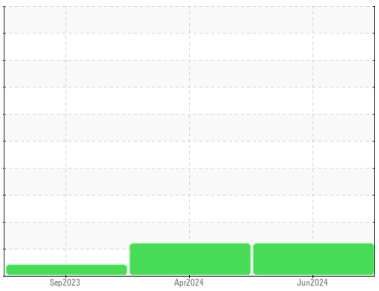
McCLUNG LOGAN EQUIPMENT COMPANY

# OIL ANALYSIS REPORT

Sample Rating Trend




**WEAR**

Machine Id
## VOLVO A40G 353284
Component
**Diesel Engine**
Fluid
**VOLVO ULTRA DIESEL ENGINE OIL 15W40 VDS-3 (13 GAL)**

## DIAGNOSIS

**Recommendation**
Oil and filter change at the time of sampling has been noted. No corrective action is recommended at this time. Resample at the next service interval to monitor.

**Wear**
The copper level has decreased, but is still abnormal. All other component wear rates are normal.

**Contamination**
There is no indication of any contamination in the oil.

**Fluid Condition**
The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil. Confirm oil type.

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **ML0001344** | ML0001192 | VCP413784 |
| Sample Date | | Client Info | | **14 Jun 2024** | 08 Apr 2024 | 14 Sep 2023 |
| Machine Age | hrs | Client Info | | **1595** | 1102 | 592 |
| Oil Age | hrs | Client Info | | **1595** | 1102 | 0 |
| Oil Changed | | Client Info | | **Changed** | Changed | Changed |
| Sample Status | | | | **ABNORMAL** | ABNORMAL | ABNORMAL |

| CONTAMINATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Water | | WC Method | >0.2 | **NEG** | NEG | NEG |

| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Iron | ppm | ASTM D5185m | >200 | **8** | 18 | 19 |
| Chromium | ppm | ASTM D5185m | >20 | **<1** | <1 | <1 |
| Nickel | ppm | ASTM D5185m | >10 | **4** | 8 | 2 |
| Titanium | ppm | ASTM D5185m | | **<1** | 2 | 0 |
| Silver | ppm | ASTM D5185m | >2 | **0** | <1 | 0 |
| Aluminum | ppm | ASTM D5185m | >30 | **2** | 3 | 3 |
| Lead | ppm | ASTM D5185m | >40 | **0** | 1 | <1 |
| Copper | ppm | ASTM D5185m | >20 | ▲ **55** | ▲ 246 | 380 |
| Tin | ppm | ASTM D5185m | >20 | **<1** | 2 | 3 |
| Vanadium | ppm | ASTM D5185m | | **0** | <1 | 0 |
| Cadmium | ppm | ASTM D5185m | | **0** | 1 | 0 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | 2.5 | **115** | 379 | 68 |
| Barium | ppm | ASTM D5185m | 0.0 | **0** | <1 | 0 |
| Molybdenum | ppm | ASTM D5185m | 0.7 | **63** | 84 | 63 |
| Manganese | ppm | ASTM D5185m | 0.0 | **<1** | 2 | 3 |
| Magnesium | ppm | ASTM D5185m | 256 | **534** | 364 | 236 |
| Calcium | ppm | ASTM D5185m | 2057 | **1561** | 1465 | 1949 |
| Phosphorus | ppm | ASTM D5185m | 935 | **908** | 1101 | 1031 |
| Zinc | ppm | ASTM D5185m | 1223 | **1119** | 1174 | 1266 |
| Sulfur | ppm | ASTM D5185m | 4079 | **2821** | 3399 | 4021 |

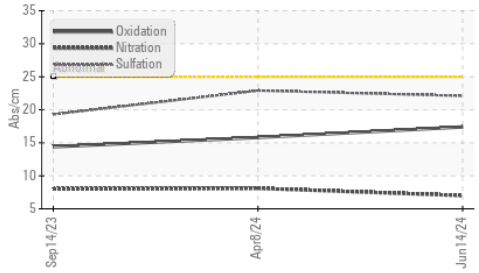
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >20 | **7** | 11 | 26 |
| Sodium | ppm | ASTM D5185m | | **0** | 0 | 3 |
| Potassium | ppm | ASTM D5185m | >20 | **1** | 2 | 4 |
| Fuel | % | ASTM D3524 | >3.0 | **<1.0** | <1.0 | 0.4 |
| Glycol | % | *ASTM D2982 | | **NEG** | NEG | NEG |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >3 | **0.2** | 0.2 | 0.2 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **7.0** | 8.1 | 8.0 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **22.1** | 22.9 | 19.3 |

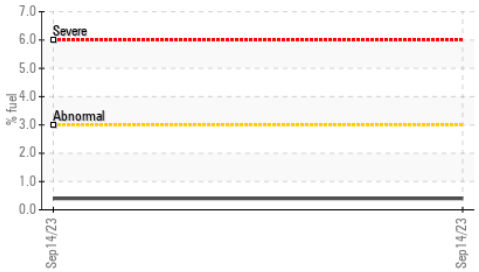
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **17.4** | 15.8 | 14.4 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 10 | **8.5** | 6.0 | 6.1 |

# OIL ANALYSIS REPORT

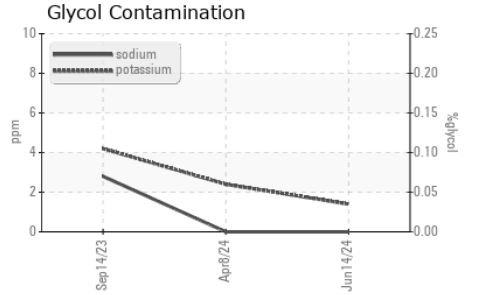
FT-IR (Direct Trend)



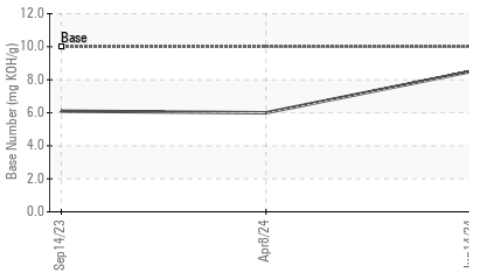

Fuel Dilution



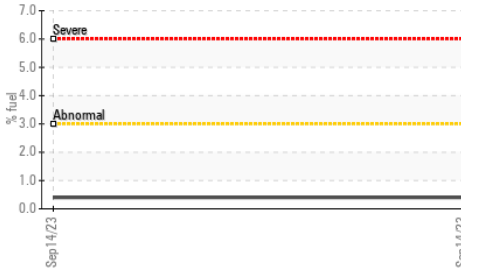

Glycol Contamination




Base Number




Fuel Dilution

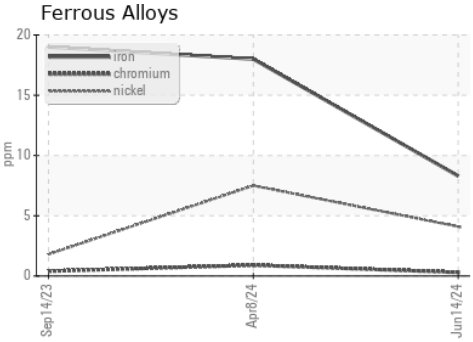



| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| 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 |

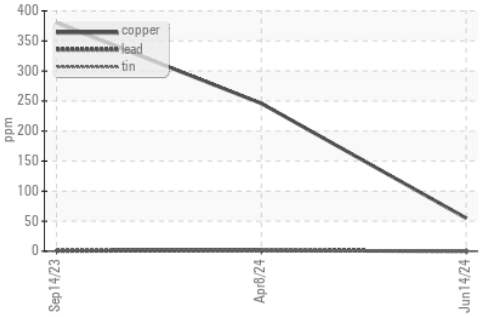
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 15.0 | ● **12.1** | ● 12.1 | ▲ 11.1 |

GRAPHS

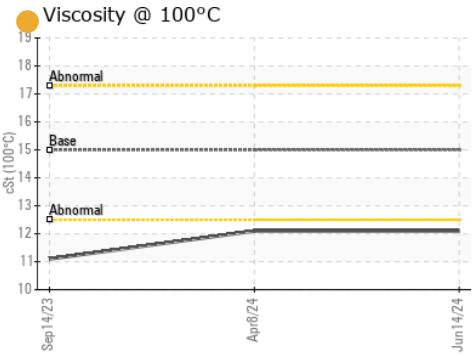
Ferrous Alloys



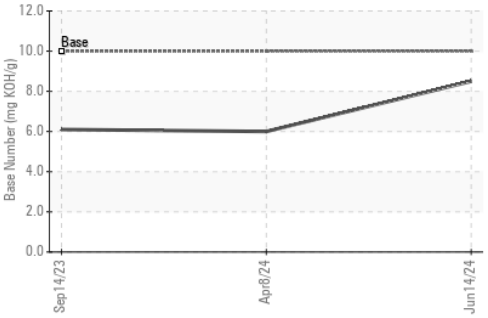

▲ Non-ferrous Metals




● Viscosity @ 100°C




Base Number




ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY
Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : ML0001344
**Lab Number** : 06216432
**Unique Number** : 11089296
**Test Package** : CONST ( Additional Tests: FuelDilution, Glycol, PercentFuel, TBN )
**Received** : 20 Jun 2024
**Tested** : 23 Jun 2024
**Diagnosed** : 23 Jun 2024 - Don Baldridge

*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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Submitted By: Emylio Pineda