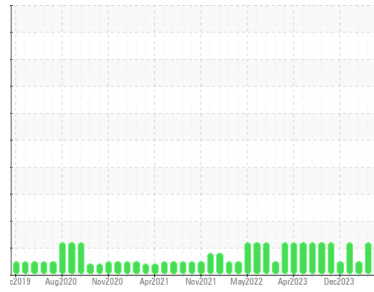




OIL ANALYSIS REPORT

Sample Rating Trend



FUEL



Area

Canton

Machine Id

[Canton] Oil - Starboard Genset

Component

Starboard Genset

Fluid

MARATHON 15W40 (35 GAL)

DIAGNOSIS

Recommendation

We advise that you check the fuel injection system. Resample at the next service interval to monitor.

Wear

All component wear rates are normal.

Contamination

There is a moderate amount of fuel present in the oil.

Fluid Condition

Fuel is present in the oil and is lowering the viscosity. The BN result indicates that there is suitable alkalinity remaining in the oil.

SAMPLE INFORMATION

| method | limit/base | current | history1 | history2 |
|---------------|-------------|--------------------|-------------|-------------|
| Sample Number | Client Info | WC0874842 | WC0805422 | WC0805434 |
| Sample Date | Client Info | 22 Apr 2024 | 28 Mar 2024 | 27 Feb 2024 |
| Machine Age | hrs | Client Info | 17688 | 0 |
| Oil Age | hrs | Client Info | 2242 | 0 |
| Oil Changed | Client Info | N/A | Oil Added | N/A |
| Sample Status | | ABNORMAL | ABNORMAL | NORMAL |

CONTAMINATION

| method | limit/base | current | history1 | history2 |
|--------|------------|------------|----------|----------|
| Glycol | WC Method | NEG | NEG | NEG |

WEAR METALS

| method | limit/base | current | history1 | history2 | |
|----------|------------|-----------------|--------------|----------|---|
| Iron | ppm | ASTM D5185m >50 | 7 | 4 | 6 |
| Chromium | ppm | ASTM D5185m >4 | <1 | <1 | 0 |
| Nickel | ppm | ASTM D5185m >2 | <1 | 0 | 0 |
| Titanium | ppm | ASTM D5185m | <1 | 0 | 0 |
| Silver | ppm | ASTM D5185m >5 | <1 | 0 | 0 |
| Aluminum | ppm | ASTM D5185m >12 | 3 | 3 | 1 |
| Lead | ppm | ASTM D5185m >17 | 1 | 0 | 0 |
| Copper | ppm | ASTM D5185m >70 | 1 | 0 | 0 |
| 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 | |
|------------|------------|-------------|--------------|----------|------|
| Boron | ppm | ASTM D5185m | 128 | 153 | 149 |
| Barium | ppm | ASTM D5185m | <1 | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | 103 | 104 | 101 |
| Manganese | ppm | ASTM D5185m | <1 | <1 | 0 |
| Magnesium | ppm | ASTM D5185m | 626 | 637 | 710 |
| Calcium | ppm | ASTM D5185m | 1339 | 1325 | 1388 |
| Phosphorus | ppm | ASTM D5185m | 722 | 688 | 676 |
| Zinc | ppm | ASTM D5185m | 853 | 830 | 861 |
| Sulfur | ppm | ASTM D5185m | 2774 | 2934 | 3285 |

CONTAMINANTS

| method | limit/base | current | history1 | history2 | |
|-----------|------------|-----------------|--------------|----------|-----|
| Silicon | ppm | ASTM D5185m >25 | 5 | 5 | 5 |
| Sodium | ppm | ASTM D5185m | 5 | 4 | 2 |
| Potassium | ppm | ASTM D5185m >20 | 2 | 2 | 0 |
| Fuel | % | ASTM D3524 >4.0 | ▲ 4.3 | ▲ 5.1 | 1.6 |
| Water | % | ASTM D6304 >0.1 | NEG | NEG | NEG |

INFRA-RED

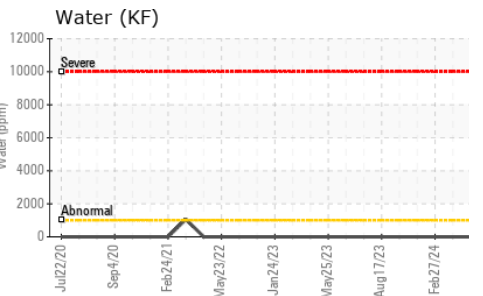
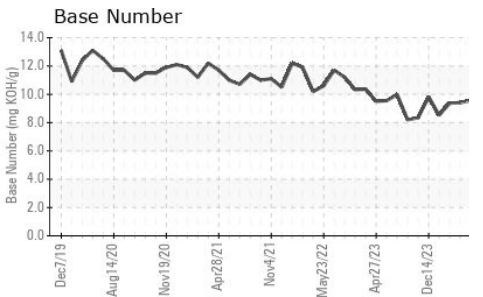
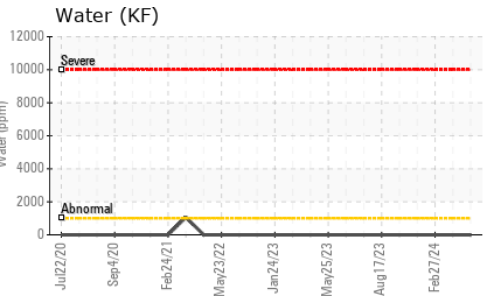
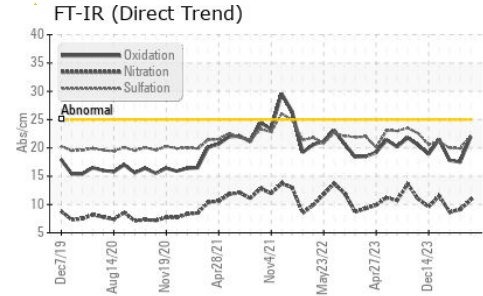
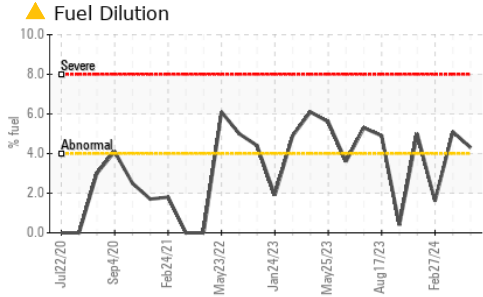
| method | limit/base | current | history1 | history2 | |
|-----------|------------|-----------------|-------------|----------|------|
| Soot % | % | *ASTM D7844 | 0.2 | 0.1 | 0.1 |
| Nitration | Abs/cm | *ASTM D7624 >20 | 10.8 | 9.1 | 8.7 |
| Sulfation | Abs/.1mm | *ASTM D7415 >30 | 22.0 | 19.9 | 20.0 |

FLUID DEGRADATION

| method | limit/base | current | history1 | history2 | |
|------------------|------------|-----------------|-------------|----------|------|
| Oxidation | Abs/.1mm | *ASTM D7414 >25 | 21.9 | 17.5 | 17.8 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 9.56 | 9.41 | 9.37 |



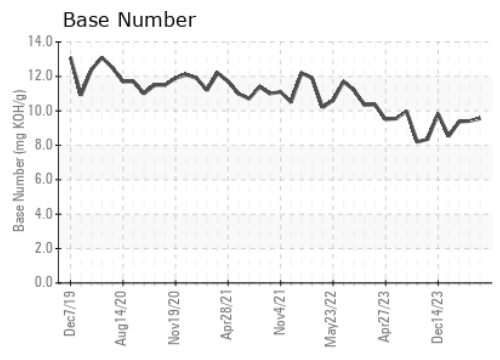
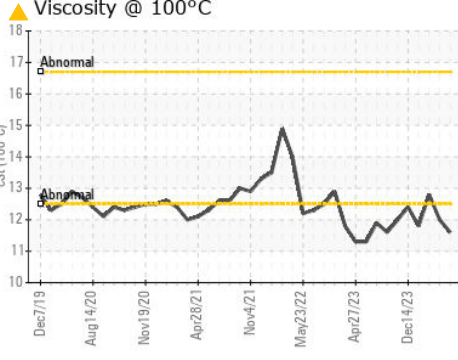
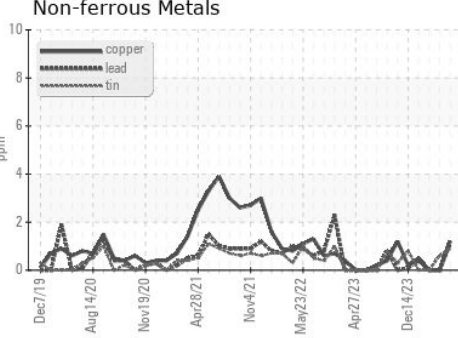
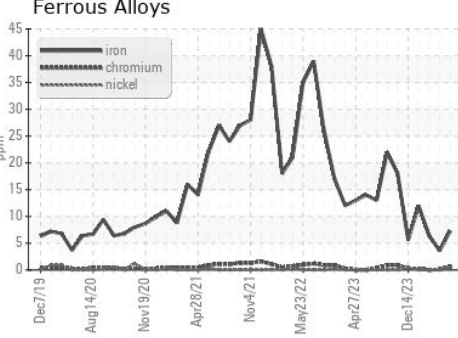
OIL ANALYSIS REPORT



| VISUAL | method | limit/base | current | history1 | history2 | |
|------------------|--------|------------|---------|--------------|----------|-------|
| White Metal | scalar | *Visual | NONE | LIGHT | 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 | >0.1 | NEG | NEG | NEG |
| Free Water | scalar | *Visual | | NEG | NEG | NEG |

| FLUID PROPERTIES | method | limit/base | current | history1 | history2 |
|------------------|--------|------------|---------------|----------|----------|
| Visc @ 100°C | cSt | ASTM D445 | ▲ 11.6 | ▲ 12.0 | 12.8 |

GRAPHS



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : WC0874842 **Received** : 16 May 2024
Lab Number : **06181573** **Tested** : 20 May 2024
Unique Number : 11032899 **Diagnosed** : 20 May 2024 - Sean Felton
Test Package : IND 2 (Additional Tests: KF, PercentFuel)

MARATHON PETROLEUM CO.
 101 12TH ST
 CATLETTSBURG, KY
 US 41169
 Contact: M/V CANTON
 mvcanton@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)