MAR II

WEAR CHECK
Inland Marine Oil Analysis Program

OIL ANALYSIS REPORT

WEAR	NORMAL
CONTAMINATION	SEVERE
FLUID CONDITION	SEVERE

Machine Id
MWL
Component
Starboard Main Engine
Fluid
CHEVRON DELO 400 XLE 15W40 (39 GAL)

RECOMMENDATION

We advise that you check the fuel injection system. We recommend that you change the oil at the next available stoppage or outage. We recommend an early resample to monitor this condition.

WEAR

All component wear rates are normal.

CONTAMINATION

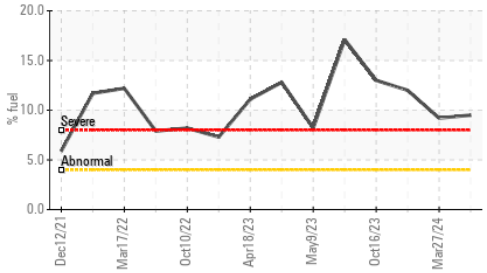
Elevated aluminum (Al) and/or lead (Pb) and potassium (K) levels in your metals analysis are likely a result of solder flux release into the lubricant and is common on new equipment/components. There is a high amount of fuel present in the oil. Tests confirm the presence of fuel in the oil.

FLUID CONDITION

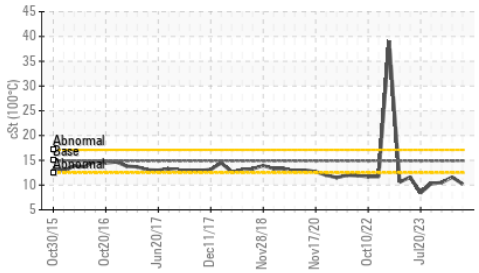
The BN result indicates that there is suitable alkalinity remaining in the oil. Fuel is present in the oil and is lowering the viscosity. The oil is no longer serviceable due to the presence of contaminants.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		MW06178042	MW06131696	MW06017191
Sample Date		Client Info		13 May 2024	27 Mar 2024	23 Nov 2023
Machine Age	hrs	Client Info		40034	39141	38072
Oil Age	hrs	Client Info		893	1069	668
Filter Age	hrs	Client Info		0	0	0
Oil Changed		Client Info		N/A	N/A	N/A
Filter Changed		Client Info		N/A	N/A	N/A
Sample Status				SEVERE	SEVERE	SEVERE
Iron	ppm	ASTM D5185m	>75	15	16	8
Chromium	ppm	ASTM D5185m	>8	1	<1	<1
Nickel	ppm	ASTM D5185m	>2	<1	1	<1
Titanium	ppm	ASTM D5185m	>3	<1	<1	<1
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>15	2	4	2
Lead	ppm	ASTM D5185m	>18	2	4	<1
Copper	ppm	ASTM D5185m	>80	2	1	<1
Tin	ppm	ASTM D5185m	>14	<1	1	<1
Vanadium	ppm	ASTM D5185m		<1	<1	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	6	2	2
Fuel	%	ASTM D3524	>4.0	▲ 9.5	▲ 9.2	▲ 12.0
Water		WC Method	>0.1	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
Soot %	%	*ASTM D7844		3.7	4.2	1.9
Nitration	Abs/cm	*ASTM D7624	>20	10.7	10.9	7.9
Sulfation	Abs/.1mm	*ASTM D7415	>30	29.0	31.6	28.4
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	1	3	<1
Boron	ppm	ASTM D5185m		99	200	285
Barium	ppm	ASTM D5185m		0	0	0
Molybdenum	ppm	ASTM D5185m		45	96	107
Manganese	ppm	ASTM D5185m		<1	<1	<1
Magnesium	ppm	ASTM D5185m		207	516	504
Calcium	ppm	ASTM D5185m		1827	1422	1217
Phosphorus	ppm	ASTM D5185m	760	781	653	567
Zinc	ppm	ASTM D5185m	830	900	795	748
Sulfur	ppm	ASTM D5185m	2770	3336	2663	2431
Oxidation	Abs/.1mm	*ASTM D7414	>25	22.5	24.6	22.8
Base Number (BN)	mg KOH/g	ASTM D2896	10.7	4.4	▲ 0.3	6.5
Visc @ 100°C	cSt	ASTM D445	14.9	▲ 10.2	▲ 11.6	▲ 10.5

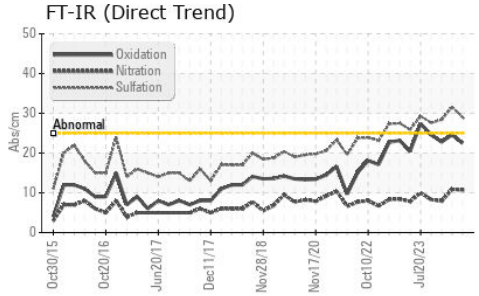
Fuel Dilution



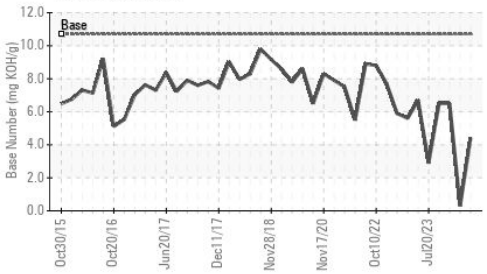
Viscosity @ 100°C



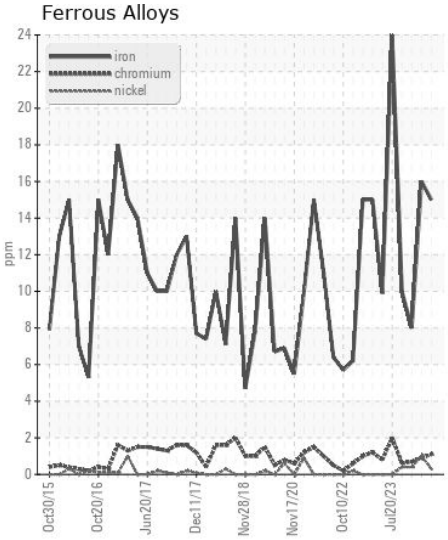
FT-IR (Direct Trend)



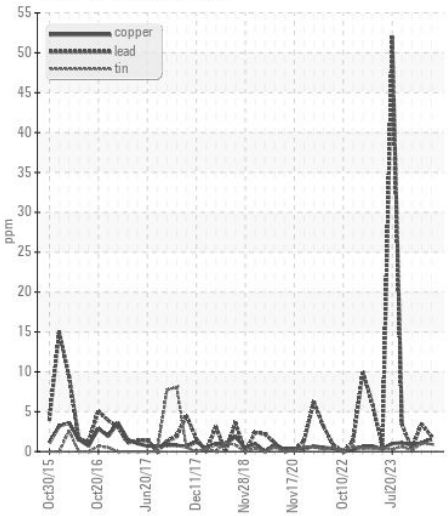
Base Number



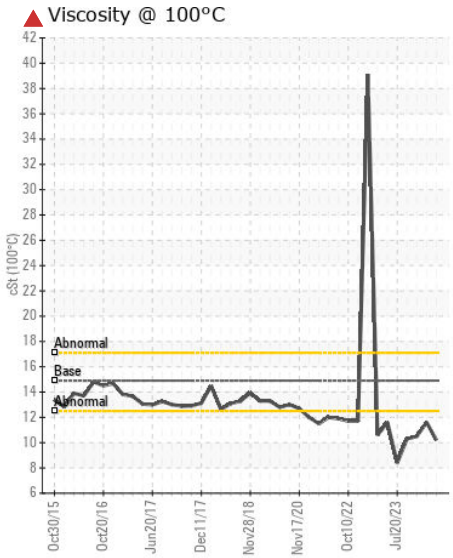
Ferrous Alloys



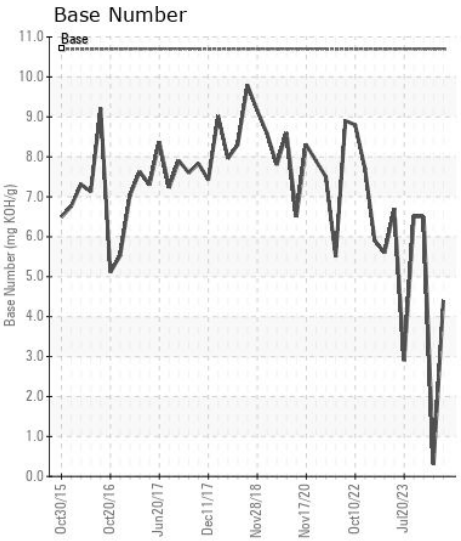
Non-ferrous Metals



Viscosity @ 100°C



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : MW06178042
Lab Number : 06178042
Unique Number : 11029368
Test Package : MAR 2 (Additional Tests: PercentFuel)

Received : 13 May 2024
Tested : 16 May 2024
Diagnosed : 16 May 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)

ILLINOIS MARINE TOWING
PO BOX 391
LEMONT, IL
US 60439
Contact: RHETT DANIEL
rdaniel@imtowing.com
T: (630)280-4926
F: (630)739-2041