

OIL ANALYSIS REPORT

Sample Rating Trend





Machine Id 940009-192504

Component Natural Gas Engine

PETRO CANADA DURON GEO LD 15W40 (8 GAL)

Sample Date Client Info 26 Mar 2024 12 Jan 2024 01 Dec 2023 Machine Age hrs Client Info 11191 10635 10381 Oil Age hrs Client Info 600 600 600 600 Sample Status Client Info Changed Chan	N GEO LD 15W40 (8 GAL)								
Sample Date Client Info 26 Mar 2024 12 Jan 2024 01 Dec 2023 Machine Age hrs Client Info 11191 10635 10381 Oil Age hrs Client Info 600 600 600 Oil Changed Client Info Changed Changed Changed Changed Sample Status Client Info Changed Changed Changed Changed CONTAMINATION method imilibase current history1 history2 Water WC Method >0.1 NEG NEG NEG WEAR METALS method imilibase current history1 history2 Iron ppm ASTM D5185m >50 24 9 17 Chromium ppm ASTM D5185m >4 1 0 0 Iron ppm ASTM D5185m >5 <1 0 0 Itanium ppm ASTM D5185m >4 1 0 0	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2		
Machine Age hrs Client Info 11191 10635 10381 Oil Age hrs Client Info 600 600 600 Oil Changed Client Info Changed Changed Changed Changed Sample Status Imitibase current history1 history2 Water WC Method >0.1 NEG NEG NEG WEAR METALS method imitibase current history1 history2 Iron ppm ASTM 05165m >50 24 9 17 Chromium ppm ASTM 05165m >55 1 <1 <1 <1 Nickel ppm ASTM 05165m >52 10 3 2 Lead 0 0 0 Aluminum ppm ASTM 05165m >40 1 0 0 0 0 0 0 0 0 0 1 <1 0 0 1 1 1	Sample Number		Client Info		GFL0110808	GFL0088464	GFL0088458		
Oil Age hrs Client Info 600 600 600 600 Oil Changed Client Info Changed Chad Changed Chad </td <td>Sample Date</td> <td></td> <td>Client Info</td> <td></td> <th>26 Mar 2024</th> <td>12 Jan 2024</td> <td>01 Dec 2023</td>	Sample Date		Client Info		26 Mar 2024	12 Jan 2024	01 Dec 2023		
Oil Changed Sample StatusClient InfoChanged NORMALChanged NORMALChanged ABNORMALCONTAMINATIONmethodimil/basecurrenthistory1history2WaterWC Method>0.1NEGNEGNEGWEAR METALSmethodimil/basecurrenthistory1history2IronppmASTM D5185m>5024917ChromiumppmASTM D5185m>551<1	Machine Age	hrs	Client Info		11191	10635	10381		
Sample Status NORMAL NORMAL NORMAL ABNORMAL CONTAMINATION method limit/base current history1 history2 Water WC Method >0.1 NEG NEG NEG Wear method limit/base current history1 history2 Iron ppm ASTM D5185m >50 24 9 17 Chromium ppm ASTM D5185m >55 1 <1	Oil Age	hrs	Client Info		600	600	600		
CONTAMINATION method limit/base current history1 history2 Water WC Method >0.1 NEG NEG NEG Wear WC Method >0.1 NEG NEG NEG Wear ppm ASTM D5185m >50 24 9 17 Chromium ppm ASTM D5185m >55 1 <1	Oil Changed		Client Info		Changed	Changed	Changed		
Water WC Method >0.1 NEG NEG NEG WEAR METALS method imil/base current history1 history2 Iron ppm ASTM D5185m >50 24 9 17 Chromium ppm ASTM D5185m >50 1 <1	Sample Status				NORMAL	NORMAL	ABNORMAL		
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >50 24 9 17 Chromium ppm ASTM D5185m >5 1 <1	CONTAMINATI	ON	method	limit/base	current	history1	history2		
Iron ppm ASTM D5185m >50 24 9 17 Chromium ppm ASTM D5185m >5 1 <1 <1 <1 Nickel ppm ASTM D5185m >4 1 0 0 Titanium ppm ASTM D5185m >5 <1 0 8 Silver ppm ASTM D5185m >2 10 3 2 Lead ppm ASTM D5185m >3 0 0 0 Auminum 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	Water		WC Method	>0.1	NEG	NEG	NEG		
Chromium ppm ASTM D5185m >5 1 <1 <1 <1 Nickel ppm ASTM D5185m >4 1 0 0 Titanium ppm ASTM D5185m >5 <1	WEAR METAL	S	method	limit/base	current	history1	history2		
Nickel ppm ASTM D5185m >4 1 0 0 Titanium ppm ASTM D5185m >5 <1	Iron	ppm	ASTM D5185m	>50	24	9	17		
Titanium ppm ASTM D5185m >5 <1 0 8 Silver ppm ASTM D5185m >3 0 0 0 Aluminum ppm ASTM D5185m >25 10 3 2 Lead ppm ASTM D5185m >40 1 <1	Chromium	ppm	ASTM D5185m	>5	1	<1	<1		
Silver ppm ASTM D5185m >3 0 0 0 Aluminum ppm ASTM D5185m >25 10 3 2 Lead ppm ASTM D5185m >40 1 <1 <1 <1 Copper ppm ASTM D5185m >150 2 <1 0 0 Vanadium ppm ASTM D5185m >4 1 0 0 0 Vanadium ppm ASTM D5185m >4 1 0 0 0 Vanadium ppm ASTM D5185m 50 7 20 9 Boron ppm ASTM D5185m 50 65 59 52 Magnesium ppm ASTM D5185m 50 65 59 52 Magnesium ppm ASTM D5185m 50 65 57 548 847 Calcium ppm ASTM D5185m 1510 1705 1513 1126 Phosphorus <td>Nickel</td> <td>ppm</td> <td>ASTM D5185m</td> <td>>4</td> <th>1</th> <td>0</td> <td>0</td>	Nickel	ppm	ASTM D5185m	>4	1	0	0		
Aluminum ppm ASTM D5185m >25 10 3 2 Lead ppm ASTM D5185m >40 1 <1	Titanium	ppm	ASTM D5185m	>5	<1	0	8		
Lead ppm ASTM D5185m >40 1 <1 <1 <1 Copper ppm ASTM D5185m >150 2 <1	Silver	ppm	ASTM D5185m	>3	0	0	0		
Lead ppm ASTM D5185m >40 1 <1 <1 <1 Copper ppm ASTM D5185m >150 2 <1	Aluminum		ASTM D5185m	>25	10	3	2		
Tin ppm ASTM D5185m >4 1 0 0 Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 <1 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 50 7 20 9 Barium ppm ASTM D5185m 50 65 59 52 Magnesium ppm ASTM D5185m 50 655 59 52 Magnesium ppm ASTM D5185m 50 655 57 548 847 Calcium ppm ASTM D5185m 780 666 781 1056 Zinc ppm ASTM D5185m 780 666 781 1056 Sulfur ppm ASTM D5185m 2040 2429 2309 3644 CONTAMINANTS method limit/base c	Lead		ASTM D5185m	>40	1	<1	<1		
Tin ppm ASTM D5185m >4 1 0 0 Vanadium ppm ASTM D5185m 0 0 0 <1	Copper	ppm	ASTM D5185m	>150	2	<1	2		
Vanadium ppm ASTM D5185m 0 0 0 0 Cadmium ppm ASTM D5185m 0 0 0 <1 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 50 7 20 9 Barium ppm ASTM D5185m 50 65 59 52 Manganese ppm ASTM D5185m 50 65 59 52 Magnesium ppm ASTM D5185m 50 65 57 548 847 Calcium ppm ASTM D5185m 560 557 548 847 Calcium ppm ASTM D5185m 780 666 781 1056 Zinc ppm ASTM D5185m 780 980 926 1206 Sulfur ppm ASTM D5185m >2040 2429 2309 3644 CONTAMINANTS method limit/base			ASTM D5185m	>4	1	0	0		
Cadmium ppm ASTM D5185m 0 0 <1 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 50 7 20 9 Barium ppm ASTM D5185m 50 7 20 9 Barium ppm ASTM D5185m 50 65 59 52 Manganese ppm ASTM D5185m 50 65 59 52 Magnesium ppm ASTM D5185m 560 557 548 847 Calcium ppm ASTM D5185m 780 666 781 1056 Zinc ppm ASTM D5185m 780 980 926 1206 Sulfur ppm ASTM D5185m 2040 2429 2309 3644 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 2 <	Vanadium		ASTM D5185m		0	0	0		
Boron ppm ASTM D5185m 50 7 20 9 Barium ppm ASTM D5185m 5 0 0 0 Molybdenum ppm ASTM D5185m 50 65 59 52 Manganese ppm ASTM D5185m 0 1 <1			ASTM D5185m		0		<1		
Barium ppm ASTM D5185m 5 0 0 0 Molybdenum ppm ASTM D5185m 50 65 59 52 Manganese ppm ASTM D5185m 0 1 <1 0 Magnesium ppm ASTM D5185m 560 557 548 847 Calcium ppm ASTM D5185m 1510 1705 1513 1126 Phosphorus ppm ASTM D5185m 780 6666 781 1056 Zinc ppm ASTM D5185m 870 980 926 1206 Sulfur ppm ASTM D5185m 2040 2429 2309 3644 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 4 5 Sodium ppm ASTM D5185m >20 2 0 4 INFRA-RED method limit/base cu	ADDITIVES		method	limit/base	current	history1	history2		
Molybdenum ppm ASTM D5185m 50 65 59 52 Manganese ppm ASTM D5185m 0 1 <1	Boron	ppm	ASTM D5185m	50	7	20	9		
Manganese ppm ASTM D5185m 0 1 <1 0 Magnesium ppm ASTM D5185m 560 557 548 847 Calcium ppm ASTM D5185m 1510 1705 1513 1126 Phosphorus ppm ASTM D5185m 780 666 781 1056 Zinc ppm ASTM D5185m 870 980 926 1206 Sulfur ppm ASTM D5185m 2040 2429 2309 3644 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 2 0 4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0 0 0 Nitration Abs/cm *ASTM D7624 >20 11.6 9.1 10.7 Sulfation Abs/cm *ASTM D7415 >30	Barium	ppm	ASTM D5185m	5	0	0	0		
Magnesium ppm ASTM D5185m 560 557 548 847 Calcium ppm ASTM D5185m 1510 1705 1513 1126 Phosphorus ppm ASTM D5185m 780 6666 781 1056 Zinc ppm ASTM D5185m 870 980 926 1206 Sulfur ppm ASTM D5185m 2040 2429 2309 3644 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 4 5 Sodium ppm ASTM D5185m >20 2 0 4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0 0 0 Nitration Abs/.mm *ASTM D7624 >20 11.6 9.1 10.7 Sulfation Abs/.hmm *ASTM D7415 >30	Molybdenum	ppm	ASTM D5185m	50	65	59	52		
Calcium ppm ASTM D5185m 1510 1705 1513 1126 Phosphorus ppm ASTM D5185m 780 666 781 1056 Zinc ppm ASTM D5185m 870 980 926 1206 Sulfur ppm ASTM D5185m 2040 2429 2309 3644 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 4 5 Sodium ppm ASTM D5185m >20 2 0 4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0 0 0 Nitration Abs/cm *ASTM D7624 >20 11.6 9.1 10.7 Sulfation Abs/.tmm *ASTM D7624 >20 11.6 9.1 10.7 Sulfation Abs/.tmm *ASTM D7415 >30<	Manganese	ppm	ASTM D5185m	0	1	<1	0		
Phosphorus ppm ASTM D5185m 780 666 781 1056 Zinc ppm ASTM D5185m 870 980 926 1206 Sulfur ppm ASTM D5185m 2040 2429 2309 3644 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 4 5 Sodium ppm ASTM D5185m >20 2 0 4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D784 0 0 0 Nitration Abs/cm *ASTM D7624 >20 11.6 9.1 10.7 Sulfation Abs/.1mm *ASTM D7624 >20 11.6 9.1 10.7 Sulfation Abs/.1mm *ASTM D7624 >20 11.6 9.1 10.7 Sulfation Abs/.1mm *ASTM D7415	Magnesium	ppm	ASTM D5185m	560	557	548	847		
Zinc ppm ASTM D5185m 870 980 926 1206 Sulfur ppm ASTM D5185m 2040 2429 2309 3644 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 6 4 5 Sodium ppm ASTM D5185m >20 2 0 4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0 0 0 Nitration Abs/cm *ASTM D7624 >20 11.6 9.1 10.7 Sulfation Abs/.1mm *ASTM D7624 >20 11.6 9.1 10.7 Sulfation Abs/.1mm *ASTM D7415 >30 22.7 18.8 21.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 <	Calcium	ppm	ASTM D5185m	1510	1705	1513	1126		
SulfurppmASTM D5185m2040242923093644CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>25645SodiumppmASTM D5185m>20960PotassiumppmASTM D5185m>20204INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844000NitrationAbs/cm*ASTM D7624>2011.69.110.7SulfationAbs/.1mm*ASTM D7415>3022.718.821.9FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2518.715.817.5	Phosphorus	ppm	ASTM D5185m	780	666	781	1056		
CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>25645SodiumppmASTM D5185m960PotassiumppmASTM D5185m>20204INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D78440000NitrationAbs/cm*ASTM D7624>2011.69.110.7SulfationAbs/.1mm*ASTM D7415>3022.718.821.9FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2518.715.817.5	Zinc	ppm	ASTM D5185m	870	980	926	1206		
Silicon ppm ASTM D5185m >25 6 4 5 Sodium ppm ASTM D5185m >20 9 6 0 Potassium ppm ASTM D5185m >20 2 0 4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0 0 0 0 Nitration Abs/cm *ASTM D7624 >20 11.6 9.1 10.7 Sulfation Abs/.1mm *ASTM D7624 >20 11.6 9.1 10.7 Sulfation Abs/.1mm *ASTM D7415 >30 22.7 18.8 21.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.7 15.8 17.5	Sulfur	ppm	ASTM D5185m	2040	2429	2309	3644		
Sodium ppm ASTM D5185m 9 6 0 Potassium ppm ASTM D5185m<>20 2 0 4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0 0 0 0 Nitration Abs/cm *ASTM D7624 >20 11.6 9.1 10.7 Sulfation Abs/.1mm *ASTM D7415 >30 22.7 18.8 21.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.7 15.8 17.5	CONTAMINAN	TS	method	limit/base	current	history1	history2		
Potassium ppm ASTM D5185m >20 2 0 4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0 0 0 Nitration Abs/cm *ASTM D7624 >20 11.6 9.1 10.7 Sulfation Abs/.1mm *ASTM D7415 >30 22.7 18.8 21.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.7 15.8 17.5	Silicon	ppm	ASTM D5185m	>25	6	4	5		
Potassium ppm ASTM D5185m >20 2 0 4 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0 0 0 Nitration Abs/cm *ASTM D7624 >20 11.6 9.1 10.7 Sulfation Abs/.1mm *ASTM D7415 >30 22.7 18.8 21.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.7 15.8 17.5	Sodium		ASTM D5185m		9	6	0		
Soot % % *ASTM D7844 0 0 0 Nitration Abs/cm *ASTM D7624 >20 11.6 9.1 10.7 Sulfation Abs/.1mm *ASTM D7624 >20 11.6 9.1 10.7 Sulfation Abs/.1mm *ASTM D7415 >30 22.7 18.8 21.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.7 15.8 17.5	Potassium	ppm	ASTM D5185m	>20	2	0	4		
Nitration Abs/cm *ASTM D7624 >20 11.6 9.1 10.7 Sulfation Abs/.1mm *ASTM D7415 >30 22.7 18.8 21.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.7 15.8 17.5	INFRA-RED		method	limit/base	current	history1	history2		
Sulfation Abs/.1mm *ASTM D7415 >30 22.7 18.8 21.9 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.7 15.8 17.5	Soot %	%	*ASTM D7844		0	0	0		
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 18.7 15.8 17.5	Nitration	Abs/cm	*ASTM D7624	>20	11.6	9.1	10.7		
Oxidation Abs/.1mm *ASTM D7414 >25 18.7 15.8 17.5	Sulfation	Abs/.1mm	*ASTM D7415	>30	22.7	18.8	21.9		
	FLUID DEGRAD	DATION	method	limit/base	current	history1	history2		
Base Number (BN) mg KOH/g ASTM D2896 10.2 4.0 6.2 🔺 3.7	Oxidation	Abs/.1mm	*ASTM D7414	>25	18.7	15.8	17.5		
	Base Number (BN)	mg KOH/g	ASTM D2896	10.2	4.0	6.2	▲ 3.7		

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

Wear

All component wear rates are normal.

Contamination

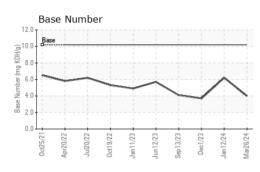
There is no indication of any contamination in the oil.

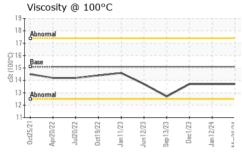
Fluid Condition

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

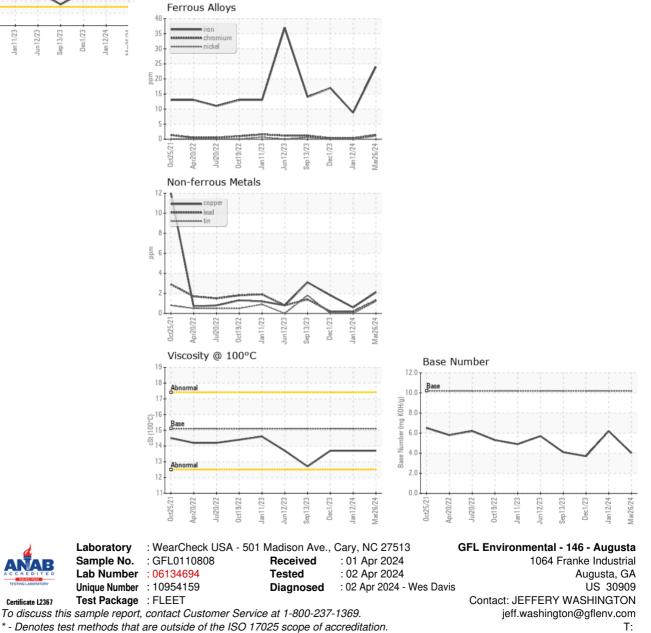


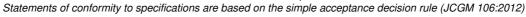
OIL ANALYSIS REPORT





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	>0.1	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG
FLUID PROPE	RTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.1	13.7	13.7	13.7
GRAPHS						





Certificate L2367

Submitted By: CHRISTOPHER FARRER

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