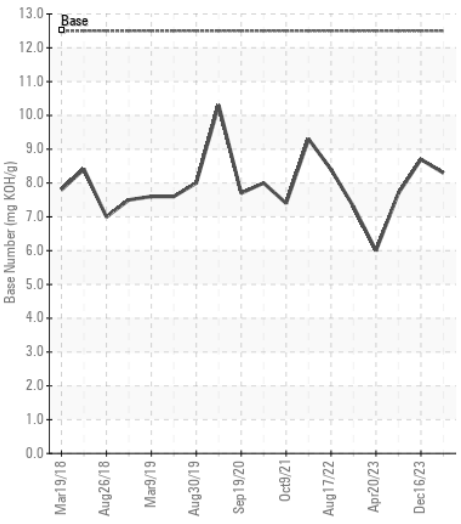
Non-ferrous Metals



Viscosity @ 100°C



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : MW0057110
Lab Number : 06089376
Unique Number : 10876821
Test Package : MAR 2 (Additional Tests: PercentFuel)

Received : 14 Feb 2024
Tested : 15 Feb 2024
Diagnosed : 15 Feb 2024 - Wes Davis

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)

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