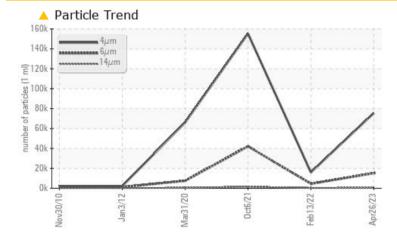


### Machine Id **E-08** Component **Wind Turbine Gearbox** Fluid **ROYAL PURPLE SYNFILM GT 320 (65 GAL)**

### 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>	<b>4</b> 536	<b>4</b> 2101		
Particles >14µm	ASTM D7647	>40	<b>428</b>	<b>A</b> 345	🔺 1556		
Particles >21µm	ASTM D7647	>10	<u> </u>	<b>6</b> 5	<b>1</b> 88		
Oil Cleanliness	ISO 4406 (c)	>/15/12	<b>A</b> 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.

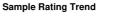


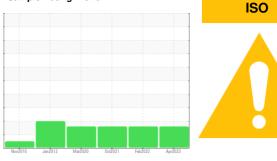


Report Id: MITWHI [WUSCAR] 06016357 (Generated: 11/29/2023 00:04:30) Rev: 1



# **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>&lt;1 0 47</th><td>&lt;1 0 65</td><td>&lt;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 <b>method</b> 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 <b>method</b> 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

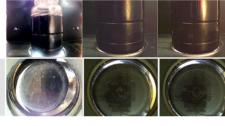
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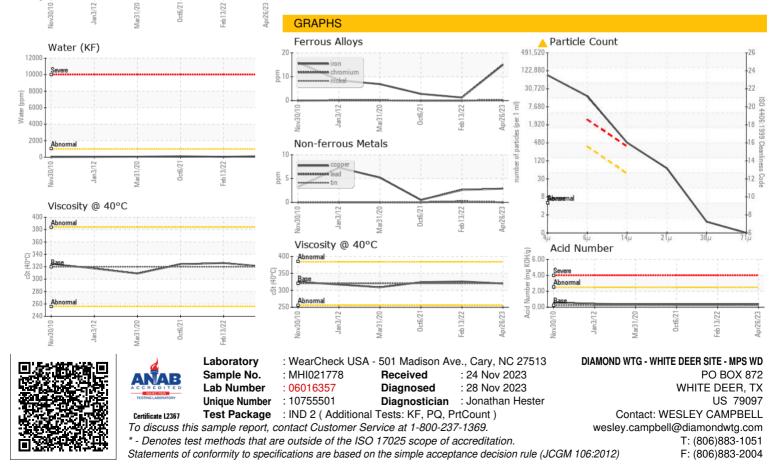
CUSHO(

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