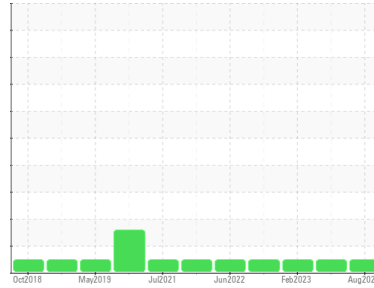




OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL



Machine Id
FREIGHTLINER 35140
 Component
Diesel Engine
 Fluid
DIESEL ENGINE OIL SAE 15W40 (--- QTS)

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

Wear

All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil. The amount and size of particulates present in the system are acceptable.

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 | | KL0012039 | KLM2339414 | KLM2339394 |
| Sample Date | Client Info | | 02 Aug 2023 | 08 Apr 2023 | 11 Feb 2023 |
| Machine Age | mls | Client Info | 172629 | 168281 | 167630 |
| Oil Age | mls | Client Info | 0 | 0 | 0 |
| Oil Changed | Client Info | | N/A | N/A | N/A |
| Sample Status | | | NORMAL | NORMAL | NORMAL |

CONTAMINATION

| | method | limit/base | current | history1 | history2 |
|--------|-----------|------------|----------------|----------|----------|
| Fuel | WC Method | >3.0 | <1.0 | <1.0 | 0.6 |
| Glycol | WC Method | | NEG | NEG | NEG |

WEAR METALS

| | method | limit/base | current | history1 | history2 | |
|----------|--------|-------------|---------|--------------|----------|----|
| Iron | ppm | ASTM D5185m | >65 | 7 | 4 | 8 |
| Chromium | ppm | ASTM D5185m | >5 | <1 | <1 | <1 |
| Nickel | ppm | ASTM D5185m | >3 | 0 | 0 | 0 |
| Titanium | ppm | ASTM D5185m | >5 | <1 | <1 | <1 |
| Silver | ppm | ASTM D5185m | >2 | 0 | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >35 | 1 | 0 | <1 |
| Lead | ppm | ASTM D5185m | >10 | 0 | 0 | 3 |
| Copper | ppm | ASTM D5185m | >180 | 1 | <1 | <1 |
| Tin | ppm | ASTM D5185m | >8 | 0 | 0 | 0 |
| Vanadium | ppm | ASTM D5185m | | 0 | 0 | 0 |
| Cadmium | ppm | ASTM D5185m | | 0 | 0 | 0 |

ADDITIVES

| | method | limit/base | current | history1 | history2 | |
|------------|--------|-------------|---------|--------------|----------|------|
| Boron | ppm | ASTM D5185m | 250 | 78 | 107 | 110 |
| Barium | ppm | ASTM D5185m | 10 | 0 | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | 100 | 64 | 58 | 56 |
| Manganese | ppm | ASTM D5185m | | <1 | <1 | 1 |
| Magnesium | ppm | ASTM D5185m | 450 | 1125 | 1049 | 1037 |
| Calcium | ppm | ASTM D5185m | 3000 | 1270 | 1154 | 1226 |
| Phosphorus | ppm | ASTM D5185m | 1150 | 1138 | 1074 | 1010 |
| Zinc | ppm | ASTM D5185m | 1350 | 1405 | 1314 | 1332 |
| Sulfur | ppm | ASTM D5185m | 4250 | 4489 | 4342 | 4072 |

CONTAMINANTS

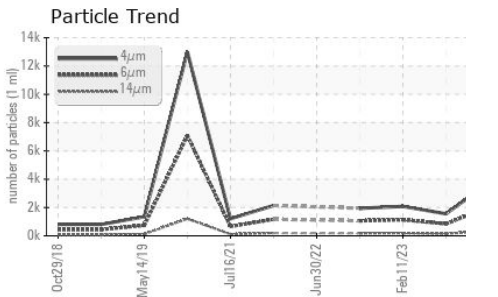
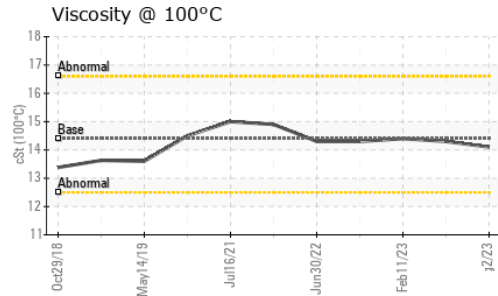
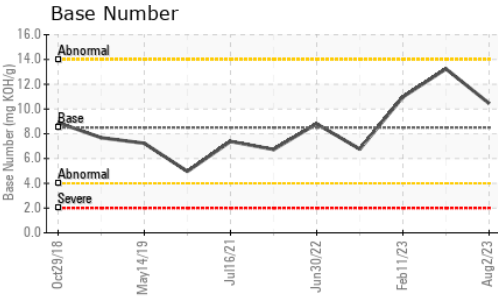
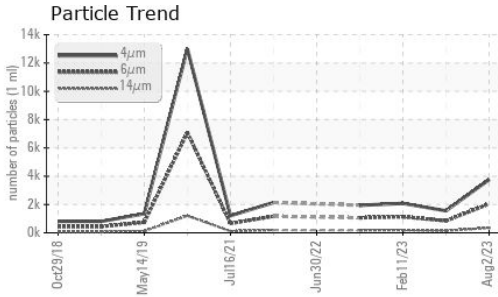
| | method | limit/base | current | history1 | history2 | |
|-----------|--------|-------------|---------|--------------|----------|---|
| Silicon | ppm | ASTM D5185m | >15 | 5 | 4 | 7 |
| Sodium | ppm | ASTM D5185m | >158 | 4 | 3 | 2 |
| Potassium | ppm | ASTM D5185m | >20 | <1 | 1 | 2 |

INFRA-RED

| | method | limit/base | current | history1 | history2 | |
|-----------|----------|-------------|---------|-------------|----------|------|
| Soot % | % | *ASTM D7844 | >3 | 0.3 | 0.2 | 0.3 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | 7.4 | 6.2 | 6.6 |
| Sulfation | Abs./1mm | *ASTM D7415 | >30 | 19.9 | 19.7 | 20.4 |



OIL ANALYSIS REPORT



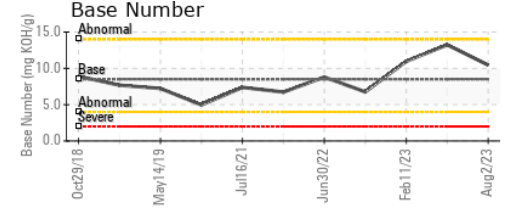
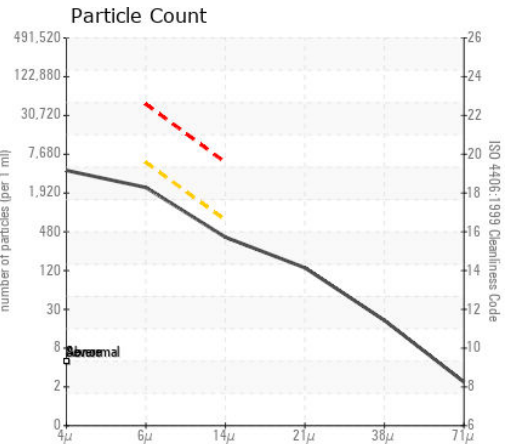
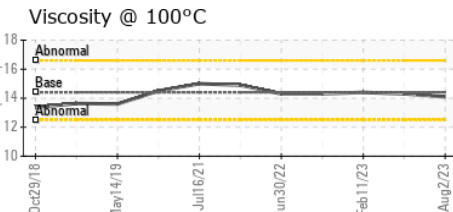
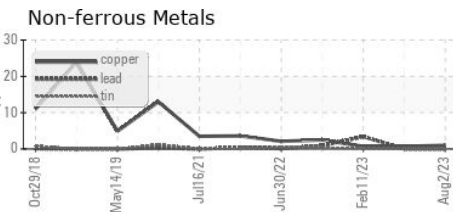
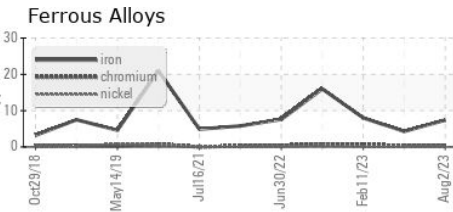
| FLUID CLEANLINESS | method | limit/base | current | history1 | history2 |
|-------------------|--------------|------------|--------------|----------|----------|
| Particles >4µm | ASTM D7647 | | 3758 | 1557 | 2079 |
| Particles >6µm | ASTM D7647 | >5000 | 2047 | 848 | 1133 |
| Particles >14µm | ASTM D7647 | >640 | 348 | 144 | 193 |
| Particles >21µm | ASTM D7647 | >160 | 117 | 49 | 65 |
| Particles >38µm | ASTM D7647 | >40 | 18 | 8 | 10 |
| Particles >71µm | ASTM D7647 | >10 | 2 | 1 | 1 |
| Oil Cleanliness | ISO 4406 (c) | >19/16 | 18/16 | 17/14 | 17/15 |

| FLUID DEGRADATION | method | limit/base | current | history1 | history2 | |
|-------------------|----------|-------------|---------|--------------|----------|-------|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | 15.8 | 14.8 | 16.6 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 8.5 | 10.45 | 13.24 | 10.97 |

| VISUAL | method | limit/base | current | history1 | history2 | |
|------------------|--------|------------|---------|------------|----------|-----|
| White Metal | scalar | *Visual | NONE | NONE | NONE | |
| Yellow Metal | scalar | *Visual | NONE | NONE | NONE | |
| Precipitate | scalar | *Visual | NONE | NONE | NONE | |
| Silt | scalar | *Visual | NONE | NONE | NONE | |
| Debris | scalar | *Visual | NONE | NONE | NONE | |
| Sand/Dirt | scalar | *Visual | NONE | NONE | NONE | |
| Appearance | scalar | *Visual | NORML | NORML | NORML | |
| Odor | scalar | *Visual | 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 | 14.1 | 14.3 | 14.4 |

GRAPHS



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : KL0012039 **Received** : 14 Aug 2023
Lab Number : 05923551 **Diagnosed** : 15 Aug 2023
Unique Number : 10603498 **Diagnostician** : Doug Bogart
Test Package : MOB 2 (Additional Tests: PrtCount)

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 AIEA, HI
 US 96701
 Contact: CLYDE OMIJA
 comija@honolulu.gov
 T: (575)623-9952
 F:

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)