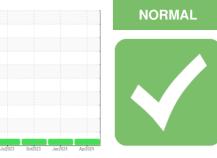


# **OIL ANALYSIS REPORT**

SAMPLE INFORMATION method

Sample Rating Trend



#### Machine Id **2309** Component **Diesel Engine** Fluid **SHELL ROTELLA T 15W40 (--- GAL)**

#### 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.

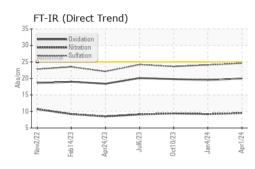
## Fluid Condition

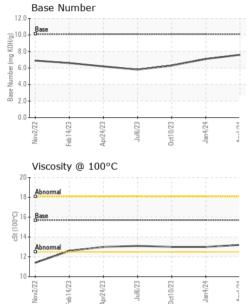
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

| SAMPLE INFORM   |  | method  | limit/base  | current   | history1  | history2  |
|---|--|---|---|---|---|---|
| Sample Number   |  | Client Info   |   | WC0859258   | WC0859300   | WC0859249   |
| Sample Date   |  | Client Info   |   | 01 Apr 2024   | 04 Jan 2024   | 10 Oct 2023   |
| Machine Age   | mls  | Client Info   |   | 132006  | 112013  | 95572   |
| Oil Age   | mls  | Client Info   |   | 0   | 0   | 0   |
| Oil Changed   |  | Client Info   |   | Changed   | Changed   | Changed   |
| Sample Status   |  |   |   | NORMAL  | NORMAL  | NORMAL  |
|   | _  |   |   |   |   |   |
| CONTAMINATIO  | N  | method  | limit/base  | current   | history1  | history2  |
| Fuel  |  | WC Method   | >3.0  | <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   | >90   | 19  | 16  | 21  |
| Chromium  | ppm  | ASTM D5185m   | >20   | <1  | <1  | 3   |
| Nickel  | ppm  | ASTM D5185m   | >2  | 0   | 0   | <1  |
| Titanium  | ppm  | ASTM D5185m   | >2  | 0   | 0   | <1  |
| Silver  | ppm  | ASTM D5185m   | >2  | 0   | 0   | 0   |
| Aluminum  | ppm  | ASTM D5185m   | >20   | 10  | 12  | 20  |
| Lead  | ppm  | ASTM D5185m   | >40   | 0   | 0   | 2   |
| Copper  | ppm  | ASTM D5185m   | >330  | <1  | <1  | 7   |
| Tin   | ppm  | ASTM D5185m   | >15   | <1  | 0   | <1  |
| Vanadium  | ppm  | ASTM D5185m   |   | 0   | 0   | <1  |
| Cadmium   | ppm  | ASTM D5185m   |   | 0   | 0   | <1  |
|   |  |   |   |   |   |   |
| ADDITIVES   |  | method  |   |   |   | history2  |
| ADDITIVES<br>Boron  | ppm  | method<br>ASTM D5185m   | limit/base<br>316   | current<br>213  | history1<br>264   | history2<br>167   |
|   | ppm<br>ppm   |   |   |   |   |   |
| Boron   |  | ASTM D5185m   | 316   | 213   | 264   | 167   |
| Boron<br>Barium   | ppm  | ASTM D5185m<br>ASTM D5185m  | 316<br>0.0  | 213<br>0  | 264<br>0  | 167<br>4  |
| Boron<br>Barium<br>Molybdenum   | ppm<br>ppm   | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m   | 316<br>0.0  | 213<br>0<br>131   | 264<br>0<br>131   | 167<br>4<br>113   |
| Boron<br>Barium<br>Molybdenum<br>Manganese  | ppm<br>ppm<br>ppm  | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m  | 316<br>0.0<br>1.2   | 213<br>0<br>131<br><1   | 264<br>0<br>131<br>0  | 167<br>4<br>113<br>1  |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium   | ppm<br>ppm<br>ppm<br>ppm   | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m   | 316<br>0.0<br>1.2<br>24   | 213<br>0<br>131<br><1<br>701  | 264<br>0<br>131<br>0<br>668   | 167<br>4<br>113<br>1<br>548   |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium  | ppm<br>ppm<br>ppm<br>ppm<br>ppm                                    | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m  | 316<br>0.0<br>1.2<br>24<br>2292   | 213<br>0<br>131<br><1<br>701<br>1689  | 264<br>0<br>131<br>0<br>668<br>1550   | 167<br>4<br>113<br>1<br>548<br>1440   |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus  | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm                             | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m  | 316<br>0.0<br>1.2<br>24<br>2292<br>1064   | 213<br>0<br>131<br><1<br>701<br>1689<br>751   | 264<br>0<br>131<br>0<br>668<br>1550<br>738  | 167<br>4<br>113<br>1<br>548<br>1440<br>598  |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc  | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm                      | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m   | 316<br>0.0<br>1.2<br>24<br>2292<br>1064<br>1160   | 213<br>0<br>131<br><1<br>701<br>1689<br>751<br>892  | 264<br>0<br>131<br>0<br>668<br>1550<br>738<br>870   | 167<br>4<br>113<br>1<br>548<br>1440<br>598<br>726   |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur  | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm                      | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m  | 316<br>0.0<br>1.2<br>24<br>2292<br>1064<br>1160<br>4996   | 213<br>0<br>131<br><1<br>701<br>1689<br>751<br>892<br>2997  | 264<br>0<br>131<br>0<br>668<br>1550<br>738<br>870<br>2585   | 167<br>4<br>113<br>1<br>548<br>1440<br>598<br>726<br>2101   |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINANTS  | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm                      | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m   | 316<br>0.0<br>1.2<br>24<br>2292<br>1064<br>1160<br>4996   | 213<br>0<br>131<br><1<br>701<br>1689<br>751<br>892<br>2997<br>current   | 264<br>0<br>131<br>0<br>668<br>1550<br>738<br>870<br>2585<br>history1   | 167<br>4<br>113<br>1<br>548<br>1440<br>598<br>726<br>2101<br>history2   |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINANTS<br>Silicon   | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm               | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br><b>method</b>   | 316<br>0.0<br>1.2<br>24<br>2292<br>1064<br>1160<br>4996<br><b>limit/base</b><br>>25   | 213<br>0<br>131<br><1<br>701<br>1689<br>751<br>892<br>2997<br>current<br>8  | 264<br>0<br>131<br>0<br>668<br>1550<br>738<br>870<br>2585<br>history1<br>7  | 167<br>4<br>113<br>1<br>548<br>1440<br>598<br>726<br>2101<br>history2<br>9  |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINANTS<br>Silicon<br>Sodium   | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm               | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m  | 316<br>0.0<br>1.2<br>24<br>2292<br>1064<br>1160<br>4996<br><b>limit/base</b><br>>25   | 213<br>0<br>131<br><1<br>701<br>1689<br>751<br>892<br>2997<br>current<br>8<br>2   | 264<br>0<br>131<br>0<br>668<br>1550<br>738<br>870<br>2585<br>history1<br>7<br><1  | 167<br>4<br>113<br>548<br>1440<br>598<br>726<br>2101<br>history2<br>9<br>3  |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINANTS<br>Silicon<br>Sodium<br>Potassium  | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm               | ASTM D5185m<br>ASTM D5185m   | 316<br>0.0<br>1.2<br>24<br>2292<br>1064<br>1160<br>4996<br><b>Imit/base</b><br>>25<br>>20   | 213<br>0<br>131<br><1<br>701<br>1689<br>751<br>892<br>2997<br>current<br>8<br>2<br>2997   | 264<br>0<br>131<br>0<br>668<br>1550<br>738<br>870<br>2585<br>history1<br>7<br>< 1<br>25   | 167<br>4<br>113<br>1<br>548<br>1440<br>598<br>726<br>2101<br>history2<br>9<br>3<br>48   |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINANTS<br>Silicon<br>Sodium<br>Potassium<br>INFRA-RED                                     | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm               | ASTM D5185m<br>ASTM D5185m  | 316<br>0.0<br>1.2<br>24<br>2292<br>1064<br>1160<br>4996<br><b>limit/base</b><br>>25<br>>20<br><b>limit/base</b><br>>6                           | 213<br>0<br>131<br><1<br>701<br>1689<br>751<br>892<br>2997<br>current<br>8<br>2<br>2997<br>current                                  | 264<br>0<br>131<br>0<br>668<br>1550<br>738<br>870<br>2585<br>history1<br>7<br><1<br>25<br>5<br>history1                                   | 167<br>4<br>113<br>548<br>1440<br>598<br>726<br>2101<br>history2<br>9<br>3<br>48<br>history2  |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINANTS<br>Silicon<br>Sodium<br>Potassium<br>INFRA-RED<br>Soot %                           | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm | ASTM D5185m<br>ASTM D5185m   | 316<br>0.0<br>1.2<br>24<br>2292<br>1064<br>1160<br>4996<br><b>limit/base</b><br>>25<br>>20<br><b>limit/base</b><br>>6                           | 213<br>0<br>131<br><1<br>701<br>1689<br>751<br>892<br>2997<br>current<br>8<br>2<br>19<br>current<br>0.3                             | 264<br>0<br>131<br>0<br>668<br>1550<br>738<br>870<br>2585<br>history1<br>7<br><1<br>25<br>5<br>history1<br>0.3                            | 167<br>4<br>113<br>1<br>548<br>1440<br>598<br>726<br>2101<br>history2<br>9<br>3<br>48<br>kistory2<br>0.3                            |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINANTS<br>Silicon<br>Sodium<br>Potassium<br>INFRA-RED<br>Soot %<br>Nitration              | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm | ASTM D5185m<br>ASTM D5185m                              | 316<br>0.0<br>1.2<br>24<br>2292<br>1064<br>1160<br>4996<br><i>imit/base</i><br>>25<br>>20<br><i>imit/base</i><br>>6<br>>20                      | 213<br>0<br>131<br><1<br>701<br>1689<br>751<br>892<br>2997<br>current<br>8<br>2<br>19<br>current<br>0.3<br>9.5                      | 264<br>0<br>131<br>0<br>668<br>1550<br>738<br>870<br>2585<br>history1<br>7<br><1<br>25<br>5<br>history1<br>0.3<br>9.2                     | 167<br>4<br>113<br>1<br>548<br>1440<br>598<br>726<br>2101<br>history2<br>9<br>3<br>48<br>48<br>history2<br>0.3<br>9.4               |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINANTS<br>Silicon<br>Sodium<br>Potassium<br>INFRA-RED<br>Soot %<br>Nitration<br>Sulfation | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm | ASTM D5185m<br>ASTM D7844<br>*ASTM D7624 | 316<br>0.0<br>1.2<br>24<br>2292<br>1064<br>1160<br>4996<br><b>imit/base</b><br>>25<br>>20<br><b>imit/base</b><br>>20<br>>30<br><b>imit/base</b> | 213<br>0<br>131<br><1<br>701<br>1689<br>751<br>892<br>2997<br>Current<br>8<br>2<br>2997<br>Current<br>0.3<br>9.5<br>24.6<br>Current | 264<br>0<br>131<br>0<br>668<br>1550<br>738<br>870<br>2585<br>history1<br>7<br><1<br>25<br>5<br>history1<br>0.3<br>9.2<br>24.1<br>history1 | 167<br>4<br>113<br>1<br>548<br>1440<br>598<br>726<br>2101<br>history2<br>9<br>3<br>48<br>history2<br>0.3<br>9.4<br>23.6<br>history2 |
| Boron<br>Barium<br>Molybdenum<br>Manganese<br>Magnesium<br>Calcium<br>Phosphorus<br>Zinc<br>Sulfur<br>CONTAMINANTS<br>Silicon<br>Sodium<br>Potassium<br>INFRA-RED<br>Soot %<br>Nitration<br>Sulfation | ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm<br>ppm | ASTM D5185m<br>ASTM D5185m               | 316<br>0.0<br>1.2<br>24<br>2292<br>1064<br>1160<br>4996<br><b>Imit/base</b><br>>25<br>>20<br><b>Imit/base</b><br>>20<br><b>S</b>                | 213<br>0<br>131<br><1<br>701<br>1689<br>751<br>892<br>2997<br>current<br>8<br>2<br>19<br>current<br>0.3<br>9.5<br>24.6              | 264<br>0<br>131<br>0<br>668<br>1550<br>738<br>870<br>2585<br>history1<br>7<br><1<br>25<br><u>history1</u><br>0.3<br>9.2<br>24.1           | 167<br>4<br>113<br>548<br>1440<br>598<br>726<br>2101<br><b>history2</b><br>9<br>3<br>48<br><b>history2</b><br>0.3<br>9.4<br>23.6    |



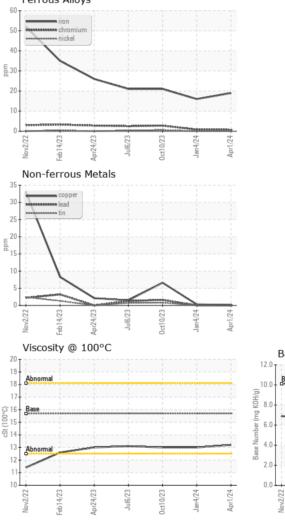
# **OIL ANALYSIS REPORT**

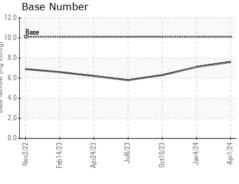




| VISUAL           |        | method    | limit/base | current | history1 | history2 |
|------------------|--------|-----------|------------|---------|----------|----------|
| White Metal      | scalar | *Visual   | NONE       | NONE    | NONE     | NONE     |
| Yellow Metal     | scalar | *Visual   | 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 PROPERT    | TIES   | method    | limit/base | current | history1 | history2 |
| Visc @ 100°C     | cSt    | ASTM D445 | 15.7       | 13.2    | 13.0     | 13.0     |
| ОРАРИС           |        |           |            |         |          |          |

GRAPHS Ferrous Alloys





Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513 Ergon Trucking Inc. - MAG601 : WC0859258 Sample No. Received : 08 Apr 2024 11337 State Route 800 Lab Number : 06141966 Tested : 09 Apr 2024 Magnolia, OH US 44643 Unique Number : 10966774 Diagnosed : 09 Apr 2024 - Wes Davis Test Package : FLEET Contact: Eddy Smith Certificate 12367 To discuss this sample report, contact Customer Service at 1-800-237-1369. eddy.smith@ergon.com \* - Denotes test methods that are outside of the ISO 17025 scope of accreditation. T: Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012) F: