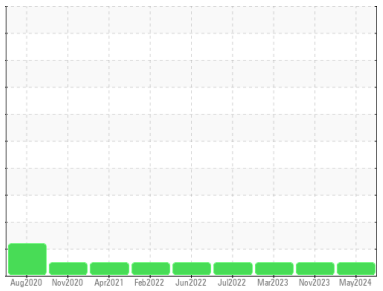
# OIL ANALYSIS REPORT

Sample Rating Trend




**NORMAL**

Machine Id
**2105**
Component
**Diesel Engine**
Fluid
**DIESEL ENGINE OIL SAE 5W30 (--- 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.

**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 | | **HRE0000196** | WC0876685 | WC0786083 |
| Sample Date | | Client Info | | **29 May 2024** | 19 Nov 2023 | 01 Mar 2023 |
| Machine Age | mls | Client Info | | **480938** | 431852 | 402737 |
| Oil Age | mls | Client Info | | **50000** | 50000 | 100000 |
| Oil Changed | | Client Info | | **Not Changd** | 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 | **43** | 56 | 40 |
| Chromium | ppm | ASTM D5185m | >20 | **<1** | <1 | <1 |
| Nickel | ppm | ASTM D5185m | >4 | **0** | 0 | 0 |
| Titanium | ppm | ASTM D5185m | | **0** | <1 | 2 |
| Silver | ppm | ASTM D5185m | >3 | **<1** | 0 | <1 |
| Aluminum | ppm | ASTM D5185m | >20 | **8** | 17 | 6 |
| Lead | ppm | ASTM D5185m | >40 | **<1** | 0 | 2 |
| Copper | ppm | ASTM D5185m | >330 | **5** | 11 | 9 |
| Tin | ppm | ASTM D5185m | >15 | **<1** | 1 | 2 |
| Vanadium | ppm | ASTM D5185m | | **0** | <1 | <1 |
| Cadmium | ppm | ASTM D5185m | | **0** | <1 | 0 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | 250 | **11** | 5 | 22 |
| Barium | ppm | ASTM D5185m | 10 | **0** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | 100 | **63** | 64 | 78 |
| Manganese | ppm | ASTM D5185m | | **<1** | <1 | 2 |
| Magnesium | ppm | ASTM D5185m | 450 | **1094** | 987 | 827 |
| Calcium | ppm | ASTM D5185m | 3000 | **877** | 1113 | 1275 |
| Phosphorus | ppm | ASTM D5185m | 1150 | **1052** | 1063 | 1059 |
| Zinc | ppm | ASTM D5185m | 1350 | **1297** | 1308 | 1365 |
| Sulfur | ppm | ASTM D5185m | 4250 | **3342** | 2825 | 3117 |

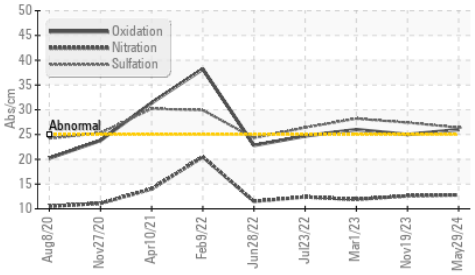
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >25 | **12** | 12 | 8 |
| Sodium | ppm | ASTM D5185m | | **6** | 4 | 7 |
| Potassium | ppm | ASTM D5185m | >20 | **6** | 17 | 10 |

| INFRA-RED | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Soot % | % | *ASTM D7844 | >3 | **1** | 1.1 | 0.8 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | **12.8** | 12.6 | 11.9 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | **26.4** | 27.4 | 28.2 |

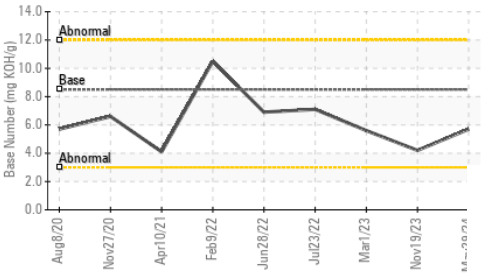
| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | **26.0** | 25.0 | 26.0 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 8.5 | **5.7** | 4.2 | 5.6 |

# OIL ANALYSIS REPORT

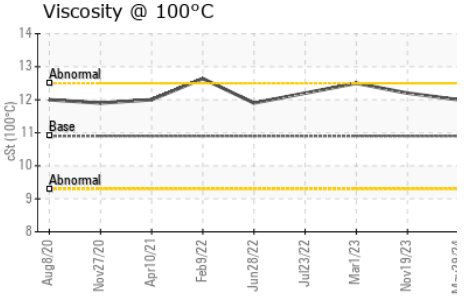
FT-IR (Direct Trend)




Base Number




Viscosity @ 100°C

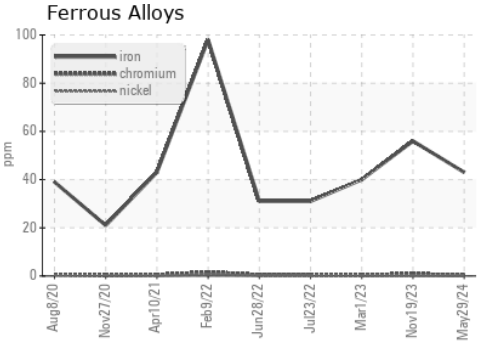



| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
|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

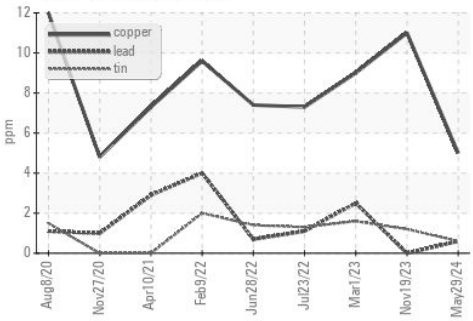
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 100°C | cSt | ASTM D445 | 10.9 | **12.0** | 12.2 | 12.5 |

## GRAPHS

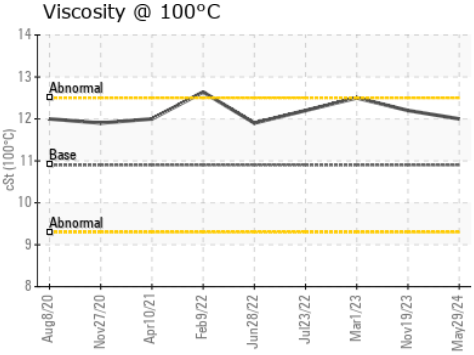
Ferrous Alloys



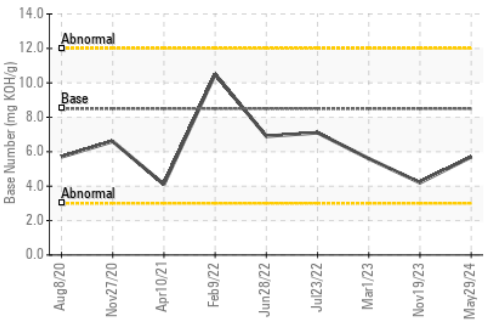

Non-ferrous Metals




Viscosity @ 100°C




Base Number




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : HRE0000196
**Lab Number** : 06198586
**Unique Number** : 11060709
**Test Package** : FLEET

**Received** : 03 Jun 2024
**Tested** : 04 Jun 2024
**Diagnosed** : 05 Jun 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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Report Id: MABEDE [WUSCAR] 06198586 (Generated: 06/05/2024 21:28:18) Rev: 1

Contact/Location: MAINTENANCE ? - MABEDE