

# **OIL ANALYSIS REPORT**

Sample Rating Trend

DIRT



## Machine Id **2 (S/N GZJ00315)** Component

Natural Gas Engine

PETRO CANADA SENTRON CG 40 (145 GAL)

Sample DateIClient Info20 Mar 202313 Mar 202307 Mar 2023Machine AgehrsClient Info117302117136116944Oil AgehrsClient Info26094928Oil ChangedClient InfoN/AN/AN/AN/ASample StatusIImit/basecurrenthistory1History2WaterWC Method>0.1NEGNEGNEGWEAR METALSwethodimit/basecurrenthistory1history2IronpmASTM 05185m>50115ChromiumppmASTM 05185m>2000NickelppmASTM 05185m>300<1OpperppmASTM 05185m>300<1<12CopperppmASTM 05185m>300<1<11AdminumppmASTM 05185m>300<1<11AdminumppmASTM 05185m>300<1<11AdminumppmASTM 05185m>300<1<11AdminumppmASTM 05185m>300<1<11AdminumppmASTM 05185m>4<1111AdminumppmASTM 05185m2<<<1<1111AdminumppmASTM 05185m2<1111Adminumppm<	RON CG 40 (145	5 GAL)	n2022 Jul20	22 Aug2022 Sep2022	Oct2022 Dec2022 Jan2023	Feb2023	
Sample Date       Client Info       20 Mar 2023       13 Mar 2023       07 Mar 2023         Machine Age       hrs       Client Info       117302       117136       116994         Oil Age       hrs       Client Info       260       94       928         Oil Changed       Client Info       N/A       N/A       N/A       N/A         Sample Status       Imit base       current       history1       history2         Water       WC Method       >0.1       NEG       NEG       NEG         WEAR METALS       method       limit base       current       history1       history2         Iron       ppm       ASTM 05185m       >50       1       1       5         Othornium       ppm       ASTM 05185m       >20       0       0       0         Nickel       ppm       ASTM 05185m       >30       0       0       1       1         Auminum       ppm       ASTM 05185m       >30       0       0       1       1         Qapper       ppm       ASTM 05185m       >30       0       0       1       1	SAMPLE INFORM	<b>IATION</b>	method	limit/base	current	history1	history2
Machine Age Oil Age I hrsClient Info117302117136116994Oil Age Agm StatusClient Info26094928Oil Changed Sample StatusClient InfoN/AN/AN/ACONTAMINATIONmethodlimit/basecurrenthistory1history2WaterWC Method>0.1NEGNEGNEGWEAR METALSmethodlimit/basecurrenthistory1history2IronppmASTM D5185m>50115ChromiumppmASTM D5185m>2000NickelppmASTM D5185m>301ItaniumppmASTM D5185m>30<	Sample Number		Client Info		WC0699021	WC0699018	WC0699024
Oil Age       hrs       Client Info       250       94       928         Oil Changed       Client Info       N/A       N/A       N/A       N/A         Sample Status       Image       Limit/base       current       history1       history2         Water       WC Method       >0.1       NEG       NEG       NEG         Water       WC Method       >0.1       NEG       NEG       NEG         Water       WC Method       >0.1       1       1       5         Chromium       ppm       ASTM D5185m       >4       <1	Sample Date		Client Info		20 Mar 2023	13 Mar 2023	07 Mar 2023
Oli ChangedClient InfoN/AN/AN/AABNORMALN/AABNORMALSample StatusImage StatusImage StatusImage StatusImage StatusNethodNethodNethodNethodABNORMALCONTAMINATIONWc Method>0.1NEGNEGNEGNEGWaterWC Method>0.1NEGNEGNEGWEAR METALSmethodImil/basecurrenthistory1history2IronppmASTM D5185m>50115ChromiumppmASTM D5185m>2000NickelppmASTM D5185m>2000SilverppmASTM D5185m>3000<1	Machine Age	hrs	Client Info		117302	117136	116994
Sample Status       Method       Imil/base       current       Netoryl       ABNORMAL       ABNORMAL         CONTAMINATION       method       limit/base       current       historyl       historyl         Water       WC Method       >0.1       NEG       NEG       NEG         WEAR METALS       method       limit/base       current       historyl       historyl         Iron       ppm       ASTM D5185m       >50       1       1       5         Chromium       ppm       ASTM D5185m       >22       0       0       0         Nickel       ppm       ASTM D5185m       >30       0       <1	Oil Age	hrs	Client Info		260	94	928
CONTAMINATION       method       limit/base       current       history1       history2         Water       WC Method       >0.1       NEG       NEG       NEG         Water       wC Method       >0.1       NEG       NEG       NEG         Water       ppm       ASTM D5185m       >50       1       1       5         Chromium       ppm       ASTM D5185m       >4       <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       1       1       5         Chromium       ppm       ASTM D5185m       >2       0       0       0         Nickel       ppm       ASTM D5185m       >2       0       0       0         Silver       ppm       ASTM D5185m       >3       0       0       <1	Sample Status				ABNORMAL	NORMAL	ABNORMAL
WEAR METALS       method       limit/base       current       history1       history2         Iron       ppm       ASTM D5185m       >50       1       1       5         Chromium       ppm       ASTM D5185m       >4       <1       0       0         Nickel       ppm       ASTM D5185m       >2       0       0       0         Silver       ppm       ASTM D5185m       >3       0       0       <1         Aluminum       ppm       ASTM D5185m       >3       0       <1       <1         Lead       ppm       ASTM D5185m       >35       <1       <1       <1       <1         Copper       ppm       ASTM D5185m       >35       <1       <1       <1       <1         Cadmium       ppm       ASTM D5185m       >4       <1       1       6          Boron       ppm       ASTM D5185m       0       0       1       <1         Magnesium       ppm       ASTM D5185m       1       <1       1       1         Magnesium       ppm       ASTM D5185m	CONTAMINATIO	N	method	limit/base	current	history1	history2
Iron       ppm       ASTM D5185m       >50       1       1       5         Chromium       ppm       ASTM D5185m       >4       <1       0       0         Nickel       ppm       ASTM D5185m       >2       0       0       0         Silver       ppm       ASTM D5185m       >3       0       0       <1         Aluminum       ppm       ASTM D5185m       >3       0       <1       <1         Auminum       ppm       ASTM D5185m       >30       0       <1       <1       2         Lead       ppm       ASTM D5185m       >30       0       <1       <1       2         Lead       ppm       ASTM D5185m       30       0       <1       <1       2         Cadmium       ppm       ASTM D5185m       0       0       0       <1       1         Cadmium       ppm       ASTM D5185m       0       0       0       0       0         Boron       ppm       ASTM D5185m       1       0       0       0       0       0       0       0	Water		WC Method	>0.1	NEG	NEG	NEG
Chromium       ppm       ASTM D5185m       >4       <1       0       0         Nickel       ppm       ASTM D5185m       >2       0       0       0         Silver       ppm       ASTM D5185m       >3       0       0       <1	WEAR METALS		method	limit/base	current	history1	history2
Nickel       ppm       ASTM D5185m       >2       0       0       0         Titanium       ppm       ASTM D5185m       >3       0       0       <1	Iron	ppm	ASTM D5185m	>50	1	1	5
Titanium       ppm       ASTM D5185m       0       0       0         Silver       ppm       ASTM D5185m       >3       0       0       <1	Chromium	ppm	ASTM D5185m	>4	<1	0	0
Silver       ppm       ASTM D5185m       >3       0       0       <1         Aluminum       ppm       ASTM D5185m       >9       2       2       2         Lead       ppm       ASTM D5185m       >30       0       <1       <1         Copper       ppm       ASTM D5185m       >35       <1       <1       2         Tin       ppm       ASTM D5185m       >4       <1       1       6         Vanadium       ppm       ASTM D5185m       0       0       0       <1         Cadmium       ppm       ASTM D5185m       0       0       1       <1       6         ADDITIVES       method       limit/base       current       history1       history2         Boron       ppm       ASTM D5185m       1       0       0       0       0         Magneses       ppm       ASTM D5185m       1       <1       <1       1         Magnesium       ppm       ASTM D5185m       2/12       26411       2680       2878         Phosphorus       ppm       ASTM D5185m       2/12 <td>Nickel</td> <td>ppm</td> <td>ASTM D5185m</td> <td>&gt;2</td> <th>0</th> <td>0</td> <td>0</td>	Nickel	ppm	ASTM D5185m	>2	0	0	0
AluminumppmASTM D5185m>92222LeadppmASTM D5185m>300<1	Titanium	ppm	ASTM D5185m		0	0	0
Lead       ppm       ASTM D5185m       >30       0       <1       <1         Copper       ppm       ASTM D5185m       >35       <1	Silver	ppm	ASTM D5185m	>3			
CopperppmASTM D5185m>35<1<12TinppmASTM D5185m>4<1	Aluminum	ppm	ASTM D5185m	>9	2	2	2
Tin       ppm       ASTM D5185m       >4       <1       1       6         Vanadium       ppm       ASTM D5185m       0       0       <1	Lead	ppm			0	<1	
Vanadium       ppm       ASTM D5185m       0       0       <1         Cadmium       ppm       ASTM D5185m       0       0       0         ADDITIVES       method       limit/base       current       history1       history2         Boron       ppm       ASTM D5185m       0       0       1       <1		ppm	ASTM D5185m	>35	<1		
Cadmium       ppm       ASTM D5185m       0       0       0         ADDITIVES       method       limit/base       current       history1       history2         Boron       ppm       ASTM D5185m       0       0       1       <1         Barium       ppm       ASTM D5185m       1       0       0       0       0         Magnesium       ppm       ASTM D5185m       2       <1       1       1         Magnesium       ppm       ASTM D5185m       2       <1       1       1         Magnesium       ppm       ASTM D5185m       9       12       14       15         Calcium       ppm       ASTM D5185m       2712       2641       2680       2878         Phosphorus       ppm       ASTM D5185m       292       242       256       273         Sulfur       ppm       ASTM D5185m       2575       3508       3598       3409         CONTAMINANTS       method       limit/base       current       history1       history2         Solicon       ppm       ASTM D5185m       >20		ppm		>4			
ADDITIVES       method       limit/base       current       history1       history2         Boron       ppm       ASTM D5185m       0       0       1       <1	Vanadium	ppm	ASTM D5185m		0	0	<1
Boron       ppm       ASTM D5185m       0       0       1       <1         Barium       ppm       ASTM D5185m       1       0       0       0         Molybdenum       ppm       ASTM D5185m       2       <1	Cadmium	ppm	ASTM D5185m		0	0	0
Barium       pm       ASTM D5185m       1       0       0       0         Molybdenum       ppm       ASTM D5185m       2       <1       1       1         Manganese       ppm       ASTM D5185m       1       <1       <1       <1         Magnesium       ppm       ASTM D5185m       9       12       14       15         Calcium       ppm       ASTM D5185m       2712       2641       2680       2878         Phosphorus       ppm       ASTM D5185m       292       242       256       273         Zinc       ppm       ASTM D5185m       292       242       309       312       339         Sulfur       ppm       ASTM D5185m       2575       3508       3598       3409         CONTAMINANTS       method       limit/base       current       history1       history2         Silicon       ppm       ASTM D5185m       >4100       137       67       351         Sodium       ppm       ASTM D5185m       >20       0       <1       0         Fuel       %       ASTM D5185m	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum       ppm       ASTM D5185m       2       <1       1       1         Manganese       ppm       ASTM D5185m       1       <1	Boron	ppm		0			
Manganese     ppm     ASTM D5185m     1     <1     <1     <1     <1       Magnesium     ppm     ASTM D5185m     9     12     14     15       Calcium     ppm     ASTM D5185m     2712     2641     2680     2878       Phosphorus     ppm     ASTM D5185m     292     242     256     273       Zinc     ppm     ASTM D5185m     342     309     312     339       Sulfur     ppm     ASTM D5185m     2575     3508     3598     3409       CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >+100     137     67     351       Sodium     ppm     ASTM D5185m     >20     0     <1		ppm	ASTM D5185m	1	0		0
Magnesium       ppm       ASTM D5185m       9       12       14       15         Calcium       ppm       ASTM D5185m       2712       2641       2680       2878         Phosphorus       ppm       ASTM D5185m       292       242       256       273         Zinc       ppm       ASTM D5185m       342       309       312       339         Sulfur       ppm       ASTM D5185m       2575       3508       3598       3409         CONTAMINANTS       method       limit/base       current       history1       history2         Silicon       ppm       ASTM D5185m       >+100       137       67       351         Sodium       ppm       ASTM D5185m       >20       0       <11       0       <1         Potassium       ppm       ASTM D5185m       >20       0       <1       0.1       0.1         INFRA-RED       method       limit/base       current       history1       history2         Soot %       %       *ASTM D7624       >20       4.9       4.2       6.1         Sulfation       Abs		ppm					
Calcium       ppm       ASTM D5185m       2712       2641       2680       2878         Phosphorus       ppm       ASTM D5185m       292       242       256       273         Zinc       ppm       ASTM D5185m       342       309       312       339         Sulfur       ppm       ASTM D5185m       2575       3508       3598       3409         CONTAMINANTS       method       limit/base       current       history1       history2         Silicon       ppm       ASTM D5185m       >+100       137       67       ▲ 351         Sodium       ppm       ASTM D5185m       >+100       ▲ 137       67       ▲ 351         Sodium       ppm       ASTM D5185m       >20       0       <1	•	ppm					
Phosphorus       ppm       ASTM D5185m       292       242       256       273         Zinc       ppm       ASTM D5185m       342       309       312       339         Sulfur       ppm       ASTM D5185m       2575       3508       3598       3409         CONTAMINANTS       method       limit/base       current       history1       history2         Silicon       ppm       ASTM D5185m       >+100       137       67       ▲ 351         Sodium       ppm       ASTM D5185m       >+100       ▲ 137       67       ▲ 351         Sodium       ppm       ASTM D5185m       >20       0       <1	-						
Zinc       ppm       ASTM D5185m       342       309       312       339         Sulfur       ppm       ASTM D5185m       2575       3508       3598       3409         CONTAMINANTS       method       limit/base       current       history1       history2         Silicon       ppm       ASTM D5185m       >+100       137       67       ▲ 351         Sodium       ppm       ASTM D5185m       >+100       ▲ 137       67       ▲ 351         Sodium       ppm       ASTM D5185m       >+100       ▲ 137       67       ▲ 351         Sodium       ppm       ASTM D5185m       >20       0       <1		ppm					
SulfurppmASTM D5185m2575350835983409CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>+100<							
CONTAMINANTS     method     limit/base     current     history1     history2       Silicon     ppm     ASTM D5185m     >+100     137     67     351       Sodium     ppm     ASTM D5185m     >+100     137     67     351       Potassium     ppm     ASTM D5185m     >20     0     <1		ppm					
Silicon     ppm     ASTM D5185m     >+100     137     67     351       Sodium     ppm     ASTM D5185m     >+100     <137     67     351       Sodium     ppm     ASTM D5185m     >20     0     <1     0     <1       Potassium     ppm     ASTM D5185m     >20     0     <1     0     <1       Fuel     %     ASTM D3524     >4.0     0.3     0.3     0.4       INFRA-RED     method     limit/base     current     history1     history2       Soot %     %     *ASTM D7844     0.1     0.1     0.1     0.1       Nitration     Abs/.mm     *ASTM D7624     >20     4.9     4.2     6.1       Sulfation     Abs/.1mm     *ASTM D7415     >30     17.3     15.4     21.6       FLUID DEGRADATION     method     limit/base     current     history1     history2       Oxidation     Abs/.1mm     *ASTM D7414     >25     9.3     8.2     13.5       Acid Number (AN)     mg KOH/g     ASTM D8045     0.98     0.76     0.60     1.28 <td></td> <td></td> <td>ASTM D5185m</td> <td>2575</td> <th>3508</th> <td>3598</td> <td>3409</td>			ASTM D5185m	2575	3508	3598	3409
Social       ppm       ASTM D5185m       <1	CONTAMINANTS	5	method	limit/base	current	history1	history2
Potassium       ppm       ASTM D5185m       >20       0       <1       0         Fuel       %       ASTM D3524       >4.0       0.3       0.3       0.4         INFRA-RED       method       limit/base       current       history1       history2         Soot %       %       *ASTM D7844       0.1       0.1       0.1       0.1         Nitration       Abs/cm       *ASTM D7624       >20       4.9       4.2       6.1         Sulfation       Abs/.1mm       *ASTM D7415       >30       17.3       15.4       21.6         FLUID DEGRADATION       method       limit/base       current       history1       history2         Oxidation       Abs/.1mm       *ASTM D7414       >25       9.3       8.2       13.5         Acid Number (AN)       mg KOH/g       ASTM D8045       0.98       0.76       0.60       1.28	Silicon	ppm	ASTM D5185m	>+100	<u> </u>	67	<b>A</b> 351
Fuel       %       ASTM D3524       >4.0       0.3       0.3       0.4         INFRA-RED       method       limit/base       current       history1       history2         Soot %       %       *ASTM D7844       0.1       0.1       0.1       0.1         Nitration       Abs/cm       *ASTM D7624       >20       4.9       4.2       6.1         Sulfation       Abs/.1mm       *ASTM D7415       >30       17.3       15.4       21.6         FLUID DEGRADATION       method       limit/base       current       history1       history2         Oxidation       Abs/.1mm       *ASTM D7414       >25       9.3       8.2       13.5         Acid Number (AN)       mg KOH/g       ASTM D8045       0.98       0.76       0.60       1.28	Sodium	ppm	ASTM D5185m		<1	0	<1
INFRA-RED       method       limit/base       current       history1       history2         Soot %       %       *ASTM D7844       0.1       0.1       0.1         Nitration       Abs/cm       *ASTM D7624       >20       4.9       4.2       6.1         Sulfation       Abs/.1mm       *ASTM D7415       >30       17.3       15.4       21.6         FLUID DEGRADATION       method       limit/base       current       history1       history2         Oxidation       Abs/.1mm       *ASTM D7414       >25       9.3       8.2       13.5         Acid Number (AN)       mg KOH/g       ASTM D8045       0.98       0.76       0.60       1.28							
Soot %       %       *ASTM D7844       0.1       0.1       0.1         Nitration       Abs/cm       *ASTM D7624       >20       4.9       4.2       6.1         Sulfation       Abs/.1mm       *ASTM D7415       >30       17.3       15.4       21.6         FLUID DEGRADATION       method       limit/base       current       history1       history2         Oxidation       Abs/.1mm       *ASTM D7414       >25       9.3       8.2       13.5         Acid Number (AN)       mg KOH/g       ASTM D8045       0.98       0.76       0.60       1.28	Fuel	%	ASTM D3524	>4.0	0.3	0.3	0.4
Nitration       Abs/cm       *ASTM D7624       >20       4.9       4.2       6.1         Sulfation       Abs/.1mm       *ASTM D7615       >30       17.3       15.4       21.6         FLUID DEGRADATION       method       limit/base       current       history1       history2         Oxidation       Abs/.1mm       *ASTM D7414       >25       9.3       8.2       13.5         Acid Number (AN)       mg KOH/g       ASTM D8045       0.98       0.76       0.60       1.28	INFRA-RED		method	limit/base	current	history1	history2
Sulfation       Abs/.1mm       *ASTM D7415       >30       17.3       15.4       21.6         FLUID DEGRADATION       method       limit/base       current       history1       history2         Oxidation       Abs/.1mm       *ASTM D7414       >25       9.3       8.2       13.5         Acid Number (AN)       mg KOH/g       ASTM D8045       0.98       0.76       0.60       1.28	Soot %	%	*ASTM D7844		0.1	0.1	0.1
FLUID DEGRADATION       method       limit/base       current       history1       history2         Oxidation       Abs/.1mm       *ASTM D7414       >25       9.3       8.2       13.5         Acid Number (AN)       mg KOH/g       ASTM D8045       0.98       0.76       0.60       1.28	Nitration	Abs/cm	*ASTM D7624	>20	4.9	4.2	6.1
Oxidation       Abs/.1mm       *ASTM D7414       >25       9.3       8.2       13.5         Acid Number (AN)       mg KOH/g       ASTM D8045       0.98       0.76       0.60       1.28	Sulfation	Abs/.1mm	*ASTM D7415	>30	17.3	15.4	21.6
Acid Number (AN)       mg KOH/g       ASTM D8045       0.98       0.76       0.60       1.28	FLUID DEGRADA	TION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	9.3	8.2	13.5
Base Number (BN) mg KOH/g ASTM D2896 8.1 7.19 8.29 6.36	Acid Number (AN)	mg KOH/g	ASTM D8045	0.98	0.76	0.60	1.28
	Base Number (BN)	mg KOH/g	ASTM D2896	8.1	7.19	8.29	6.36

## DIAGNOSIS

## Recommendation

No corrective action is recommended at this time. Resample at the next service interval to monitor. ( Customer Sample Comment: Total oil added 38 gal )

Fluic

## Wear

All component wear rates are normal.

### Contamination

Fuel content negligible. Elemental level of silicon (Si) above normal.

### 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.



# **OIL ANALYSIS REPORT**

scalar

scalar

scalar

method

\*Visual

\*Visual

\*Visua

limit/base

NONE

NONE

NONE

current

NONE

NONE

NONE

history1

NONE

NONE

NONE

history2

NONE

NONE

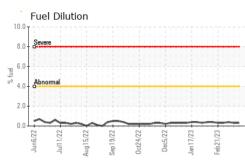
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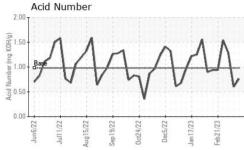
VISUAL

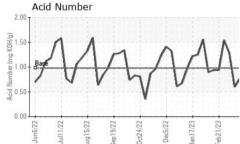
White Metal

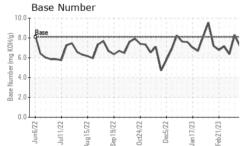
Yellow Metal

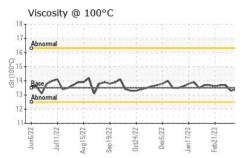
Precipitate



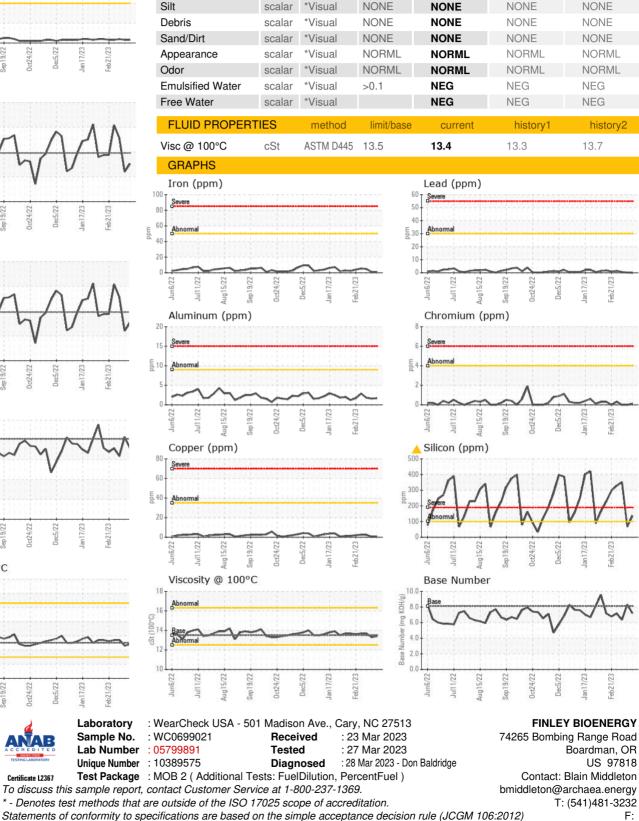








Certificate L2367



Submitted By: Blain Middleton

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