



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

Area
LOUISIANA BELLE
Machine Id
LBE
Component
Starboard Genset
Fluid
DIESEL ENGINE OIL SAE 15W40 (5 GAL)

RECOMMENDATION

Resample at the next service interval to monitor.

| Test | UOM | Method | Limit/Abn | Current | History1 | History2 |
|----------------|-----|-------------|-----------|--------------------|-------------|-------------|
| Sample Number | | Client Info | | MW0065065 | MW0065110 | MW0054780 |
| Sample Date | | Client Info | | 27 Mar 2024 | 13 Feb 2024 | 13 Dec 2023 |
| Machine Age | hrs | Client Info | | 38818 | 38484 | 37893 |
| Oil Age | hrs | Client Info | | 0 | 0 | 0 |
| Filter Age | hrs | Client Info | | 0 | 0 | 0 |
| Oil Changed | | Client Info | | N/A | N/A | N/A |
| Filter Changed | | Client Info | | N/A | N/A | N/A |
| Sample Status | | | | NORMAL | NORMAL | NORMAL |

WEAR

All component wear rates are normal.

| | | | | | | |
|--------------|--------|-------------|------|--------------|------|------|
| Iron | ppm | ASTM D5185m | >50 | 2 | 5 | 3 |
| Chromium | ppm | ASTM D5185m | >4 | <1 | <1 | <1 |
| Nickel | ppm | ASTM D5185m | >2 | 0 | <1 | 0 |
| Titanium | ppm | ASTM D5185m | | 0 | <1 | 0 |
| Silver | ppm | ASTM D5185m | >5 | 0 | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >12 | 1 | 3 | 2 |
| Lead | ppm | ASTM D5185m | >17 | 0 | <1 | 0 |
| Copper | ppm | ASTM D5185m | >70 | 0 | <1 | <1 |
| Tin | ppm | ASTM D5185m | >15 | <1 | <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.

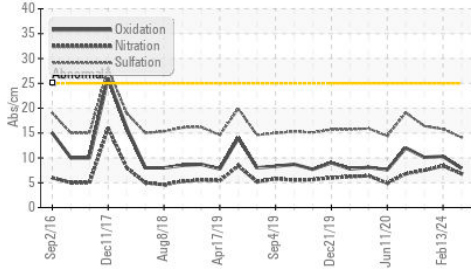
| | | | | | | |
|------------------|----------|-------------|-------|----------------|-------|-------|
| Silicon | ppm | ASTM D5185m | >25 | 19 | 4 | 3 |
| Potassium | ppm | ASTM D5185m | >20 | 0 | 2 | 2 |
| Fuel | | WC Method | >4.0 | <1.0 | <1.0 | <1.0 |
| Water | | WC Method | >0.1 | NEG | NEG | NEG |
| Glycol | | WC Method | | NEG | NEG | NEG |
| Soot % | % | *ASTM D7844 | | 0.1 | 0.2 | 0.1 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | 6.8 | 8.4 | 7.5 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | 14.1 | 15.8 | 16.4 |
| 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

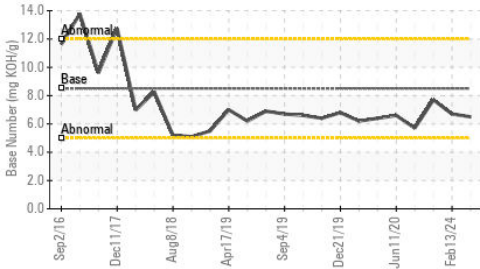
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is acceptable for the time in service.

| | | | | | | |
|------------------|----------|-------------|------|--------------|------|------|
| Sodium | ppm | ASTM D5185m | >158 | <1 | 1 | 0 |
| Boron | ppm | ASTM D5185m | 250 | 49 | 25 | 27 |
| Barium | ppm | ASTM D5185m | 10 | 0 | 34 | 3 |
| Molybdenum | ppm | ASTM D5185m | 100 | 44 | 31 | 25 |
| Manganese | ppm | ASTM D5185m | | <1 | <1 | 0 |
| Magnesium | ppm | ASTM D5185m | 450 | 9 | 8 | 9 |
| Calcium | ppm | ASTM D5185m | 3000 | 3459 | 2604 | 3147 |
| Phosphorus | ppm | ASTM D5185m | 1150 | 0 | 37 | 52 |
| Zinc | ppm | ASTM D5185m | 1350 | 0 | 30 | 0 |
| Sulfur | ppm | ASTM D5185m | 4250 | 2830 | 2336 | 3595 |
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | 7.9 | 10.3 | 10.1 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 8.5 | 6.5 | 6.7 | 7.7 |
| Visc @ 100°C | cSt | ASTM D445 | 14.4 | 14.2 | 14.4 | 14.2 |

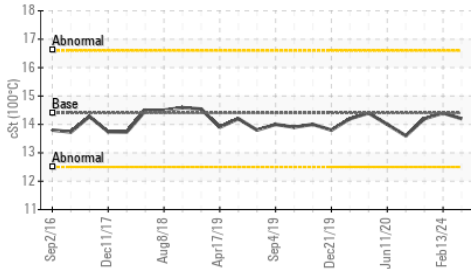
FT-IR (Direct Trend)



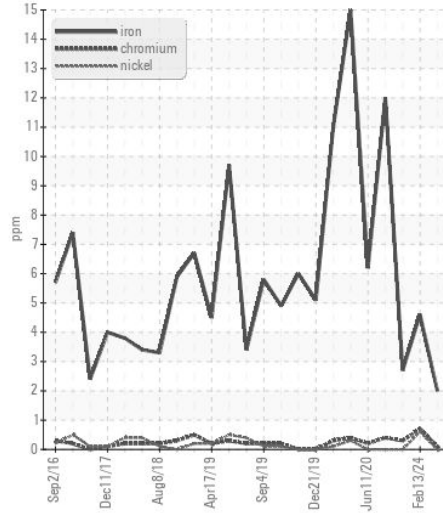
Base Number



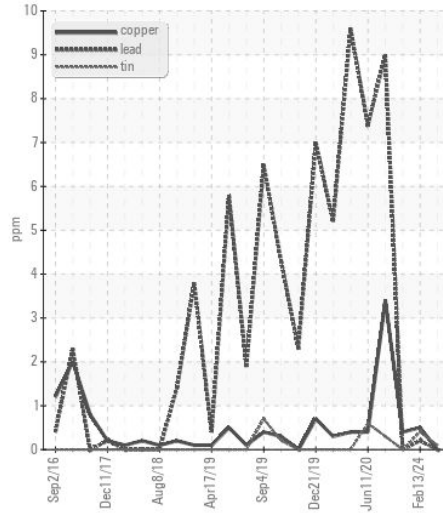
Viscosity @ 100°C



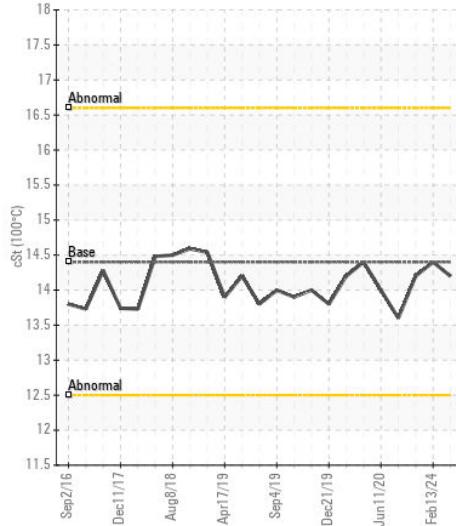
Ferrous Alloys



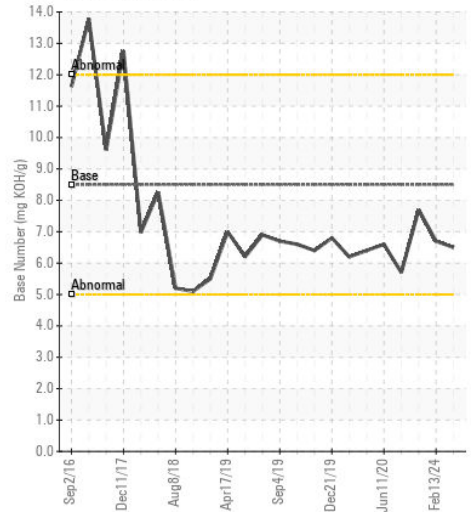
Non-ferrous Metals



Viscosity @ 100°C



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : MW0065065
Lab Number : 06150055
Unique Number : 10980133
Test Package : MAR 2

Received : 16 Apr 2024
Tested : 17 Apr 2024
Diagnosed : 18 Apr 2024 - Sean Felton

AMERICAN RIVER TRANSPORTATION CO.
 P.O. BOX 2889
 ST. LOUIS, MO
 US 63111
 Contact: BRIAN GRIEWING
 brian.griewing@adm.com
 T:
 F: (314)481-5278

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)