

# **OIL ANALYSIS REPORT**

NORMAL 



Sample Rating Trend

# DIAGNOSIS

## 69.01 [OKLAHOMA^3^EG - TRUCK-OFF-HWY-HEAVY HAUL] **Diesel Engine** MOBIL DELVAC 1300 SUPER15W40 (--- GAL)

Area OKLAHOMA/3/EG - TRUCK-OFF-HWY-HEAVY HAUL

| SAMPLE INFORM   | IATION   | method  | limit/base   | current  | history1  | history2  |
|---|--|---|--|--|---|---|
| Sample Number   |  | Client Info   |  | WC0935296  | WC0914535   | WC0886869   |
| Sample Date   |  | Client Info   |  | 12 May 2024  | 01 Apr 2024   | 20 Feb 2024   |
| Machine Age   | hrs  | Client Info   |  | 23761  | 23567   | 2443  |
| Oil Age   | hrs  | Client Info   |  | 23000  | 567   | 166   |
| Oil Changed   |  | Client Info   |  | Changed  | Not Changd  | Changed   |
| Sample Status   |  |   |  | NORMAL   | NORMAL  | ABNORMAL  |
| CONTAMINATION   | N  | 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   | 20.L   | NEG  | NEG   | NEG   |
| WEAR METALS   |  |   |  | -  |   |   |
|   |  | method  | limit/base   | current  | history1  | history2  |
| Iron  | ppm  | ASTM D5185m   | >100   | 6  | 7   | 7   |
| Chromium  | ppm  | ASTM D5185m   |  | <1   | <1  | <1  |
| Nickel  | ppm  | ASTM D5185m   | >2   | <1   | <1  | 1   |
| Titanium  | ppm  | ASTM D5185m   | >2   | <1   | <1  | <1  |
| Silver  | ppm  | ASTM D5185m   | >2   | <1   | 0   | 0   |
| Aluminum  | ppm  | ASTM D5185m   | >25  | 2  | 2   | 2   |
| Lead  | ppm  | ASTM D5185m   | >40  | <1   | <1  | <1  |
| Copper  | ppm  | ASTM D5185m   |  | <1   | 1   | 2   |
| Tin   | ppm  | ASTM D5185m   | >15  | <1   | <1  | <1  |
| Vanadium  | ppm  | ASTM D5185m   |  | <1   | <1  | <1  |
| Cadmium   | ppm  | ASTM D5185m   |  | 0  | <1  | <1  |
|   |  |   |  |  |   |   |
| ADDITIVES   |  | method  | limit/base   | current  | history1  | history2  |
| ADDITIVES<br>Boron  | ppm  | method<br>ASTM D5185m   | limit/base   | current<br>67  | history1<br>57  | history2<br>55  |
|   | ppm<br>ppm   |   |  |  |   |   |
| Boron   |  | ASTM D5185m   | 0  | 67   | 57  | 55  |
| Boron<br>Barium   | ppm  | ASTM D5185m<br>ASTM D5185m  | 0  | 67<br>0  | 57<br>0   | 55<br>1   |
| Boron<br>Barium<br>Molybdenum   | ppm<br>ppm   | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m   | 0  | 67<br>0<br>39  | 57<br>0<br>38   | 55<br>1<br>39   |
| Boron<br>Barium<br>Molybdenum<br>Manganese  | ppm<br>ppm<br>ppm  | ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m<br>ASTM D5185m  | 0<br>0<br>0  | 67<br>0<br>39<br>0   | 57<br>0<br>38<br><1   | 55<br>1<br>39<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   | 0<br>0<br>0  | 67<br>0<br>39<br>0<br>472  | 57<br>0<br>38<br><1<br>482  | 55<br>1<br>39<br>1<br>449   |
| 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  | 0<br>0<br>0  | 67<br>0<br>39<br>0<br>472<br>1658  | 57<br>0<br>38<br><1<br>482<br>1614  | 55<br>1<br>39<br>1<br>449<br>1516   |
| 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  | 0<br>0<br>0  | 67<br>0<br>39<br>0<br>472<br>1658<br>827   | 57<br>0<br>38<br><1<br>482<br>1614<br>756   | 55<br>1<br>39<br>1<br>449<br>1516<br>687  |
| 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   | 0<br>0<br>0  | 67<br>0<br>39<br>0<br>472<br>1658<br>827<br>904  | 57<br>0<br>38<br><1<br>482<br>1614<br>756<br>891  | 55<br>1<br>39<br>1<br>449<br>1516<br>687<br>837   |
| 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<br>ASTM D5185m   | 0<br>0<br>0<br>0   | 67<br>0<br>39<br>0<br>472<br>1658<br>827<br>904<br>2826  | 57<br>0<br>38<br><1<br>482<br>1614<br>756<br>891<br>2604  | 55<br>1<br>39<br>1<br>449<br>1516<br>687<br>837<br>2589   |
| 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   | 0<br>0<br>0<br>0<br>Imit/base  | 67<br>0<br>39<br>0<br>472<br>1658<br>827<br>904<br>2826<br>current   | 57<br>0<br>38<br><1<br>482<br>1614<br>756<br>891<br>2604<br>history1  | 55<br>1<br>39<br>1<br>449<br>1516<br>687<br>837<br>2589<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>   | 0<br>0<br>0<br>0<br>Imit/base  | 67<br>0<br>39<br>0<br>472<br>1658<br>827<br>904<br>2826<br>current<br>10   | 57<br>0<br>38<br><1<br>482<br>1614<br>756<br>891<br>2604<br>history1<br>18  | 55<br>1<br>39<br>1<br>449<br>1516<br>687<br>837<br>2589<br>history2<br>▲ 37   |
| 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  | 0<br>0<br>0<br>0<br>   | 67<br>0<br>39<br>0<br>472<br>1658<br>827<br>904<br>2826<br><u>current</u><br>10<br>2   | 57<br>0<br>38<br><1<br>482<br>1614<br>756<br>891<br>2604<br>history1<br>18<br>2   | 55<br>1<br>39<br>1<br>449<br>1516<br>687<br>837<br>2589<br>history2<br>▲ 37<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   | 0<br>0<br>0<br>0<br><u>limit/base</u><br>>25   | 67<br>0<br>39<br>0<br>472<br>1658<br>827<br>904<br>2826<br><u>current</u><br>10<br>2<br>2  | 57<br>0<br>38<br><1<br>482<br>1614<br>756<br>891<br>2604<br>history1<br>18<br>2<br>2<br>2   | 55<br>1<br>39<br>1<br>449<br>1516<br>687<br>837<br>2589<br>history2<br>▲ 37<br>3<br>1   |
| 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  | 0<br>0<br>0<br>0<br>0<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1 | 67<br>0<br>39<br>0<br>472<br>1658<br>827<br>904<br>2826<br>current<br>10<br>2<br>2<br>2<br>2   | 57<br>0<br>38<br><1<br>482<br>1614<br>756<br>891<br>2604<br>history1<br>18<br>2<br>2<br>2<br>2<br>history1                              | 55<br>1<br>39<br>1<br>449<br>1516<br>687<br>837<br>2589<br>bistory2<br>37<br>3<br>3<br>1<br>1<br>bistory2                           |
| 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                            | ASTM D5185m<br>ASTM D5185m   | 0<br>0<br>0<br>0<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1 | 67<br>0<br>39<br>0<br>472<br>1658<br>827<br>904<br>2826<br>current<br>10<br>2<br>2<br>2<br>2<br>current<br>0                         | 57<br>0<br>38<br><1<br>482<br>1614<br>756<br>891<br>2604<br>history1<br>18<br>2<br>2<br>2<br>history1<br>0.2                            | 55<br>1<br>39<br>1<br>449<br>1516<br>687<br>837<br>2589<br>history2<br>37<br>3<br>1<br>1<br>history2<br>0.2                         |
| 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  | 0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0      | 67<br>0<br>39<br>0<br>472<br>1658<br>827<br>904<br>2826<br><u>current</u><br>10<br>2<br>2<br>2<br><u>current</u><br>0<br>4.6         | 57<br>0<br>38<br><1<br>482<br>1614<br>756<br>891<br>2604<br>history1<br>18<br>2<br>2<br>2<br>history1<br>0.2<br>6.0                     | 55<br>1<br>39<br>1<br>449<br>1516<br>687<br>837<br>2589<br>history2<br>37<br>3<br>1<br>3<br>1<br>bistory2<br>0.2<br>5.5             |
| 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   | 0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0      | 67<br>0<br>39<br>0<br>472<br>1658<br>827<br>904<br>2826<br><b>current</b><br>10<br>2<br>2<br>2<br><b>current</b><br>0<br>4.6<br>16.7 | 57<br>0<br>38<br><1<br>482<br>1614<br>756<br>891<br>2604<br>history1<br>18<br>2<br>2<br>2<br>history1<br>0.2<br>6.0<br>21.9             | 55<br>1<br>39<br>1<br>449<br>1516<br>687<br>837<br>2589<br><b>history2</b><br>37<br>3<br>1<br><b>history2</b><br>0.2<br>5.5<br>21.6 |
| 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 D7844 | 0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0      | 67<br>0<br>39<br>0<br>472<br>1658<br>827<br>904<br>2826<br>current<br>10<br>2<br>2<br>2<br>current<br>0<br>4.6<br>16.7               | 57<br>0<br>38<br><1<br>482<br>1614<br>756<br>891<br>2604<br>history1<br>18<br>2<br>2<br>2<br>history1<br>0.2<br>6.0<br>21.9<br>history1 | 55<br>1<br>39<br>1<br>449<br>1516<br>687<br>837<br>2589<br>bistory2<br>▲ 37<br>3<br>1<br>bistory2<br>0.2<br>5.5<br>21.6<br>bistory2 |

### 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.



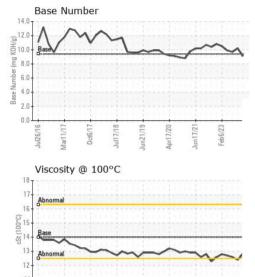
Jul26/16

Mar11/17

lcf6/17

# **OIL ANALYSIS REPORT**





un21/19 or17/20 Jun17/21

| 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    | ΓIES   | method    | limit/base | current | history1 | history2 |
| Visc @ 100°C     | cSt    | ASTM D445 | 14         | 12.8    | 12.4     | 12.6     |
| GRAPHS           |        |           |            |         |          |          |

Ferrous Alloys

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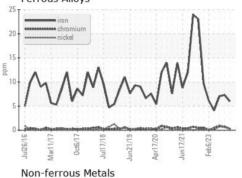
cSt (100°C) 14

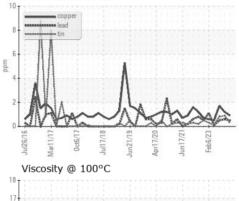
13 Abnorma

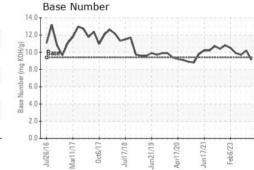
12

Jul26/16

Mar11/17 Oct6/17







Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513 SHERWOOD CONSTRUCTION CO INC Sample No. : WC0935296 Received : 20 May 2024 3219 WEST MAY ST Lab Number : 06185456 Tested : 22 May 2024 WICHITA, KS Unique Number : 11036782 Diagnosed : 22 May 2024 - Wes Davis US 67213 Test Package : CONST (Additional Tests: TBN) Contact: DOUG KING Certificate 12367 To discuss this sample report, contact Customer Service at 1-800-237-1369. doug.king@sherwood.net \* - Denotes test methods that are outside of the ISO 17025 scope of accreditation. T: (316)617-3161 Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012) F: x:

1/7118/

Feb6/23 -

Apr17/20

Jun17/21

Submitted By: GARRETT ADAMS