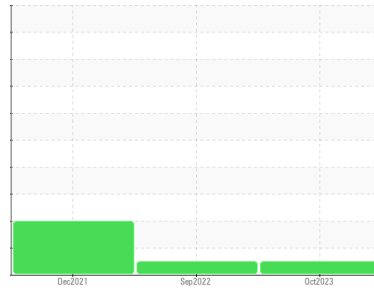




OIL ANALYSIS REPORT

Sample Rating Trend

NORMAL



Area
OCEAN VOYAGER
 Machine Id
[OCEAN VOYAGER] OCEAN VOYAGER STEERING SB
 Component
Starboard Steering
 Fluid
CASTROL HYSPIN AWH-M ISO 32 (400 LTR)

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 fluid. The amount and size of particulates present in the system are acceptable.

Fluid Condition

The AN level is acceptable for this fluid. The condition of the fluid is suitable for further service.

SAMPLE INFORMATION

	method	limit/base	current	history1	history2
Sample Number	Client Info		WC0824573	WC0693030	WC0633831
Sample Date	Client Info		03 Oct 2023	03 Sep 2022	13 Dec 2021
Machine Age	hrs	Client Info	0	0	0
Oil Age	hrs	Client Info	0	0	0
Oil Changed	Client Info		N/A	N/A	Changed
Sample Status			NORMAL	NORMAL	ABNORMAL

WEAR METALS

	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m >60	4	<1	4
Chromium	ppm	ASTM D5185m >12	0	0	0
Nickel	ppm	ASTM D5185m >6	0	0	0
Titanium	ppm	ASTM D5185m	0	0	0
Silver	ppm	ASTM D5185m	0	0	2
Aluminum	ppm	ASTM D5185m >4	2	0	<1
Lead	ppm	ASTM D5185m >12	0	0	<1
Copper	ppm	ASTM D5185m >30	2	1	5
Tin	ppm	ASTM D5185m	0	0	0
Antimony	ppm	ASTM D5185m	---	---	0
Vanadium	ppm	ASTM D5185m	0	0	0
Cadmium	ppm	ASTM D5185m	0	0	<1

ADDITIVES

	method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	0	0	8
Barium	ppm	ASTM D5185m	0	0	0
Molybdenum	ppm	ASTM D5185m	0	<1	<1
Manganese	ppm	ASTM D5185m	0	0	<1
Magnesium	ppm	ASTM D5185m	<1	5	22
Calcium	ppm	ASTM D5185m	62	74	149
Phosphorus	ppm	ASTM D5185m	380	404	458
Zinc	ppm	ASTM D5185m	499	494	574
Sulfur	ppm	ASTM D5185m	2546	3272	3132

CONTAMINANTS

	method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m >10	1	<1	1
Sodium	ppm	ASTM D5185m	0	0	1
Potassium	ppm	ASTM D5185m >20	<1	0	0

FLUID CLEANLINESS

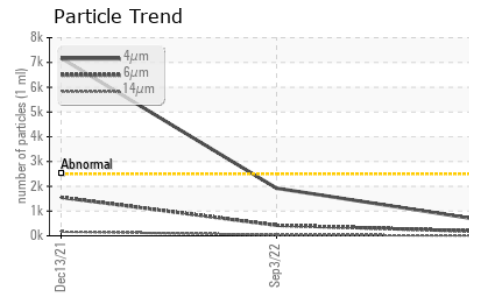
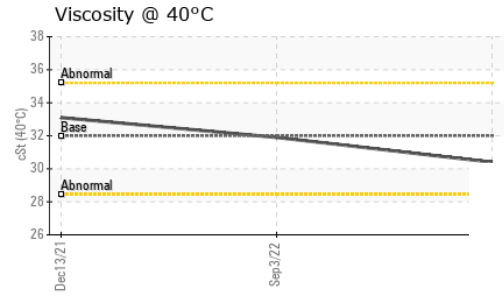
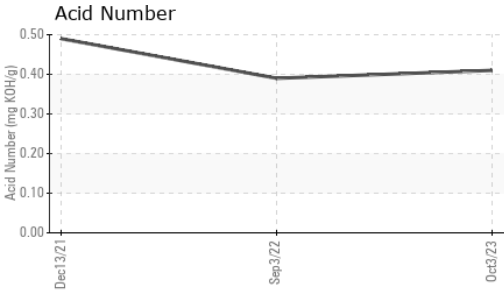
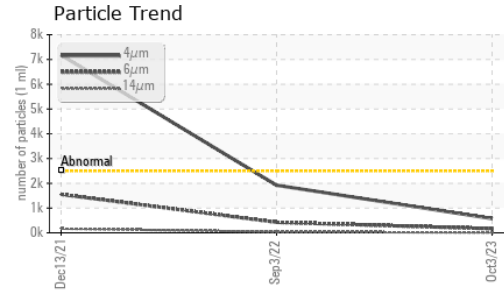
	method	limit/base	current	history1	history2
Particles >4µm	ASTM D7647	>2500	574	1921	▲ 7178
Particles >6µm	ASTM D7647	>640	166	425	▲ 1553
Particles >14µm	ASTM D7647	>80	10	37	▲ 167
Particles >21µm	ASTM D7647	>20	2	12	▲ 50
Particles >38µm	ASTM D7647	>4	0	1	▲ 7
Particles >71µm	ASTM D7647	>3	0	0	0
Oil Cleanliness	ISO 4406 (c)	>18/16/13	16/15/10	18/16/12	▲ 20/18/15

FLUID DEGRADATION

	method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D8045	0.41	0.39	0.49



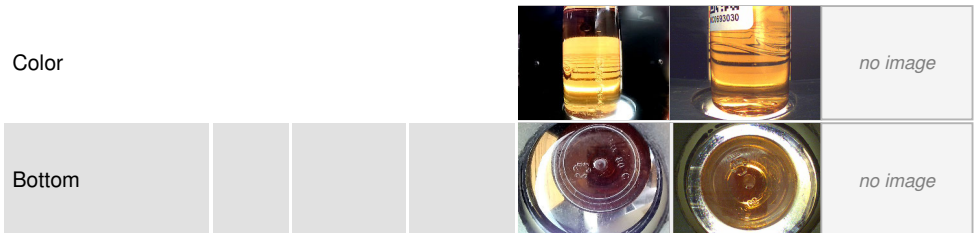
OIL ANALYSIS REPORT



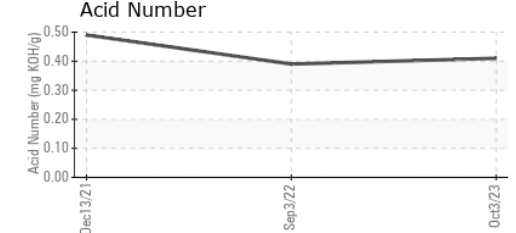
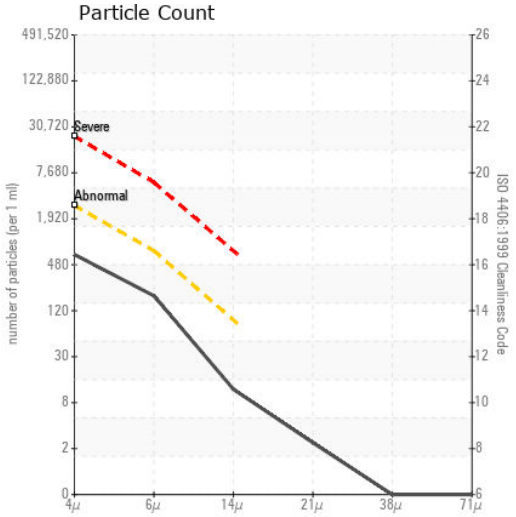
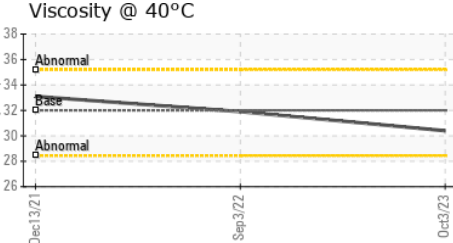
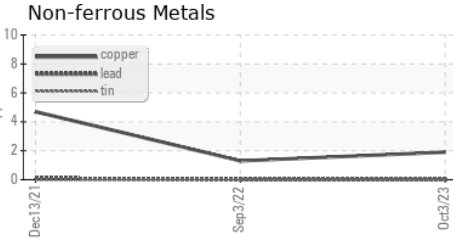
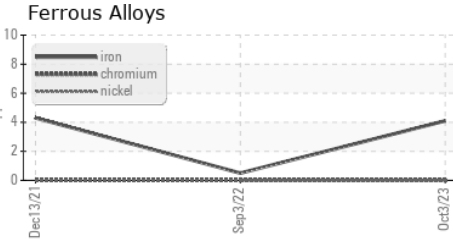
VISUAL	method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	LIGHT
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE
Appearance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

FLUID PROPERTIES	method	limit/base	current	history1	history2	
Visc @ 40°C	cSt	ASTM D445	32.0	30.4	31.9	33.1

SAMPLE IMAGES	method	limit/base	current	history1	history2
---------------	--------	------------	---------	----------	----------



GRAPHS



Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0824573 **Received** : 04 Oct 2023
Lab Number : 05968895 **Diagnosed** : 06 Oct 2023
Unique Number : 10675446 **Diagnostician** : Angela Borella
Test Package : MAR 2 (Additional Tests: PrtCount)

American Queen Voyages - Oceans
 1201 Bridgeport Drive
 Jeffersonville, IN
 US 47130
 Contact: Dietrich Giles
 DIETRICH.GILES@AQVOYAGES.COM
 T: (228)591-6239
 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)