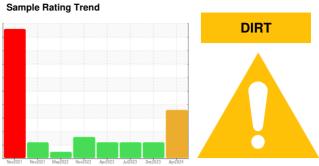


OIL ANALYSIS REPORT

BAGLINE KETTLE 9 TUBLINE

Refrigeration Compressor

PETRO CANADA PURITY FG SYNTH EP GEAR 220 (1 GAL)



DIAGNOSIS

Recommendation

We recommend you service the filters on this component. Resample at the next service interval to monitor.

Wear

All component wear rates are normal.

Contamination

There is a high amount of particulates present in the oil. Elemental level of silicon (Si) above normal indicating ingress of seal material.

Fluid Condition

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

Sample Number Client Info USP0006692 USP0004473 USP25025 Sample Date Client Info 25 Apr 2024 17 Dec 2023 05 Jul 202 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 N/A Sample Status Method Imitibase Current history1 history1 Iron ppm ASTM D5185m >8 6 5 10 Chromium ppm ASTM D5185m >2 0 0 0 Chromium ppm ASTM D5185m 2 0 0 0 Nickel ppm ASTM D5185m 2 0 0 0 Aluminum ppm ASTM D5185m 2 0 0 0 Copper ppm ASTM D5185m 2 0 0 0 Cardadium ppm<	AR 220 (1 GAL))	Nov2021	Nov2021 May2022 Nov20	22 Apr2023 Jul2023 Dec2023	Apr2024	
Sample Date	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info	Sample Number		Client Info		USP0006692	USP0004473	USP250221
Oil Age hrs Client Info N/A	Sample Date		Client Info		25 Apr 2024	17 Dec 2023	05 Jul 2023
Cilient Info	Machine Age	hrs	Client Info		0	0	0
Sample Status method limit/base current history1 history1 Iron ppm ASTM D5185m >8 6 5 10 Chromium ppm ASTM D5185m >2 0 0 0 Nickel ppm ASTM D5185m 0 0 0 0 Silver ppm ASTM D5185m >2 0 0 0 0 Silver ppm ASTM D5185m >2 0 0 0 0 Aluminum ppm ASTM D5185m >2 0 0 0 0 Copper ppm ASTM D5185m >2 0 0 0 1 Tin ppm ASTM D5185m >2 0 0 0 1 Vanadium ppm ASTM D5185m 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Oil Age	hrs	Client Info		0	0	0
WEAR METALS method limit/base current history1 history1 Iron ppm ASTM D5185m >8 6 5 10 Chromium ppm ASTM D5185m >2 0 0 0 Nickel ppm ASTM D5185m 0 0 1 <1	Oil Changed		Client Info		N/A	N/A	N/A
Iron	Sample Status				ABNORMAL	ABNORMAL	ABNORMAL
Chromium ppm ASTM D5185m >2 0 0 0 Nickel ppm ASTM D5185m 0 <1 <1 Silver ppm ASTM D5185m 2 0 0 0 Aluminium ppm ASTM D5185m >2 0 0 0 Aluminium ppm ASTM D5185m >2 0 0 0 Lead ppm ASTM D5185m >2 0 0 0 Copper ppm ASTM D5185m >4 0 0 <1 Vanadium ppm ASTM D5185m 0 0 0 <1 Barium ppm ASTM D5185m 0 0 0 <1 <t< td=""><td>WEAR METALS</td><td></td><td>method</td><td>limit/base</td><td>current</td><td>history1</td><td>history2</td></t<>	WEAR METALS		method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>8	6	5	10
Titanium ppm ASTM D5185m 0 <1 <1 Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >3 0 2 <1	Chromium	ppm	ASTM D5185m	>2	0	0	0
Silver	Nickel	ppm	ASTM D5185m		0	0	0
Aluminum	Titanium	ppm	ASTM D5185m		0	<1	<1
Lead ppm ASTM D5185m >2 0 0 0 Copper ppm ASTM D5185m >8 0 0 <1 Tin ppm ASTM D5185m >8 0 0 <1 Vanadium ppm ASTM D5185m 0 0 <1 Cadmium ppm ASTM D5185m 0 0 <1 history1 history1 ADITIVES method limit/base current history1 history1 history1 Boron ppm ASTM D5185m 0 0 0 0 Boron ppm ASTM D5185m 0 0 0 1 Molybdenum ppm ASTM D5185m 0 0 0 0 Manganese ppm ASTM D5185m 0 0 0 0 Calcium ppm ASTM D5185m 0 0 0 2 Zinc ppm ASTM D5185m 0 <	Silver	ppm	ASTM D5185m	>2	0	0	0
Copper ppm ASTM D5185m >8 0 0 <1 Fin ppm ASTM D5185m >4 0 0 <1	Aluminum	ppm	ASTM D5185m	>3	0	2	<1
Tin	_ead	ppm	ASTM D5185m	>2	0	0	0
Vanadium ppm ASTM D5185m 0 0 <1 Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185m 0 0 0 <1 Boron ppm ASTM D5185m 0 0 <1 Molybdenum ppm ASTM D5185m 0 0 0 <1 Manganese ppm ASTM D5185m 0 0 0 0 Magnesium ppm ASTM D5185m 0 0 2 Calcium ppm ASTM D5185m 0 0 5 Phosphorus ppm ASTM D5185m 0 0 0 5 Silico ppm ASTM D5185m 0 0 0 0 0 CONTAMINANTS method limit/base current history1 history1 Silicon	Copper	ppm	ASTM D5185m	>8	0	0	<1
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185m 0 0 0 Barium ppm ASTM D5185m 0 0 0 Molybdenum ppm ASTM D5185m 0 0 0 Magnesium ppm ASTM D5185m 0 0 0 Magnesium ppm ASTM D5185m 0 0 2 Calcicium ppm ASTM D5185m 0 0 5 Phosphorus ppm ASTM D5185m 0 0 0 0 Zinc ppm ASTM D5185m 0 0 0 0 Sulfur ppm ASTM D5185m >15 15 8 5 Scilicon ppm ASTM D5185m >0 2 1 Potassium ppm ASTM D5185m >0 2 1<	Tin	ppm	ASTM D5185m	>4	0	0	<1
ADDITIVES	Vanadium	ppm	ASTM D5185m		0	0	<1
Boron ppm ASTM D5185m 0 0 0 0	Cadmium	ppm	ASTM D5185m		0	0	0
Sarium	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 0 0 0 Manganese ppm ASTM D5185m 0 0 0 Magnesium ppm ASTM D5185m 0 0 2 Calcium ppm ASTM D5185m 0 0 5 Phosphorus ppm ASTM D5185m 517 512 585 Zinc ppm ASTM D5185m 0 0 0 0 Sulfur ppm ASTM D5185m 409 347 653 CONTAMINANTS method limit/base current history1 history1 history1 Silicon ppm ASTM D5185m >15 4 15 8 5 Godium ppm ASTM D5185m 0 2 1 2 Potassium ppm ASTM D5185m 0 2 1 2 Vater % ASTM D5185m >20 0 0 1 3 2 Va	Boron	ppm	ASTM D5185m		0	0	0
Manganese ppm ASTM D5185m 0 0 0 Magnesium ppm ASTM D5185m 0 0 2 Calcium ppm ASTM D5185m 0 0 5 Phosphorus ppm ASTM D5185m 517 512 585 Zinc ppm ASTM D5185m 0 0 0 Sulfur ppm ASTM D5185m 409 347 653 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >15 4 15 8 5 Sodium ppm ASTM D5185m >0 2 1 1 Potassium ppm ASTM D5185m >20 0 0 1 1 Vater % ASTM D5185m >20 0 0 1 1 Vater % ASTM D5185m >20 0 0 1 1 Vater	Barium	ppm	ASTM D5185m		0	0	<1
Magnesium ppm ASTM D5185m 0 0 2 Calcium ppm ASTM D5185m 0 0 5 Phosphorus ppm ASTM D5185m 517 512 585 Zinc ppm ASTM D5185m 0 0 0 Sulfur ppm ASTM D5185m 409 347 653 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >15 15 8 5 Sodium ppm ASTM D5185m 0 2 1 Potassium ppm ASTM D5185m 0 2 1 Potassium ppm ASTM D5185m 0 2 1 Potassium ppm ASTM D5185m 0 0 0 1 Water % ASTM D5185m 0 0 0 1 Particles >4µm ASTM D6304 >0.01 21 90 <td>Molybdenum</td> <td>ppm</td> <td>ASTM D5185m</td> <td></td> <td>0</td> <td>0</td> <td>0</td>	Molybdenum	ppm	ASTM D5185m		0	0	0
Calcium ppm ASTM D5185m 0 0 5 Phosphorus ppm ASTM D5185m 517 512 585 Zinc ppm ASTM D5185m 0 0 0 Sulfur ppm ASTM D5185m 409 347 653 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >15 15 8 5 Sodium ppm ASTM D5185m >15 15 8 5 Sodium ppm ASTM D5185m >20 0 0 1 Water % ASTM D5185m >20 0 0 1 Water % ASTM D6304 >0.01 0.002 0.009 0.001 Particles >4μm ASTM D6304 >100 21 90 14.9 Particles >6μm ASTM D7647 >10000 98875 37020 100424 Particles >21μm	Manganese	ppm	ASTM D5185m		0	0	0
Phosphorus ppm ASTM D5185m 517 512 585 Zinc ppm ASTM D5185m 0 0 0 Gulfur ppm ASTM D5185m 409 347 653 CONTAMINANTS method limit/base current history1 history1 Gilicon ppm ASTM D5185m >15 ▲ 15 8 5 Godium ppm ASTM D5185m >0 2 1 Potassium ppm ASTM D5185m >20 0 0 1 Water % ASTM D5185m >20 0 0 0 0 Particles >4m ASTM D6304 >0.01 21 90 14.9 14.9 Par	Magnesium	ppm	ASTM D5185m		0	0	2
Zinc ppm ASTM D5185m 0 0 0 Sulfur ppm ASTM D5185m 409 347 653 CONTAMINANTS method limit/base current history1 history1 Silicon ppm ASTM D5185m >15 ▲ 15 8 5 Sodium ppm ASTM D5185m >0 2 1 Potassium ppm ASTM D5185m >20 0 0 1 Water % ASTM D6304 >0.01 0.002 0.009 0.001 Opm Water ppm ASTM D6304 >100 21 90 14.9 FLUID CLEANLINESS method limit/base current history1 history1 Particles >4μm ASTM D7647 >10000 98875 △ 37020 △ 100424 Particles >6μm ASTM D7647 >640 △ 1066 293 370 Particles >21μm ASTM D7647 >160 △ 228 56 36	Calcium	ppm	ASTM D5185m		0	0	5
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >15 ▲ 15 8 5 Sodium ppm ASTM D5185m >0 2 1 Potassium ppm ASTM D5185m >20 0 0 1 Nater % ASTM D6304 >0.01 0.002 0.009 0.001 opm Water ppm ASTM D6304 >100 21 90 14.9 Particles >4μm ASTM D6304 >100 21 90 14.9 Particles >4μm ASTM D7647 >10000 40	Phosphorus	ppm	ASTM D5185m		517	512	585
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >15 ▲ 15 8 5 Sodium ppm ASTM D5185m 0 2 1 Potassium ppm ASTM D5185m >20 0 0 1 Water % ASTM D5185m >20 0 0 1 Water % ASTM D5185m >20 0 0 1 Water % ASTM D5185m >20 0 0 0 1 Water % ASTM D5185m >20 1 0 0 0 0 0 0 0 0 0 0 0 0 0	Zinc	ppm	ASTM D5185m		0	0	0
Silicon ppm ASTM D5185m >15	Sulfur	ppm	ASTM D5185m		409	347	653
Sodium ppm ASTM D5185m 0 2 1 Potassium ppm ASTM D5185m >20 0 0 1 Water % ASTM D6304 >0.01 0.002 0.009 0.001 opm Water ppm ASTM D6304 >100 21 90 14.9 PLUID CLEANLINESS method limit/base current history1 history1 Particles >4μm ASTM D7647 >10000 4 98875 37020 100424 Particles >6μm ASTM D7647 >2500 4 22794 6919 21696 Particles >14μm ASTM D7647 >640 1066 293 370 Particles >21μm ASTM D7647 >160 228 56 36 Particles >38μm ASTM D7647 >40 9 2 0 Particles >71μm ASTM D7647 >10 0 0 0 Particles >71μm ASTM D7647 >10 0 0 0	CONTAMINANTS	}	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 0 0 1 Water % ASTM D6304 >0.01 0.002 0.009 0.001 opm Water ppm ASTM D6304 >100 21 90 14.9 FLUID CLEANLINESS method limit/base current history1 history1 Particles >4μm ASTM D7647 >10000 ♣ 98875 ♠ 37020 ♠ 100424 Particles >6μm ASTM D7647 >2500 ♠ 22794 ♠ 6919 ♠ 21696 Particles >14μm ASTM D7647 >640 ♠ 1066 293 370 Particles >21μm ASTM D7647 >160 ♠ 228 56 36 Particles >38μm ASTM D7647 >40 9 2 0 Particles >71μm ASTM D7647 >10 0 0 0 Particles >71μm ASTM D7647 >10 0 0 0 Particles >71μm ASTM D7647 >10 0 0 0	Silicon	ppm	ASTM D5185m	>15	<u> </u>	8	5
Water % ASTM D6304 >0.01 0.002 0.009 0.001 opm Water ppm ASTM D6304 >100 21 90 14.9 FLUID CLEANLINESS method limit/base current history1 history1 Particles >4μm ASTM D7647 >10000 4 98875 4 37020 4 100424 Particles >6μm ASTM D7647 >2500 4 22794 6919 4 21696 Particles >14μm ASTM D7647 >640 4 1066 293 370 Particles >21μm ASTM D7647 >160 228 56 36 Particles >38μm ASTM D7647 >40 9 2 0 Particles >71μm ASTM D7647 >10 0 0 0 Dil Cleanliness ISO 4406 (c) >20/18/16 24/22/17 22/20/15 24/22/1 FLUID DEGRADATION method limit/base current history1 history1	Sodium	ppm	ASTM D5185m		0	2	1
Opm Water ppm ASTM D6304 >100 21 90 14.9 FLUID CLEANLINESS method limit/base current history1 history1 Particles >4μm ASTM D7647 >10000 4 98875 4 37020 4 100424 Particles >6μm ASTM D7647 >2500 4 22794 4 6919 4 21696 Particles >14μm ASTM D7647 >640 4 1066 293 370 Particles >21μm ASTM D7647 >160 228 56 36 Particles >38μm ASTM D7647 >40 9 2 0 Particles >71μm ASTM D7647 >10 0 0 0 Particles >71μm	Potassium	ppm	ASTM D5185m	>20	0	0	1
FLUID CLEANLINESS method limit/base current history1 history1 Particles >4μm ASTM D7647 >10000 Δ 98875 Δ 37020 Δ 100424 Particles >6μm ASTM D7647 >2500 Δ 22794 Δ 6919 Δ 21696 Particles >14μm ASTM D7647 >640 Δ 1066 293 370 Particles >21μm ASTM D7647 >160 Δ 228 56 36 Particles >38μm ASTM D7647 >40 9 2 0 Particles >71μm ASTM D7647 >10 0 0 0 Dil Cleanliness ISO 4406 (c) >20/18/16 Δ 24/22/17 Δ 22/20/15 Δ 24/22/1 FLUID DEGRADATION method limit/base current history1 history1	<i>N</i> ater	%	ASTM D6304	>0.01	0.002	0.009	0.001
Particles >4μm ASTM D7647 >10000 4 98875 4 37020 100424 Particles >6μm ASTM D7647 >2500 22794 6919 21696 Particles >14μm ASTM D7647 >640 1066 293 370 Particles >21μm ASTM D7647 >160 228 56 36 Particles >38μm ASTM D7647 >40 9 2 0 Particles >71μm ASTM D7647 >10 0 0 0 Dil Cleanliness ISO 4406 (c) >20/18/16 24/22/17 22/20/15 24/22/1 FLUID DEGRADATION method limit/base current history1 history1	opm Water	ppm	ASTM D6304	>100	21	90	14.9
Particles >6μm ASTM D7647 >2500 22794 6919 21696 Particles >14μm ASTM D7647 >640 1066 293 370 Particles >21μm ASTM D7647 >160 228 56 36 Particles >38μm ASTM D7647 >40 9 2 0 Particles >71μm ASTM D7647 >10 0 0 0 Dil Cleanliness ISO 4406 (c) >20/18/16 24/22/17 22/20/15 24/22/1 FLUID DEGRADATION method limit/base current history1 history1	FLUID CLEANLIN	IESS	method	limit/base	current	history1	history2
Particles >14μm ASTM D7647 >640 ▲ 1066 293 370 Particles >21μm ASTM D7647 >160 ▲ 228 56 36 Particles >38μm ASTM D7647 >40 9 2 0 Particles >71μm ASTM D7647 >10 0 0 0 Dil Cleanliness ISO 4406 (c) >20/18/16 ▲ 24/22/17 ▲ 22/20/15 ▲ 24/22/1 FLUID DEGRADATION method limit/base current history1 history1	Particles >4µm		ASTM D7647	>10000	98875	▲ 37020	▲ 100424
Particles >21μm ASTM D7647 >160 228 56 36 Particles >38μm ASTM D7647 >40 9 2 0 Particles >71μm ASTM D7647 >10 0 0 0 Dil Cleanliness ISO 4406 (c) >20/18/16 24/22/17 22/20/15 24/22/1 FLUID DEGRADATION method limit/base current history1 history1	Particles >6µm		ASTM D7647	>2500	<u>22794</u>	△ 6919	<u>^</u> 21696
Particles >38μm ASTM D7647 >40 9 2 0 Particles >71μm ASTM D7647 >10 0 0 0 Dil Cleanliness ISO 4406 (c) >20/18/16 Δ 24/22/17 Δ 22/20/15 Δ 24/22/1 FLUID DEGRADATION method limit/base current history1 history1	Particles >14µm		ASTM D7647	>640	1066	293	370
Particles >71μm ASTM D7647 >10 0 0 0 Dil Cleanliness ISO 4406 (c) >20/18/16 ▲ 24/22/17 ▲ 22/20/15 ▲ 24/22/1 FLUID DEGRADATION method limit/base current history1 history1	Particles >21µm		ASTM D7647	>160	<u>^</u> 228	56	36
Dil Cleanliness ISO 4406 (c) >20/18/16 ▲ 24/22/17 ▲ 22/20/15 ▲ 24/22/1 FLUID DEGRADATION method limit/base current history1 history	Particles >38µm		ASTM D7647	>40	9	2	0
FLUID DEGRADATION method limit/base current history1 history	Particles >71µm		ASTM D7647	>10	0	0	0
	Oil Cleanliness		ISO 4406 (c)	>20/18/16	<u>4</u> 24/22/17	<u>22/20/15</u>	<u>4</u> 24/22/16
Acid Number (AN) mg KOH/g ASTM D974 0.59 0.66 0.60 0.72	FLUID DEGRADA	NOITA	method	limit/base	current	history1	history2
	Acid Number (AN)	mg KOH/g	ASTM D974	0.59	0.66	0.60	0.72



OIL ANALYSIS REPORT







Certificate 12367

Laboratory Sample No. Lab Number

: 06161490 Unique Number : 10996913 Test Package : IND 2

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : USP0006692 Received : 26 Apr 2024

Tested : 30 Apr 2024 Diagnosed : 30 Apr 2024 - Jonathan Hester

KraftHeinz - Cedar Rapids - Plant 8370 4601 C ST SW

CEDAR RAPIDS, IA US 52404

Contact: Service Manager

To discuss this sample report, contact Customer Service at 1-800-237-1369.

* - Denotes test methods that are outside of the ISO 17025 scope of accreditation.

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

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F: