MAR II

WEAR CHECK Inland Marine Oil Analysis Program

# OIL ANALYSIS REPORT

| | |
|---|---|
| WEAR | ABNORMAL |
| CONTAMINATION | NORMAL |
| FLUID CONDITION | ATTENTION |

Machine Id
**PRS**
Component
**Port Main Engine**
Fluid
**CHEVRON DELO 400 XLE 15W40 (28 GAL)**

## RECOMMENDATION

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

## WEAR

The copper level is abnormal. In the absence of other significant wear metals, suspect copper due to sources other than wear (i.e. cooling core). All other component wear rates are normal.

## CONTAMINATION

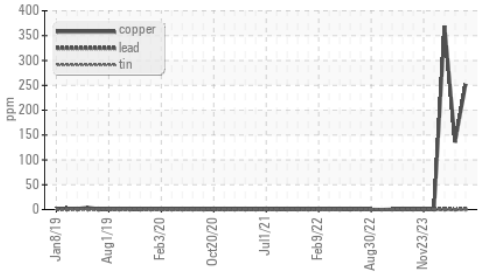
There is no indication of any contamination in the oil.

## FLUID CONDITION

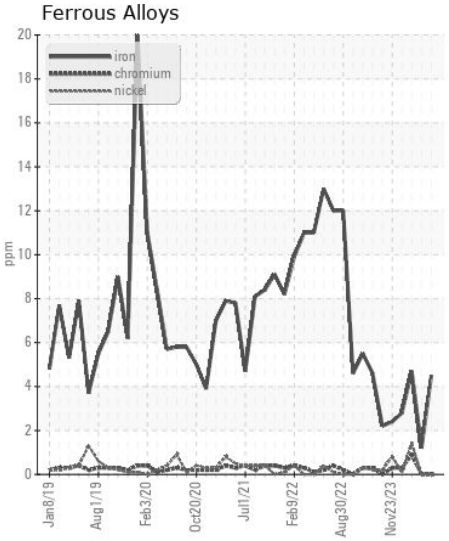
The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil. Confirm oil type.

| Test | UOM | Method | Limit/Abn | Current | History1 | History2 |
|---|---|---|---|---|---|---|
| Sample Number | | Client Info | | MW06187006 | MW06144862 | MW06101484 |
| Sample Date | | Client Info | | 21 May 2024 | 09 Apr 2024 | 26 Feb 2024 |
| Machine Age | hrs | Client Info | | 33509 | 32623 | 31947 |
| Oil Age | hrs | Client Info | | 886 | 676 | 831 |
| Filter Age | hrs | Client Info | | 0 | 0 | 0 |
| Oil Changed | | Client Info | | N/A | N/A | N/A |
| Filter Changed | | Client Info | | N/A | N/A | N/A |
| Sample Status | | | | ABNORMAL | ABNORMAL | ABNORMAL |
| Iron | ppm | ASTM D5185m | >75 | 4 | 1 | 5 |
| Chromium | ppm | ASTM D5185m | >8 | 0 | 0 | <1 |
| Nickel | ppm | ASTM D5185m | >2 | 0 | 0 | 1 |
| Titanium | ppm | ASTM D5185m | >3 | <1 | <1 | <1 |
| Silver | ppm | ASTM D5185m | >2 | 0 | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >15 | 2 | <1 | 1 |
| Lead | ppm | ASTM D5185m | >18 | <1 | 0 | <1 |
| Copper | ppm | ASTM D5185m | >80 | ▲ 252 | ▲ 136 | ▲ 369 |
| Tin | ppm | ASTM D5185m | >14 | <1 | 0 | <1 |
| Vanadium | ppm | ASTM D5185m | | 0 | 0 | <1 |
| White Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Silicon | ppm | ASTM D5185m | >20 | 4 | 3 | 4 |
| Potassium | ppm | ASTM D5185m | >20 | 0 | 0 | 4 |
| Fuel | | WC Method | >4.0 | <1.0 | <1.0 | <1.0 |
| Water | | WC Method | >0.1 | NEG | NEG | NEG |
| Glycol | % | *ASTM D2982 | | NEG | NEG | NEG |
| Soot % | % | *ASTM D7844 | | 0.1 | 0.1 | 0.1 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | 6.3 | 6.1 | 6.3 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | 21.3 | 20.6 | 18.5 |
| 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 |
| Sodium | ppm | ASTM D5185m | >75 | 1 | <1 | 3 |
| Boron | ppm | ASTM D5185m | | 297 | 267 | 59 |
| Barium | ppm | ASTM D5185m | | 0 | 0 | 1 |
| Molybdenum | ppm | ASTM D5185m | | 61 | 54 | 25 |
| Manganese | ppm | ASTM D5185m | | <1 | <1 | <1 |
| Magnesium | ppm | ASTM D5185m | | 297 | 279 | 112 |
| Calcium | ppm | ASTM D5185m | | 1493 | 1595 | 1803 |
| Phosphorus | ppm | ASTM D5185m | 760 | 928 | 903 | 767 |
| Zinc | ppm | ASTM D5185m | 830 | 1069 | 1036 | 928 |
| Sulfur | ppm | ASTM D5185m | 2770 | 3431 | 3401 | 3416 |
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | 17.0 | 15.4 | 13.6 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 10.7 | 6.0 | 6.5 | 6.0 |
| Visc @ 100°C | cSt | ASTM D445 | 14.9 | ● 11.5 | ● 11.6 | ● 10.5 |

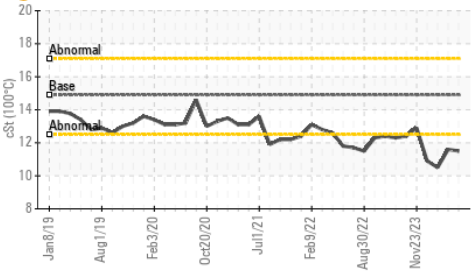
Non-ferrous Metals



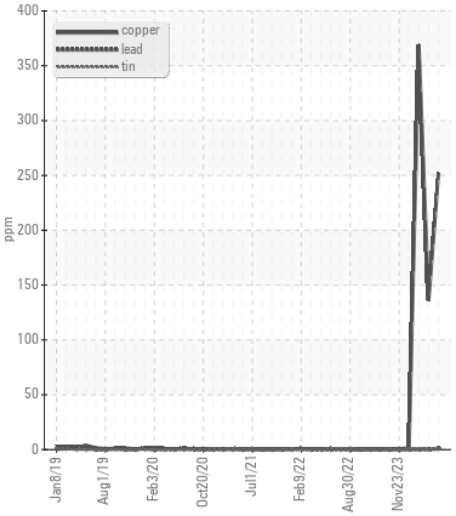

Ferrous Alloys



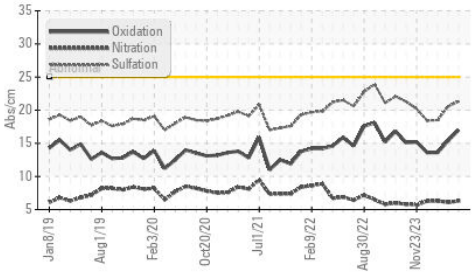

Viscosity @ 100°C



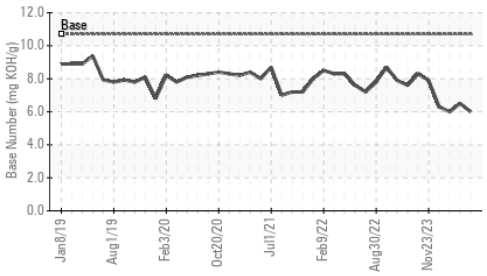

Non-ferrous Metals



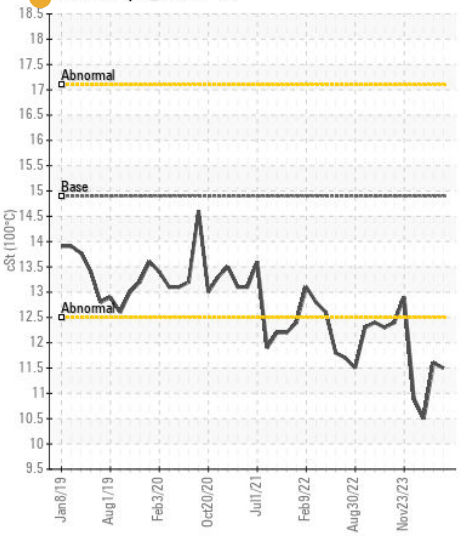

FT-IR (Direct Trend)



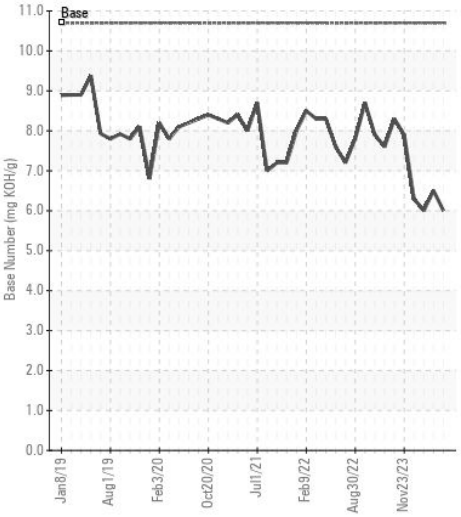

Base Number



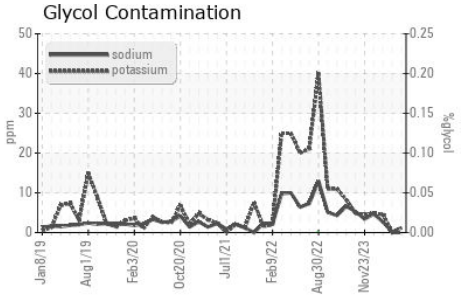

Viscosity @ 100°C




Base Number




Glycol Contamination




ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY
Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513
**Sample No.** : MW06187006
**Lab Number** : 06187006
**Unique Number** : 11043758
**Test Package** : MAR 2 ( Additional Tests: Glycol )

**Received** : 21 May 2024
**Tested** : 23 May 2024
**Diagnosed** : 23 May 2024 - Sean Felton

*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)*

**ILLINOIS MARINE TOWING**
PO BOX 391
LEMONT, IL
US 60439
Contact: RHETT DANIEL
rdaniel@imtowing.com
T: (630)280-4926
F: (630)739-2041