



# OIL ANALYSIS REPORT

|                 |               |
|-----------------|---------------|
| WEAR            | <b>NORMAL</b> |
| CONTAMINATION   | <b>NORMAL</b> |
| FLUID CONDITION | <b>NORMAL</b> |

Machine Id  
**4160227**  
 Component  
**Diesel Engine**  
 Fluid  
**VALVOLINE 15W40 (--- GAL)**

## RECOMMENDATION

Resample at the next service interval to monitor. Please specify the component make and model with your next sample.

| Test           | UOM | Method      | Limit/Abn | Current            | History1    | History2    |
|----------------|-----|-------------|-----------|--------------------|-------------|-------------|
| Sample Number  |     | Client Info |           | <b>WC0808649</b>   | WC0808705   | WC0599562   |
| Sample Date    |     | Client Info |           | <b>28 Mar 2024</b> | 18 Sep 2023 | 07 Feb 2023 |
| Machine Age    | hrs | Client Info |           | <b>9650</b>        | 9031        | 8727        |
| Oil Age        | hrs | Client Info |           | <b>619</b>         | 250         | 0           |
| Filter Age     | hrs | Client Info |           | <b>619</b>         | 250         | 0           |
| Oil Changed    |     | Client Info |           | <b>Changed</b>     | Changed     | Changed     |
| Filter Changed |     | Client Info |           | <b>Changed</b>     | Changed     | Changed     |
| Sample Status  |     |             |           | <b>NORMAL</b>      | NORMAL      | NORMAL      |

## WEAR

All component wear rates are normal.

|              |        |             |      |              |      |      |
|--------------|--------|-------------|------|--------------|------|------|
| Iron         | ppm    | ASTM D5185m | >100 | <b>16</b>    | 4    | 5    |
| Chromium     | ppm    | ASTM D5185m | >20  | <b>&lt;1</b> | <1   | <1   |
| Nickel       | ppm    | ASTM D5185m | >4   | <b>&lt;1</b> | 0    | 0    |
| Titanium     | ppm    | ASTM D5185m |      | <b>&lt;1</b> | 0    | 0    |
| Silver       | ppm    | ASTM D5185m | >3   | <b>0</b>     | 0    | 0    |
| Aluminum     | ppm    | ASTM D5185m | >20  | <b>5</b>     | 1    | <1   |
| Lead         | ppm    | ASTM D5185m | >40  | <b>&lt;1</b> | <1   | 0    |
| Copper       | ppm    | ASTM D5185m | >330 | <b>2</b>     | 1    | 1    |
| Tin          | ppm    | ASTM D5185m | >15  | <b>&lt;1</b> | <1   | <1   |
| Vanadium     | ppm    | ASTM D5185m |      | <b>0</b>     | 0    | <1   |
| White Metal  | scalar | *Visual     | NONE | <b>NONE</b>  | NONE | NONE |
| Yellow Metal | scalar | *Visual     | NONE | <b>NONE</b>  | NONE | NONE |

## CONTAMINATION

There is no indication of any contamination in the oil.

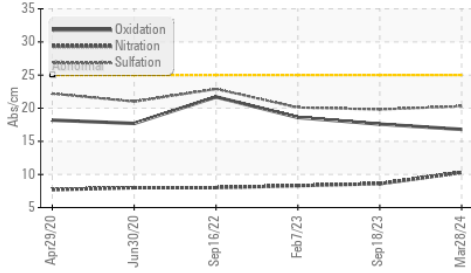
|                  |          |             |       |                |       |       |
|------------------|----------|-------------|-------|----------------|-------|-------|
| Silicon          | ppm      | ASTM D5185m | >25   | <b>5</b>       | 3     | 3     |
| Potassium        | ppm      | ASTM D5185m | >20   | <b>5</b>       | 0     | 3     |
| Fuel             |          | WC Method   | >5    | <b>&lt;1.0</b> | <1.0  | <1.0  |
| Water            |          | WC Method   | >0.2  | <b>NEG</b>     | NEG   | NEG   |
| Glycol           |          | WC Method   |       | <b>NEG</b>     | NEG   | NEG   |
| Soot %           | %        | *ASTM D7844 | >3    | <b>0.4</b>     | 0.2   | 0.2   |
| Nitration        | Abs/cm   | *ASTM D7624 | >20   | <b>10.3</b>    | 8.6   | 8.3   |
| Sulfation        | Abs/.1mm | *ASTM D7415 | >30   | <b>20.3</b>    | 19.8  | 20.1  |
| Silt             | scalar   | *Visual     | NONE  | <b>NONE</b>    | NONE  | NONE  |
| Debris           | scalar   | *Visual     | NONE  | <b>NONE</b>    | NONE  | NONE  |
| Sand/Dirt        | scalar   | *Visual     | NONE  | <b>NONE</b>    | NONE  | NONE  |
| Appearance       | scalar   | *Visual     | NORML | <b>NORML</b>   | NORML | NORML |
| Odor             | scalar   | *Visual     | NORML | <b>NORML</b>   | NORML | NORML |
| Emulsified Water | scalar   | *Visual     | >0.2  | <b>NEG</b>     | NEG   | NEG   |

## FLUID CONDITION

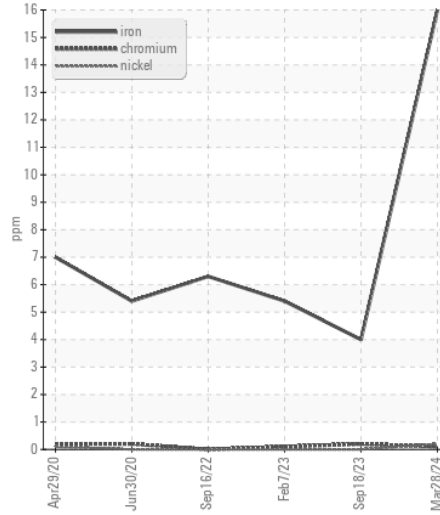
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

|                  |          |             |      |             |      |      |
|------------------|----------|-------------|------|-------------|------|------|
| Sodium           | ppm      | ASTM D5185m |      | <b>2</b>    | 2    | 3    |
| Boron            | ppm      | ASTM D5185m | 39   | <b>46</b>   | 25   | 38   |
| Barium           | ppm      | ASTM D5185m | 1    | <b>0</b>    | 0    | <1   |
| Molybdenum       | ppm      | ASTM D5185m | 49   | <b>37</b>   | 45   | 49   |
| Manganese        | ppm      | ASTM D5185m | 1    | <b>0</b>    | <1   | <1   |
| Magnesium        | ppm      | ASTM D5185m | 616  | <b>372</b>  | 781  | 708  |
| Calcium          | ppm      | ASTM D5185m | 1554 | <b>1874</b> | 1181 | 1404 |
| Phosphorus       | ppm      | ASTM D5185m | 899  | <b>957</b>  | 794  | 766  |
| Zinc             | ppm      | ASTM D5185m | 1069 | <b>1140</b> | 875  | 931  |
| Sulfur           | ppm      | ASTM D5185m | 2624 | <b>3877</b> | 2395 | 2987 |
| Oxidation        | Abs/.1mm | *ASTM D7414 | >25  | <b>16.8</b> | 17.6 | 18.6 |
| Base Number (BN) | mg KOH/g | ASTM D2896  | 6.9  | <b>7.0</b>  | 8.9  | 9.0  |
| Visc @ 100°C     | cSt      | ASTM D445   | 13.6 | <b>13.0</b> | 13.4 | 13.4 |

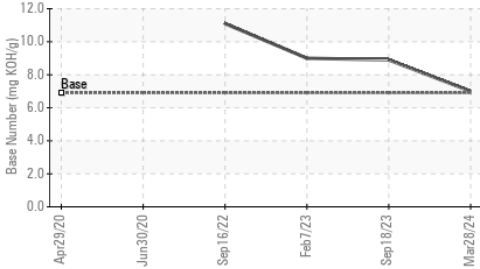
**FT-IR (Direct Trend)**



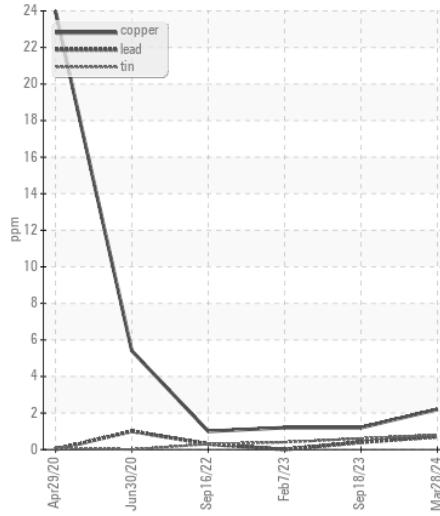
**Ferrous Alloys**



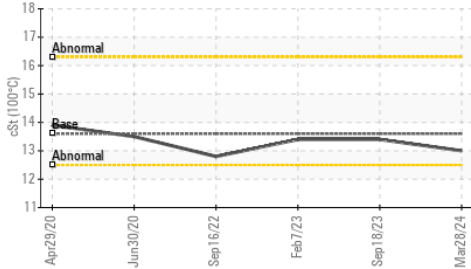
**Base Number**



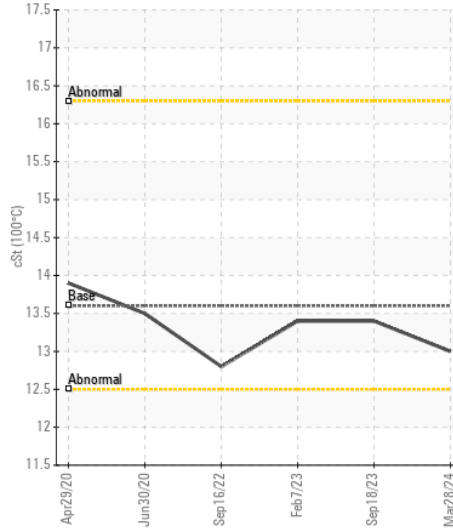
**Non-ferrous Metals**



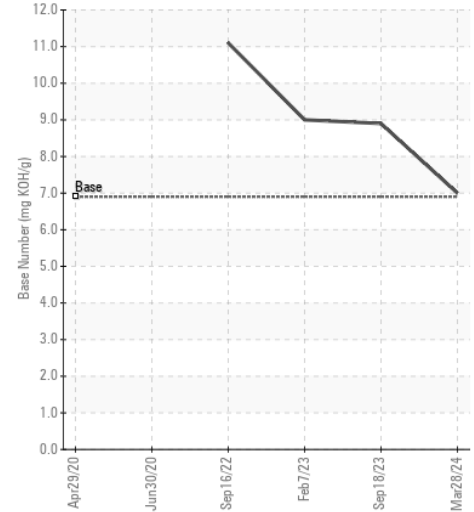
**Viscosity @ 100°C**



**Viscosity @ 100°C**



**Base Number**



Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513  
**Sample No.** : WC0808649 **Received** : 12 Jul 2024  
**Lab Number** : 06234422 **Tested** : 12 Jul 2024  
**Unique Number** : 11123256 **Diagnosed** : 12 Jul 2024 - Wes Davis  
**Test Package** : CONST ( Additional Tests: TBN )

**KELLER NORTH AMERICA - TAMPA**  
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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)