

## **OIL ANALYSIS REPORT**

Sample Rating Trend





## Component

Diesel Engine

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

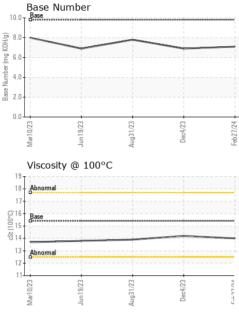
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0112983	GFL0098434	GFL0089506
Sample Date		Client Info		27 Feb 2024	04 Dec 2023	31 Aug 2023
Machine Age	hrs	Client Info		6645	6113	5520
Oil Age	hrs	Client Info		6645	6113	0
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	ASTM D5185m	>110	19	23	19
Chromium	ppm	ASTM D5185m	>4	1	1	1
Nickel	ppm	ASTM D5185m	>2	<1	<1	0
Titanium	ppm	ASTM D5185m		<1	<1	0
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>25	3	2	<1
Lead	ppm	ASTM D5185m	>45	0	<1	1
Copper	ppm	ASTM D5185m	>85	1	2	2
Tin	ppm	ASTM D5185m	>4	<1	<1	<1
Vanadium	ppm	ASTM D5185m		<1	0	0
Cadmium	ppm	ASTM D5185m		<1	<1	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base 0	current	history1 0	history2 2
	ppm ppm					
Boron		ASTM D5185m	0	1	0	2
Boron Barium	ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0	1 0	0 12	2 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	1 0 64	0 12 60	2 0 60
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	1 0 64 <1	0 12 60 <1	2 0 60 1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150	1 0 64 <1 978	0 12 60 <1 931 1020 964	2 0 60 1 1006 1095 1063
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 0 64 <1 978 1030	0 12 60 <1 931 1020	2 0 60 1 1006 1095 1063 1298
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 0 64 <1 978 1030 1053	0 12 60 <1 931 1020 964	2 0 60 1 1006 1095 1063
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 0 64 <1 978 1030 1053 1285	0 12 60 <1 931 1020 964 1213	2 0 60 1 1006 1095 1063 1298
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 ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	1 0 64 <1 978 1030 1053 1285 3052	0 12 60 <1 931 1020 964 1213 3105	2 0 60 1 1006 1095 1063 1298 3647
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 ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	1 0 64 <1 978 1030 1053 1285 3052 current	0 12 60 <1 931 1020 964 1213 3105 history1	2 0 60 1 1006 1095 1063 1298 3647 history2
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 <b>method</b> ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	1 0 64 <1 978 1030 1053 1285 3052 current 4	0 12 60 <1 931 1020 964 1213 3105 history1 4	2 0 60 1 1006 1095 1063 1298 3647 history2 5
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm 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 ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 Limit/base >30	1 0 64 <1 978 1030 1053 1285 3052 current 4 7	0 12 60 <1 931 1020 964 1213 3105 history1 4 4	2 0 60 1 1006 1095 1063 1298 3647 history2 5 8
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm 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> >30	1 0 64 <1 978 1030 1053 1285 3052 current 4 7 4	0 12 60 <1 931 1020 964 1213 3105 history1 4 4 7	2 0 60 1 1006 1095 1063 1298 3647 <b>history2</b> 5 8 4 4 <b>history2</b> 0
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 <b>limit/base</b> >20 <b>limit/base</b>	1 0 64 <1 978 1030 1053 1285 3052 current 4 7 4 X	0 12 60 <1 931 1020 964 1213 3105 history1 4 4 7 <i>history1</i>	2 0 60 1 1006 1095 1063 1298 3647 <b>history2</b> 5 8 4 4
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	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >30 20 20	1 0 64 <1 978 1030 1053 1285 3052 <i>current</i> 4 7 4 <i>current</i>	0 12 60 <1 931 1020 964 1213 3105 history1 4 4 7 history1 0.6	2 0 60 1 1006 1095 1063 1298 3647 <b>history2</b> 5 8 4 4 <b>history2</b> 0
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 >30 200 imit/base >30	1 0 64 <1 978 1030 1053 1285 3052 <i>current</i> 4 7 4 <i>current</i> 0.5 9.9	0 12 60 <1 931 1020 964 1213 3105 history1 4 4 4 7 history1 0.6 10.8	2 0 60 1 1006 1095 1063 1298 3647 history2 5 8 4 4 history2 0 11.3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAD	ppm ppm ppm ppm ppm ppm ppm ppm <b>TS</b> ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7415	0 0 0 1010 1070 1150 1270 2060 <b>Iimit/base</b> >30 220 <b>Iimit/base</b> >3 >20 >30	1 0 64 <1 978 1030 1053 1285 3052 <i>current</i> 4 7 4 <i>current</i> 0.5 9.9 19.8	0 12 60 <1 931 1020 964 1213 3105 history1 4 4 4 7 history1 0.6 10.8 21.0 history1	2 0 60 1 1006 1095 1063 1298 3647 <b>history2</b> 5 8 4 4 <b>history2</b> 0 11.3 22.9 <b>history2</b>
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	1 0 64 <1 978 1030 1053 1285 3052 <u>current</u> 4 7 4 <u>current</u> 0.5 9.9 19.8	0 12 60 <1 931 1020 964 1213 3105 history1 4 4 7 history1 0.6 10.8 21.0	2 0 60 1 1006 1095 1063 1298 3647 <b>history2</b> 5 8 4 4 <b>history2</b> 0 11.3 22.9



# **OIL ANALYSIS REPORT**

VISUAL



	-	VISUAL		method	iiiiii/Dase	current	Thistory I	nistory2
		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
Aug31/23	Dec4/23 Feb27/24	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Aug	Feb2	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
		Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
		Free Water	scalar	*Visual		NEG	NEG	NEG
		FLUID PROPI	ERTIES	method	limit/base	current	history1	history2
		Visc @ 100°C	cSt	ASTM D445	15.4	14.0	14.2	13.9
		GRAPHS						
		Ferrous Alloys						
23	23	iron						
Aug31/23	Dec4/23	25						
4	-							
		E 15						
		10-						
		5		1				
		3 3	23	23				
		Mar10/23 Jun19/23	Aug31/23	Dec4/23	Feb27/24			
		≥ ¬ Non-ferrous Meta			LL.			
		10 <sub>T</sub>	115					
		copper						
		8 - management tin						
		6 -						
		udd						
		4						
		2						
			South States of					
		3 3	23	533				
		Mar10/23 Jun19/23	Aug31/23	Dec4/23	Feb27/24			
	≥ ¬ Viscosity @ 100°			LL.				
	<sup>19</sup> T			10.	Base Number			
		18 - Abnormal			10.			
		17-			(B)	0		1
		O <sup>16</sup> Base			Base Number (mg KOH/g)			
		00015 314			LE LE			
		<sup>63</sup> 14				0		
		13		I 	880 2.	0		
		Abnormal		1	2.			
		12 -					1	
		12	23	53			53	53.
		12	ıg31/23	)ec4/23			ıg31/23 -	Dec4/23 -
		Abnormai	Aug31/23	Dec4/23 +	.0	Mar10/23	Aug31/23 -	Dec4/23
d	Laboratory	: WearCheck USA - 50		n Ave., Cary	+7//2794 , NC 27513	Mar10/23 Jun19/23	ironmental - 9 <sup>.</sup>	
AB	Sample No.	: WearCheck USA - 56 : GFL0112983	01 Madiso <b>Rece</b> i	n Ave., Cary i <b>ved</b> : 01	7, NC 27513 Mar 2024	Mar10/23 Jun19/23	ironmental - 9	18 - Hartland H
	Sample No. Lab Number	: WearCheck USA - 56 : GFL0112983 : 06105766	01 Madiso Recei Teste	n Ave., Cary i <b>ved</b> : 01 i <b>d</b> : 01	r, NC 27513 Mar 2024 Mar 2024	EZ/61unr GFL Env	ironmental - 9	1 <b>8 - Hartland H</b> Industrial Driv Hartland, V
THE LIZET	Sample No.	: WearCheck USA - 56 : GFL0112983 : 06105766 : 10909263	01 Madiso <b>Rece</b> i	n Ave., Cary i <b>ved</b> : 01 i <b>d</b> : 01	7, NC 27513 Mar 2024	EZ/61unr GFL Env	ironmental - 9 630 E	18 - Hartland H

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

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