

OIL ANALYSIS REPORT

Sample Rating Trend





MACK 813005

Component Diesel Engine Fluid

DIESEL ENGINE OIL SAE 40 (--- GAL)

DIAGNOSIS

Recommendation

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

Wear

All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil.

Fluid Condition

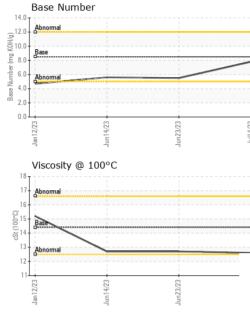
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

| | | | Jul2023 | | | |
|---|--|---|---|---|---|--|
| SAMPLE INFOR | MATION | method | limit/base | current | history1 | history2 |
| Sample Number | | Client Info | | GFL0086231 | GFL0057564 | GFL0086244 |
| Sample Date | | Client Info | | 14 Jul 2023 | 23 Jun 2023 | 14 Jun 2023 |
| Machine Age | hrs | Client Info | | 2327 | 2205 | 425 |
| Oil Age | hrs | Client Info | | 2327 | 2205 | 2180 |
| Oil Changed | | Client Info | | N/A | N/A | N/A |
| Sample Status | | | | NORMAL | NORMAL | NORMAL |
| CONTAMINAT | ION | method | limit/base | current | history1 | history2 |
| Fuel | | WC Method | >3.0 | <1.0 | <1.0 | <1.0 |
| Glycol | | WC Method | | NEG | NEG | NEG |
| WEAR METAL | S | method | limit/base | current | history1 | history2 |
| Iron | ppm | ASTM D5185m | >120 | 9 | 40 | 38 |
| Chromium | ppm | ASTM D5185m | >20 | <1 | 1 | 2 |
| Nickel | ppm | ASTM D5185m | >5 | 2 | 11 | 11 |
| Titanium | ppm | ASTM D5185m | >2 | 0 | <1 | <1 |
| Silver | ppm | ASTM D5185m | >2 | 0 | <1 | <1 |
| Aluminum | ppm | ASTM D5185m | >20 | 3 | <1 | 0 |
| Lead | ppm | ASTM D5185m | >40 | 0 | 0 | 2 |
| Copper | ppm | ASTM D5185m | >330 | 5 | 28 | 28 |
| Tin | | ASTM D5185m | >15 | ر 1 | 2 | 3 |
| Vanadium | ppm ppm | ASTM D5185m | >15 | 0 | 0 | 0 |
| Cadmium | | ASTM D5185m | | 0 | 0 | <1 |
| | ppm | | | 0 | | |
| | | | | | | |
| ADDITIVES | | method | limit/base | current | history1 | history2 |
| ADDITIVES Boron | ppm | method ASTM D5185m | limit/base 250 | current 26 | history1 5 | history2 6 |
| | ppm ppm | | | | | |
| Boron | | ASTM D5185m | 250 | 26 | 5 | 6 |
| Boron Barium | ppm | ASTM D5185m ASTM D5185m | 250 10 | 26 0 | 5 14 | 6 4 |
| Boron Barium Molybdenum | ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m | 250 10 | 26 0 70 | 5 14 71 | 6 4 67 |
| Boron Barium Molybdenum Manganese | ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 250 10 100 | 26 0 70 <1 | 5 14 71 1 | 6 4 67 2 |
| Boron Barium Molybdenum Manganese Magnesium | ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 250 10 100 450 | 26 0 70 <1 818 | 5 14 71 1 875 | 6 4 67 2 859 |
| 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 | 26 0 70 <1 818 1143 | 5 14 71 1 875 1187 | 6 4 67 2 859 1142 |
| 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 | 26 0 70 <1 818 1143 995 | 5 14 71 1 875 1187 887 | 6 4 67 2 859 1142 879 |
| 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 | 250 10 100 450 3000 1150 1350 | 26 0 70 <1 818 1143 995 1189 | 5 14 71 1 875 1187 887 1232 | 6 4 67 2 859 1142 879 1161 |
| 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 | 250 10 100 450 3000 1150 1350 4250 | 26 0 70 <1 818 1143 995 1189 3201 | 5 14 71 1 875 1187 887 1232 2719 | 6 4 67 2 859 1142 879 1161 2551 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN | 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 limit/base >25 | 26 0 70 <1 818 1143 995 1189 3201 current | 5 14 71 1 875 1187 887 1232 2719 history1 | 6 4 67 2 859 1142 879 1161 2551 history2 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon | ppm ppm ppm ppm ppm ppm ppm ppm TS | 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 >216 | 26 0 70 <1 818 1143 995 1189 3201 current 5 | 5 14 71 1 875 1187 887 1232 2719 history1 7 | 6 4 67 2 859 1142 879 1161 2551 history2 9 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium | ppm ppm ppm ppm ppm ppm ppm ppm ppm TS | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m | 250 10 100 450 3000 1150 1350 4250 limit/base >25 >216 | 26 0 70 <1 818 1143 995 1189 3201 current 5 0 | 5 14 71 1 875 1187 887 1232 2719 history1 7 3 | 6 4 67 2 859 1142 879 1161 2551 history2 9 3 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium | ppm ppm ppm ppm ppm ppm ppm ppm ppm TS | ASTM D5185m ASTM D5185m | 250 10 100 450 3000 1150 1350 4250 limit/base >25 >216 >20 | 26 0 70 <1 818 1143 995 1189 3201 current 5 0 1 | 5 14 71 1 875 1187 887 1232 2719 history1 7 3 2 | 6 4 67 2 859 1142 879 1161 2551 history2 9 3 2 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED | ppm ppm ppm ppm ppm ppm ppm ppm TS | ASTM D5185m ASTM D5185m | 250 10 100 450 3000 1150 1350 4250 Imit/base >216 >216 >20 Imit/base >4 | 26 0 70 <1 818 1143 995 1189 3201 current 5 0 1 1 | 5 14 71 1 875 1187 887 1232 2719 history1 7 3 2 2 | 6 4 67 2 859 1142 879 1161 2551 history2 9 3 2 2 history2 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % | ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm | ASTM D5185m ASTM D5185m | 250 10 100 450 3000 1150 1350 4250 20 imit/base >25 >216 >20 imit/base >20 | 26 0 70 <1 818 1143 995 1189 3201 current 5 0 1 1 current 0.3 | 5 14 71 1 875 1187 887 1232 2719 history1 7 3 2 2 history1 1.1 | 6 4 67 2 859 1142 879 1161 2551 history2 9 3 2 9 3 2 2 history2 1 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN 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 20 imit/base >25 >216 >20 imit/base >20 | 26 0 70 <1 818 1143 995 1189 3201 <i>current</i> 5 0 1 <i>current</i> 0.3 5.8 | 5 14 71 1 875 1187 887 1232 2719 history1 7 3 2 2 1.1 1.1 1.1 10.4 | 6 4 67 2 859 1142 879 1161 2551 history2 9 3 2 9 3 2 2 history2 1 10.0 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation | ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m | 250 10 100 450 3000 1150 1350 4250 20 i mit/base >25 >216 >20 20 i mit/base >4 >20 >30 | 26 0 70 <1 818 1143 995 1189 3201 current 5 0 1 1 current 0.3 5.8 17.0 | 5 14 71 1 875 1187 887 1232 2719 history1 7 3 2 2 history1 1.1 1.0.4 22.4 | 6 4 67 2 859 1142 879 1161 2551 history2 9 3 2 9 3 2 2 history2 1 1 0.0 22.0 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAI | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D7844 *ASTM D7844 | 250 10 100 450 3000 1150 1350 4250 imit/base >25 >216 >20 >20 imit/base >30 imit/base | 26 0 70 <1 818 1143 995 1189 3201 Current 5 0 1 Current 0.3 5.8 17.0 Current | 5 14 71 1 875 1187 887 1232 2719 history1 7 3 2 7 3 2 <i>history1</i> 1.1 10.4 22.4 <i>history1</i> | 6 4 67 2 859 1142 879 1161 2551 history2 9 3 2 9 3 2 history2 1 10.0 22.0 history2 |



OIL ANALYSIS REPORT

VISUAL



| | Laboratory Sample No. | : WearCheck USA - 501 Madison Ave., Cary, NC 27513 : GFL0086231 Received : 19 Jul 2023 6905 Roosevelt : 05902747 Diagnosed : 20 Jul 2023 Fairburn : 10564103 Diagnostician : Wes Davis US 3 : FLEET Contact Customer Service at 1-800-237-1369. erjones@gflenv re outside of the ISO 17025 scope of accreditation. T: (678)630- ifications are based on the simple acceptance decision rule (JCGM 106:2012) | | | | | | |
|-----------|---------------------------|---|--------------------|---------------|--|---------------|---------------|----------|
| | | Abnomal 12 12 11 12 12 12 12 12 12 12 12 12 12 | | Jun23/23 | 2.0 | Jan 12/23 | Jun14/23 | Jul 4/23 |
| | | 12 | | | (0) HOX W 8.0 .0.0 mp er 6.0.0 mp er 888 | Abnormal | | |
| | | (0-001) ts 14 | | | у ш ы | Base | | |
| | | 16 | | | (B/HO) | Page | | |
| | | 17- Abnormal | | | 12.0 | Abnormal | | |
| | | Viscosity @ 100°C | . | | 14.0 | Base Number | | |
| | | EZZ1 luer Viscosity @ 100°C | - | Jun23/23 | Jul14/23 | | | |
| | | | | | | | | |
| | | 100 | | | | | | |
| | | 200 tin | | | | | | |
| | | Non-ferrous Meta | ls | | | | | |
| | | Jan12/23 | | Jun23/23 - | Jul14/23 • | | | |
| | | 20 | | | | | | |
| | | E 40 30 | | ~ | | | | |
| 00 00 mil | - C2/C7/UDC | 80 70 60 | | | | | | |
| | | GRAPHS Ferrous Alloys | | | | | | |
| | | Visc @ 100°C | cSt | ASTM D445 | 14.4 | 12.6 | 12.7 | 12.7 |
| | | FLUID PROPE | RTIES | method | limit/base | current | history1 | history2 |
| C | | Free Water | scalar | *Visual | | NEG | NEG | NEG |
| | 3 | Emulsified Water | scalar | *Visual | >0.2 | NEG | NEG | NEG |
| 50/56-mil | c2/c2/ln1 | Odor | scalar | *Visual | NORML | NORML | NORML | NORML |
| 23 - | _ Sand/Dirt Appearance | scalar scalar | *Visual *Visual | NONE NORML | NONE NORML | NONE NORML | NONE NORML | |
| | | Debris | scalar | *Visual | NONE | NONE | NONE | NONE |
| | | Silt | scalar | *Visual | NONE | NONE | NONE | NONE |
| | | Precipitate | scalar | *Visual | NONE | NONE | NONE | NONE |
| | | Yellow Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| | | White Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| | | VISUAL | | method | limit/base | current | history1 | history2 |