



# OIL ANALYSIS REPORT

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

Machine Id  
**HYUNDAI 2013 HYUNDAI SONATA**  
 Component  
**Gasoline Engine**  
 Fluid  
**VALVOLINE 5W20 FULL SYN (5 QTS)**

## RECOMMENDATION

Resample at the next service interval to monitor.

| Test           | UOM | Method      | Limit/Abn | Current            | History1    | History2    |
|----------------|-----|-------------|-----------|--------------------|-------------|-------------|
| Sample Number  |     | Client Info |           | <b>WC06152659</b>  | WC05875741  | WC05728184  |
| Sample Date    |     | Client Info |           | <b>17 Apr 2024</b> | 15 Jun 2023 | 29 Dec 2022 |
| Machine Age    | mls | Client Info |           | <b>148037</b>      | 141122      | 136069      |
| Oil Age        | mls | Client Info |           | <b>6915</b>        | 4735        | 7165        |
| Filter Age     | mls | Client Info |           | <b>6915</b>        | 4735        | 7165        |
| Oil Changed    |     | Client Info |           | <b>Not Changed</b> | Changed     | Not Changed |
| Filter Changed |     | Client Info |           | <b>Not Changed</b> | Changed     | Not Changed |
| Sample Status  |     |             |           | <b>NORMAL</b>      | NORMAL      | ATTENTION   |

## WEAR

All component wear rates are normal.

|              |        |             |      |              |      |      |
|--------------|--------|-------------|------|--------------|------|------|
| Iron         | ppm    | ASTM D5185m | >150 | <b>28</b>    | 17   | 26   |
| Chromium     | ppm    | ASTM D5185m | >20  | <b>&lt;1</b> | <1   | <1   |
| Nickel       | ppm    | ASTM D5185m | >5   | <b>0</b>     | <1   | 0    |
| Titanium     | ppm    | ASTM D5185m |      | <b>&lt;1</b> | <1   | <1   |
| Silver       | ppm    | ASTM D5185m | >2   | <b>&lt;1</b> | 0    | <1   |
| Aluminum     | ppm    | ASTM D5185m | >40  | <b>6</b>     | 3    | 6    |
| Lead         | ppm    | ASTM D5185m | >50  | <b>0</b>     | 0    | 0    |
| Copper       | ppm    | ASTM D5185m | >155 | <b>8</b>     | 10   | 23   |
| Tin          | ppm    | ASTM D5185m | >10  | <b>&lt;1</b> | <1   | <1   |
| Vanadium     | ppm    | ASTM D5185m |      | <b>0</b>     | <1   | 0    |
| White Metal  | scalar | *Visual     | NONE | <b>NONE</b>  | NONE | NONE |
| Yellow Metal | scalar | *Visual     | NONE | <b>NONE</b>  | NONE | NONE |

## CONTAMINATION

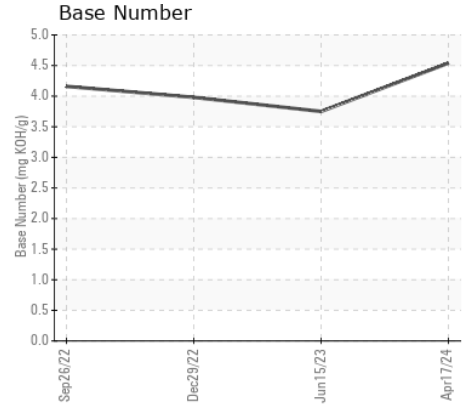
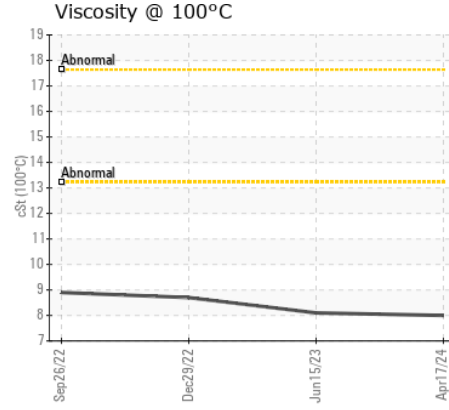
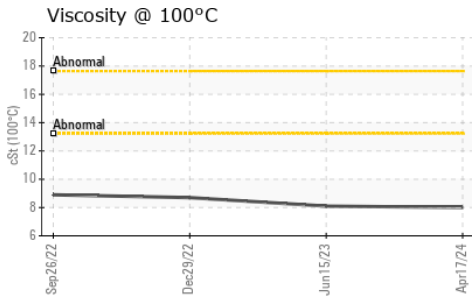
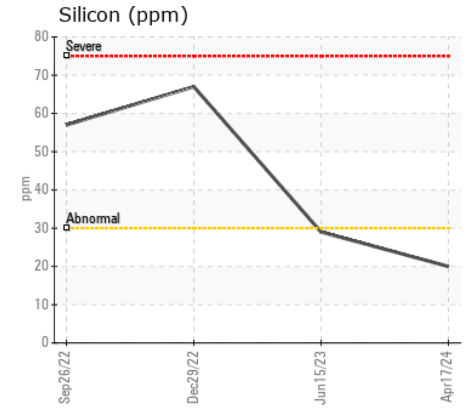
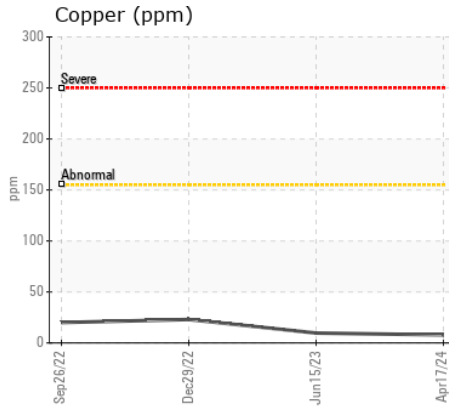
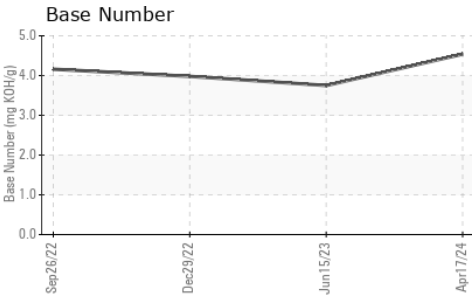
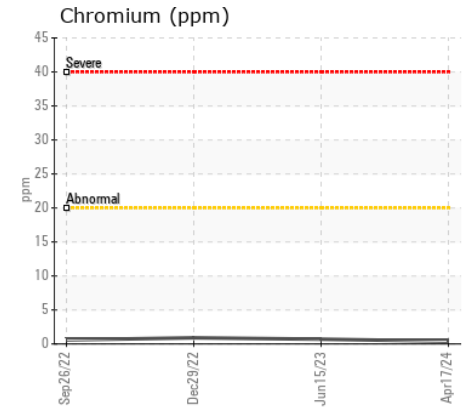
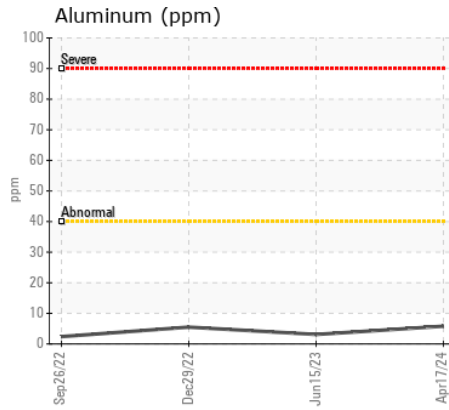
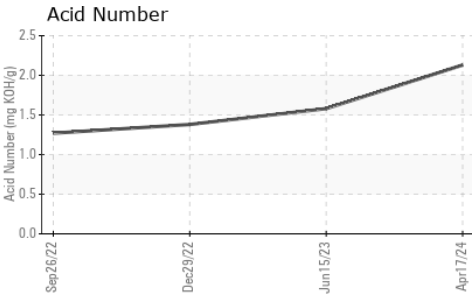
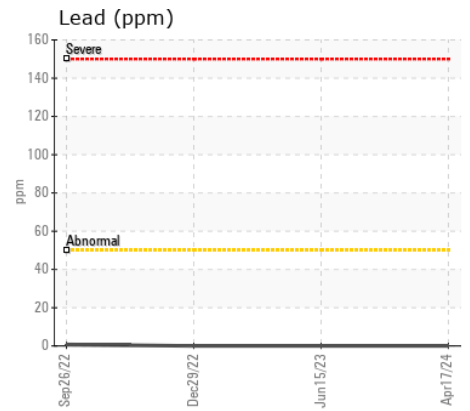
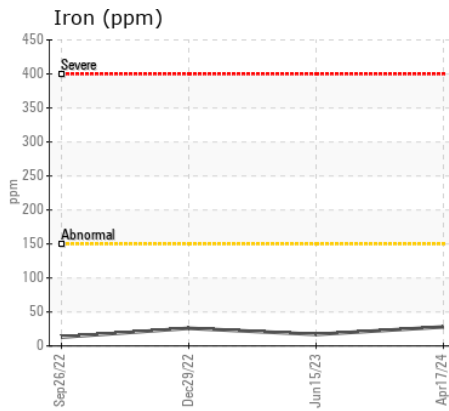
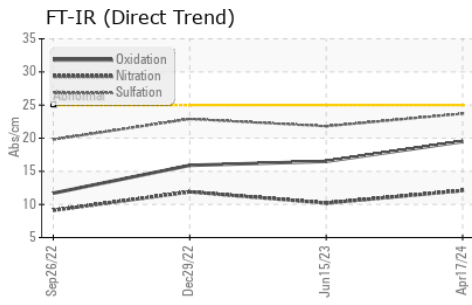
There is no indication of any contamination in the oil.

|                  |          |             |       |                |       |       |
|------------------|----------|-------------|-------|----------------|-------|-------|
| Silicon          | ppm      | ASTM D5185m | >30   | <b>20</b>      | 29    | 67    |
| Potassium        | ppm      | ASTM D5185m | >20   | <b>6</b>       | 10    | 23    |
| Fuel             |          | WC Method   | >4.0  | <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 |       | <b>0.1</b>     | 0.1   | 0.1   |
| Nitration        | Abs/cm   | *ASTM D7624 | >20   | <b>12.1</b>    | 10.2  | 11.9  |
| Sulfation        | Abs/.1mm | *ASTM D7415 | >30   | <b>23.7</b>    | 21.8  | 22.9  |
| 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 AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

|                  |          |             |      |             |      |      |
|------------------|----------|-------------|------|-------------|------|------|
| Sodium           | ppm      | ASTM D5185m | >400 | <b>5</b>    | 5    | 13   |
| Boron            | ppm      | ASTM D5185m |      | <b>26</b>   | 32   | 12   |
| Barium           | ppm      | ASTM D5185m |      | <b>0</b>    | 0    | 4    |
| Molybdenum       | ppm      | ASTM D5185m |      | <b>208</b>  | 97   | 56   |
| Manganese        | ppm      | ASTM D5185m |      | <b>4</b>    | 2    | 3    |
| Magnesium        | ppm      | ASTM D5185m |      | <b>468</b>  | 464  | 297  |
| Calcium          | ppm      | ASTM D5185m |      | <b>1123</b> | 1119 | 1263 |
| Phosphorus       | ppm      | ASTM D5185m |      | <b>682</b>  | 613  | 590  |
| Zinc             | ppm      | ASTM D5185m |      | <b>759</b>  | 733  | 638  |
| Sulfur           | ppm      | ASTM D5185m |      | <b>2620</b> | 3105 | 2267 |
| Oxidation        | Abs/.1mm | *ASTM D7414 | >25  | <b>19.5</b> | 16.5 | 15.9 |
| Acid Number (AN) | mg KOH/g | ASTM D8045  |      | <b>2.13</b> | 1.58 | 1.38 |
| Base Number (BN) | mg KOH/g | ASTM D2896  |      | <b>4.54</b> | 3.75 | 3.98 |
| Visc @ 100°C     | cSt      | ASTM D445   |      | <b>8.0</b>  | 8.1  | 8.7  |



Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513  
**Sample No.** : WC06152659  
**Lab Number** : 06152659  
**Unique Number** : 10982737  
**Test Package** : MOB 2 ( Additional Tests: TBN )

**Received** : 17 Apr 2024  
**Tested** : 18 Apr 2024  
**Diagnosed** : 22 Apr 2024 - Sean Felton

**JODY HARRIS**  
 502 BENEEMER LN  
 ROLESVILLE, NC  
 US 27587

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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)

T:  
F: