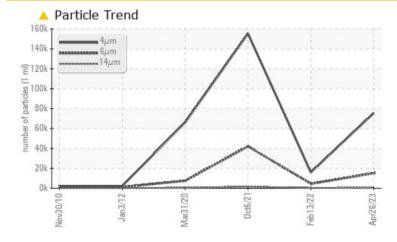


Machine Id **E-08** Component **Wind Turbine Gearbox** Fluid **ROYAL PURPLE SYNFILM GT 320 (65 GAL)**

COMPONENT CONDITION SUMMARY



RECOMMENDATION

Replace filter element and resample at later date. In case already attempted and cleanliness was not improved then proceed to replace oil.

| PROBLEMATIC TEST RESULTS | | | | | | | |
|--------------------------|--------------|---------|-------------------|--------------|---------------|--|--|
| Sample Status | | | ABNORMAL | ABNORMAL | ABNORMAL | | |
| Particles >6µm | ASTM D7647 | >320 | <u> </u> | 4 536 | 4 2101 | | |
| Particles >14µm | ASTM D7647 | >40 | 428 | A 345 | 🔺 1556 | | |
| Particles >21µm | ASTM D7647 | >10 | <u> </u> | 6 5 | 1 88 | | |
| Oil Cleanliness | ISO 4406 (c) | >/15/12 | A 23/21/16 | 🔺 21/19/16 | 🔺 24/23/18 | | |

Customer Id: MITWHI Sample No.: MHI021778 Lab Number: 06016357 Test Package: IND 2



To manage this report scan the QR code

To discuss the diagnosis or test data: Jonathan Hester +1 919-379-4092 x4092 jhester@wearcheckusa.com

To change component or sample information: Customer Service +1 1-800-237-1369 customerservice@wearcheck.com

| RECOMMENDE | RECOMMENDED ACTIONS | | | | | | |
|---------------|---------------------|------|---------|--|--|--|--|
| Action | Status | Date | Done By | Description | | | |
| Change Filter | | | ? | Replace filter element and resample at later date. In case already attempted and cleanliness was not improved then proceed to replace oil. | | | |
| Resample | | | ? | Replace filter element and resample at later date. In case already attempted and cleanliness was not improved then proceed to replace oil. | | | |

HISTORICAL DIAGNOSIS



13 Feb 2022 Diag: Jonathan Hester

Replace filter element and resample at later date. In case already attempted and cleanliness was not improved then proceed to replace oil.All component wear rates are normal. There is a high amount of particulates present in the oil. The AN level is acceptable for this fluid.



view report

06 Oct 2021 Diag: Jonathan Hester



Replace filter element and resample at later date. In case already attempted and cleanliness was not improved then proceed to replace oil.All component wear rates are normal. There is a high amount of particulates present in the oil. The AN level is acceptable for this fluid.

31 Mar 2020 Diag: Doug Bogart



Replace filter element and resample at later date. In case already attempted and cleanliness was not improved then proceed to replace oil.All component wear rates are normal. There is a high amount of particulates present in the oil. The AN level is acceptable for this fluid.



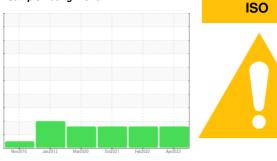


Report Id: MITWHI [WUSCAR] 06016357 (Generated: 11/29/2023 00:04:30) Rev: 1



OIL ANALYSIS REPORT





E-08 Component Wind Turbine Gearbox Fluid **ROYAL PURPLE SYNFILM GT 320 (65 GAL)**

DIAGNOSIS

Machine Id

A Recommendation

Replace filter element and resample at later date. In case already attempted and cleanliness was not improved then proceed to replace oil.

Wear

All component wear rates are normal.

Contamination

There is a high amount of particulates present in the oil.

Fluid Condition

The AN level is acceptable for this fluid.

| Sample Date Image Client Info 26 Apr 2023 13 Feb 2022 06 Oct 2011 Machine Age hrs Client Info 0 0 0 Dil Age hrs Client Info 0 0 0 Sample Status Image Image N/A N/A ABNORMAL ABNORMAL ABNORMAL WEAR METALS method Imit/base current history1 history2 PQ ASTM D8186 >200 15 1 3 3 Chromium ppm ASTM D8186 >3 -1 0 0 Nickel ppm ASTM D5185m >3 0 0 0 Aluminum ppm ASTM D5185m >30 2 0 0 Aluminum ppm ASTM D5185m >30 2 0 0 Aluminum ppm ASTM D5185m >5 0 0 0 Cadadium ppm ASTM D5185m >5 | SAMPLE INFORM | ATION | method | limit/base | current | history1 | history2 |
|---|---|--|---|--|---|--|--|
| Machine Age hrs Client Info 0 0 0 Dil Age hrs Client Info N/A N/A N/A Sample Status Client Info N/A N/A N/A N/A WEAR METALS method Imit/base current history1 history2 PQ ASTM D5186m >200 15 1 3 Chromium ppm ASTM D5186m >3 <1 | Sample Number | | Client Info | | MHI021778 | MHI023701 | MHI017107 |
| Dil Age hrs Client Info 0 0 0 Dil Changed Client Info N/A N/A N/A N/A Sample Status Image Client Info N/A ABNORMAL ABNORMAL WEAR METALS method limit/base current history1 history2 PQ ASTM 05185m >200 19 15 24 iron ppm ASTM 05185m >3 -1 0 0 Nickel ppm ASTM 05185m >3 0 0 0 Silver ppm ASTM 05185m >10 <1 | Sample Date | | Client Info | | 26 Apr 2023 | 13 Feb 2022 | 06 Oct 2021 |
| Dil ChangedClient InfoN/AN/AN/AABNORMAL <t< td=""><td>Machine Age</td><td>hrs</td><td>Client Info</td><td></td><th>0</th><td>0</td><td>0</td></t<> | Machine Age | hrs | Client Info | | 0 | 0 | 0 |
| Sample Status method Imit/base current ABNORMAL ABNORMAL ABNORMAL WEAR METALS method limit/base current history1 history2 PQ ASTM D5185m >200 15 1 3 Chromium ppm ASTM D5185m >3 <1 | Oil Age | hrs | Client Info | | 0 | 0 | 0 |
| WEAR METALS method limit/base ourrent history1 history2 PQ ASTM D8164 >200 19 15 24 iron ppm ASTM D8166 >200 15 1 3 Chromium ppm ASTM D5165m >3 0 0 0 Nickel ppm ASTM D5165m >3 0 0 0 Silver ppm ASTM D5165m >30 2 0 0 Aluminum ppm ASTM D5165m >75 3 3 -1 0 Copper ppm ASTM D5165m >75 3 3 -1 0 Antimony ppm ASTM D5165m >5 0 0 0 0 Addium ppm ASTM D5165m 0 0 0 0 0 Addium ppm ASTM D5165m 0 0 0 0 0 0 0 0 0< | Oil Changed | | Client Info | | N/A | N/A | N/A |
| PQ ASTM D8184 >200 19 15 24 Iron ppm ASTM D5185m >200 15 1 3 Chromium ppm ASTM D5185m >3 0 0 0 Nickel ppm ASTM D5185m >3 0 0 0 Titanium ppm ASTM D5185m >10 <1 | Sample Status | | | | ABNORMAL | ABNORMAL | ABNORMAL |
| tron ppm ASTM D5185m >200 15 1 3 Chromium ppm ASTM D5185m >3 <1 0 0 Nickel ppm ASTM D5185m >3 0 0 0 Silver ppm ASTM D5185m >10 <1 0 0 Silver ppm ASTM D5185m >30 2 0 0 Aluminum ppm ASTM D5185m >50 <1 0 0 Copper ppm ASTM D5185m >10 0 0 0 Antimony ppm ASTM D5185m >10 0 0 0 Cadmium ppm ASTM D5185m >0 0 0 0 Cadmium ppm ASTM D5185m <0 0 0 0 Adagaesium ppm ASTM D5185m <1 <1 <1 <1 Mangauese ppm ASTM D5185m 0 0 0 | WEAR METALS | | method | limit/base | current | history1 | history2 |
| Dromium ppm ASTM D5185m >3 <1 0 0 Nickel ppm ASTM D5185m >3 0 0 0 Silver ppm ASTM D5185m >10 <1 | PQ | | ASTM D8184 | >200 | 19 | 15 | 24 |
| Nickel ppm ASTM D5185m >3 0 0 0 Titanium ppm ASTM D5185m >10 <1 | Iron | ppm | ASTM D5185m | >200 | 15 | 1 | 3 |
| TitaniumppmASTM D5185m>10<100SilverppmASTM D5185m>30200AluminumppmASTM D5185m>30200AluminumppmASTM D5185m>75333<1 | Chromium | ppm | ASTM D5185m | >3 | <1 | 0 | 0 |
| Silver ppm ASTM D5185m >30 2 0 0 Aluminum ppm ASTM D5185m >30 2 0 0 Lead ppm ASTM D5185m >15 0 <1 | Nickel | ppm | ASTM D5185m | >3 | 0 | 0 | 0 |
| Silver ppm ASTM D5185m >30 2 0 0 Aluminum ppm ASTM D5185m >30 2 0 0 Lead ppm ASTM D5185m >15 0 <1 | Titanium | | | | <1 | 0 | 0 |
| Aluminum ppm ASTM D5185m >30 2 0 0 Lead ppm ASTM D5185m >15 0 <1 0 Copper ppm ASTM D5185m >75 3 3 <1 Tin ppm ASTM D5185m >10 0 0 0 Antimony ppm ASTM D5185m >5 0 0 Cadmium ppm ASTM D5185m >5 0 0 ADDITIVES method limit/base current history1 history2 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m <1 <1 <1 <1 Barium ppm ASTM D5185m <0 0 0 0 0 Maganese ppm ASTM D5185m <1 <1 <1 <1 Calcium ppm ASTM D5185m <20 2 | Silver | | ASTM D5185m | | 0 | 0 | 0 |
| Lead ppm ASTM D5185m >15 0 <1 0 Copper ppm ASTM D5185m >75 3 3 <1 | Aluminum | ppm | ASTM D5185m | >30 | 2 | 0 | 0 |
| Copper ppm ASTM D5185m >75 3 3 <1 Tin ppm ASTM D5185m >10 0 0 0 Antimony ppm ASTM D5185m >5 0 0 Vanadium ppm ASTM D5185m >5 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 Manganese ppm ASTM D5185m <1 | Lead | | ASTM D5185m | >15 | 0 | <1 | 0 |
| Tin ppm ASTM D5185m >10 0 0 0 Antimony ppm ASTM D5185m >5 0 0 Vanadium ppm ASTM D5185m >5 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 Manganese ppm ASTM D5185m <1 | Copper | | | | | | |
| Antimony ppm ASTM D5185m >-5 0 0 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 Barium ppm ASTM D5185m -1 <1 | Tin | | ASTM D5185m | >10 | 0 | 0 | 0 |
| Vanadium ppm ASTM D5185m 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 <1 | Antimony | | ASTM D5185m | >5 | | 0 | 0 |
| CadmiumppmASTM D5185m000ADDITIVESmethodlimit/basecurrenthistory1history2BoronppmASTM D5185m0<1 | Vanadium | | ASTM D5185m | | 0 | 0 | 0 |
| Boron ppm ASTM D5185m 0 <1 <1 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m <1 | Cadmium | | ASTM D5185m | | 0 | 0 | 0 |
| Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m <1 <1 <1 Manganese ppm ASTM D5185m 90 47 65 81 Calcium ppm ASTM D5185m 90 12 16 16 Zinc ppm ASTM D5185m 0 0 0 0 Sulfur ppm ASTM D5185m >+30 2 4 6 Sodium ppm ASTM D5185m >20 2 <1 0 Vater % ASTM D5185m >20 2 <1 0 | ADDITIVES | | method | limit/base | current | history1 | history2 |
| Molybdenum ppm ASTM D5185m <1 <1 <1 <1 Manganese ppm ASTM D5185m 90 47 65 81 Calcium ppm ASTM D5185m 90 47 65 81 Calcium ppm ASTM D5185m 90 47 65 81 Calcium ppm ASTM D5185m 0 12 16 Phosphorus ppm ASTM D5185m 0 0 0 Sulfur ppm ASTM D5185m 20990 15708 15466 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >+30 2 4 6 Sodium ppm ASTM D5185m >20 2 <1 | Boron | ppm | ASTM D5185m | | 0 | <1 | <1 |
| Maganese ppm ASTM D5185m 0 0 0 0 Magnesium ppm ASTM D5185m 90 47 65 81 Calcium ppm ASTM D5185m 90 47 0 1 Phosphorus ppm ASTM D5185m 0 12 16 Zinc ppm ASTM D5185m 0 0 0 Sulfur ppm ASTM D5185m 20990 15708 15466 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >+30 2 4 6 Sodium ppm ASTM D5185m >+30 2 <1 | Davisura | | ACTM DE10Em | | • | 0 | 0 |
| Magnesium ppm ASTM D5185m 90 47 65 81 Calcium ppm ASTM D5185m 0 12 16 Phosphorus ppm ASTM D5185m 0 12 16 Zinc ppm ASTM D5185m 0 0 0 0 Sulfur ppm ASTM D5185m 20990 15708 15466 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >+30 2 4 6 Sodium ppm ASTM D5185m >20 2 <1 | Barlum | ppm | ASTM DS185m | | 0 | 0 | 0 |
| Calcium ppm ASTM D5185m <1 0 <1 Phosphorus ppm ASTM D5185m 0 12 16 Zinc ppm ASTM D5185m 0 0 0 0 Sulfur ppm ASTM D5185m 20990 15708 15466 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >+30 2 4 6 Sodium ppm ASTM D5185m >20 2 <1 | | | | | - | | |
| Phosphorus ppm ASTM D5185m 0 12 16 Zinc ppm ASTM D5185m 0 0 0 0 Sulfur ppm ASTM D5185m 20990 15708 15466 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >+30 2 4 6 Sodium ppm ASTM D5185m >+30 2 4 6 Sodium ppm ASTM D5185m >+30 2 4 6 Sodium ppm ASTM D5185m >20 2 <1 0 Water % ASTM D5185m >20 2 <1 0 opm ASTM D5185m >20 2 <1 0 0 Water % ASTM D5185m >20 2 <1 0 ppm ASTM D6304 >0.0 131 53.0 113.9 FLUID CL | | ppm | ASTM D5185m | | <1 | <1 | <1 |
| Zinc ppm ASTM D5185m 0 0 0 Sulfur ppm ASTM D5185m 20990 15708 15466 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >+30 2 4 6 Sodium ppm ASTM D5185m >+30 2 4 6 Sodium ppm ASTM D5185m >+30 2 4 6 Sodium ppm ASTM D5185m >20 2 <1 | Molybdenum | ppm ppm | ASTM D5185m ASTM D5185m | 90 | <1 0 | <1 0 | <1 0 |
| Sulfur ppm ASTM D5185m 20990 15708 15466 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >+30 2 4 6 Sodium ppm ASTM D5185m >+30 2 4 6 Sodium ppm ASTM D5185m >+30 2 4 6 Sodium ppm ASTM D5185m >+30 2 4 6 Potassium ppm ASTM D5185m >20 2 <1 0 Water % ASTM D6304 >0.1 0.013 0.005 0.011 opm Water ppm ASTM D6304 >1000 131 53.0 113.9 FLUID CLEANLINESS method limit/base current history1 history2 Particles >4µm ASTM D7647 >320 15169 4536 42101 Particles >14µm ASTM D7647 >40 428 <th< td=""><td>Molybdenum Manganese</td><td>ppm ppm ppm</td><td>ASTM D5185m ASTM D5185m ASTM D5185m</td><td>90</td><th><1 0 47</th><td><1 0 65</td><td><1 0 81</td></th<> | Molybdenum Manganese | ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m | 90 | <1 0 47 | <1 0 65 | <1 0 81 |
| CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >+30 2 4 6 Sodium ppm ASTM D5185m >+30 2 4 6 Sodium ppm ASTM D5185m >20 2 <1 | Molybdenum Manganese Magnesium | ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 90 | <1 0 47 <1 | <1 0 65 0 | <1 0 81 <1 |
| Silicon ppm ASTM D5185m >+30 2 4 6 Sodium ppm ASTM D5185m >20 2 <1 0 Potassium ppm ASTM D5185m >20 2 <1 0 Water % ASTM D6304 >0.1 0.013 0.005 0.011 opm Water ppm ASTM D6304 >1000 131 53.0 113.9 FLUID CLEANLINESS method limit/base current history1 history2 Particles >4µm ASTM D7647 75495 15994 155289 Particles >6µm ASTM D7647 >320 15169 4536 42101 Particles >14µm ASTM D7647 >40 428 345 1556 Particles >21µm ASTM D7647 >10 60 65 188 Particles >38µm ASTM D7647 >3 1 7 10 Particles >71µm ASTM D7647 >3 0 1 2 | Molybdenum Manganese Magnesium Calcium | ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 90 | <1 0 47 <1 0 | <1 0 65 0 12 | <1 0 81 <1 16 |
| Sodium ppm ASTM D5185m 0 0 0 Potassium ppm ASTM D5185m >20 2 <1 0 Water % ASTM D6304 >0.1 0.013 0.005 0.011 opm Water ppm ASTM D6304 >1000 131 53.0 113.9 FLUID CLEANLINESS method limit/base current history1 history2 Particles >4µm ASTM D7647 >320 ▲ 15169 ▲ 4536 ▲ 42101 Particles >6µm ASTM D7647 >40 ▲ 428 ▲ 345 ▲ 1556 Particles >14µm ASTM D7647 >10 ▲ 60 ▲ 65 ▲ 188 Particles >21µm ASTM D7647 >3 1 ▲ 7 ▲ 100 Particles >38µm ASTM D7647 >3 0 1 2 | Molybdenum Manganese Magnesium Calcium Phosphorus | ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | 90 | <1 0 47 <1 0 0 | <1 0 65 0 12 0 | <1 0 81 <1 16 0 |
| Potassium ppm ASTM D5185m >20 2 <1 0 Water % ASTM D6304 >0.1 0.013 0.005 0.011 opm Water ppm ASTM D6304 >1000 131 53.0 113.9 FLUID CLEANLINESS method limit/base current history1 history2 Particles >4µm ASTM D7647 >320 ▲ 15169 ▲ 4536 ▲ 42101 Particles >6µm ASTM D7647 >40 ▲ 428 ▲ 345 ▲ 1556 Particles >14µm ASTM D7647 >10 ▲ 60 ▲ 65 ▲ 188 Particles >21µm ASTM D7647 >3 1 ▲ 7 ▲ 10 Particles >71µm ASTM D7647 >3 0 1 2 | 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 | | <1 0 47 <1 0 0 20990 | <1 0 65 0 12 0 15708 | <1 0 81 <1 16 0 15466 |
| Water % ASTM D6304 >0.1 0.013 0.005 0.011 opm Water ppm ASTM D6304 >1000 131 53.0 113.9 FLUID CLEANLINESS method limit/base current history1 history2 Particles >4µm ASTM D7647 75495 15994 155289 Particles >6µm ASTM D7647 >320 15169 4536 42101 Particles >14µm ASTM D7647 >40 428 345 1556 Particles >21µm ASTM D7647 >10 60 65 188 Particles >38µm ASTM D7647 >3 1 7 10 Particles >71µm ASTM D7647 >3 0 1 2 | Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur | ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m | limit/base | <1 0 47 <1 0 0 20990 current | <1 0 65 0 12 0 15708 history1 | <1 0 81 <1 16 0 15466 history2 |
| opm Water ppm ASTM D6304 >1000 131 53.0 113.9 FLUID CLEANLINESS method limit/base current history1 history2 Particles >4µm ASTM D7647 75495 15994 155289 Particles >6µm ASTM D7647 >320 15169 4536 42101 Particles >14µm ASTM D7647 >40 428 345 1556 Particles >21µm ASTM D7647 >10 60 65 188 Particles >38µm ASTM D7647 >3 1 7 10 2 | 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 method ASTM D5185m | limit/base | <1 0 47 <1 0 0 20990 current 2 | <1 0 65 0 12 0 15708 history1 4 | <1 0 81 <1 16 0 15466 history2 6 |
| FLUID CLEANLINESS method limit/base current history1 history2 Particles >4μm ASTM D7647 75495 15994 155289 Particles >6μm ASTM D7647 >320 15169 4536 42101 Particles >14μm ASTM D7647 >40 428 345 1556 Particles >21μm ASTM D7647 >10 60 65 188 Particles >38μm ASTM D7647 >3 1 7 10 Particles >71μm ASTM D7647 >3 0 1 2 | Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon | ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method ASTM D5185m | limit/base >+30 | <1 0 47 <1 0 0 20990 current 2 0 | <1 0 65 0 12 0 15708 history1 4 0 | <1 0 81 <1 16 0 15466 history2 6 0 |
| Particles >4µm ASTM D7647 75495 15994 155289 Particles >6µm ASTM D7647 >320 15169 4536 42101 Particles >14µm ASTM D7647 >40 428 345 1556 Particles >21µm ASTM D7647 >10 60 65 188 Particles >38µm ASTM D7647 >3 1 7 10 Particles >71µm ASTM D7647 >3 0 1 2 | Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium | ppm ppm ppm 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 >+30 >20 | <1 0 47 <1 0 0 20990 current 2 0 2 | <1 0 65 0 12 0 15708 history1 4 0 <1 | <1 0 81 <1 16 0 15466 history2 6 0 0 |
| Particles >6μm ASTM D7647 >320 15169 4536 42101 Particles >14μm ASTM D7647 >40 428 345 1556 Particles >21μm ASTM D7647 >10 60 65 188 Particles >38μm ASTM D7647 >3 1 7 10 Particles >71μm ASTM D7647 >3 0 1 2 | Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Water | ppm ppm ppm ppm ppm ppm ppm ppm ppm % | ASTM D5185m ASTM D5185m | limit/base >+30 >20 >0.1 | <1 0 47 <1 0 0 20990 current 2 0 2 0 2 0 0 2 0 0.013 | <1 0 65 0 12 0 15708 history1 4 0 <1 0.005 | <1 0 81 <1 16 0 15466 history2 6 0 0 0 0.011 |
| Particles >14μm ASTM D7647 >40 428 345 1556 Particles >21μm ASTM D7647 >10 ▲ 60 ▲ 65 ▲ 188 Particles >38μm ASTM D7647 >3 1 ▲ 7 ▲ 10 Particles >71μm ASTM D7647 >3 0 1 2 | Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Water ppm Water | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D6304 | limit/base >+30 >20 >0.1 >1000 | <1 0 47 <1 0 20990 current 2 0 2 0 2 0.013 131 | <1 0 65 0 12 0 15708 history1 4 0 <1 0.005 53.0 | <1 0 81 <1 16 0 15466 history2 6 0 0 0 0.011 113.9 |
| Particles >21μm ASTM D7647 >10 60 65 188 Particles >38μm ASTM D7647 >3 1 7 10 Particles >71μm ASTM D7647 >3 0 1 2 | Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Water ppm Water FLUID CLEANLIN | ppm ppm ppm 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 ASTM D5304 ASTM D6304 ASTM D6304 | limit/base >+30 >20 >0.1 >1000 | <1 0 47 <1 0 0 20990 current 2 0 2 0 0 2 0.013 131 current | <1 0 65 0 12 0 15708 history1 4 0 <1 0.005 53.0 history1 | <1 0 81 <1 16 0 15466 history2 6 0 0 0.011 113.9 history2 |
| Particles >38μm ASTM D7647 >3 1 ▲ 7 ▲ 10 Particles >71μm ASTM D7647 >3 0 1 2 | Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Water ppm Water | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D6304 ASTM D6304 ASTM D6304 ASTM D6304 | limit/base >+30 >20 >0.1 >1000 limit/base | <1 0 47 <1 0 20990 current 2 0 2 0.013 131 current 75495 | <1 0 65 0 12 0 15708 history1 4 0 <1 0.005 53.0 history1 15994 | <1 0 81 <1 16 0 15466 bistory2 6 0 0 0 0.011 113.9 bistory2 155289 |
| Particles >38μm ASTM D7647 >3 1 ▲ 7 ▲ 10 Particles >71μm ASTM D7647 >3 0 1 2 | Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Water pm Water FLUID CLEANLIN Particles >4µm | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D6304 ASTM D6304 ASTM D6304 ASTM D7647 ASTM D7647 | limit/base >+30 >20 >0.1 >1000 limit/base >320 | <1 0 47 <1 0 20990 current 2 0 2 0 2 0.013 131 current 75495 ▲ 15169 | <1 0 65 0 12 0 15708 history1 4 0 <1 0.005 53.0 history1 15994 ▲ 4536 | <1 0 81 <1 16 0 15466 history2 6 0 0 0.011 113.9 history2 155289 ▲ 42101 |
| | Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Water ppm Water FLUID CLEANLIN Particles >4µm Particles >6µm | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D6304 ASTM D6304 ASTM D6304 ASTM D7647 ASTM D7647 ASTM D7647 | limit/base >+30 >20 >0.1 >1000 limit/base >320 >40 | <1 0 47 <1 0 20990 current 2 0 2 0 2 0.013 131 current 75495 15169 4 428 | <1 0 65 0 12 0 15708 history1 4 0 <1 0.005 53.0 history1 15994 4536 345 | <1 0 81 <1 16 0 15466 history2 6 0 0 0 0.011 113.9 history2 155289 ▲ 42101 ▲ 1556 |
| | Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Water ppm Water FLUID CLEANLIN Particles >4µm Particles >14µm | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D6304 ASTM D6304 ASTM D6304 ASTM D7647 ASTM D7647 ASTM D7647 ASTM D7647 | limit/base >+30 >20 >0.1 >1000 limit/base >320 >40 >10 | <1 0 47 <1 0 20990 current 2 0 2 0.013 131 current 75495 15169 428 60 | <1 0 65 0 12 0 15708 history1 4 0 <1 0.005 53.0 history1 15994 4536 345 65 | <1 0 81 <1 16 0 15466 history2 6 0 0 0.011 113.9 history2 155289 ▲ 42101 ▲ 1556 ▲ 188 |
| | Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Water ppm Water FLUID CLEANLIN Particles >4µm Particles >6µm Particles >14µm Particles >21µm | ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm | ASTM D5185m ASTM D6304 ASTM D6304 ASTM D6304 ASTM D7647 ASTM D7647 ASTM D7647 ASTM D7647 | limit/base >+30 >20 >0.1 >1000 limit/base >320 >40 >10 >3 | <1 0 47 <1 0 20990 20990 current 2 0 2 0.013 131 current 75495 15169 4 28 428 60 1 | <1 0 65 0 12 0 15708 history1 4 0 <1 0.005 53.0 history1 15994 ▲ 4536 ▲ 345 ▲ 65 ▲ 7 | <1 0 81 <1 16 0 15466 history2 6 0 0 0.011 113.9 history2 155289 ▲ 42101 ▲ 1556 ▲ 188 ▲ 10 |



Particle Trend

1400

1/2/mm

01/2 us

PQ

400 350 - Seve 300 -250 -

Water (KF)

Feb 13/22

Feb13/22

Color

Bottom

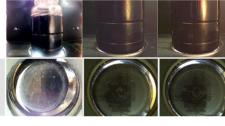
0ct6/71

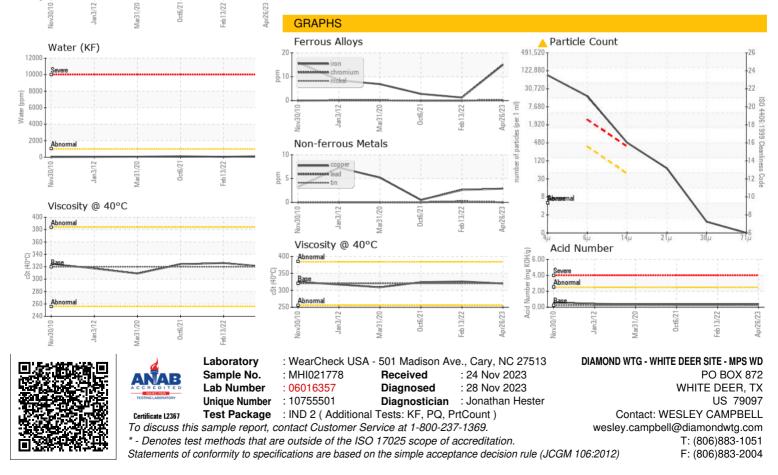
CUSHO(

160k 140k E 120k

OIL ANALYSIS REPORT

| FLUID DEGRADA | TION | method | limit/base | current | history1 | history2 |
|------------------|----------|------------|------------|---------|----------|----------|
| Acid Number (AN) | mg KOH/g | ASTM D8045 | 0.25 | 0.38 | 0.35 | 0.36 |
| VISUAL | | method | limit/base | current | history1 | history2 |
| White Metal | scalar | *Visual | NONE | NONE | NONE | LIGHT |
| Yellow Metal | scalar | *Visual | NONE | NONE | NONE | NONE |
| Precipitate | scalar | *Visual | NONE | NONE | NONE | NONE |
| Silt | scalar | *Visual | NONE | LIGHT | NONE | NONE |
| Debris | scalar | *Visual | NONE | NONE | LIGHT | LIGHT |
| 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 |
| Free Water | scalar | *Visual | | NEG | NEG | NEG |
| FLUID PROPERT | ES | method | limit/base | current | history1 | history2 |
| Visc @ 40°C | cSt | ASTM D445 | 320 | 320 | 326 | 324 |
| SAMPLE IMAGES | | method | limit/base | current | history1 | history2 |





Contact/Location: WESLEY CAMPBELL - MITWHI