

OIL ANALYSIS REPORT

Sample Rating Trend



Area [23632] 40-226

Component Diesel Engine

Fluid CONOCO PHILLIPS GUARDOL ECT 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 | IATION | method | limit/base | current | history1 | history2 |
|---|--|---|---|---|--|--|
| Sample Number | | Client Info | | WC0940641 | WC0793219 | |
| Sample Date | | Client Info | | 30 May 2024 | 19 Dec 2023 | |
| Machine Age | hrs | Client Info | | 1854 | 1605 | |
| Oil Age | hrs | Client Info | | 249 | 1605 | |
| Oil Changed | | Client Info | | Changed | Changed | |
| Sample Status | | | | NORMAL | ATTENTION | |
| CONTAMINATION | ٧ | method | limit/base | current | history1 | history2 |
| Fuel | | WC Method | >5 | <1.0 | 0.5 | |
| Water | | WC Method | >0.2 | NEG | NEG | |
| Glycol | | WC Method | | NEG | NEG | |
| WEAR METALS | | method | limit/base | current | history1 | history2 |
| Iron | ppm | ASTM D5185m | >100 | 21 | 11 | |
| Chromium | ppm | ASTM D5185m | >20 | 1 | <1 | |
| Nickel | ppm | ASTM D5185m | >4 | <1 | 0 | |
| Titanium | ppm | ASTM D5185m | | <1 | <1 | |
| Silver | ppm | ASTM D5185m | >3 | <1 | 0 | |
| Aluminum | ppm | ASTM D5185m | >20 | 3 | 3 | |
| Lead | ppm | ASTM D5185m | >40 | <1 | <1 | |
| Copper | ppm | ASTM D5185m | >330 | 10 | 91 | |
| Tin | ppm | ASTM D5185m | >15 | <1 | <1 | |
| Vanadium | ppm | ASTM D5185m | | <1 | 0 | |
| Cadmium | ppm | ASTM D5185m | | <1 | 0 | |
| | | | | | | |
| ADDITIVES | | method | limit/base | current | history1 | history2 |
| ADDITIVES Boron | ppm | method ASTM D5185m | limit/base 85 | current 61 | history1 20 | history2 |
| | ppm ppm | | | | · · · · · · | |
| Boron | | ASTM D5185m | | 61 | 20 | |
| Boron Barium | ppm | ASTM D5185m ASTM D5185m | | 61 1 | 20 9 | |
| Boron Barium Molybdenum | ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m | | 61 1 15 | 20 9 19 | |
| Boron Barium Molybdenum Manganese | ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 85 | 61 1 15 1 | 20 9 19 0 | |
| Boron Barium Molybdenum Manganese Magnesium | ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 85 350 1800 1000 | 61 1 15 1 555 | 20 9 19 0 131 1034 596 | |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc | ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 85 350 1800 | 61 1 15 1 555 1354 | 20 9 19 0 131 1034 | |
| 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 | 85 350 1800 1000 | 61 1 15 1 555 1354 919 | 20 9 19 0 131 1034 596 | |
| 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 | 85 350 1800 1000 1100 | 61 1 15 1 555 1354 919 1124 | 20 9 19 0 131 1034 596 656 | |
| 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 | 85 350 1800 1000 1100 3500 | 61 1 15 1 555 1354 919 1124 3446 | 20 9 19 0 131 1034 596 656 3336 | |
| 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 | 85 350 1800 1000 1100 3500 limit/base | 61 1 15 1 555 1354 919 1124 3446 current | 20 9 19 0 131 1034 596 656 3336 history1 | |
| 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 ASTM D5185m ASTM D5185m | 85 350 1800 1000 1100 3500 limit/base | 61 1 15 1 555 1354 919 1124 3446 current 5 | 20 9 19 0 131 1034 596 656 3336 history1 3 | history2 |
| 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 ASTM D5185m | 85 350 1800 1000 1100 3500 limit/base >25 | 61 1 15 1 555 1354 919 1124 3446 <u>current</u> 5 1 | 20 9 19 0 131 1034 596 656 3336 history1 3 0 | 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 | ASTM D5185m ASTM D5185m | 85 350 1800 1000 1100 3500 limit/base >25 >20 | 61 1 15 1 555 1354 919 1124 3446 <u>current</u> 5 1 4 | 20 9 19 0 131 596 656 3336 history1 3 0 3 history1 0.3 | history2 |
| 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 | 85 350 1800 1000 1100 3500 limit/base >25 >20 limit/base | 61 1 15 1 555 1354 919 1124 3446 current 5 1 4 current | 20 9 19 0 131 596 656 3336 history1 3 0 3 3 | history2 history2 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % | ppm | ASTM D5185m ASTM D5185m | 85 350 1800 1000 1100 3500 limit/base >25 >20 limit/base >3 | 61 1 15 1 555 1354 919 1124 3446 current 5 1 4 current 0.6 | 20 9 19 0 131 596 656 3336 history1 3 0 3 history1 0.3 | history2 history2 |
| 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 | 85 350 1800 1000 1100 3500 imit/base >25 >20 imit/base >3 >20 | 61 1 15 1 555 1354 919 1124 3446 current 5 1 4 current 0.6 8.3 | 20 9 19 0 131 1034 596 656 3336 history1 3 0 3 0 3 history1 0.3 5.2 | history2 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 | 85 350 1800 1000 1100 3500 imit/base >25 >20 imit/base >3 >20 >30 | 61 1 15 1 555 1354 919 1124 3446 <u>current</u> 5 1 4 <u>current</u> 0.6 8.3 19.6 | 20 9 19 0 131 596 656 3336 history1 3 0 3 0 3 history1 0.3 5.2 15.2 | history2 history2 history2 |



35

30

10.0 T Base

8.0 Mumber (mg KOH/g) 4.0 2.0

0.0

20 18 Al 16 Bas

()-00L) tS2 12

OIL ANALYSIS REPORT

| FT-IR (Direct Trend) | VISUAL | | method | limit/base | current | history1 | history2 |
|---|--------------------------|----------|---------------|--|-------------|--------------|--------------------------|
| Oxidation | White Metal | scalar | *Visual | NONE | NONE | NONE | |
| Autonoman Sulfation | Yellow Metal | scalar | *Visual | NONE | NONE | NONE | |
| | Precipitate | scalar | *Visual | NONE | NONE | NONE | |
| - 34459910000100000000000000000000000000000 | Silt | scalar | *Visual | NONE | NONE | NONE | |
| | Debris | scalar | *Visual | NONE | NONE | NONE | |
| | Sand/Dirt | scalar | *Visual | NONE | NONE | NONE | |
| Dec19/23 | Appearance | scalar | *Visual | NORML | NORML | NORML | |
| Dec19/23 | Odor | scalar | *Visual | NORML | NORML | NORML | |
| Base Number | Emulsified Water | scalar | *Visual | >0.2 | NEG | NEG | |
| | Free Water | scalar | *Visual | | NEG | NEG | |
|] | FLUID PROPER | TIES | method | limit/base | current | history1 | history2 |
| 2 | Visc @ 100°C | cSt | ASTM D445 | 15.3 | 13.2 | 8.2 | |
| + | GRAPHS | | | | | | |
| 1 | Ferrous Alloys | | | | | | |
| | iron | | | | | | |
| Deci 9,23 | 20- | | | | | | |
| Viscosity @ 100°C | 15- E | | | | | | |
| T. | 8 | | | | | | |
| Abnormal | | | | | | | |
| Base | 5 | | | | | | |
| Abnormal | 0 | | 0 | | | | |
| | Dec19/23 | | | May30/24 | | | |
| 3- | | | | May | | | |
| 5 | Non-ferrous Meta | ls | | | | | |
| Dec19/23 | copper | | | | | | |
| О | 80 - tin | | | | | | |
| | 60 | | | | | | |
| | udd | | | | | | |
| | 40 | | | | | | |
| | 20 | | | | | | |
| | | | | | | | |
| | | | | 24 | | | |
| | Dec19/ | | | May30/24 | | | |
| | Viscosity @ 100°C | 2 | | 2 | Daga Number | - | |
| | 20 | | 10. | Base Numbe | r | | |
| | 18 Abnormal | | | | | | |
| | 16 Base | | | (B/HC | | | |
| | | | |)) Вш 6. | 0 | | |
| | 0014 Abnormal 5312 | | | nber (| | | |
| | 10 | | | .8 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 | | | |
| | 8 | | | ⁸⁰ 2. | 0 - | | |
| | 6 | | | 0 | 0 | | |
| | 9/23 | | | | | | 0/24 - |
| | Dec19/23 | | | May30/24 | Dec19/23 | | May30/24 |
| | | | | _ | | | <u> </u> |
| Laboratory | : WearCheck USA - 50 | 1 Madisc | on Ave., Carv | , NC 27513 | MAN | IHATTAN ROAD | AND BRIDGE |
| ANAR Sample No. | | Rece | ived : 25 | 5 Jun 2024 5 Jun 2024 | | | 122ND E AVE TULSA. OK |



Lab Number : 06219459 Tested : 26 Jun 2024 TULSA, OK ACCREDITED Unique Number : 11097656 : 26 Jun 2024 - Wes Davis Diagnosed Contact: BEN CALDWELL Test Package : CONST (Additional Tests: TBN) Certificate 12367 To discuss this sample report, contact Customer Service at 1-800-237-1369. kevin.marson@wearcheck.com * - Denotes test methods that are outside of the ISO 17025 scope of accreditation. T: (918)728-5749 Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

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Submitted By: JAMES STEELMON

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