

# **OIL ANALYSIS REPORT**

Sample Rating Trend



# Machine Id 929068

#### 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.

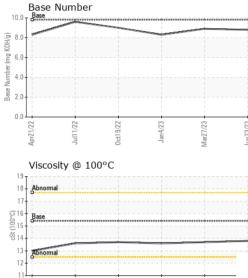
SAMPLE INFORM	MATION	method	limit/base	current	history 1	history 2
Sample Number		Client Info		GFL0076932	GFL0055232	GFL0055227
Sample Date		Client Info		23 Jun 2023	27 Mar 2023	04 Jan 2023
Machine Age	hrs	Client Info		33276	32786	32298
Oil Age	hrs	Client Info		490	488	487
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT	ION	method	limit/base	current	history 1	history 2
Fuel		WC Method	>5	<1.0	<1.0	<1.0
Glycol		WC Method		NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history 1	history 2
Iron	ppm	ASTM D5185m	>110	8	8	9
Chromium	ppm	ASTM D5185m	>4	<1	<1	<1
Nickel	ppm	ASTM D5185m	>2	0	0	<1
Titanium	ppm	ASTM D5185m		0	0	0
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m		<1	0	0
Lead	ppm	ASTM D5185m	>45	0	0	1
Copper	ppm	ASTM D5185m		0	0	1
Tin	ppm	ASTM D5185m	>4	0	0	<1
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method			history 1	history 2
ADDITIVES Boron	maa		limit/base		history 1 21	history 2 21
Boron	ppm	ASTM D5185m	0	16	21	21
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	16 0	21 0	21 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	16 0 62	21 0 71	21 0 86
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	16 0 62 <1	21 0 71 <1	21 0 86 <1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	16 0 62 <1 969	21 0 71 <1 1063	21 0 86 <1 917
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	16 0 62 <1 969 1142	21 0 71 <1 1063 1243	21 0 86 <1 917 1181
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150	16 0 62 <1 969 1142 1056	21 0 71 <1 1063 1243 1101	21 0 86 <1 917 1181 965
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	16 0 62 <1 969 1142	21 0 71 <1 1063 1243	21 0 86 <1 917 1181
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270	16 0 62 <1 969 1142 1056 1311	21 0 71 <1 1063 1243 1101 1416	21 0 86 <1 917 1181 965 1257
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	16 0 62 <1 969 1142 1056 1311 3893 current	21 0 71 <1 1063 1243 1101 1416 3874	21 0 86 <1 917 1181 965 1257 3549 history 2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm 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	0 0 60 1010 1070 1150 1270 2060	16 0 62 <1 969 1142 1056 1311 3893 current 3	21 0 71 <1 1063 1243 1101 1416 3874 history 1 4	21 0 86 <1 917 1181 965 1257 3549 history 2 2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 Limit/base >30	16 0 62 <1 969 1142 1056 1311 3893 current	21 0 71 <1 1063 1243 1101 1416 3874 history 1	21 0 86 <1 917 1181 965 1257 3549 history 2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b> ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 Limit/base >30	16 0 62 <1 969 1142 1056 1311 3893 current 3 2	21 0 71 <1 1063 1243 1101 1416 3874 history 1 4 2	21 0 86 <1 917 1181 965 1257 3549 history 2 2 4
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>limit/base</b> >20 <b>limit/base</b>	16 0 62 <1 969 1142 1056 1311 3893 current 3 2 2 2	21 0 71 <1 1063 1243 1101 1416 3874 history 1 4 2 5 5 history 1	21 0 86 <1 917 1181 965 1257 3549 history 2 2 4 8 8
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >30 >20 limit/base >33	16 0 62 <1 969 1142 1056 1311 3893 <u>current</u> 3 2 2 2 <u>current</u> 0.2	21 0 71 <1 1063 1243 1101 1416 3874 history 1 4 2 5 history 1 0.2	21 0 86 <1 917 1181 965 1257 3549 history 2 2 4 8 <u>history 2</u> 0.2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>limit/base</b> >20 <b>limit/base</b>	16 0 62 <1 969 1142 1056 1311 3893 current 3 2 2 2	21 0 71 <1 1063 1243 1101 1416 3874 history 1 4 2 5 5 history 1	21 0 86 <1 917 1181 965 1257 3549 history 2 2 4 8 8
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 imit/base >30 220 imit/base >3 >20	16 0 62 <1 969 1142 1056 1311 3893 <i>current</i> 3 2 2 2 <i>current</i> 0.2 7.4	21 0 71 <1 1063 1243 1101 1416 3874 history 1 4 2 5 history 1 0.2 7.3	21 0 86 <1 917 1181 965 1257 3549 history 2 2 2 4 8 history 2 0.2 7.7
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844	0 0 0 1010 1070 1150 1270 2060 2060 2060 2060 200 200 200 200 20	16 0 62 <1 969 1142 1056 1311 3893 <i>current</i> 3 2 2 2 <i>current</i> 0.2 7.4 19.6 <i>current</i>	21 0 71 <1 1063 1243 1101 1416 3874 history 1 4 2 5 history 1 0.2 7.3 19.2 history 1	21 0 86 <1 917 1181 965 1257 3549 history 2 2 4 8 history 2 0.2 7.7 19.2 history 2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>imit/base</b> >30 <b>imit/base</b> >3 >20	16 0 62 <1 969 1142 1056 1311 3893 <u>current</u> 3 2 2 2 <u>current</u> 0.2 7.4 19.6	21 0 71 <1 1063 1243 1101 1416 3874 history 1 4 2 5 <u>history 1</u> 0.2 7.3 19.2	21 0 86 <1 917 1181 965 1257 3549 history 2 2 4 8 <u>history 2</u> 0.2 7.7 19.2



Apr21/22

Jul11/22

# **OIL ANALYSIS REPORT**



						3 GFL En	GFL Environmental - 930 - Mosinee H 1372 State Highway 3 MOSINEE, V US 5445 Contact: Kirk Ko		
		Apr21/22	0ct19/22	Jan4/23	Jun23/23	Apr21/22	0ct19/22 Jan4/23	Mar27/23	
		13 Abnormal		· · · · · · · · · · · · · · · · · · ·	2 <sup>88</sup>	.0 -			
					Base Number (mg KOH/g)	.0			
		(0,001) 15- tso 14			er (mg KC	.0			
		17			(B/H0	.0			
		18 Abnormal			10	Base			
		Viscosity @	₫ 100°C			Base Number			
		Apr21/22 Jul11/22	0ct19/22	Jan4/23 Mar27/23	Jun23/23				
		22 0	22	53 53	23				
		5	<u> </u>						
		10							
		E <sup>15</sup>							
		20 - tin							
	Non-ferro								
		Apr21/22	0	Jan 4/23 Mar 27/23	Jun23/23				
		1/22 0	22/6	Jan 4/23 4					
		5-							
		ط 10-							
~	M	15							
Jan4/23 -	Mar27/23 +	20 - iron nicke	mium						
		Ferrous Al	loys						
		GRAPH							
		Visc @ 100°		ASTM D445		13.8	13.7	13.6	
		Free Water	scalar ROPERTIES		limit/base	NEG current	NEG history 1	NEG history 2	
		Emulsified V			>0.2	NEG	NEG	NEG	
Jan4	Mar27/23 Jun23/23	Odor	scalar		NORML	NORML	NORML	NORML	
Jan4/23	7/23	Appearance	scalar scalar		NORML	NONE NORML	NONE NORML	NONE NORML	
	Debris Sand/Dirt	scalar		NONE NONE	NONE	NONE	NONE		
	Silt	scalar		NONE	NONE	NONE	NONE		
	Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE		
		Yellow Meta			NONE	NONE	NONE	NONE	
		White Metal	scalar	· *Visual	NONE	NONE	NONE	NONE	

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)