

## **OIL ANALYSIS REPORT**

Sample Rating Trend



## Machine Id 413001

#### 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 INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0093526	GFL0077263	GFL0060576
Sample Date		Client Info		06 Sep 2023	10 Apr 2023	23 Mar 2023
Machine Age	hrs	Client Info		2439	1383	1266
Oil Age	hrs	Client Info		559	133	565
Oil Changed		Client Info		Changed	Not Changd	Changed
Sample Status				NORMAL	NORMAL	ATTENTION
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	<1.0	<1.0
Glycol		WC Method		NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	10	7	11
Chromium	ppm	ASTM D5185m	>20	1	0	1
Nickel	ppm	ASTM D5185m	>4	<1	<1	0
Titanium	ppm	ASTM D5185m		2	<1	83
Silver	ppm	ASTM D5185m	>3	- <1	0	3
Aluminum	ppm	ASTM D5185m	>20	5	2	3
Lead	ppm	ASTM D5185m	>40	1	0	<1
Copper	ppm	ASTM D5185m	>330	13	33	10
Tin	ppm	ASTM D5185m	>15	3	<1	<1
Vanadium	ppm	ASTM D5185m	210	0	0	<1
Cadmium	ppm	ASTM D5185m		<1	0	0
Caumum	ppm	AGTIM D3103III		S1	0	0
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	0	<1	6	83
Boron Barium	ppm ppm	ASTM D5185m ASTM D5185m	0	<1 44	6 0	83 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	<1 44 56	6 0 59	83 0 5
Boron Barium Molybdenum Manganese	ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	<1 44 56 1	6 0 59 <1	83 0 5 1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	<1 44 56 1 898	6 0 59 <1 880	83 0 5 1 456
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	<1 44 56 1 898 978	6 0 59 <1 880 1066	83 0 5 1 456 1896
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	<1 44 56 1 898	6 0 59 <1 880	83 0 5 1 456
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	<1 44 56 1 898 978	6 0 59 <1 880 1066	83 0 5 1 456 1896
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	<1 44 56 1 898 978 907	6 0 59 <1 880 1066 936	83 0 5 1 456 1896 997
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	<1 44 56 1 898 978 907 1153	6 0 59 <1 880 1066 936 1158	83 0 5 1 456 1896 997 1194
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 ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	<1 44 56 1 898 978 907 1153 2927	6 0 59 <1 880 1066 936 1158 3088	83 0 5 1 456 1896 997 1194 4045
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 1010 1070 1150 1270 2060	<1 44 56 1 898 978 907 1153 2927 current	6 0 59 <1 880 1066 936 1158 3088 history1	83 0 5 1 456 1896 997 1194 4045 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm <b>TS</b>	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	<1 44 56 1 898 978 907 1153 2927 current 8	6 0 59 <1 880 1066 936 1158 3088 history1 9	83 0 5 1 456 1896 997 1194 4045 history2 8
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 ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 Limit/base >25	<1 44 56 1 898 978 907 1153 2927 current 8 4	6 0 59 <1 880 1066 936 1158 3088 history1 9 2	83 0 5 1 456 1896 997 1194 4045 <b>history2</b> 8 0
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 <b>limit/base</b> >25 >20	<1 44 56 1 898 978 907 1153 2927 current 8 4 15	6 0 59 <1 880 1066 936 1158 3088 history1 9 2 4	83 0 5 1 456 1896 997 1194 4045 history2 8 0 3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>limit/base</b> >25	<1 44 56 1 898 978 907 1153 2927 current 8 4 15 current	6 0 59 <1 880 1066 936 1158 3088 history1 9 2 4 4 history1	83 0 5 1 456 1896 997 1194 4045 <b>history2</b> 8 0 3 3
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 ppm	ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base >20	<1 44 56 1 898 978 907 1153 2927 current 8 4 15 current 0.3	6 0 59 <1 880 1066 936 1158 3088 history1 9 2 4 4 history1 0.1	83 0 5 1 456 1896 997 1194 4045 <b>history2</b> 8 0 3 <b>history2</b> 0.4
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 <i>limit/base</i> >25 >20 <i>limit/base</i> >3 >20	<1 44 56 1 898 978 907 1153 2927 current 8 4 15 current 0.3 7.5	6 0 59 <1 880 1066 936 1158 3088 history1 9 2 4 4 history1 0.1 5.7	83 0 5 1 456 1896 997 1194 4045 history2 8 0 3 history2 0.4 11.9
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 20 225 20 20 3 20 3 20 3 20 20 20 20 20 20 20 20 20 20 20 20 20	<1 44 56 1 898 978 907 1153 2927 current 8 4 15 current 0.3 7.5 19.3	6 0 59 <1 880 1066 936 1158 3088 history1 9 2 4 4 history1 0.1 5.7 18.4	83 0 5 1 456 1896 997 1194 4045 <b>history2</b> 8 0 3 <b>history2</b> 0.4 11.9 24.2
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 TS ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844	0 0 0 1010 1070 1150 1270 2060 2060 225 20 220 20 20 30 20 30 20 30 20 20 20 20 20 20 20 20 20 20 20 20 20	<1 44 56 1 898 978 907 1153 2927 current 8 4 15 current 0.3 7.5 19.3 current	6 0 59 <1 880 1066 936 1158 3088 history1 9 2 4 4 history1 0.1 5.7 18.4 history1	83 0 5 1 456 1896 997 1194 4045 <b>history2</b> 8 0 3 <b>history2</b> 0.4 11.9 24.2 <b>history2</b>



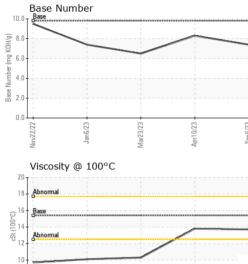
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Nov22/22

Jan6/23

# **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	
Mar23/23	Apr1 0/23 - Sep6/23 -	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML	
Mar2	Apr1 Sep	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	RTIES	method	limit/base	current	history1	history2	
		Visc @ 100°C	cSt	ASTM D445	15.4	13.7	13.8	▲ 10.3	
		GRAPHS							
		Ferrous Alloys							
/23	/23	30 - iron							
Mar23/23	Apr10/23	25 - nickel							
		E 15							
		10-							
		5 -							
		23 52	23	53	<b>3111111</b>				
		Jan6,23	Mar23/23	Apr10/23	Sep6/23				
		N ,	_	A	05				
		Non-ferrous Meta	ls						
		copper							
		200 - tin							
		150							
		md la							
		100							
			$\mathbf{N}$						
		50 -							
		Vov22/22 Jan6/23	lar23/23	Apr10/23	Sep6/23				
		Novi	Mari	Apr	Sel				
		Viscosity @ 100°C				Base Number			
		20			10.0		1		
		18 - Abnormal			8.0·				
		16 Base			KOH/		$\sim$		
		(3.00 (1) (2.00 (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)			B 6.0				
			1		.a 5 4.0				
		12-	/		0.04 6.04 8888 Number (mg KOH(0) 4.0-				
		10-	_		<sup>66</sup> 2.0·				
		8			0.0-				
		ov22/22 -	3/23	0/23	Sep6/23	lov22/22 - Jan6/23 -	3/23	4pr10/23 -	
		Nov22/22 Jan6/23	Mar23/23	Apr10/23	Sep	Nov22/22 Jan6/23	Mar23/23	Apr10/23	
	l	: WearCheck USA - 5			ry, NC 27513 Sep 2023	3 1001 South Rockwe			
	Laboratory Sample No. Lab Number Unique Numbe Test Package	: 05952506 r : 10648465	Received Diagnos Diagnosi	ed : 18 \$	Sep 2023 Sep 2023 s Davis		Ok	lahoma City, O US 7312	

Contact/Location: Andy Smith - GFL891