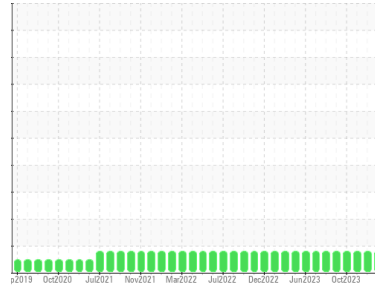




OIL ANALYSIS REPORT

Sample Rating Trend



WEAR



Area

Patoka

Machine Id

[Patoka] Oil - Starboard Reduction Gear

Component

Starboard Reduction Gear

Fluid

{not provided} (35 GAL)

DIAGNOSIS

▲ Recommendation

No corrective action is recommended at this time. Resample at the next service interval to monitor.

▲ Wear

The copper level is abnormal. All other component wear rates are normal.

Contamination

There is no indication of any contamination in the oil.

Fluid Condition

The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

SAMPLE INFORMATION

| | method | limit/base | current | history1 | history2 |
|---------------|-------------|-------------|--------------------|-------------|-------------|
| Sample Number | Client Info | | WC0805574 | WC0859904 | WC0804862 |
| Sample Date | Client Info | | 26 Feb 2024 | 13 Jan 2024 | 18 Nov 2023 |
| Machine Age | hrs | Client Info | 0 | 42510 | 41430 |
| Oil Age | hrs | Client Info | 0 | 8796 | 7716 |
| Oil Changed | Client Info | | N/A | N/A | N/A |
| Sample Status | | | ABNORMAL | ABNORMAL | ABNORMAL |

WEAR METALS

| | method | limit/base | current | history1 | history2 |
|----------|--------|------------------|--------------|----------|----------|
| Iron | ppm | ASTM D5185m >150 | 10 | 10 | 10 |
| Chromium | ppm | ASTM D5185m >10 | 0 | 0 | 0 |
| Nickel | ppm | ASTM D5185m >10 | 0 | 0 | 0 |
| Titanium | ppm | ASTM D5185m | 0 | 0 | 0 |
| Silver | ppm | ASTM D5185m | 0 | 0 | 0 |
| Aluminum | ppm | ASTM D5185m >25 | <1 | <1 | 0 |
| Lead | ppm | ASTM D5185m >100 | 1 | 4 | 2 |
| Copper | ppm | ASTM D5185m >50 | ▲ 279 | ▲ 263 | ▲ 257 |
| Tin | ppm | ASTM D5185m >10 | 0 | <1 | 0 |
| Vanadium | ppm | ASTM D5185m | 0 | 0 | 0 |
| Cadmium | ppm | ASTM D5185m | 0 | 0 | 0 |

ADDITIVES

| | method | limit/base | current | history1 | history2 |
|------------|--------|-------------|-------------|----------|----------|
| Boron | ppm | ASTM D5185m | 14 | 15 | 15 |
| Barium | ppm | ASTM D5185m | 0 | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | 47 | 48 | 49 |
| Manganese | ppm | ASTM D5185m | 0 | <1 | 0 |
| Magnesium | ppm | ASTM D5185m | 591 | 603 | 633 |
| Calcium | ppm | ASTM D5185m | 1123 | 1104 | 1193 |
| Phosphorus | ppm | ASTM D5185m | 817 | 858 | 923 |
| Zinc | ppm | ASTM D5185m | 915 | 979 | 1127 |
| Sulfur | ppm | ASTM D5185m | 2713 | 2952 | 3033 |

CONTAMINANTS

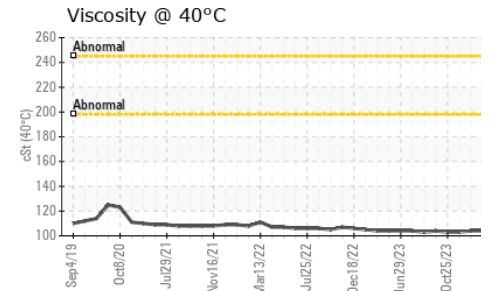
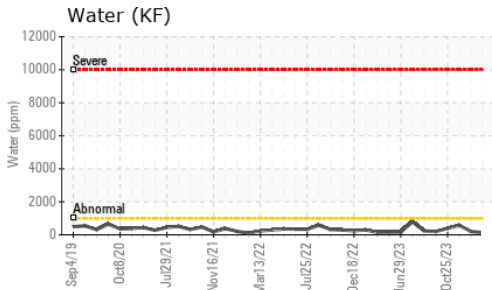
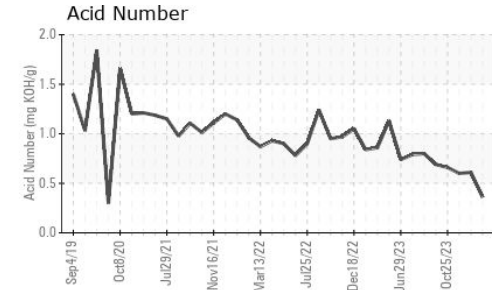
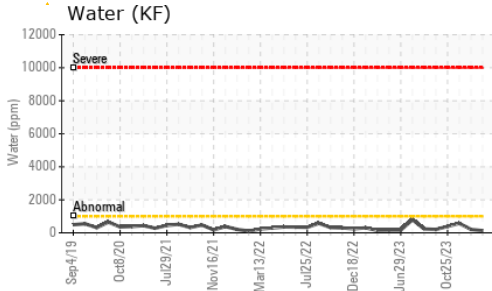
| | method | limit/base | current | history1 | history2 |
|-----------|--------|------------------|--------------|----------|----------|
| Silicon | ppm | ASTM D5185m >50 | 2 | 3 | 2 |
| Sodium | ppm | ASTM D5185m | 4 | 3 | 3 |
| Potassium | ppm | ASTM D5185m >20 | 0 | 1 | 0 |
| Water | % | ASTM D6304 >0.1 | 0.012 | 0.020 | 0.057 |
| ppm Water | ppm | ASTM D6304 >1000 | 128 | 208 | 575 |

FLUID DEGRADATION

| | method | limit/base | current | history1 | history2 |
|------------------|----------|------------|-------------|----------|----------|
| Acid Number (AN) | mg KOH/g | ASTM D8045 | 0.36 | 0.61 | 0.60 |



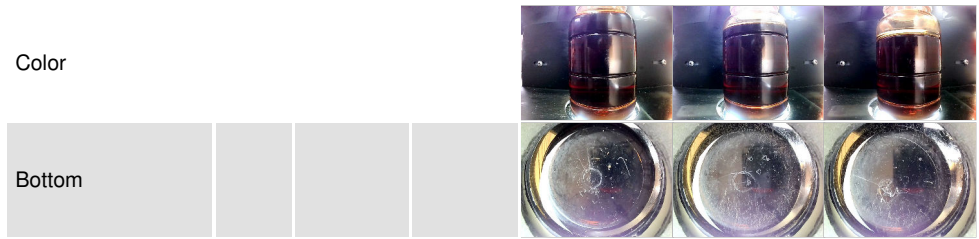
OIL ANALYSIS REPORT



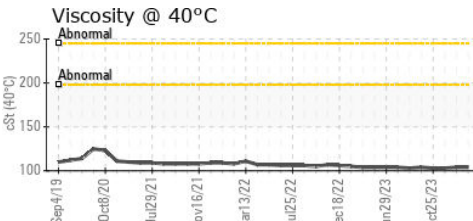
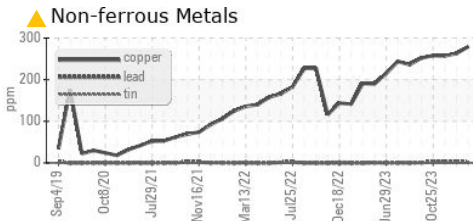
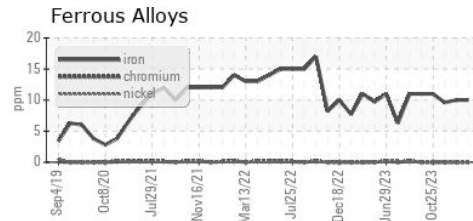
| VISUAL | method | limit/base | current | history1 | history2 |
|------------------|--------|------------|---------|----------|----------|
| White Metal | scalar | *Visual | NONE | NONE | LIGHT |
| Yellow Metal | scalar | *Visual | NONE | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | NONE | NONE |
| Silt | scalar | *Visual | NONE | NONE | NONE |
| Debris | scalar | *Visual | NONE | NONE | NONE |
| Sand/Dirt | scalar | *Visual | NONE | NONE | NONE |
| Appearance | scalar | *Visual | NORML | NORML | NORML |
| Odor | scalar | *Visual | NORML | NORML | NORML |
| Emulsified Water | scalar | *Visual | >0.1 | NEG | NEG |
| Free Water | scalar | *Visual | | NEG | NEG |

| FLUID PROPERTIES | method | limit/base | current | history1 | history2 |
|------------------|--------|------------|---------|----------|----------|
| Visc @ 40°C | cSt | ASTM D445 | 104 | 104 | 103 |

| SAMPLE IMAGES | method | limit/base | current | history1 | history2 |
|---------------|--------|------------|---------|----------|----------|
|---------------|--------|------------|---------|----------|----------|



GRAPHS



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
 Sample No. : WC0805574 Received : 27 Feb 2024
 Lab Number : 06101739 Tested : 28 Feb 2024
 Unique Number : 10899969 Diagnosed : 29 Feb 2024 - Don Baldrige
 Test Package : IND 2 (Additional Tests: KF)

MARATHON PETROLEUM CO.
 101 12TH ST
 CATLETTSBURG, KY
 US 41169
 Contact: CORY GUMBERT
 cagumbert@marathonpetroleum.com

To discuss this sample report, contact Customer Service at 1-800-237-1369.

* - Denotes test methods that are outside of the ISO 17025 scope of accreditation.

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

T: (606)585-3950

F: x: