



WEAR	NORMAL
CONTAMINATION	NORMAL
FLUID CONDITION	NORMAL

Machine Id
MCKENZIE M
Component
Starboard Main Engine
Fluid
DIESEL ENGINE OIL SAE 15W40 (20 GAL)

RECOMMENDATION

Resample at the next service interval to monitor. Please specify the component make and model with your next sample. Please specify the brand, type, and viscosity of the oil on your next sample.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		MW0048138	MW0048179	MW0017493
Sample Date		Client Info		23 Feb 2024	25 Dec 2023	22 Mar 2023
Machine Age	hrs	Client Info		7197	6398	3584
Oil Age	hrs	Client Info		799	1023	846
Filter Age	hrs	Client Info		799	1023	846
Oil Changed		Client Info		Changed	Changed	Changed
Filter Changed		Client Info		Changed	Changed	Changed
Sample Status				NORMAL	ABNORMAL	NORMAL

WEAR

All component wear rates are normal.

Iron	ppm	ASTM D5185m	>75	9	10	8
Chromium	ppm	ASTM D5185m	>8	<1	<1	<1
Nickel	ppm	ASTM D5185m	>2	0	0	0
Titanium	ppm	ASTM D5185m	>3	<1	0	0
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>15	4	4	4
Lead	ppm	ASTM D5185m	>18	5	▲ 36	4
Copper	ppm	ASTM D5185m	>80	2	2	2
Tin	ppm	ASTM D5185m	>14	<1	<1	<1
Vanadium	ppm	ASTM D5185m		<1	0	0
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE

CONTAMINATION

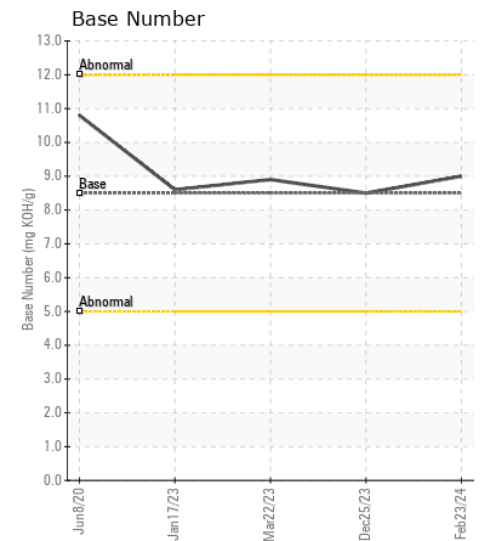
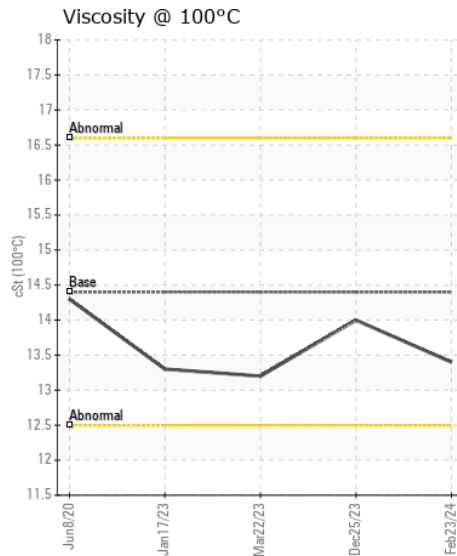
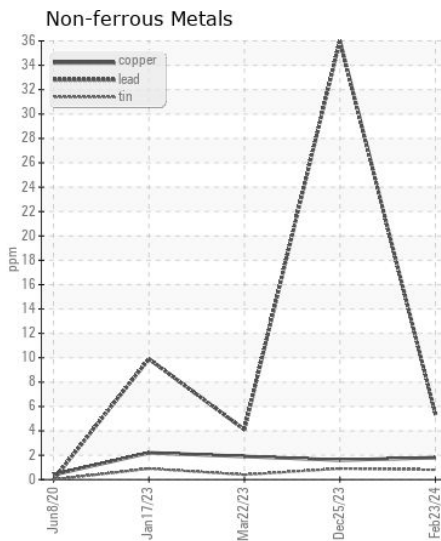
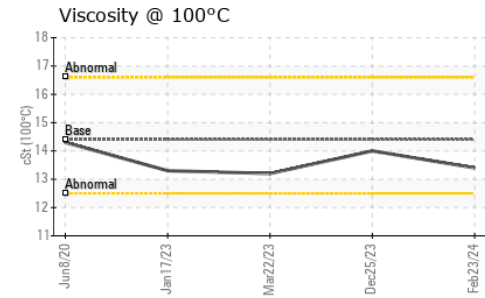
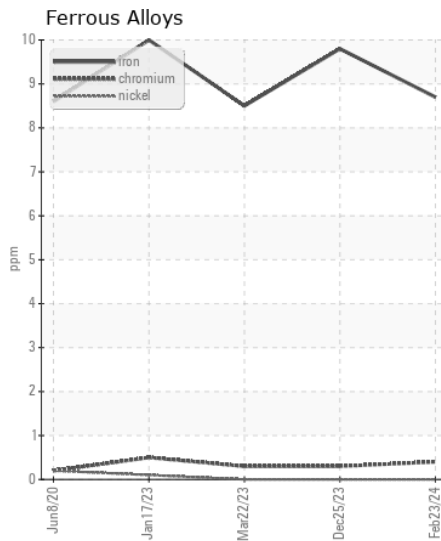
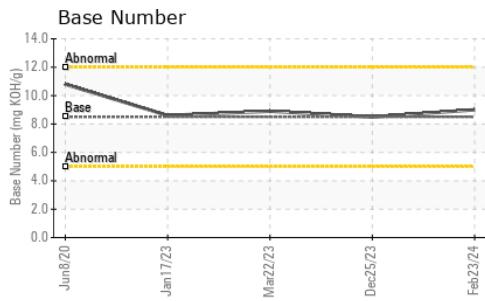
There is no indication of any contamination in the oil.

Silicon	ppm	ASTM D5185m	>20	6	6	6
Potassium	ppm	ASTM D5185m	>20	2	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		0.4	0.5	0.4
Nitration	Abs/cm	*ASTM D7624	>20	8.2	9.2	7.6
Sulfation	Abs/.1mm	*ASTM D7415	>30	24.2	24.9	23.8
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	0	2	<1
Boron	ppm	ASTM D5185m	250	332	270	378
Barium	ppm	ASTM D5185m	10	2	0	0
Molybdenum	ppm	ASTM D5185m	100	146	132	130
Manganese	ppm	ASTM D5185m		<1	<1	<1
Magnesium	ppm	ASTM D5185m	450	688	707	614
Calcium	ppm	ASTM D5185m	3000	1706	1590	1539
Phosphorus	ppm	ASTM D5185m	1150	777	790	712
Zinc	ppm	ASTM D5185m	1350	931	900	848
Sulfur	ppm	ASTM D5185m	4250	2846	2475	2524
Oxidation	Abs/.1mm	*ASTM D7414	>25	18.7	19.8	17.3
Base Number (BN)	mg KOH/g	ASTM D2896	8.5	9.0	8.5	8.9
Visc @ 100°C	cSt	ASTM D445	14.4	13.4	14.0	13.2



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : MW0048138
Lab Number : 06124716
Unique Number : 10938867
Test Package : MAR 2
Received : 21 Mar 2024
Tested : 22 Mar 2024
Diagnosed : 22 Mar 2024 - Wes Davis

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

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)