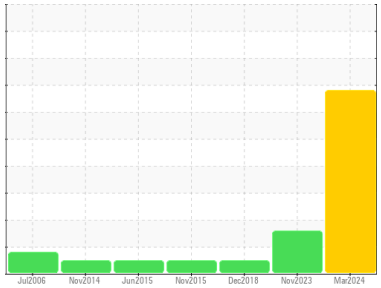
# OIL ANALYSIS REPORT

Sample Rating Trend




**WEAR**

Area
**CFR#41795 [224423]**
Machine Id
**06D0312076**
Component
**Diesel Engine**
Fluid
**DIESEL ENGINE OIL SAE 40 (--- LTR)**

## DIAGNOSIS

**▲ Recommendation**

We recommend that you drain the oil from the component if this has not already been done. We recommend an early resample to monitor this condition. The fluid was not specified, however, a fluid match indicates that this fluid is (GENERIC) DIESEL ENGINE OIL SAE 40. Please confirm.

**▲ Wear**

Tin ppm levels are severe. Lead ppm levels are noted. A sharp increase in the lead level is noted. Piston wear is indicated.

**Contamination**

There is no indication of any contamination in the oil.

**Fluid Condition**

The oil is no longer serviceable as a result of the abnormal and/or severe wear.

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **WA0020752** | WA0020747 | WC876389 |
| Sample Date | | Client Info | | **12 Mar 2024** | 28 Nov 2023 | 11 Dec 2018 |
| Machine Age | hrs | Client Info | | **0** | 0 | 822 |
| Oil Age | hrs | Client Info | | **0** | 0 | 0 |
| Oil Changed | | Client Info | | **N/A** | Changed | N/A |
| Sample Status | | | | **SEVERE** | ABNORMAL | NORMAL |

| CONTAMINATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Fuel | | WC Method | >3.0 | **<1.0** | <1.0 | <1.0 |
| Water | | WC Method | >0.2 | **NEG** | NEG | NEG |
| Glycol | | WC Method | | **NEG** | NEG | NEG |

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Iron | ppm | ASTM D5185(m) | >101 | **14** | 16 | 11 |
| Chromium | ppm | ASTM D5185(m) | >16 | **<1** | <1 | <1 |
| Nickel | ppm | ASTM D5185(m) | >6 | **0** | <1 | <1 |
| Titanium | ppm | ASTM D5185(m) | >2 | **0** | 0 | 0 |
| Silver | ppm | ASTM D5185(m) | >2 | **0** | <1 | 0 |
| Aluminum | ppm | ASTM D5185(m) | >21 | **0** | <1 | <1 |
| Lead | ppm | ASTM D5185(m) | >41 | ● **25** | 12 | 4 |
| Copper | ppm | ASTM D5185(m) | >21 | **20** | 22 | 34 |
| Tin | ppm | ASTM D5185(m) | >13 | ▲ **52** | 3 | 3 |
| Antimony | ppm | ASTM D5185(m) | | **0** | 0 | 0 |
| Vanadium | ppm | ASTM D5185(m) | | **0** | 0 | 0 |
| Beryllium | ppm | ASTM D5185(m) | | **0** | 0 | 0 |
| Cadmium | ppm | ASTM D5185(m) | | **0** | 0 | <1 |

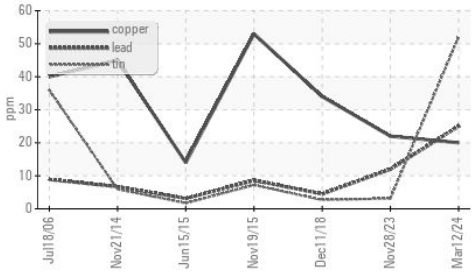
| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185(m) | 250 | **0** | 10 | 22 |
| Barium | ppm | ASTM D5185(m) | 10 | **<1** | <1 | 0 |
| Molybdenum | ppm | ASTM D5185(m) | 100 | **105** | 2 | 2 |
| Manganese | ppm | ASTM D5185(m) | | **<1** | 0 | <1 |
| Magnesium | ppm | ASTM D5185(m) | 450 | **14** | 50 | 46 |
| Calcium | ppm | ASTM D5185(m) | 3000 | **2380** | 1574 | 1580 |
| Phosphorus | ppm | ASTM D5185(m) | 1150 | **946** | 598 | 591 |
| Zinc | ppm | ASTM D5185(m) | 1350 | **1026** | 679 | 746 |
| Sulfur | ppm | ASTM D5185(m) | 4250 | **4507** | 2227 | 2312 |
| Lithium | ppm | ASTM D5185(m) | | **<1** | <1 | 0 |

| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185(m) | >16 | **15** | ▲ 23 | 12 |
| Sodium | ppm | ASTM D5185(m) | >216 | **8** | 11 | 8 |
| Potassium | ppm | ASTM D5185(m) | >20 | **4** | <1 | 1 |

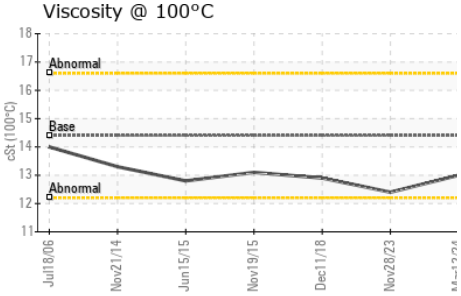
| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | ASTM D7844* | >0.8 | **0** | 0 | 0 |
| Nitration | Abs/cm | ASTM D7624* | >20 | **3.8** | 3.6 | 4.0 |
| Sulfation | Abs/.1mm | ASTM D7415* | >30 | **13.7** | 14.6 | 15.3 |

# OIL ANALYSIS REPORT

Non-ferrous Metals




Viscosity @ 100°C



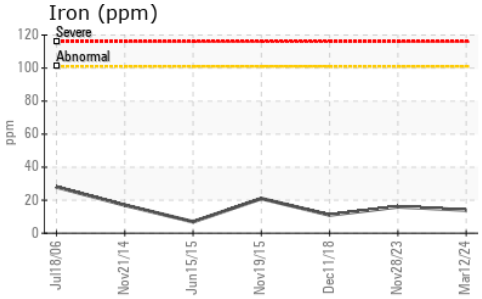

| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | ASTM D7414* | >25 | **6.4** | 8.9 | 9.7 |

| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Emulsified Water | scalar | Visual* | >0.2 | **NEG** | NEG | NEG |
| Free Water | scalar | Visual* | | **NEG** | NEG | NEG |

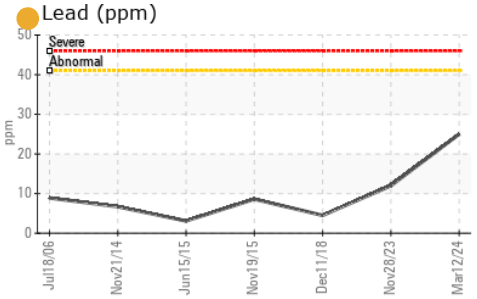
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D7279(m) | 14.4 | **13.0** | 12.4 | 12.9 |

## GRAPHS

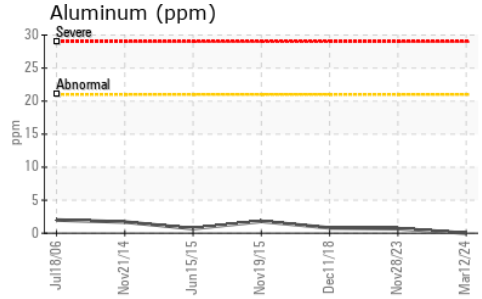
Iron (ppm)



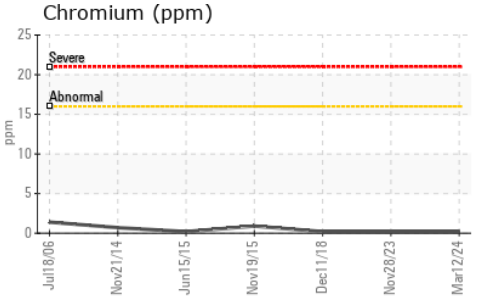

Lead (ppm)



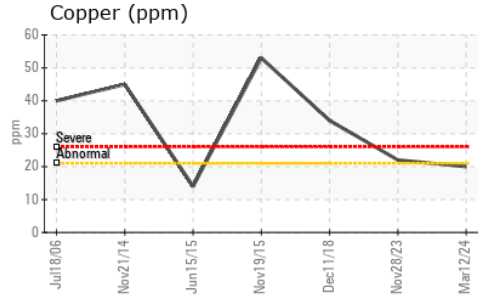

Aluminum (ppm)



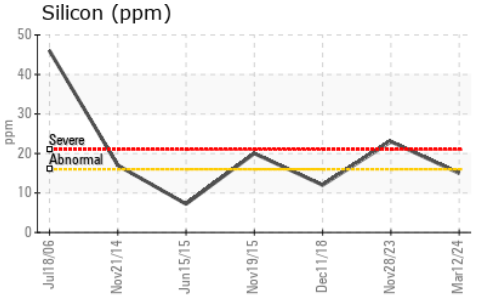

Chromium (ppm)



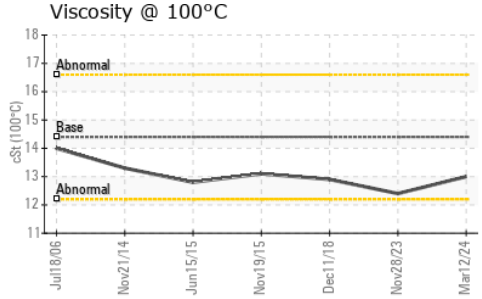

Copper (ppm)



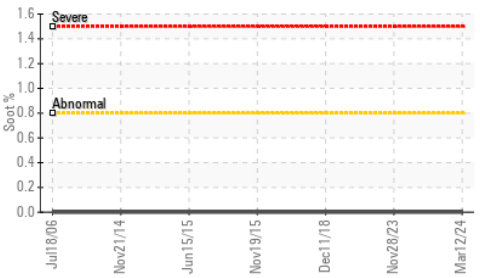

Silicon (ppm)




Viscosity @ 100°C




Soot %




ISO 17025:2017 Accredited Laboratory

**Laboratory** : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
**Sample No.** : WA0020752
**Lab Number** : 02623678
**Unique Number** : 5748797
**Test Package** : MOB 1

**Received** : 21 Mar 2024
**Tested** : 21 Mar 2024
**Diagnosed** : 21 Mar 2024 - Kevin Marson

*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.*


**DEPARTMENT OF NATIONAL DEFENSE**
MGEN.GEORGE R.PEARKES BUILDING
OTTAWA, ON
CA K1A 0K2
Contact: Jean-Marc Beaudoin
JEAN-MARC.BEAUDOIN@Forces.gc.ca
T: (819)993-0911
F: (819)997-9989