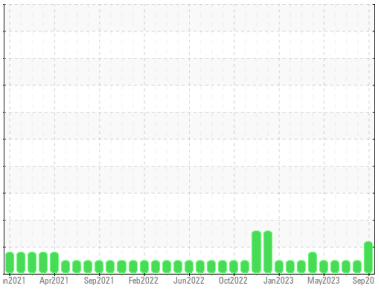
# PROBLEM SUMMARY

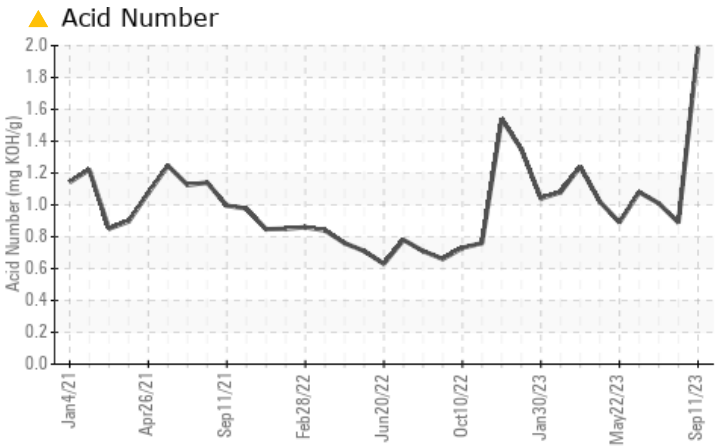
Sample Rating Trend



**DEGRADATION**

Area
**Detroit**
Machine Id
## [Detroit] Oil - Starboard Reduction Gear
Component
**Starboard Reduction Gear**
Fluid
**MARATHON 30W (35 GAL)**

## COMPONENT CONDITION SUMMARY




## RECOMMENDATION

The oil is near the end of it`s useful service life, recommend schedule an oil change. Resample at the next service interval to monitor.

## PROBLEMATIC TEST RESULTS

| | | | | | | |
|---|---|---|---|---|---|---|
| Sample Status | | | | **ABNORMAL** | NORMAL | NORMAL |
| Acid Number (AN) | mg KOH/g | ASTM D8045 | | ▲ **1.985** | 0.89 | 1.01 |

**Customer Id:** MARCAT
**Sample No.:** WC0769301
**Lab Number:** 05960713
**Test Package:** IND 2

*To manage this report scan the QR code*

*To discuss the diagnosis or test data:*
Jonathan Hester +1 919-379-4092 x4092
jhester@wearcheckusa.com

*To change component or sample information:*
Customer Service +1 1-800-237-1369
customerservice@wearcheck.com

## RECOMMENDED ACTIONS

| Action | Status | Date | Done By | Description |
|---|---|---|---|---|
| Service/change Fluid | --- | --- | ? | The oil is near the end of it's useful service life, recommend schedule an oil change. |

## HISTORICAL DIAGNOSIS

**14 Aug 2023 Diag: Don Baldridge**

NORMAL

Resample at the next service interval to monitor.All component wear rates are normal. There is no indication of any contamination in the oil. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

view report

**17 Jul 2023 Diag: Angela Borella**

NORMAL

Resample at the next service interval to monitor.All component wear rates are normal. There is no indication of any contamination in the oil. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

view report

**19 Jun 2023 Diag: Don Baldridge**

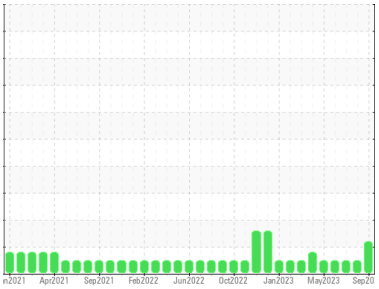
NORMAL

Resample at the next service interval to monitor.All component wear rates are normal. There is no indication of any contamination in the oil. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

view report

# OIL ANALYSIS REPORT

Sample Rating Trend



**DEGRADATION**

Area
## Detroit
Machine Id
## [Detroit] Oil - Starboard Reduction Gear
Component
**Starboard Reduction Gear**
Fluid
**MARATHON 30W (35 GAL)**

## DIAGNOSIS

**Recommendation**
The oil is near the end of it`s useful service life, recommend schedule an oil change. 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 AN level is at the top-end of the recommended limit.

| SAMPLE INFORMATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | **WC0769301** | WC0769394 | WC0769390 |
| Sample Date | | Client Info | | **11 Sep 2023** | 14 Aug 2023 | 17 Jul 2023 |
| Machine Age | hrs | Client Info | | **24818** | 24295 | 23846 |
| Oil Age | hrs | Client Info | | **5017** | 4493 | 4044 |
| Oil Changed | | Client Info | | **N/A** | Not Changd | Not Changd |
| Sample Status | | | | **ABNORMAL** | NORMAL | NORMAL |

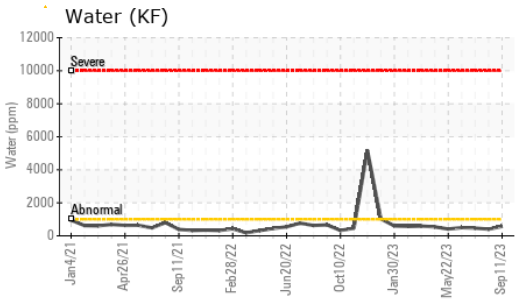
| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Iron | ppm | ASTM D5185m | >150 | **34** | 32 | 31 |
| Chromium | ppm | ASTM D5185m | >10 | **<1** | 0 | 0 |
| Nickel | ppm | ASTM D5185m | >10 | **0** | 0 | 0 |
| Titanium | ppm | ASTM D5185m | | **0** | 0 | <1 |
| Silver | ppm | ASTM D5185m | | **<1** | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >25 | **<1** | <1 | <1 |
| Lead | ppm | ASTM D5185m | >100 | **0** | <1 | 0 |
| Copper | ppm | ASTM D5185m | >50 | **63** | 57 | 53 |
| Tin | ppm | ASTM D5185m | >10 | **1** | <1 | <1 |
| Vanadium | ppm | ASTM D5185m | | **0** | <1 | <1 |
| Cadmium | ppm | ASTM D5185m | | **0** | 0 | 0 |

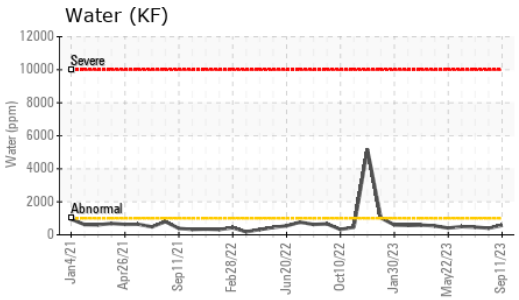
| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185m | | **32** | 30 | 35 |
| Barium | ppm | ASTM D5185m | | **0** | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | | **14** | 13 | 14 |
| Manganese | ppm | ASTM D5185m | | **1** | <1 | <1 |
| Magnesium | ppm | ASTM D5185m | | **235** | 223 | 233 |
| Calcium | ppm | ASTM D5185m | | **3304** | 3051 | 3248 |
| Phosphorus | ppm | ASTM D5185m | | **995** | 888 | 980 |
| Zinc | ppm | ASTM D5185m | | **1107** | 1047 | 1091 |
| Sulfur | ppm | ASTM D5185m | | **8704** | 7795 | 8559 |

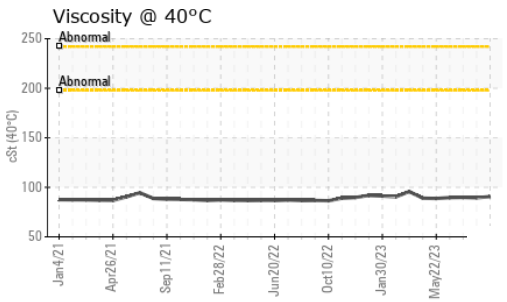
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185m | >50 | **4** | 4 | 4 |
| Sodium | ppm | ASTM D5185m | | **4** | <1 | 3 |
| Potassium | ppm | ASTM D5185m | >20 | **1** | 0 | 0 |
| Water | % | ASTM D6304 | >0.1 | **0.057** | 0.040 | 0.046 |
| ppm Water | ppm | ASTM D6304 | >1000 | **571.7** | 402.2 | 468.3 |

| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Acid Number (AN) | mg KOH/g | ASTM D8045 | | ▲ **1.985** | 0.89 | 1.01 |

# OIL ANALYSIS REPORT



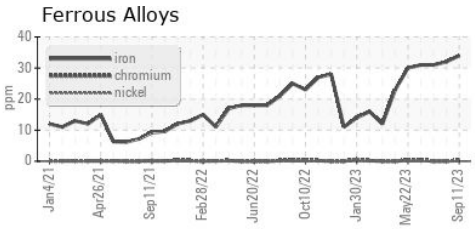



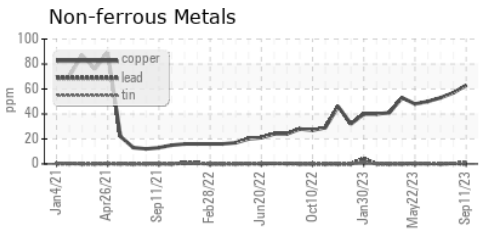

| VISUAL | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| White Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | **NONE** | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | **NONE** | NONE | NONE |
|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

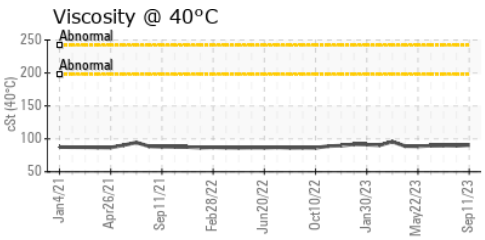
| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 40°C | cSt | ASTM D445 | | **90.6** | 89.4 | 89.8 |

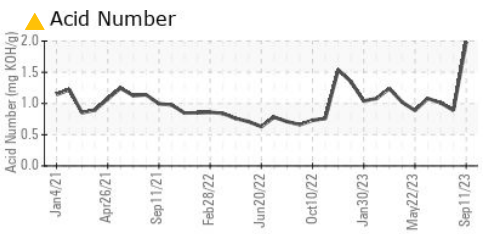
| SAMPLE IMAGES | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|
| Color | | |  | | |
| Bottom | | |  | | |

## GRAPHS




Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : WC0769301 **Received** : 25 Sep 2023
**Lab Number** : 05960713 **Diagnosed** : 29 Sep 2023
**Unique Number** : 10661926 **Diagnostician** : Jonathan Hester
**Test Package** : IND 2 ( Additional Tests: KF )

*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)*

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