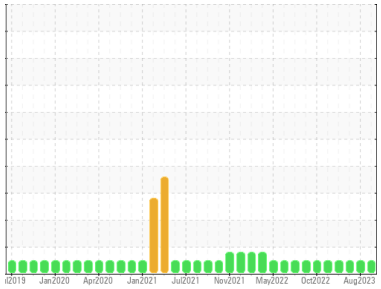
OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL

Area
Garyville
Machine Id
[Garyville] Oil - Starboard Main Engine
Component
Starboard Main Engine
Fluid
ROYAL PURPLE MOTOR OIL 15W40 (150 GAL)

DIAGNOSIS

Recommendation
Resample at the next service interval to monitor.

Wear
All component wear rates are normal.

Contamination
There is no indication of any contamination in the oil.

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.

SAMPLE INFORMATION		method	limit/base	current	history1	history2
Sample Number		Client Info		**WC0805380**	WC0805378	WC0683223
Sample Date		Client Info		**26 Sep 2023**	29 Aug 2023	04 Jul 2023
Machine Age	hrs	Client Info		**12929**	6867	6867
Oil Age	hrs	Client Info		**714**	4208	4208
Oil Changed		Client Info		**Filtered**	Filtered	Filtered
Sample Status				**NORMAL**	NORMAL	NORMAL

CONTAMINATION		method	limit/base	current	history1	history2
Fuel		WC Method	>4.0	**<1.0**	<1.0	<1.0
Glycol		WC Method		**NEG**	NEG	NEG

WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>75	**14**	13	40
Chromium	ppm	ASTM D5185m	>8	**<1**	<1	1
Nickel	ppm	ASTM D5185m	>2	**0**	0	0
Titanium	ppm	ASTM D5185m	>3	**1**	<1	<1
Silver	ppm	ASTM D5185m	>2	**0**	0	0
Aluminum	ppm	ASTM D5185m	>15	**<1**	<1	<1
Lead	ppm	ASTM D5185m	>18	**7**	7	31
Copper	ppm	ASTM D5185m	>80	**8**	8	35
Tin	ppm	ASTM D5185m	>14	**<1**	<1	<1
Vanadium	ppm	ASTM D5185m		**0**	<1	<1
Cadmium	ppm	ASTM D5185m		**0**	0	0

ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	0	**76**	104	56
Barium	ppm	ASTM D5185m	0	**0**	0	0
Molybdenum	ppm	ASTM D5185m	100	**19**	20	27
Manganese	ppm	ASTM D5185m		**<1**	<1	<1
Magnesium	ppm	ASTM D5185m	60	**522**	518	543
Calcium	ppm	ASTM D5185m	3050	**1670**	1764	1702
Phosphorus	ppm	ASTM D5185m	1050	**863**	864	790
Zinc	ppm	ASTM D5185m	1200	**1062**	1048	1026
Sulfur	ppm	ASTM D5185m	12500	**3214**	3752	3071

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	>20	**3**	3	4
Sodium	ppm	ASTM D5185m	>75	**1**	2	3
Potassium	ppm	ASTM D5185m	>20	**2**	2	2

INFRA-RED		method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844		**0.3**	0.3	0.7
Nitration	Abs/cm	*ASTM D7624	>20	**8.0**	7.8	10.3
Sulfation	Abs/.1mm	*ASTM D7415	>30	**19.6**	20.2	23.6

FLUID DEGRADATION		method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414	>25	**15.1**	15.5	20.9
Base Number (BN)	mg KOH/g	ASTM D2896	10.5	**9.68**	9.33	8.83

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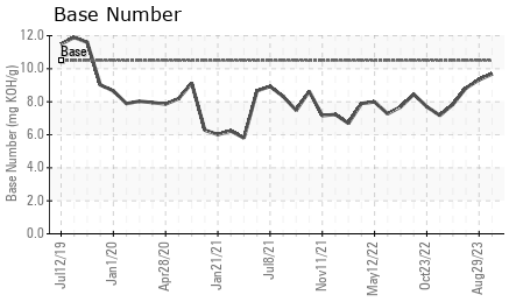
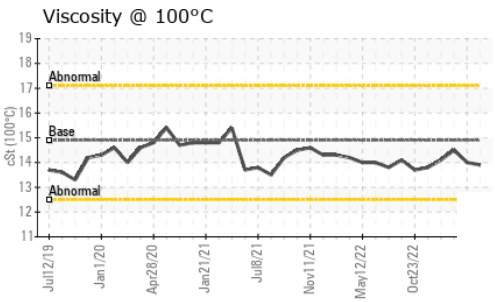
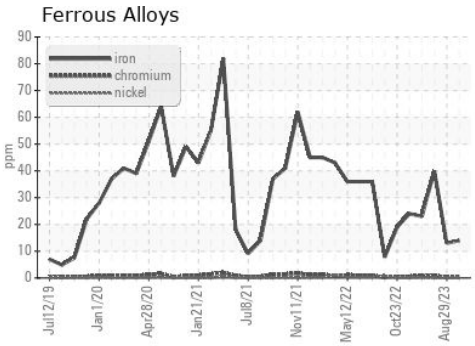


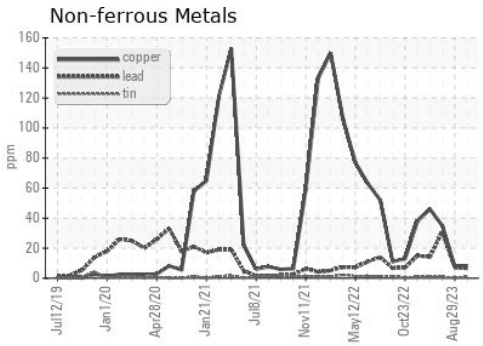


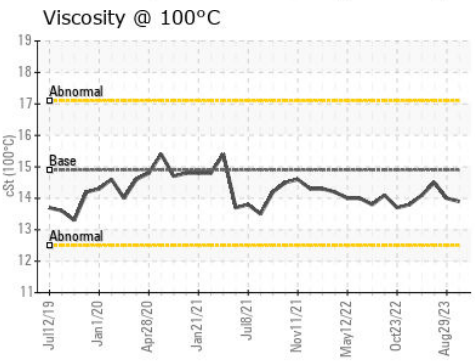
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	**NONE**	NONE	NONE
Precipitate	scalar	*Visual	NONE	**NONE**	NONE	NONE
Silt	scalar	*Visual	NONE	**NONE**	NONE	NONE
Debris	scalar	*Visual	NONE	**NONE**	NONE	NONE
Sand/Dirt	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
Free Water	scalar	*Visual		**NEG**	NEG	NEG

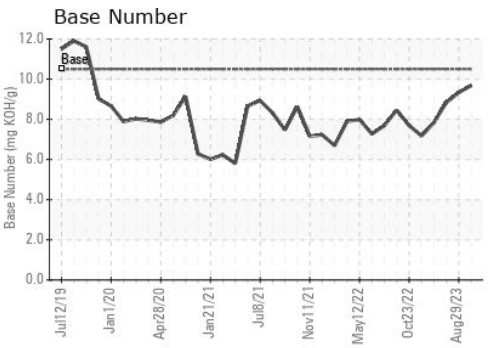
FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	14.9	**13.9**	14.0	14.5

GRAPHS









Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0805380 **Received** : 03 Oct 2023
Lab Number : 05967935 **Diagnosed** : 05 Oct 2023
Unique Number : 10674486 **Diagnostician** : Don Baldridge
Test Package : IND 2 (Additional Tests: KF)

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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Report Id: MARCAT [WUSCAR] 05967935 (Generated: 10/05/2023 17:53:53) Rev: 1

Submitted By: M/V GARYVILLE