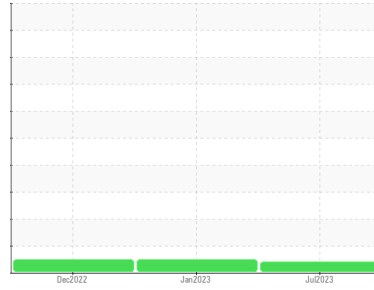




PROBLEM SUMMARY

Sample Rating Trend



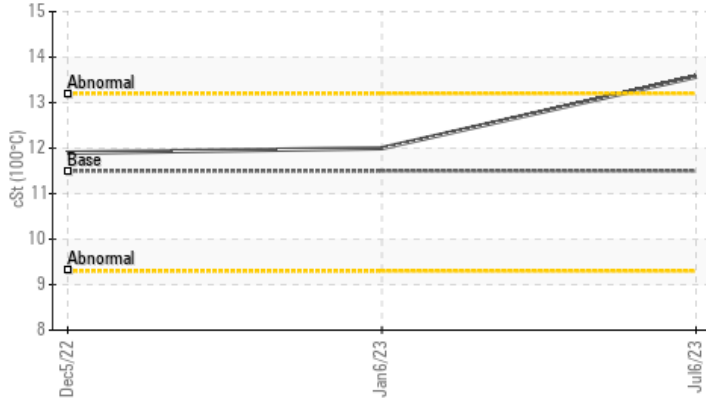
VISCOSITY



Machine Id
ENDEAVOR (S/N 2WB11168)
 Component
Starboard Main Engine
 Fluid
SHELL ROTELLA T 30 (--- QTS)

COMPONENT CONDITION SUMMARY

▲ Viscosity @ 100°C



RECOMMENDATION

Resample at the next service interval to monitor.

PROBLEMATIC TEST RESULTS

| Sample Status | | | | ATTENTION | NORMAL | NORMAL |
|---------------|-----|-----------|------|-----------|--------|--------|
| Visc @ 100°C | cSt | ASTM D445 | 11.5 | ▲ 13.57 | 12.0 | 11.9 |

Customer Id: CITSANUS
 Sample No.: WC0834566
 Lab Number: 05903914
 Test Package: MAR 2



To manage this report scan the QR code

To discuss the diagnosis or test data:
 Doug Bogart +1 (800)237-1369 x4016
dougb@wearcheckusa.com

To change component or sample information:
 Customer Service +1 1-800-237-1369
customerservice@wearcheck.com

RECOMMENDED ACTIONS

There are no recommended actions for this sample.

HISTORICAL DIAGNOSIS

06 Jan 2023 Diag: Sean Felton

NORMAL



Resample at the next service interval to monitor. Please specify the brand, type, and viscosity of the oil on your next sample. All component wear rates are normal. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

view report



05 Dec 2022 Diag: Angela Borella

NORMAL



Resample at the next service interval to monitor. All component wear rates are normal. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

view report





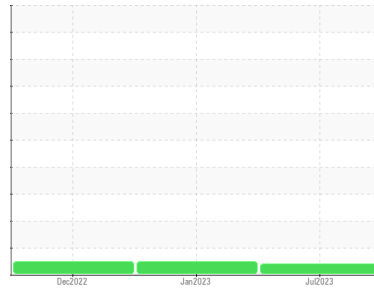
OIL ANALYSIS REPORT

Sample Rating Trend

VISCOSITY

Machine Id
ENDEAVOR (S/N 2WB11168)

Component
Starboard Main Engine
Fluid
SHELL ROTELLA T 30 (--- QTS)



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

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|--------------------|-------------|-------------|------------|--------------------|-------------|-------------|
| Sample Number | Client Info | | | WC0834566 | WC0754324 | WC0754320 |
| Sample Date | Client Info | | | 06 Jul 2023 | 06 Jan 2023 | 05 Dec 2022 |
| Machine Age | hrs | Client Info | | 13761 | 12985 | 12824 |
| Oil Age | hrs | Client Info | | 200 | 200 | 12568 |
| Oil Changed | Client Info | | | Not Chngd | Not Chngd | N/A |
| Sample Status | | | | ATTENTION | 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 | 6 | 6 | 6 |
| Chromium | ppm | ASTM D5185m | >8 | 0 | <1 | 0 |
| Nickel | ppm | ASTM D5185m | >2 | 0 | 0 | 0 |
| Titanium | ppm | ASTM D5185m | >3 | 1 | 9 | 10 |
| Silver | ppm | ASTM D5185m | >2 | <1 | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >15 | 1 | 1 | 0 |
| Lead | ppm | ASTM D5185m | >18 | <1 | <1 | 0 |
| Copper | ppm | ASTM D5185m | >80 | <1 | 2 | 2 |
| Tin | ppm | ASTM D5185m | >14 | 0 | <1 | 0 |
| Vanadium | ppm | ASTM D5185m | | 0 | <1 | 0 |
| Cadmium | ppm | ASTM D5185m | | 0 | 0 | 0 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|------------|-----|-------------|------------|-------------|----------|----------|
| Boron | ppm | ASTM D5185m | 0 | 342 | 59 | 62 |
| Barium | ppm | ASTM D5185m | | 1 | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | 0 | 81 | 48 | 47 |
| Manganese | ppm | ASTM D5185m | | 0 | <1 | <1 |
| Magnesium | ppm | ASTM D5185m | | 381 | 525 | 497 |
| Calcium | ppm | ASTM D5185m | 1890 | 1664 | 1625 | 1577 |
| Phosphorus | ppm | ASTM D5185m | 680 | 1056 | 737 | 696 |
| Zinc | ppm | ASTM D5185m | 750 | 1233 | 911 | 818 |
| Sulfur | ppm | ASTM D5185m | | 3498 | 4222 | 4304 |

| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|--------------|-----|-------------|------------|----------|----------|----------|
| Silicon | ppm | ASTM D5185m | >20 | 3 | 3 | 3 |
| Sodium | ppm | ASTM D5185m | >75 | 0 | 2 | 1 |
| Potassium | ppm | ASTM D5185m | >20 | 2 | 2 | 3 |

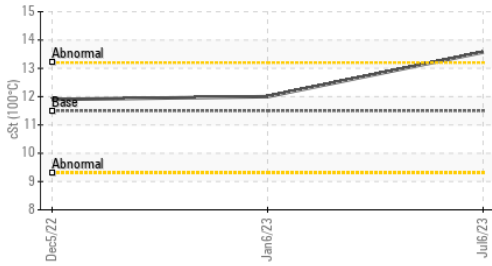
| INFRA-RED | | method | limit/base | current | history1 | history2 |
|-----------|----------|-------------|------------|-------------|----------|----------|
| Soot % | % | *ASTM D7844 | | 0.1 | 0.1 | 0.1 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | 6.5 | 7.8 | 8.4 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | 20.5 | 17.5 | 18.5 |

| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|-------------------|----------|-------------|------------|-------------|----------|----------|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | 15.9 | 12.9 | 13.1 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 6.0 | 9.19 | 7.8 | 9.3 |

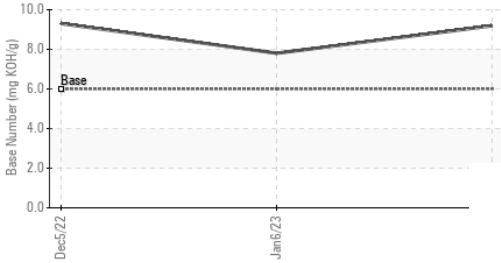


OIL ANALYSIS REPORT

▲ Viscosity @ 100°C



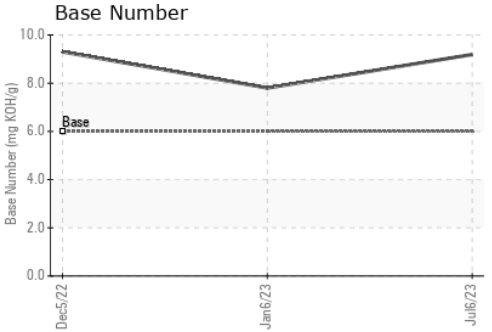
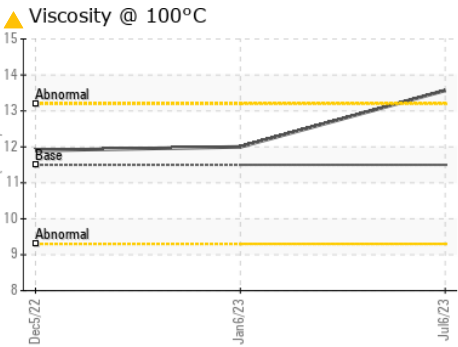
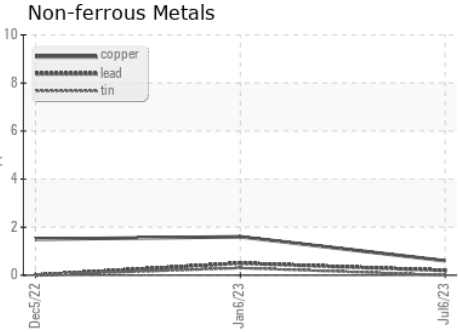
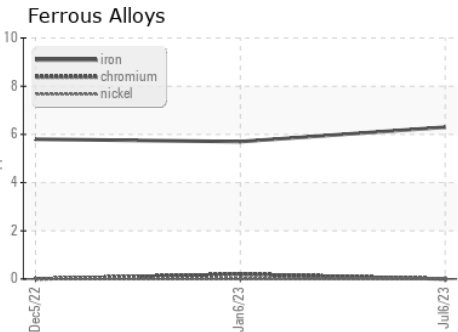
Base Number



| 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 | 11.5 ▲ 13.57 | 12.0 | 11.9 |

GRAPHS



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0834566 **Received** : 20 Jul 2023
Lab Number : 05903914 **Diagnosed** : 27 Jul 2023
Unique Number : 10565270 **Diagnostician** : Doug Bogart
Test Package : MAR 2

CITY EXPERIENCES - SEAWARD EXPLORER
 2825 5TH AVENUE
 SAN DIEGO, CA
 US 92103
 Contact: Service Manager

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)

T:
F: