

OIL ANALYSIS REPORT

Sample Rating Trend





Natural Gas Engine

PETRO CANADA DURON GEO LD 15W40 (24 LTR)

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.

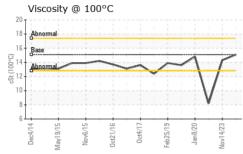
Fluid Condition

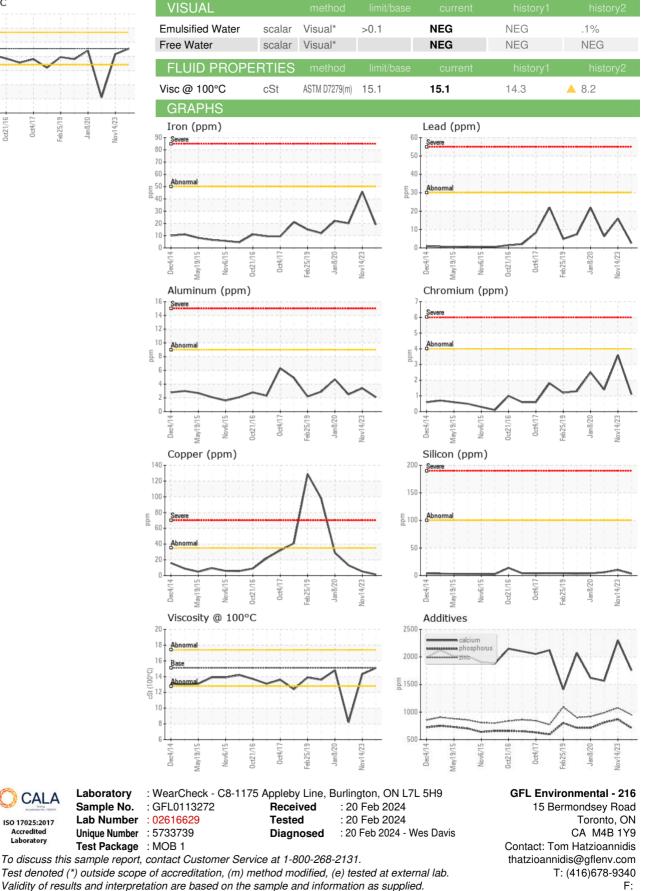
The condition of the oil is acceptable for the time in service.

Sample Number Client Info GFL0113272 GFL007520 GFL0037521 Sample Date Client Info 10 Feb 2024 14 Nov 2023 22 Oct 2011 Machine Age hrs Client Info 823 1406 0 Oil Age hrs Client Info 823 1406 0 Oil Age hrs Client Info NORMAL Normal ABNORMAL Sample Status Immobility Normal Normal ABNORMAL ABNORMAL CONTAMINATION method Immobility Current history Filtsory Water WC Method >0.1 NEG NEG NEG Glycol WC Method >0.1 NEG NEG NEG Mater WC Method >0.1 NEG NEG NEG Nickel ppm ASTU DISS60 >2.4 1 1 1 1 Nickel ppm ASTU DISS60 >3.0 2 16 6 Aluminum ppm ASTU DISS60 >3.0 2 1 1 1	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 10029 9205 0 Oil Age hrs Client Info 823 1406 0 Oil Changed Client Info 823 1406 0 Sample Status NORMAL NORMAL ABNORMAL CONTAMINATION method imit/base current history1 history2 Water WC Method >0.1 NEG NEG NEG Glycol WC Method 0.033 WEAR METALS method limit/base current history1 history2 Iron ppm ASTM0588(m) >50 19 46 20 Chromium ppm ASTM0588(m) >3 0 <1 1 Nickel ppm ASTM0588(m) >3 0 <1 1 Mainium ppm ASTM0588(m) >3 1 5 13 Numium ppm ASTM0588(m) >4	Sample Number		Client Info		GFL0113272	GFL0097520	GFL0037572
Oil Age hrs Client Info 823 1406 0 Oil Changed Client Info Changed N/A Sample Status Imit/base current history1 CONTAMINATION method imit/base current history1 Water WC Method >0.1 NEG NEG Glycol WC Method ▲ 0.033 WEAR METALS method imit/base current history1 Nickel ppm ASTM0585(m) >0 19 46 20 Chromium ppm ASTM0585(m) >3 0 <1 0 Nickel ppm ASTM0585(m) >30 2 16 6 Copper ppm ASTM0585(m) >30 2 16 6 Cadmium ppm ASTM0585(m) >30 2 16 6 Copper ppm ASTM0585(m) >0 0 0 0 Cadmium <th>Sample Date</th> <th></th> <th>Client Info</th> <th></th> <th>16 Feb 2024</th> <th>14 Nov 2023</th> <th>22 Oct 2021</th>	Sample Date		Client Info		16 Feb 2024	14 Nov 2023	22 Oct 2021
Oil Changed Sample Status Client Info Changed NORMAL N/A ABNORMAL CONTAMINATION method limit/base current history1 history2 Water WC Method >0.1 NEG NEG NEG Glycol WC Method >0.1 NEG NEG NEG Ornom ppm ASTM 05165(m) >6.0 19 46 20 Chromium ppm ASTM 05165(m) >2 <1 1 <1 Nickel ppm ASTM 05165(m) >2 <1 1 <1 Silver ppm ASTM 05165(m) >3 0 <1 0 Aluminum ppm ASTM 05165(m) >3 0 <1 0 Additionary ppm ASTM 05165(m) >3 0 <1 0 Additionary ppm ASTM 05165(m) >3 0 0 0 Boron ppm ASTM 05165(m) >4 <1 <1 <1	Machine Age	hrs	Client Info		10029	9205	0
Sample Status NORMAL NORMAL ABNORMAL ABNORMAL CONTAMINATION method limit/base current history1 history2 Water WC Method >0.1 NEG NEG NEG Glycol WC Method 0.033 WEAR METALS method limit/base current history1 history2 Iron ppm ASTM05585(m) >0 19 46 20 Chromium ppm ASTM05585(m) >2 1 1 <1 Nickel ppm ASTM05585(m) >3 0 <1 0 Silver ppm ASTM0588(m) >30 2 16 6 Copper ppm ASTM0588(m) >35 1 5 13 Tin ppm ASTM0588(m) 0 0 0 0 Vanadium ppm ASTM0588(m) 0 0 0 0 Vanatiumin	Oil Age	hrs	Client Info		823	1406	0
CONTAMINATION method limit/base current history1 history2 Water WC Method >0.1 NEG NEG NEG Glycol WC Method ▲ 0.033 WEAR METALS method limit/base current history1 history2 Iron ppm ASTM 05185(m) >50 19 46 20 Chromium ppm ASTM 05185(m) >2 1 1 -1 Nickel ppm ASTM 05185(m) >2 16 6 Copper ppm ASTM 05185(m) >30 2 16 6 Copper ppm ASTM 05185(m) >35 1 5 13 Tin ppm ASTM 05185(m) >0 0 0 0 Vanadium ppm ASTM 05185(m) 0 0 0 0 Vanadium ppm ASTM 05185(m) 50 8 6 9	Oil Changed		Client Info		Changed	Changed	N/A
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Glycol WC Method ▲ 0.033 WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185(m) >50 19 46 20 Chromium ppm ASTM D5185(m) >2 <1 1 <1 Titanium ppm ASTM D5185(m) >2 <1 1 <1 Silver ppm ASTM D5185(m) >30 <1 0 <1 Aluminum ppm ASTM D5185(m) >30 2 16 6 Copper ppm ASTM D5185(m) >30 2 16 6 Copper ppm ASTM D5185(m) >30 0 0 0 Vanadium ppm ASTM D5185(m) >4 <1 <1 <1 Antimony ppm ASTM D5185(m) 0 0 0 0 Vanadium ppm ASTM D5185(m) 50 52 <td< th=""><th>CONTAMINATI</th><th>ON</th><th>method</th><th>limit/base</th><th>current</th><th>history1</th><th>history2</th></td<>	CONTAMINATI	ON	method	limit/base	current	history1	history2
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM 05/86/m >50 19 46 20 Chromium ppm ASTM 05/86/m >4 1 4 1 Nickel ppm ASTM 05/86/m >2 <1 1 <1 Nickel ppm ASTM 05/86/m >2 <1 1 <1 Aluminum ppm ASTM 05/86/m >3 0 <1 0 Aluminum ppm ASTM 05/86/m >30 2 16 6 Copper ppm ASTM 05/86/m >30 2 16 6 Copper ppm ASTM 05/86/m >30 0 0 0 Vanadium ppm ASTM 05/86/m 0 0 0 0 Vanadium ppm ASTM 05/86/m 50 52 24 52 Boron ppm ASTM 05/86/m 50 525	Water		WC Method	>0.1	NEG	NEG	NEG
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Nickel ppm ASTM D5185(m) >2 <1	Iron	ppm	ASTM D5185(m)	>50	19	46	20
Titanium ppm ASTM D5185(m) >3 0 <1	Chromium	ppm	ASTM D5185(m)	>4	1	4	1
Silver ppm ASTM D5185(m) >3 0 <1	Nickel	ppm	ASTM D5185(m)	>2	<1	1	<1
Aluminum ppm ASTM D5185(m) >9 2 3 2 Lead ppm ASTM D5185(m) >30 2 16 6 Copper ppm ASTM D5185(m) >35 1 5 13 Tin ppm ASTM D5185(m) >4 <1 <1 <1 Antimony ppm ASTM D5185(m) >4 <1 <1 <1 Antimony ppm ASTM D5185(m) >4 <1 <1 <1 Attimony ppm ASTM D5185(m) 0 0 0 0 Vanadium ppm ASTM D5185(m) 50 8 6 9 Boron ppm ASTM D5185(m) 50 52 24 52 Magnesium ppm ASTM D5185(m) 50 52 239 630 Calcium ppm ASTM D5185(m) 50 52 239 630 Calcium ppm ASTM D5185(m) 712 <td< th=""><th>Titanium</th><th>ppm</th><th>ASTM D5185(m)</th><th></th><th>0</th><th>0</th><th><1</th></td<>	Titanium	ppm	ASTM D5185(m)		0	0	<1
Lead ppm ASTM D5185(m) >30 2 16 6 Copper ppm ASTM D5185(m) >35 1 5 13 Tin ppm ASTM D5185(m) >4 <1	Silver	ppm	ASTM D5185(m)	>3	0	<1	0
Copper ppm ASTM D5185(m) >35 1 5 13 Tin ppm ASTM D5185(m) >4 <1 <1 <1 Antimony ppm ASTM D5185(m) 0 0 0 0 Vanadium ppm ASTM D5185(m) 0 0 0 0 Beryllium ppm ASTM D5185(m) 0 0 0 0 Cadmium ppm ASTM D5185(m) 50 8 6 9 Boron ppm ASTM D5185(m) 50 8 6 9 Barium ppm ASTM D5185(m) 50 52 24 52 Manganese ppm ASTM D5185(m) 50 52 239 630 Calcium ppm ASTM D5185(m) 50 712 868 812 Zinc ppm ASTM D5185(m) 760 712 868 812 Sulfur ppm ASTM D5185(m) 2040 226	Aluminum	ppm	ASTM D5185(m)	>9	2	3	2
Tin ppm ASTM D5185(m) >4 <1	Lead	ppm	ASTM D5185(m)	>30	2	16	6
Antimony ppm ASTM D5185(m) 0 0 0 0 Vanadium ppm ASTM D5185(m) 0 0 0 0 Beryllium ppm ASTM D5185(m) 0 0 0 0 ADDITIVES method imit/base current history1 history2 Boron ppm ASTM D5185(m) 50 8 6 9 Barium ppm ASTM D5185(m) 50 52 24 52 Manganese ppm ASTM D5185(m) 50 52 24 52 Manganese ppm ASTM D5185(m) 50 52 239 630 Calcium ppm ASTM D5185(m) 510 1756 2299 1566 Phosphorus ppm ASTM D5185(m) 712 868 812 21nc Sulfur ppm ASTM D5185(m) 70 951 1077 988 Sulfur ppm ASTM D5185(m) 20	Copper	ppm	ASTM D5185(m)	>35	1	5	13
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Beryllium ppm ASTM D5185(m) 0 0 0 Cadmium ppm ASTM D5185(m) 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185(m) 50 8 6 9 Barium ppm ASTM D5185(m) 50 52 24 52 Magnesse ppm ASTM D5185(m) 50 52 24 52 Magnesium ppm ASTM D5185(m) 560 525 239 630 Calcium ppm ASTM D5185(m) 760 712 868 812 Zinc ppm ASTM D5185(m) 700 951 1077 988 Sulfur ppm ASTM D5185(m) 2040 2260 2662 2137 Lithium ppm ASTM D5185(m) >410 3 10 6 Sodium ppm ASTM D5185(m) >20 2 5	Antimony	ppm	ASTM D5185(m)		0	0	0
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Boron ppm ASTM D5185(m) 50 8 6 9 Barium ppm ASTM D5185(m) 5 0 <1 0 Molybdenum ppm ASTM D5185(m) 50 52 24 52 Manganese ppm ASTM D5185(m) 0 0 <1 <1 Magnesium ppm ASTM D5185(m) 560 525 239 630 Calcium ppm ASTM D5185(m) 1510 1756 2299 1566 Phosphorus ppm ASTM D5185(m) 780 712 868 812 Zinc ppm ASTM D5185(m) 870 951 1077 988 Sulfur ppm ASTM D5185(m) 2040 2260 2662 2137 Lithium ppm ASTM D5185(m) >+100 3 10 6 Sodium ppm ASTM D5185(m) >20 2 5 17 INFRA-RED method timit/base <th>Cadmium</th> <th>ppm</th> <th>ASTM D5185(m)</th> <th></th> <th>0</th> <th>0</th> <th>0</th>	Cadmium	ppm	ASTM D5185(m)		0	0	0
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Manganese ppm ASTM D5185(m) 0 0 0 <1	Barium	ppm	ASTM D5185(m)	5	0	<1	0
Magnesium ppm ASTM D5185(m) 560 525 239 630 Calcium ppm ASTM D5185(m) 1510 1756 2299 1566 Phosphorus ppm ASTM D5185(m) 780 712 868 812 Zinc ppm ASTM D5185(m) 870 951 1077 988 Sulfur ppm ASTM D5185(m) 2040 2260 2662 2137 Lithium ppm ASTM D5185(m) 2040 2260 2662 2137 Sulfur ppm ASTM D5185(m) 2040 2260 2662 2137 Lithium ppm ASTM D5185(m) 2040 3 10 6 Sodium ppm ASTM D5185(m) >+100 3 10 6 Sodium ppm ASTM D5185(m) >20 2 5 17 INFRA-RED method limit/base current history1 history2 Soot % % A	Molybdenum	ppm	ASTM D5185(m)	50	52	24	52
Calcium ppm ASTM D5185(m) 1510 1756 2299 1566 Phosphorus ppm ASTM D5185(m) 780 712 868 812 Zinc ppm ASTM D5185(m) 870 951 1077 988 Sulfur ppm ASTM D5185(m) 2040 2260 2662 2137 Lithium ppm ASTM D5185(m) 2040 2260 2662 2137 Sulfur ppm ASTM D5185(m) 2040 2260 2662 2137 Lithium ppm ASTM D5185(m) 2040 210 41 <1	Manganese	ppm	ASTM D5185(m)	0	0	<1	<1
Phosphorus ppm ASTM D5185(m) 780 712 868 812 Zinc ppm ASTM D5185(m) 870 951 1077 988 Sulfur ppm ASTM D5185(m) 2040 2260 2662 2137 Lithium ppm ASTM D5185(m) 2040 2260 2662 2137 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >+100 3 10 6 Sodium ppm ASTM D5185(m) >+100 3 10 6 Sodium ppm ASTM D5185(m) >20 2 5 17 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7844* 0 0 0 0 Nitration Abs/.tm ASTM D7415*<>30 24.7 28.6 21.1 FLUID DEGRADATION Method limit/base	Magnesium	ppm	ASTM D5185(m)	560	525	239	630
Zinc ppm ASTM D5185(m) 870 951 1077 988 Sulfur ppm ASTM D5185(m) 2040 2260 2662 2137 Lithium ppm ASTM D5185(m) 2040 2160 2662 2137 Lithium ppm ASTM D5185(m) <1 <1 <1 <1 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >+100 3 10 6 Sodium ppm ASTM D5185(m) >+100 3 10 6 Sodium ppm ASTM D5185(m) >20 2 5 17 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7844* 0 0 0 0 Nitration Abs/cm ASTM D7414* >20 12.3 11.2 12.3 Sulfation Abs/.1mm ASTM D7415* >30 24.7 28.6 21.1 FLUID DEGRADATION met	Calcium	ppm	ASTM D5185(m)	1510	1756	2299	1566
Sulfur ppm ASTM D5185(m) 2040 2260 2662 2137 Lithium ppm ASTM D5185(m) <<1 <1 <1 <1 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185(m) >+100 3 10 6 Sodium ppm ASTM D5185(m) >+100 3 10 6 Sodium ppm ASTM D5185(m) >+100 3 10 6 Sodium ppm ASTM D5185(m) >+100 3 10 6 Potassium ppm ASTM D5185(m) >20 2 5 17 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7844* 0 0 0 0 Nitration Abs/.rm ASTM D7415* >30 24.7 28.6 21.1 FLUID DEGRADATION method limit/base <th>Phosphorus</th> <th>ppm</th> <th>ASTM D5185(m)</th> <th>780</th> <th>712</th> <th>868</th> <th>812</th>	Phosphorus	ppm	ASTM D5185(m)	780	712	868	812
LithiumppmASTM D5185(m)<1		ppm	ASTM D5185(m)				
CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185(m)>+1003106SodiumppmASTM D5185(m)88106PotassiumppmASTM D5185(m)>202517INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%ASTM D7844*000NitrationAbs/cmASTM D7624*>2012.311.212.3SulfationAbs/.1mmASTM D7415*>3024.728.621.1FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mmASTM D7414*>2520.116.717.5	Sulfur	ppm	. ,	2040	2260	2662	2137
SiliconppmASTM D5185(m)>+1003106SodiumppmASTM D5185(m) $*100$ 88106PotassiumppmASTM D5185(m)>202517INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%ASTM D7844*000NitrationAbs/cmASTM D7624*>2012.311.212.3SulfationAbs/.1mmASTM D7415*>3024.728.621.1FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mmASTM D7414*>2520.116.717.5	Lithium	ppm	ASTM D5185(m)		<1	<1	<1
Sodium ppm ASTM D5185(m) 8 8 ▲ 106 Potassium ppm ASTM D5185(m) >20 2 5 ▲ 17 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7844* 0 0 0 Nitration Abs/cm ASTM D7624* >20 12.3 11.2 12.3 Sulfation Abs/.1mm ASTM D7415* >30 24.7 28.6 21.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm ASTM D7414* >25 20.1 16.7 17.5		TS					-
Potassium ppm ASTM D5185(m) >20 2 5 ▲ 17 INFRA-RED method limit/base current history1 history2 Soot % % ASTM D7844* 0 0 0 Nitration Abs/cm ASTM D7624* >20 12.3 11.2 12.3 Sulfation Abs/.1mm ASTM D7415* >30 24.7 28.6 21.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm ASTM D7414* >25 20.1 16.7 17.5	Silicon	ppm	ASTM D5185(m)	>+100	3		6
INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%ASTM D7844*000NitrationAbs/cmASTM D7624*>2012.311.212.3SulfationAbs/.1mmASTM D7415*>3024.728.621.1FLUID DEGRADATION methodlimit/basecurrenthistory1history2OxidationAbs/.1mmASTM D7414*>2520.116.717.5	Sodium	ppm	ASTM D5185(m)		8	8	1 06
Soot % % ASTM D7844* 0 0 0 Nitration Abs/cm ASTM D7624* >20 12.3 11.2 12.3 Sulfation Abs/.1mm ASTM D7415* >30 24.7 28.6 21.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm ASTM D7414* >25 20.1 16.7 17.5	Potassium	ppm	ASTM D5185(m)	>20	2	5	▲ 17
Nitration Abs/cm ASTM D7624* >20 12.3 11.2 12.3 Sulfation Abs/.1mm ASTM D7415* >30 24.7 28.6 21.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm ASTM D7414* >25 20.1 16.7 17.5	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm ASTM D7415* >30 24.7 28.6 21.1 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm ASTM D7414* >25 20.1 16.7 17.5	Soot %	%			0	0	0
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm ASTM D7414* >25 20.1 16.7 17.5	Nitration	Abs/cm		>20	12.3	11.2	12.3
Oxidation Abs/.1mm ASTM D7414* >25 20.1 16.7 17.5	Sulfation	Abs/.1mm	ASTM D7415*	>30	24.7	28.6	21.1
	FLUID DEGRAD	DATION	method	limit/base	current	history1	history2
:49:26) Rev: 1 Submitted By: Tom Hatzioannidis		Abs/.1mm	ASTM D7414*	>25			
	7:49:26) Rev: 1				S	ubmitted By: To	m Hatzioannidis



OIL ANALYSIS REPORT





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CALA

ISO 17025:2017 Accredited Laboratory