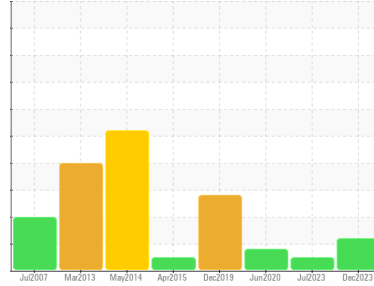


Area
Fwd Machinery Space [450231348]
Machine Id
Thruster Fwd Aft - Steering Gear Lubrication (S/N Sample Tag CL-06004-S4)
Component
Gear Unit
Fluid
PETRO CANADA ENERGOL GR-XP ISO 150 (5000 LTR)



DIAGNOSIS

Recommendation
We recommend you service the filters on this component. Resample at the next service interval to monitor.

Wear
All component wear rates are normal.

Contamination
There is a light amount of silt (particulates < 14 microns in size) present in the oil.

Fluid Condition
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 | PC | PC |
| Sample Date | Client Info | 02 Dec 2023 | 24 Jul 2023 | 05 Jun 2020 |
| Machine Age | hrs | 0 | 0 | 0 |
| Oil Age | hrs | 0 | 0 | 0 |
| Oil Changed | Client Info | N/A | N/A | N/A |
| Sample Status | | ATTENTION | NORMAL | 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) >125 | 1 | <1 | 3 |
| Chromium | ppm ASTM D5185(m) >5 | 0 | 0 | <1 |
| Nickel | ppm ASTM D5185(m) >10 | <1 | <1 | <1 |
| Titanium | ppm ASTM D5185(m) | 0 | 0 | 0 |
| Silver | ppm ASTM D5185(m) | 0 | 0 | 0 |
| Aluminum | ppm ASTM D5185(m) >30 | <1 | <1 | 0 |
| Lead | ppm ASTM D5185(m) >5 | 0 | 0 | 0 |
| Copper | ppm ASTM D5185(m) >100 | <1 | <1 | <1 |
| Tin | ppm ASTM D5185(m) >5 | 0 | 0 | 0 |
| Antimony | ppm ASTM D5185(m) >5 | 0 | 0 | <1 |
| Vanadium | ppm ASTM D5185(m) | 0 | 0 | 0 |
| Beryllium | ppm ASTM D5185(m) | 0 | 0 | 0 |
| Cadmium | ppm ASTM D5185(m) | 0 | 0 | 0 |

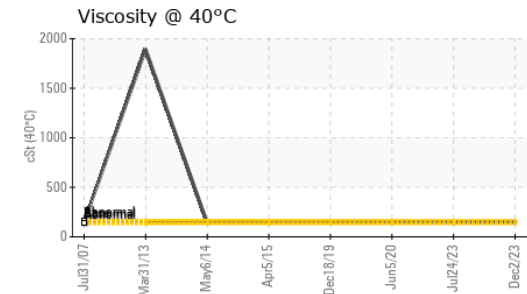
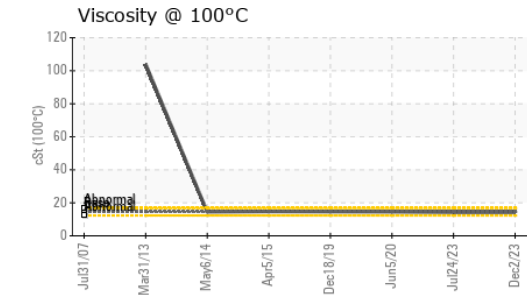
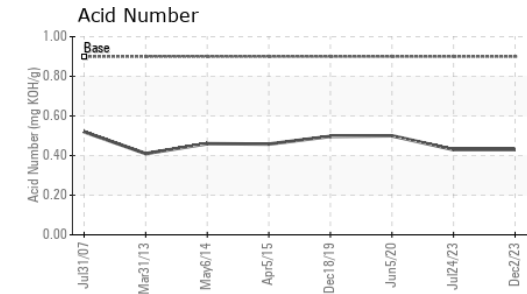
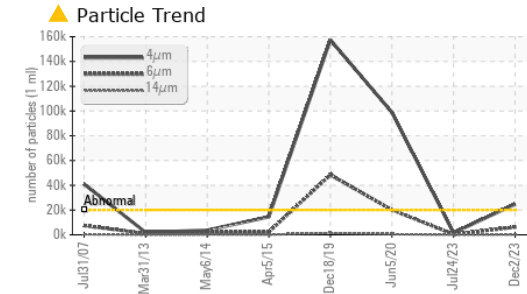
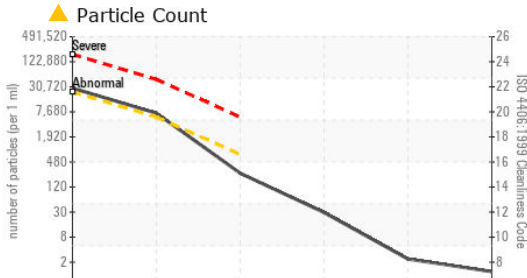
ADDITIVES

| method | limit/base | current | history1 | history2 |
|------------|-------------------|--------------|----------|----------|
| Boron | ppm ASTM D5185(m) | 10 | 7 | 3 |
| Barium | ppm ASTM D5185(m) | 0 | 0 | 0 |
| Molybdenum | ppm ASTM D5185(m) | 0 | 0 | <1 |
| Manganese | ppm ASTM D5185(m) | 0 | 0 | <1 |
| Magnesium | ppm ASTM D5185(m) | <1 | <1 | 0 |
| Calcium | ppm ASTM D5185(m) | 7 | 13 | 1 |
| Phosphorus | ppm ASTM D5185(m) | 157 | 155 | 328 |
| Zinc | ppm ASTM D5185(m) | 5 | 3 | 4 |
| Sulfur | ppm ASTM D5185(m) | 10803 | 14646 | 10466 |
| Lithium | ppm ASTM D5185(m) | <1 | <1 | <1 |

CONTAMINANTS

| method | limit/base | current | history1 | history2 |
|-----------|-----------------------|--------------|----------|----------|
| Silicon | ppm ASTM D5185(m) >50 | 4 | <1 | 1 |
| Sodium | ppm ASTM D5185(m) | <1 | <1 | 0 |
| Potassium | ppm ASTM D5185(m) >20 | 0 | <1 | <1 |

OIL ANALYSIS REPORT



Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
Sample No. : PC
Lab Number : 02605587
Unique Number : 5698672
Test Package : MAR 2 (Additional Tests: KV100, PQ, VI)
Received : 28 Dec 2023
Diagnosed : 02 Jan 2024
Diagnostician : 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.

Suncor - Terra Nova Projects
 Scotia Centre, 235 Water Street
 St. John's, NL
 CA A1C 1B6
 Contact: Josh Hynes
 joshhynes@suncor.com
 T: (709)778-3575
 F: (709)724-2835

| FLUID CLEANLINESS | | method | limit/base | current | history1 | history2 |
|-------------------|--------------|-----------|------------|----------|------------|----------|
| Particles >4µm | ASTM D7647 | >20000 | ▲ 24791 | 1569 | ▲ 98875 | |
| Particles >6µm | ASTM D7647 | >5000 | ▲ 6217 | 328 | ▲ 20151 | |
| Particles >14µm | ASTM D7647 | >640 | 227 | 31 | 503 | |
| Particles >21µm | ASTM D7647 | >160 | 26 | 12 | 69 | |
| Particles >38µm | ASTM D7647 | >40 | 2 | 2 | 2 | |
| Particles >71µm | ASTM D7647 | >10 | 1 | 1 | 0 | |
| Oil Cleanliness | ISO 4406 (c) | >21/19/16 | ▲ 22/20/15 | 18/16/12 | ▲ 24/22/16 | |

| FLUID DEGRADATION | | method | limit/base | current | history1 | history2 |
|-------------------|----------|------------|------------|---------|----------|----------|
| Acid Number (AN) | mg KOH/g | ASTM D974* | 0.9 | 0.43 | 0.43 | 0.50 |

| 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* | >0.2 | NEG | NEG | NEG |
| Free Water | scalar | Visual* | | NEG | NEG | NEG |

| FLUID PROPERTIES | | method | limit/base | current | history1 | history2 |
|----------------------|-------|---------------|------------|---------|----------|----------|
| Visc @ 40°C | cSt | ASTM D7279(m) | 149 | 145 | 147 | 147 |
| Visc @ 100°C | cSt | ASTM D7279(m) | 14.5 | 14.2 | 14.2 | 14.5 |
| Viscosity Index (VI) | Scale | ASTM D2270* | | 94 | 93 | 96 |

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