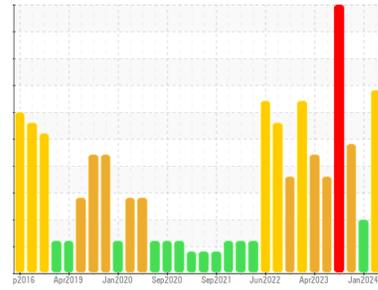




PROBLEM SUMMARY

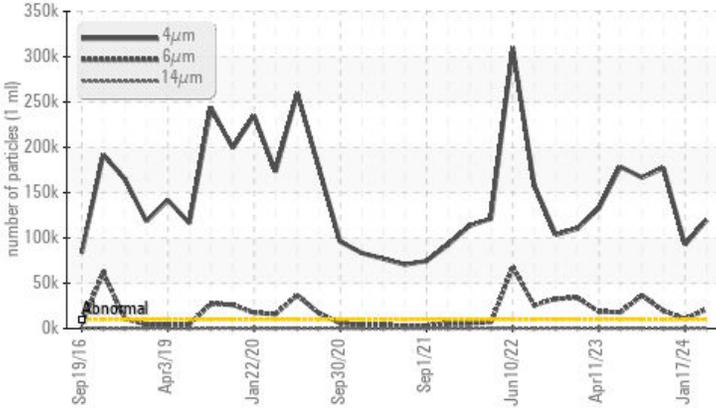
Area
BRUCE B/0B/54300
 Machine Id
0B-54300-EPG1-CP1-OIL
 Component
Compressor
 Fluid
ESSO NUTO H ISO 150 (--- GAL)

Sample Rating Trend

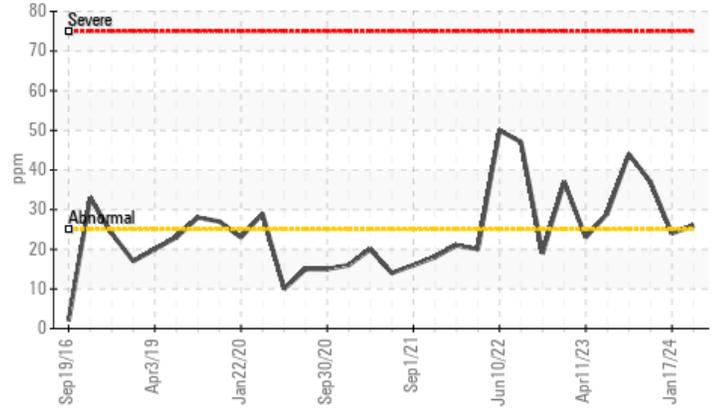


COMPONENT CONDITION SUMMARY

▲ Particle Trend



▲ Silicon (ppm)



RECOMMENDATION

Check seals and/or filters for points of contaminant entry. We advise that you check for visible metal particles in the oil. 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.

PROBLEMATIC TEST RESULTS

Sample Status			SEVERE	SEVERE	SEVERE	
Silicon	ppm	ASTM D5185(m)	>25	▲ 26	24	▲ 37
Particles >4µm		ASTM D7647	>10000	▲ 119565	▲ 92713	▲ 177075
Particles >6µm		ASTM D7647	>2500	▲ 21257	▲ 10703	▲ 19457
Oil Cleanliness		ISO 4406 (c)	>20/18/15	▲ 24/22/16	▲ 24/21/14	▲ 25/21/14
White Metal	scalar	Visual*	NONE	▲ VLITE	NONE	▲ VLITE

PrtFilter



Customer Id: BRUTIV
 Sample No.: WC0896807
 Lab Number: 02628473
 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	---	---	?	Resample in 30-45 days to monitor this situation.
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 For Visual Metal	---	---	?	We advise that you check for visible metal particles in the oil.
Check Seals	---	---	?	Check seals and/or filters for points of contaminant entry.

HISTORICAL DIAGNOSIS

ISO



17 Jan 2024 Diag: Kevin Marson
 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. All component wear rates are normal. The ferrography results are normal indicating no abnormal wear in the system. There is a high amount of silt (particulates < 14 microns in size) present in the oil. The water content is negligible. The AN level is acceptable for this fluid. The oil is still serviceable provided that the contaminant(s) can be reduced to acceptable levels.

view report



DIRT



19 Oct 2023 Diag: Kevin Marson
 Check seals and/or filters for points of contaminant entry. We advise that you check for visible metal particles in the oil. 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. Light concentration of visible metal present. There is a high amount of silt (particulates < 14 microns in size) present in the oil. The water content is negligible. High silicon level indicates possible contamination with silicone-based oil or silicone-based fitting compound/grease. Advise investigate any possible cross-contamination with silicone-based oil, or any points that are sealed/greased with silicone-based compound/grease. The AN level is acceptable for this fluid. The oil is still serviceable provided that the contaminant(s) can be reduced to acceptable levels.

view report



ISO



13 Sep 2023 Diag: Bill Quesnel
 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. Wear particle analysis indicates that the ferrous rolling particles are abnormal. Severity Index and total particles, large particles and small particles levels are abnormal. Wear particle analysis indicates that the ferrous corrosive particles are abnormal. There is a high amount of silt (particulates < 14 microns in size) present in the oil. High silicon level indicates possible contamination with silicone-based oil or silicone-based fitting compound/grease. Advise investigate any possible cross-contamination with silicone-based oil, or any points that are sealed/greased with silicone-based compound/grease. High amount of ingressed dirt has caused abrasive wear to the component. The viscosity of the oil is higher than normal, possibly indicating the addition of a heavier grade of oil. The AN level is acceptable for this fluid. The oil is no longer serviceable as a result of the abnormal and/or severe wear.

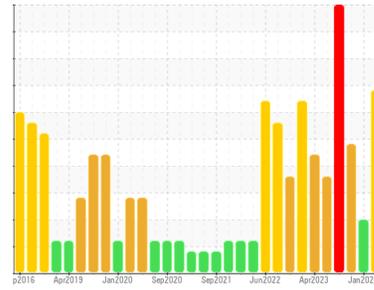
view report





OIL ANALYSIS REPORT

Sample Rating Trend



ISO



Area
BRUCE B/0B/54300
 Machine Id
0B-54300-EPG1-CP1-OIL
 Component
Compressor
 Fluid
ESSO NUTO H ISO 150 (--- GAL)

DIAGNOSIS

▲ Recommendation

Check seals and/or filters for points of contaminant entry. We advise that you check for visible metal particles in the oil. 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.

▲ Wear

Light concentration of visible metal present.

▲ Contaminants

There is a high amount of silt (particulates < 14 microns in size) present in the oil. The water content is negligible. High silicon level indicates possible contamination with silicone-based oil or silicone-based fitting compound/grease. Advise investigate any possible cross-contamination with silicone-based oil, or any points that are sealed/greased with silicone-based compound/grease.

Oil 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.

Particle Filter (Magn: 200 x)



SAMPLE INFORMATION

	method	limit/base	current	history1	history2
Sample Number	Client Info		WC0896807	WC0642732	WC0642817
Sample Date	Client Info		10 Apr 2024	17 Jan 2024	19 Oct 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			SEVERE	SEVERE	SEVERE

WEAR METALS

	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185(m) >50	9	8	10
Chromium	ppm	ASTM D5185(m) >10	0	0	0
Nickel	ppm	ASTM D5185(m)	0	<1	<1
Titanium	ppm	ASTM D5185(m)	0	0	0
Silver	ppm	ASTM D5185(m)	0	0	<1
Aluminum	ppm	ASTM D5185(m) >25	<1	<1	<1
Lead	ppm	ASTM D5185(m) >25	0	<1	<1
Copper	ppm	ASTM D5185(m) >50	4	3	3
Tin	ppm	ASTM D5185(m) >15	0	<1	<1
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)	1	1	1

ADDITIVES

	method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185(m)	0	0	<1
Barium	ppm	ASTM D5185(m)	0	0	<1
Molybdenum	ppm	ASTM D5185(m)	0	0	0
Manganese	ppm	ASTM D5185(m)	<1	0	0
Magnesium	ppm	ASTM D5185(m)	<1	<1	<1
Calcium	ppm	ASTM D5185(m)	22	21	23
Phosphorus	ppm	ASTM D5185(m)	333	332	333
Zinc	ppm	ASTM D5185(m)	362	353	362
Sulfur	ppm	ASTM D5185(m)	1357	1396	1320
Lithium	ppm	ASTM D5185(m)	<1	<1	<1

CONTAMINANTS

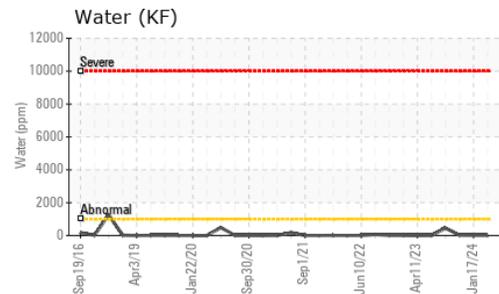
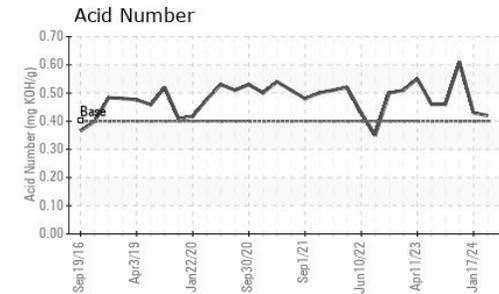
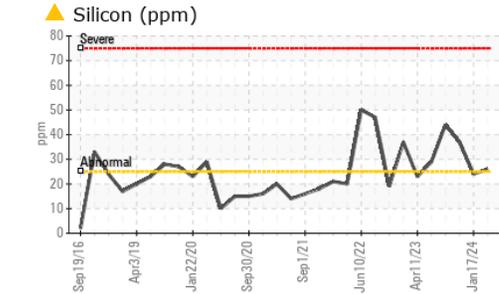
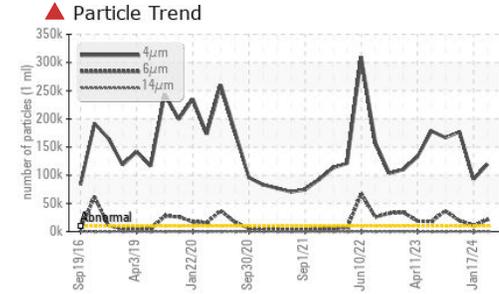
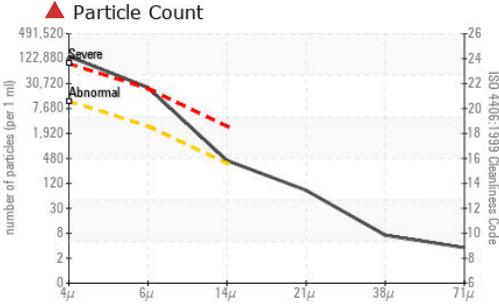
	method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185(m) >25	▲ 26	24	▲ 37
Sodium	ppm	ASTM D5185(m)	2	2	2
Potassium	ppm	ASTM D5185(m) >20	<1	1	<1
Water	%	ASTM D6304* >0.1	0.001	0.001	0.002
ppm Water	ppm	ASTM D6304* >1000	3	11	21.1

FLUID CLEANLINESS

	method	limit/base	current	history1	history2
Particles >4µm	ASTM D7647	>10000	▲ 119565	▲ 92713	▲ 177075
Particles >6µm	ASTM D7647	>2500	▲ 21257	▲ 10703	▲ 19457
Particles >14µm	ASTM D7647	>320	● 375	84	115
Particles >21µm	ASTM D7647	>80	72	16	19
Particles >38µm	ASTM D7647	>20	6	3	1
Particles >71µm	ASTM D7647	>4	3	2	0
Oil Cleanliness	ISO 4406 (c)	>20/18/15	▲ 24/22/16	▲ 24/21/14	▲ 25/21/14



OIL ANALYSIS REPORT



FLUID DEGRADATION		method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D974*	.40	0.42	0.43	0.61

VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	Visual*	NONE	▲ VLITE	NONE	▲ VLITE
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	VLITE	NONE	VLITE
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*	>0.1	NEG	NEG	NEG
Free Water	scalar	Visual*		NEG	NEG	NEG

FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D7279(m)	151.3	135	136	135

SAMPLE IMAGES		method	limit/base	current	history1	history2
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Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
Sample No. : WC0896807
Lab Number : 02628473
Unique Number : 5761605
Test Package : IND 2 (Additional Tests: A-FERR, BottomAnalysis, DR-FERR, FILTERPATCH, PrtFilter, RPVC)

Bruce Power - Bruce A PdM
 P.O.Box 1540, 177 Tie Road, RM-222 U2 Column 2N11 615'
 Tiverton, ON
 CA N0G 2T0
 Contact: Pierre Adouki
 pierre.adouki@brucepower.com

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.

T: (519)361-2673
 F:



FERROGRAPHY REPORT

Area
BRUCE B/0B/54300
 Machine Id
0B-54300-EPG1-CP1-OIL
 Component
Compressor
 Fluid
ESSO NUTO H ISO 150 (--- GAL)

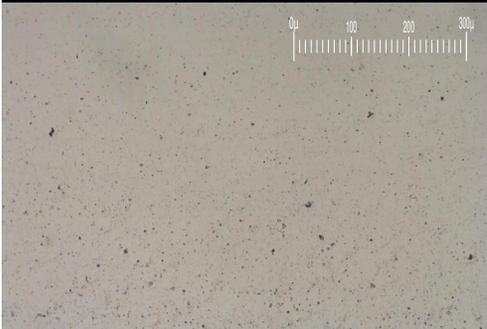
Magn: 200x Illum: BC



Magn: 50x Illum: RW



Magn: 100x Illum: RW



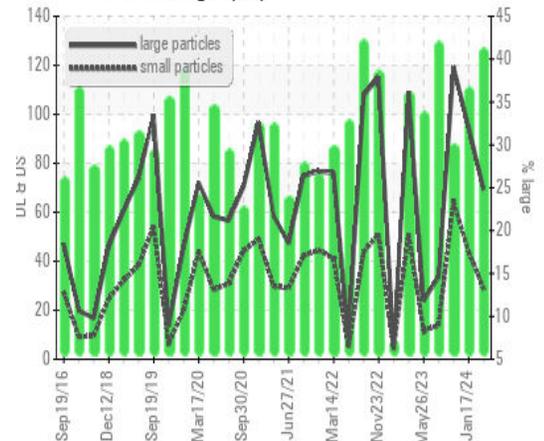
DR-FERROGRAPHY		method	limit/base	current	history1	history2
Large Particles		DR-Ferr*		69.2	95.0	119.3
Small Particles		DR-Ferr*		28.8	43.9	64.2
Total Particles		DR-Ferr*	>---	98	138.9	183.5
Large Particles Percentage	%	DR-Ferr*		41.2	36.8	30
Severity Index		DR-Ferr*		2796	4855	6573

FERROGRAPHY		method	limit/base	current	history1	history2
Ferrous Rubbing	Scale 0-10	ASTM D7684*		4	3	
Ferrous Sliding	Scale 0-10	ASTM D7684*			2	
Ferrous Cutting	Scale 0-10	ASTM D7684*				
Ferrous Rolling	Scale 0-10	ASTM D7684*		2	2	
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*		1	3	
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*		1	2	
Fibres	Scale 0-10	ASTM D7684*				
Spheres	Scale 0-10	ASTM D7684*				
Other	Scale 0-10	ASTM D7684*		2		

WEAR

Light concentration of visible metal present.

DR Ferrography



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