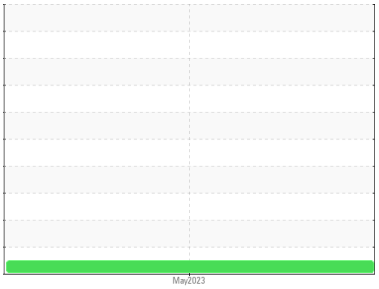
# OIL ANALYSIS REPORT

Sample Rating Trend




NORMAL

Machine Id
## STBD MAIN ENGINE
Component
**Starboard Main Engine**
Fluid
**SHELL ROTELLA T4 15W40 (--- LTR)**

## DIAGNOSIS

**Recommendation**
Resample at the next service interval to monitor.

**Wear**
All component wear rates are normal.

**Contamination**
Elevated aluminum (Al) and/or lead (Pb) and potassium (K) levels in your metals analysis are likely a result of solder flux release into the lubricant and is common on new equipment/components. There is no indication of any contamination in the oil.

**Fluid Condition**
The condition of the oil is acceptable for the time in service.

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **WA0019685** | --- | --- |
| Sample Date | | Client Info | | **15 May 2023** | --- | --- |
| Machine Age | hrs | Client Info | | **602** | --- | --- |
| Oil Age | hrs | Client Info | | **115** | --- | --- |
| Oil Changed | | Client Info | | **Not Changd** | --- | --- |
| Sample Status | | | | **NORMAL** | --- | --- |

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

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Iron | ppm | ASTM D5185(m) | >75 | **8** | --- | --- |
| Chromium | ppm | ASTM D5185(m) | >8 | **<1** | --- | --- |
| Nickel | ppm | ASTM D5185(m) | >2 | **0** | --- | --- |
| Titanium | ppm | ASTM D5185(m) | >3 | **4** | --- | --- |
| Silver | ppm | ASTM D5185(m) | >2 | **0** | --- | --- |
| Aluminum | ppm | ASTM D5185(m) | >15 | **2** | --- | --- |
| Lead | ppm | ASTM D5185(m) | >18 | **<1** | --- | --- |
| Copper | ppm | ASTM D5185(m) | >80 | **4** | --- | --- |
| Tin | ppm | ASTM D5185(m) | >14 | **<1** | --- | --- |
| Antimony | ppm | ASTM D5185(m) | | **<1** | --- | --- |
| Vanadium | ppm | ASTM D5185(m) | | **<1** | --- | --- |
| Beryllium | ppm | ASTM D5185(m) | | **0** | --- | --- |
| Cadmium | ppm | ASTM D5185(m) | | **0** | --- | --- |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185(m) | | **131** | --- | --- |
| Barium | ppm | ASTM D5185(m) | | **0** | --- | --- |
| Molybdenum | ppm | ASTM D5185(m) | | **14** | --- | --- |
| Manganese | ppm | ASTM D5185(m) | | **<1** | --- | --- |
| Magnesium | ppm | ASTM D5185(m) | | **211** | --- | --- |
| Calcium | ppm | ASTM D5185(m) | | **2239** | --- | --- |
| Phosphorus | ppm | ASTM D5185(m) | | **1012** | --- | --- |
| Zinc | ppm | ASTM D5185(m) | | **1101** | --- | --- |
| Sulfur | ppm | ASTM D5185(m) | | **3054** | --- | --- |
| Lithium | ppm | ASTM D5185(m) | | **<1** | --- | --- |

| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185(m) | >20 | **3** | --- | --- |
| Sodium | ppm | ASTM D5185(m) | >75 | **2** | --- | --- |
| Potassium | ppm | ASTM D5185(m) | >20 | **6** | --- | --- |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | ASTM D7844* | | **0.2** | --- | --- |
| Nitration | Abs/cm | ASTM D7624* | >20 | **8.6** | --- | --- |
| Sulfation | Abs/.1mm | ASTM D7415* | >30 | **21.7** | --- | --- |

| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | ASTM D7414* | >25 | **17.5** | --- | --- |

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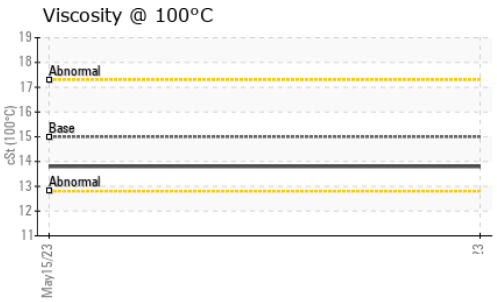
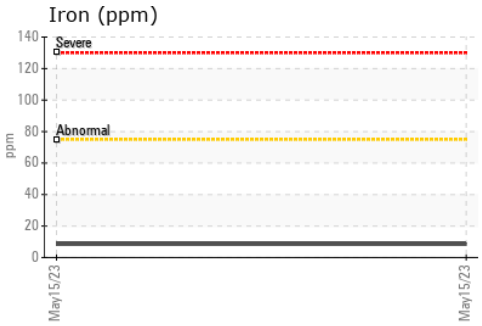
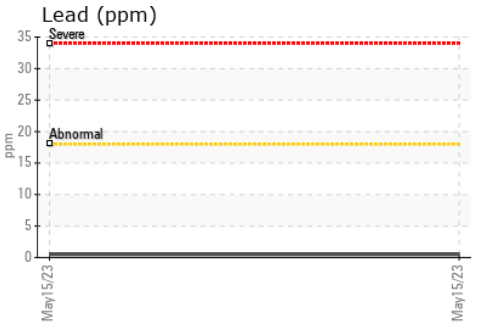


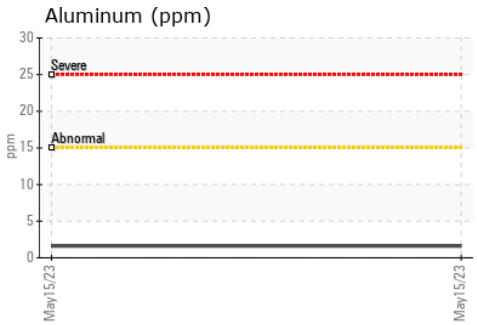

| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Emulsified Water | scalar | Visual* | >0.1 | **NEG** | --- | --- |
| Free Water | scalar | Visual* | | **NEG** | --- | --- |

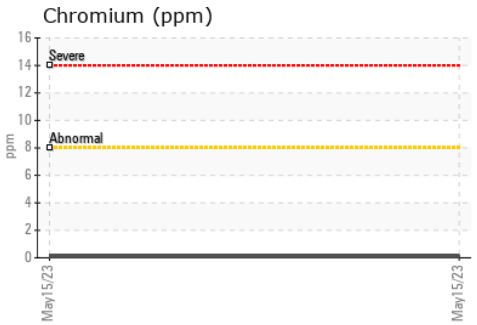
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D7279(m) | 15 | **13.8** | --- | --- |

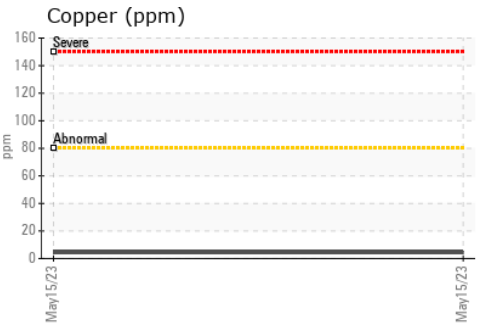
## GRAPHS

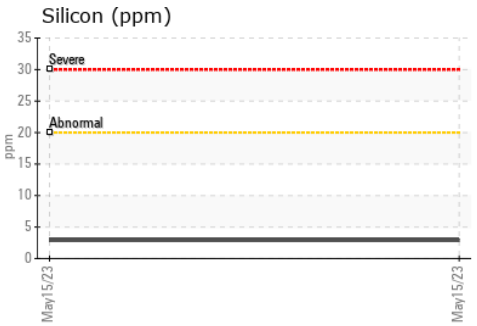


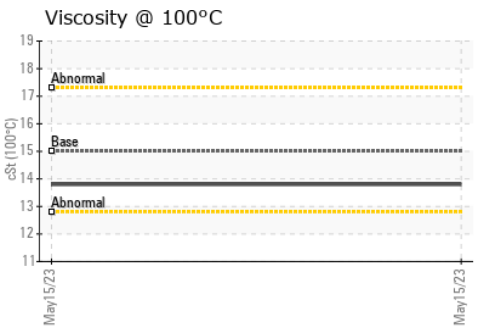



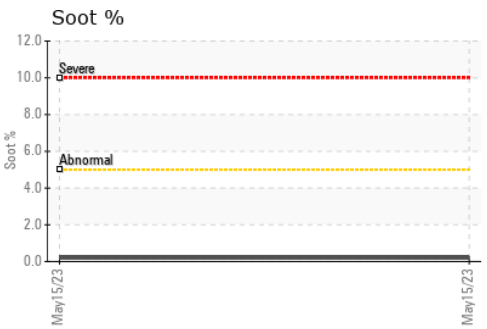




ISO 17025:2017 Accredited Laboratory

**Laboratory** : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
**Sample No.** : WA0019685
**Lab Number** : 02558838
**Unique Number** : 5579878
**Test Package** : MOB 1

**Received** : 23 May 2023
**Diagnosed** : 23 May 2023
**Diagnostician** : Wes Davis

*To discuss this sample report, contact Customer Service at 1-800-268-2131.*
*Test denoted (*) outside scope of accreditation, (m) method modified, (e) tested at external lab.*
*Validity of results and interpretation are based on the sample and information as supplied.*


**CCGS LA POILE BAY**
21 LOWER WARREN STREET
LOUISBOURG, NS
CA B1L 1B5
Contact: Service Manager
spindrifteng.ccgs@dg-mpo.gc.ca
T: (902)733-3700
F: