

OIL ANALYSIS REPORT

Sample Rating Trend



PWD-104

Component Diesel Engine Fluid MOBIL 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.

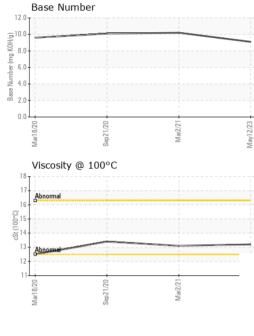
Fluid Condition

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

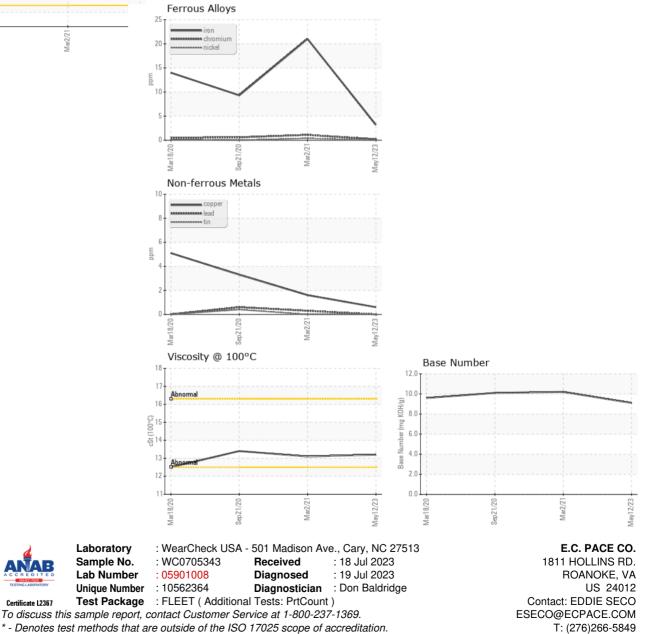
| | | mothed | limit/bogs | outroat | biotonut | history |
|---|--|---|---|--|--|--|
| SAMPLE INFORM | | method | limit/base | | history1 | history2 |
| Sample Number | | Client Info | | WC0705343 | WC0534237 | WC0475592 |
| Sample Date | | Client Info | | 12 May 2023 | 02 Mar 2021 | 21 Sep 2020 |
| Machine Age | hrs | Client Info | | 2718 | 1788 | 1327 |
| Oil Age | hrs | Client Info | | 1000 | 250 | 250 |
| Oil Changed | | Client Info | | Changed | Changed | Changed |
| Sample Status | | | | NORMAL | NORMAL | NORMAL |
| CONTAMINATION | N | method | limit/base | current | history1 | history2 |
| Fuel | | WC Method | >5 | <1.0 | <1.0 | <1.0 |
| Glycol | | WC Method | | NEG | NEG | NEG |
| WEAR METALS | | method | limit/base | current | history1 | history2 |
| Iron | ppm | ASTM D5185m | >100 | 3 | 21 | 9 |
| Chromium | ppm | ASTM D5185m | >20 | <1 | 1 | <1 |
| Nickel | ppm | ASTM D5185m | >4 | 0 | <1 | 0 |
| Titanium | ppm | ASTM D5185m | | 0 | 0 | <1 |
| Silver | ppm | ASTM D5185m | >3 | 0 | 0 | <1 |
| Aluminum | ppm | | >20 | <1 | 2 | 2 |
| Lead | ppm | ASTM D5185m | >40 | 0 | <1 | <1 |
| Copper | ppm | | >330 | <1 | 2 | 3 |
| Tin | ppm | ASTM D5185m | >15 | 0 | 0 | <1 |
| Antimony | ppm | ASTM D5185m | | | 0 | <1 |
| Vanadium | ppm | ASTM D5185m | | 0 | 0 | 0 |
| Cadmium | ppm | ASTM D5185m | | 0 | 0 | 0 |
| | | | | | | |
| ADDITIVES | | method | limit/base | current | history1 | history2 |
| ADDITIVES Boron | ppm | method ASTM D5185m | limit/base | current 0 | history1 16 | history2 105 |
| | ppm ppm | | limit/base | | | |
| Boron | | ASTM D5185m | limit/base | 0 | 16 | 105 |
| Boron Barium | ppm | ASTM D5185m ASTM D5185m | limit/base | 0 0 | 16 0 | 105 0 |
| Boron Barium Molybdenum | ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m | limit/base | 0 0 60 | 16 0 54 | 105 0 19 |
| Boron Barium Molybdenum Manganese | ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | limit/base | 0 0 60 <1 | 16 0 54 <1 | 105 0 19 <1 |
| Boron Barium Molybdenum Manganese Magnesium | ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | limit/base | 0 0 60 <1 888 | 16 0 54 <1 939 | 105 0 19 <1 495 |
| Boron Barium Molybdenum Manganese Magnesium Calcium | ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | limit/base | 0 0 60 <1 888 1246 | 16 0 54 <1 939 1293 | 105 0 19 <1 495 1670 |
| 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 | limit/base | 0 0 60 <1 888 1246 1050 | 16 0 54 <1 939 1293 1030 | 105 0 19 <1 495 1670 796 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc | ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | limit/base | 0 0 60 <1 888 1246 1050 1290 | 16 0 54 <1 939 1293 1030 1174 | 105 0 19 <1 495 1670 796 963 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur | ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | limit/base | 0 0 60 <1 888 1246 1050 1290 4005 | 16 0 54 <1 939 1293 1030 1174 2634 | 105 0 19 <1 495 1670 796 963 2646 |
| 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 | limit/base | 0 0 60 <1 888 1246 1050 1290 4005 | 16 0 54 <1 939 1293 1030 1174 2634 history1 | 105 0 19 <1 495 1670 796 963 2646 history2 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus 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 | limit/base >25 >118 | 0 0 60 <1 888 1246 1050 1290 4005 <u>current</u> 11 | 16 0 54 <1 939 1293 1030 1174 2634 history1 4 | 105 0 19 <1 495 1670 796 963 2646 history2 4 |
| 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 method ASTM D5185m | limit/base >25 >118 | 0 0 60 <1 888 1246 1050 1290 4005 current 11 0 1 | 16 0 54 <1 939 1293 1030 1174 2634 <u>history1</u> 4 2 | 105 0 19 <1 495 1670 796 963 2646 history2 4 3 |
| 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 | limit/base >25 >118 >20 | 0 0 60 <1 888 1246 1050 1290 4005 current 11 0 1 | 16 0 54 <1 939 1293 1030 1174 2634 history1 4 2 2 2 | 105 0 19 <1 495 1670 796 963 2646 history2 4 3 3 |
| 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 | limit/base >25 >118 >20 limit/base | 0 0 60 <1 888 1246 1050 1290 4005 current 11 0 1 | 16 0 54 <1 939 1293 1030 1174 2634 history1 4 2 2 2 history1 | 105 0 19 <1 495 1670 796 963 2646 history2 4 3 3 3 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % | ppm | ASTM D5185m ASTM D5185m | limit/base >25 >118 >20 limit/base >3 | 0 0 60 <1 888 1246 1050 1290 4005 <u>current</u> 11 0 1 <u>current</u> 0.1 | 16 0 54 <1 939 1293 1030 1174 2634 history1 4 2 2 2 history1 0.5 | 105 0 19 <1 495 1670 796 963 2646 history2 4 3 3 3 history2 0.1 |
| 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 | limit/base >25 >118 >20 limit/base >3 >20 | 0 0 60 <1 888 1246 1050 1290 4005 <i>current</i> 11 0 1 <i>current</i> 0.1 5.8 | 16 0 54 <1 939 1293 1030 1174 2634 history1 4 2 2 2 history1 0.5 8.3 | 105 0 19 <1 495 1670 796 963 2646 history2 4 3 3 3 history2 0.1 7.4 |
| 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 D7844 *ASTM D7624 *ASTM D7415 | limit/base >25 >118 >20 limit/base >3 >20 >30 >30 | 0 0 60 <1 888 1246 1050 1290 4005 <i>current</i> 11 0 1 <i>current</i> 0.1 5.8 17.5 | 16 0 54 <1 939 1293 1030 1174 2634 history1 4 2 2 2 history1 0.5 8.3 21 history1 | 105 0 19 <1 495 1670 796 963 2646 history2 4 3 3 history2 0.1 7.4 21.1 history2 |
| 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 | limit/base >25 >118 >20 limit/base >3 >20 >30 | 0 0 60 <1 888 1246 1050 1290 4005 current 11 0 1 1 current 0.1 5.8 17.5 | 16 0 54 <1 939 1293 1030 1174 2634 history1 4 2 2 2 history1 0.5 8.3 21 | 105 0 19 <1 495 1670 796 963 2646 history2 4 3 3 history2 0.1 7.4 21.1 |



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 | IES | method | limit/base | current | history1 | history2 |
| Visc @ 100°C | cSt | ASTM D445 | | 13.2 | 13.1 | 13.4 |
| GRAPHS | | | | | | |



Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

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