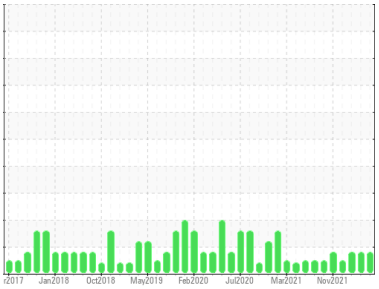
# OIL ANALYSIS REPORT

Sample Rating Trend



VISCOSITY

Area
**Cranes**
Machine Id
**Crane - Fwd Distribution Gearbox (S/N Sample Tag MA-04003-S11)**
Component
**Gearbox**
Fluid
**PETRO CANADA GEARLUBE TOS 80W90 (6 LTR)**

## DIAGNOSIS

**Recommendation**
Resample at the next service interval to monitor.

**Wear**
All component wear rates are normal.

**Contamination**
The system cleanliness is acceptable for your target ISO 4406 cleanliness code. The system and fluid cleanliness is acceptable.

**Fluid Condition**
The oil viscosity is lower than typical, possibly indicating the addition of lighter grade oil. 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 | | **PC** | PC0040629 | PC0076451 |
| Sample Date | | Client Info | | **20 Mar 2024** | 24 Jan 2024 | 04 Oct 2023 |
| Machine Age | hrs | Client Info | | **0** | 0 | 0 |
| Oil Age | hrs | Client Info | | **0** | 0 | 0 |
| Oil Changed | | Client Info | | **N/A** | N/A | N/A |
| Sample Status | | | | **ABNORMAL** | ABNORMAL | ABNORMAL |

| CONTAMINATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Water | | WC Method | >0.2 | **NEG** | NEG | NEG |

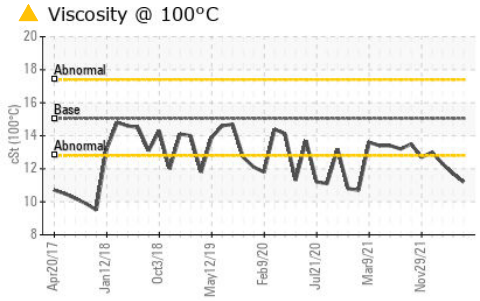
| WEAR METALS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| PQ | | ASTM D8184* | | **0** | 0 | 0 |
| Iron | ppm | ASTM D5185(m) | >150 | **24** | 24 | 26 |
| Chromium | ppm | ASTM D5185(m) | >10 | **0** | 0 | 0 |
| Nickel | ppm | ASTM D5185(m) | >10 | **0** | 0 | <1 |
| Titanium | ppm | ASTM D5185(m) | | **0** | 0 | 0 |
| Silver | ppm | ASTM D5185(m) | | **0** | 0 | <1 |
| Aluminum | ppm | ASTM D5185(m) | >5 | **<1** | <1 | <1 |
| Lead | ppm | ASTM D5185(m) | >65 | **0** | <1 | <1 |
| Copper | ppm | ASTM D5185(m) | >80 | **2** | 2 | 2 |
| Tin | ppm | ASTM D5185(m) | >8 | **0** | 0 | 0 |
| Antimony | ppm | ASTM D5185(m) | >5 | **0** | 0 | 0 |
| Vanadium | ppm | ASTM D5185(m) | | **0** | 0 | 0 |
| Beryllium | ppm | ASTM D5185(m) | | **0** | 0 | 0 |
| Cadmium | ppm | ASTM D5185(m) | | **0** | 0 | 0 |

| ADDITIVES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Boron | ppm | ASTM D5185(m) | 240 | **181** | 187 | 203 |
| Barium | ppm | ASTM D5185(m) | 1 | **<1** | 0 | <1 |
| Molybdenum | ppm | ASTM D5185(m) | 0.0 | **0** | 0 | 0 |
| Manganese | ppm | ASTM D5185(m) | | **0** | <1 | <1 |
| Magnesium | ppm | ASTM D5185(m) | 2 | **2** | 2 | 2 |
| Calcium | ppm | ASTM D5185(m) | 6 | **34** | 31 | 32 |
| Phosphorus | ppm | ASTM D5185(m) | 1000 | **756** | 807 | 811 |
| Zinc | ppm | ASTM D5185(m) | 3 | **56** | 55 | 60 |
| Sulfur | ppm | ASTM D5185(m) | 19400 | **12635** | 13744 | 13961 |
| Lithium | ppm | ASTM D5185(m) | | **5** | 5 | 6 |

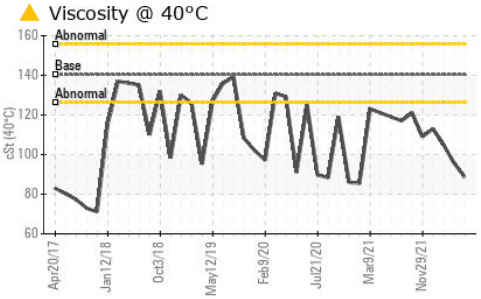
| CONTAMINANTS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Silicon | ppm | ASTM D5185(m) | >20 | **3** | 4 | 5 |
| Sodium | ppm | ASTM D5185(m) | | **2** | 2 | 2 |
| Potassium | ppm | ASTM D5185(m) | >20 | **<1** | 1 | <1 |

# OIL ANALYSIS REPORT

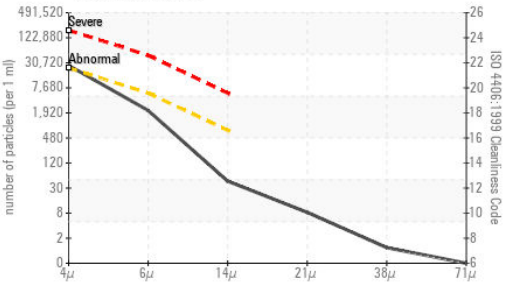
Viscosity @ 100°C



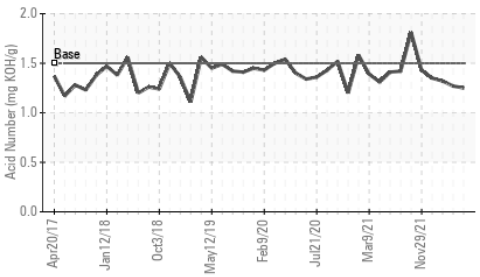

Viscosity @ 40°C



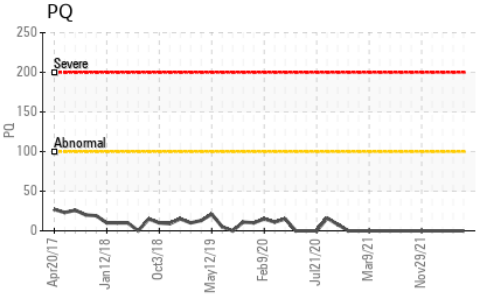

Particle Count




Acid Number




PQ

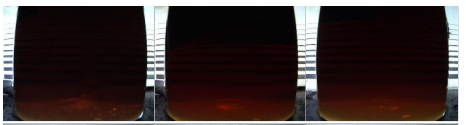



| FLUID CLEANLINESS | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Particles >4µm | | ASTM D7647 | >20000 | **23004** | 28341 | 44670 |
| Particles >6µm | | ASTM D7647 | >5000 | **1923** | 2678 | 3781 |
| Particles >14µm | | ASTM D7647 | >640 | **39** | 53 | 44 |
| Particles >21µm | | ASTM D7647 | >160 | **7** | 9 | 8 |
| Particles >38µm | | ASTM D7647 | >40 | **1** | 2 | 2 |
| Particles >71µm | | ASTM D7647 | >10 | **0** | 1 | 2 |
| Oil Cleanliness | | ISO 4406 (c) | >21/19/16 | **22/18/12** | 22/19/13 | 23/19/13 |

| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Acid Number (AN) | mg KOH/g | ASTM D974* | 1.5 | **1.25** | 1.27 | 1.32 |

| 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** | VLITE | VLITE |
| Sand/Dirt | scalar | Visual* | NONE | **VLITE** | NONE | NONE |
| Appearance | scalar | Visual* | NORML | **NORML** | NORML | NORML |
| Odor | scalar | Visual* | NORML | **NORML** | NORML | NORML |
| Emulsified Water | scalar | Visual* | >0.2 | **NEG** | .2% | NEG |
| Free Water | scalar | Visual* | | **NEG** | NEG | NEG |

| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|---|---|---|---|---|---|---|
| Visc @ 40°C | cSt | ASTM D7279(m) | 140.3 | ▲ **88.6** | ▲ 95.7 | ▲ 105 |
| Visc @ 100°C | cSt | ASTM D7279(m) | 15.05 | ▲ **11.2** | ▲ 11.7 | ▲ 12.3 |
| Viscosity Index (VI) | Scale | ASTM D2270* | 109 | **113** | 111 | 108 |

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

ISO 17025:2017 Accredited Laboratory

**Laboratory** : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
**Sample No.** : PC
**Lab Number** : 02626218
**Unique Number** : 5759350
**Test Package** : MAR 2 ( Additional Tests: KV100, PQ, PrtCount, TAN Man, VI )
**Received** : 02 Apr 2024
**Tested** : 03 Apr 2024
**Diagnosed** : 03 Apr 2024 - Kevin Marson

*To discuss this sample report, contact Customer Service at 1-800-268-2131.*
*Test denoted (*) outside scope of accreditation, (m) method modified, (e) tested at external lab.*
*Validity of results and interpretation are based on the sample and information as supplied.*

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