



|                 |               |
|-----------------|---------------|
| WEAR            | <b>NORMAL</b> |
| CONTAMINATION   | <b>NORMAL</b> |
| FLUID CONDITION | <b>NORMAL</b> |

Area  
**ROBERT W TAYLOR**  
Machine Id  
[ROBERT W TAYLOR] 003 568680-3  
Component  
Starboard Main Engine  
Fluid  
SHELL ROTELLA T 15W40 (--- GAL)

**RECOMMENDATION**

Resample at the next service interval to monitor.

| Test           | UOM | Method      | Limit/Abn | Current            | History1    | History2    |
|----------------|-----|-------------|-----------|--------------------|-------------|-------------|
| Sample Number  |     | Client Info |           | <b>MW0061513</b>   | MW0063114   | MW0063117   |
| Sample Date    |     | Client Info |           | <b>02 May 2024</b> | 01 Mar 2024 | 02 Jan 2024 |
| Machine Age    | hrs | Client Info |           | <b>23283</b>       | 22670       | 11426       |
| Oil Age        | hrs | Client Info |           | <b>172</b>         | 453         | 41          |
| Filter Age     | hrs | Client Info |           | <b>172</b>         | 453         | 41          |
| Oil Changed    |     | Client Info |           | <b>N/A</b>         | Not Changd  | Not Changd  |
| Filter Changed |     | Client Info |           | <b>Not Changd</b>  | Not Changd  | Not Changd  |
| Sample Status  |     |             |           | <b>NORMAL</b>      | NORMAL      | NORMAL      |

**WEAR**

All component wear rates are normal.

|              |        |             |      |              |      |      |
|--------------|--------|-------------|------|--------------|------|------|
| Iron         | ppm    | ASTM D5185m | >75  | <b>2</b>     | 6    | 5    |
| Chromium     | ppm    | ASTM D5185m | >8   | <b>0</b>     | <1   | <1   |
| Nickel       | ppm    | ASTM D5185m | >2   | <b>0</b>     | 0    | 0    |
| Titanium     | ppm    | ASTM D5185m | >3   | <b>0</b>     | 0    | 0    |
| Silver       | ppm    | ASTM D5185m | >2   | <b>0</b>     | 0    | 0    |
| Aluminum     | ppm    | ASTM D5185m | >15  | <b>&lt;1</b> | <1   | 2    |
| Lead         | ppm    | ASTM D5185m | >18  | <b>&lt;1</b> | 0    | <1   |
| Copper       | ppm    | ASTM D5185m | >80  | <b>0</b>     | 3    | 2    |
| Tin          | ppm    | ASTM D5185m | >14  | <b>&lt;1</b> | 0    | 0    |
| Vanadium     | ppm    | ASTM D5185m |      | <b>0</b>     | 0    | 0    |
| White Metal  | scalar | *Visual     | NONE | <b>NONE</b>  | NONE | NONE |
| Yellow Metal | scalar | *Visual     | NONE | <b>NONE</b>  | NONE | NONE |

**CONTAMINATION**

There is no indication of any contamination in the oil.

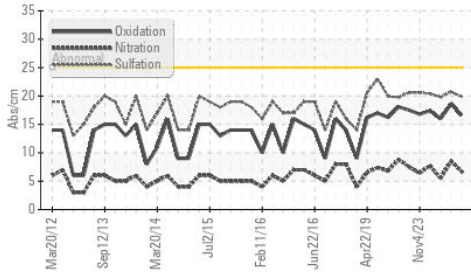
|                  |          |             |       |                |       |       |
|------------------|----------|-------------|-------|----------------|-------|-------|
| Silicon          | ppm      | ASTM D5185m | >20   | <b>4</b>       | 4     | 6     |
| Potassium        | ppm      | ASTM D5185m | >20   | <b>6</b>       | 6     | 8     |
| Fuel             |          | WC Method   | >4.0  | <b>&lt;1.0</b> | <1.0  | <1.0  |
| Water            |          | WC Method   | >0.1  | <b>NEG</b>     | NEG   | NEG   |
| Glycol           |          | WC Method   |       | <b>NEG</b>     | NEG   | NEG   |
| Soot %           | %        | *ASTM D7844 |       | <b>0.1</b>     | 0.1   | 0.1   |
| Nitration        | Abs/cm   | *ASTM D7624 | >20   | <b>6.7</b>     | 8.5   | 5.5   |
| Sulfation        | Abs/.1mm | *ASTM D7415 | >30   | <b>19.9</b>    | 20.7  | 19.8  |
| Silt             | scalar   | *Visual     | NONE  | <b>NONE</b>    | NONE  | NONE  |
| Debris           | scalar   | *Visual     | NONE  | <b>NONE</b>    | NONE  | NONE  |
| Sand/Dirt        | scalar   | *Visual     | NONE  | <b>NONE</b>    | NONE  | NONE  |
| Appearance       | scalar   | *Visual     | NORML | <b>NORML</b>   | NORML | NORML |
| Odor             | scalar   | *Visual     | NORML | <b>NORML</b>   | NORML | NORML |
| Emulsified Water | scalar   | *Visual     | >0.1  | <b>NEG</b>     | NEG   | NEG   |

**FLUID CONDITION**

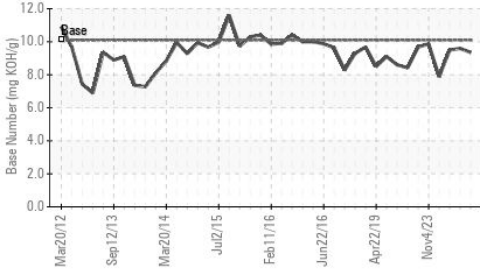
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

|                  |          |             |      |              |      |      |
|------------------|----------|-------------|------|--------------|------|------|
| Sodium           | ppm      | ASTM D5185m | >75  | <b>&lt;1</b> | 2    | 2    |
| Boron            | ppm      | ASTM D5185m | 316  | <b>193</b>   | 167  | 243  |
| Barium           | ppm      | ASTM D5185m | 0.0  | <b>0</b>     | 0    | 0    |
| Molybdenum       | ppm      | ASTM D5185m | 1.2  | <b>2</b>     | 7    | 4    |
| Manganese        | ppm      | ASTM D5185m |      | <b>0</b>     | 0    | 0    |
| Magnesium        | ppm      | ASTM D5185m | 24   | <b>21</b>    | 53   | 33   |
| Calcium          | ppm      | ASTM D5185m | 2292 | <b>2168</b>  | 2021 | 2025 |
| Phosphorus       | ppm      | ASTM D5185m | 1064 | <b>976</b>   | 884  | 1019 |
| Zinc             | ppm      | ASTM D5185m | 1160 | <b>1099</b>  | 1087 | 1135 |
| Sulfur           | ppm      | ASTM D5185m | 4996 | <b>3932</b>  | 3021 | 3821 |
| Oxidation        | Abs/.1mm | *ASTM D7414 | >25  | <b>16.6</b>  | 18.6 | 16.0 |
| Base Number (BN) | mg KOH/g | ASTM D2896  | 10.1 | <b>9.35</b>  | 9.60 | 9.49 |
| Visc @ 100°C     | cSt      | ASTM D445   | 15.7 | <b>13.5</b>  | 13.3 | 14.1 |

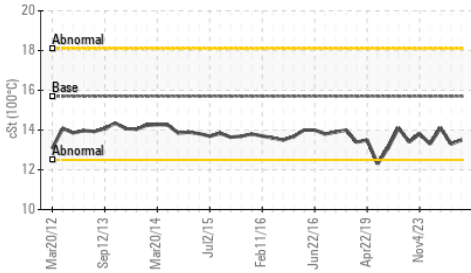
**FT-IR (Direct Trend)**



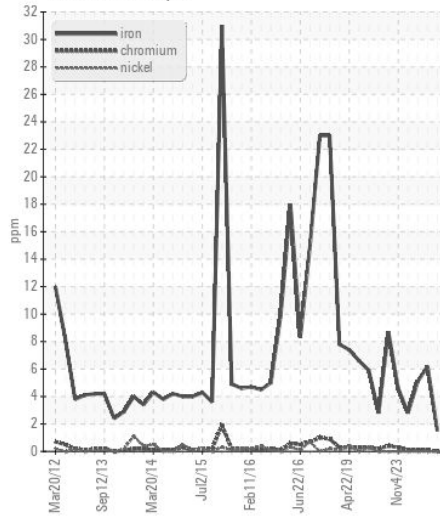
**Base Number**



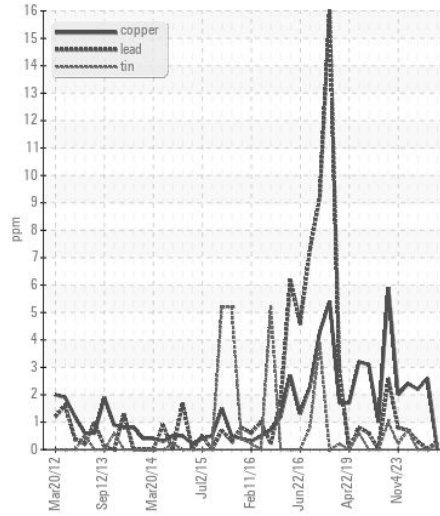
**Viscosity @ 100°C**



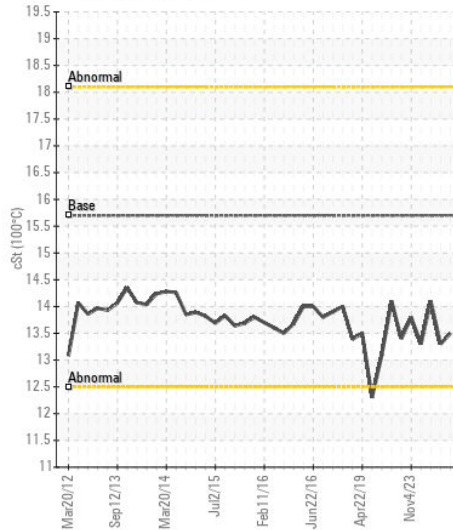
**Ferrous Alloys**



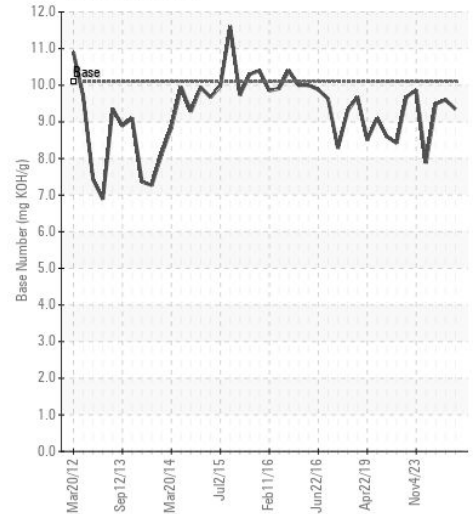
**Non-ferrous Metals**



**Viscosity @ 100°C**



**Base Number**



Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513

**Sample No.** : MW0061513

**Lab Number** : 06174728

**Unique Number** : 11020781

**Test Package** : MAR 2

**Received** : 09 May 2024

**Tested** : 10 May 2024

**Diagnosed** : 10 May 2024 - Wes Davis

**INGRAM BARGE**

900 S 3RD ST

PADUCAH, KY

US 42003

Contact: KEN ELLISON

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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)