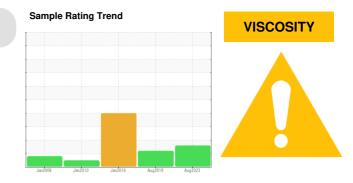


PROBLEM SUMMARY

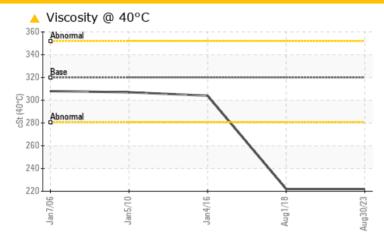
SAB2
Machine Id
South Crane Trolley
Component

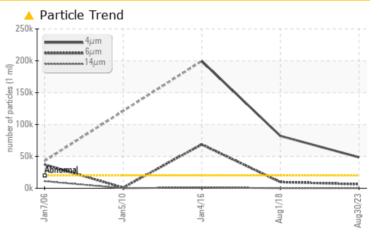
Gearbox

ESSO SPARTAN EP 320 (--- LTR)









RECOMMENDATION

We recommend you service the filters on this component. We recommend an early resample to monitor this condition. NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample.

PROBLEMATIC 1	EST R	ESULTS				
Sample Status				ABNORMAL	ABNORMAL	SEVERE
Particles >4µm		ASTM D7647	>20000	48654	<u>▲</u> 82123	199632
Particles >6µm		ASTM D7647	>5000	6268	<u> </u>	68734
Oil Cleanliness		ISO 4406 (c)	>21/19/16	<u>^</u> 23/20/15	<u>4</u> 24/20/14	25/23/17
Visc @ 40°C	cSt	ASTM D7279(m)	320	222	<u>^</u> 222	304

Customer Id: ONTQUE Sample No.: WC0565995 Lab Number: 02579811 Test Package: IND 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 gloria.gonzalez@wearcheck.com

RECOMMENDED ACTIONS

Action	Status	Date	Done By	Description
Change Filter			?	We recommend you service the filters on this component.
Resample			?	We recommend an early resample to monitor this condition.
Information Required			?	NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample.

HISTORICAL DIAGNOSIS

01 Aug 2018 Diag: Bill Quesnel

VISCOSITY



We recommend you service the filters on this component. We recommend an early resample to monitor this condition. NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample. All component wear rates are normal. Particles $>4\mu m$ are abnormally high. Particles $>6\mu m$ are notably high. Viscosity of sample indicates oil is within ISO 220 range, advise investigate. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.



04 Jan 2016 Diag: Kevin Marson

ISO



Check seals and/or filters for points of contaminant entry. 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. We recommend you service the filters on this component. Resample in 30-45 days to monitor this situation. NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample.Lead ppm levels are noted. All other component wear rates are normal. Particles >6µm are severely high. Particles >4µm are severely high. Particles >14µm are notably high. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.



05 Jan 2010 Diag:

WEAR



Resample at the next service interval to monitor. 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. Cleanliness target codes are in part dependent on the system filter micron ratings. Please provide the micron rating of the filters in this system for future samples. All component wear rates are normal. A decrease in the lead level is noted. The system cleanliness is acceptable for your target ISO 4406 cleanliness code. The system and fluid cleanliness is acceptable. The condition of the oil is acceptable for the time in service.





OIL ANALYSIS REPORT

SAB2 **South Crane Trolley**

Gearbox

ESSO SPARTAN EP 320 (--- LTR)

Sample Rating Trend



DIAGNOSIS

Recommendation

We recommend you service the filters on this component. We recommend an early resample to monitor this condition. NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample.

Wear

All component wear rates are normal.

Contamination

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

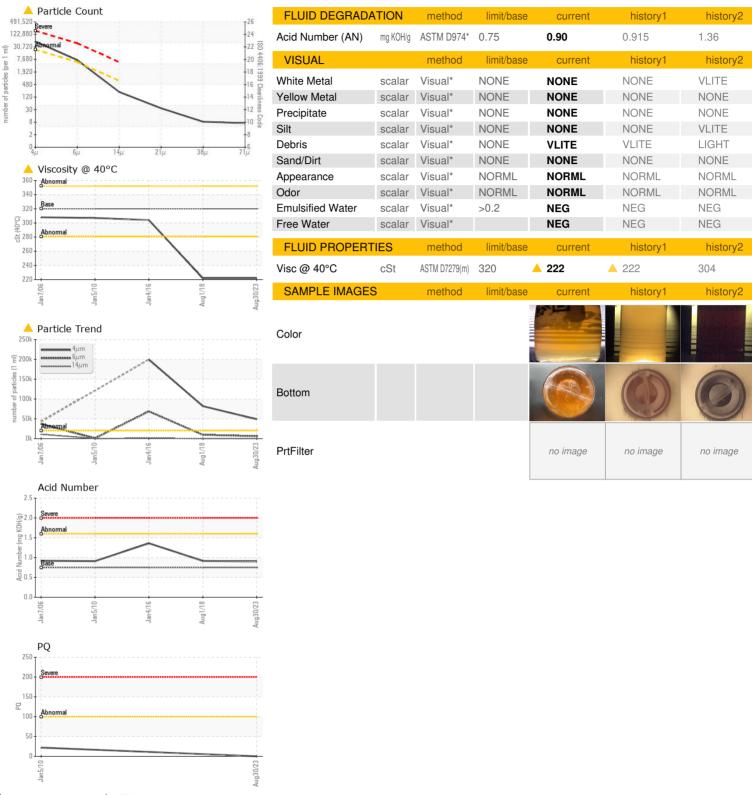
▲ Fluid Condition

Viscosity of sample indicates oil is within ISO 220 range, advise investigate. The AN level is acceptable for this fluid. The oil is still serviceable provided that the contaminant(s) can be reduced to acceptable levels.

Sample Number Client Info WC0565995 WC02238638 WC			Jan2006	Jan2010	Jan 2016 Aug 2018	Aug2023	
Sample Date Client Info 30 Aug 2023 01 Aug 2018 04 Jan 2016	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age yrs	Sample Number		Client Info		WC0565995	WC02238638	WC
Oil Age yrs Client Info N/A N/A N/A N/A Sample Status Method limit/base current history1 history2 PQ ASTM D8184* 0 Iron ppm ASTM D5185(m) ≥200 6 5 26 Chromium ppm ASTM D5185(m) ≥200 6 5 26 Chromium ppm ASTM D5185(m) ≥15 0 0 0 Nickel ppm ASTM D5185(m) ≥15 <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	Sample Date		Client Info		30 Aug 2023	01 Aug 2018	04 Jan 2016
Oil Changed Sample Status	Machine Age	yrs	Client Info		0	0	0
Sample Status ABNORMAL ABNORMAL SEVERE WEAR METALS method limit/base current history1 history2 PQ ASTM D8184* 0 Iron ppm ASTM D5185(m) >200 6 5 26 Chromium ppm ASTM D5185(m) >200 0 0 0 Nickel ppm ASTM D5185(m) >15 0 0 0 0 Nickel ppm ASTM D5185(m) >25 0 0 0 0 All minimum ppm ASTM D5185(m) >25 0 0 <1 1 Lead ppm ASTM D5185(m) >200 <1 0 <1 1 Capper ppm ASTM D5185(m) >20 0 0 0 0 Capper ppm ASTM D5185(m) 0 0 0 0 0	Oil Age	yrs	Client Info		0	0	0
WEAR METALS method limit/base current history1 history2 PQ ASTM D8184¹ 0 Iron ppm ASTM D8185(m) >200 6 5 26 Chromium ppm ASTM D8185(m) >15 0 0 0 Nikcel ppm ASTM D8185(m) 15 <1	Oil Changed		Client Info		N/A	N/A	N/A
PQ	Sample Status				ABNORMAL	ABNORMAL	SEVERE
Iron	WEAR METALS		method	limit/base	current	history1	history2
Chromium ppm ASTM D5185(m) >15 0 0 0 Nickel ppm ASTM D5185(m) >15 <1 <1 <1 Titanium ppm ASTM D5185(m) >10 0 0 0 Aluminum ppm ASTM D5185(m) >25 0 0 <1 Lead ppm ASTM D5185(m) >20 0 <1 Copper ppm ASTM D5185(m) >20 <1 0 <1 Tin ppm ASTM D5185(m) >22 0 0 0 Antimony ppm ASTM D5185(m) >22 0 0 0 Vanadium ppm ASTM D5185(m) 0 0 0 0 Beryllium ppm ASTM D5185(m) 0 0 0 0 Beryllium ppm ASTM D5185(m) 0 0 0 0 Abdraum ppm ASTM D5185(m) 0 0	PQ		ASTM D8184*		0		
Nickel ppm ASTM D5185(m) >15 <1 <1 <1 <1 <1 <1 <1	Iron	ppm	ASTM D5185(m)	>200	6	5	26
Titanium ppm ASTM D5185(m) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Chromium	ppm	ASTM D5185(m)	>15	0	0	0
Silver	Nickel	ppm	ASTM D5185(m)	>15	<1	<1	<1
Aluminum ppm ASTM D5185(m) >25 0 0 <1 Lead ppm ASTM D5185(m) >100 30 40 ▲ 401 Copper ppm ASTM D5185(m) >200 <1 0 <1 Tin ppm ASTM D5185(m) >25 0 0 0 Antimony ppm ASTM D5185(m) 0 0 0 0 Vanadium ppm ASTM D5185(m) 0 0 0 0 Beryllium ppm ASTM D5185(m) 0 0 0 0 Cadmium ppm ASTM D5185(m) 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) 4 <1 1 1 Barium ppm ASTM D5185(m) 0 0 0 <1 1 Barium ppm ASTM D5185(m) 0 <	Titanium	ppm	ASTM D5185(m)		0	0	0
Lead	Silver	ppm	ASTM D5185(m)		0	0	0
Lead ppm ASTM D5185(m) >100 30 40 ▲ 401 Copper ppm ASTM D5185(m) >200 <1	Aluminum	ppm	ASTM D5185(m)	>25	0	0	<1
Tin ppm ASTM D5185(m) >25 0 0 0 0 0 Antimony ppm ASTM D5185(m) >5 0 0 0 0 0 Beryllium ppm ASTM D5185(m) 0 0 0 0 0 Beryllium ppm ASTM D5185(m) 0 0 0 0 0 Cadmium ppm ASTM D5185(m) 0 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) 0 0 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) 0 0 0 0 0 0 Manganese ppm ASTM D5185(m) 0 0 0 0 0 0 Manganese ppm ASTM D5185(m) 0 0 0 0 0 0 0 Manganesium ppm ASTM D5185(m) 0 0 0 0 0 0 0 Manganese ppm ASTM D5185(m) 0 0 0 0 0 0 0 0 Manganesium ppm ASTM D5185(m) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lead		ASTM D5185(m)	>100	30	40	<u>401</u>
Antimony ppm ASTM D5185(m) >5 0 0 0 0 0 Vanadium ppm ASTM D5185(m) 0 0 0 0 Beryllium ppm ASTM D5185(m) 0 0 0 0 Cadmium ppm ASTM D5185(m) 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) 0 0 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) 0 0 0 0 0 0 Manganese ppm ASTM D5185(m) 0 0 0 0 0 0 Manganese ppm ASTM D5185(m) 0 0 0 0 0 0 Manganese ppm ASTM D5185(m) 0 0 0 0 0 0 Manganesium ppm ASTM D5185(m) 0 0 0 1 0 0 Calcium ppm ASTM D5185(m) 0 0 0 1 0 0 Manganesium ppm ASTM D5185(m) 0 0 0 1 0 1 0 1 0 0 Calcium ppm ASTM D5185(m) 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Copper	ppm	ASTM D5185(m)	>200	<1	0	<1
Vanadium ppm ASTM D518S(m) 0 0 0 Beryllium ppm ASTM D518S(m) 0 0 0 Cadmium ppm ASTM D518S(m) 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D518S(m) 0 0 0 1 Barium ppm ASTM D518S(m) 0 0 0 1 Molybdenum ppm ASTM D518S(m) 0 0 0 1 Manganese ppm ASTM D518S(m) 0 <1 <1 <1 Calcium ppm ASTM D518S(m) 0 <1 <1 <1 <1 Phosphorus ppm ASTM D518S(m) 250 389 402 305 Zinc ppm ASTM D518S(m) 20 3 2 4 Sulfur ppm ASTM D518S(m) 20 3 2 4	Tin	ppm	ASTM D5185(m)	>25	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 history1 history2 Boron ppm ASTM D5185(m) 4 <1 <1 <1 <1 Barium ppm ASTM D5185(m) 0 0 0 <1 <1 Molybdenum ppm ASTM D5185(m) 0 0 0 <1 <1 Magnesium ppm ASTM D5185(m) 0 <1 <1 <1 <1 Calcium ppm ASTM D5185(m) 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	Antimony	ppm	ASTM D5185(m)	>5	0	0	0
Cadmium ppm ASTM D5185(m) 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) .4 <1	Vanadium	ppm	ASTM D5185(m)		0	0	0
Cadmium ppm ASTM D5185(m) 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) .4 <1	Beryllium		ASTM D5185(m)		0	0	0
Boron ppm ASTM D5185(m) .4 <1 <1 <1 <1 Barium ppm ASTM D5185(m) 0 0 0 <1 Molybdenum ppm ASTM D5185(m) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Cadmium				0	0	0
Barium ppm ASTM D5185(m) 0 0 <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185(m) 0 0 0 0 Manganese ppm ASTM D5185(m) 0 <1 <1 Magnesium ppm ASTM D5185(m) 0 <1 <1 <1 Calcium ppm ASTM D5185(m) 0 <1 <1 <1 Phosphorus ppm ASTM D5185(m) 250 389 402 305 Zinc ppm ASTM D5185(m) 0 3 2 4 Sulfur ppm ASTM D5185(m) 2058 2155 6343 Lithium ppm ASTM D5185(m) <1 0 <1 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >50 19 21 6 Sodium ppm ASTM D5185(m) >20 0 0 <1 FLUID CLEANLINESS method limit/base current history1	Б.						
Manganese ppm ASTM D5185(m) 0 <1 <1 Magnesium ppm ASTM D5185(m) 0 <1 <1 <1 Calcium ppm ASTM D5185(m) 0 <1 <1 <1 Phosphorus ppm ASTM D5185(m) 250 389 402 305 Zinc ppm ASTM D5185(m) 0 3 2 4 Sulfur ppm ASTM D5185(m) 2058 2155 6343 Lithium ppm ASTM D5185(m) <1 0 <1 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >50 19 21 6 Sodium ppm ASTM D5185(m) >20 0 0 <1 FLUID CLEANLINESS method limit/base current history1 history2 Particles >4µm ASTM D7647 >20000 48654 82123 199	Boron	ppm	ASTM D5185(m)	.4	<1	<1	<1
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Phosphorus ppm ASTM D5185(m) 250 389 402 305 Zinc ppm ASTM D5185(m) 0 3 2 4 Sulfur ppm ASTM D5185(m) 2058 2155 6343 Lithium ppm ASTM D5185(m) <1 0 <1 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >50 19 21 6 Sodium ppm ASTM D5185(m) >20 0 0 <1	Barium	ppm ppm	ASTM D5185(m) ASTM D5185(m)		0	0	<1 0
Zinc ppm ASTM D5185(m) 0 3 2 4 Sulfur ppm ASTM D5185(m) 2058 2155 6343 Lithium ppm ASTM D5185(m) <1 0 <1 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >50 19 21 6 Sodium ppm ASTM D5185(m) >50 19 21 6 Sodium ppm ASTM D5185(m) >20 0 0 <1 FLUID CLEANLINESS method limit/base current history1 history2 Particles >4μm ASTM D7647 >20000 48654 82123 199632 Particles >6μm ASTM D7647 >5000 6268 9658 68734 Particles >14μm ASTM D7647 >640 187 151 1275 Particles >21μm ASTM D7647 >40 7 0 <td>Barium Molybdenum</td> <td>ppm ppm</td> <td>ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)</td> <td>0</td> <th>0 0 0</th> <td>0 0 <1</td> <td><1 0 <1</td>	Barium Molybdenum	ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	0	0 0 0	0 0 <1	<1 0 <1
Sulfur ppm ASTM D5185(m) 2058 2155 6343 Lithium ppm ASTM D5185(m) <1 0 <1 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >50 19 21 6 Sodium ppm ASTM D5185(m) <1	Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	0	0 0 0 <1	0 0 <1 <1	<1 0 <1 <1
Lithium ppm ASTM D5185(m) <1 0 <1 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >50 19 21 6 Sodium ppm ASTM D5185(m) <1 0 2 Potassium ppm ASTM D5185(m) >20 0 0 <1 FLUID CLEANLINESS method limit/base current history1 history2 Particles >4μm ASTM D7647 >20000 48654 82123 199632 Particles >6μm ASTM D7647 >5000 6268 9658 68734 Particles >14μm ASTM D7647 >640 187 151 1275 Particles >21μm ASTM D7647 >160 31 22 224 Particles >38μm ASTM D7647 >40 7 0 10 Particles >71μm ASTM D7647 >10 6 0	Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	0 0 0	0 0 0 <1 <1	0 0 <1 <1 <1	<1 0 <1 <1 <1
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >50 19 21 6 Sodium ppm ASTM D5185(m) <1	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) ASTM D5185(m)	0 0 0 0 250	0 0 0 <1 <1 389	0 0 <1 <1 <1 <1 402	<1 0 <1 <1 <1 <1 305
Silicon ppm ASTM D5185(m) >50 19 21 6 Sodium ppm ASTM D5185(m) <1 0 2 Potassium ppm ASTM D5185(m) >20 0 0 <1 FLUID CLEANLINESS method limit/base current history1 history2 Particles >4μm ASTM D7647 >20000 Δ 48654 Δ 82123 199632 Particles >6μm ASTM D7647 >5000 Δ 6268 Δ 9658 Φ 68734 Particles >14μm ASTM D7647 >640 187 151 Δ 1275 Particles >21μm ASTM D7647 >160 31 22 224 Particles >38μm ASTM D7647 >40 7 0 10 Particles >71μm ASTM D7647 >10 6 0 0	Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	ASTM D5185(m)	0 0 0 0 250	0 0 0 <1 <1 389	0 0 <1 <1 <1 402 2	<1 0 <1 <1 <1 <1 305 4
Sodium ppm ASTM D5185(m) <1 0 2 Potassium ppm ASTM D5185(m) >20 0 0 <1 FLUID CLEANLINESS method limit/base current history1 history2 Particles >4μm ASTM D7647 >20000 Δ 48654 Δ 82123 Φ 199632 Particles >6μm ASTM D7647 >5000 Δ 6268 Δ 9658 Φ 68734 Particles >14μm ASTM D7647 >640 187 151 Δ 1275 Particles >21μm ASTM D7647 >160 31 22 224 Particles >38μm ASTM D7647 >40 7 0 10 Particles >71μm ASTM D7647 >10 6 0 0	Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m)	0 0 0 0 250	0 0 0 <1 <1 389 3 2058	0 0 <1 <1 <1 402 2 2155	<1 0 <1 <1 <1 <1 305 4 6343
Potassium ppm ASTM D5185(m) >20 0 0 <1 FLUID CLEANLINESS method limit/base current history1 history2 Particles >4μm ASTM D7647 >20000 48654 82123 199632 Particles >6μm ASTM D7647 >5000 6268 9658 68734 Particles >14μm ASTM D7647 >640 187 151 1275 Particles >21μm ASTM D7647 >160 31 22 224 Particles >38μm ASTM D7647 >40 7 0 10 Particles >71μm ASTM D7647 >10 6 0 0	Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m)	0 0 0 250	0 0 0 <1 <1 389 3 2058	0 0 <1 <1 <1 402 2 2155	<1 0 <1 <1 <1 305 4 6343 <1
FLUID CLEANLINESS method limit/base current history1 history2 Particles >4μm ASTM D7647 >20000 48654 82123 199632 Particles >6μm ASTM D7647 >5000 6268 9658 68734 Particles >14μm ASTM D7647 >640 187 151 1275 Particles >21μm ASTM D7647 >160 31 22 224 Particles >38μm ASTM D7647 >40 7 0 10 Particles >71μm ASTM D7647 >10 6 0 0	Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m)	0 0 0 250 0	0 0 0 <1 <1 389 3 2058 <1	0 0 <1 <1 <1 402 2 2155 0	<1 0 <1 <1 <1 305 4 6343 <1 history2
Particles >4μm ASTM D7647 >20000 48654 82123 199632 Particles >6μm ASTM D7647 >5000 6268 9658 68734 Particles >14μm ASTM D7647 >640 187 151 1275 Particles >21μm ASTM D7647 >160 31 22 224 Particles >38μm ASTM D7647 >40 7 0 10 Particles >71μm ASTM D7647 >10 6 0 0	Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m)	0 0 0 250 0	0 0 0 <1 <1 389 3 2058 <1 current	0 0 <1 <1 <1 402 2 2155 0 history1	<1 0 <1 <1 <1 305 4 6343 <1 history2
Particles >6μm ASTM D7647 >5000 46268 9658 68734 Particles >14μm ASTM D7647 >640 187 151 1275 Particles >21μm ASTM D7647 >160 31 22 224 Particles >38μm ASTM D7647 >40 7 0 10 Particles >71μm ASTM D7647 >10 6 0 0	Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185(m)	0 0 0 250 0 limit/base >50	0 0 0 <1 <1 389 3 2058 <1 current	0 0 <1 <1 <1 402 2 2155 0 history1 21	<1 0 <1 <1 <1 305 4 6343 <1 history2 6 2
Particles >14μm ASTM D7647 >640 187 151 ▲ 1275 Particles >21μm ASTM D7647 >160 31 22 224 Particles >38μm ASTM D7647 >40 7 0 10 Particles >71μm ASTM D7647 >10 6 0 0	Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium	ppm	ASTM D5185(m)	0 0 0 250 0 limit/base >50 >20	0 0 0 <1 <1 389 3 2058 <1 current 19 <1	0 0 0 <1 <1 <1 402 2 2155 0 history1 21 0	<1 0 <1 <1 <1 305 4 6343 <1 history2 6 2 <1
Particles >14μm ASTM D7647 >640 187 151 ▲ 1275 Particles >21μm ASTM D7647 >160 31 22 224 Particles >38μm ASTM D7647 >40 7 0 10 Particles >71μm ASTM D7647 >10 6 0 0	Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium FLUID CLEANLIN	ppm	ASTM D5185(m)	0 0 0 250 0 limit/base >50 >20	0 0 0 <1 <1 389 3 2058 <1 current 19 <1 0	0 0 0 <1 <1 <1 402 2 2155 0 history1 21 0 0	<1 0 <1 <1 <1 305 4 6343 <1 history2 6 2 <1
Particles >21μm ASTM D7647 >160 31 22 224 Particles >38μm ASTM D7647 >40 7 0 10 Particles >71μm ASTM D7647 >10 6 0 0	Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium FLUID CLEANLIN Particles >4µm	ppm	ASTM D5185(m) method ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m)	0 0 0 250 0 limit/base >50 >20 limit/base	0 0 0 <1 <1 <1 389 3 2058 <1 current 19 <1 0 current 48654	0 0 0 <1 <1 <1 402 2 2155 0 history1 21 0 0 history1 ▲ 82123	<1 0 <1 <1 <1 305 4 6343 <1 history2 6 2 <1 history2
Particles >38μm ASTM D7647 >40 7 0 10 Particles >71μm ASTM D7647 >10 6 0 0	Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium FLUID CLEANLIN Particles >4µm Particles >6µm	ppm	ASTM D5185(m) METHOD ASTM D5185(m)	0 0 0 250 0 limit/base >50 >20 limit/base >20000 >5000	0 0 0 <1 <1 389 3 2058 <1 current 19 <1 0 current △ 48654 △ 6268	0 0 <1 <1 <1 402 2 2155 0 history1 21 0 0 history1 ▲ 82123 ▲ 9658	<1 0 <1 <1 <1 305 4 6343 <1 history2 6 2 <1 history2
Particles >71μm ASTM D7647 >10 6 0 0	Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium FLUID CLEANLIN Particles >4µm Particles >14µm Particles >14µm	ppm	ASTM D5185(m) METHOD ASTM D5185(m) ASTM D7647 ASTM D7647	0 0 0 250 0 limit/base >50 >20 limit/base >20000 >5000 >640	0 0 0 <1 <1 389 3 2058 <1 current 19 <1 0 current △ 48654 △ 6268 187	0 0 0 <1 <1 <1 <1 402 2 2155 0 history1 21 0 0 history1 A 82123 A 9658 151	<1 0 <1 <1 <1 305 4 6343 <1 history2 6 2 <1 history2 199632 68734 ▲ 1275
	Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium FLUID CLEANLIN Particles >4µm Particles >6µm	ppm	ASTM D5185(m) METHOD 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 D7647 ASTM D7647 ASTM D7647	0 0 0 250 0 limit/base >50 >20 limit/base >20000 >5000 >640 >160	0 0 0 <1 <1 389 3 2058 <1 current 19 <1 0 current ▲ 48654 ▲ 6268 187 31	0 0 0 <1 <1 <1 402 2 2155 0 history1 21 0 0 history1 ▲ 82123 ▲ 9658 151 22	<1 0 <1 <1 <1 305 4 6343 <1 history2 6 2 <1 history2 ● 199632 ● 68734 ▲ 1275 224
	Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINANTS Silicon Sodium Potassium FLUID CLEANLIN Particles >4µm Particles >14µm Particles >21µm Particles >38µm	ppm	ASTM D5185(m) METHOD ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D5185(m) ASTM D7647 ASTM D7647 ASTM D7647 ASTM D7647	0 0 0 250 0 !imit/base >50 >20 !imit/base >20000 >5000 >640 >160 >40	0 0 0 <1 <1 389 3 2058 <1 current 19 <1 0 current 48654 48654 6268 187 31 7	0 0 0 <1 <1 <1 402 2 2155 0 history1 21 0 0 history1 A 82123 9658 151 22 0	<1 0 <1 <1 <1 305 4 6343 <1 history2 6 2 <1 history2 ● 199632 ● 68734 ▲ 1275 224 10



OIL ANALYSIS REPORT





CALA ISO 17025:2017 Accredited

Laboratory

Laboratory Sample No. Lab Number **Unique Number**

: WC0565995 : 02579811 : 5632871

: WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9 Received Diagnosed

: 31 Aug 2023 : 05 Sep 2023 Diagnostician : Kevin Marson

Ontario Power Generation NIAGARA PLANT GROUP,, 14000 NIAGARA PKWY NIAGARA ON THE LAKE, ON

CA LOS 1J0 Contact: Michael Brochu

mike.brochu@opg.com T: (905)357-0322 F: (905)374-5466

To discuss this sample report, contact Customer Service at 1-800-268-2131.

Test Package : IND 2 (Additional Tests: PQ, PrtCount)

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.