



OIL ANALYSIS REPORT

| | |
|-----------------|-----------|
| WEAR | NORMAL |
| CONTAMINATION | NORMAL |
| FLUID CONDITION | ATTENTION |

Machine Id
FREIGHTLINER TDI1410

Component
Diesel Engine

Fluid
DIESEL ENGINE OIL SAE 15W40 (40 QTS)

RECOMMENDATION

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 | | WC0936245 | WC0936283 | WC0869217 |
| Sample Date | | Client Info | | 02 Jul 2024 | 25 Apr 2024 | 19 Oct 2023 |
| Machine Age | mls | Client Info | | 227345 | 223412 | 209407 |
| Oil Age | mls | Client Info | | 25000 | 25000 | 25000 |
| Filter Age | mls | Client Info | | 25000 | 25000 | 25000 |
| Oil Changed | | Client Info | | Changed | Changed | Changed |
| Filter Changed | | Client Info | | Changed | Changed | Changed |
| Sample Status | | | | ATTENTION | ATTENTION | ATTENTION |

WEAR

All component wear rates are normal.

| | | | | | | |
|--------------|--------|-------------|------|--------------|------|------|
| Iron | ppm | ASTM D5185m | >80 | 10 | 11 | 8 |
| Chromium | ppm | ASTM D5185m | >5 | <1 | 1 | <1 |
| Nickel | ppm | ASTM D5185m | >2 | 0 | <1 | 0 |
| Titanium | ppm | ASTM D5185m | | 0 | <1 | <1 |
| Silver | ppm | ASTM D5185m | >3 | 0 | <1 | 0 |
| Aluminum | ppm | ASTM D5185m | >30 | 2 | 2 | 1 |
| Lead | ppm | ASTM D5185m | >30 | <1 | 1 | 2 |
| Copper | ppm | ASTM D5185m | >150 | 0 | 1 | <1 |
| Tin | ppm | ASTM D5185m | >5 | 0 | 1 | 0 |
| Vanadium | ppm | ASTM D5185m | | 0 | <1 | 0 |
| White Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | NONE | NONE | NONE |

CONTAMINATION

There is no indication of any contamination in the oil.

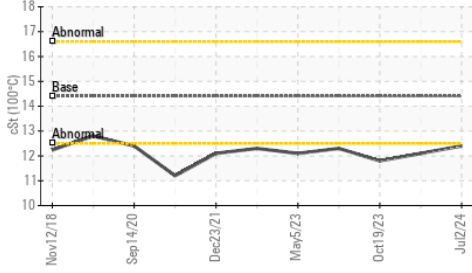
| | | | | | | |
|------------------|----------|-------------|-------|----------------|-------|-------|
| Silicon | ppm | ASTM D5185m | >20 | 4 | 5 | 4 |
| Potassium | ppm | ASTM D5185m | >20 | 1 | 4 | 4 |
| Fuel | % | ASTM D3524 | >5 | <1.0 | <1.0 | ▲ 3.1 |
| Water | | WC Method | >0.2 | NEG | NEG | NEG |
| Glycol | | WC Method | | NEG | NEG | NEG |
| Soot % | % | *ASTM D7844 | >3 | 1.3 | 0.8 | 0.8 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | 6.6 | 7.2 | 6.4 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | 21.7 | 21.7 | 19.6 |
| 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

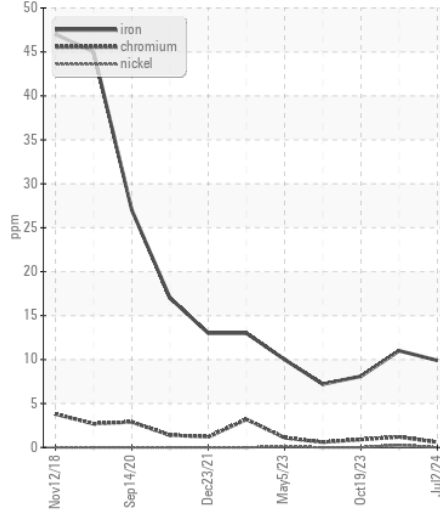
The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil. Confirm oil type.

| | | | | | | |
|------------------|----------|-------------|------|---------------|--------|--------|
| Sodium | ppm | ASTM D5185m | >158 | 1 | <1 | 0 |
| Boron | ppm | ASTM D5185m | 250 | 318 | 385 | 9 |
| Barium | ppm | ASTM D5185m | 10 | 0 | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | 100 | 89 | 91 | 65 |
| Manganese | ppm | ASTM D5185m | | <1 | <1 | 0 |
| Magnesium | ppm | ASTM D5185m | 450 | 424 | 361 | 864 |
| Calcium | ppm | ASTM D5185m | 3000 | 1541 | 1517 | 1068 |
| Phosphorus | ppm | ASTM D5185m | 1150 | 1048 | 939 | 993 |
| Zinc | ppm | ASTM D5185m | 1350 | 1245 | 1224 | 1126 |
| Sulfur | ppm | ASTM D5185m | 4250 | 3740 | 3449 | 3033 |
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | 14.2 | 15.1 | 13.6 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 8.5 | 7.2 | 7.0 | 9.2 |
| Visc @ 100°C | cSt | ASTM D445 | 14.4 | ● 12.4 | ● 12.1 | ● 11.8 |

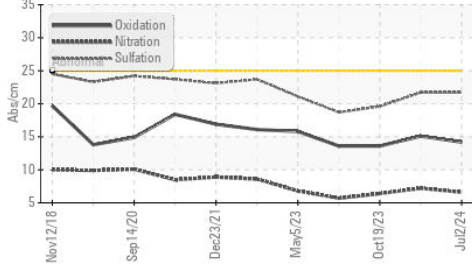
● Viscosity @ 100°C



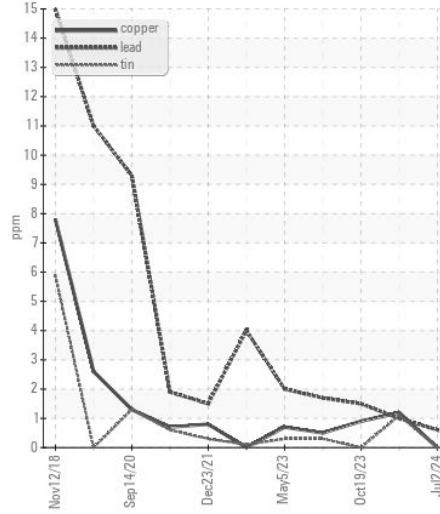
Ferrous Alloys



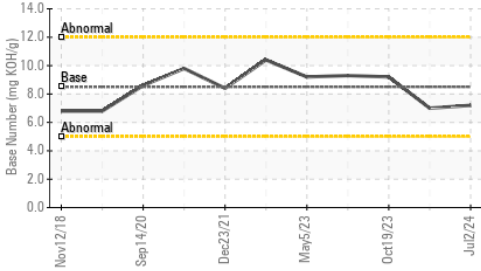
FT-IR (Direct Trend)



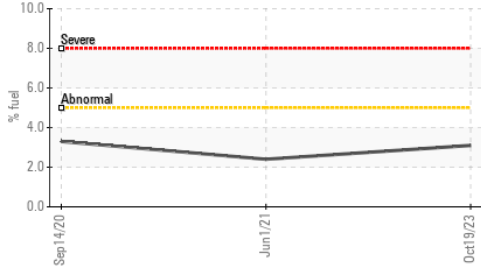
Non-ferrous Metals



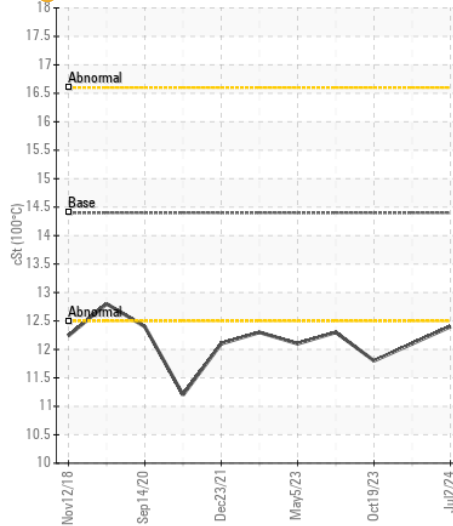
Base Number



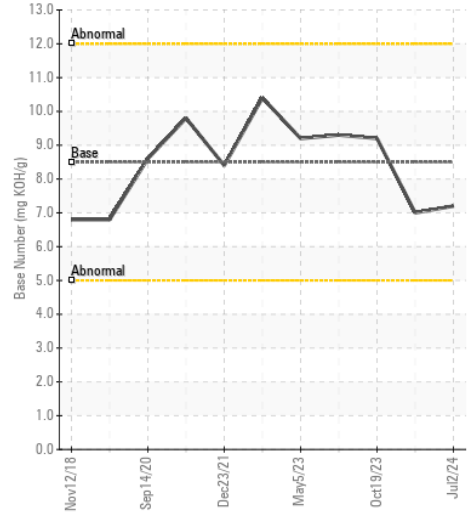
Fuel Dilution



● Viscosity @ 100°C



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513

Sample No. : WC0936245

Lab Number : 06231066

Unique Number : 11114559

Test Package : FLEET (Additional Tests: FuelDilution, PercentFuel)

Received : 08 Jul 2024

Tested : 10 Jul 2024

Diagnosed : 10 Jul 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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