MAR II

WEAR CHECK
Inland Marine Oil Analysis Program

OIL ANALYSIS REPORT

WEAR	NORMAL
CONTAMINATION	SEVERE
FLUID CONDITION	ABNORMAL

Machine Id
FLETCHER ARMSTRONG
Component
Starboard Main Engine
Fluid
CHEVRON DELO 400 MULTIGRADE 15W40 (11 GAL)

RECOMMENDATION

We advise that you check the fuel injection system. 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

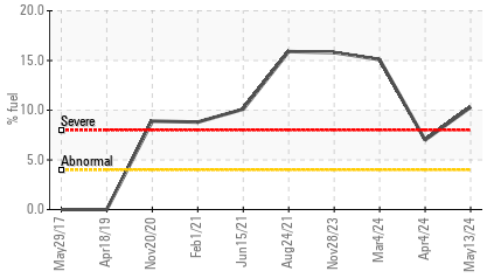
There is a high amount of fuel present in the oil. Tests confirm the presence of fuel in the oil.

FLUID CONDITION

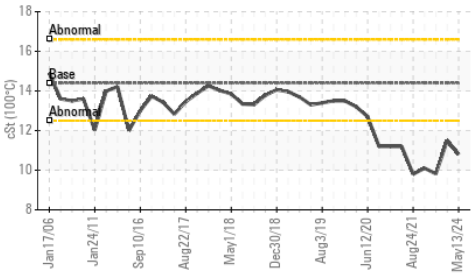
The BN result indicates that there is suitable alkalinity remaining in the oil. Fuel is present in the oil and is lowering the viscosity. The oil is no longer serviceable due to the presence of contaminants.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		MWM717223	MW0060587	MW0060601
Sample Date		Client Info		13 May 2024	04 Apr 2024	04 Mar 2024
Machine Age	hrs	Client Info		6585	5900	5557
Oil Age	hrs	Client Info		0	0	0
Filter Age	hrs	Client Info		0	0	0
Oil Changed		Client Info		Changed	Changed	Changed
Filter Changed		Client Info		Changed	Changed	Changed
Sample Status				SEVERE	ABNORMAL	SEVERE
Iron	ppm	ASTM D5185m	>120	17	14	48
Chromium	ppm	ASTM D5185m	>10	<1	<1	<1
Nickel	ppm	ASTM D5185m	>5	0	1	1
Titanium	ppm	ASTM D5185m		0	<1	0
Silver	ppm	ASTM D5185m	>5	0	<1	0
Aluminum	ppm	ASTM D5185m	>20	2	3	3
Lead	ppm	ASTM D5185m	>40	4	3	25
Copper	ppm	ASTM D5185m	>300	7	10	23
Tin	ppm	ASTM D5185m	>10	<1	2	4
Vanadium	ppm	ASTM D5185m		0	<1	0
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Silicon	ppm	ASTM D5185m	>25	4	6	5
Potassium	ppm	ASTM D5185m	>20	0	2	<1
Fuel	%	ASTM D3524	>4.0	▲ 10.3	▲ 7.0	▲ 15.1
Water		WC Method	>0.1	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
Soot %	%	*ASTM D7844		0.6	0.4	0.9
Nitration	Abs/cm	*ASTM D7624	>20	8.2	7.6	10.0
Sulfation	Abs/.1mm	*ASTM D7415	>30	21.5	21.8	22.9
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		4	2	6
Boron	ppm	ASTM D5185m	151	189	279	90
Barium	ppm	ASTM D5185m	0.4	0	0	0
Molybdenum	ppm	ASTM D5185m	250	104	107	97
Manganese	ppm	ASTM D5185m		<1	<1	1
Magnesium	ppm	ASTM D5185m	0	545	556	538
Calcium	ppm	ASTM D5185m	2046	1462	1329	1277
Phosphorus	ppm	ASTM D5185m	1043	600	570	488
Zinc	ppm	ASTM D5185m	943	679	706	620
Sulfur	ppm	ASTM D5185m	5012	2841	2906	2283
Oxidation	Abs/.1mm	*ASTM D7414	>25	15.6	17.1	18.6
Base Number (BN)	mg KOH/g	ASTM D2896	12.5	7.3	7.8	5.3
Visc @ 100°C	cSt	ASTM D445	14.4	▲ 10.8	▲ 11.5	▲ 9.82

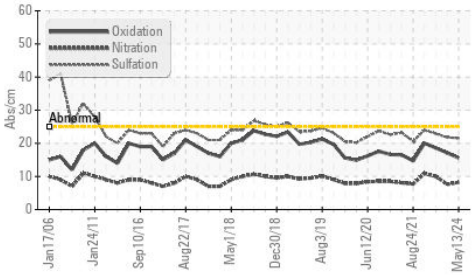
Fuel Dilution



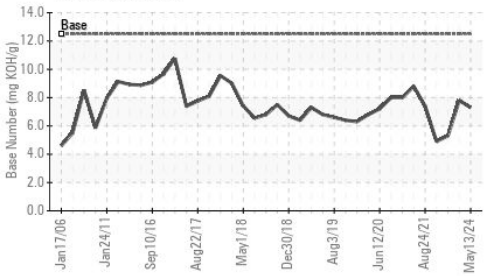
Viscosity @ 100°C



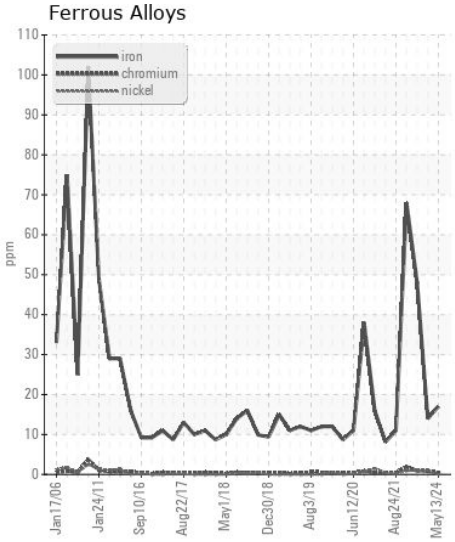
FT-IR (Direct Trend)



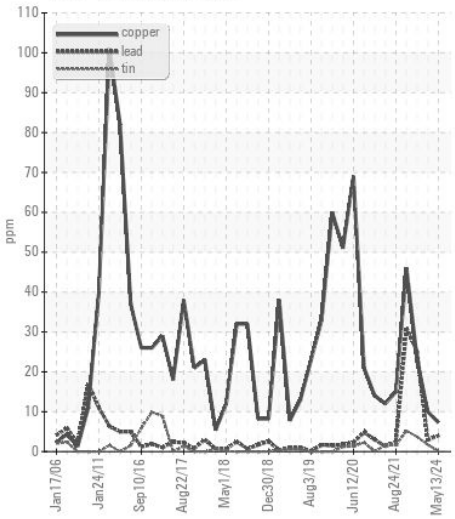
Base Number



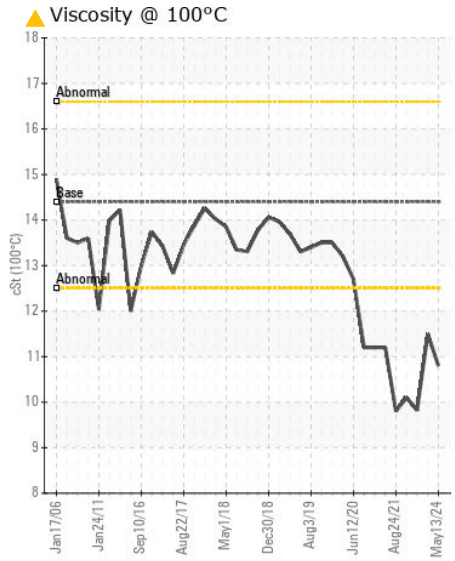
Ferrous Alloys



Non-ferrous Metals



Viscosity @ 100°C



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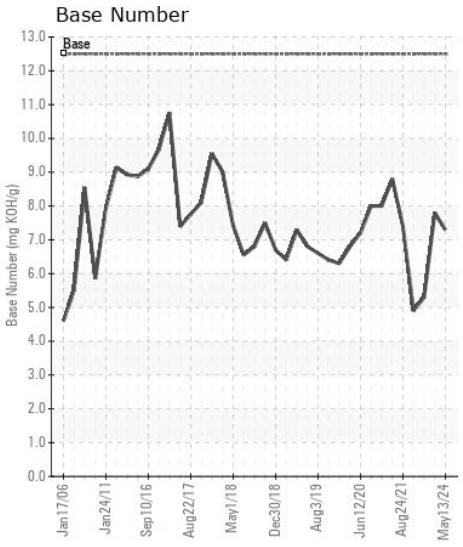

Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : MWM717223 **Received** : 11 Jul 2024
Lab Number : 06234147 **Tested** : 16 Jul 2024
Unique Number : 11122981 **Diagnosed** : 16 Jul 2024 - Wes Davis
Test Package : MAR 2 (Additional Tests: PercentFuel)

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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