

# **OIL ANALYSIS REPORT**

#### Sample Rating Trend



## Machine Id 914030

# Component Diesel Engine

Fluid PETRO CANADA DURON SHP 15W40 (--- GAL)

### 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.

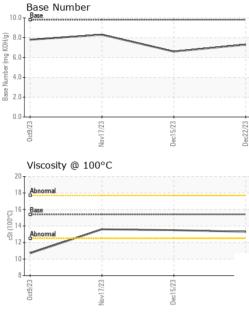
## Fluid Condition

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

SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0077273	GFL0093590	GFL0093550
Sample Date		Client Info		22 Dec 2023	15 Dec 2023	17 Nov 2023
Machine Age	hrs	Client Info		1160	1120	878
Oil Age	hrs	Client Info		545	505	263
Oil Changed		Client Info		Changed	Not Changd	Not Changd
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT	ION	method	limit/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	20.2	NEG	NEG	NEG
-	0		line it /le e e e	-	-	
WEAR METAL	5	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	21	18	13
Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Nickel	ppm	ASTM D5185m	>4	5	4	3
Titanium	ppm	ASTM D5185m		<1	<1	<1
Silver	ppm	ASTM D5185m	>3	2	1	1
Aluminum	ppm	ASTM D5185m	>20	1	2	1
Lead	ppm	ASTM D5185m	>40	0	0	0
Copper	ppm	ASTM D5185m	>330	188	135	59
Tin	ppm	ASTM D5185m	>15	<1	1	<1
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	0	9	8	10
Barium	ppm	ASTM D5185m	0	<1	0	0
Malyhdanum	ppm		-			
Molybdenum	ppm	ASTM D5185m	60	67	61	66
Manganese				67 2	61 1	66 <1
-	ppm	ASTM D5185m	60			
Manganese	ppm ppm	ASTM D5185m ASTM D5185m	60 0	2	1	<1
Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	60 0 1010	2 913	1 914	<1 908
Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	60 0 1010 1070	2 913 1071	1 914 1010	<1 908 1070
Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	60 0 1010 1070 1150	2 913 1071 1002	1 914 1010 940	<1 908 1070 984
Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	60 0 1010 1070 1150 1270	2 913 1071 1002 1194	1 914 1010 940 1191	<1 908 1070 984 1154
Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	60 0 1010 1070 1150 1270 2060 <b>limit/base</b>	2 913 1071 1002 1194 2540	1 914 1010 940 1191 2653	<1 908 1070 984 1154 2872
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	60 0 1010 1070 1150 1270 2060 <b>limit/base</b>	2 913 1071 1002 1194 2540 current	1 914 1010 940 1191 2653 history1	<1 908 1070 984 1154 2872 history2
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b> ASTM D5185m	60 0 1010 1070 1150 1270 2060 limit/base >25	2 913 1071 1002 1194 2540 current 11	1 914 1010 940 1191 2653 history1 7	<1 908 1070 984 1154 2872 history2 8
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	60 0 1010 1070 1150 1270 2060 limit/base >25	2 913 1071 1002 1194 2540 current 11 6	1 914 1010 940 1191 2653 history1 7 4	<1 908 1070 984 1154 2872 history2 8 <
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	60 0 1010 1070 1150 1270 2060 <i>limit/base</i> >25 >20	2 913 1071 1002 1194 2540 current 11 6 2	1 914 1010 940 1191 2653 history1 7 4 3	<1 908 1070 984 1154 2872 history2 8 < <1 4
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m	60 0 1010 1070 1150 1270 2060 <i>limit/base</i> >25 >20 <i>limit/base</i> >3	2 913 1071 1002 1194 2540 <u>current</u> 11 6 2 2 <u>current</u> 0.5	1 914 1010 940 1191 2653 history1 7 4 3 history1 0.4	<1 908 1070 984 1154 2872 history2 8 <1 4 history2
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m	60 0 1010 1070 1150 1270 2060 <b>limit/base</b> >25	2 913 1071 1002 1194 2540 current 11 6 2 2 current	1 914 1010 940 1191 2653 history1 7 4 3 history1	<1 908 1070 984 1154 2872 history2 8 <1 4 history2 0.3
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	60 0 1010 1070 1150 1270 2060 <b>imit/base</b> >25 >20 <b>imit/base</b> >3 >20 >30	2 913 1071 1002 1194 2540 <u>current</u> 11 6 2 2 <u>current</u> 0.5 8.0 20.3	1 914 1010 940 1191 2653 history1 7 4 3 history1 0.4 7.6 19.9	<1 908 1070 984 1154 2872 history2 8 <11 4 history2 0.3 6.4 19.4
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAI	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D7844 *ASTM D7624 *ASTM D7624	60 0 1010 1070 1150 1270 2060 imit/base >25 20 20 imit/base >3 >20 >30 imit/base	2 913 1071 1002 1194 2540 current 11 6 2 2 current 0.5 8.0 20.3 current	1 914 1010 940 1191 2653 history1 7 4 3 history1 0.4 7.6 19.9 history1	<1 908 1070 984 1154 2872 history2 8 <11 4 history2 0.3 6.4 19.4 history2
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAI Oxidation	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm ppm ppm ppm ppm ppm pp	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D7844 *ASTM D7624 *ASTM D7415	60 0 1010 1070 1150 1270 2060 <i>limit/base</i> >25 <i>limit/base</i> >3 >20 <i>limit/base</i> >30 <i>limit/base</i>	2 913 1071 1002 1194 2540 current 11 6 2 current 0.5 8.0 20.3 current 16.0	1 914 1010 940 1191 2653 history1 7 4 3 history1 0.4 7.6 19.9 history1 15.7	<1 908 1070 984 1154 2872 history2 8 <11 4 history2 0.3 6.4 19.4 history2 14.8
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAI	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D7844 *ASTM D7624 *ASTM D7624	60 0 1010 1070 1150 1270 2060 imit/base >25 20 20 imit/base >3 >20 >30 imit/base	2 913 1071 1002 1194 2540 current 11 6 2 2 current 0.5 8.0 20.3 current	1 914 1010 940 1191 2653 history1 7 4 3 history1 0.4 7.6 19.9 history1	<1 908 1070 984 1154 2872 history2 8 <11 4 history2 0.3 6.4 19.4 history2



# **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	NONE
		Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
50 J 1-10	Dec15/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
	Dec,	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	15.4	13.3	13.5	13.6
		GRAPHS						
		Ferrous Alloys						
5	- 27/0	25 -						
	27/c1390	nickel						
		20	_					
		E 15						
		10-						
		5-						
		A surger to the state of the law to the state of the stat						
		53 53		23	23			
		0ct9/23 Vov17/23		Dec15/23	Dec22/23			
		≥ Non-ferrous Meta	als					
		300						
		250 - copper						
		sesses tin						
		200			-			
		<u>ة</u> 150						
		100						
		50						
		3 33		23	23			
		0ct9/23 lov17/23		lec15/23	lec22/23			
		Ziscosity @ 100°	с			Base Number		
		19 18 Abnormal			10.0	Base	<u></u>	
		17-			- 8.0 ·			
		16 Base			B/HOX			
		0 14			Ē 6.0			
		(5) 15 (1) 14 (7) 14 (7) 13 (1) 4 (1) 4 (1						
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		10			0.0			
		0ct9/23 -		5/23		0ct9/23 -	1//23	
		0ct9/23 Nov17/23		Dec15/23	Dec22/23	000	Nov17/23	
	Laboratory Sample No. Lab Number Unique Number		501 Madis Recieved Diagnose Diagnost	l :26 l ed :27 l	ry, NC 27513 Dec 2023 Dec 2023 s Davis	GFL Enviro	1001 S Okla	South Rockwe homa City, O US 7312
CAREADONTONY NECLASIONTONY	Sample No. Lab Number Unique Number Test Package	: GFL0077273 : 06044302 r : 10804910	Recievec Diagnose Diagnost	l : 26   ed : 27   ician : We	Dec 2023 Dec 2023 s Davis	GFL ENVIR	1001 S Okla Conta	South Rockwe homa City, O

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