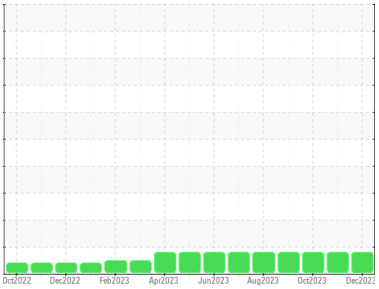
# PROBLEM SUMMARY

Area
**ARIZONA**
Machine Id
**VOLVO 4903**
Component
**Diesel Engine**
Fluid
**NAPA Motor Oil 15W40 (--- QTS)**

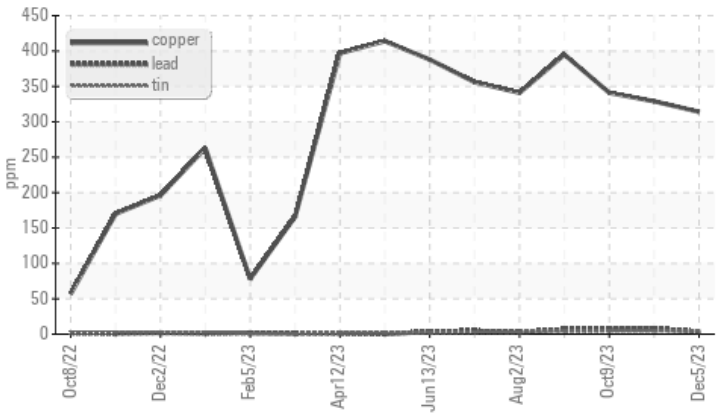
**Sample Rating Trend**




**WEAR**

## COMPONENT CONDITION SUMMARY

▲ Non-ferrous Metals




## RECOMMENDATION

No corrective action is recommended at this time.
Resample at the next service interval to monitor.

## PROBLEMATIC TEST RESULTS

| | | | | | | |
|---|---|---|---|---|---|---|
| Sample Status | | | | **ABNORMAL** | ABNORMAL | ABNORMAL |
| Copper | ppm | ASTM D5185m | >330 | ▲ **314** | ▲ 329 | ▲ 341 |

**Customer Id:** SEAOKL
**Sample No.:** WC0881844
**Lab Number:** 06029902
**Test Package:** FLEET

*To manage this report scan the QR code*

*To discuss the diagnosis or test data:*
Don Baldridge +1
don.b505@comcast.net

*To change component or sample information:*
Customer Service +1 1-800-237-1369
customerservice@wearcheck.com

## RECOMMENDED ACTIONS

*There are no recommended actions for this sample.*

## HISTORICAL DIAGNOSIS

**15 Nov 2023 Diag: Jonathan Hester**

WEAR

No corrective action is recommended at this time. Resample at the next service interval to monitor.The copper level is abnormal. In the absence of other significant wear metals, suspect copper due to sources other than wear (i.e. cooling core). All other component wear rates are normal. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

**view report**

**09 Oct 2023 Diag: Don Baldridge**

WEAR

No corrective action is recommended at this time. Resample at the next service interval to monitor.The copper level is abnormal. In the absence of other significant wear metals, suspect copper due to sources other than wear (i.e. cooling core). All other component wear rates are normal. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

**view report**

**05 Sep 2023 Diag: Don Baldridge**

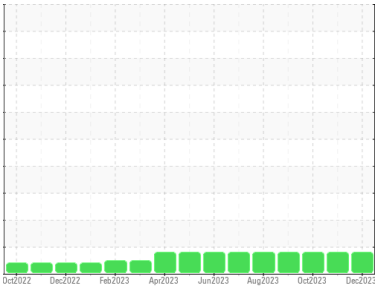
WEAR

No corrective action is recommended at this time. Resample at the next service interval to monitor.The copper level is abnormal. In the absence of other significant wear metals, suspect copper due to sources other than wear (i.e. cooling core). All other component wear rates are normal. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

**view report**

# OIL ANALYSIS REPORT

Sample Rating Trend




**WEAR**

Area
**ARIZONA**
Machine Id
**VOLVO 4903**
Component
**Diesel Engine**
Fluid
**NAPA Motor Oil 15W40 (--- QTS)**

## DIAGNOSIS

**Recommendation**

No corrective action is recommended at this time. Resample at the next service interval to monitor.

**Wear**

The copper level is abnormal. In the absence of other significant wear metals, suspect copper due to sources other than wear (i.e. cooling core). All other component wear rates are normal.

**Contamination**

There is no indication of any contamination in the oil.

**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.

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **WC0881844** | WC0881836 | WC0857170 |
| Sample Date | | Client Info | | **05 Dec 2023** | 15 Nov 2023 | 09 Oct 2023 |
| Machine Age | hrs | Client Info | | **2275** | 2176 | 1976 |
| Oil Age | hrs | Client Info | | **1459** | 1360 | 1160 |
| Oil Changed | | Client Info | | **Not Changd** | Not Changd | Not Changd |
| Sample Status | | | | **ABNORMAL** | ABNORMAL | ABNORMAL |

| CONTAMINATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Fuel | | WC Method | >6.0 | **<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 D5185m | >100 | **75** | 71 | 65 |
| Chromium | ppm | ASTM D5185m | >20 | **1** | 1 | 1 |
| Nickel | ppm | ASTM D5185m | >2 | **6** | 6 | 6 |
| Titanium | ppm | ASTM D5185m | | **0** | <1 | <1 |
| Silver | ppm | ASTM D5185m | >2 | **0** | 0 | <1 |
| Aluminum | ppm | ASTM D5185m | >25 | **8** | 8 | 8 |
| Lead | ppm | ASTM D5185m | >40 | **3** | 8 | 7 |
| Copper | ppm | ASTM D5185m | >330 | ▲ **314** | ▲ 329 | ▲ 341 |
| Tin | ppm | ASTM D5185m | >15 | **4** | 4 | 4 |
| Vanadium | ppm | ASTM D5185m | | **0** | <1 | <1 |
| Cadmium | ppm | ASTM D5185m | | **0** | 0 | 0 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | | **25** | 22 | 39 |
| Barium | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | | **44** | 37 | 39 |
| Manganese | ppm | ASTM D5185m | | **1** | 2 | 2 |
| Magnesium | ppm | ASTM D5185m | | **632** | 618 | 670 |
| Calcium | ppm | ASTM D5185m | | **1518** | 1450 | 1407 |
| Phosphorus | ppm | ASTM D5185m | | **778** | 697 | 710 |
| Zinc | ppm | ASTM D5185m | | **966** | 872 | 870 |
| Sulfur | ppm | ASTM D5185m | | **2368** | 2307 | 2343 |

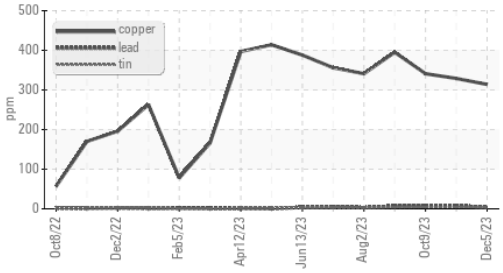
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >25 | **16** | 15 | 18 |
| Sodium | ppm | ASTM D5185m | | **4** | 3 | 3 |
| Potassium | ppm | ASTM D5185m | >20 | **16** | 15 | 18 |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >3 | **0.7** | 0.8 | 0.7 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **10.6** | 10.8 | 9.9 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **22.2** | 22.9 | 21.2 |

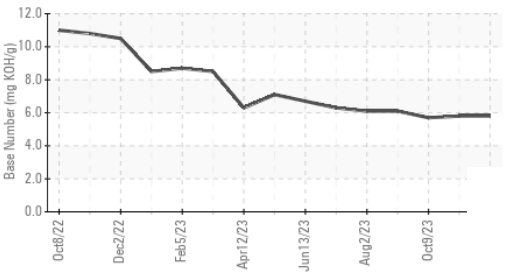
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **18.9** | 19.6 | 18.3 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | | **5.8** | 5.8 | 5.7 |

# OIL ANALYSIS REPORT

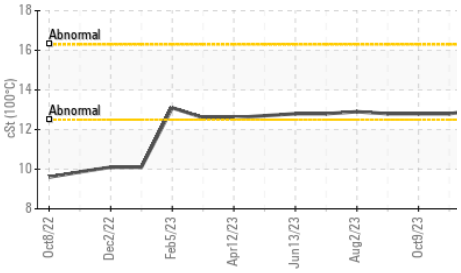
Non-ferrous Metals




Base Number




Viscosity @ 100°C

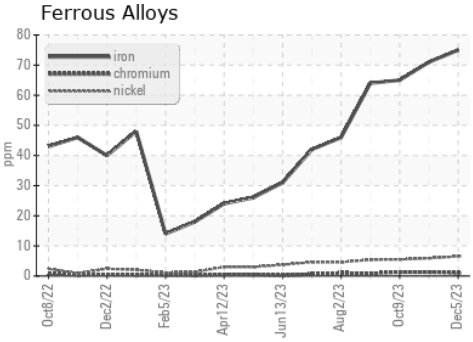



| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| 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 | >0.2 | **NEG** | NEG | NEG |
| Free Water | scalar | *Visual | | **NEG** | NEG | NEG |

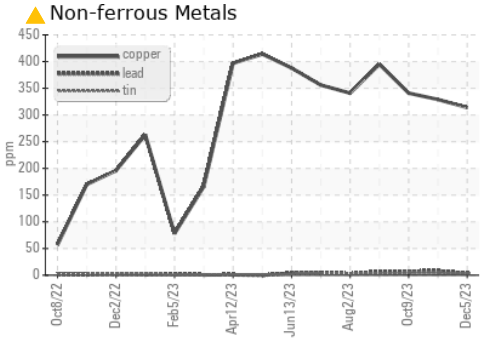
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | | **13.0** | 12.8 | 12.8 |

## GRAPHS

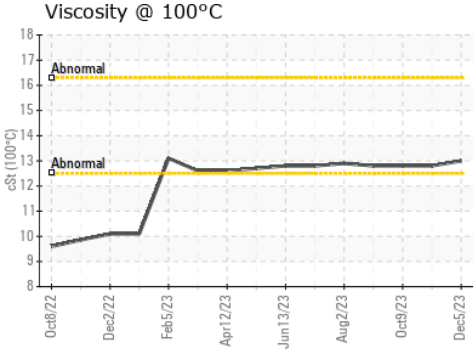
Ferrous Alloys



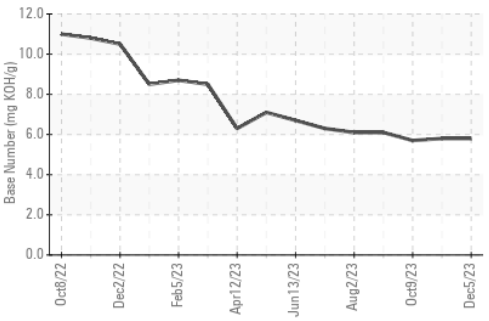

Non-ferrous Metals




Viscosity @ 100°C




Base Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : WC0881844 **Received** : 08 Dec 2023
**Lab Number** : 06029902 **Diagnosed** : 12 Dec 2023
**Unique Number** : 10779693 **Diagnostician** : Don Baldridge
**Test Package** : FLEET

*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)*

**LIBERTY DISPOSAL**
6401 S EASTERN AVE
OKLAHOMA CITY, OK
US 73149
Contact: CATHY ROSA
c.rosa@ldi89.com
T:
F: