

# **OIL ANALYSIS REPORT**

### Area Fwd Machinery Space [450343811] Thruster Fwd Aft - Lower Gearbox (S/N Sample Tag CL-06004- S6) Lube System

Fluid GEAR OIL ISO 150 (--- GAL)

### DIAGNOSIS

#### Recommendation

Little or no information is provided as to the component and lubricant being tested. Recommendations are therefore generic in nature and may not apply to the current application. Please forward information as to equipment type, reservoir capacity, lubricant type and any pertinent information to allow for a more accurate assessment. We recommend you service the filters on this component. Resample at the next service interval to monitor. NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample. Please specify the brand, type, and viscosity of the oil on your next sample.

#### Wear

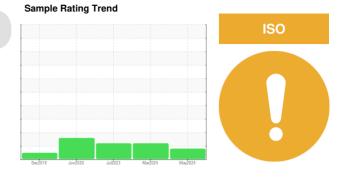
All component wear rates are normal.

#### Contamination

There is a light amount of silt (particulates < 14 microns in size) present in the oil.

#### Fluid Condition

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



SAMPLE INFOR	IOITAM	M method	limit/base	current		
Sample Number		Client Info		PC0080642	PC0081680	PC
Sample Date		Client Info		16 May 2024	31 Mar 2024	24 Jul 2023
Machine Age	hrs	Client Info		0	0	0
Oil Age	hrs	Client Info		0	0	0
Oil Changed		Client Info		N/A	N/A	N/A
Sample Status				ATTENTION	ABNORMAL	ABNORMAL
CONTAMINAT		method	limit/base	current	history1	history2
Water		WC Method		NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185(m)	>20	<1	0	<1
Chromium	ppm	ASTM D5185(m)		0	0	0
Nickel	ppm	ASTM D5185(m)		0	0	<1
Titanium	ppm	ASTM D5185(m)	-	0	0	0
Silver	ppm	ASTM D5185(m)		0	0	0
Aluminum	ppm	ASTM D5185(m)	>10	0	0	<1
Lead	ppm	ASTM D5185(m)	>20	0	0	0
Copper	ppm	ASTM D5185(m)		0	0	0
Tin	ppm	ASTM D5185(m)		0	0	0
Antimony	ppm	ASTM D5185(m)		0	0	0
Vanadium	ppm	ASTM D5185(m)		0	0	0
Beryllium	ppm	ASTM D5185(m)		0	0	0
Cadmium	ppm	ASTM D5185(m)		0	0	0
ADDITIVES		method	limit/base	current	bistorut	history2
Boron	ppm	ASTM D5185(m)	50	11	15	15
	ppm ppm					
Boron Barium	ppm	ASTM D5185(m)	50	11	15	15
Boron Barium Molybdenum	ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	50 15	11 0	15 0	15 0
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185(m) ASTM D5185(m)	50 15	11 0 0	15 0 0	15 0 0
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	50 15 15 50	11 0 0 0	15 0 0 0	15 0 0 0
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	50 15 15 50	11 0 0 0 <1	15 0 0 0 <1	15 0 0 0 <1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	50 15 15 50 50 350	11 0 0 0 <1 14	15 0 0 0 <1 6	15 0 0 0 <1 3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	50 15 15 50 50 350	11 0 0 0 <1 14 160	15 0 0 <1 6 166	15 0 0 <1 3 172
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	50 15 15 50 50 350 100	11 0 0 <1 14 160 4	15 0 0 <1 6 166 5	15 0 0 0 <1 3 172 4
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	50 15 15 50 50 350 100	11 0 0 <1 14 160 4 12406 <1	15 0 0 <1 6 166 5 8255	15 0 0 0 <1 3 172 4 9509
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	50 15 15 50 50 350 100 12500	11 0 0 <1 14 160 4 12406 <1	15 0 0 <1 6 166 5 8255 <1	15 0 0 <1 3 172 4 9509 <1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) <b>method</b>	50 15 15 50 50 350 100 12500	11 0 0 3 3 3 3 4 12406 3 1 2406 3 3 1 2 4 3 2 4 3 2 4 3 3 4 3 2 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 4	15 0 0 <1 6 166 5 8255 <1 history1	15 0 0 0 <1 3 172 4 9509 <1 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAM Silicon	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) <b>method</b> ASTM D5185(m)	50 15 15 50 50 350 100 12500	11 0 0 (0 <1 14 160 4 12406 <1 <b>current</b> 0	15 0 0 2 3 4 1 6 5 8 255 5 8 255 <1 history1 1	15 0 0 <1 3 172 4 9509 <1 history2 2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm <b>tTS</b>	ASTM D5185(m) ASTM D5185(m)	50 15 15 50 50 350 100 12500 limit/base >15	11 0 0 (0 <1 14 160 4 12406 <1 <b>current</b> 0 0 0 <1	15 0 0 ( 1 6 166 5 8255 <1 <b>kistory1</b> 1 ( 1	15 0 0 ( 1 3 172 4 9509 <1 <b>history2</b> 2 <1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium Potassium FLUID CLEAN	ppm ppm ppm ppm ppm ppm ppm ppm ppm <b>tTS</b>	ASTM D5185(m) ASTM D5185(m)	50 15 15 50 50 350 100 12500 limit/base >15 >20	11 0 0 (0 <1 14 160 4 12406 <1 <b>current</b> 0 0 0 <1	15 0 0 3 4 1 6 166 5 8255 <1 <b>bistory1</b> 1 4 3 0	15 0 0 ( 1 3 172 4 9509 <1 <b>history2</b> 2 <1 <1 ( 1 ( 1)
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium Potassium FLUID CLEAN Particles >4µm	ppm ppm ppm ppm ppm ppm ppm ppm ppm <b>tTS</b>	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) <b>method</b> ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	50 15 15 50 50 350 100 12500 imit/base >20 imit/base >5000	11 0 0 1 1 1 1 4 12406 4 12406 <1 <i>current</i> 0 0 2 1 <i>current</i>	15 0 0 ( 1 6 166 5 8255 <1 <b>history1</b> 1 <1 0 <b>history1</b>	15 0 0 ( 1 3 172 4 9509 <1 <b>history2</b> 2 2 <1 <1 <1 <1 <b>history2</b>
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm <b>tTS</b>	ASTM D5185(m) ASTM D5185(m)	50 15 15 50 50 350 100 12500 imit/base >20 imit/base >5000	11 0 0 1 1 1 1 4 1 2 4 0 4 1 2 4 0 4 1 2 4 0 0 0 4 1 2 4 0 0 0 4 1 0 0 0 4 1 0 0 0 1 1 1 1 1 1	15 0 0 2 3 4 1 6 6 166 5 8255 <1 8255 <1 <b>history1</b> 1 <1 0 0 <b>history1</b>	15 0 0 10 11 3 172 4 9509 <1 • • • • • • • • • • • • • • • • • •
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAM Silicon Sodium Potassium FLUID CLEAN Particles >4µm Particles >6µm	ppm ppm ppm ppm ppm ppm ppm ppm ppm <b>tTS</b>	ASTM D5185(m) ASTM D7647	50 15 15 50 50 350 100 12500 100 100 100 100 100 100 100	11 0 0 0 <1 14 160 4 12406 <1 current 0 0 <1 current 0 0 6079 1230	15 0 0 0 <1 6 166 5 8255 <1 history1 1 <1 0 history1 ∧ 15348 2227	15 0 0 10 <1 3 172 4 9509 <1 • • • • • • • • • • • • • • • • • •
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium Potassium FLUID CLEAN Particles >4µm Particles >6µm Particles >14µm	ppm ppm ppm ppm ppm ppm ppm ppm ppm <b>tTS</b>	ASTM D5185(m)	50 15 15 50 50 350 100 12500 100 100 100 100 100 100 100	11 0 0 () () () () () () () () () () () () ()	15 0 0 0 <1 6 166 5 8255 <1 0 1 1 <1 0 0 history1 1 0 0 history1 0 2227 93	15 0 0 10 172 4 9509 11 172 1 4 9509 1 172 1 2 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium Potassium FLUID CLEAN Particles >4µm Particles >14µm Particles >21µm	ppm ppm ppm ppm ppm ppm ppm ppm ppm <b>tTS</b>	ASTM D5185(m)   ASTM D5185(m) <td< td=""><td>50 15 15 50 50 350 100 12500 100 12500 100 12500 100 5000 50</td><th>11 0 0 0 3 3 4 12406 4 12406 3 3 1 2 0 0 3 3 3 4 1 2 30 4 1 2 30 4 1 10</th><td>15 0 0 0 &lt;1 6 166 5 8255 &lt;1 0 1 1 &lt;1 0 0 history1 1 0 0 history1 0 2227 93 19</td><td>15 0 0 0 1 172 4 9509 1 172 4 9509 1 172 1 2 1 2 1 1 172 1 2 172 1 2 172 1 172 1 2 1</td></td<>	50 15 15 50 50 350 100 12500 100 12500 100 12500 100 5000 50	11 0 0 0 3 3 4 12406 4 12406 3 3 1 2 0 0 3 3 3 4 1 2 30 4 1 2 30 4 1 10	15 0 0 0 <1 6 166 5 8255 <1 0 1 1 <1 0 0 history1 1 0 0 history1 0 2227 93 19	15 0 0 0 1 172 4 9509 1 172 4 9509 1 172 1 2 1 2 1 1 172 1 2 172 1 2 172 1 172 1 2 1



491,52 122,880 7 68

number of particles (per 1 1.92 480 120 30 8 2

> 30 Ê 25 u () 20k 15k

number of 10

Particle Count

Particle Trend

Abnorma 5 0

Acid Number

Dec18/19

Bas

Abnorma

Dec18/19

1.60-Abnorma

1.40

1.40 1.20 1.00 K0H/d) 0.80 0.60

- 명 0.40

0.20 0.00

> 13 Abnorma

12 11 Jun7/20

Jun7/20

Viscosity @ 100°C

ul24/23

144

214

Mar31/24

Mar31/24

# **OIL ANALYSIS REPORT**

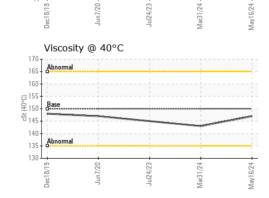
FLUID DEGRA	DATION	method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D974*	0.85	0.38	0.46	0.51
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	Visual*	NONE	NONE	NONE	NONE
Yellow Metal	scalar	Visual*	NONE	NONE	NONE	NONE
Precipitate	scalar	Visual*	NONE	NONE	NONE	NONE
Silt	scalar	Visual*	NONE	NONE	NONE	NONE
Debris	scalar	Visual*	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	Visual*	NONE	NONE	NONE	NONE
Appearance	scalar	Visual*	NORML	NORML	NORML	NORML
Odor	scalar	Visual*	NORML	NORML	NORML	NORML
Emulsified Water	scalar	Visual*	>0.05	NEG	NEG	NEG
Free Water	scalar	Visual*		NEG	NEG	NEG
FLUID PROPE	RTIES	method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D7279(m)	150	147	143	145
Visc @ 100°C	cSt	ASTM D7279(m)	15.0	14.3	14.2	14.2
Viscosity Index (VI)	Scale	ASTM D2270*	99	94	96	94
SAMPLE IMAG	ES	method	limit/base	current	history1	history
			2	13		k

Color

Bottom

May16/24







Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9 CALA : PC0080642 Received : 04 Jun 2024 Sample No. Lab Number : 02639710 Tested : 07 Jun 2024 ISO 17025:2017 Accredited Laboratory Unique Number : 5788872 Diagnosed : 07 Jun 2024 - Kevin Marson Test Package : MAR 2 (Additional Tests: KV100, VI) 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.

Scotia Centre, 235 Water Strret St. John`s, NL CA A1C 1B6 Contact: Josh Hynes joshynes@suncor.com T: (709)778-3575 F: (709)724-2835

Suncor - Terra Nova Projects

Report Id: TERHAM [WCAMIS] 02639710 (Generated: 06/07/2024 10:09:35) Rev: 1

Contact/Location: Josh Hynes - TERHAM Page 2 of 2