

## **OIL ANALYSIS REPORT**

#### Sample Rating Trend



## Machine Id 712002

#### 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.

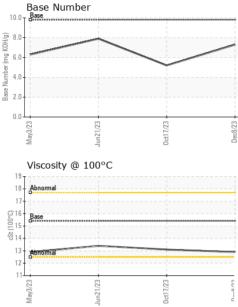
SAMPLE INFOR	MAT <u>IO</u> N	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0099491	GFL0099481	GFL0082196
Sample Date		Client Info		08 Dec 2023	17 Oct 2023	21 Jun 2023
Machine Age	hrs	Client Info		45764	42079	1016
Oil Age	hrs	Client Info		2345	6289	1016
Oil Changed		Client Info		Changed	Changed	Changed
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		NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm		>100	12	18	7
Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Nickel	ppm		>4	3	<1	<1
Titanium	ppm	ASTM D5185m ASTM D5185m	. 2	<1	0	<1
Silver	ppm		>3	0	0	0
Aluminum	ppm	ASTM D5185m	>20	3 0	<1	<1
Lead	ppm		>40 >330	2	3	2
Copper Tin	ppm	ASTM D5185m	>330	2 <1	1	<1
Vanadium	ppm	ASTM D5185m	>10	< 1	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
Caumum	ppm	ASTIVI DJ10JIII		U	0	0
			11 1. 4			
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base 0	current 9	history1 8	history2 9
	ppm ppm				8	
Boron		ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	9	8 0 60	9
Boron Barium Molybdenum Manganese	ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	9 0 71 <1	8 0 60 <1	9 0 63 <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	9 0 71 <1 878	8 0 60 <1 836	9 0 63 <1 817
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	9 0 71 <1 878 1146	8 0 60 <1 836 1095	9 0 63 <1 817 1092
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	9 0 71 <1 878 1146 890	8 0 60 <1 836 1095 904	9 0 63 <1 817 1092 964
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	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	9 0 71 <1 878 1146 890 1155	8 0 60 <1 836 1095 904 1131	9 0 63 <1 817 1092 964 1099
Boron Barium Molybdenum 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	0 0 60 0 1010 1070 1150	9 0 71 <1 878 1146 890	8 0 60 <1 836 1095 904	9 0 63 <1 817 1092 964 1099 2660
Boron Barium Molybdenum 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	0 0 60 0 1010 1070 1150 1270	9 0 71 <1 878 1146 890 1155 2812 current	8 0 60 <1 836 1095 904 1131	9 0 63 <1 817 1092 964 1099 2660 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b>	0 0 60 0 1010 1070 1150 1270 2060	9 0 71 <1 878 1146 890 1155 2812 current 5	8 0 60 <1 836 1095 904 1131 2249 history1 5	9 0 63 <1 817 1092 964 1099 2660 history2 3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m 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	9 0 71 <1 878 1146 890 1155 2812 current	8 0 60 <1 836 1095 904 1131 2249 history1 5 6	9 0 63 <1 817 1092 964 1099 2660 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b>	0 0 60 0 1010 1070 1150 1270 2060 Limit/base	9 0 71 <1 878 1146 890 1155 2812 current 5	8 0 60 <1 836 1095 904 1131 2249 history1 5	9 0 63 <1 817 1092 964 1099 2660 history2 3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m 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	9 0 71 <1 878 1146 890 1155 2812 <u>current</u> 5 0	8 0 60 <1 836 1095 904 1131 2249 history1 5 6	9 0 63 <1 817 1092 964 1099 2660 history2 3 0
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 <b>limit/base</b> >25 >20	9 0 71 <1 878 1146 890 1155 2812 current 5 0 2	8 0 60 <1 836 1095 904 1131 2249 history1 5 6 2	9 0 63 <1 817 1092 964 1099 2660 history2 3 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 TS	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25	9 0 71 <1 878 1146 890 1155 2812 <u>current</u> 5 0 2 2	8 0 60 <1 836 1095 904 1131 2249 history1 5 6 2 2 history1	9 0 63 <1 817 1092 964 1099 2660 history2 3 0 2 2 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base >3	9 0 71 <1 878 1146 890 1155 2812 <u>current</u> 5 0 2 2 <u>current</u> 0.4	8 0 60 <1 836 1095 904 1131 2249 history1 5 6 2 2 history1 0.8	9 0 63 <1 817 1092 964 1099 2660 history2 3 0 2 2 history2 0.3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus 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 >25 >20 imit/base >3 >20	9 0 71 <1 878 1146 890 1155 2812 <u>current</u> 5 0 2 2 <u>current</u> 0.4 7.8	8 0 60 <1 836 1095 904 1131 2249 history1 5 6 2 2 history1 0.8 9.8	9 0 63 <1 817 1092 964 1099 2660 history2 3 0 2 2 history2 0.3 7.5
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 2060 225 220 220 220 20 1imit/base >3 220 30	9 0 71 <1 878 1146 890 1155 2812 <u>current</u> 5 0 2 2 <u>current</u> 0.4 7.8 19.3	8 0 60 <1 836 1095 904 1131 2249 history1 5 6 2 2 history1 0.8 9.8 24.1	9 0 63 <1 817 1092 964 1099 2660 history2 3 0 2 2 history2 0.3 7.5 23.0
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 D7844 *ASTM D7624	0 0 0 1010 1070 1150 1270 2060 2060 225 20 225 20 20 3 20 3 20 3 20 20 20 20 20 20 20 20 20 20 20 20 20	9 0 71 <1 878 1146 890 1155 2812 current 5 0 2 2 current 0.4 7.8 19.3 current	8 0 60 <1 836 1095 904 1131 2249 history1 5 6 2 2 history1 0.8 9.8 24.1 history1	9 0 63 <1 817 1092 964 1099 2660 history2 3 0 2 2 history2 0.3 7.5 23.0 history2

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# **OIL ANALYSIS REPORT**

VISUAL



		White Metal	coolor	*Visual	NONE	NONE	NONE	NONE	
		Yellow Metal	scalar scalar	*Visual	NONE	NONE	NONE	NONE	
			scalar	*Visual	NONE	NONE	NONE	NONE	
		Precipitate Silt							
			scalar	*Visual	NONE	NONE	NONE	NONE	
		Debris	scalar	*Visual	NONE	NONE	NONE	NONE	
23	23	Sand/Dirt	scalar	*Visual	NONE	NONE		NONE	
0ct17/23	Dec8/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML	
0		Odor	scalar	*Visual	NORML	NORML	NORML	NORML	
°C		Emulsified Water		*Visual	>0.2	NEG	NEG	NEG	
		Free Water	scalar	*Visual		NEG	NEG	NEG	
		FLUID PRO	PERTIES	method	limit/base	current	history1	history2	
	*****	Visc @ 100°C	cSt	ASTM D445	15.4	12.9	13.1	13.4	
		GRAPHS							
		Ferrous Alloys							
		18 16 iron		$\wedge$					
0ct17/23	1 J	16 - Iron 14 - nickel	/						
00	ć	12 -							
		e <sup>10</sup>	- /						
		8	/						
		6							
		4			ALC: YOU WANTER				
				and Research and a structure of the second s					
		May3/23 -		0ct17/23 .	Dec8/23 -				
		May Jun2		0ct1	Dec				
		Non-ferrous Me	etals						
		10 copper							
		8-							
		exercise tin							
		6-							
		u d							
		2-							
			R. W. C.	and the Lot of Statement of Sta	With the second				
		0		//23	3/23				
		May3/23 Jun21/23		0ct17/23	Dec8/23				
		Viscosity @ 100	0°C			Dear Number			
		19 <sub>1</sub>			10.0	Base Number			
		18 - Abnormal				1			
		17			Ş <sup>8.0</sup>				
		D <sup>16</sup> Base			0.4 Nrumpet (10,100)				
		016 Base 15 5 14			Der (m				
		<sup>3</sup> 14			<sup>4</sup> 4.0	D			
		13 Abnormal							
		12							
		11	1	23	0.0		3	23	
		May3/23 Jun21/23		0ct17/23	Dec8/23	May3/23	CC/ L 1400	Dec8/23	
Certificate L2367	Laboratory Sample No. Lab Number Unique Number Test Package Sample report	: WearCheck USA - 501 Madison Ave., Cary, NC 27513 GFL Environmental - 015 - Columbi : GFL0099491 Received : 22 Dec 2023 7800 Farrow Ro : 06043016 Tested : 25 Dec 2023 Columbia, S : 10803624 Diagnosed : 26 Dec 2023 - Don Baldridge US 29203-32							
* - Denotes tes	st methods that	are outside of the ISC pecifications are base	О 17025 sco	pe of accrea	litation.	rule (JCGM 106.	T:	(803)935-0249 (803)935-0244	

Submitted By: NOEL MATTHEWS