



POWER SYSTEMS
SYSTÈMES DE PUISSANCE

OIL ANALYSIS REPORT

| | |
|-----------------|-----------------|
| WEAR | MARGINAL |
| CONTAMINATION | ABNORMAL |
| FLUID CONDITION | NORMAL |

Area
[01-26758]

Machine Id
45588211

Component
Starboard Diesel Engine

Fluid
VALVOLINE 15W40 (--- GAL)

RECOMMENDATION

We advise that you check the air filter, air induction system, and any areas where dirt may enter the component. We recommend that you drain the oil from the component if this has not already been done. We recommend you service the filters on this component. We recommend an early resample to monitor this condition.

WEAR

Nickel ppm levels are marginal. All other component wear rates are normal.

CONTAMINATION

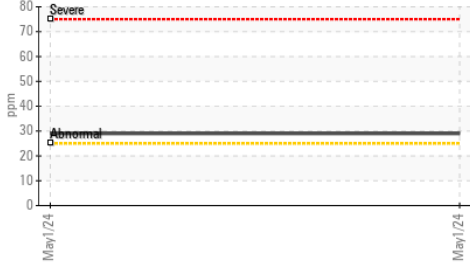
There is a moderate concentration of dirt present in the oil.

FLUID CONDITION

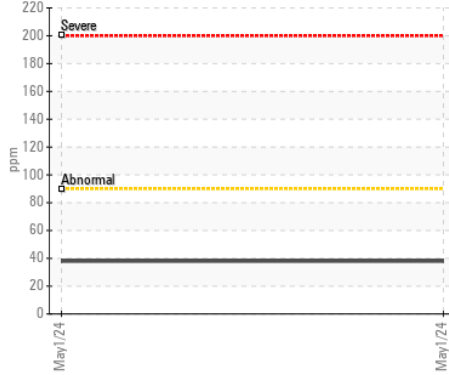
The BN result indicates that there is suitable alkalinity remaining in the oil. The oil is no longer serviceable due to the presence of contaminants.

| Test | UOM | Method | Limit/Abn | Current | History1 | History2 |
|------------------|----------|---------------|-----------|--------------------|----------|----------|
| Sample Number | | Client Info | | WA0021535 | --- | --- |
| Sample Date | | Client Info | | 01 May 2024 | --- | --- |
| Machine Age | hrs | Client Info | | 1658 | --- | --- |
| Oil Age | hrs | Client Info | | 250 | --- | --- |
| Filter Age | hrs | Client Info | | 250 | --- | --- |
| Oil Changed | | Client Info | | Not Changd | --- | --- |
| Filter Changed | | Client Info | | Not Changd | --- | --- |
| Sample Status | | | | ABNORMAL | --- | --- |
| Iron | ppm | ASTM D5185(m) | >90 | 38 | --- | --- |
| Chromium | ppm | ASTM D5185(m) | >20 | 3 | --- | --- |
| Nickel | ppm | ASTM D5185(m) | >2 | ▲ 2 | --- | --- |
| Titanium | ppm | ASTM D5185(m) | >2 | 0 | --- | --- |
| Silver | ppm | ASTM D5185(m) | >2 | 0 | --- | --- |
| Aluminum | ppm | ASTM D5185(m) | >20 | 12 | --- | --- |
| Lead | ppm | ASTM D5185(m) | >40 | 32 | --- | --- |
| Copper | ppm | ASTM D5185(m) | >330 | 7 | --- | --- |
| Tin | ppm | ASTM D5185(m) | >15 | 0 | --- | --- |
| Vanadium | ppm | ASTM D5185(m) | | 0 | --- | --- |
| Silicon | ppm | ASTM D5185(m) | >25 | ▲ 29 | --- | --- |
| Potassium | ppm | ASTM D5185(m) | >20 | 1 | --- | --- |
| Fuel | | WC Method | >3.0 | <1.0 | --- | --- |
| Water | | WC Method | >0.2 | NEG | --- | --- |
| Glycol | | WC Method | | NEG | --- | --- |
| Soot % | % | ASTM D7844* | >6 | 0.2 | --- | --- |
| Nitration | Abs/cm | ASTM D7624* | >20 | 11.9 | --- | --- |
| Sulfation | Abs/.1mm | ASTM D7415* | >30 | 23.0 | --- | --- |
| Emulsified Water | scalar | Visual* | >0.2 | NEG | --- | --- |
| Sodium | ppm | ASTM D5185(m) | | 4 | --- | --- |
| Boron | ppm | ASTM D5185(m) | 39 | 70 | --- | --- |
| Barium | ppm | ASTM D5185(m) | 1 | 0 | --- | --- |
| Molybdenum | ppm | ASTM D5185(m) | 49 | 67 | --- | --- |
| Manganese | ppm | ASTM D5185(m) | 1 | <1 | --- | --- |
| Magnesium | ppm | ASTM D5185(m) | 616 | 707 | --- | --- |
| Calcium | ppm | ASTM D5185(m) | 1554 | 1395 | --- | --- |
| Phosphorus | ppm | ASTM D5185(m) | 899 | 704 | --- | --- |
| Zinc | ppm | ASTM D5185(m) | 1069 | 832 | --- | --- |
| Sulfur | ppm | ASTM D5185(m) | 2624 | 1956 | --- | --- |
| Oxidation | Abs/.1mm | ASTM D7414* | >25 | 23.1 | --- | --- |
| Base Number (BN) | mg KOH/g | ASTM D2896* | 6.9 | 8.41 | --- | --- |
| Visc @ 100°C | cSt | ASTM D7279(m) | 13.6 | 13.9 | --- | --- |

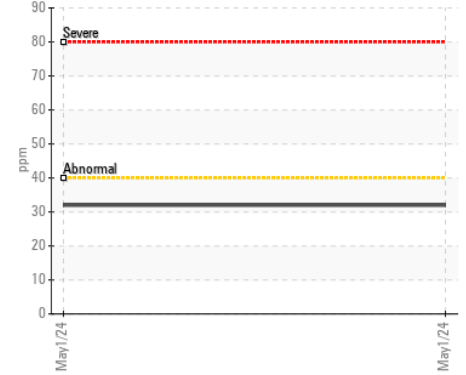
▲ Silicon (ppm)



Iron (ppm)



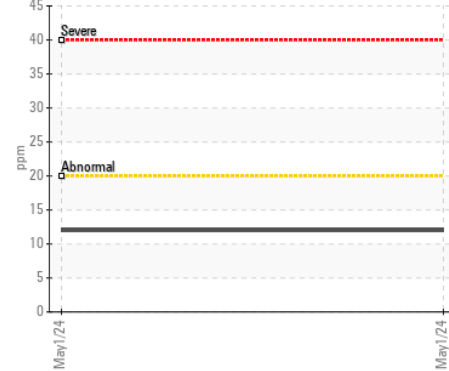
Lead (ppm)



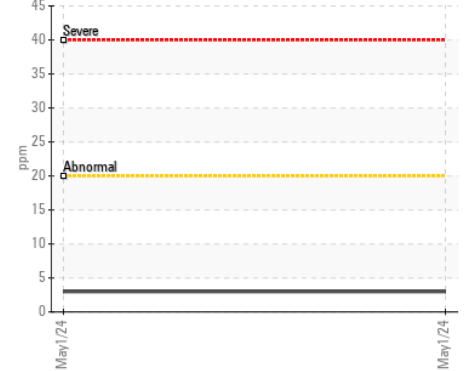
▲ Ferrous Alloys



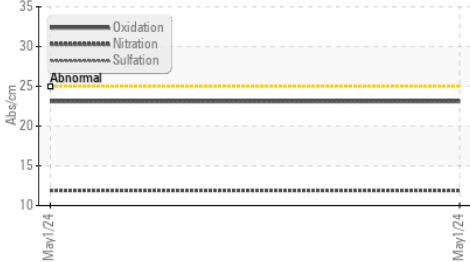
Aluminum (ppm)



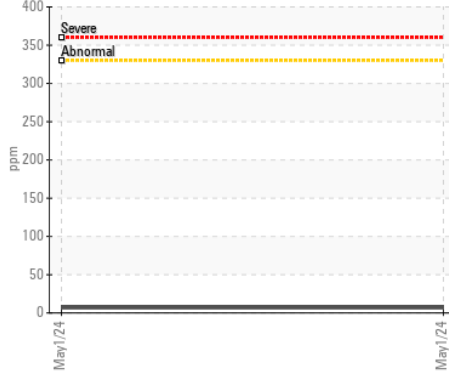
Chromium (ppm)



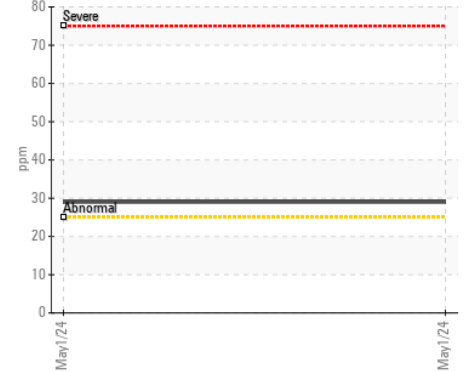
FT-IR (Direct Trend)



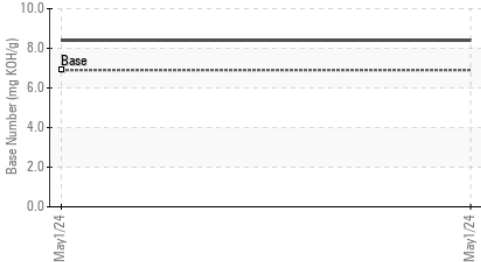
Copper (ppm)



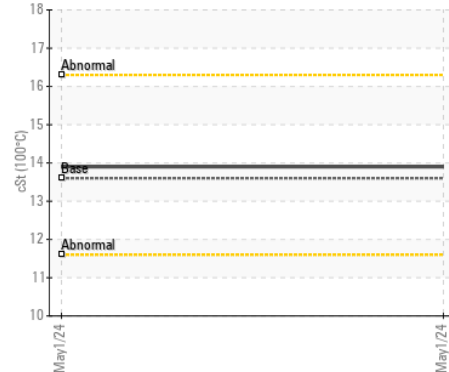
▲ Silicon (ppm)



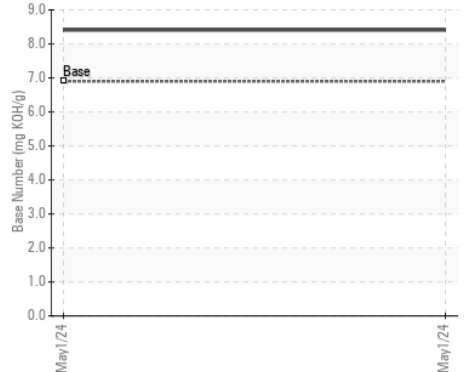
Base Number



Viscosity @ 100°C



Base Number



Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
Sample No. : WA0021535 **Received** : 06 May 2024
Lab Number : 02633464 **Tested** : 07 May 2024
Unique Number : 5774617 **Diagnosed** : 07 May 2024 - Kevin Marson
Test Package : MOB 2

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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.