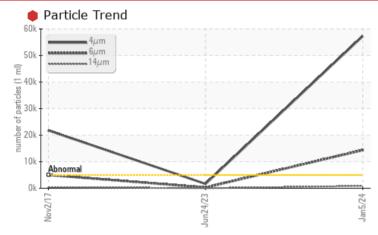


#### Area [450245753] Machine Id TB-42163 Component

DIAGNOSTICS

Hydraulic System Fluid AW HYDRAULIC OIL ISO 15 (--- GAL)

## COMPONENT CONDITION SUMMARY



## 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 advise that you check all areas where contaminants can enter the system. We advise that you perform a filter service, and use offline filtration to improve the cleanliness of the system fluid. The air breather requires service. If unrated, we recommend that you replace with a suitable micron rated and/or desiccant air breather. If rated, we recommend that you service/replace the breather. Resample in 30-45 days to monitor this situation. 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.

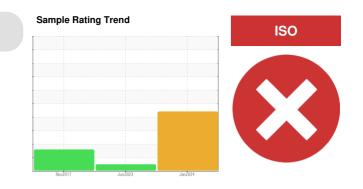
Customer Id: TERHAM Sample No.: PC0052503 Lab Number: 02611102 Test Package: MAR 2



To manage this report scan the QR code

*To discuss the diagnosis or test data:* Kevin Marson +1 (289)291-4644 x4644 Kevin.Marson@wearcheck.com

*To change component or sample information:* Gloria Gonzalez +1 (289)291-4643 x4643 <u>gloria.gonzalez@wearcheck.com</u>



PROBLEMATIC TEST RESULTS							
Sample Status		SEVERE	NORMAL	ABNORMAL			
Particles >4µm	ASTM D7647 >5000	<b>ම</b> 57286	1647	<b>A</b> 21762			
Particles >6µm	ASTM D7647 >1300	<b>e</b> 14385	300	▲ 5007			
Particles >14µm	ASTM D7647 >160	<u> </u>	15	▲ 386			
Particles >21µm	ASTM D7647 >40	🔺 165	5	<u> </u>			
Oil Cleanliness	ISO 4406 (c) >19/17/14	4 🛑 23/21/17	18/15/11	▲ 22/20/16			

RECOMMENDED ACTIONS							
Action	Status	Date	Done By	Description			
Change Filter			?	We advise that you perform a filter service, and use off-line filtration to improve the cleanliness of the system fluid.			
Resample			?	Resample in 30-45 days to monitor this situation.			
Alert			?	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.			
Information Required			?	Please specify the brand, type, and viscosity of the oil on your next sample. NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample.			
Check Breathers			?	The air breather requires service. If unrated, we recommend that you replace with a suitable micron rated and/or desiccant air breather. If rated, we recommend that you service/replace the breather.			
Check Dirt Access			?	We advise that you check all areas where contaminants can enter the system.			
Filter Fluid			?	We advise that you perform a filter service, and use off-line filtration to improve the cleanliness of the system fluid.			

### HISTORICAL DIAGNOSIS



#### 24 Jun 2023 Diag: Kevin Marson

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. 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.All component wear rates are normal. The system cleanliness is acceptable for your target ISO 4406 cleanliness code. The system and fluid cleanliness is acceptable. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.



#### 02 Nov 2017 Diag: Kevin Marson



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 advise that you perform a filter service, and use off-line filtration to improve the cleanliness of the system fluid. We recommend an early resample to monitor this condition. 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.All component wear rates are normal. Particles >14µm are abnormally high. Particles >21µm are abnormally high. Particles >24µm are abnormally high. Particles suitable for further service. The oil is still serviceable provided that the contaminant(s) can be reduced to acceptable levels.





[450245753]

## **OIL ANALYSIS REPORT**

#### Sample Rating Trend



TB-42163 Component Hydraulic System Fluid AW HYDRAULIC OIL ISO 15 (--- 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 advise that you check all areas where contaminants can enter the system. We advise that you perform a filter service, and use offline filtration to improve the cleanliness of the system fluid. The air breather requires service. If unrated, we recommend that you replace with a suitable micron rated and/or desiccant air breather. If rated, we recommend that you service/replace the breather. Resample in 30-45 days to monitor this situation. 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 high amount of particulates (2 to 100 microns in size) present in the oil.

#### Fluid Condition

The AN level is acceptable for this fluid. The oil is still serviceable provided that the contaminant(s) can be reduced to acceptable levels.

			limit/base	current	history1	history2
SAMPLE INFOR	MATIO	M method	11111100000	Guironi	motory	matoryz
Sample Number		Client Info		PC0052503	PC	PC360589
Sample Date		Client Info		05 Jan 2024	24 Jun 2023	02 Nov 2017
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				SEVERE	NORMAL	ABNORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Water		WC Method	>0.05	NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185(m)	>20	0	0	2
Chromium	ppm	ASTM D5185(m)	>10	0	0	0
Nickel	ppm	ASTM D5185(m)	>10	<1	<1	0
Titanium	ppm	ASTM D5185(m)		0	0	0
Silver	ppm	ASTM D5185(m)		<1	0	0
Aluminum	ppm	ASTM D5185(m)	>10	<1	<1	0
Lead	ppm	ASTM D5185(m)	>20	0	<1	<1
Copper	ppm	ASTM D5185(m)	>20	2	2	7
Tin	ppm	ASTM D5185(m)	>10	0	0	0
Antimony	ppm	ASTM D5185(m)	-	0	0	0
•				-		
vanadium	DDM	ASTM D5185(m)		0	0	0
Vanadium Bervllium	mqq mqq	ASTM D5185(m) ASTM D5185(m)		0	0	0
Vanadium Beryllium Cadmium	ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)		-	0 0 0	0
Beryllium	ppm	ASTM D5185(m)	limit/base	0	0	0
Beryllium Cadmium	ppm	ASTM D5185(m) ASTM D5185(m)	limit/base	0	0	0
Beryllium Cadmium ADDITIVES	ppm ppm	ASTM D5185(m) ASTM D5185(m) method		0 0 current	0 0 history1	0 0 history2
Beryllium Cadmium ADDITIVES Boron	ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) method ASTM D5185(m)	5	0 0 current <1	0 0 history1 <1	0 0 history2 <1
Beryllium Cadmium ADDITIVES Boron Barium Molybdenum	ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) method ASTM D5185(m) ASTM D5185(m)	5 5	0 0 current <1 0	0 0 history1 <1 0	0 0 history2 <1 0
Beryllium Cadmium ADDITIVES Boron Barium	ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) Method ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	5 5	0 0 current <1 0 0	0 0 history1 <1 0 0	0 0 history2 <1 0 0
Beryllium Cadmium ADDITIVES Boron Barium Molybdenum Manganese	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) Method ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	5 5 5	0 0 Current <1 0 0 0	0 0 history1 <1 0 0 0	0 0 history2 <1 0 0 <1
Beryllium Cadmium ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium	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)	5 5 25 25	0 0 current <1 0 0 0 0 <1	0 0 history1 <1 0 0 0 0 <1	0 0 history2 <1 0 0 <1 0
Beryllium Cadmium ADDITIVES Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m)	5 5 25 200	0 0 current <1 0 0 0 0 <1 50	0 0 <b>history1</b> <1 0 0 0 0 <1 47	0 0 history2 <1 0 0 <1 0 0 105
Beryllium Cadmium ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m)	5 5 25 200 300	0 0 current <1 0 0 0 0 <1 50 355	0 0 <b>history1</b> <1 0 0 0 0 <1 47 378	0 0 +istory2 <1 0 0 <1 0 105 250
Beryllium Cadmium ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m)	5 5 25 200 300 370	0 0 current <1 0 0 0 0 <1 50 355 431	0 0 <b>history1</b> <1 0 0 0 <1 47 378 453	0 0 +istory2 <1 0 0 <1 0 105 250 340
Beryllium Cadmium ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m)	5 5 25 200 300 370	0 0 current <1 0 0 0 0 <1 50 355 431 901	0 0 history1 <1 0 0 0 <1 47 378 453 838	0 0 history2 <1 0 0 <1 0 105 250 340 638
Beryllium Cadmium ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m)	5 5 25 200 300 370 2500	0 0 current <1 0 0 0 <1 50 355 431 901 <1	0 0 <b>history1</b> <1 0 0 0 <1 47 378 453 838 <1	0 0 +istory2 <1 0 0 <1 0 105 250 340 638 <1
Beryllium Cadmium ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m)	5 5 25 200 300 370 2500 <b>limit/base</b>	0 0 current <1 0 0 0 <1 50 355 431 901 <1 current	0 0 <b>history1</b> <1 0 0 0 <1 47 378 453 838 <1 <b>kistory1</b>	0 0 <b>history2</b> <1 0 0 <1 0 105 250 340 638 <1 <b>history2</b>
Beryllium Cadmium ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m)	5 5 25 200 300 370 2500 <b>limit/base</b>	0 0 current <1 0 0 0 <1 50 355 431 901 <1 current 0	0 0 history1 <1 0 0 0 0 <1 47 378 453 838 <1 838 <1 history1 <1	0 0 1 1 0 0 105 250 340 638 <1 history2 <1
Beryllium Cadmium ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m)	5 5 5 25 200 300 370 2500 <b>limit/base</b> >15	0 0 current <1 0 0 0 <1 50 355 431 901 <1 <1 current 0 <1	0 0 <b>history1</b> <1 0 0 0 <1 47 378 453 838 453 838 <1 <b>history1</b> <1 <1	0 0 1 1 0 0 105 250 340 638 <1 1 history2 <1 <1
Beryllium Cadmium ADDITIVES 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 ppm	ASTM D5185(m)	5 5 25 200 300 370 2500 <b>limit/base</b> >15	0 0 current <1 0 0 0 <1 50 355 431 901 <1 <1 current 0 <1 <1 <1	0 0 1 1 1 0 0 0 0 0 1 1 47 378 453 838 838 453 838 10 10 10 10 10 10 10 10 10 10 10 10 10	0 0 1 1 0 0 105 250 340 638 <1 history2 <1 <1 0
Beryllium Cadmium ADDITIVES 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 ppm	ASTM D5185(m) ASTM D5185(m)	5 5 5 25 200 300 370 2500 <b>limit/base</b> >15 >20 <b>limit/base</b>	0 0 current <1 0 0 0 <1 50 355 431 901 <1 <1 current 0 <1 <1 <1 current	0 0 <b>history1</b> <1 0 0 0 0 <1 47 378 453 838 453 838 <1 <b>history1</b> <1 0 <b>history1</b>	0 0 1 1 0 0 0 105 250 340 638 <1 1 1 1 1 1 1 1 0 105 250 340 638 <1 1 1 1 1 0 105 250 340 638 538 <1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Beryllium Cadmium ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m)	5 5 5 200 300 370 2500 imit/base >15 >20 imit/base >5000	0 0 (urrent <1 0 0 0 <1 50 355 431 901 <1 <1 (urrent 0 <1 <1 <1 (urrent <1 <1 (urrent)	0 0 1 1 1 0 0 0 0 0 1 1 47 378 453 838 838 453 838 10 10 10 10 10 10 10 10 10 10 10 10 10	0 0 1istory2 <1 0 0 <10 105 250 340 638 <1 638 <1 0 history2 <1 <1 <1 0 0 history2
Beryllium Cadmium ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium Potassium FLUID CLEAN Particles >4µm Particles >6µm	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m)	5 5 5 200 300 370 2500 imit/base >15 >20 imit/base >5000 >1300 >1300 >160	0 0 current <1 0 0 0 <1 50 355 431 901 <1 <1 current 0 <1 <1 <1 current 0 57286 • 14385	0 0 <b>history1</b> <1 0 0 0 <1 47 378 453 838 <1 <b>history1</b> <1 <1 0 <b>history1</b> 1647 300	0 0 1 1 0 0 1 1 0 1 0 1 0 5 0 3 4 0 6 3 8 <1 0 6 3 8 <1 1 0 1 0 1 0 1 0 1 0 5 0 2 5 0 3 4 0 6 3 8 <1 0 0 1 0 5 0 2 5 0 3 4 0 6 3 8 1 0 0 1 0 5 0 2 5 0 1 0 0 1 0 1 0 1 0 1 0 0 1 0 1 0 1 0
Beryllium Cadmium ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium Potassium FLUID CLEAN Particles >4µm Particles >14µm	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m)   ASTM D5185(m)	5 5 5 200 300 370 2500 imit/base >15 >20 imit/base >5000 >1300 >1300 >160	0 0 2 2 3 1 0 0 0 0 3 5 5 3 5 5 4 3 1 5 0 3 5 5 3 5 5 4 3 1 5 0 3 5 5 4 3 1 5 0 3 5 5 4 3 1 0 0 0 0 1 3 5 5 4 3 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 1 1 1 0 0 0 0 1 1 47 378 453 838 453 838 453 838 453 838 453 838 453 838 453 838 453 838 453 838 453 838 453 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0 0 history2 <1 0 0 <105 250 340 638 <1 history2 <1 <1 <1 0 0 history2 <1 <1 0 0 history2 <1 <1 0 0
Beryllium Cadmium ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium Potassium FLUID CLEAN Particles >4µm Particles >6µm Particles >14µm Particles >21µm	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m)   ASTM D7647   ASTM D7647   ASTM D7647   ASTM D7647   ASTM D7647   ASTM D7647	5 5 5 25 200 300 370 2500 2500 <b>limit/base</b> >15 >20 <b>limit/base</b> >5000 >1300 >160 >40 >10	0 0 0 current <1 0 0 0 <1 50 355 431 901 <1 <1 0 <1 <1 0 <1 <1 <1 0 57286 ● 14385 ▲ 856 ▲ 165	0 0 <b>history1</b> <1 0 0 0 0 <1 47 378 453 838 <1 <b>4</b> 53 838 <1 <b>history1</b> <1 <1 <1 0 <b>history1</b> 1647 300 15 5	0 0 1 1 1 0 0 1 1 1 2 5 0 3 4 0 6 3 8 3 4 0 6 3 8 3 4 0 6 3 8 1 7 1 6 3 8 1 7 1 7 1 0 7 1 7 1 7 1 7 1 7 1 7 7 7 7



Acid Number

1.00 T Abnormal

Ab Pio 0.20

(B).80 KOH/d)

Ê0.60 Ê 0.40

0.00

# **OIL ANALYSIS REPORT**

Part	ticle Cour	nt			<b>T</b> 26
22,880 Severe					-24
30,720					-22 8
7,680 Abnom	nal				-22 0 400 -20 0 00 -18 00 -16 00 -14 00 -12 00 -10 000
1,920-		No.			-18 -
480 -					-16 5
120-		1.00			-14
30-					-12 8
8-					
2-					8
0. 4µ	6 <i>µ</i>	14µ	21µ	38µ	71µ
🛑 Parl	ticle Tren	d			
60k T					
= 50k -	4μm 6μm				
40k -	••••••14μm				
TOK					
leg 30k				/	
40k -				/	
10k Abno				Contract of the local division of the local	CONTRACTOR DUCKNERS
Abho		Castless Castless Castless		ALC: NO. OF THE OWNER.	
0k Leanna					
11			Jun24/23		Jan5/24

FLUID DEGRAD	DATION	method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D974*	0.57	0.43	0.44	0.39
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	.2%
Free Water	scalar	Visual*		NEG	NEG	NEG
FLUID PROPE	RTIES	method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D7279(m)	15	13.1	13.2	14.5
Visc @ 100°C	cSt	ASTM D7279(m)	3.3	4.8	4.9	4.6
Viscosity Index (VI)	Scale	ASTM D2270*	80	355	365	272
SAMPLE IMAG	iES	method	limit/base	current	history1	history2
			-	- 216 -	1027	

Color

## Bottom

Recieved

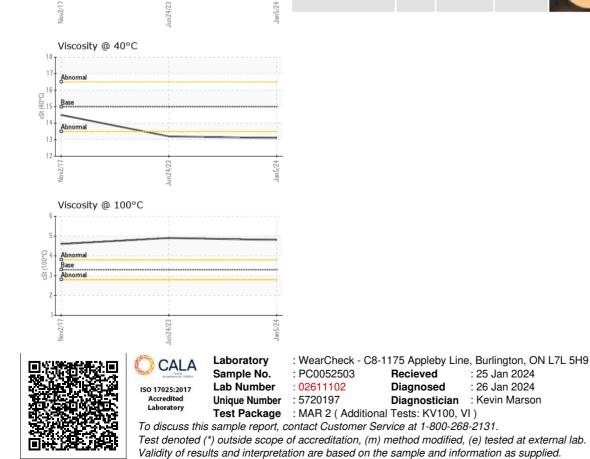
Diagnosed

: 25 Jan 2024

: 26 Jan 2024

Diagnostician : Kevin Marson





Suncor - Terra Nova Projects 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