

OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id Machine Id 8510 Component Diesel Engine Fluid DIESEL ENGINE OIL SAE 15W40 (--- QTS)

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor. Please specify the component make and model with your next sample. Please specify the brand, type, and viscosity of the oil on your next sample.

Wear

Area

All component wear rates are normal.

Contamination

Elevated aluminum (Al) and/or lead (Pb) and potassium (K) levels in your metals analysis are likely a result of solder flux release into the lubricant and is common on new equipment/components. There is no indication of any contamination in the oil.

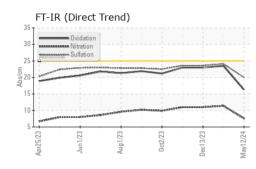
Fluid Condition

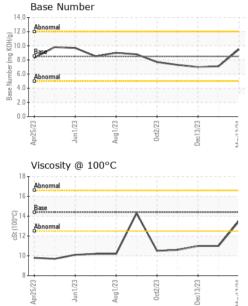
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

| SAMPLE INFORM | IATION | method | limit/base | current | | history2 |
|---|--|---|--|--|---|--|
| Sample Number | | Client Info | | WC0911656 | WC0892142 | WC0881855 |
| Sample Date | | Client Info | | 12 May 2024 | 10 Jan 2024 | 13 Dec 2023 |
| Machine Age | mls | Client Info | | 0 | 43273 | 39673 |
| Oil Age | mls | Client Info | | 0 | 0 | 0 |
| Oil Changed | | Client Info | | N/A | Not Changd | Not Changd |
| Sample Status | | | | NORMAL | ATTENTION | ATTENTION |
| CONTAMINATION | ٨ | 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 | 20 | 86 | 89 |
| Chromium | ppm | ASTM D5185m | >20 | 2 | 6 | 7 |
| Nickel | ppm | ASTM D5185m | >4 | <1 | 0 | <1 |
| Titanium | ppm | ASTM D5185m | | <1 | 0 | 0 |
| Silver | ppm | ASTM D5185m | >3 | 0 | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >20 | 13 | 46 | 46 |
| Lead | ppm | ASTM D5185m | >40 | <1 | 0 | 0 |
| Copper | ppm | ASTM D5185m | >330 | 1 | 7 | 7 |
| Tin | ppm | ASTM D5185m | >15 | <1 | <1 | 0 |
| Vanadium | ppm | ASTM D5185m | | <1 | 0 | 0 |
| Cadmium | ppm | ASTM D5185m | | <1 | 0 | 0 |
| | | | | | | |
| ADDITIVES | | method | limit/base | current | history1 | history2 |
| ADDITIVES Boron | ppm | method ASTM D5185m | limit/base 250 | current 37 | history1 19 | history2 21 |
| | ppm ppm | | | | | |
| Boron | | ASTM D5185m | 250 | 37 | 19 | 21 |
| Boron Barium | ppm | ASTM D5185m ASTM D5185m | 250 10 | 37 2 | 19 1 | 21 4 |
| Boron Barium Molybdenum | ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m | 250 10 | 37 2 49 | 19 1 38 | 21 4 40 |
| Boron Barium Molybdenum Manganese | ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 250 10 100 | 37 2 49 <1 | 19 1 38 3 | 21 4 40 3 |
| Boron Barium Molybdenum Manganese Magnesium | ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 250 10 100 450 | 37 2 49 <1 500 | 19 1 38 3 496 | 21 4 40 3 531 |
| Boron Barium Molybdenum Manganese Magnesium Calcium | ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 250 10 100 450 3000 | 37 2 49 <1 500 1432 | 19 1 38 3 496 1493 | 21 4 40 3 531 1623 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus | ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 250 10 100 450 3000 1150 | 37 2 49 <1 500 1432 989 | 19 1 38 3 496 1493 676 | 21 4 40 3 531 1623 844 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc | ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 250 10 100 450 3000 1150 1350 | 37 2 49 <1 500 1432 989 1112 | 19 1 38 3 496 1493 676 923 | 21 4 40 3 531 1623 844 1002 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur | ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 250 10 100 450 3000 1150 1350 4250 | 37 2 49 <1 500 1432 989 1112 3033 | 19 1 38 3 496 1493 676 923 2277 | 21 4 40 3 531 1623 844 1002 2528 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS | ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 250 10 100 450 3000 1150 1350 4250 | 37 2 49 <1 500 1432 989 1112 3033 current | 19 1 38 3 496 1493 676 923 2277 history1 | 21 4 40 3 531 1623 844 1002 2528 history2 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Chosphorus Zinc Sulfur CONTAMINANTS Silicon | ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method | 250 10 100 450 3000 1150 1350 4250 limit/base >25 | 37 2 49 <1 500 1432 989 1112 3033 current 5 | 19 1 38 3 496 1493 676 923 2277 history1 12 | 21 4 40 3 531 1623 844 1002 2528 history2 13 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium | ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 250 10 100 450 3000 1150 1350 4250 limit/base >25 >158 | 37 2 49 <1 500 1432 989 1112 3033 <u>current</u> 5 < | 19 1 38 3 496 1493 676 923 2277 history1 12 5 | 21 4 40 3 531 1623 844 1002 2528 history2 13 7 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium | ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m | 250 10 100 450 3000 1150 1350 4250 limit/base >25 >158 >20 | 37 2 49 <1 500 1432 989 1112 3033 current 5 < <1 40 | 19 1 38 3 496 1493 676 923 2277 history1 12 5 5 146 | 21 4 40 3 531 1623 844 1002 2528 history2 13 7 152 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED | ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m | 250 10 100 450 3000 1150 1350 4250 Imit/base >25 >158 >20 Imit/base | 37 2 49 <1 500 1432 989 1112 3033 current 5 <1 40 current | 19 1 38 3 496 1493 676 923 2277 history1 12 5 146 history1 | 21 4 40 3 531 1623 844 1002 2528 history2 13 7 152 history2 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m | 250 10 100 450 3000 1150 1350 4250 limit/base >25 >158 >20 limit/base >3 | 37 2 49 <1 500 1432 989 1112 3033 current 5 <1 40 current 0.3 | 19 1 38 3 496 1493 676 923 2277 history1 12 5 146 history1 1 | 21 4 40 3 531 1623 844 1002 2528 history2 13 7 152 history2 1 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m | 250 10 100 450 3000 1150 1350 4250 Iimit/base >25 >158 >20 Iimit/base >3 >20 | 37 2 49 <1 500 1432 989 1112 3033 <i>current</i> 5 <1 40 <i>current</i> 0.3 7.6 | 19 1 38 3 496 1493 676 923 2277 history1 12 5 146 history1 1 1 1 1 1 | 21 4 40 3 531 1623 844 1002 2528 history2 13 7 152 history2 1 152 1 11.0 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m | 250 10 100 450 3000 1150 1350 4250 binit/base >25 >158 >20 binit/base >3 >20 | 37 2 49 <1 500 1432 989 1112 3033 current 5 <1 40 current 0.3 7.6 20.0 | 19 1 38 3 496 1493 676 923 2277 history1 12 5 146 history1 1 1 1 1.4 24.1 | 21 4 40 3 531 1623 844 1002 2528 history2 13 7 152 history2 1 1 11.0 23.6 |



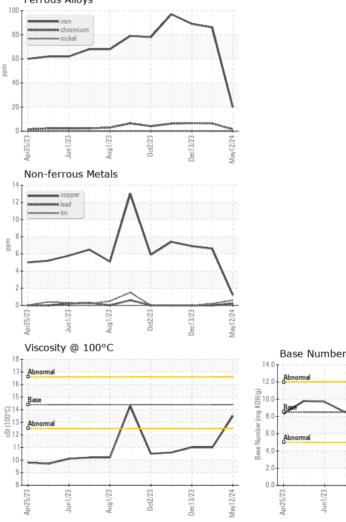
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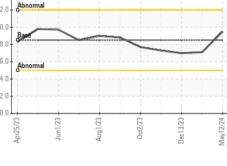




| VISUAL | | method | limit/base | current | history1 | history2 |
|------------------|--------|-----------|------------|---------|----------|----------|
| White Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Precipitate | scalar | *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 PROPER | TIES | method | limit/base | current | history1 | history2 |
| Visc @ 100°C | cSt | ASTM D445 | 14.4 | 13.5 | 11.0 | 11.0 |
| GRAPHS | | | | | | |

Ferrous Alloys





Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513 LIBERTY DISPOSAL Sample No. : WC0911656 6401 S EASTERN AVE Received : 10 May 2024 Lab Number : 06176525 Tested : 13 May 2024 OKLAHOMA CITY, OK Unique Number : 11022578 Diagnosed : 13 May 2024 - Wes Davis US 73149 Test Package : FLEET Contact: M Rutherford Certificate 12367 To discuss this sample report, contact Customer Service at 1-800-237-1369. M.Rutherford@ldi89.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:

Contact/Location: M Rutherford - SEAOKL