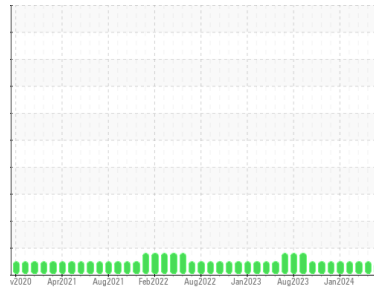




OIL ANALYSIS REPORT

Area
Map Runner
 Machine Id
[Map Runner] Oil - Starboard Main Engine
 Component
Starboard Main Engine
 Fluid
DIESEL ENGINE OIL SAE 15W40 (37 GAL)

Sample Rating Trend



VISCOSITY



DIAGNOSIS

Recommendation

Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.

Wear

All component wear rates are normal.

Contamination

Fuel content negligible. There is no indication of any contamination in the oil.

Fluid Condition

The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil.

SAMPLE INFORMATION

method	limit/base	current	history1	history2
Sample Number	Client Info	WC0874581	WC0874628	WC0859926
Sample Date	Client Info	28 May 2024	22 Apr 2024	20 Mar 2024
Machine Age	hrs	Client Info	7191	6538
Oil Age	hrs	Client Info	529	283
Oil Changed	Client Info	Changed	Changed	Changed
Sample Status		MARGINAL	NORMAL	NORMAL

CONTAMINATION

method	limit/base	current	history1	history2
Glycol	WC Method	NEG	NEG	NEG

WEAR METALS

method	limit/base	current	history1	history2	
Iron	ppm	ASTM D5185m >75	7	6	7
Chromium	ppm	ASTM D5185m >8	<1	<1	<1
Nickel	ppm	ASTM D5185m >2	0	0	<1
Titanium	ppm	ASTM D5185m >3	0	<1	<1
Silver	ppm	ASTM D5185m >2	0	<1	<1
Aluminum	ppm	ASTM D5185m >15	<1	2	2
Lead	ppm	ASTM D5185m >18	<1	2	<1
Copper	ppm	ASTM D5185m >80	2	2	2
Tin	ppm	ASTM D5185m >14	<1	1	<1
Vanadium	ppm	ASTM D5185m	<1	<1	<1
Cadmium	ppm	ASTM D5185m	0	<1	<1

ADDITIVES

method	limit/base	current	history1	history2	
Boron	ppm	ASTM D5185m 250	11	10	7
Barium	ppm	ASTM D5185m 10	0	0	0
Molybdenum	ppm	ASTM D5185m 100	61	70	66
Manganese	ppm	ASTM D5185m	<1	0	<1
Magnesium	ppm	ASTM D5185m 450	1317	1536	1439
Calcium	ppm	ASTM D5185m 3000	1237	1229	1188
Phosphorus	ppm	ASTM D5185m 1150	1051	1228	1126
Zinc	ppm	ASTM D5185m 1350	1243	1351	1303
Sulfur	ppm	ASTM D5185m 4250	3833	3653	3697

CONTAMINANTS

method	limit/base	current	history1	history2	
Silicon	ppm	ASTM D5185m >20	4	6	4
Sodium	ppm	ASTM D5185m >158	3	0	<1
Potassium	ppm	ASTM D5185m >20	0	3	2
Fuel	%	ASTM D3524 >4.0	0.2	<1.0	<1.0
Water	%	ASTM D6304 >0.1	NEG	NEG	NEG

INFRA-RED

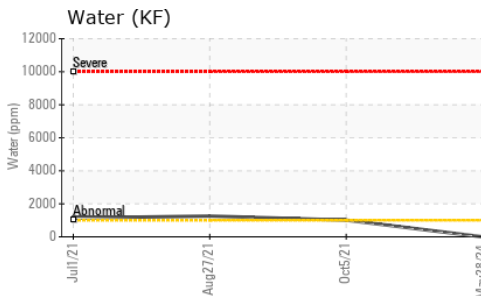
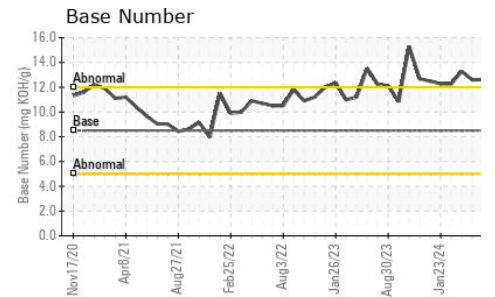
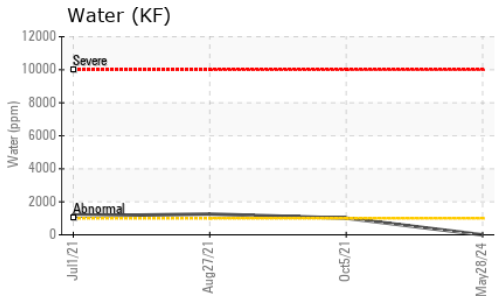
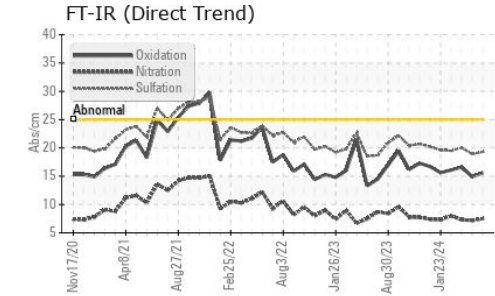
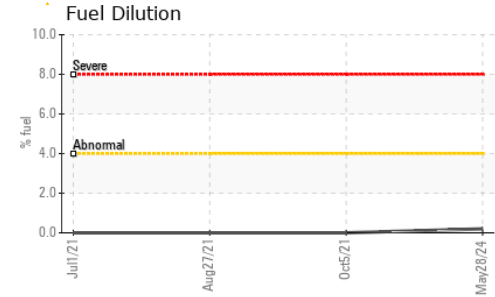
method	limit/base	current	history1	history2	
Soot %	%	*ASTM D7844	0.2	0.2	0.2
Nitration	Abs/cm	*ASTM D7624 >20	7.5	7.2	7.3
Sulfation	Abs/.1mm	*ASTM D7415 >30	19.3	18.9	20.0

FLUID DEGRADATION

method	limit/base	current	history1	history2	
Oxidation	Abs/.1mm	*ASTM D7414 >25	15.6	14.9	16.6
Base Number (BN)	mg KOH/g	ASTM D2896 8.5	12.61	12.60	13.29



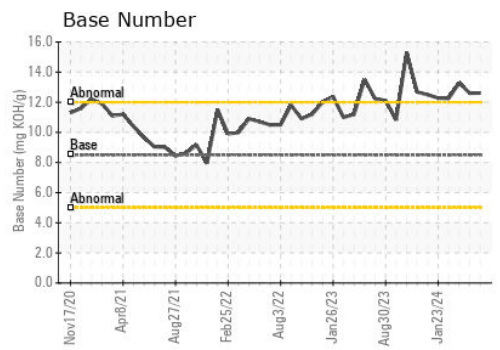
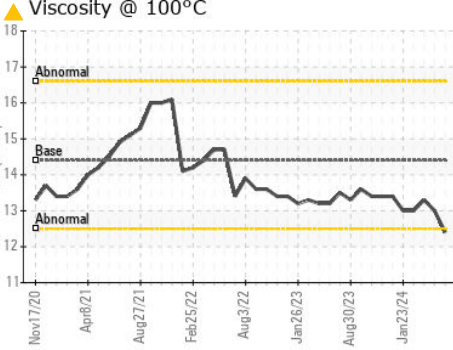
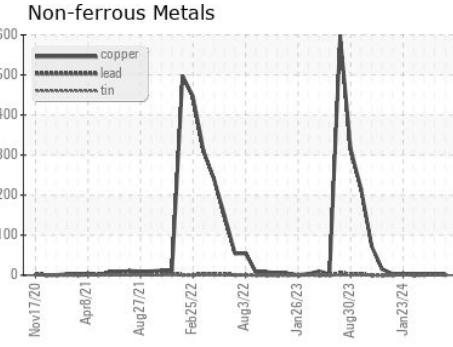
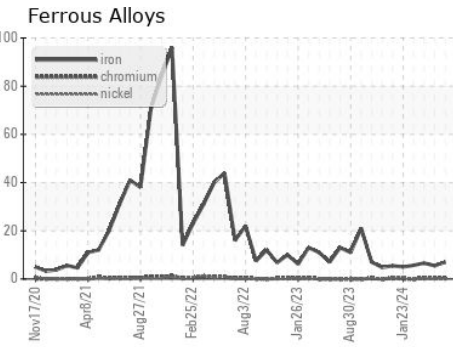
OIL ANALYSIS REPORT



VISUAL	method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.1	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG

FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	14.4 ▲ 12.4	13.0	13.3

GRAPHS



Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0874581 **Received** : 07 Jun 2024
Lab Number : 06202978 **Tested** : 12 Jun 2024
Unique Number : 11070439 **Diagnosed** : 12 Jun 2024 - Jonathan Hester
Test Package : IND 2 (Additional Tests: FuelDilution, KF, PercentFuel)

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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)