

# **OIL ANALYSIS REPORT**

Area **P2** 3543-A - 3540A CRYSTALLIZER Component

Gearbox

**MOBIL MOBILGEAR 600 XP ISO 150 (44 QTS)** 

# Sample Rating Trend



# DIAGNOSIS Recommendation

Resample at the next service interval to monitor.

All component wear rates are normal.

# Contamination

The system cleanliness is acceptable for your target ISO 4406 cleanliness code. The water content is negligible. The system and fluid cleanliness is acceptable.

# **Fluid Condition**

The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

SAMPLE INFORMATION   method   fimit/base   current   mistory1   mistory2	TS)		Fel	2020	May2021 Sep20	21	
Sample Date	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age   hrs   Client Info   0   0   0   0   150	Sample Number		Client Info		WC0614175	WC0565728	WC0425042
Oil Age         hrs         Client Info         N/A         N/A         N/A         NICA Not Changd           Sample Status         Client Info         N/A         N/A         N/A         NORMAL         NORMAL           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         ≥200         0         <1	Sample Date		Client Info		02 Sep 2021	07 May 2021	24 Feb 2020
Oil Changed Sample Status         Client Info         N/A         N/A         NORMAL         NORMAL	Machine Age	hrs	Client Info		0	0	0
NORMAL   NORMAL   NORMAL   NORMAL	Oil Age	hrs	Client Info		0	0	150
WEAR METALS	Oil Changed		Client Info		N/A	N/A	Not Changd
Iron	Sample Status				NORMAL	NORMAL	NORMAL
Chromium         ppm         ASTM D5185m         >15         0         0         0           Titanium         ppm         ASTM D5185m         0         0         0         0           Silver         ppm         ASTM D5185m         0         0         0         0           Silver         ppm         ASTM D5185m         1         2         2         2           Aluminum         ppm         ASTM D5185m         100         0         <1         0           Lead         ppm         ASTM D5185m         >200         0         <1         0           Copper         ppm         ASTM D5185m         >200         0         <1         0           Tin         ppm         ASTM D5185m         0         0         0         0           Antimony         ppm         ASTM D5185m         0         0         0         0           Vanadium         ppm         ASTM D5185m         0         0         0         -1           ADDITIVES         method         limit/base         current         history1         history2           Barium         ppm         ASTM D5185m         0         0         -1         0 <th>WEAR METALS</th> <th></th> <th>method</th> <th>limit/base</th> <th>current</th> <th>history1</th> <th>history2</th>	WEAR METALS		method	limit/base	current	history1	history2
Nickel         ppm         ASTM D5185m         >15         0         0         0           Titanium         ppm         ASTM D5185m         0         0         0         0           Silver         ppm         ASTM D5185m         1         2         2         2           Aluminum         ppm         ASTM D5185m         >20         0         0         0         0         0           Lead         ppm         ASTM D5185m         >200         0         <1	Iron	ppm	ASTM D5185m	>200	0	<1	<1
Titanium         ppm         ASTM D5185m         0         0         0         0           Silver         ppm         ASTM D5185m         1         2         2           Aluminum         ppm         ASTM D5185m         >25         0         0         0           Lead         ppm         ASTM D5185m         >200         0         <1	Chromium	ppm	ASTM D5185m	>15	0	0	0
Silver         ppm         ASTM D5185m         1         2         2           Aluminum         ppm         ASTM D5185m         >25         0         0         0           Lead         ppm         ASTM D5185m         >100         0         <1	Nickel	ppm	ASTM D5185m	>15	0	0	0
Aluminum	Titanium	ppm	ASTM D5185m		0	0	0
Lead         ppm         ASTM D5185m         >100         0         <1         0           Copper         ppm         ASTM D5185m         >200         0         <1         0           Tin         ppm         ASTM D5185m         >25         0         0         0           Antimony         ppm         ASTM D5185m         0         0         0         0           Vanadium         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         <1         No           Barium         ppm         ASTM D5185m         0         0         <1         No         0         <1         No         0         <1         No         0         <1         No         0         <1         0         <1         0         <1         0         <1         0         <1         0         <1         0         <1         0         <1         0         <1         0         <1         0         <1         0         <1         0         <1         0         <1         0         <1         0         <1         <0         <1         0 </td <td>Silver</td> <td>ppm</td> <td>ASTM D5185m</td> <td></td> <th>1</th> <td>2</td> <td>2</td>	Silver	ppm	ASTM D5185m		1	2	2
Copper         ppm         ASTM D5185m         >200         0         <1         0           Tin         ppm         ASTM D5185m         >25         0         0         0           Antimony         ppm         ASTM D5185m         0         0         0         0           Vanadium         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         1           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         0         <1	Aluminum	ppm	ASTM D5185m	>25	0	0	0
Tin         ppm         ASTM D5185m         ≥25         0         0         0           Antimony         ppm         ASTM D5185m         0         0         0         0           Vanadium         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0         <1           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         0         <1         0           Barium         ppm         ASTM D5185m         0         0         <1         0           Molybdenum         ppm         ASTM D5185m         0         <1         0           Manganese         ppm         ASTM D5185m         0         <1         0           Magnesium         ppm         ASTM D5185m         0         <1         0           Phosphorus         ppm         ASTM D5185m         0         <1         0           Phosphorus         ppm         ASTM D5185m         0         0         0         0           Sulfur         ppm	Lead	ppm	ASTM D5185m	>100	0	<1	0
Antimony         ppm         ASTM D5185m         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         0         <1           Boron         ppm         ASTM D5185m         0         0         <1           Molybdenum         ppm         ASTM D5185m         0         0         0           Magnesium         ppm         ASTM D5185m         0         <1         <1           Calcium         ppm         ASTM D5185m         0         <1         <1           Calcium         ppm         ASTM D5185m         0         <1         <1           Viliar         ppm         ASTM D5185m         0         <1         <0           Phosphorus         ppm         ASTM D5185m         0         <1         <0           Sulfur         ppm         ASTM D5185m         0         <0         <0           Sulfur	Copper	ppm	ASTM D5185m	>200	0	<1	0
Vanadium         ppm         ASTM D5185m         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         <1           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         12         22         29           Barium         ppm         ASTM D5185m         0         0         <1           Molybdenum         ppm         ASTM D5185m         0         <1         0           Magnesium         ppm         ASTM D5185m         0         <1         0           Magnesium         ppm         ASTM D5185m         0         <1         0           Phosphorus         ppm         ASTM D5185m         326         316         310           Zinc         ppm         ASTM D5185m         0         0         0           Sulfur			ASTM D5185m	>25	0	0	0
Vanadium         ppm         ASTM D5185m         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         <1           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         0         <1         0           Barium         ppm         ASTM D5185m         0         0         0         <1           Molybdenum         ppm         ASTM D5185m         0         0         0         0           Magnessum         ppm         ASTM D5185m         0         <1         0         0           Calcium         ppm         ASTM D5185m         0         <1         0         1         0           Phosphorus         ppm         ASTM D5185m         0         <1         0         0         0           Sulfur         ppm         ASTM D5185m         0         0         0         0         0           Sulfur         ppm         ASTM D5185m         0         0         0         0         0           Sulfur         ppm         ASTM D5185m         0         0 <td>Antimony</td> <td></td> <td></td> <td></td> <th>0</th> <td>0</td> <td>0</td>	Antimony				0	0	0
Cadmium         ppm         ASTM D5185m         0         0         <1           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         0         <1         0           Barium         ppm         ASTM D5185m         0         0         <1         0           Molybdenum         ppm         ASTM D5185m         0         <1         0         <1         0           Magnesium         ppm         ASTM D5185m         0         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1 <td>•</td> <td></td> <td>ASTM D5185m</td> <td></td> <th>0</th> <td></td> <td>0</td>	•		ASTM D5185m		0		0
Boron         ppm         ASTM D5185m         12         22         29           Barium         ppm         ASTM D5185m         0         0         <1           Molybdenum         ppm         ASTM D5185m         0         0         0           Magnesium         ppm         ASTM D5185m         0         <1         0           Magnesium         ppm         ASTM D5185m         0         <1         0           Calcium         ppm         ASTM D5185m         326         316         310           Zinc         ppm         ASTM D5185m         0         0         0           Zinc         ppm         ASTM D5185m         0         0         0           Sulfur         ppm         ASTM D5185m         0         0         0           Sulfur         ppm         ASTM D5185m         >0         0         0           Sodium         ppm         ASTM D5185m         >0         0         0           Sodium         ppm         ASTM D5185m         >0         0         0         0           Sodium         ppm         ASTM D5185m         >0         0         0         0           Value							
Barium	ADDITIVES		method	limit/base	current	history1	history2
Barium	Boron	maa	ASTM D5185m		12	22	29
Molybdenum         ppm         ASTM D5185m         0         0         0           Manganese         ppm         ASTM D5185m         0         <1         0           Magnesium         ppm         ASTM D5185m         0         <1         <1           Calcium         ppm         ASTM D5185m         0         <1         0           Phosphorus         ppm         ASTM D5185m         326         316         310           Zinc         ppm         ASTM D5185m         0         0         0           Sulfur         ppm         ASTM D5185m         0         0         0           Sulfur         ppm         ASTM D5185m         50         0         0         0           Sodium         ppm         ASTM D5185m         >50         0         0         0           Sodium         ppm         ASTM D5185m         >50         0         0         0           Sodium         ppm         ASTM D5185m         0         0         0         0           Vater         %         ASTM D5185m         0         0         0         0           Vater         %         ASTM D5185m         0         0	Barium		ASTM D5185m		0	0	<1
Manganese         ppm         ASTM D5185m         0         <1         0           Magnesium         ppm         ASTM D5185m         0         <1         <1           Calcium         ppm         ASTM D5185m         0         <1         0           Phosphorus         ppm         ASTM D5185m         326         316         310           Zinc         ppm         ASTM D5185m         0         0         0           Sulfur         ppm         ASTM D5185m         10494         13752         14118           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >50         0         0         0           Sodium         ppm         ASTM D5185m         >50         0         0         0           Potassium         ppm         ASTM D5185m         >20         0         <1	Molybdenum				0	0	
Magnesium         ppm         ASTM D5185m         0         <1         <1           Calcium         ppm         ASTM D5185m         0         <1         0           Phosphorus         ppm         ASTM D5185m         326         316         310           Zinc         ppm         ASTM D5185m         0         0         0           Sulfur         ppm         ASTM D5185m         10494         13752         14118           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >50         0         0         0           Sodium         ppm         ASTM D5185m         >50         0         0         0           Sodium         ppm         ASTM D5185m         >20         0         <1	-		ASTM D5185m		0		
Calcium         ppm         ASTM D5185m         0         <1         0           Phosphorus         ppm         ASTM D5185m         326         316         310           Zinc         ppm         ASTM D5185m         0         0         0           Sulfur         ppm         ASTM D5185m         10494         13752         14118           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >50         0         0         0           Sodium         ppm         ASTM D5185m         >50         0         0         0           Sodium         ppm         ASTM D5185m         >20         0         <1	-		ASTM D5185m		0	<1	<1
Phosphorus         ppm         ASTM D5185m         326         316         310           Zinc         ppm         ASTM D5185m         0         0         0           Sulfur         ppm         ASTM D5185m         10494         13752         14118           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >50         0         0         0           Sodium         ppm         ASTM D5185m         >50         0         0         0           Potassium         ppm         ASTM D5185m         >20         0         <1	_		ASTM D5185m		0	<1	0
Zinc         ppm         ASTM D5185m         0         0         0           Sulfur         ppm         ASTM D5185m         10494         13752         14118           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >50         0         0         0           Sodium         ppm         ASTM D5185m         >20         0         <1	Phosphorus				326	316	310
Sulfur         ppm         ASTM D5185m         10494         13752         14118           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >50         0         0         0           Sodium         ppm         ASTM D5185m         >0         0         0         0           Potassium         ppm         ASTM D5185m         >20         0         <1							
Silicon         ppm         ASTM D5185m         >50         0         0         0           Sodium         ppm         ASTM D5185m         0         0         0         0           Potassium         ppm         ASTM D5185m         >20         0         <1         <1           Water         %         ASTM D6304         >0.2         0.007         0.012         0.008           ppm Water         ppm         ASTM D6304         >2000         75.1         120.2         80           FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4μm         ASTM D7647         >20000         7122         1835         3846           Particles >6μm         ASTM D7647         >5000         1317         305         829           Particles >14μm         ASTM D7647         >640         101         21         41           Particles >21μm         ASTM D7647         >160         20         7         8           Particles >71μm         ASTM D7647         >10         0         0         0           Oil Cleanliness         ISO 4406 (c)         >21/19/16         20/18/14         18/15/12	-				-		14118
Sodium         ppm         ASTM D5185m         0         0         0           Potassium         ppm         ASTM D5185m         >20         0         <1	CONTAMINANTS	3	method	limit/base	current	history1	history2
Sodium         ppm         ASTM D5185m         0         0         0           Potassium         ppm         ASTM D5185m         >20         0         <1	Silicon	ppm	ASTM D5185m	>50	0	0	0
Potassium         ppm         ASTM D5185m         >20         0         <1         <1           Water         %         ASTM D6304         >0.2         0.007         0.012         0.008           ppm Water         ppm         ASTM D6304         >2000         75.1         120.2         80           FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4μm         ASTM D7647         >20000         7122         1835         3846           Particles >6μm         ASTM D7647         >5000         1317         305         829           Particles >14μm         ASTM D7647         >640         101         21         41           Particles >21μm         ASTM D7647         >160         20         7         8           Particles >38μm         ASTM D7647         >40         0         0         0           Particles >71μm         ASTM D7647         >10         0         0         0           Oil Cleanliness         ISO 4406 (c)         >21/19/16         20/18/14         18/15/12         19/17/13           FLUID DEGRADATION         method         limit/base         current         history1	Sodium		ASTM D5185m		0	0	0
Water         %         ASTM D6304         >0.2         0.007         0.012         0.008           ppm Water         ppm         ASTM D6304         >2000         75.1         120.2         80           FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4μm         ASTM D7647         >20000         7122         1835         3846           Particles >6μm         ASTM D7647         >5000         1317         305         829           Particles >14μm         ASTM D7647         >640         101         21         41           Particles >21μm         ASTM D7647         >160         20         7         8           Particles >38μm         ASTM D7647         >40         0         0         0           Particles >71μm         ASTM D7647         >10         0         0         0           Oil Cleanliness         ISO 4406 (c)         >21/19/16         20/18/14         18/15/12         19/17/13           FLUID DEGRADATION         method         limit/base         current         history1         history2	Potassium		ASTM D5185m	>20	0	<1	<1
ppm Water         ppm         ASTM D6304         >2000         75.1         120.2         80           FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4μm         ASTM D7647         >20000         7122         1835         3846           Particles >6μm         ASTM D7647         >5000         1317         305         829           Particles >14μm         ASTM D7647         >640         101         21         41           Particles >21μm         ASTM D7647         >160         20         7         8           Particles >38μm         ASTM D7647         >40         0         0         0           Particles >71μm         ASTM D7647         >10         0         0         0           Oil Cleanliness         ISO 4406 (c)         >21/19/16         20/18/14         18/15/12         19/17/13           FLUID DEGRADATION         method         limit/base         current         history1         history2	Water		ASTM D6304		0.007	0.012	0.008
Particles >4μm         ASTM D7647         >20000         7122         1835         3846           Particles >6μm         ASTM D7647         >5000         1317         305         829           Particles >14μm         ASTM D7647         >640         101         21         41           Particles >21μm         ASTM D7647         >160         20         7         8           Particles >38μm         ASTM D7647         >40         0         0         0           Particles >71μm         ASTM D7647         >10         0         0         0           Oil Cleanliness         ISO 4406 (c)         >21/19/16         20/18/14         18/15/12         19/17/13           FLUID DEGRADATION         method         limit/base         current         history1         history2	ppm Water		ASTM D6304		75.1		
Particles >6μm         ASTM D7647         >5000         1317         305         829           Particles >14μm         ASTM D7647         >640         101         21         41           Particles >21μm         ASTM D7647         >160         20         7         8           Particles >38μm         ASTM D7647         >40         0         0         0           Particles >71μm         ASTM D7647         >10         0         0         0           Oil Cleanliness         ISO 4406 (c)         >21/19/16         20/18/14         18/15/12         19/17/13           FLUID DEGRADATION         method         limit/base         current         history1         history2	FLUID CLEANLIN	IESS	method	limit/base	current	history1	history2
Particles >6μm         ASTM D7647         >5000         1317         305         829           Particles >14μm         ASTM D7647         >640         101         21         41           Particles >21μm         ASTM D7647         >160         20         7         8           Particles >38μm         ASTM D7647         >40         0         0         0           Particles >71μm         ASTM D7647         >10         0         0         0           Oil Cleanliness         ISO 4406 (c)         >21/19/16         20/18/14         18/15/12         19/17/13           FLUID DEGRADATION         method         limit/base         current         history1         history2	Particles >4µm		ASTM D7647	>20000	7122	1835	3846
Particles >14μm         ASTM D7647         >640         101         21         41           Particles >21μm         ASTM D7647         >160         20         7         8           Particles >38μm         ASTM D7647         >40         0         0         0           Particles >71μm         ASTM D7647         >10         0         0         0           Oil Cleanliness         ISO 4406 (c)         >21/19/16         20/18/14         18/15/12         19/17/13           FLUID DEGRADATION         method         limit/base         current         history1         history2					1317		
Particles >21μm         ASTM D7647         >160         20         7         8           Particles >38μm         ASTM D7647         >40         0         0         0           Particles >71μm         ASTM D7647         >10         0         0         0           Oil Cleanliness         ISO 4406 (c)         >21/19/16         20/18/14         18/15/12         19/17/13           FLUID DEGRADATION         method         limit/base         current         history1         history2							
Particles >38μm         ASTM D7647         >40         0         0         0           Particles >71μm         ASTM D7647         >10         0         0         0           Oil Cleanliness         ISO 4406 (c)         >21/19/16         20/18/14         18/15/12         19/17/13           FLUID DEGRADATION         method         limit/base         current         history1         history2	· ·						
Particles >71μm         ASTM D7647         >10         0         0         0           Oil Cleanliness         ISO 4406 (c)         >21/19/16         20/18/14         18/15/12         19/17/13           FLUID DEGRADATION         method         limit/base         current         history1         history2							
Oil Cleanliness         ISO 4406 (c)         >21/19/16         20/18/14         18/15/12         19/17/13           FLUID DEGRADATION         method         limit/base         current         history1         history2	·						
							-
Acid Number (AN)         mg KOH/g         ASTM D8045         0.753         0.808         0.722	FLUID DEGRADA	ATION	method	limit/base	current	history1	history2
	Acid Number (AN)	mg KOH/g	ASTM D8045		0.753	0.808	0.722



# **OIL ANALYSIS REPORT**

