



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

Machine Id
RIVER SPIRIT
Component
Starboard Main Engine
Fluid
PETRO CANADA DURON MARINE SAE 40 (19 GAL)

RECOMMENDATION

Resample at the next service interval to monitor.

| Test | UOM | Method | Limit/Abn | Current | History1 | History2 |
|----------------|-----|-------------|-----------|--------------------|-------------|-------------|
| Sample Number | | Client Info | | MW0066899 | MW0066825 | MW0036018 |
| Sample Date | | Client Info | | 09 Apr 2024 | 08 Feb 2024 | 12 Dec 2023 |
| Machine Age | hrs | Client Info | | 22579 | 21870 | 20945 |
| Oil Age | hrs | Client Info | | 709 | 925 | 311 |
| Filter Age | hrs | Client Info | | 709 | 925 | 311 |
| Oil Changed | | Client Info | | Changed | N/A | Changed |
| Filter Changed | | Client Info | | Changed | N/A | Changed |
| Sample Status | | | | NORMAL | NORMAL | NORMAL |

WEAR

All component wear rates are normal.

| | | | | | | |
|--------------|--------|-------------|------|--------------|------|------|
| Iron | ppm | ASTM D5185m | >120 | 0 | 4 | 0 |
| Chromium | ppm | ASTM D5185m | >10 | 0 | <1 | 0 |
| Nickel | ppm | ASTM D5185m | >5 | 0 | <1 | 0 |
| Titanium | ppm | ASTM D5185m | | 0 | <1 | 0 |
| Silver | ppm | ASTM D5185m | >5 | 0 | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >20 | 0 | 1 | 0 |
| Lead | ppm | ASTM D5185m | >40 | 0 | 1 | 0 |
| Copper | ppm | ASTM D5185m | >300 | <1 | 2 | <1 |
| Tin | ppm | ASTM D5185m | >10 | 0 | <1 | 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.

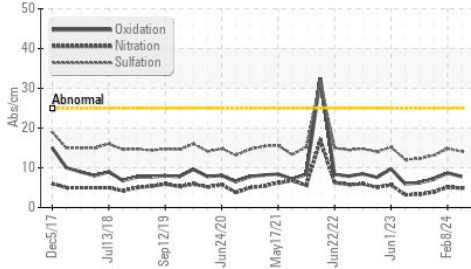
| | | | | | | |
|------------------|----------|-------------|-------|----------------|-------|-------|
| Silicon | ppm | ASTM D5185m | >25 | <1 | 2 | 2 |
| Potassium | ppm | ASTM D5185m | >20 | 0 | 1 | 0 |
| Fuel | | WC Method | >4.0 | <1.0 | <1.0 | <1.0 |
| Water | | WC Method | >0.1 | NEG | NEG | NEG |
| Glycol | | WC Method | | NEG | NEG | NEG |
| Soot % | % | *ASTM D7844 | | 0.1 | 0.1 | 0.1 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | 4.9 | 5.1 | 3.9 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | 14.1 | 14.8 | 13.1 |
| 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

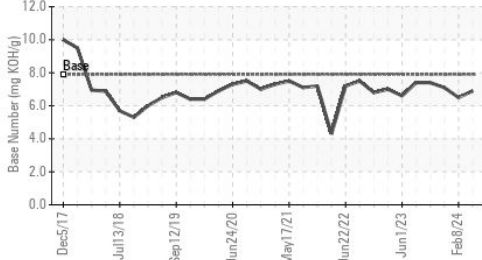
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

| | | | | | | |
|------------------|----------|-------------|------|--------------|------|------|
| Sodium | ppm | ASTM D5185m | | <1 | <1 | 0 |
| Boron | ppm | ASTM D5185m | 1.0 | <1 | 0 | 0 |
| Barium | ppm | ASTM D5185m | 1.0 | 0 | 34 | 0 |
| Molybdenum | ppm | ASTM D5185m | 1.0 | 0 | 1 | 0 |
| Manganese | ppm | ASTM D5185m | 1 | 0 | <1 | <1 |
| Magnesium | ppm | ASTM D5185m | 15 | 861 | 807 | 906 |
| Calcium | ppm | ASTM D5185m | 2540 | 1056 | 934 | 993 |
| Phosphorus | ppm | ASTM D5185m | 1000 | 1098 | 945 | 1058 |
| Zinc | ppm | ASTM D5185m | 1110 | 1279 | 1179 | 1311 |
| Sulfur | ppm | ASTM D5185m | 3700 | 3460 | 3010 | 3061 |
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | 7.8 | 8.7 | 7.1 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 7.9 | 6.9 | 6.5 | 7.1 |
| Visc @ 100°C | cSt | ASTM D445 | 14.6 | 13.2 | 13.2 | 13.3 |

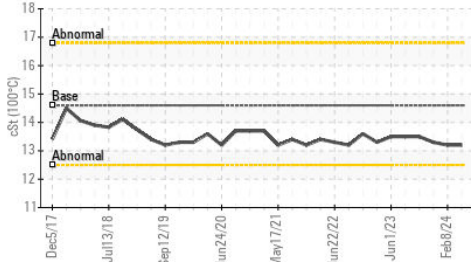
FT-IR (Direct Trend)



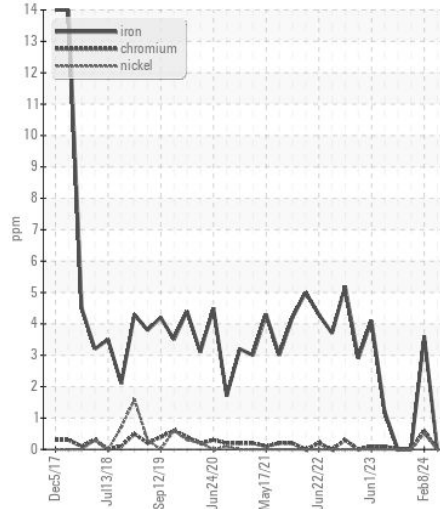
Base Number



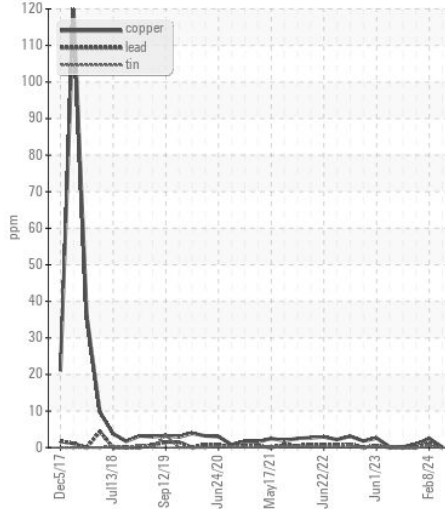
Viscosity @ 100°C



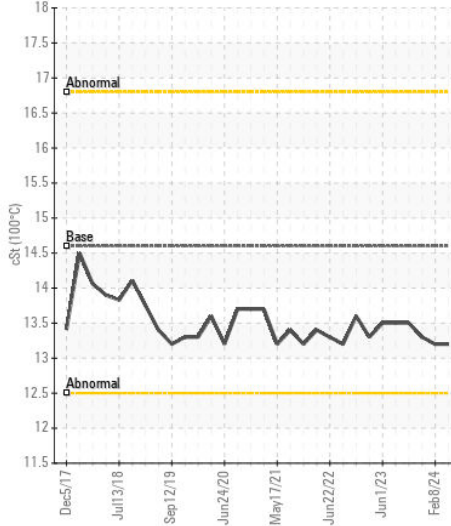
Ferrous Alloys



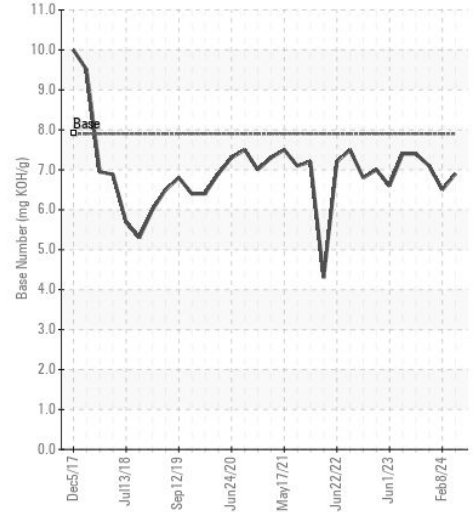
Non-ferrous Metals



Viscosity @ 100°C



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : MW0066899
Lab Number : 06195243
Unique Number : 11057366
Test Package : MAR 2

Received : 30 May 2024
Tested : 31 May 2024
Diagnosed : 31 May 2024 - Wes Davis

AMERICAN RIVER TRANSPORTATION
 1495 EAST ILLINOIS RT 71
 OTTAWA, IL
 US 61350

Contact: Jackson Hayes
 jackson.hayes@adm.com

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)

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