

OIL ANALYSIS REPORT

Sample Rating Trend







Machine Id 427022-423

Component **Diesel Engine**

PETRO CANADA DUR

DIAGNOSIS

Recommendation

No corrective action is recommended at this time. Resample at the next service interval to monitor.

All component wear rates are normal.

Contamination

Light fuel dilution occurring. No other contaminants were detected in the oil.

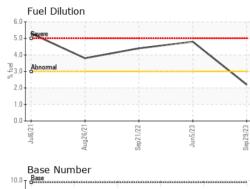
Fluid Condition

The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Sample Number Client Info GFL0091811 GFL0074335 GFL00 Sample Date Client Info 29 Sep 2023 05 Jun 2023 21 Sep Machine Age hrs Client Info 28388 28046 27168 Oil Age hrs Client Info 28388 28046 27168 Oil Age hrs Client Info 28388 O O O Oil Changed Client Info Not Changd Not Changd North ABNORMAL A	N SHP 15W40 (LTR)	Dec2020	Jul2021 Aug2021	Sep2022 Jun2023	Sep2023	
Sample Date Cilient Info 29 Sep 2023 05 Jun 2023 21 Sep	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age	Sample Number		Client Info		GFL0091811	GFL0074335	GFL003969
Dil Age hrs Client Info 28388 0 0 Dil Changed Client Info Not Changd Not Changd N/A Sample Status NORMAL ABNORMAL ABNORMAL CONTAMINATION method limit/base current history1 history1 Miscolor WEAR METALS method limit/base current history1 history1 ron ppm ASTM D5185m >120 8 5 19 Chromium ppm ASTM D5185m >20 <1	Sample Date		Client Info		29 Sep 2023	05 Jun 2023	21 Sep 2022
Dil Changed Client Info Not Changed North Changed NORMAL ABNORMAL ABNORMAL	Machine Age	hrs	Client Info		28388	28046	27168
CONTAMINATION method limit/base current history1 histo	Oil Age	hrs	Client Info		28388	0	0
NEG Neg	Oil Changed		Client Info		Not Changd	Not Changd	N/A
WEAR METALS	Sample Status				NORMAL	ABNORMAL	ABNORMAL
WEAR METALS	CONTAMINAT	ION	method	limit/base	current	history1	history2
Chromium	Glycol		WC Method		NEG	NEG	NEG
Chromium	WEAR METAL	S	method	limit/base	current	history1	history2
ASTM D5185m >5 2 0 0 0 0 0 0 0 0 0	ron	ppm	ASTM D5185m	>120	8	5	19
Fittanium ppm ASTM D5185m ≥2 0 <1 <1 Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >20 4 <1 4 Lead ppm ASTM D5185m >40 <1 <1 <1 <1 Copper ppm ASTM D5185m >330 8 26 12 I Clin ppm ASTM D5185m >330 8 26 12 I Antimony ppm ASTM D5185m 0 0 0 0 0 Aradium ppm ASTM D5185m 0 0 0 0 0 Adamium ppm ASTM D5185m 0 41 3 5 Boron ppm ASTM D5185m 0 0 0 0 Boron ppm ASTM D5185m 0 0 0 0 Boron ASTM D5185m	Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Silver	Nickel	ppm	ASTM D5185m	>5	2	0	0
Aluminum ppm ASTM D5185m >20 4 < 1 4 Lead ppm ASTM D5185m >40 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1	- itanium	ppm	ASTM D5185m	>2	0	<1	<1
Lead ppm ASTM D5185m >40 <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	Silver	ppm	ASTM D5185m	>2	0	0	0
Description	Aluminum	ppm	ASTM D5185m	>20	4	<1	4
Antimony ppm ASTM D5185m >15 1 2 1 1 2 1 2 1 2 1 2 1 2 1 2 1 2 3 3 3 3 3 3 3 3 3	_ead	ppm	ASTM D5185m	>40	<1	<1	<1
Antimony ppm ASTM D5185m Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 history1 Barium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 1010 934 921 853 Calcium ppm ASTM D5185m 1070 1027 1073 1022 Calcium ppm ASTM D5185m 1150 1042 960 912 Calcium ppm ASTM D5185m 1270 1280 1184 1122 Calcium ppm ASTM D5185m 2060 3466 3491 3246 CONTAMINANTS method limit/base current history1 history1 Calcium ppm ASTM D5185m 20 4 0 <1 Calcium ppm ASTM D5185m 20 0 Calcium ppm ASTM D5185m 20 0 0 Calcium ppm ASTM D5185	Copper	ppm	ASTM D5185m	>330	8	26	12
Anadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 0 ADDITIVES method limit/base current history1 his Boron ppm ASTM D5185m 0 <1 3 5 Barium ppm ASTM D5185m 0 0 0 0 Molybdenum ppm ASTM D5185m 0 41 <1 <1 <1 Magnesium ppm ASTM D5185m 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 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1	Γin	ppm	ASTM D5185m	>15	1	2	1
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 his Boron ppm ASTM D5185m 0 <1	Antimony	ppm	ASTM D5185m				
ADDITIVES method limit/base current history1 history1 Boron ppm ASTM D5185m 0 <1	/anadium	ppm	ASTM D5185m		0	0	0
Soron ppm ASTM D5185m 0 0 0 0 0 0 0 0 0	Cadmium	ppm	ASTM D5185m		0	0	0
Description	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 60 63 58 53 Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 934 921 853 Calcium ppm ASTM D5185m 1070 1027 1073 102° Phosphorus ppm ASTM D5185m 1150 1042 960 912 Zinc ppm ASTM D5185m 1270 1280 1184 112° Gulfur ppm ASTM D5185m 2060 3466 3491 3246 CONTAMINANTS method limit/base current history1 his Goldium ppm ASTM D5185m >25 5 3 5 Goldium ppm ASTM D5185m >20 4 0 <1 Fuel % ASTM D5185m >20 4 0 <1 Fuel % ASTM D5185m >20	Boron	ppm	ASTM D5185m	0	<1	3	5
Manganese ppm ASTM D5185m 0 <1 <1 <1 Magnesium ppm ASTM D5185m 1010 934 921 853 Calcium ppm ASTM D5185m 1070 1027 1073 1027 Phosphorus ppm ASTM D5185m 1150 1042 960 912 Zinc ppm ASTM D5185m 1270 1280 1184 1127 Sulfur ppm ASTM D5185m 2060 3466 3491 3246 CONTAMINANTS method limit/base current history1 his Silicon ppm ASTM D5185m >25 5 3 5 Goldium ppm ASTM D5185m >20 4 0 <1 Potassium ppm ASTM D5185m >20 4 0 <1 Fuel % ASTM D5185m >20 4 0 <1 1 Potassium ppm ASTM D5185m </td <td>Barium</td> <td>ppm</td> <td>ASTM D5185m</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td>	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium ppm ASTM D5185m 1010 934 921 853 Calcium ppm ASTM D5185m 1070 1027 1073 1027 Phosphorus ppm ASTM D5185m 1150 1042 960 912 Zinc ppm ASTM D5185m 1270 1280 1184 1127 Sulfur ppm ASTM D5185m 2060 3466 3491 3246 CONTAMINANTS method limit/base current history1 his Silicon ppm ASTM D5185m >25 5 3 5 Sodium ppm ASTM D5185m >20 4 0 <1 1 Potassium ppm ASTM D5185m >20 4 0 <1 1 Fuel % ASTM D5185m >20 4 0 <1 4 Soot % % *ASTM D7844 >4 0.3 0.2 0.3 Soot % %	Molybdenum	ppm	ASTM D5185m	60	63	58	53
Calcium ppm ASTM D5185m 1070 1027 1073 1027 Phosphorus ppm ASTM D5185m 1150 1042 960 912 Zinc ppm ASTM D5185m 1270 1280 1184 1127 Sulfur ppm ASTM D5185m 2060 3466 3491 3246 CONTAMINANTS method limit/base current history1 his Silicon ppm ASTM D5185m >25 5 3 5 Sodium ppm ASTM D5185m >20 4 0 <1	Manganese	ppm	ASTM D5185m	0	<1		
Phosphorus ppm ASTM D5185m 1150 1042 960 912 Zinc ppm ASTM D5185m 1270 1280 1184 1127 Sulfur ppm ASTM D5185m 2060 3466 3491 3246 CONTAMINANTS method limit/base current history1 his Silicon ppm ASTM D5185m >25 5 3 5 Sodium ppm ASTM D5185m >20 4 0 <1	Magnesium	ppm	ASTM D5185m	1010	934	921	
Zinc ppm ASTM D5185m 1270 1280 1184 1127 Sulfur ppm ASTM D5185m 2060 3466 3491 3246 CONTAMINANTS method limit/base current history1 his Silicon ppm ASTM D5185m >25 5 3 5 Sodium ppm ASTM D5185m 1 1 1 1 Potassium ppm ASTM D5185m >20 4 0 <1	Calcium	ppm	ASTM D5185m	1070	1027	1073	1021
Sulfur ppm ASTM D5185m 2060 3466 3491 3246 CONTAMINANTS method limit/base current history1 his Silicon ppm ASTM D5185m >25 5 3 5 Sodium ppm ASTM D5185m 20 4 0 <1		ppm	ASTM D5185m	1150			912
CONTAMINANTS method limit/base current history1 his Silicon ppm ASTM D5185m >25 5 3 5 Sodium ppm ASTM D5185m 1 1 1 1 Potassium ppm ASTM D5185m >20 4 0 <1		ppm	ASTM D5185m	1270		1184	1121
Silicon ppm ASTM D5185m >25 5 3 5 Sodium ppm ASTM D5185m 1 1 1 1 Potassium ppm ASTM D5185m >20 4 0 <1 Fuel % ASTM D3524 >3.0 2.2 4.8 4.4 INFRA-RED method limit/base current history1 his Soot % % *ASTM D7844 >4 0.3 0.2 0.3 Nitration Abs/cm *ASTM D7624 >20 7.1 7.6 9.2 Sulfation Abs/.1mm *ASTM D7415 >30 18.8 18.6 19.4 FLUID DEGRADATION method limit/base current history1 his Dxidation Abs/.1mm *ASTM D7414 >25 14.9 15.0 16.6			ASTM D5185m	2060	3466		3246
Sodium ppm ASTM D5185m 1 2 2 2 4 8 4 4 4 4 4 8 4	CONTAMINAN	TS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 4 0 <1 Fuel % ASTM D3524 >3.0 2.2 4.8 4.4 INFRA-RED method limit/base current history1 his Soot % % *ASTM D7844 >4 0.3 0.2 0.3 Nitration Abs/cm *ASTM D7624 >20 7.1 7.6 9.2 Sulfation Abs/.1mm *ASTM D7415 >30 18.8 18.6 19.4 FLUID DEGRADATION method limit/base current history1 his Dxidation Abs/.1mm *ASTM D7414 >25 14.9 15.0 16.6		ppm	ASTM D5185m	>25	5	3	5
Fuel % ASTM D3524 >3.0 2.2		ppm			1		
INFRA-RED method limit/base current history1 his Soot % % *ASTM D7844 >4 0.3 0.2 0.3 Nitration Abs/cm *ASTM D7624 >20 7.1 7.6 9.2 Sulfation Abs/.1mm *ASTM D7415 >30 18.8 18.6 19.4 FLUID DEGRADATION method limit/base current history1 his Oxidation Abs/.1mm *ASTM D7414 >25 14.9 15.0 16.6							
Soot % % *ASTM D7844 >4 0.3 0.2 0.3 Nitration Abs/cm *ASTM D7624 >20 7.1 7.6 9.2 Sulfation Abs/.1mm *ASTM D7415 >30 18.8 18.6 19.4 FLUID DEGRADATION method limit/base current history1 history1 his Oxidation Abs/.1mm *ASTM D7414 >25 14.9 15.0 16.6	-uel	%	ASTM D3524	>3.0	2.2	4.8	<u>4.4</u>
Nitration Abs/cm *ASTM D7624 >20 7.1 7.6 9.2 Sulfation Abs/.1mm *ASTM D7415 >30 18.8 18.6 19.4 FLUID DEGRADATION method limit/base current history1 history1 history1 history1 Oxidation Abs/.1mm *ASTM D7414 >25 14.9 15.0 16.6	INFRA-RED		method	limit/base	current	history1	history2
Nitration Abs/cm *ASTM D7624 >20 7.1 7.6 9.2 Sulfation Abs/.1mm *ASTM D7415 >30 18.8 18.6 19.4 FLUID DEGRADATION method limit/base current history1 history1 history1 history1 Oxidation Abs/.1mm *ASTM D7414 >25 14.9 15.0 16.6	Soot %	%	*ASTM D7844	>4	0.3	0.2	0.3
Sulfation Abs/.1mm *ASTM D7415 >30 18.8 18.6 19.4 FLUID DEGRADATION method limit/base current history1 his Dxidation Abs/.1mm *ASTM D7414 >25 14.9 15.0 16.6	Nitration	Abs/cm	*ASTM D7624	>20			9.2
Oxidation	Sulfation	Abs/.1mm	*ASTM D7415	>30		18.6	19.4
	FLUID DEGRAD	DATION	method	limit/base	current	history1	history2
Rase Number (RN) mr KOH/n ASTM D2896 Q 8 92 82	Oxidation	Abs/.1mm	*ASTM D7414	>25	14.9	15.0	16.6
Dase (variable (DIV) higherly Actividence 5.0 0.2 0.2		ma 1/011/a	VCTM DOODE	0.0	0.0	0.0	0.6



OIL ANALYSIS REPORT



VISUAL		method				history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
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	NONE	NONE	NONE
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	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG

13.1

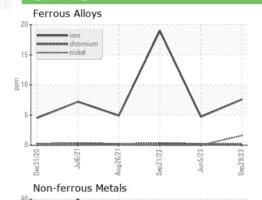
<u>11.9</u>

<u></u> 11.8

	10.0 T	Base	umber				
(B/H0	8.0-			_			
mg K	6.0-						
Base Number (mg KOH/g)	4.0						
Base	2.0						
	0.0		Jul6/21	Aug26/21	Sep21/22 -	Jun5/23	

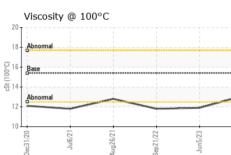


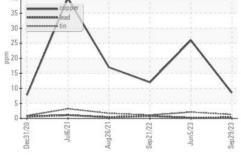
FLUID PROPERTIES

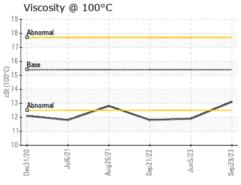


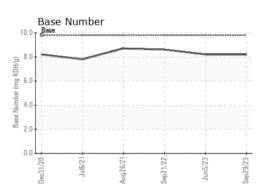
cSt

ASTM D445 15.4











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

: GFL0091811 : 05967339

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 03 Oct 2023 Diagnosed : 10673890

: 05 Oct 2023 Diagnostician : Wes Davis

Test Package : FLEET (Additional Tests: PercentFuel) 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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T: F: