

OIL ANALYSIS REPORT

Sample Rating Trend



F/V ARCTIC FURY

Fluid MOBIL DELVAC MX 15W40 (--- QTS)

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

Wear

All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil.

Fluid Condition

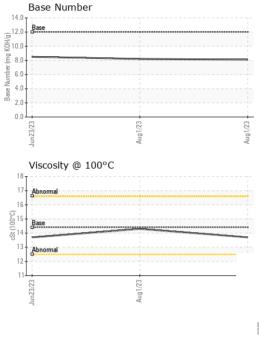
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

| | | | | Aug2023 Aug20 | | |
|---|--|--|--|--|--|--|
| SAMPLE INFORM | ΛΑΤΙΟΝ | method | limit/base | current | history1 | history2 |
| Sample Number | | Client Info | | PE0001208 | PE0001209 | PE0001211 |
| Sample Date | | Client Info | | 01 Aug 2023 | 01 Aug 2023 | 23 Jun 2023 |
| Machine Age | hrs | Client Info | | 13230 | 25360 | 12733 |
| Oil Age | hrs | Client Info | | 855 | 540 | 642 |
| Oil Changed | | Client Info | | Not Changd | Not Changd | Not Changd |
| Sample Status | | | | NORMAL | NORMAL | NORMAL |
| CONTAMINATIO | N | method | limit/base | current | history1 | history2 |
| Fuel | | WC Method | >4.0 | <1.0 | <1.0 | <1.0 |
| Glycol | | WC Method | | NEG | NEG | NEG |
| WEAR METALS | | method | limit/base | current | history1 | history2 |
| Iron | ppm | ASTM D5185m | >25 | 3 | 4 | 2 |
| Chromium | ppm | ASTM D5185m | >5 | <1 | 0 | 0 |
| Nickel | ppm | ASTM D5185m | >5 | <1 | 0 | 0 |
| Titanium | ppm | ASTM D5185m | | 0 | <1 | <1 |
| Silver | ppm | ASTM D5185m | >5 | 0 | 0 | 0 |
| Aluminum | ppm | ASTM D5185m | >10 | 1 | 0 | 2 |
| Lead | ppm | ASTM D5185m | >10 | 0 | <1 | <1 |
| Copper | ppm | ASTM D5185m | >20 | <1 | <1 | <1 |
| Tin | ppm | ASTM D5185m | >5 | <1 | <1 | <1 |
| Vanadium | ppm | ASTM D5185m | | 0 | 0 | <1 |
| Cadmium | ppm | ASTM D5185m | | 0 | 0 | <1 |
| | | | | | | |
| ADDITIVES | | method | limit/base | current | history1 | history2 |
| ADDITIVES Boron | ppm | method ASTM D5185m | limit/base | current 119 | history1 113 | history2 120 |
| | ppm ppm | | limit/base | | | |
| Boron | | ASTM D5185m | limit/base | 119 | 113 | 120 |
| Boron Barium | ppm | ASTM D5185m ASTM D5185m | limit/base | 119 0 | 113 0 | 120 0 |
| Boron Barium Molybdenum | ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m | limit/base | 119 0 11 | 113 0 11 | 120 0 14 |
| Boron Barium Molybdenum Manganese | ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | limit/base | 119 0 11 <1 | 113 0 11 <1 | 120 0 14 <1 |
| Boron Barium Molybdenum Manganese Magnesium | ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | limit/base | 119 0 11 <1 477 | 113 0 11 <1 595 | 120 0 14 <1 375 |
| Boron Barium Molybdenum Manganese Magnesium Calcium | ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | limit/base | 119 0 11 <1 477 1622 | 113 0 11 <1 595 1814 | 120 0 14 <1 375 1807 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus | ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | limit/base | 119 0 11 <1 477 1622 789 | 113 0 11 <1 595 1814 856 | 120 0 14 <1 375 1807 807 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc | ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | limit/base | 119 0 11 <1 477 1622 789 950 | 113 0 11 <1 595 1814 856 1069 | 120 0 14 <1 375 1807 807 972 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur | ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | | 119 0 11 <1 477 1622 789 950 3360 | 113 0 11 <1 595 1814 856 1069 4042 | 120 0 14 <1 375 1807 807 972 3501 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS | ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | limit/base | 119 0 11 <1 477 1622 789 950 3360 current | 113 0 11 <1 595 1814 856 1069 4042 history1 | 120 0 14 <1 375 1807 807 972 3501 history2 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon | ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method | limit/base >25 | 119 0 11 <1 477 1622 789 950 3360 current 5 | 113 0 11 <1 595 1814 856 1069 4042 history1 6 | 120 0 14 <1 375 1807 807 972 3501 history2 4 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium | ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m | limit/base >25 | 119 0 11 <1 477 1622 789 950 3360 current 5 <1 5 | 113 0 11 <1 595 1814 856 1069 4042 history1 6 2 | 120 0 14 <1 375 1807 807 972 3501 history2 4 2 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium | ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m | limit/base >25 >20 | 119 0 11 <1 477 1622 789 950 3360 Current 5 <1 5 | 113 0 11 <1 595 1814 856 1069 4042 history1 6 2 4 | 120 0 14 <1 375 1807 807 972 3501 history2 4 2 4 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m | limit/base >25 >20 limit/base | 119 0 11 <1 477 1622 789 950 3360 <u>current</u> 5 <1 5 <1 | 113 0 11 <1 595 1814 856 1069 4042 history1 6 2 4 4 | 120 0 14 <1 375 1807 807 972 3501 history2 4 2 4 4 kistory2 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % | ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m | limit/base >25 >20 limit/base | 119 0 11 <1 477 1622 789 950 3360 <u>current</u> 5 <1 5 < <u>current</u> 0.1 | 113 0 11 <1 595 1814 856 1069 4042 history1 6 2 4 4 4 0.3 | 120 0 14 <1 375 1807 807 972 3501 history2 4 2 4 2 4 1 0.1 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m | limit/base >25 >20 limit/base | 119 0 11 <1 477 1622 789 950 3360 <u>current</u> 5 <1 5 <1 5 <u>current</u> 0.1 7.6 19.0 | 113 0 11 <1 595 1814 856 1069 4042 history1 6 2 4 4 <u>history1</u> 0.3 7.5 | 120 0 14 <1 375 1807 807 972 3501 history2 4 2 4 2 4 history2 0.1 7.3 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m | limit/base >25 >20 limit/base >20 20 | 119 0 11 <1 477 1622 789 950 3360 <u>current</u> 5 <1 5 <1 5 <u>current</u> 0.1 7.6 19.0 | 113 0 11 <1 595 1814 856 1069 4042 history1 6 2 4 4 4 0.3 7.5 18.8 | 120 0 14 <1 375 1807 807 972 3501 history2 4 2 4 2 4 4 <u>history2</u> 0.1 7.3 20.5 |
| Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D7844 *ASTM D7844 *ASTM D7844 | limit/base >25 >20 limit/base >20 >30 limit/base | 119 0 11 <1 477 1622 789 950 3360 Current 5 <1 5 <1 5 Current 0.1 7.6 19.0 Current | 113 0 11 <1 595 1814 856 1069 4042 history1 6 2 4 4 0.3 7.5 18.8 history1 | 120 0 14 <1 375 1807 807 972 3501 history2 4 2 4 2 4 history2 0.1 7.3 20.5 history2 |



OIL ANALYSIS REPORT

VISUAL



| | 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 |
| Aug1/23 Aug1/23 | Appearance | scalar | *Visual | NORML | NORML | NORML | NORML |
| Aug | Odor | scalar | *Visual | NORML | NORML | NORML | NORML |
| | Emulsified Water | scalar | *Visual | >0.1 | NEG | NEG | NEG |
| | Free Water | | *Visual | | NEG | NEG | NEG |
| | FLUID PROPER | | method | limit/base | current | history1 | history2 |
| | Visc @ 100°C | cSt | ASTM D445 | | 13.7 | 14.3 | 13.7 |
| | GRAPHS | | | | | | |
| | Ferrous Alloys | | | | | | |
| 2 | 10 iron | | | | | | |
| Aug1/23 | 8 - chromium | | | | | | |
| 4 | | | | | | | |
| | u d | | | | | | |
| | 4 | | | | | | |
| | | | | | | | |
| | 2 | | | | | | |
| | 0 | Jana Contraction of the local division of th | | | | | |
| | Jun 23/23 | Aug 1/23 | | Aug1/23 | | | |
| | , | | | Au | | | |
| | Non-ferrous Meta | ls | | | | | |
| | copper | | | | | | |
| | 8 - second lead | | | | | | |
| | | | | | | | |
| | ud d | | | | | | |
| | 4 | | | | | | |
| | 2 | | | | | | |
| | 2 | | | | | | |
| | | 2 | | | | | |
| | Jun23/23 | Aug1/23 | | Aug 1/23 | | | |
| | | A | | \triangleleft | | | |
| | | | | | | | |
| | Viscosity @ 100°C | 2 | | | Base Number | | |
| | Viscosity @ 100°C | | | 14.0 | T | | |
| | Viscosity @ 100°C | C | | 12.0 | Base Number | | |
| | Viscosity @ 100°C | 5 | | 12.0 | T | | |
| | Viscosity @ 100°C | 5 | | 12.0 | T | | |
| | Viscosity @ 100°C | | | 12.0 | T | | |
| | Viscosity @ 100°C | | | 12.0 | T | | |
| | Viscosity @ 100°C | | | | T | | |
| | Viscosity @ 100°C | | | 12.0. (B)HOU W W B0.0 B0.0 B0.0 B0.0 B0.0 B0.0 B0.0 B0.0 | Base | | |
| | Viscosity @ 100°C | | | 12.0. (B)HOU W W B0.0 B0.0 B0.0 B0.0 B0.0 B0.0 B0.0 B0.0 | Base | 01/23 | |
| | Viscosity @ 100°C | Aug 1/23 | | 12.0- (9)HOX HOX BU 39UHOX 8.0- 30UHOX 8.0- 30UHOX 8.0 | T | Aug 1/23 | |
| Laboratory Sample No. Lab Number Unique Number Test Package | Viscosity @ 100°C | 501 Madis Received Diagnose Diagnost I Tests: F | l : 167 ed : 187 ician : Sea T-IR, ICP, KV | 12.0 (Hoy 0) Hoy 0) | EXECUTION N | THE 400 Contact: Se | FURY GROU 5 20TH AVE SEATTLE, V US 981 ervice Manag |
| Sample No. Lab Number Unique Numbe | Viscosity @ 100°C | 501 Madis Received Diagnose Diagnost I Tests: F <i>rice at 1-8</i> 0 | l : 16 / ed : 18 / ician : Sea T-IR, ICP, K\ <i>00-237-136</i> 9 | 12.0 (Hoy Du) 12.0 (Hoy Du) 12.0 (Hoy Du) 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 12.0 10.0 | EXECUTION N | THE 400 | 5 20TH AVE SEATTLE, V US 981 ervice Manag |

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Contact/Location: Service Manager - FURSEA