

PROBLEM SUMMARY

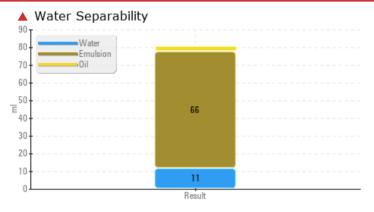
Sample Rating Trend

CONTAMINANT

A2 - Thrust Bearing

Component Thrust Bearing Fluid PETRO CANADA TURBOFLO R&O 46 (5705 LTR)

COMPONENT CONDITION SUMMARY



RECOMMENDATION

We recommend that you perform vacuum distillation and/or air drying to attempt to remove any residual water and/or entrained gases from this oil that may be contributing to abnormal foaming and/or poor water separability. We recommend an early resample to monitor this condition.

| PROBLEMATIC TEST RESULTS | | | | | | | |
|--------------------------|------------|-------------|---------|--|-----------------|---------------------|--|
| Sample Status | | | | SEVERE | SEVERE | SEVERE | |
| Separability | oil/h2o/em | ASTM D1401* | 41/39/0 | a 3/11/66 (30) | ▲ 38/32/10 (30) | 40/36/4 (30) | |
| Foam Tendency | 1/11/111 | ASTM D892* | 10 | 6 520/50/500 | ▲ 510/50/490 | 490/60/440 | |
| | | | | | | | |
| PrtFilter | | | | | | | |
| | | | | the state of the s | | | |

Customer Id: CHUCHU Sample No.: WC0679959 Lab Number: 02508116 Test Package: AOM 3



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To discuss the diagnosis or test data: Bill Quesnel CLS,OMA II,MLA-III,LLA-I +1 (289)291-4641 x4641 Bill.Quesnel@wearcheck.com

To change component or sample information: Gloria Gonzalez +1 (289)291-4643 x4643 gloria.gonzalez@wearcheck.com

| RECOMMENDED ACTIONS | | | | | | | | |
|---------------------|--------|-------------|---------|---|--|--|--|--|
| Action | Status | Date | Done By | Description | | | | |
| Resample | MISSED | Jan 09 2024 | ? | We recommend an early resample to monitor this condition. | | | | |
| Filter Fluid | MISSED | Jan 09 2024 | ? | We recommend that you perform vacuum distillation and/or air drying to attempt to remove any residual water and/or entrained gases from this oil that may be contributing to abnormal foaming and/or poor water separability. | | | | |

HISTORICAL DIAGNOSIS



13 Jul 2021 Diag: Bill Quesnel

We recommend that you perform vacuum distillation and/or air drying to attempt to remove any residual water and/or entrained gases from this oil that may be contributing to abnormal foaming and/or poor water separability. We recommend an early resample to monitor this condition.All component wear rates are normal. The direct-reading & analytical ferrographic results are normal indicating no abnormal wear in the system. MPC (Membrane Patch Colorimetry) test indicates acceptable levels of varnish present. Water Separability results (ASTM D1401) are poor and indicate that the oil will form emulsions with water. The system cleanliness is acceptable for your target ISO 4406 cleanliness code. The water content is negligible. Foaming Tendency (ASTM D892) results are abnormal indicating a tendency for oil foaming. The Air Release Value (ASTM D3427) indicates that the oil has good deaeration properties. Linear Sweep Voltammetry (RULER - ASTM D6971) testing indicates normal levels of anti-oxidants present in the oil. The Rotating Pressure Vessel Oxidation Test (RPVOT - ASTM D2272) result indicates suitable amounts of anti-oxidant(s) present in the oil. The AN level is acceptable for this fluid.



view report

08 May 2020 Diag: Bill Quesnel



mend that you perform vacuum distillation and/or air drying to attempt to remove any residual water and/or entrained gases from this oil that may be We recom contributing to abnormal foaming and/or poor water separability. We advise that you check all areas where contaminants can enter the system. We advise that you perform a filter service, and use off-line filtration to improve the cleanliness of the system fluid. The air breather requires service. If unrated, we recommend that you replace with a suitable micron rated and/or desiccant air breather. If rated, we recommend that you service/replace the breather. Resample in 30-45 days to monitor this situation. All component wear rates are normal. The direct-reading & analytical ferrographic results are normal indicating no abnormal wear in the system. Particles >21µm are severely high. Separability (Emulsion) % is abnormally high. Separability (Water) % is abnormally low. Particles >14µm are abnormally high. Particles >54µm are abnormally high. Particles >38µm are abnormally high. Particles >64µm are abnormally high. MPC (Membrane Patch Colorimetry) test indicates acceptable levels of varnish present. Water Separability results (ASTM D1401) are poor and indicate that the oil will form emulsions with water. The water content is negligible. The Air Release Value (ASTM D3427) indicates that the oil has good deaeration properties. Foaming Tendency and Stability (ASTM D892) results all within normal range. Linear Sweep Voltammetry (RULER – ASTM D6971) testing indicates normal levels of anti-oxidants present in the oil. The Rotating Pressure Vessel Oxidation Test (RPVOT - ASTM D2272) result indicates suitable amounts of anti-oxidant(s) present in the oil. The AN level is acceptable for this fluid. The oil is still serviceable provided that the contaminant(s) can be reduced to acceptable levels.

09 Jul 2019 Diag: Bill Quesnel





We recommend that you perform vacuum distillation and/or air drying to attempt to remove any residual water and/or entrained gases from this oil that may be contributing to abnormal foaming and/or poor water separability. We recommend that you investigate the system for introduction of a surfactant to the reservoir. Some potential surfactants include incorrect oil make-up with an oil containing emulsifying agents (engine oil, compressor oil, gear oil), or soaps entering the system after wash down. We recommend you service the filters on this component. We recommend an early resample to monitor this condition. All component wear rates are normal. The direct-reading & analytical ferrographic results are normal indicating no abnormal wear in the system. There is a light amount of silt (particulates < 14 microns in size) present in the oil. MPC (Membrane Patch Colorimetry) test indicates acceptable levels of varnish present. Water Separability results (ASTM D1401) are poor and indicate that the oil will form emulsions with water. The water content is negligible. Foaming Stability stage I (ASTM D892) result is abnormal indicating an oil foaming problem that could lead to erratic operation. The Air Release Value (ASTM D3427) indicates that the oil has good deaeration properties. Linear Sweep Voltammetry (RULER – ASTM D6971) testing indicates normal levels of anti-oxidants present in the oil. The Rotating Pressure Vessel Oxidation Test (RPVOT – ASTM D2272) result indicates suitable amounts of anti-oxidant(s) present in the oil. The AN level is acceptable for this fluid.

view report





OIL ANALYSIS REPORT

Sample Rating Trend

CONTAMINANT

Machine Id

A2 - Thrust Bearing

Thrust Bearing

PETRO CANADA TURBOFLO R&O 46 (5705 LTR)

DIAGNOSIS

Recommendation

We recommend that you perform vacuum distillation and/or air drying to attempt to remove any residual water and/or entrained gases from this oil that may be contributing to abnormal foaming and/or poor water separability. We recommend an early resample to monitor this condition.

Wear

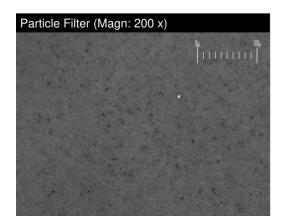
All component wear rates are normal. The directreading & analytical ferrographic results are normal indicating no abnormal wear in the system.

Contaminants

Water Separability results (ASTM D1401) are poor and indicate that the oil will form emulsions with water. The system cleanliness is acceptable for your target ISO 4406 cleanliness code. The water content is negligible.

Oil Condition

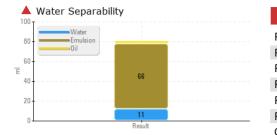
Foaming Tendency (ASTM D892) results are abnormal indicating a tendency for oil foaming. The AN level is acceptable for this fluid.

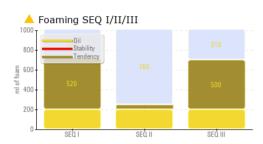


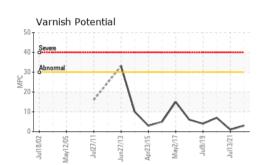
| SAMPLE INFORM | ATION | method | limit/base | current | history1 | history2 |
|--|--|---|---|--|--|--|
| Sample Number | | Client Info | | WC0679959 | WC0575659 | WC944655 |
| Sample Date | | Client Info | | 01 Apr 2022 | 13 Jul 2021 | 08 May 2020 |
| Machine Age | hrs | Client Info | | 0 | 0 | 0 |
| Oil Age | hrs | Client Info | | 0 | 0 | 0 |
| Oil Changed | | Client Info | | N/A | N/A | N/A |
| Sample Status | | | | SEVERE | SEVERE | SEVERE |
| WEAR METALS | | method | limit/base | current | history1 | history2 |
| PQ | | ASTM D8184* | | 0 | 0 | 0 |
| Iron | ppm | ASTM D5185(m) | >85 | <1 | <1 | <1 |
| Chromium | ppm | ASTM D5185(m) | | 0 | 0 | 0 |
| Nickel | ppm | ASTM D5185(m) | | 0 | <1 | 0 |
| Titanium | ppm | ASTM D5185(m) | | 0 | 0 | 0 |
| Silver | ppm | ASTM D5185(m) | | 0 | 0 | <1 |
| Aluminum | ppm | ASTM D5185(m) | >40 | <1 | 0 | 0 |
| Lead | ppm | ASTM D5185(m) | | <1 | <1 | <1 |
| Copper | ppm | ASTM D5185(m) | >7 | <1 | <1 | <1 |
| Tin | ppm | ASTM D5185(m) | >40 | 0 | <1 | 0 |
| Antimony | ppm | ASTM D5185(m) | | 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 |
| | | | 11 11 11 | | | |
| ADDITIVES | | method | limit/base | current | history1 | history2 |
| ADDITIVES | | method | limit/base | current | history1 | history2 |
| Boron | ppm | ASTM D5185(m) | limit/base | <1 | <1 | 0 |
| Boron Barium | ppm | ASTM D5185(m) ASTM D5185(m) | limit/base | <1 0 | <1 0 | 0 0 |
| Boron Barium Molybdenum | ppm ppm | ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) | limit/base | <1 0 0 | <1 0 0 | 0 0 0 |
| Boron Barium Molybdenum Manganese | ppm ppm ppm | ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) | limit/base | <1 0 0 0 | <1 0 0 0 | 0 0 0 0 |
| Boron Barium Molybdenum Manganese Magnesium | ppm ppm ppm ppm | ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) | | <1 0 0 0 <1 | <1 0 0 0 0 | 0 0 0 0 0 |
| Boron Barium Molybdenum Manganese Magnesium Calcium | ppm ppm ppm ppm ppm | ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) | 0 | <1 0 0 <1 0 | <1 0 0 0 0 <1 | 0 0 0 0 0 <1 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus | ppm ppm ppm ppm ppm ppm | ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) | 0 3 | <1 0 0 <1 0 6 | <1 0 0 0 0 <1 3 | 0 0 0 0 0 <1 3 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc | ppm ppm ppm ppm ppm ppm | ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) | 0 3 | <1 0 0 <1 0 6 <1 | <1 0 0 0 0 <1 3 1 | 0 0 0 0 0 <1 3 <1 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur | ppm ppm ppm ppm ppm ppm ppm | ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) | 0 3 | <1 0 0 <1 0 6 <1 130 | <1 0 0 0 0 <1 3 1 116 | 0 0 0 0 <1 3 <1 112 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium | ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) | 0 3 0 | <1 0 0 <1 0 6 <1 130 <1 | <1 0 0 0 <1 3 1 116 <1 | 0 0 0 0 <1 3 <1 112 <1 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS | ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) | 0 3 | <1 0 0 <1 0 6 <1 130 | <1 0 0 0 0 <1 3 1 116 | 0 0 0 0 <1 3 <1 112 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon | ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) method ASTM D5185(m) | 0 3 0 | <1 0 0 <1 0 6 <1 130 <1 | <1 0 0 0 <1 3 1 116 <1 history1 <1 | 0 0 0 0 <1 3 <1 112 <1 history2 <1 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium | ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) method ASTM D5185(m) ASTM D5185(m) | 0 3 0 limit/base | <1 0 0 <1 0 6 <1 130 <1 2 1 20 2 1 | <1 0 0 0 <1 3 1 116 <1 history1 | 0 0 0 0 <1 3 <1 112 <1 history2 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon | ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185(m) ASTM D5185(m) | 0 3 0 limit/base >20 >20 | <1 0 0 <1 0 6 <1 130 <1 2 1 0 0 0 | <1 0 0 0 <1 3 1 1 116 <1 history1 <1 0 <1 | 0 0 0 0 <1 3 <1 112 <1 history2 <1 0 <1 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium Water | ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) method ASTM D5185(m) ASTM D5185(m) | 0 3 0 limit/base >20 >20 | <1 0 0 <1 0 6 <1 130 <1 current <1 0 0 0 0 0.001 | <1 0 0 0 <1 3 1 116 <1 history1 <1 0 | 0 0 0 0 <1 3 <1 112 <1 history2 <1 0 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium | ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185(m) ASTM D5185(m) | 0 3 0 limit/base >20 >20 | <1 0 0 <1 0 6 <1 130 <1 2 1 0 0 0 | <1 0 0 0 <1 3 1 1 116 <1 history1 <1 0 <1 | 0 0 0 0 <1 3 <1 112 <1 history2 <1 0 <1 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium Water | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185(m) ASTM D5185(m) | 0 3 0 limit/base >20 >20 | <1 0 0 <1 0 6 <1 130 <1 current <1 0 0 0 0 0.001 | <1 0 0 0 <1 3 1 116 <1 history1 <1 0 <1 0 0.00 | 0 0 0 0 <1 3 <1 112 <1 history2 <1 0 <1 0 0 <1 0.00 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium Water ppm Water | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185(m) ASTM D5304* | 0 3 0 limit/base >20 >20 >20 >20 | <1 0 0 (1 0 6 <1 130 <1 2 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | <1 0 0 0 <1 3 1 116 <1 history1 <1 0 <1 0 0 <1 0.00 0.00 | 0 0 0 0 -1 -3 -1 -1 -1 -1 -1 0 -1 0 -1 0 -1 0 -1 -1 0 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium Water ppm Water INFRA-RED | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185(m) ASTM D6304* | 0 3 0 limit/base >20 >20 >20 >20 | <1 0 0 -1 0 6 <1 130 <1 <u>current</u> -1 0 0 0 0.001 13.5 <u>current</u> | <1 0 0 0 (0 (1 3 1 1 1 1 6 <1 () 1 ()) () ())) ()) ()) ())) ())) ())) ())) ())) ())) ())) ())) ())) ())) ()))) ()))) ()))) ()))))) | 0 0 0 0 <1 3 <1 112 <1 history2 <1 0 <1 0 0 <1 0.00 0.00 0.00 history2 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium Water ppm Water INFRA-RED Soot % | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185(m) ASTM D5185(m) | 0 3 0 limit/base >20 >20 >20 >20 | <1 0 0 1 0 1 0 4 1 0 6 4 1 0 6 <1 1 3 0 <1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | <1 0 0 0 (1 3 1 116 <1 history1 <1 0 <1 0.00 0.00 history1 0 | 0 0 0 0 (1 3 (1 112 (1 112 (1 history2 (1 0 0 (1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 |

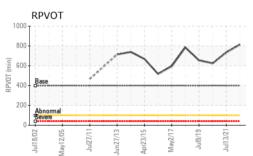


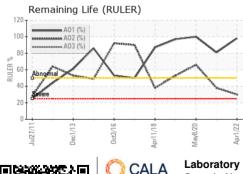
OIL ANALYSIS REPORT









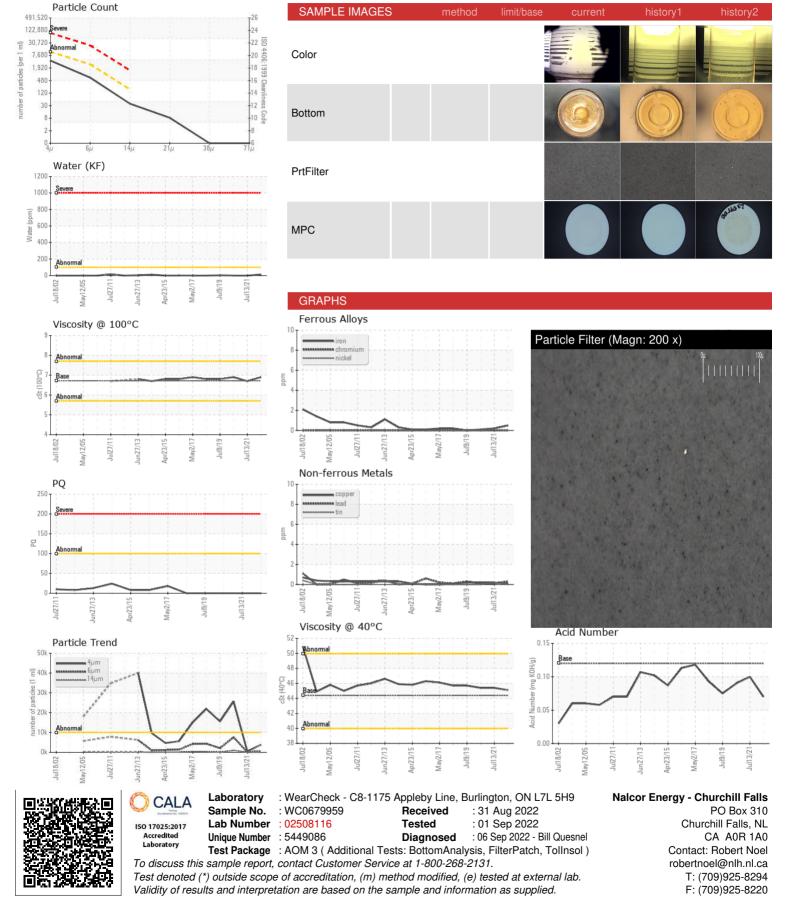


| Particles >6µm ASTM D7647 >≥2500 583 120 ▲ 7532 Particles >14µm ASTM D7647 >160 33 19 ●908 Particles >21µm ASTM D7647 >100 0 0 3 Particles >88µm ASTM D7647 >3 0 0 3 Oll Cleanliness ISO 4406 (c) >20/17 16/14/11 22/20/17 FLUID DEGRADATION method limi/base current history1 history2 Oxidation Abs:1mm ASTM D7647 >3 0 0.10 0.09 Anti-Oxidant 1 % ASTM D974* 0.12 0.07 0.10 0.09 Anti-Oxidant 2 % ASTM D974* 0.12 0.07 0.10 0.09 Anti-Oxidant 1 % ASTM D7647 >15 3 1 7 VISUAL method limi/base current history1 history2 Anti-Oxidant 1 % ASTM D784/% NONE NONE NONE <th>FLUID CLEANLIN</th> <th>ESS</th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th> | FLUID CLEANLIN | ESS | method | limit/base | current | history1 | history2 |
|--|------------------------|----------|----------------|------------|----------|----------|-------------|
| Particles >6µm ASTM D7647 >2500 583 120 ▲ 7532 Particles >14µm ASTM D7647 >160 33 19 ●908 Particles >21µm ASTM D7647 >100 0 0 3 Particles >88µm ASTM D7647 >3 0 0 3 Oll Cleanliness ISO 4406 (c) >20/17 16/14/11 22/20/17 FLUID DEGRADATION method limi/base current history1 history2 Oxidation Abs/Imm ASTM D7647 >3 0 0.10 0.09 Anti-Oxidant 1 % ASTM D7414* 2.9 2.6 2.6 Anti-Oxidant 2 % ASTM D974* 0.12 0.07 0.10 0.09 Anti-Oxidant 1 % ASTM D7647 >15 3 1 7 VISUAL method limi/base current history1 history2 Anti-Oxidant 1 \$calar Visual* NONE NONE NONE NONE | Particles >4µm | | ASTM D7647 | >10000 | 3832 | 394 | ▲ 25666 |
| Particles >21µm ASTM D7647 >40 7 6 ▲ 406 Particles >38µm ASTM D7647 >10 0 0 30 Particles >71µm ASTM D7647 >3 0 0 3 Oil Cleanliness ISO 4406 (c) >20/1/8/14 19/16/12 16/14/11 ▲ 22/20/17 FLUID DEGRADATION method limit/base current history1 ASTM D7647 Acid Number (AN) Mg/Hy ASTM D7414* 2.9 2.6 2.6 Acid Number (AN) mg K0Hy ASTM D7814* 2.9 8 81 100 Anti-Oxidant 2 % ASTM D7840* >15 3 1 7 VISUAL method limit/base current history1 history2 White Metal scalar Visual* NONE NONE NONE NONE Yellow Metal scalar Visual* NONE NONE NONE NONE NONE Sold Oir scalar Visual* NONE NONE <th>Particles >6µm</th> <td></td> <td>ASTM D7647</td> <td>>2500</td> <th>583</th> <td>120</td> <td>▲ 7532</td> | Particles >6µm | | ASTM D7647 | >2500 | 583 | 120 | ▲ 7532 |
| Particles >38µm ASTM D7647 >10 0 0 ▲ 30 Particles >71µm ASTM D7647 >3 0 0 3 Dil Cleanliness ISO 4406 (c) >20/18/14 19/16/12 16/14/11 ▲ 22/20/17 FLUID DEGRADATION method limit/base current history1 history1 Add Number (AN) mg/K0Hg ASTM D671* <2.9 2.6 2.6 Acid Number (AN) mg/K0Hg ASTM D671* <2.5 98 81 100 Anti-Oxidant 1 % ASTM D671* <2.5 30 38 66 Mrti-Oxidant 2 % ASTM D671* <2.5 30 38 100 Mrti-Oxidant 2 % ASTM D671* <2.5 30 38 66 Mrti-Oxidant 2 % ASTM D671* <2.5 30 38 60 Visual* NONE NONE NONE NONE NONE NONE Visual* NONE NONE NONE <th>Particles >14µm</th> <th></th> <th>ASTM D7647</th> <th>>160</th> <th>33</th> <th>19</th> <th><u> </u></th> | Particles >14µm | | ASTM D7647 | >160 | 33 | 19 | <u> </u> |
| Particles >71 µm ASTM D7647 >3 0 0 3 Oil Cleanliness ISO 4406 (c) >20/18/14 19/16/12 16/14/11 ▲ 22/20/17 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/Imm ASTM D7414* 2.9 2.6 2.6 Acid Number (AN) mgK0Hg ASTM D6971* -225 98 81 100 Anti-Oxidant 2 % ASTM D7847 >15 3 1 7 VISUAL method limit/base current history1 history2 White Metal scalar Visual* NONE NONE NONE NONE NONE Yellow Metal scalar Visual* NONE NONE NONE NONE NONE NONE Yellow Metal scalar Visual* NONE | Particles >21µm | | ASTM D7647 | >40 | 7 | 6 | 4 06 |
| Dil Cleanliness ISO 4406 (c) >20/18/14 19/16/12 16/14/11 ▲ 22/20/17 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/Imm ASTM D7414* 2.9 2.6 2.6 Acid Number (AN) mgKOHg ASTM D6971* <25 98 81 100 Anti-Oxidant 1 % ASTM D6971* <25 30 38 66 MPC Varnish Potential Scale ASTM D784(m)* >15 3 1 7 VISUAL method limit/base current history1 history2 White Metal scalar Visual* NONE NONE NONE NONE Precipitate scalar Visual* NONE NONE NONE NONE Sit scalar Visual* NONE NONE NONE NONE Precipitate scalar Visual* NORE NONE NONE NONE Sad//Dirt <t< th=""><th>Particles >38µm</th><th></th><th>ASTM D7647</th><th>>10</th><th>0</th><th>0</th><th>A 30</th></t<> | Particles >38µm | | ASTM D7647 | >10 | 0 | 0 | A 30 |
| FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.tmm ASTM D7414* 2.9 2.6 2.6 Acid Number (AN) mg KOHig ASTM D7414* 0.07 0.10 0.09 Anti-Oxidant 1 % ASTM D6971* <25 98 81 100 Anti-Oxidant 2 % ASTM D6971* <25 30 38 66 MPC Varnish Potential Scale ASTM D7843(m)* >15 3 1 7 VISUAL method limit/base current history1 history2 White Metal scalar Visual* NONE NONE NONE NONE Yellow Metal scalar Visual* NONE NONE NONE NONE NONE Precipitate scalar Visual* NONE NONE NONE NONE NONE Sand/Dirt scalar Visual* NORML NORML NORML NORML NORML NORM | Particles >71µm | | ASTM D7647 | >3 | 0 | 0 | 3 |
| Oxidation Abs/.tmm ASTM D7414* 2.9 2.6 2.6 Acid Number (AN) mg K0Hg ASTM D974* 0.12 0.07 0.10 0.09 Anti-Oxidant 1 % ASTM D974* 0.12 0.07 0.10 0.09 Anti-Oxidant 2 % ASTM D743(m)* >25 30 38 66 MPC Varnish Potential Scale ASTM D743(m)* >15 3 1 7 VISUAL method limit/base current history1 history1 White Metal scalar Visual* NONE NONE NONE NONE Yellow Metal scalar Visual* NONE NONE NONE NONE Stad/Dirt scalar Visual* NONE NONE NONE NONE Odor scalar Visual* NONE NONE NORML | Oil Cleanliness | | ISO 4406 (c) | >20/18/14 | 19/16/12 | 16/14/11 | ▲ 22/20/17 |
| Acid Number (AN) mg K0Hg ASTM D974* 0.12 0.07 0.10 0.09 Anti-Oxidant 1 % ASTM D6971* <25 98 81 100 Anti-Oxidant 2 % ASTM D6971* <25 30 38 66 MPC Varnish Potential Scale ASTM D6971* <25 30 38 66 VISUAL method limit/base current history1 history2 White Metal scalar Visual* NONE NONE NONE NONE NONE Yellow Metal scalar Visual* NONE NONE NONE NONE NONE Silt scalar Visual* NONE NONE NONE NONE NONE NONE Appearance scalar Visual* NORML NORML <td< th=""><th>FLUID DEGRADA</th><th>TION</th><th>method</th><th>limit/base</th><th>current</th><th>history1</th><th>history2</th></td<> | FLUID DEGRADA | TION | method | limit/base | current | history1 | history2 |
| Anti-Oxidant 1 % ASTM D6971* <25 | Oxidation | Abs/.1mm | ASTM D7414* | | 2.9 | 2.6 | 2.6 |
| Anti-Oxidant 2%ASTM D6971*<25 | Acid Number (AN) | mg KOH/g | ASTM D974* | 0.12 | 0.07 | 0.10 | 0.09 |
| MPC Varnish Potential Scale ASTM D7843(m)* >15 3 1 7 VISUAL method limit/base current history1 history2 White Metal scalar Visual* NONE NONE NONE NONE NONE Yellow Metal scalar Visual* NONE NONE NONE NONE NONE Precipitate scalar Visual* NONE NONE NONE NONE NONE Silt scalar Visual* NONE NONE NONE NONE NONE Debris scalar Visual* NONE NONE NONE NONE NONE Sand/Dirt scalar Visual* NORML NORML NORML NORML Odor scalar Visual* NORML NORML NORML NORML Odor scalar Visual* >2 NEG NEG NEG Flue Water scalar Visual* >2 NEG NEG NEG Visco@ 40°C cSt ASTM D7279(m) 6.72 6.9 6.7 6.9 Visco@ 100°C cSt ASTM D279(m) 6.72 6.9 6.7 6.9 <th>Anti-Oxidant 1</th> <td>%</td> <td>ASTM D6971*</td> <td><25</td> <th>98</th> <td>81</td> <td>100</td> | Anti-Oxidant 1 | % | ASTM D6971* | <25 | 98 | 81 | 100 |
| VISUALmethodlimit/basecurrenthistory1history2White MetalscalarVisual*NONENONENONENONENONEYellow MetalscalarVisual*NONENONENONENONENONEPrecipitatescalarVisual*NONENONENONENONENONESiltscalarVisual*NONENONENONENONENONEDebrisscalarVisual*NONENONENONENONENONESand/DirtscalarVisual*NONENONENONENORMLNORMLAppearancescalarVisual*NORMLNORMLNORMLNORMLNORMLOdorscalarVisual*NORMLNORMLNORMLNORMLNORMLOdorscalarVisual*NORMLNORMLNORMLNORMLNORMLEmulsified WaterscalarVisual*NEGNEGNEGNEGFree WaterscalarVisual*NEGNEGNEGNEGFull D PROPERTIESmethodlimit/basecurrenthistory1history2Visco@ 40°CcStASTM D7279(m)6.726.96.76.9Viscosity Index (VI)ScaleASTM D2270*10410899107Separabilityoilh20(emASTM D3427*3.56.806.807.90Foam TendencyVIII/IIIASTM D892*10520/50/500510/50/490490/60/444 </th <th>Anti-Oxidant 2</th> <td>%</td> <td>ASTM D6971*</td> <td><25</td> <th>30</th> <td>38</td> <td>66</td> | Anti-Oxidant 2 | % | ASTM D6971* | <25 | 30 | 38 | 66 |
| White MetalscalarVisual*NONENONENONENONENONEYellow MetalscalarVisual*NONENONENONENONENONEPrecipitatescalarVisual*NONENONENONENONENONESiltscalarVisual*NONENONENONENONENONEDebrisscalarVisual*NONENONENONENONENONESand/DirtscalarVisual*NONENONENONENONENONEAppearancescalarVisual*NORMLNORMLNORMLNORMLNORMLOdorscalarVisual*NORMLNORMLNORMLNORMLNORMLOdorscalarVisual*NORMLNORMLNORMLNORMLNORMLCodorscalarVisual*NORMLNORMLNORMLNORMLNORMLDdorscalarVisual*>2NEGNEGNEGFLUID PROPERTIESmethodlimit/basecurrenthistory1history2Visco@ 40°CcStASTM D7279(m)6.726.96.76.9Visco@ 100°CcStASTM D7279(m)6.726.96.76.9Separabilityoilh2o/emASTM D19270*10410899107Separabilityoilh2o/emASTM D19273.56.806.807.90Foam TendencyVII/IIIASTM D892*10520/50/500510/50/490490/60/444< | MPC Varnish Potential | Scale | ASTM D7843(m)* | >15 | 3 | 1 | 7 |
| Yellow MetalscalarVisual*NONENONENONENONENONEPrecipitatescalarVisual*NONENONENONENONENONESiltscalarVisual*NONENONENONENONENONEDebrisscalarVisual*NONENONENONENONENONESand/DirtscalarVisual*NONENONENONENONENONEAppearancescalarVisual*NORMLNORMLNORMLNORMLNORMLOdorscalarVisual*NORMLNORMLNORMLNORMLNORMLCodorscalarVisual*VORMLNORMLNORMLNORMLNORMLCodorscalarVisual*>2NEGNEGNEGFree WaterscalarVisual*>2NEGNEGNEGFull D PROPERTIESmethodlimit/basecurrenthistory1history2Visco@ 100°CcStASTM D7279(m)6.726.96.76.9Viscosity Index (VI)ScaleASTM D1401*41/39/03/11/66 (30)38/32/10 (30)4/0/36/4 (30Air Release TimeminASTM D892*10520/50/500510/50/490490/60/444Foam TendencyI/II/IIIASTM D892*00/0/00/0/00/0/0ASTM D665*PASSPASSPASSPASSPASSOxidation Test (RPVOT)minutesASTM D2272*400814735624 | VISUAL | | method | limit/base | current | history1 | history2 |
| PrecipitatescalarVisual*NONENONENONENONESiltscalarVisual*NONENONENONENONENONEDebrisscalarVisual*NONENONENONENONENONESand/DirtscalarVisual*NONENONENONENONENONEAppearancescalarVisual*NORMLNORMLNORMLNORMLNORMLOdorscalarVisual*NORMLNORMLNORMLNORMLNORMLEmulsified WaterscalarVisual*>2NEGNEGNEGFree WaterscalarVisual*>2NEGNEGNEGFullD PROPERTIESmethodlimit/basecurrenthistory1history2Visco@ 40°CcStASTM D7279(m)44.445.145.445.4Visco@ 100°CcStASTM D2270*10410899107Separabilityoilh20/emASTM D1401*41/39/03/11/66 (30)3/8/32/10 (30)4/0/36/4 (30Air Release TimeminASTM D3427*3.56.806.807.90Foam TendencyVII/IIIASTM D892*00/0/00/0/00/0/0ASTM ColorscalarASTM D65*PASSPASSPASSPASSOxidation Test (RPVOT)minutesASTM D2272*400814735624SEDIMENTmethodlimit/basecurrenthistory1history2Pentane Insol | White Metal | scalar | Visual* | NONE | NONE | NONE | NONE |
| SiltscalarVisual*NONENONENONENONENONENONENONENONENONENONELIGHTDebrisscalarVisual*NONENONENONENONENONENONENONESand/DirtscalarVisual*NONENONENONENONENONENONENONEAppearancescalarVisual*NORMLNORMLNORMLNORMLNORMLNORMLNORMLNORMLOdorscalarVisual*NORMLNORMLNORMLNORMLNORMLNORMLNORMLNORMLEmulsified WaterscalarVisual*>2NEGNEGNEGNEGFree WaterscalarVisual*>2NEGNEGNEGNEGVisc @ 40°CcStASTM D7279(m)44.445.145.445.4Visc @ 100°CcStASTM D7279(m)6.726.96.76.9Viscosity Index (VI)ScaleASTM D7270(m)6.726.806.807.90Air Release TimeminASTM D1401*41/39/03/11/66 (30)38/32/10 (30)4/0/36/4 (30)Air Release TimeminASTM D3427*3.56.806.807.90Foam TendencyI/II/IIASTM D89200/0/00/0/00/0/0ASTM ColorscalarASTM D1500*0.51.01.01.0Rust PreventionPASSFALASTM D2272*400814735624 | Yellow Metal | scalar | Visual* | NONE | NONE | NONE | NONE |
| DebrisscalarVisual*NONENONENONENONELIGHTSand/DirtscalarVisual*NONENONENONENONENONENONEAppearancescalarVisual*NORMLNORMLNORMLNORMLNORMLNORMLOdorscalarVisual*NORMLNORMLNORMLNORMLNORMLNORMLEmulsified WaterscalarVisual*>2NEGNEGNEGFree WaterscalarVisual*>2NEGNEGNEGFLUID PROPERTIESmethodimit/basecurrenthistory1history2Visc @ 40°CcStASTM D7279(m)44.445.145.445.4Visc @ 100°CcStASTM D7279(m)6.726.96.76.9Viscosity Index (VI)ScaleASTM D1270*10410899107Separabilityoil/h2o/emASTM D1401*41/39/03/11/66 (30)38/32/10 (30)40/36/4 (30Air Release TimeminASTM D3427*3.56.806.807.90Foam TendencyI/II/IIIASTM D892*10520/50/500510/50/490490/60/444Foam StabilityI/II/IIIASTM D892*00/0/00/0/00/0/0ASTM ColorscalarASTM D150*0.51.01.01.0Rust PreventionPASS/FALASTM D665*PASSPASSPASSPASSOxidation Test (RPVOT)minutesASTM D2272*< | Precipitate | scalar | Visual* | NONE | NONE | NONE | NONE |
| Sand/DirtscalarVisual*NONENONENONENONENONEAppearancescalarVisual*NORMLNORMLNORMLNORMLNORMLNORMLOdorscalarVisual*NORMLNORMLNORMLNORMLNORMLNORMLEmulsified WaterscalarVisual*>2NEGNEGNEGFree WaterscalarVisual*>2NEGNEGNEGFLUID PROPERTIESmethodlimit/basecurrenthistory1history2Visc @ 40°CcStASTM D7279(m)6.726.96.76.9Viscosity Index (VI)ScaleASTM D2270*10410899107Separabilityoil/h20/emASTM D1401*41/39/043/11/66 (30)43/3/2/10 (30)40/36/4 (30)Air Release TimeminASTM D3427*3.56.806.807.90Foam Tendency//II/IIIASTM D892*10520/50/500510/50/490490/60/440Foam Stability//II/IIIASTM D892*00/0/00/0/00/0/0ASTM ColorscalarASTM D1500*0.51.01.01.01.0Rust PreventionPASSFAILASTM D655*PASSPASSPASSPASSOxidation Test (RPVOT)minutesASTM D2272*400814735624SEDIMENTmethodlimit/basecurrenthistory1history2Pentane Insolubles%ASTM D893(m)* <td< th=""><th>Silt</th><th>scalar</th><th>Visual*</th><th>NONE</th><th>NONE</th><th>NONE</th><th>NONE</th></td<> | Silt | scalar | Visual* | NONE | NONE | NONE | NONE |
| AppearancescalarVisual*NORMLNORMLNORMLNORMLNORMLNORMLOdorscalarVisual*NORMLNORMLNORMLNORMLNORMLNORMLEmulsified WaterscalarVisual*>2NEGNEGNEGFree WaterscalarVisual*NEGNEGNEGNEGFLUID PROPERTIESmethodlimit/basecurrenthistory1history2Visc @ 40°CcStASTM D7279(m)44.445.145.445.4Visc @ 100°CcStASTM D7279(m)6.726.96.76.9Viscosity Index (VI)ScaleASTM D2270*10410899107Separabilityoil/h2o/emASTM D1401*41/39/03/11/66 (30)3/8/32/10 (30)4/0/36/4 (30)Air Release TimeminASTM D3427*3.56.806.807.90Foam Tendency//II//IIIASTM D892*10520/50/500510/50/490490/60/440Foam Stability//II//IIIASTM D892*00/0/00/0/00/0/0ASTM ColorscalarASTM D1500*0.51.01.01.0Rust PreventionPASS/FAILASTM D2272*400814735624SEDIMENTmethodlimit/basecurrenthistory1history2Pentane Insolubles%ASTM D893(m)*0.0380.1000.124 | Debris | scalar | Visual* | NONE | NONE | NONE | LIGHT |
| OdorscalarVisual*NORMLNORMLNORMLNORMLNORMLEmulsified WaterscalarVisual*>2NEGNEGNEGFree WaterscalarVisual*NEGNEGNEGNEGFLUID PROPERTIESmethodlimit/basecurrenthistory1history2Visc @ 40°CcStASTM D7279(m)44.445.145.445.4Visc @ 100°CcStASTM D7279(m)6.726.96.76.9Viscosity Index (VI)ScaleASTM D2270*10410899107Separabilityoil/h20/emASTM D1401*41/39/03/11/66 (30)38/32/10 (30)40/36/4 (30Air Release TimeminASTM D3427*3.56.806.807.90Foam Tendency//II/IIIASTM D892*10520/50/500510/50/490490/60/440Foam Stability//II/IIIASTM D892*00/0/00/0/00/0/00/0/0ASTM ColorscalarASTM D1500*0.51.01.01.01.0Rust PreventionPASS/FAILASTM D2272*400814735624SEDIMENTmethodlimit/basecurrenthistory1history2Pentane Insolubles%ASTM D893(m)*0.0380.1000.124 | Sand/Dirt | scalar | Visual* | NONE | NONE | NONE | NONE |
| Emulsified WaterscalarVisual*>2NEGNEGNEGFree WaterscalarVisual*NEGNEGNEGFLUID PROPERTIESmethodlimit/basecurrenthistory1history2Visc @ 40°CcStASTM D7279(m)44.445.145.445.4Visc @ 100°CcStASTM D7279(m)6.726.96.76.9Viscosity Index (VI)ScaleASTM D2270*10410899107Separabilityoil/h20/emASTM D1401*41/39/03/11/66 (30)38/32/10 (30)40/36/4 (30Air Release TimeminASTM D3427*3.56.806.807.90Foam TendencyI/II/IIIASTM D892*10520/50/500510/50/490490/60/440Foam StabilityI/II/IIIASTM D892*00/0/00/0/00/0/0ASTM ColorscalarASTM D1500*0.51.01.01.0Rust PreventionPASSFAILASTM D2272*400814735624SEDIMENTmethodlimit/basecurrenthistory1history2Pentane Insolubles%ASTM D893(m)*0.0380.1000.124 | Appearance | scalar | Visual* | NORML | NORML | NORML | NORML |
| Free WaterscalarVisual*NEGNEGNEGFLUID PROPERTIESmethodlimit/basecurrenthistory1history2Visc @ 40°CcStASTM D7279(m)44.445.145.445.4Visc @ 100°CcStASTM D7279(m)6.726.96.76.9Viscosity Index (VI)ScaleASTM D7279(m)6.726.96.76.9Viscosity Index (VI)ScaleASTM D1401*41/39/03/11/66 (30)38/32/10 (30)40/36/4 (30Air Release TimeminASTM D3427*3.56.806.807.90Foam TendencyI/II/IIIASTM D892*10520/50/500510/50/490490/60/440Foam StabilityI/II/IIIASTM D892*00/0/00/0/00/0/0ASTM ColorscalarASTM D1500*0.51.01.01.0Rust PreventionPASSFAILASTM D2272*400814735624SEDIMENTmethodlimit/basecurrenthistory1history2Pentane Insolubles%ASTM D893(m)*0.0380.1000.124 | Odor | scalar | | - | NORML | | |
| FLUID PROPERTIES method limit/base current history1 history2 Visc @ 40°C cSt ASTM D7279(m) 44.4 45.1 45.4 45.4 Visc @ 100°C cSt ASTM D7279(m) 6.72 6.9 6.7 6.9 Viscosity Index (VI) Scale ASTM D7279(m) 6.72 6.9 6.7 6.9 Viscosity Index (VI) Scale ASTM D7279(m) 6.72 6.9 6.7 6.9 Viscosity Index (VI) Scale ASTM D7279(m) 6.72 6.9 6.7 6.9 Viscosity Index (VI) Scale ASTM D7279(m) 6.72 6.9 6.7 6.9 Viscosity Index (VI) Scale ASTM D7279(m) 6.72 6.9 6.7 6.9 Viscosity Index (VI) Scale ASTM D7279(m) 6.72 6.9 6.7 6.9 107 Separability oil/h20/em ASTM D3427* 3.5 6.80 6.80 7.90 490/60/44 Foam Tendency I/II/III | | scalar | | >2 | | | |
| Visc @ 40°C cSt ASTM D7279(m) 44.4 45.1 45.4 45.4 Visc @ 100°C cSt ASTM D7279(m) 6.72 6.9 6.7 6.9 Viscosity Index (VI) Scale ASTM D7279(m) 6.72 6.9 6.7 6.9 Viscosity Index (VI) Scale ASTM D2270* 104 108 99 107 Separability øil/h2o/em ASTM D1401* 41/39/0 A 3/11/66 (30) A 38/32/10 (30) 40/36/4 (30 Air Release Time min ASTM D3427* 3.5 6.80 6.80 7.90 Foam Tendency I/II/III ASTM D892* 10 520/50/500 510/50/490 490/60/440 Foam Stability I/II/III ASTM D892* 0 0/0/0 0/0/0 0/0/0 Foam Stability I/II/III ASTM D892* 0 0/0/0 0/0/0 0/0/0 ASTM Color scalar ASTM D1500* 0.5 1.0 1.0 1.0 Rust Prevention PASSIFAIL ASTM D2272* 400 814 735 624 SEDIMENT <t< th=""><th>Free Water</th><th>scalar</th><th>Visual*</th><th></th><th>NEG</th><th>NEG</th><th>NEG</th></t<> | Free Water | scalar | Visual* | | NEG | NEG | NEG |
| Visc @ 100°C cSt ASTM D7279(m) 6.72 6.9 6.7 6.9 Viscosity Index (VI) Scale ASTM D2270* 104 108 99 107 Separability øl/h2ø/em ASTM D1401* 41/39/0 Å 3/11/66 (30) Å 38/32/10 (30) Å 40/36/4 (30 Air Release Time min ASTM D3427* 3.5 6.80 6.80 7.90 Foam Tendency I/II/III ASTM D892* 10 Å 520/50/500 Å 510/50/490 490/60/440 Foam Stability I/II/III ASTM D892* 0 0/0/0 0/0/0 0/0/0 Foam Stability I/II/III ASTM D892* 0 0/0/0 0/0/0 0/0/0 Foam Stability I/II/III ASTM D1500* 0.5 1.0 1.0 1.0 Rust Prevention PASS/FAIL ASTM D2272* 400 814 735 624 SEDIMENT method limit/base current history1 history2 Pentane Insolubles % ASTM D893(m)* 0.038 0.100 0.124 | FLUID PROPERT | IES | method | limit/base | current | history1 | history2 |
| Viscosity Index (VI) Scale ASTM D2270* 104 108 99 107 Separability oil/h2o/em ASTM D1401* 41/39/0 3/11/66 (30) 38/32/10 (30) 40/36/4 (30) Air Release Time min ASTM D3427* 3.5 6.80 6.80 7.90 Foam Tendency I/II/III ASTM D892* 10 520/50/500 510/50/490 490/60/440 Foam Stability I/II/III ASTM D892* 0 0/0/0 0/0/0 0/0/0 Foam Stability I/II/III ASTM D892* 0 0/0/0 0/0/0 0/0/0 ASTM Color scalar ASTM D1500* 0.5 1.0 1.0 1.0 Rust Prevention PASS/FAIL ASTM D2272* 400 814 735 624 SEDIMENT method limit/base current history1 history2 Pentane Insolubles % ASTM D893(m)* 0.038 0.100 0.124 | Visc @ 40°C | | ASTM D7279(m) | 44.4 | 45.1 | 45.4 | 45.4 |
| Separability oil/h2o/em ASTM D1401* 41/39/0 3/11/66 (30) 38/32/10 (30) 40/36/4 (30) Air Release Time min ASTM D3427* 3.5 6.80 6.80 7.90 Foam Tendency I/II/III ASTM D892* 10 520/50/500 510/50/490 490/60/440 Foam Stability I/II/III ASTM D892* 0 0/0/0 0/0/0 0/0/0 Foam Stability I/II/III ASTM D892* 0 0/0/0 0/0/0 0/0/0 ASTM Color scalar ASTM D1500* 0.5 1.0 1.0 1.0 Rust Prevention PASS/FAIL ASTM D2272* 400 814 735 624 SEDIMENT method limit/base current history1 history2 Pentane Insolubles % ASTM D893(m)* 0.038 0.100 0.124 | Visc @ 100°C | | | | | | |
| Air Release Time min ASTM D3427* 3.5 6.80 6.80 7.90 Foam Tendency I/II/III ASTM D892* 10 ▲ 520/50/500 ▲ 510/50/490 490/60/440 Foam Stability I/II/III ASTM D892* 0 0/0/0 0/0/0 0/0/0 Foam Stability I/II/III ASTM D892* 0 0/0/0 0/0/0 0/0/0 ASTM Color scalar ASTM D1500* 0.5 1.0 1.0 1.0 Rust Prevention PASSFAIL ASTM D665* PASS PASS PASS PASS Dxidation Test (RPVOT) minutes ASTM D2272* 400 814 735 624 SEDIMENT method limit/base current history1 history2 Pentane Insolubles % ASTM D893(m)* 0.038 0.100 0.124 | , | | | | | | |
| Foam Tendency I/II/III ASTM D892* 10 ▲ 520/50/500 ▲ 510/50/490 490/60/440 Foam Stability I/II/III ASTM D892* 0 0/0/0 0/0/0 0/0/0 ASTM Color scalar ASTM D1500* 0.5 1.0 1.0 1.0 Rust Prevention PASS/FAIL ASTM D655* PASS PASS PASS Dxidation Test (RPVOT) minutes ASTM D2272* 400 814 735 624 SEDIMENT method limit/base current history1 history2 Pentane Insolubles % ASTM D893(m)* 0.038 0.100 0.124 | 1 1 | | | | . , | () | () |
| Foam Stability I/II/III ASTM D892* 0 0/0/0 0/0/0 0/0/0 ASTM Color scalar ASTM D1500* 0.5 1.0 1.0 1.0 Rust Prevention PASS/FAIL ASTM D665* PASS PASS PASS PASS Oxidation Test (RPVOT) minutes ASTM D2272* 400 814 735 624 SEDIMENT method limit/base current history1 history2 Pentane Insolubles % ASTM D893(m)* 0.038 0.100 0.124 | | | | | | | |
| ASTM Color scalar ASTM D1500* 0.5 1.0 1.0 1.0 Rust Prevention PASS/FAIL ASTM D665* PASS PASS PASS PASS Oxidation Test (RPVOT) minutes ASTM D2272* 400 814 735 624 SEDIMENT method limit/base current history1 history2 Pentane Insolubles % ASTM D893(m)* 0.038 0.100 0.124 | - | | | | | | |
| Rust Prevention PASS/FAIL ASTM D665* PASS PASS PASS PASS Oxidation Test (RPVOT) minutes ASTM D2272* 400 814 735 624 SEDIMENT method limit/base current history1 history2 Pentane Insolubles % ASTM D893(m)* 0.0038 0.100 0.124 | , | ., | | - | | | |
| Oxidation Test (RPVOT) minutes ASTM D2272* 400 814 735 624 SEDIMENT method limit/base current history1 history2 Pentane Insolubles % ASTM D893(m)* 0.038 0.100 0.124 | | | | | - | | |
| SEDIMENT method limit/base current history1 history2 Pentane Insolubles % ASTM D893(m)* 0.038 0.100 0.124 | | | | | | | |
| Pentane Insolubles % ASTM D893(m)* 0.038 0.100 0.124 | Oxidation Test (RPVOT) | minutes | ASTM D2272* | 400 | 814 | 735 | 624 |
| | SEDIMENT | | method | limit/base | current | history1 | history2 |
| Toluene Insolubles % ASTM D893(m)* 0.010 0.072 0.015 | Pentane Insolubles | % | ASTM D893(m)* | | 0.038 | 0.100 | 0.124 |
| | Toluene Insolubles | % | ASTM D893(m)* | | 0.010 | 0.072 | 0.015 |

Nalcor Energy - Churchill Falls : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9 CALA Sample No. : WC0679959 Received : 31 Aug 2022 PO Box 310 Lab Number : 02508116 Tested :01 Sep 2022 Churchill Falls, NL ISO 17025:2017 Accredited Laboratory Unique Number : 5449086 Diagnosed : 06 Sep 2022 - Bill Quesnel CA A0R 1A0 Test Package : AOM 3 (Additional Tests: BottomAnalysis, FilterPatch, TolInsol) Contact: Robert Noel To discuss this sample report, contact Customer Service at 1-800-268-2131. robertnoel@nlh.nl.ca Test denoted (*) outside scope of accreditation, (m) method modified, (e) tested at external lab. T: (709)925-8294 Validity of results and interpretation are based on the sample and information as supplied. F: (709)925-8220



OIL ANALYSIS REPORT



Contact/Location: Mechanical Engineering - Robert Noel - CHUCHU



FERROGRAPHY REPORT

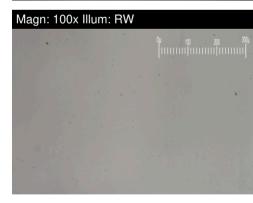
A2 - Thrust Bearing

Thrust Bearing

PETRO CANADA TURBOFLO R&O 46 (5705 LTR)



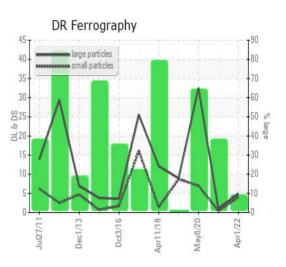


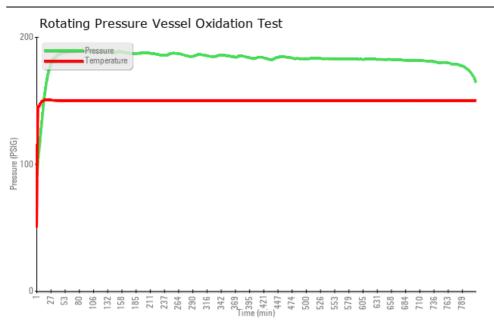


| DR-FERROGRAP | РΗΥ | method | limit/base | current | history1 | history2 |
|----------------------------|------------|-------------|------------|---------|----------|----------|
| Large Particles | | DR-Ferr* | | 4.8 | 0.9 | 32.5 |
| Small Particles | | DR-Ferr* | | 4.0 | 0.4 | 7.0 |
| Total Particles | | DR-Ferr* | > | 8.8 | 1.3 | 39.5 |
| Large Particles Percentage | % | DR-Ferr* | | 9.1 | 38.5 | 64.6 |
| Severity Index | /0 | DR-Ferr* | | 4 | 0.5 | 829 |
| , | | | | - | 0.0 | |
| FERROGRAPHY | | method | limit/base | current | history1 | history2 |
| Ferrous Rubbing | Scale 0-10 | ASTM D7684* | | 1 | 1 | 2 |
| Ferrous Sliding | Scale 0-10 | ASTM D7684* | | | | |
| Ferrous Cutting | Scale 0-10 | ASTM D7684* | | | | |
| Ferrous Rolling | Scale 0-10 | ASTM D7684* | | 1 | 1 | 1 |
| Ferrous Break-in | Scale 0-10 | ASTM D7684* | | | | |
| Ferrous Spheres | Scale 0-10 | ASTM D7684* | | | | |
| Ferrous Black Oxides | Scale 0-10 | ASTM D7684* | | | | 1 |
| Ferrous Red Oxides | Scale 0-10 | ASTM D7684* | | | | |
| Ferrous Corrosive | Scale 0-10 | ASTM D7684* | | | | |
| Ferrous Other | Scale 0-10 | ASTM D7684* | | | | |
| Nonferrous Rubbing | Scale 0-10 | ASTM D7684* | | | | |
| Nonferrous Sliding | Scale 0-10 | ASTM D7684* | | | | |
| Nonferrous Cutting | Scale 0-10 | ASTM D7684* | | | | |
| Nonferrous Rolling | Scale 0-10 | ASTM D7684* | | | | |
| Nonferrous Other | Scale 0-10 | ASTM D7684* | | | | |
| Carbonaceous Material | Scale 0-10 | ASTM D7684* | | | | |
| Lubricant Degradation | Scale 0-10 | ASTM D7684* | | | | |
| Sand/Dirt | Scale 0-10 | ASTM D7684* | | 1 | | 1 |
| Fibres | Scale 0-10 | ASTM D7684* | | | | |
| Spheres | Scale 0-10 | ASTM D7684* | | | | |
| Other | Scale 0-10 | ASTM D7684* | | 1 | 1 | 1 |

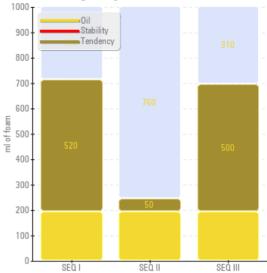
WEAR

All component wear rates are normal. The direct-reading & analytical ferrographic results are normal indicating no abnormal wear in the system.

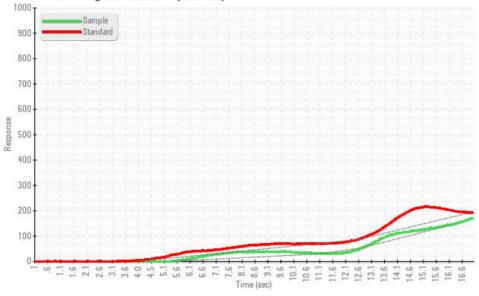




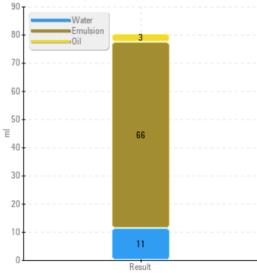
Foaming SEQ I/II/III

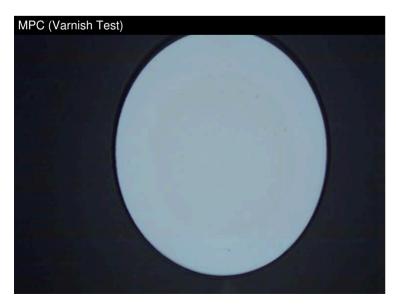


Remaining Useful Life (RULER)

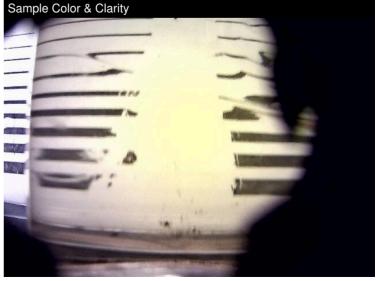


Water Separability





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