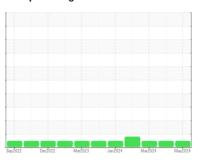


OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL



Machine Id Liberty 1
Component
Natural Gas Engine

PETRO CANADA SENTRON LD 3000 (--- G

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

All component wear rates are normal.

Contamination

Tests indicate that there is no fuel present in the oil. There is no indication of any contamination in the

Fluid Condition

The BN result indicates that there is suitable alkalinity remaining in the oil. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

Client Info	AL)		Sep2022	Dec2022 Mar2023	Jan2024 Mar2024	May2024	
Client Info	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 71644 70936 70196 Oil Age hrs Client Info 13434 12726 11986 Oil Changed Client Info N/A N/A N/A N/A Sample Status NORMAL NORMAL NORMAL CONTAMINATION method Imit/base current history1 history2 Water WC Method 0.0.1 NEG NEG NEG WEAR METALS method Imit/base current history1 history2 Iron ppm ASTM 05185m >4 <1 1 0 Nickel ppm ASTM 05185m >2 2 2 0 Chromium ppm ASTM 05185m >2 <1 <1 0 Nickel ppm ASTM 05185m >2 <1 <1 0 Titanium ppm ASTM 05185m >3 0 0 0 Aluminum ppm ASTM 05185m >3 0 0 0 Aluminum ppm ASTM 05185m >3 0 0 0 Capper ppm ASTM 05185m >35 <1 <1 0 Tin ppm ASTM 05185m >4 1 1 <1 Copper ppm ASTM 05185m >4 1 1 <1 Capper ppm ASTM 05185m >4 1 1 <1 Cadmium ppm ASTM 05185m >4 1 1 <1 Cadmium ppm ASTM 05185m <1 1 0 ADDITIVES method Imit/base current history1 history2 Boron ppm ASTM 05185m 5 0 0 0 ADDITIVES method Imit/base current history1 history2 Boron ppm ASTM 05185m 5 0 0 0 Molybdenum ppm ASTM 05185m 5 8 10 9 Calcium ppm ASTM 05185m 5 8 10 9 Calcium ppm ASTM 05185m 1220 1241 1716 1179 Phosphorus ppm ASTM 05185m 298 288 395 270 Zinc ppm ASTM 05185m 290 343 457 342 Sulfur ppm ASTM 05185m 200 3 2 1 Potassium ppm ASTM 05185m 200 3 2 1 Potassium ppm ASTM 05185m 200 3 2 1 Potassium ppm ASTM 05185m 200 3 2 1 Fuel % ASTM 07844 30 0 0 0 NIFRA-RED method Imit/base current history1 history2 NIFRA-RED method Imit/base current history1 history2 NIFRA-RED method Imit/base current history1 history2 NIFRA-RED method Imit/base current history1 hi	Sample Number		Client Info		PCA0112019	PCA0111972	PCA0117137
Oil Changed	Sample Date		Client Info		01 May 2024	02 Apr 2024	01 Mar 2024
Colic Changed Client Info N/A N/A N/A NORMAL NORMA	Machine Age	hrs	Client Info		71644	70936	70196
NORMAL NORMAL NORMAL NORMAL	Oil Age	hrs	Client Info		13434	12726	11986
CONTAMINATION method limit/base current history1 history2 Water WC Method >0.1 NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >50 2 2 2 0 Chromium ppm ASTM D5185m >50 2 2 2 0 Nickel ppm ASTM D5185m >2 -1 -1 0 Silver ppm ASTM D5185m >3 0 0 0 All minimum ppm ASTM D5185m >30 1 1 -1 -1 Capper ppm ASTM D5185m >30 1 1 -	Oil Changed		Client Info		N/A	N/A	N/A
Water WC Method >0.1 NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >50 2 2 0 Chromium ppm ASTM D5185m >4 <1	Sample Status				NORMAL	NORMAL	NORMAL
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >50 2 2 0 Chromium ppm ASTM D5185m >4 -1 1 0 Nickel ppm ASTM D5185m >2 -1 -1 0 Silver ppm ASTM D5185m >3 0 0 0 Aluminum ppm ASTM D5185m >3 0 0 0 Aluminum ppm ASTM D5185m >30 1 1 <1	CONTAMINAT	ION	method	limit/base	current	history1	history2
Chromium	Water		WC Method	>0.1	NEG	NEG	NEG
Chromium	WEAR METAL	S	method	limit/base	current	history1	history2
Nickel	ron	ppm		>50	2		
Silver	Chromium	ppm	ASTM D5185m	>4	<1	1	0
Silver	Nickel	ppm	ASTM D5185m	>2	<1	<1	0
Ast Ast	Titanium	ppm	ASTM D5185m		<1	<1	0
Lead	Silver	ppm	ASTM D5185m	>3	0	0	0
Copper	Aluminum	ppm	ASTM D5185m	>9	<1	2	2
Tin	Lead	ppm	ASTM D5185m	>30	1	1	<1
Vanadium ppm ASTM D5185m <1 <1 0 Cadmium ppm ASTM D5185m <1 1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 5 0 0 0 Barium ppm ASTM D5185m 1 0 0 0 Molybdenum ppm ASTM D5185m 2 2 2 <1 Manganese ppm ASTM D5185m 5 8 10 9 Calcium ppm ASTM D5185m 5 8 10 9 Calcium ppm ASTM D5185m 1220 1241 1716 1179 Phosphorus ppm ASTM D5185m 298 288 395 270 Zinc ppm ASTM D5185m 1995 2616 3448 2240 CONTAMINANTS method limit/base current history1 history2 <td>Copper</td> <td>ppm</td> <td>ASTM D5185m</td> <td>>35</td> <th><1</th> <td><1</td> <td>0</td>	Copper	ppm	ASTM D5185m	>35	<1	<1	0
ADDITIVES	Tin	ppm	ASTM D5185m	>4	1	1	<1
ADDITIVES	Vanadium	ppm	ASTM D5185m		<1	<1	0
Boron ppm ASTM D5185m 5 0 0 0 0 0 0 0 0 0	Cadmium	ppm	ASTM D5185m		<1	1	0
Barium	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 2 2 2 <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 <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 <1 <1 <1	Boron	ppm	ASTM D5185m	5	0	0	0
Manganese ppm ASTM D5185m 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 <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 <1 <1 <1 <1 <1 <1	Barium	ppm	ASTM D5185m	1	0	0	0
Magnesium ppm ASTM D5185m 5 8 10 9 Calcium ppm ASTM D5185m 1220 1241 1716 1179 Phosphorus ppm ASTM D5185m 298 288 395 270 Zinc ppm ASTM D5185m 350 343 457 342 Sulfur ppm ASTM D5185m 1995 2616 3448 2240 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >+100 2 3 1 Sodium ppm ASTM D5185m >+100 0 0 1 Potassium ppm ASTM D5185m >20 3 2 1 Fuel % ASTM D3524 >4.0 0.0 0.0 0.2 INFRA-RED method limit/base current history1 history2 Soot % %	Molybdenum	ppm	ASTM D5185m	2	2	2	<1
Calcium ppm ASTM D5185m 1220 1241 1716 1179 Phosphorus ppm ASTM D5185m 298 288 395 270 Zinc ppm ASTM D5185m 350 343 457 342 Sulfur ppm ASTM D5185m 1995 2616 3448 2240 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >+100 2 3 1 Sodium ppm ASTM D5185m >+100 0 0 1 Potassium ppm ASTM D5185m >20 3 2 1 Fuel % ASTM D3524 >4.0 0.0 0.0 0.2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 3.5 3.5 3.3 Sulfation<	Manganese	ppm	ASTM D5185m	1	<1	<1	<1
Phosphorus ppm ASTM D5185m 298 288 395 270 Zinc ppm ASTM D5185m 350 343 457 342 Sulfur ppm ASTM D5185m 1995 2616 3448 2240 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >+100 2 3 1 Sodium ppm ASTM D5185m >+100 2 3 1 Potassium ppm ASTM D5185m >20 3 2 1 Fuel % ASTM D3524 >4.0 0.0 0.0 0.2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0 0 0 Nitration Abs/.1mm *ASTM D7415 >30 13.6 13.8 13.8 FLUID DEGRADATION method limit/base	Magnesium	ppm	ASTM D5185m	5	8	10	9
Zinc ppm ASTM D5185m 350 343 457 342	Calcium	ppm	ASTM D5185m	1220	1241	1716	1179
Sulfur ppm ASTM D5185m 1995 2616 3448 2240 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >+100 2 3 1 Sodium ppm ASTM D5185m 0 0 1 Potassium ppm ASTM D5185m >20 3 2 1 Fuel % ASTM D3524 >4.0 0.0 0.0 0.2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 3.5 3.5 3.3 Sulfation Abs/.1mm *ASTM D7415 >30 13.6 13.8	Phosphorus	ppm	ASTM D5185m	298	288	395	270
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >+100 2 3 1 Sodium ppm ASTM D5185m 0 0 1 Potassium ppm ASTM D5185m >20 3 2 1 Fuel % ASTM D3524 >4.0 0.0 0.0 0.2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0 0 0 Nitration Abs/cm *ASTM D7624 >20 3.5 3.5 3.3 Sulfation Abs/.1mm *ASTM D7415 >30 13.6 13.8 13.8 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 7.5 7.6 7.3 Acid Number (AN) mg KOH/g ASTM D8045 0.86 0.	Zinc	ppm	ASTM D5185m	350	343	457	342
Silicon	Sulfur	ppm	ASTM D5185m	1995	2616	3448	2240
Sodium	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 3 2 1 Fuel % ASTM D3524 >4.0 0.0 0.0 0.2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0 0 0 Nitration Abs/cm *ASTM D7624 >20 3.5 3.5 3.3 Sulfation Abs/.1mm *ASTM D7415 >30 13.6 13.8 13.8 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 7.5 7.6 7.3 Acid Number (AN) mg KOH/g ASTM D8045 0.86 0.815 0.17 0.28	Silicon	ppm	ASTM D5185m	>+100	2	3	1
Fuel % ASTM D3524 >4.0 0.0 0.0 0.2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0 0 0 Nitration Abs/cm *ASTM D7624 >20 3.5 3.5 3.3 Sulfation Abs/.1mm *ASTM D7415 >30 13.6 13.8 13.8 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 7.5 7.6 7.3 Acid Number (AN) mg KOH/g ASTM D8045 0.86 0.815 0.17 0.28	Sodium	ppm	ASTM D5185m		0	0	1
Fuel % ASTM D3524 >4.0 0.0 0.0 0.2 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0 0 0 Nitration Abs/cm *ASTM D7624 >20 3.5 3.5 3.3 Sulfation Abs/.1mm *ASTM D7415 >30 13.6 13.8 13.8 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 7.5 7.6 7.3 Acid Number (AN) mg KOH/g ASTM D8045 0.86 0.815 0.17 0.28	Potassium	ppm	ASTM D5185m	>20	3	2	1
Soot % % *ASTM D7844 0 0 0 Nitration Abs/cm *ASTM D7624 >20 3.5 3.5 3.3 Sulfation Abs/.1mm *ASTM D7415 >30 13.6 13.8 13.8 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 7.5 7.6 7.3 Acid Number (AN) mg KOH/g ASTM D8045 0.86 0.815 0.17 0.28	Fuel	%	ASTM D3524	>4.0	0.0	0.0	0.2
Nitration Abs/cm *ASTM D7624 >20 3.5 3.5 3.3 Sulfation Abs/.1mm *ASTM D7415 >30 13.6 13.8 13.8 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 7.5 7.6 7.3 Acid Number (AN) mg KOH/g ASTM D8045 0.86 0.815 0.17 0.28	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 13.6 13.8 13.8 FLUID DEGRADATION method limit/base current Limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 7.5 7.6 7.3 Acid Number (AN) mg KOH/g ASTM D8045 0.86 0.815 0.17 0.28	Soot %	%	*ASTM D7844		0	0	0
Sulfation Abs/.1mm *ASTM D7415 >30 13.6 13.8 13.8 FLUID DEGRADATION method limit/base current Limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 7.5 7.6 7.3 Acid Number (AN) mg KOH/g ASTM D8045 0.86 0.815 0.17 0.28	Nitration	Abs/cm	*ASTM D7624	>20	3.5	3.5	3.3
Oxidation Abs/.1mm *ASTM D7414 >25 7.5 7.6 7.3 Acid Number (AN) mg KOH/g ASTM D8045 0.86 0.815 0.17 0.28	Sulfation		*ASTM D7415	>30			
Acid Number (AN) mg KOH/g ASTM D8045 0.86 0.815 0.17 0.28	FLUID DEGRA	DATION	method	limit/base	current	history1	history2
Acid Number (AN) mg KOH/g ASTM D8045 0.86 0.815 0.17 0.28	Oxidation	Abs/.1mm	*ASTM D7414	>25	7.5	7.6	7.3
	Base Number (BN)	mg KOH/g	ASTM D2896	3.9	3.73	3.74	3.93



OIL ANALYSIS REPORT







Sample No.

: PCA0112019 Lab Number : 06174044 Unique Number : 11020097

Received : 09 May 2024

Tested : 15 May 2024 Diagnosed : 15 May 2024 - Wes Davis

318 SINGLETON ROAD NORA, VA US 24272

Contact: Service Manager

Submitted By: Lee Hammons

Test Package: MOB 2 (Additional Tests: FuelDilution, PercentFuel) Certificate 12367 To discuss this sample report, contact Customer Service at 1-800-237-1369.

 st - 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)