



| | |
|-----------------|---------------|
| WEAR | NORMAL |
| CONTAMINATION | NORMAL |
| FLUID CONDITION | NORMAL |

Area

WILLARD HAMMOND

Machine Id

[WILLARD HAMMOND] 008 587215-8

Component

Starboard Genset

Fluid

CHEVRON DELO 400 MULTIGRADE 15W40 (4 GAL)

RECOMMENDATION

Resample at the next service interval to monitor.

| Test | UOM | Method | Limit/Abn | Current | History1 | History2 |
|----------------|-----|-------------|-----------|--------------------|-------------|-------------|
| Sample Number | | Client Info | | MW0070936 | MW0072271 | MW0070932 |
| Sample Date | | Client Info | | 01 Jul 2024 | 01 Jun 2024 | 01 May 2024 |
| Machine Age | hrs | Client Info | | 31575 | 31359 | 30789 |
| Oil Age | hrs | Client Info | | 0 | 234 | 0 |
| Filter Age | hrs | Client Info | | 0 | 234 | 0 |
| Oil Changed | | Client Info | | Changed | Not Changd | Changed |
| Filter Changed | | Client Info | | Changed | Not Changd | Changed |
| Sample Status | | | | NORMAL | NORMAL | NORMAL |

WEAR

All component wear rates are normal.

| | | | | | | |
|--------------|--------|-------------|------|--------------|------|------|
| Iron | ppm | ASTM D5185m | >50 | 2 | 5 | 4 |
| Chromium | ppm | ASTM D5185m | >4 | 0 | <1 | 0 |
| Nickel | ppm | ASTM D5185m | >2 | 0 | 0 | 0 |
| Titanium | ppm | ASTM D5185m | | 0 | <1 | 0 |
| Silver | ppm | ASTM D5185m | >5 | 0 | <1 | <1 |
| Aluminum | ppm | ASTM D5185m | >12 | 3 | 4 | 3 |
| Lead | ppm | ASTM D5185m | >17 | 0 | 0 | <1 |
| Copper | ppm | ASTM D5185m | >70 | 0 | <1 | 0 |
| Tin | ppm | ASTM D5185m | >15 | <1 | 0 | 0 |
| Vanadium | ppm | ASTM D5185m | | 0 | <1 | 0 |
| White Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | NONE | NONE | NONE |

CONTAMINATION

There is no indication of any contamination in the oil.

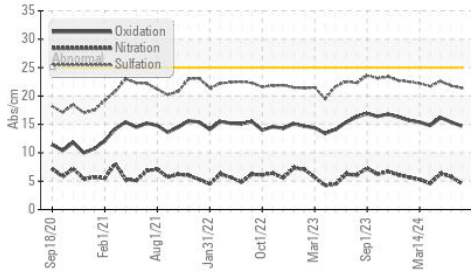
| | | | | | | |
|------------------|----------|-------------|-------|----------------|-------|-------|
| Silicon | ppm | ASTM D5185m | >25 | 5 | 6 | 5 |
| Potassium | ppm | ASTM D5185m | >20 | <1 | 2 | <1 |
| Fuel | | WC Method | >4.0 | <1.0 | <1.0 | <1.0 |
| Water | | WC Method | >0.1 | NEG | NEG | NEG |
| Glycol | | WC Method | | NEG | NEG | NEG |
| Soot % | % | *ASTM D7844 | | 0 | 0.1 | 0.1 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | 4.6 | 5.8 | 6.3 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | 21.4 | 21.8 | 22.6 |
| 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 |

FLUID CONDITION

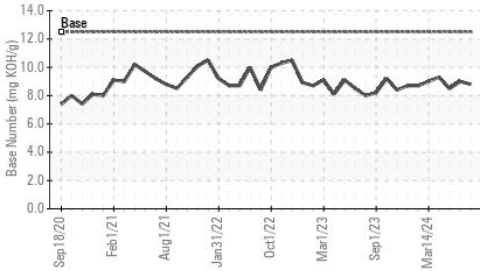
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

| | | | | | | |
|------------------|----------|-------------|------|--------------|------|------|
| Sodium | ppm | ASTM D5185m | | <1 | <1 | 0 |
| Boron | ppm | ASTM D5185m | 151 | 413 | 379 | 369 |
| Barium | ppm | ASTM D5185m | 0.4 | 0 | <1 | 0 |
| Molybdenum | ppm | ASTM D5185m | 250 | 107 | 120 | 129 |
| Manganese | ppm | ASTM D5185m | | <1 | 1 | 2 |
| Magnesium | ppm | ASTM D5185m | 0 | 542 | 605 | 692 |
| Calcium | ppm | ASTM D5185m | 2046 | 1538 | 1663 | 1932 |
| Phosphorus | ppm | ASTM D5185m | 1043 | 865 | 864 | 887 |
| Zinc | ppm | ASTM D5185m | 943 | 998 | 970 | 1075 |
| Sulfur | ppm | ASTM D5185m | 5012 | 3370 | 2869 | 3601 |
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | 14.7 | 15.4 | 16.2 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 12.5 | 8.8 | 9.0 | 8.5 |
| Visc @ 100°C | cSt | ASTM D445 | 14.4 | 14.0 | 12.8 | 13.1 |

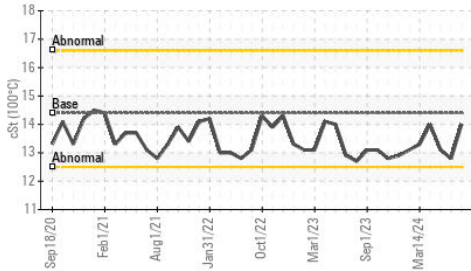
FT-IR (Direct Trend)



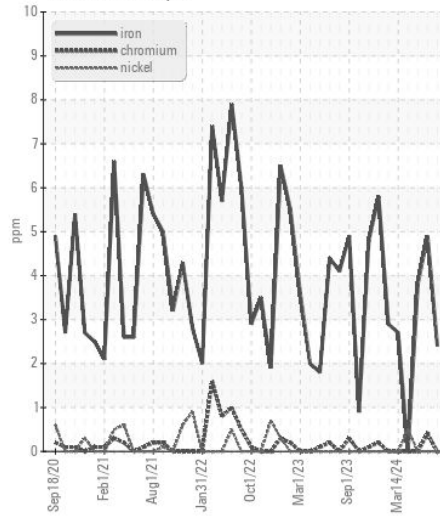
Base Number



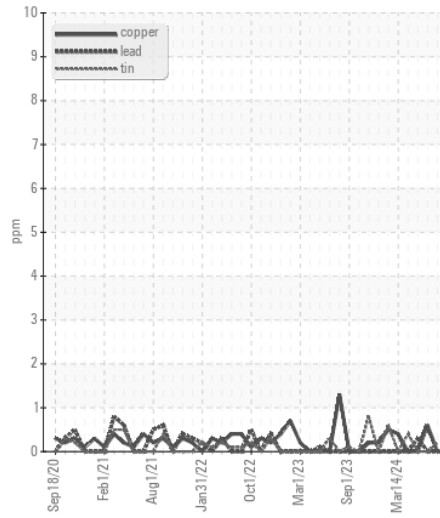
Viscosity @ 100°C



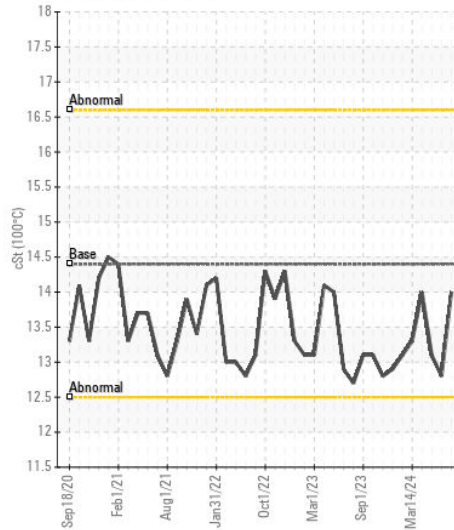
Ferrous Alloys



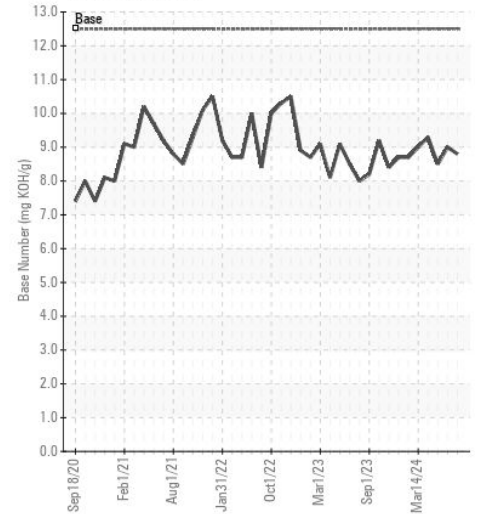
Non-ferrous Metals



Viscosity @ 100°C



Base Number



Certificate L2367

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

Sample No. : MW0070936

Lab Number : 06237307

Unique Number : 11126141

Test Package : MAR 2

Received : 15 Jul 2024

Tested : 17 Jul 2024

Diagnosed : 17 Jul 2024 - Wes Davis

INGRAM BARGE

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PADUCAH, KY

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Contact: CHARLES COPELAND

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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)