

OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id 834094

Component Diesel Engine

Fluid PETRO CANADA DURON GEO LD 15W40 (--- QTS)

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

Wear

Metal levels are typical for a new component breaking in.

Contamination

Elevated aluminum (Al) and/or lead (Pb) and potassium (K) levels in your metals analysis are likely a result of solder flux release into the lubricant and is common on new equipment/components. There is no indication of any contamination in the oil.

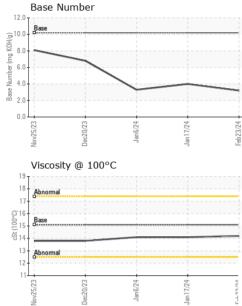
Fluid Condition

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

SAMPLE INFORMATION method imit/base current history1 history2 Sample Number Client Info 23 Feb 2024 I7 Jan 2024 06 Jan 2024 Machine Age hrs Client Info 23 Feb 2024 I7 Jan 2024 06 Jan 2024 Oil Age hrs Client Info 593 0 285 Oil Changed Client Info Not Changd Not Changd Not Changd Not Changd Sample Status Method >5 <1.0 <1.0 <1.0 CONTAMINATION method Innit/base current History1 history2 Fuel WC Method >5 <1.0 <1.0 <1.0 Water WC Method >5 <1.0 <1.0 <1.0 Kitel ppm ASTM 05165 >100 58 46 56 Chromium ppm ASTM 05165 >20 1 <1 1 Nickel ppm ASTM 05165 >100 0 0	(QTS)		Nov2023	Dec2023	Jan2024 Jan2024	Feb 2024	
Sample Date Client Info 23 Feb 2024 17 Jan 2024 06 Jan 2024 Machine Age hrs Client Info 716 0 593 Oil Age hrs Client Info 593 0 285 Oil Changed Client Info 593 0 285 Oil Changed Client Info Not Changd Not Changd Not Changd Sample Status Imitbase current Not Changd Not Changd Glycol WC Method >0.2 NEG NEG NEG Wear WC Method >0.2 NEG NEG NEG Glycol WC Method >0.2 1 -1 1 Nickel ppm ASTM 05185 >20 1 -1 2 Tatanium ppm ASTM 05185 >20 25 18 26 Lead ppm ASTM 05185 >30 0 0 -1 Chromium ppm ASTM 05185 >15 -1	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Date Initian Q2 Feb 2024 17 Jan 2024 06 Jan 2024 Machine Age hrs Client Info 716 0 593 Oil Age hrs Client Info 593 0 285 Oil Changed Client Info Not Changd Not Changd Not Changd Not Changd Sample Status Imational Mathematican Status Imational Mathematican Status Not Changd Not Changd Not Changd Fuel WC Method >5 <1.0 <1.0 <1.0 <1.0 Water WC Method >5.2 <1.0 <1.0 NeG NEG Weater ppm ASTM 051555 >2.0 1 <1 1 Nickel ppm ASTM 051555 >4 2 <1 2 Itanium ppm ASTM 051555 >4 <1 <1 <1 Silver ppm ASTM 051555 >4 <1 <1 <1 Silver ppm ASTM 051555	Sample Number		Client Info		GFL0108045	GFL0108162	GFL0108088
Machine AgehrsClient Info71605930253Oil ChangedIrrsClient InfoNot ChangdNot ChangdNORMALNORMALNORMALSample StatusIIntl/basCurrontNoRMANORMALNORMALNORMALCONTAMINATIONmethod5<1.0<1.0<1.0<1.0WaterVC Method5.2NEGNEGNEGGlycalVC Method5.2NEGNEGNEGVaterWC Method5.2NEGNEGNEGGlycalPpmASTM 05158>10058MEG56ChromiumppmASTM 05158>201<12TranppmASTM 05158>201<12SilverppmASTM 05158>20000AluminumppmASTM 05158>30000AluminumppmASTM 05158>301<11YanadiumppmASTM 05158>30611616TinppmASTM 05158>30000AbutinumppmASTM 05158>30611616TinppmASTM 05158>30611616TinppmASTM 0515850515151115AbutinumppmASTM 051585053505050BariumppmASTM 05158 <th></th> <th></th> <th>Client Info</th> <th></th> <th>23 Feb 2024</th> <th>17 Jan 2024</th> <th>06 Jan 2024</th>			Client Info		23 Feb 2024	17 Jan 2024	06 Jan 2024
Oil Changed Client Info Not Changd NORMAL Not Changd NORMAL Not Changd NORMAL Not Changd NORMAL Not Changd NORMAL CONTAMINATION method limit/base current history1 history2 Fuel WC Method >5 <1.0	-	hrs	Client Info		716	0	593
Sample Status NORMAL NORMAL NORMAL NORMAL NORMAL CONTAMINATION method imit/base current history1 history2 Fuel WC Method >5 <1.0 <1.0 <1.0 Water WC Method >0.2 NEG NEG NEG Glycol WC Method >0.2 NEG NEG NEG WEAR METALS method imit/base current history1 history2 Iron ppm ASTM D5185m >20 1 <1 1 Nickel ppm ASTM D5185m >20 1 <1 2 Itanium ppm ASTM D5185m >20 25 18 26 Lead ppm ASTM D5185m >30 16 16 16 Tin ppm ASTM D5185m >30 16 16 16 Vanadium ppm ASTM D5185m 50 9 15 17 Va	Oil Age	hrs	Client Info		593	0	285
CONTAMINATION method imit/base current history1 history2 Fuel WC Method >5 <1.0 <1.0 <1.0 <1.0 Water WC Method >5 <1.0 <1.0 <1.0 <1.0 Glycol WC Method Sol NEG NEG NEG WEAR METALS method imit/base current history1 history2 Iron ppm ASTM D5185m >100 58 46 56 Chromium ppm ASTM D5185m >20 1 <1 1 Nickel ppm ASTM D5185m >4 2 <1 2 Silver ppm ASTM D5185m >20 25 18 26 Lead ppm ASTM D5185m >15 <1 2 1 Vanadium ppm ASTM D5185m >15 <1 2 1 Vanadium pm ASTM D5185m 50 9 15	Oil Changed		Client Info		Not Changd	Not Changd	Not Changd
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Water WC Method >0.2 NEG NEG NEG Glycol WC Method Imit/base current history1 history2 Iron ppm ASTM D5185m >100 58 46 56 Chromium ppm ASTM D5185m >20 1 <1 1 Nickel ppm ASTM D5185m >4 2 <1 2 Silver ppm ASTM D5185m >20 25 18 26 Lead ppm ASTM D5185m >20 25 18 26 Lead ppm ASTM D5185m >330 16 16 16 Tin ppm ASTM D5185m >330 16 16 16 Cadmium ppm ASTM D5185m 50 9 15 17 Barium ppm ASTM D5185m 50 60 50 60 Magnesium ppm ASTM D5185m 50 60 50 60<	CONTAMINAT	ION	method	limit/base	current	history1	history2
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Nickel ppm ASTM D5185m >4 2 <1	Chromium	ppm	ASTM D5185m	>20	1	<1	1
Silver ppm ASTM D5185m >3 0 0 0 Aluminum ppm ASTM D5185m >20 25 18 26 Lead ppm ASTM D5185m >40 <1	Nickel		ASTM D5185m	>4	2	<1	2
Aluminum ppm ASTM D5185m >20 25 18 26 Lead ppm ASTM D5185m >40 <1 <1 <1 Copper ppm ASTM D5185m >330 16 16 16 Tin ppm ASTM D5185m >15 <1 2 1 Vanadium ppm ASTM D5185m >15 <1 2 1 Cadmium ppm ASTM D5185m 0 0 0 Cadmium ppm ASTM D5185m 50 9 15 17 Barium ppm ASTM D5185m 50 60 50 60 Magnaese ppm ASTM D5185m 50 60 57 782 Calcium ppm ASTM D5185m 780 803 609 702 Zinc ppm ASTM D5185m 780 803 609 702 Sulfur ppm ASTM D5185m 780 1025	Titanium	ppm	ASTM D5185m		<1	0	0
Lead ppm ASTM D5185m >40 <1 <1 <1 Copper ppm ASTM D5185m >330 16 16 16 Tin ppm ASTM D5185m >15 <1	Silver	ppm	ASTM D5185m	>3	0	0	0
Copper ppm ASTM D5185m >330 16 16 16 Tin ppm ASTM D5185m >15 <1	Aluminum	ppm	ASTM D5185m	>20	25	18	26
Tin ppm ASTM D5185m >15 <1 2 1 Vanadium ppm ASTM D5185m 0 0 <1	Lead	ppm	ASTM D5185m	>40	<1	<1	<1
Tin ppm ASTM D5185m >15 <1 2 1 Vanadium ppm ASTM D5185m 0 0 <1	Copper	ppm	ASTM D5185m	>330	16	16	16
Cadmium ppm ASTM D5185m 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 50 9 15 17 Barium ppm ASTM D5185m 50 9 15 17 Barium ppm ASTM D5185m 50 60 50 60 Malybdenum ppm ASTM D5185m 50 60 50 60 Magnesium ppm ASTM D5185m 560 871 705 782 Calcium ppm ASTM D5185m 560 871 705 782 Calcium ppm ASTM D5185m 780 803 609 702 Zinc ppm ASTM D5185m 780 803 609 702 Sulfur ppm ASTM D5185m 240 2627 1989 2329 CONTAMINANTS method limit/base current histor		ppm	ASTM D5185m	>15	<1	2	1
ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 50 9 15 17 Barium ppm ASTM D5185m 50 60 50 60 Molybdenum ppm ASTM D5185m 50 60 50 60 Magnesium ppm ASTM D5185m 560 871 705 782 Calcium ppm ASTM D5185m 780 803 609 702 Zinc ppm ASTM D5185m 780 803 609 702 Sulfur ppm ASTM D5185m 2040 2627 1989 2329 CONTAMINANTS method limit/base <	Vanadium	ppm	ASTM D5185m		0	0	<1
Boron ppm ASTM D5185m 50 9 15 17 Barium ppm ASTM D5185m 5 3 2 1 Molybdenum ppm ASTM D5185m 50 60 50 60 Manganese ppm ASTM D5185m 0 14 12 13 Magnesium ppm ASTM D5185m 560 871 705 782 Calcium ppm ASTM D5185m 560 871 705 782 Calcium ppm ASTM D5185m 1510 1369 1126 1141 Phosphorus ppm ASTM D5185m 780 803 609 702 Zinc ppm ASTM D5185m 780 803 609 32329 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 92 77 99 INFRA-RED method limit/base c	Cadmium	ppm	ASTM D5185m		0	0	0
Barium ppm ASTM D5185m 5 3 2 1 Molybdenum ppm ASTM D5185m 50 60 50 60 Manganese ppm ASTM D5185m 0 14 12 13 Magnesium ppm ASTM D5185m 560 871 705 782 Calcium ppm ASTM D5185m 560 871 705 782 Calcium ppm ASTM D5185m 560 871 705 782 Calcium ppm ASTM D5185m 560 803 609 702 Zinc ppm ASTM D5185m 780 803 609 702 Sulfur ppm ASTM D5185m 2040 2627 1989 2329 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 92 77 99 INFRA-RED method limit/base	ADDITIVES		method	limit/base	current	history1	history2
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Maganese ppm ASTM D5185m 0 14 12 13 Magnesium ppm ASTM D5185m 560 871 705 782 Calcium ppm ASTM D5185m 1510 1369 1126 1141 Phosphorus ppm ASTM D5185m 780 803 609 702 Zinc ppm ASTM D5185m 780 803 609 702 Zinc ppm ASTM D5185m 780 803 609 702 Zinc ppm ASTM D5185m 2040 2627 1989 2329 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 92 77 99 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0 0 0 Nitration Abs/mm *ASTM D7624 2	Barium	ppm	ASTM D5185m	5	3	2	1
Magnesium ppm ASTM D5185m 560 871 705 782 Calcium ppm ASTM D5185m 1510 1369 1126 1141 Phosphorus ppm ASTM D5185m 780 803 609 702 Zinc ppm ASTM D5185m 870 1025 803 919 Sulfur ppm ASTM D5185m 2040 2627 1989 2329 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 29 30 32 Sodium ppm ASTM D5185m >20 92 77 99 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0 0 0 Nitration Abs/.tm *ASTM D7624 >20 12.4 11.8 12.0 Sulfation Abs/.tm *ASTM D7624 <th>Molybdenum</th> <th>ppm</th> <th>ASTM D5185m</th> <th>50</th> <th>60</th> <th>50</th> <th>60</th>	Molybdenum	ppm	ASTM D5185m	50	60	50	60
Calcium ppm ASTM D5185m 1510 1369 1126 1141 Phosphorus ppm ASTM D5185m 780 803 609 702 Zinc ppm ASTM D5185m 870 1025 803 919 Sulfur ppm ASTM D5185m 870 1025 803 919 Sulfur ppm ASTM D5185m 2040 2627 1989 2329 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 29 30 32 Sodium ppm ASTM D5185m >20 92 77 99 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 12.4 11.8 12.0 Sulfation Abs/.mm *ASTM D7415 >30 24.1 22.1 23.4 FLUID DEGRADATION method <th< th=""><th>Manganese</th><th>ppm</th><th>ASTM D5185m</th><th>0</th><th>14</th><th>12</th><th>13</th></th<>	Manganese	ppm	ASTM D5185m	0	14	12	13
Phosphorus ppm ASTM D5185m 780 803 609 702 Zinc ppm ASTM D5185m 870 1025 803 919 Sulfur ppm ASTM D5185m 2040 2627 1989 2329 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 29 30 32 Sodium ppm ASTM D5185m >25 29 30 32 Sodium ppm ASTM D5185m >20 92 77 99 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >3 0 0 0 Nitration Abs/cm *ASTM D7624 >20 12.4 11.8 12.0 Sulfation Abs/.1mm *ASTM D7615 >30 24.1 22.1 23.4 FLUID DEGRADATION method limit/ba	Magnesium	ppm	ASTM D5185m	560	871	705	782
Zinc ppm ASTM D5185m 870 1025 803 919 Sulfur ppm ASTM D5185m 2040 2627 1989 2329 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 29 30 32 Sodium ppm ASTM D5185m >20 92 77 99 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0 0 0 Nitration Abs/cm *ASTM D7624 >20 12.4 11.8 12.0 Sulfation Abs/.mm *ASTM D7624 >20 12.4 11.8 12.0 Sulfation Abs/.mm *ASTM D7615 >30 24.1 22.1 23.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D77	Calcium	ppm	ASTM D5185m	1510	1369	1126	1141
SulfurppmASTM D5185m2040262719892329CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>25293032SodiumppmASTM D5185m>20655PotassiumppmASTM D5185m>20927799INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>3000NitrationAbs/cm*ASTM D7624>2012.411.812.0SulfationAbs/lmm*ASTM D7415>3024.122.123.4FLUID DEGRADATION methodlimit/basecurrenthistory1history2OxidationAbs/lmm*ASTM D7414>2521.919.720.8	Phosphorus	ppm	ASTM D5185m	780	803	609	702
CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>25293032SodiumppmASTM D5185m>20927799INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>3000NitrationAbs/cm*ASTM D7624>2012.411.812.0SulfationAbs/lmm*ASTM D7415>3024.122.123.4FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/lmm*ASTM D7414>2521.919.720.8	Zinc	ppm	ASTM D5185m	870	1025	803	919
Silicon ppm ASTM D5185m >25 29 30 32 Sodium ppm ASTM D5185m <26 6 5 5 Potassium ppm ASTM D5185m >20 92 77 99 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0 0 0 Nitration Abs/cm *ASTM D7624 >20 12.4 11.8 12.0 Sulfation Abs/.1mm *ASTM D7624 >20 24.1 22.1 23.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7614 >20 21.9 19.7 20.8	Sulfur	ppm	ASTM D5185m	2040	2627	1989	2329
Sodium ppm ASTM D5185m 6 5 5 Potassium ppm ASTM D5185m >20 92 77 99 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0 0 0 Nitration Abs/cm *ASTM D7624 >20 12.4 11.8 12.0 Sulfation Abs/.1mm *ASTM D7415 >30 24.1 22.1 23.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.9 19.7 20.8	CONTAMINAN	ITS	method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 92 77 99 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 >3 0 0 0 Nitration Abs/cm *ASTM D7624 >20 12.4 11.8 12.0 Sulfation Abs/.1mm *ASTM D7415 >30 24.1 22.1 23.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.9 19.7 20.8	Silicon	ppm	ASTM D5185m	>25	29	30	32
INFRA-REDmethodlimit/basecurrenthistory1history2Soot %%*ASTM D7844>3000NitrationAbs/cm*ASTM D7624>2012.411.812.0SulfationAbs/.1mm*ASTM D7415>3024.122.123.4FLUID DEGRADATIONmethodlimit/basecurrenthistory1history2OxidationAbs/.1mm*ASTM D7414>2521.919.720.8	Sodium	ppm	ASTM D5185m		6	5	5
Soot % % *ASTM D7844 >3 0 0 0 Nitration Abs/cm *ASTM D7624 >20 12.4 11.8 12.0 Sulfation Abs/.1mm *ASTM D7415 >30 24.1 22.1 23.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.9 19.7 20.8	Potassium	ppm	ASTM D5185m	>20	92	77	99
Nitration Abs/cm *ASTM D7624 >20 12.4 11.8 12.0 Sulfation Abs/.1mm *ASTM D7615 >30 24.1 22.1 23.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.9 19.7 20.8	INFRA-RED		method	limit/base	current	history1	history2
Sulfation Abs/.1mm *ASTM D7415 >30 24.1 22.1 23.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.9 19.7 20.8	Soot %	%	*ASTM D7844	>3	0	0	0
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 21.9 19.7 20.8	Nitration	Abs/cm	*ASTM D7624	>20	12.4	11.8	12.0
Oxidation Abs/.1mm *ASTM D7414 >25 21.9 19.7 20.8	Sulfation	Abs/.1mm	*ASTM D7415	>30	24.1	22.1	23.4
	FLUID DEGRAI	DATION	method	limit/base	current	history1	history2
Base Number (BN) mg KOH/g ASTM D2896 10.2 3.2 4.0 3.3	Oxidation	Abs/.1mm	*ASTM D7414	>25	21.9	19.7	20.8
	Base Number (BN)	mg KOH/g	ASTM D2896	10.2	3.2	4.0	3.3



OIL ANALYSIS REPORT



		VISUAL		method	limit/base	current	history1	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	LIGHT
		Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Jan 6/24	Jan 17/24 Feb 23/24	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Jar	Febá	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
		Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
		Free Water	scalar	*Visual		NEG	NEG	NEG
		FLUID PROPE	ERTIES	method	limit/base	current	history1	history2
		Visc @ 100°C	cSt	ASTM D445	15.1	14.2	14.1	14.1
		GRAPHS						
		Ferrous Alloys						
24 -	24	60 iron	~		/			
Jan 6/24	Jan 17/24	50 - nickel		\checkmark				
		40						
		틆 30 -						
		20-						
		10-						
		53 53	24	24	24			
		Vov25/23 Dec20/23	Jan 6/24	Jan17/24	Feb23/24			
		≥ Non-ferrous Meta		-i	LE			
		¹⁶ T	115		_			
		14 - copper						
		12		 				
		10-						
		튭 8-						
		6						
		4						
			And a designment of the local data		and the second se			
		Nov25/23	Jan 6/24	an 17/24	eb23/24			
		_		Jan	Feb			
		Viscosity @ 100°	C		12.0	Base Number		
		18 - Abnormal		 	10.0	Base		
		17-			(B/HC			
		0 16 Base			9.0 × 8.0			
		016 Base 15 \$314			6.0- Base Number (mg KOH(g)			
					N 4.0		1-	
		13 Abnormal			2.0-			
					0.0			
		12				23 - 53	24 -	24
		11	3/24 -	//24	3/2		10	
		Dec20/23	Jan6/24 -	Jan17/24	Feb23/24	Nov25/23 Dec20/23	Jan6/24	Jan17/24
THE LABORTOW THE LABORTOW	Laboratory Sample No. Lab Number Unique Number Test Package	: WearCheck USA - 50 : GFL0108045 : 06107976 : 10911473	01 Madisc Recei Teste Diagr	on Ave., Cary ived : 04 id : 05 nosed : 05	, NC 27513 Mar 2024 Mar 2024 Mar 2024 Mar 2024 - We	GFL Env	v ironmental - 8: 22820 S S H Contact: J0	



Report Id: GFL837 [WUSCAR] 06107976 (Generated: 03/05/2024 16:31:36) Rev: 1

Submitted By: JEREMY BROWN