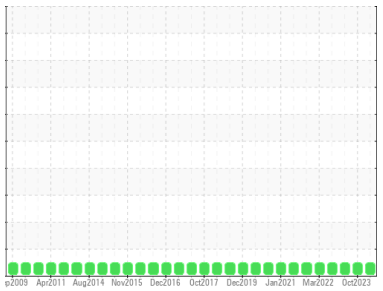
# OIL ANALYSIS REPORT

Sample Rating Trend




**NORMAL**

Machine Id
## STERLING 228
Component
**Diesel Engine**
Fluid
**DIESEL ENGINE OIL SAE 15W40 (28 QTS)**

## DIAGNOSIS

**Recommendation**
Resample at the next service interval to monitor.

**Wear**
Metal levels are typical for a new component breaking in.

**Contamination**
Elevated aluminum (Al) and/or lead (Pb) and potassium (K) levels in your metals analysis are likely a result of solder flux release into the lubricant and is common on new equipment/components. 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 | | **RW0004832** | RW0004744 | RW0003881 |
| Sample Date | | Client Info | | **04 Apr 2024** | 18 Oct 2023 | 21 Jun 2023 |
| Machine Age | mls | Client Info | | **16128** | 1434 | 1258 |
| Oil Age | mls | Client Info | | **0** | 81 | 54 |
| Oil Changed | | Client Info | | **Changed** | Changed | Changed |
| Sample Status | | | | **NORMAL** | NORMAL | NORMAL |

| CONTAMINATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Fuel | | WC Method | >5 | **<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 | **23** | 4 | 9 |
| Chromium | ppm | ASTM D5185m | >20 | **<1** | 0 | <1 |
| Nickel | ppm | ASTM D5185m | >2 | **<1** | <1 | <1 |
| Titanium | ppm | ASTM D5185m | >2 | **<1** | 0 | 0 |
| Silver | ppm | ASTM D5185m | >2 | **0** | <1 | <1 |
| Aluminum | ppm | ASTM D5185m | >25 | **13** | 3 | 3 |
| Lead | ppm | ASTM D5185m | >40 | **<1** | <1 | 0 |
| Copper | ppm | ASTM D5185m | >330 | **5** | 5 | 2 |
| Tin | ppm | ASTM D5185m | >15 | **<1** | <1 | 0 |
| Vanadium | ppm | ASTM D5185m | | **<1** | 0 | <1 |
| Cadmium | ppm | ASTM D5185m | | **<1** | 0 | 0 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | 250 | **5** | 9 | 10 |
| Barium | ppm | ASTM D5185m | 10 | **0** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | 100 | **64** | 58 | 64 |
| Manganese | ppm | ASTM D5185m | | **<1** | <1 | <1 |
| Magnesium | ppm | ASTM D5185m | 450 | **957** | 918 | 930 |
| Calcium | ppm | ASTM D5185m | 3000 | **1181** | 1010 | 1096 |
| Phosphorus | ppm | ASTM D5185m | 1150 | **1083** | 1033 | 1032 |
| Zinc | ppm | ASTM D5185m | 1350 | **1251** | 1207 | 1279 |
| Sulfur | ppm | ASTM D5185m | 4250 | **3434** | 3067 | 3853 |

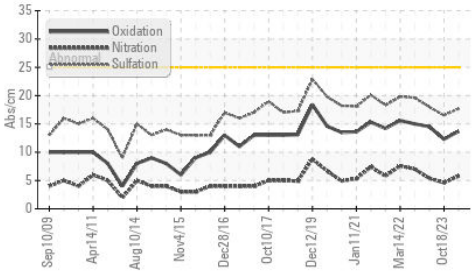
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >25 | **4** | 3 | 3 |
| Sodium | ppm | ASTM D5185m | >158 | **2** | 2 | 2 |
| Potassium | ppm | ASTM D5185m | >20 | **40** | 2 | 2 |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >3 | **0.2** | 0.1 | 0.2 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **5.8** | 4.6 | 5.4 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **17.7** | 16.5 | 18.0 |

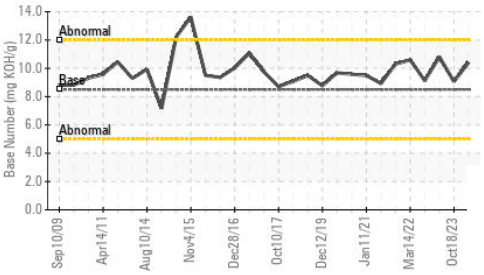
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **13.7** | 12.3 | 14.5 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 8.5 | **10.41** | 9.06 | 10.80 |

# OIL ANALYSIS REPORT

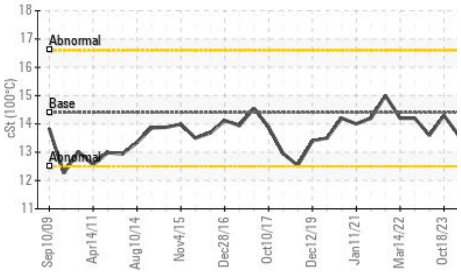
FT-IR (Direct Trend)




Base Number




Viscosity @ 100°C

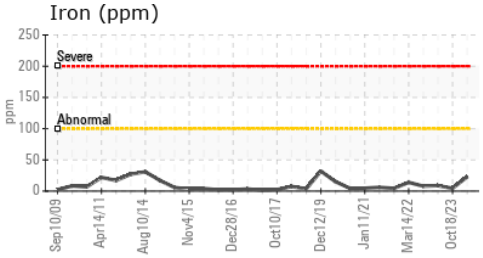



| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
|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

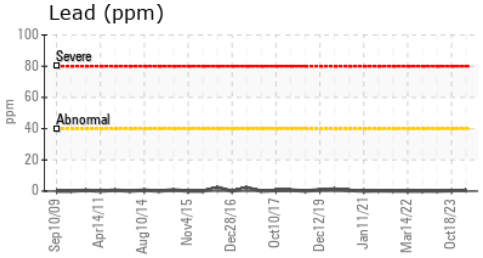
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 14.4 | **13.6** | 14.3 | 13.6 |

## GRAPHS

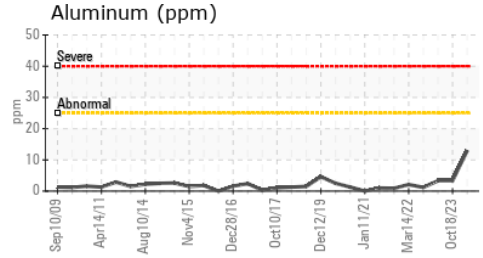
Iron (ppm)



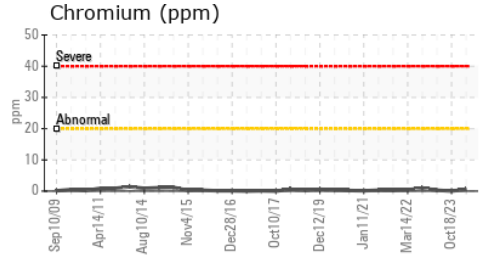

Lead (ppm)



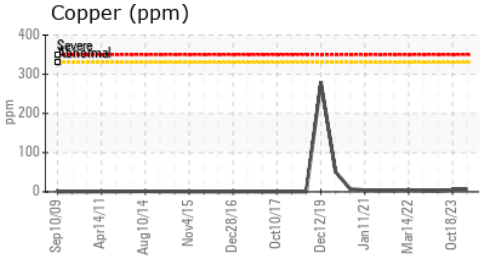

Aluminum (ppm)



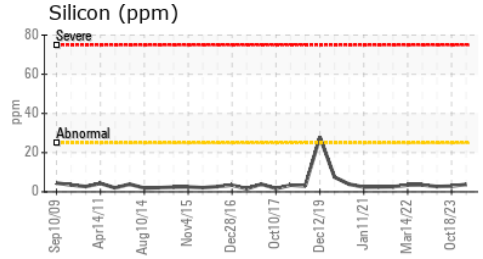

Chromium (ppm)



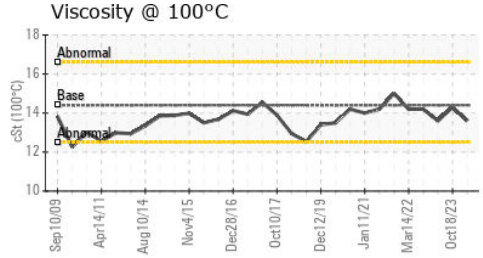

Copper (ppm)



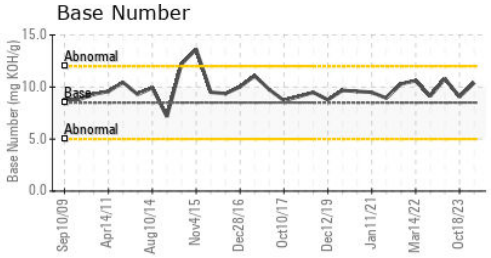

Silicon (ppm)




Viscosity @ 100°C




Base Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : RW0004832
**Lab Number** : 06148156
**Unique Number** : 10978234
**Test Package** : MOB 2

**Received** : 12 Apr 2024
**Tested** : 15 Apr 2024
**Diagnosed** : 15 Apr 2024 - Wes Davis

*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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