

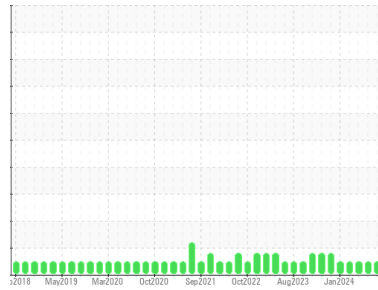


OIL ANALYSIS REPORT



Machine Id
CATERPILLAR D10T 15105049 (S/N CATOD10TCRJG01495)
 Component
Diesel Engine
 Fluid
ROYAL PURPLE MOTOR OIL 15W40 (--- GAL)

Sample Rating Trend



NORMAL



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.

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 | | RP0040782 | RP0036963 | RP0036993 |
| Sample Date | Client Info | | 22 May 2024 | 22 Apr 2024 | 25 Mar 2024 |
| Machine Age | hrs | Client Info | 28263 | 27993 | 26857 |
| Oil Age | hrs | Client Info | 1674 | 1404 | 1168 |
| Oil Changed | Client Info | | Not Chngd | Not Chngd | Not Chngd |
| Sample Status | | | NORMAL | NORMAL | NORMAL |

CONTAMINATION

| | method | limit/base | current | history1 | history2 |
|--------|-----------|------------|----------------|----------|----------|
| Fuel | WC Method | >5 | <1.0 | <1.0 | <1.0 |
| Glycol | WC Method | | NEG | NEG | NEG |

WEAR METALS

| | method | limit/base | current | history1 | history2 |
|----------|--------|------------------|--------------|----------|----------|
| Iron | ppm | ASTM D5185m >100 | 80 | 69 | 66 |
| Chromium | ppm | ASTM D5185m >20 | 2 | 1 | 1 |
| Nickel | ppm | ASTM D5185m >2 | <1 | 0 | 0 |
| Titanium | ppm | ASTM D5185m >2 | <1 | 0 | <1 |
| Silver | ppm | ASTM D5185m >2 | 1 | 0 | 0 |
| Aluminum | ppm | ASTM D5185m >25 | 2 | 2 | 2 |
| Lead | ppm | ASTM D5185m >40 | 3 | <1 | 2 |
| Copper | ppm | ASTM D5185m >330 | 160 | 165 | 144 |
| Tin | ppm | ASTM D5185m >15 | 1 | 0 | 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 0 | 0 | <1 | 4 |
| Barium | ppm | ASTM D5185m 0 | 0 | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m 100 | 100 | 103 | 100 |
| Manganese | ppm | ASTM D5185m | 1 | 1 | <1 |
| Magnesium | ppm | ASTM D5185m 60 | 22 | 25 | 25 |
| Calcium | ppm | ASTM D5185m 3050 | 2218 | 2510 | 2398 |
| Phosphorus | ppm | ASTM D5185m 1050 | 766 | 811 | 721 |
| Zinc | ppm | ASTM D5185m 1200 | 967 | 1023 | 1006 |

CONTAMINANTS

| | method | limit/base | current | history1 | history2 |
|-----------|--------|-----------------|------------|----------|----------|
| Silicon | ppm | ASTM D5185m >25 | 6 | 4 | 4 |
| Sodium | ppm | ASTM D5185m | 1 | 1 | 2 |
| Potassium | ppm | ASTM D5185m >20 | 3 | 0 | 0 |
| Water | % | ASTM D6304 >0.2 | NEG | NEG | NEG |

INFRA-RED

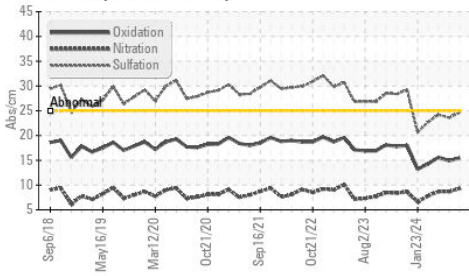
| | method | limit/base | current | history1 | history2 |
|-----------|----------|-----------------|-------------|----------|----------|
| Soot % | % | *ASTM D7844 >3 | 1.4 | 1.2 | 1.2 |
| Nitration | Abs/cm | *ASTM D7624 >20 | 9.3 | 8.7 | 8.7 |
| Sulfation | Abs/.1mm | *ASTM D7415 >30 | 24.6 | 23.6 | 24.2 |

FLUID DEGRADATION

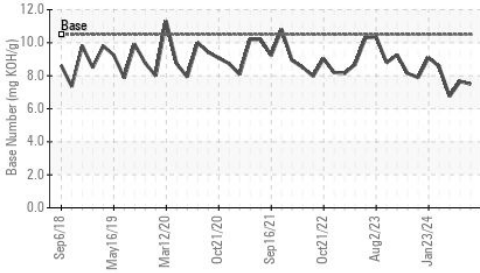
| | method | limit/base | current | history1 | history2 |
|------------------|----------|-----------------|-------------|----------|----------|
| Oxidation | Abs/.1mm | *ASTM D7414 >25 | 15.5 | 14.9 | 15.6 |
| Base Number (BN) | mg KOH/g | ASTM D2896 10.5 | 7.49 | 7.66 | 6.75 |

OIL ANALYSIS REPORT

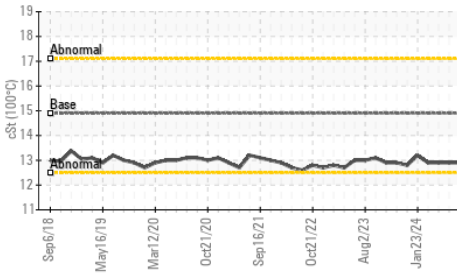
FT-IR (Direct Trend)



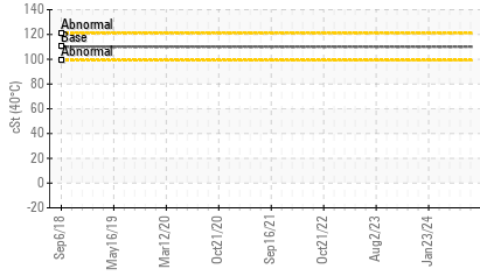
Base Number



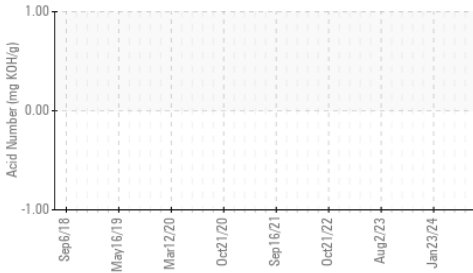
Viscosity @ 100°C



Viscosity @ 40°C



Acid Number

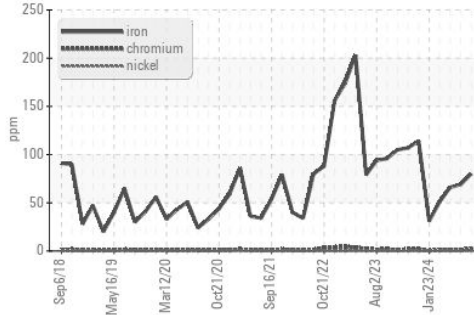


| VISUAL | method | limit/base | current | history1 | history2 | |
|------------------|--------|------------|---------|--------------|----------|-------|
| White Metal | scalar | *Visual | NONE | LIGHT | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Precipitate | scalar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

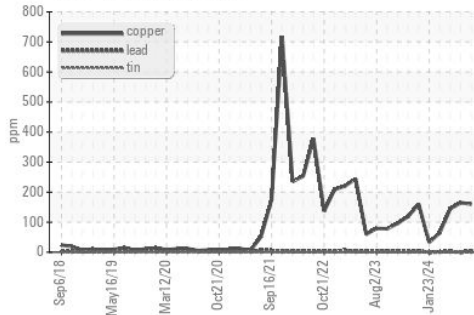
| FLUID PROPERTIES | method | limit/base | current | history1 | history2 | |
|------------------|--------|------------|---------|-------------|----------|------|
| Visc @ 100°C | cSt | ASTM D445 | 14.9 | 12.9 | 12.9 | 12.9 |

GRAPHS

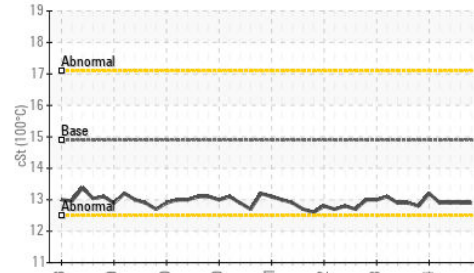
Ferrous Alloys



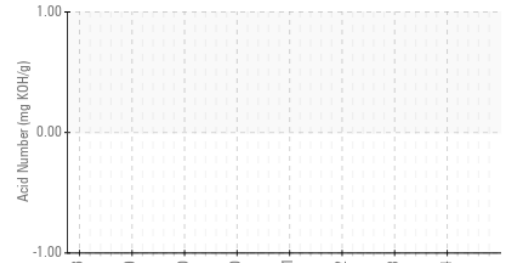
Non-ferrous Metals



Viscosity @ 100°C



Acid Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : RP0040782
Lab Number : 06194231
Unique Number : 11056354
Test Package : IND 2 (Additional Tests: FT-IR, KV100, TBN)

Received : 29 May 2024
Tested : 31 May 2024
Diagnosed : 31 May 2024 - Jonathan Hester

NRG TEXAS LLC
 3784 FM 39 SOUTH
 JEWETT, TX
 US 75846

Contact: JURGEN THOMPSON
 JThompson@ecomaterial.com

T: (903)626-9528
 F: (903)626-9772

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)