



WEAR	NORMAL
CONTAMINATION	NORMAL
FLUID CONDITION	NORMAL

Area

WILLARD HAMMOND

Machine Id

[WILLARD HAMMOND] 003 587215-3

Component

Starboard Main Engine

Fluid

CHEVRON DELO 400 MULTIGRADE 15W40 (36 GAL)

RECOMMENDATION

Resample at the next service interval to monitor.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		MW0070938	MW0072275	MW0070927
Sample Date		Client Info		01 Jul 2024	01 Jun 2024	01 May 2024
Machine Age	hrs	Client Info		15007	14407	13681
Oil Age	hrs	Client Info		528	4763	4043
Filter Age	hrs	Client Info		528	816	96
Oil Changed		Client Info		Not Changd	Not Changd	Not Changd
Filter Changed		Client Info		Not Changd	Not Changd	Not Changd
Sample Status				NORMAL	ABNORMAL	NORMAL

WEAR

All component wear rates are normal.

Iron	ppm	ASTM D5185m	>120	7	16	15
Chromium	ppm	ASTM D5185m	>10	<1	0	<1
Nickel	ppm	ASTM D5185m	>5	0	0	<1
Titanium	ppm	ASTM D5185m		0	0	<1
Silver	ppm	ASTM D5185m	>5	0	0	1
Aluminum	ppm	ASTM D5185m	>20	3	4	4
Lead	ppm	ASTM D5185m	>40	13	▲ 54	34
Copper	ppm	ASTM D5185m	>300	25	▲ 80	72
Tin	ppm	ASTM D5185m	>10	0	1	1
Vanadium	ppm	ASTM D5185m		0	0	<1
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.

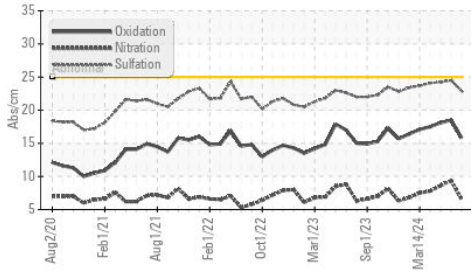
Silicon	ppm	ASTM D5185m	>25	6	8	8
Potassium	ppm	ASTM D5185m	>20	1	1	2
Fuel		WC Method	>4.0	<1.0	<1.0	<1.0
Water		WC Method	>0.1	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
Soot %	%	*ASTM D7844		0.2	0.4	0.4
Nitration	Abs/cm	*ASTM D7624	>20	6.5	9.4	8.6
Sulfation	Abs/.1mm	*ASTM D7415	>30	22.9	24.5	24.2
Silt	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

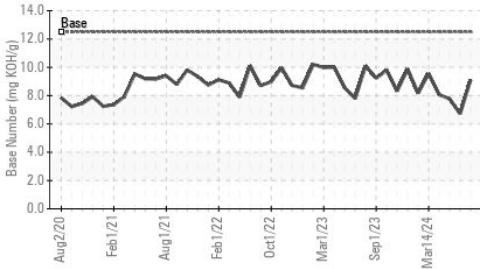
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Sodium	ppm	ASTM D5185m		0	0	2
Boron	ppm	ASTM D5185m	151	345	244	258
Barium	ppm	ASTM D5185m	0.4	0	0	<1
Molybdenum	ppm	ASTM D5185m	250	115	123	113
Manganese	ppm	ASTM D5185m		<1	3	2
Magnesium	ppm	ASTM D5185m	0	581	699	566
Calcium	ppm	ASTM D5185m	2046	1566	1764	1438
Phosphorus	ppm	ASTM D5185m	1043	707	736	592
Zinc	ppm	ASTM D5185m	943	878	934	739
Sulfur	ppm	ASTM D5185m	5012	2529	3092	2393
Oxidation	Abs/.1mm	*ASTM D7414	>25	15.8	18.5	18.1
Base Number (BN)	mg KOH/g	ASTM D2896	12.5	9.10	6.72	7.77
Visc @ 100°C	cSt	ASTM D445	14.4	13.4	13.1	13.19

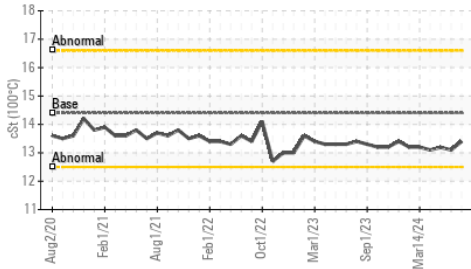
FT-IR (Direct Trend)



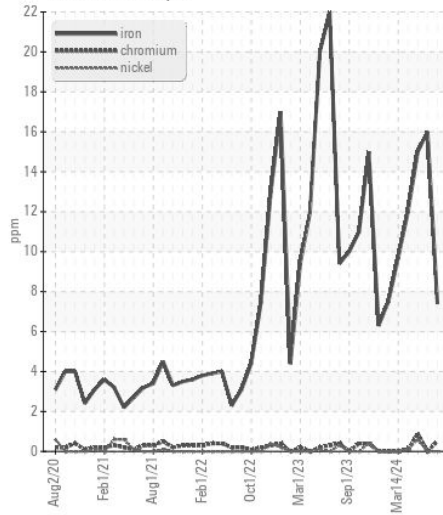
Base Number



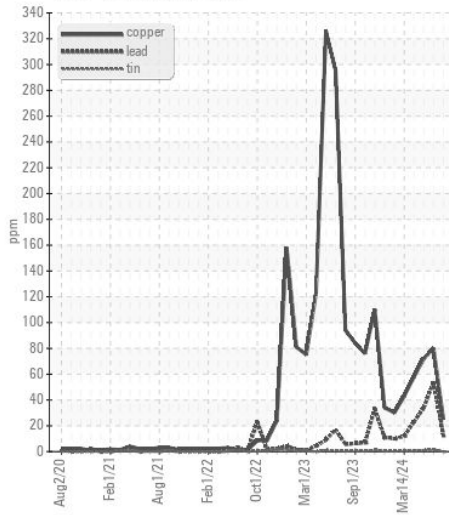
Viscosity @ 100°C



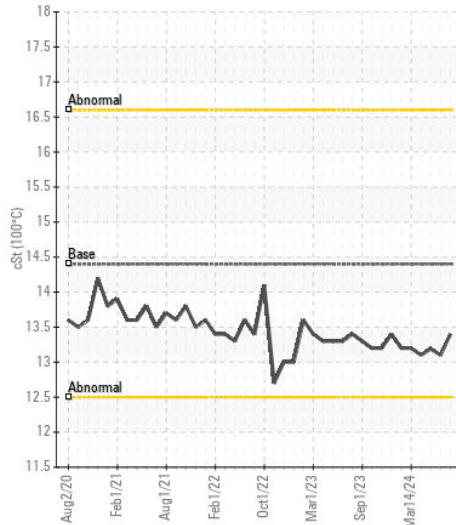
Ferrous Alloys



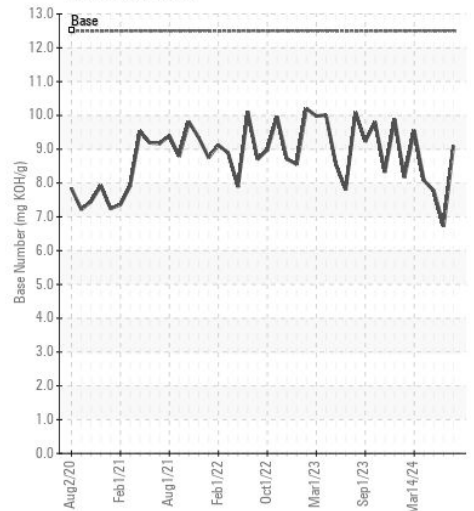
Non-ferrous Metals



Viscosity @ 100°C



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513

Sample No. : MW0070938

Lab Number : 06237075

Unique Number : 11125909

Test Package : MAR 2

Received : 15 Jul 2024

Tested : 17 Jul 2024

Diagnosed : 17 Jul 2024 - Wes Davis

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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)