



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

Machine Id
DALE ROBINS
Component
Port Main Engine
Fluid
CHEVRON URSA SUPER PLUS 40 (17 GAL)

RECOMMENDATION

Oil and filter change at the time of sampling has been noted. No corrective action is recommended at this time. Resample at the next service interval to monitor.

| Test | UOM | Method | Limit/Abn | Current | History1 | History2 |
|----------------|-----|-------------|-----------|--------------------|-------------|-------------|
| Sample Number | | Client Info | | MW0047394 | MW0036434 | MW0036465 |
| Sample Date | | Client Info | | 31 Jan 2024 | 11 Jul 2023 | 25 Apr 2023 |
| Machine Age | hrs | Client Info | | 6304 | 5760 | 5184 |
| Oil Age | hrs | Client Info | | 544 | 544 | 608 |
| Filter Age | hrs | Client Info | | 544 | 544 | 608 |
| Oil Changed | | Client Info | | Changed | Changed | Changed |
| Filter Changed | | Client Info | | Changed | Changed | Changed |
| Sample Status | | | | ABNORMAL | ABNORMAL | NORMAL |

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.

| | | | | | | |
|--------------|--------|-------------|------|--------------|------|------|
| Iron | ppm | ASTM D5185m | >75 | 51 | ▲ 91 | 6 |
| Chromium | ppm | ASTM D5185m | >8 | 1 | 4 | 0 |
| Nickel | ppm | ASTM D5185m | >2 | 0 | 0 | 0 |
| Titanium | ppm | ASTM D5185m | >3 | 0 | <1 | 0 |
| Silver | ppm | ASTM D5185m | >2 | 0 | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >15 | 1 | 2 | <1 |
| Lead | ppm | ASTM D5185m | >18 | 6 | 3 | 0 |
| Copper | ppm | ASTM D5185m | >80 | ▲ 145 | 6 | 0 |
| Tin | ppm | ASTM D5185m | >14 | 6 | 10 | <1 |
| Vanadium | ppm | ASTM D5185m | | 0 | <1 | 0 |
| White Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Yellow Metal | scalar | *Visual | NONE | NONE | NONE | NONE |

CONTAMINATION

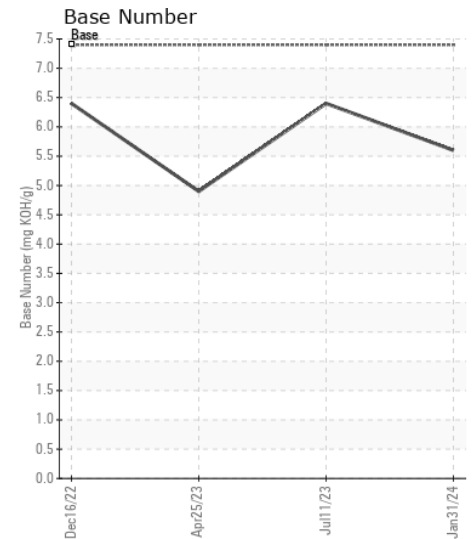
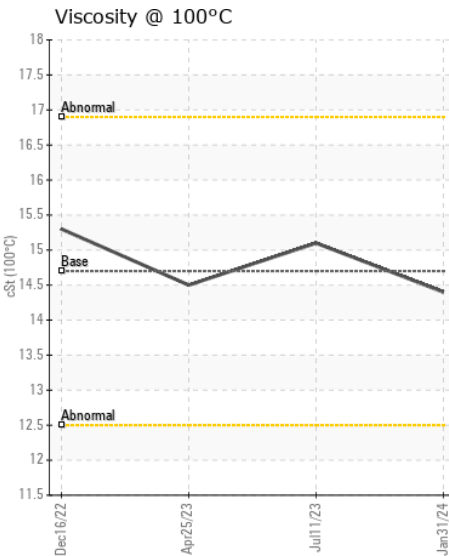
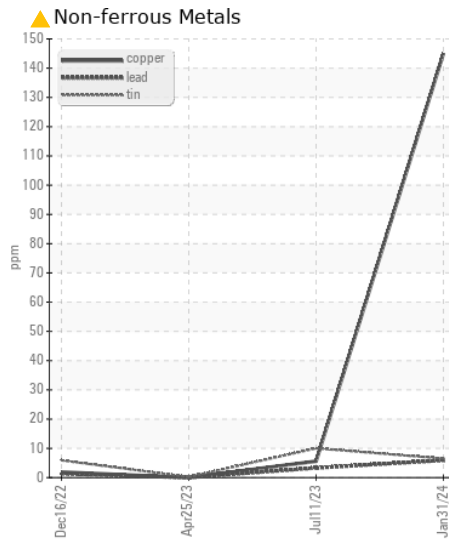
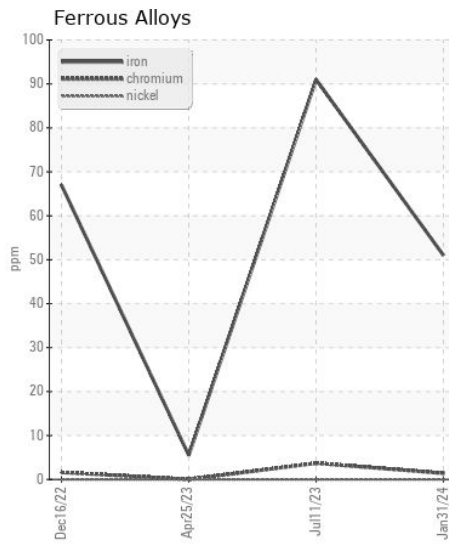
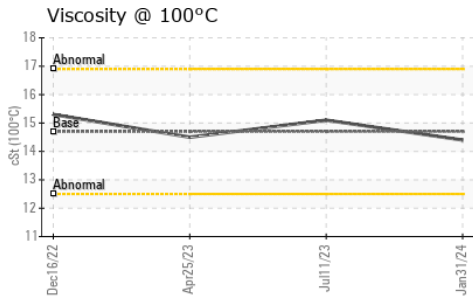
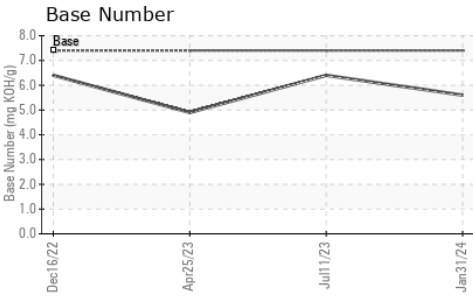
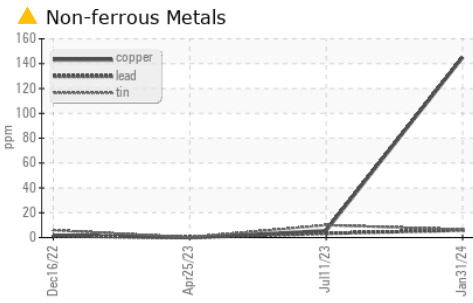
There is no indication of any contamination in the oil.

| | | | | | | |
|------------------|----------|-------------|-------|----------------|-------|-------|
| Silicon | ppm | ASTM D5185m | >20 | 12 | 17 | 5 |
| Potassium | ppm | ASTM D5185m | >20 | 4 | <1 | 0 |
| Fuel | | WC Method | >4.0 | <1.0 | <1.0 | <1.0 |
| Water | | WC Method | >0.1 | NEG | NEG | NEG |
| Glycol | | WC Method | | NEG | NEG | NEG |
| Soot % | % | *ASTM D7844 | | 0.7 | 1.9 | 0.1 |
| Nitration | Abs/cm | *ASTM D7624 | >20 | 4.2 | 5.9 | 3.4 |
| Sulfation | Abs/.1mm | *ASTM D7415 | >30 | 15.5 | 17.7 | 13.1 |
| 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 |

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.

| | | | | | | |
|------------------|----------|-------------|------|-------------|------|------|
| Sodium | ppm | ASTM D5185m | >75 | 25 | 4 | 2 |
| Boron | ppm | ASTM D5185m | | 221 | 291 | 357 |
| Barium | ppm | ASTM D5185m | | 0 | 0 | 0 |
| Molybdenum | ppm | ASTM D5185m | | 29 | 33 | 33 |
| Manganese | ppm | ASTM D5185m | | 1 | 1 | <1 |
| Magnesium | ppm | ASTM D5185m | | 20 | 52 | 22 |
| Calcium | ppm | ASTM D5185m | | 2233 | 2586 | 2640 |
| Phosphorus | ppm | ASTM D5185m | 1000 | 636 | 657 | 676 |
| Zinc | ppm | ASTM D5185m | 1090 | 760 | 807 | 820 |
| Sulfur | ppm | ASTM D5185m | | 2355 | 3157 | 2963 |
| Oxidation | Abs/.1mm | *ASTM D7414 | >25 | 6.4 | 7.8 | 6.3 |
| Base Number (BN) | mg KOH/g | ASTM D2896 | 7.4 | 5.6 | 6.4 | 4.9 |
| Visc @ 100°C | cSt | ASTM D445 | 14.7 | 14.4 | 15.1 | 14.5 |



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : MW0047394
Lab Number : 06083040
Unique Number : 10870485
Test Package : MAR 2
Received : 07 Feb 2024
Tested : 08 Feb 2024
Diagnosed : 09 Feb 2024 - Don Baldrige

OSAGE MARINE
 7501 E DAVIS ST
 ST LOUIS, MO
 US 63111

Contact: MIKE KESSLER
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 T:
 F:

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)