



OIL ANALYSIS REPORT

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

Area
Store 9 - Marietta

Machine Id

1119

Component

Diesel Engine

Fluid

SHELL ROTELLA T 15W40 (--- GAL)

RECOMMENDATION

We advise that you check the air filter, air induction system, and any areas where dirt may enter the component. Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.

| Test | UOM | Method | Limit/Abn | Current | History1 | History2 |
|----------------|-----|-------------|-----------|--------------------|-------------|-------------|
| Sample Number | | Client Info | | LEC0049239 | LEC0048273 | LEC0044055 |
| Sample Date | | Client Info | | 16 Apr 2024 | 06 Mar 2024 | 30 Nov 2023 |
| Machine Age | mls | Client Info | | 426464 | 413303 | 402327 |
| Oil Age | mls | Client Info | | 10000 | 10000 | 10000 |
| Filter Age | mls | Client Info | | 10000 | 10000 | 10000 |
| Oil Changed | | Client Info | | Changed | Changed | Changed |
| Filter Changed | | Client Info | | Changed | Changed | Changed |
| Sample Status | | | | ABNORMAL | ABNORMAL | ABNORMAL |

WEAR

All component wear rates are normal.

| | | | | | | |
|--------------|--------|-------------|------|--------------|------|------|
| Iron | ppm | ASTM D5185m | >100 | 12 | 32 | 20 |
| Chromium | ppm | ASTM D5185m | >20 | <1 | 0 | 1 |
| Nickel | ppm | ASTM D5185m | >4 | 0 | 0 | <1 |
| Titanium | ppm | ASTM D5185m | | <1 | 0 | <1 |
| Silver | ppm | ASTM D5185m | >3 | 0 | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >20 | 3 | 3 | 6 |
| Lead | ppm | ASTM D5185m | >40 | 0 | 7 | ▲ 60 |
| Copper | ppm | ASTM D5185m | >330 | 2 | 7 | 2 |
| Tin | ppm | ASTM D5185m | >15 | <1 | 0 | 1 |
| Vanadium | ppm | ASTM D5185m | | 0 | 0 | 0 |
| White Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | NONE | NONE | NONE |

CONTAMINATION

Elemental level of silicon (Si) above normal.

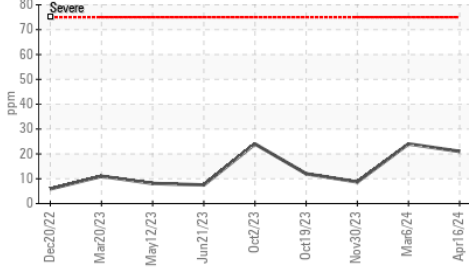
| | | | | | | |
|------------------|----------|-------------|-------|----------------|-------|-------|
| Silicon | ppm | ASTM D5185m | >120 | ▲ 21 | ▲ 24 | 9 |
| Potassium | ppm | ASTM D5185m | >20 | 9 | <1 | 6 |
| Fuel | | WC Method | >5 | <1.0 | <1.0 | <1.0 |
| Water | | WC Method | >0.2 | NEG | NEG | NEG |
| Glycol | | WC Method | | NEG | NEG | NEG |
| Soot % | % | *ASTM D7844 | >3 | 0.4 | 0.5 | 0.9 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | 6.5 | 6.1 | 11.5 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | 21.4 | 16.3 | 27.4 |
| 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 |

FLUID CONDITION

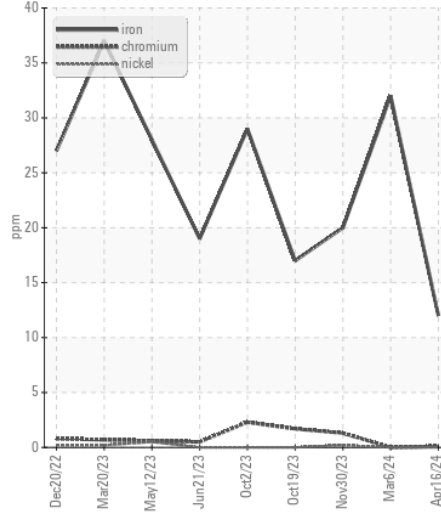
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is acceptable for the time in service.

| | | | | | | |
|------------------|----------|-------------|------|--------------|------|------|
| Sodium | ppm | ASTM D5185m | | 2 | 3 | 6 |
| Boron | ppm | ASTM D5185m | 316 | 370 | 100 | 147 |
| Barium | ppm | ASTM D5185m | 0.0 | 0 | 6 | 0 |
| Molybdenum | ppm | ASTM D5185m | 1.2 | 90 | 50 | 136 |
| Manganese | ppm | ASTM D5185m | | <1 | 2 | <1 |
| Magnesium | ppm | ASTM D5185m | 24 | 475 | 127 | 637 |
| Calcium | ppm | ASTM D5185m | 2292 | 1560 | 3120 | 1581 |
| Phosphorus | ppm | ASTM D5185m | 1064 | 944 | 910 | 762 |
| Zinc | ppm | ASTM D5185m | 1160 | 1142 | 1095 | 902 |
| Sulfur | ppm | ASTM D5185m | 4996 | 3418 | 3771 | 2712 |
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | 14.6 | 9.3 | 22.4 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 10.1 | 7.6 | 9.5 | 6.9 |
| Visc @ 100°C | cSt | ASTM D445 | 15.7 | 13.4 | 13.4 | 14.1 |

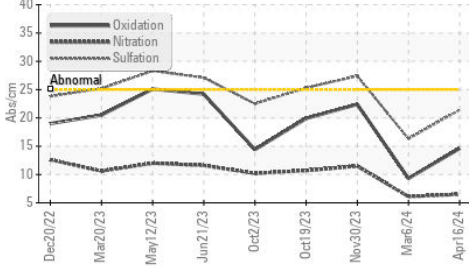
▲ Silicon (ppm)



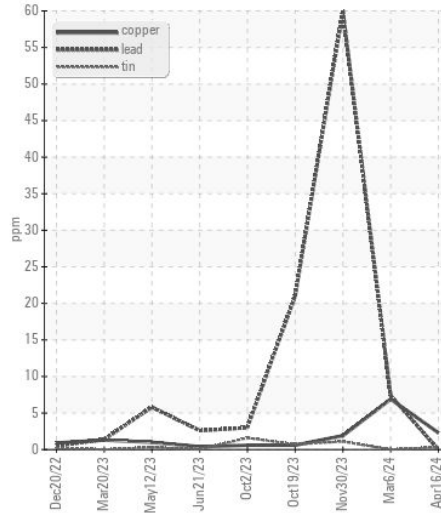
Ferrous Alloys



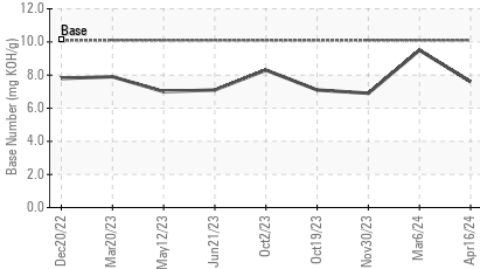
FT-IR (Direct Trend)



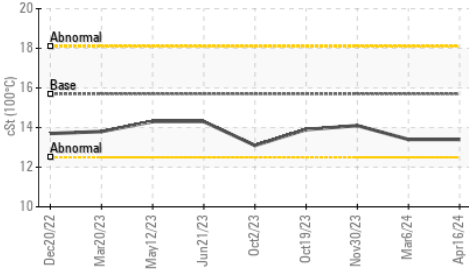
Non-ferrous Metals



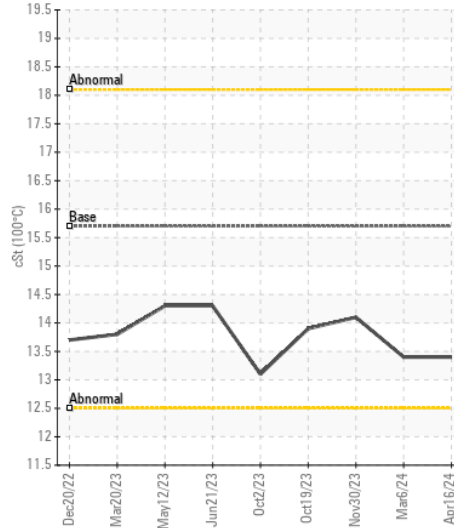
Base Number



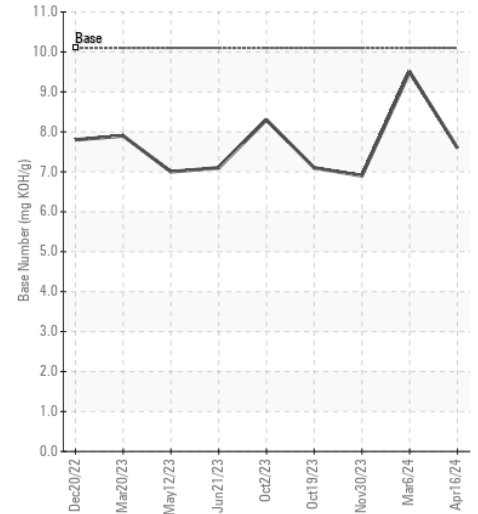
Viscosity @ 100°C



Viscosity @ 100°C



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : LEC0049239 **Received** : 23 Apr 2024
Lab Number : 06158388 **Tested** : 24 Apr 2024
Unique Number : 10993811 **Diagnosed** : 25 Apr 2024 - Don Baldrige
Test Package : CONST (Additional Tests: TBN)

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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)