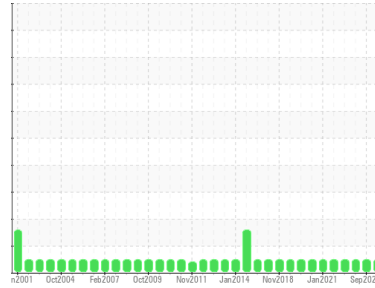




# OIL ANALYSIS REPORT

Sample Rating Trend



**NORMAL**



Area  
**EQR [163264]**  
 Machine Id  
**DONGGEAR5 (S/N 71522)**  
 Component  
**Gearbox**  
 Fluid  
**SHELL OMALA 220 (30 LTR)**

## DIAGNOSIS

### Recommendation

Resample at the next service interval to monitor.

### Wear

All component wear rates are normal. The ferrography results are normal indicating no abnormal wear in the system.

### Contaminants

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

### Oil Condition

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

SAMPLE INFORMATION		method	limit/base	current	history1	history2
Sample Number	Client Info			<b>WC0906713</b>	WC943887	WC0779159
Sample Date	Client Info			<b>04 Mar 2024</b>	19 Sep 2023	13 Mar 2023
Machine Age	hrs	Client Info		<b>108960</b>	107889	105162
Oil Age	hrs	Client Info		<b>9483</b>	8412	5085
Oil Changed	Client Info			<b>Not Changed</b>	Not Changed	Not Changed
Sample Status				<b>NORMAL</b>	NORMAL	NORMAL

CONTAMINATION		method	limit/base	current	history1	history2
Water	WC Method		>0.2	<b>NEG</b>	NEG	NEG

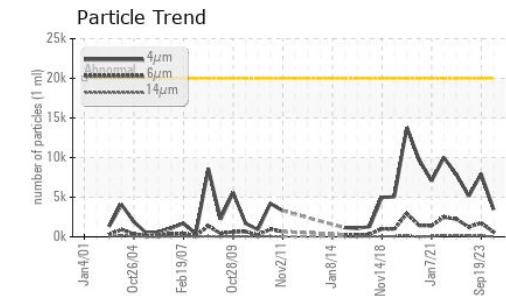
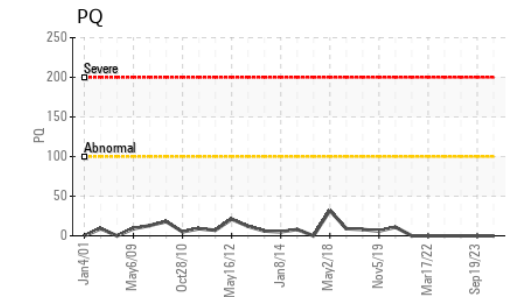
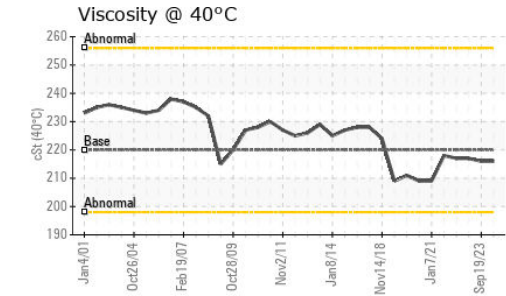
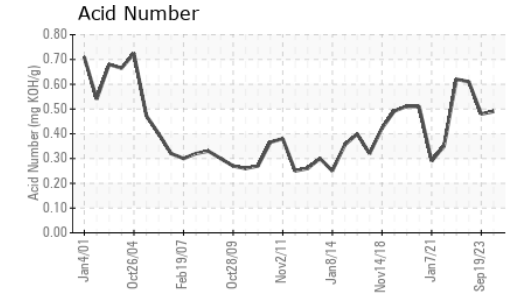
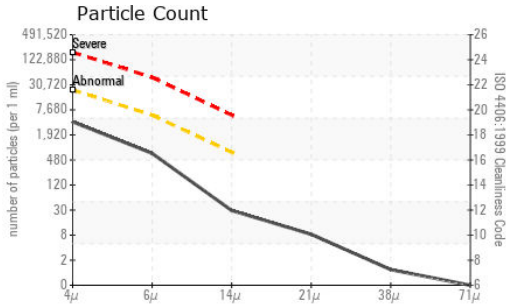
WEAR METALS		method	limit/base	current	history1	history2
PQ		ASTM D8184*		<b>0</b>	0	0
Iron	ppm	ASTM D5185(m)	>200	<b>42</b>	39	32
Chromium	ppm	ASTM D5185(m)	>15	<b>0</b>	0	0
Nickel	ppm	ASTM D5185(m)	>15	<b>&lt;1</b>	<1	0
Titanium	ppm	ASTM D5185(m)		<b>0</b>	0	0
Silver	ppm	ASTM D5185(m)		<b>0</b>	0	0
Aluminum	ppm	ASTM D5185(m)	>25	<b>2</b>	2	1
Lead	ppm	ASTM D5185(m)	>100	<b>&lt;1</b>	<1	<1
Copper	ppm	ASTM D5185(m)	>200	<b>&lt;1</b>	<1	<1
Tin	ppm	ASTM D5185(m)	>25	<b>0</b>	0	0
Antimony	ppm	ASTM D5185(m)	>5	<b>0</b>	0	<1
Vanadium	ppm	ASTM D5185(m)		<b>0</b>	0	0
Beryllium	ppm	ASTM D5185(m)		<b>0</b>	0	0
Cadmium	ppm	ASTM D5185(m)		<b>0</b>	0	0

ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185(m)	4.4	<b>5</b>	5	5
Barium	ppm	ASTM D5185(m)	0.0	<b>0</b>	0	0
Molybdenum	ppm	ASTM D5185(m)	0	<b>0</b>	0	0
Manganese	ppm	ASTM D5185(m)		<b>&lt;1</b>	1	<1
Magnesium	ppm	ASTM D5185(m)	0	<b>&lt;1</b>	0	0
Calcium	ppm	ASTM D5185(m)	0	<b>11</b>	11	11
Phosphorus	ppm	ASTM D5185(m)	215	<b>240</b>	250	283
Zinc	ppm	ASTM D5185(m)	0	<b>25</b>	24	22
Sulfur	ppm	ASTM D5185(m)	7039	<b>9220</b>	8972	8972
Lithium	ppm	ASTM D5185(m)		<b>&lt;1</b>	<1	<1

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185(m)	>50	<b>0</b>	<1	<1
Sodium	ppm	ASTM D5185(m)		<b>2</b>	1	1
Potassium	ppm	ASTM D5185(m)	>20	<b>&lt;1</b>	0	1



# OIL ANALYSIS REPORT



**Laboratory** : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9  
**Sample No.** : WC0906713  
**Lab Number** : 02622481  
**Unique Number** : 5747600  
**Test Package** : IND 3 ( Additional Tests: PrtCount, TAN Man )

**ALGONQUIN POWER SYSTEMS INC.**  
 354 DAVIS ROAD  
 OAKVILLE, ON  
 CA L6J 2X1  
 Contact: Antonino Champ Fernando  
 antoninoChamp.fernando@algonquinpower.com  
 T: (905)465-7065  
 F: x:

To discuss this sample report, contact Customer Service at 1-800-268-2131.  
 Test denoted (\*) outside scope of accreditation, (m) method modified, (e) tested at external lab.  
 Validity of results and interpretation are based on the sample and information as supplied.

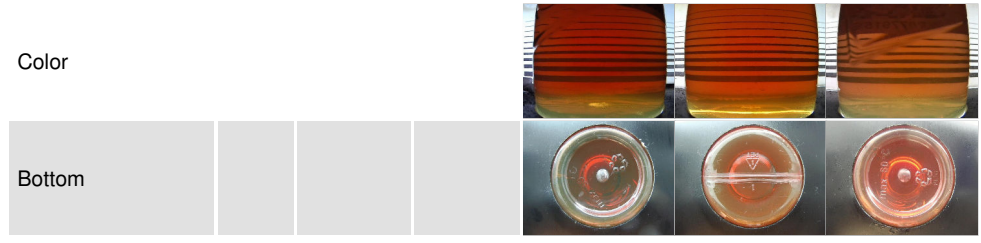
FLUID CLEANLINESS	method	limit/base	current	history1	history2
Particles >4µm	ASTM D7647	>20000	<b>3462</b>	7926	5146
Particles >6µm	ASTM D7647	>5000	<b>607</b>	1742	1221
Particles >14µm	ASTM D7647	>640	<b>26</b>	126	91
Particles >21µm	ASTM D7647	>160	<b>7</b>	35	21
Particles >38µm	ASTM D7647	>40	<b>1</b>	1	2
Particles >71µm	ASTM D7647	>10	<b>0</b>	0	1
Oil Cleanliness	ISO 4406 (c)	>21/19/16	<b>19/16/12</b>	20/18/14	20/17/14

FLUID DEGRADATION	method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g ASTM D974*		<b>0.49</b>	0.48	0.61

VISUAL	method	limit/base	current	history1	history2
White Metal	scalar Visual*	NONE	<b>NONE</b>	NONE	NONE
Yellow Metal	scalar Visual*	NONE	<b>NONE</b>	NONE	NONE
Precipitate	scalar Visual*	NONE	<b>NONE</b>	NONE	NONE
Silt	scalar Visual*	NONE	<b>NONE</b>	NONE	NONE
Debris	scalar Visual*	NONE	<b>NONE</b>	NONE	NONE
Sand/Dirt	scalar Visual*	NONE	<b>NONE</b>	NONE	NONE
Appearance	scalar Visual*	NORML	<b>NORML</b>	NORML	NORML
Odor	scalar Visual*	NORML	<b>NORML</b>	NORML	NORML
Emulsified Water	scalar Visual*	>0.2	<b>NEG</b>	NEG	NEG
Free Water	scalar Visual*		<b>NEG</b>	NEG	NEG

FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 40°C	cSt ASTM D7279(m)	220	<b>216</b>	216	217

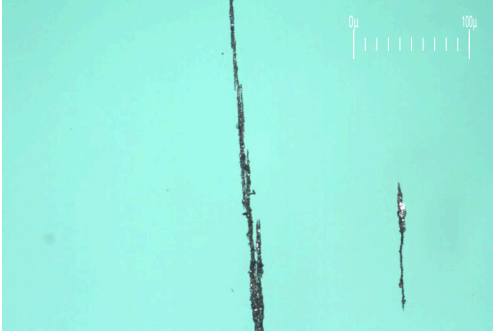
SAMPLE IMAGES	method	limit/base	current	history1	history2
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# FERROGRAPHY REPORT

Area  
**EQR [163264]**  
 Machine Id  
**DONNGEAR5 (S/N 71522)**  
 Component  
**Gearbox**  
 Fluid  
**SHELL OMALA 220 (30 LTR)**

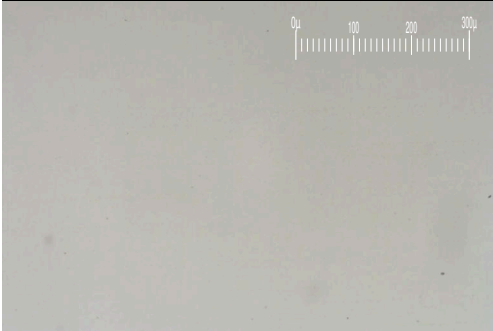
Magn: 200x Illum: BC



Magn: 50x Illum: RW



Magn: 100x Illum: RW

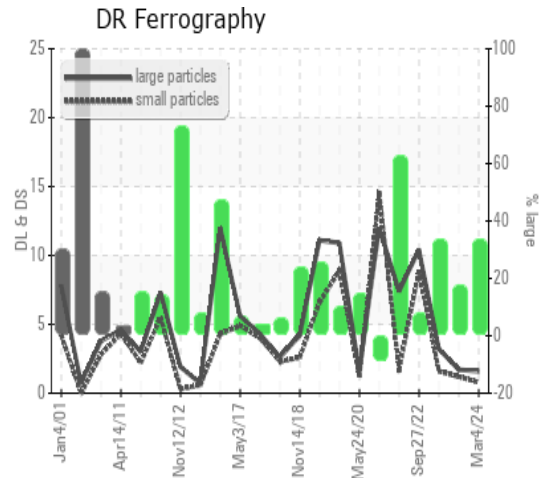


DR-FERROGRAPHY		method	limit/base	current	history1	history2
Large Particles		DR-Ferr*		<b>1.6</b>	1.7	3.2
Small Particles		DR-Ferr*		<b>0.8</b>	1.2	1.6
Total Particles		DR-Ferr*	>---	<b>2.4</b>	2.9	4.8
Large Particles Percentage	%	DR-Ferr*		<b>33.3</b>	17.2	33.3
Severity Index		DR-Ferr*		<b>1</b>	1	5

FERROGRAPHY		method	limit/base	current	history1	history2
Ferrous Rubbing	Scale 0-10	ASTM D7684*		<b>2</b>	1	2
Ferrous Sliding	Scale 0-10	ASTM D7684*				
Ferrous Cutting	Scale 0-10	ASTM D7684*				
Ferrous Rolling	Scale 0-10	ASTM D7684*		<b>1</b>	1	1
Ferrous Break-in	Scale 0-10	ASTM D7684*				
Ferrous Spheres	Scale 0-10	ASTM D7684*				
Ferrous Black Oxides	Scale 0-10	ASTM D7684*				
Ferrous Red Oxides	Scale 0-10	ASTM D7684*				
Ferrous Corrosive	Scale 0-10	ASTM D7684*				
Ferrous Other	Scale 0-10	ASTM D7684*				
Nonferrous Rubbing	Scale 0-10	ASTM D7684*				
Nonferrous Sliding	Scale 0-10	ASTM D7684*				
Nonferrous Cutting	Scale 0-10	ASTM D7684*				
Nonferrous Rolling	Scale 0-10	ASTM D7684*				
Nonferrous Other	Scale 0-10	ASTM D7684*				
Carbonaceous Material	Scale 0-10	ASTM D7684*				
Lubricant Degradation	Scale 0-10	ASTM D7684*				
Sand/Dirt	Scale 0-10	ASTM D7684*		<b>1</b>	1	1
Fibres	Scale 0-10	ASTM D7684*				
Spheres	Scale 0-10	ASTM D7684*				
Other	Scale 0-10	ASTM D7684*		<b>1</b>	1	2

### WEAR

All component wear rates are normal.  
 The ferrography results are normal indicating no abnormal wear in the system.



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