

## **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 INFORM	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0088267	GFL0077515	GFL0064481
Sample Date		Client Info		31 Aug 2023	21 Jun 2023	20 Jun 2023
Machine Age	hrs	Client Info		8527	8399	8442
Oil Age	hrs	Client Info		241	97	0
Oil Changed		Client Info		Changed	Not Changd	Not Changd
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINATI	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	<1.0	<1.0
Glycol		WC Method		NEG	NEG	NEG
WEAR METALS	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	49	19	21
Chromium	ppm	ASTM D5185m		<1	0	0
Nickel	ppm	ASTM D5185m	>4	0	0	0
Titanium	ppm	ASTM D5185m		4	2	3
Silver	ppm	ASTM D5185m	>3	0	0	0
Aluminum	ppm	ASTM D5185m		6	4	4
Lead	ppm	ASTM D5185m	>40	2	0	0
Copper	ppm	ASTM D5185m		2	<1	<1
Tin	ppm		>15	_ <1	0	0
Vanadium	ppm	ASTM D5185m		<1	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
	ppm		limit/base	current 207	history1 187	history2 215
Boron	ppm ppm	ASTM D5185m				
Boron Barium	ppm	ASTM D5185m	0	207	187	215
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m	0 0 60	207 0	187 5	215 4
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	207 0 94	187 5 78	215 4 86
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	207 0 94 1	187 5 78 <1	215 4 86 <1
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	207 0 94 1 729	187 5 78 <1 531	215 4 86 <1 610
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	207 0 94 1 729 1545	187 5 78 <1 531 1180	215 4 86 <1 610 1300
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	0 0 60 0 1010 1070 1150	207 0 94 1 729 1545 739	187 5 78 <1 531 1180 584	215 4 86 <1 610 1300 633
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	207 0 94 1 729 1545 739 903	187 5 78 <1 531 1180 584 727	215 4 86 <1 610 1300 633 789
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 ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	207 0 94 1 729 1545 739 903 3112	187 5 78 <1 531 1180 584 727 2522	215 4 86 <1 610 1300 633 789 2740
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	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 0 1010 1070 1150 1270 2060	207 0 94 1 729 1545 739 903 3112 current	187 5 78 <1 531 1180 584 727 2522 history1	215 4 86 <1 610 1300 633 789 2740 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 ASTM D5185m <b>method</b>	0 0 60 0 1010 1070 1150 1270 2060	207 0 94 1 729 1545 739 903 3112 current 6	187 5 78 <1 531 1180 584 727 2522 history1 3	215 4 86 <1 610 1300 633 789 2740 history2 4
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 <b>limit/base</b> >25	207 0 94 1 729 1545 739 903 3112 current 6 4	187 5 78 <1 531 1180 584 727 2522 history1 3 2	215 4 86 <1 610 1300 633 789 2740 <b>history2</b> 4 2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm TS ppm	ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 <b>imit/base</b> >25 >20	207 0 94 1 729 1545 739 903 3112 current 6 4 7	187 5 78 <1 531 1180 584 727 2522 history1 3 2 2 <1	215 4 86 <1 610 1300 633 789 2740 history2 4 2 1
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 2060 225 >25	207 0 94 1 729 1545 739 903 3112 current 6 4 7 7	187 5 78 <1 531 1180 584 727 2522 history1 3 2 2 <1 history1	215 4 86 <1 610 1300 633 789 2740 history2 4 2 1 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	207 0 94 1 729 1545 739 903 3112 <i>current</i> 6 4 7 <i>current</i> 1.2	187 5 78 <1 531 1180 584 727 2522 history1 3 2 2 <1 4 history1 0.6	215 4 86 <1 610 1300 633 789 2740 history2 4 2 1 history2 0.6
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	207 0 94 1 729 1545 739 903 3112 current 6 4 7 current 1.2 9.5	187 5 78 <1 531 1180 584 727 2522 history1 3 2 2 522 history1 0.6 7.8	215 4 86 <1 610 1300 633 789 2740 history2 4 2 2 1 history2 0.6 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 <b>imit/base</b> >25 20 <b>imit/base</b> >3 >20	207 0 94 1 729 1545 739 903 3112 current 6 4 7 current 1.2 9.5 23.4	187 5 78 <1 531 1180 584 727 2522 history1 3 2 2 <1 3 2 <1 0.6 7.8 22.3	215 4 86 <1 610 1300 633 789 2740 history2 4 2 2 1 history2 0.6 7.5 22.4
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAE	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7415	0 0 0 1010 1070 1150 1270 2060 2060 225 20 220 220 20 33 20 330 20 330	207 0 94 1 729 1545 739 903 3112 current 6 4 7 current 1.2 9.5 23.4 current	187 5 78 <1 531 1180 584 727 2522 history1 3 2 2522 history1 0.6 7.8 22.3 22.3 history1	215 4 86 <1 610 1300 633 789 2740 history2 4 2 1 history2 0.6 7.5 22.4 history2



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> 13 Abnormal 12 11

Mar14/22

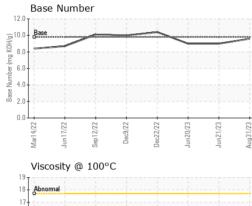
Jun17/22

# **OIL ANALYSIS REPORT**

scalar \*Visual

VISUAL

White Metal



Sep12/22

Laboratory Sample No. Lab Number Unique Number Test Package	: GFL0088267 : 05944090 r : 10634702	Received Diagnos	d : 06 : ed : 08 :	Sep 2023 Sep 2023	3 GFL Envi	GFL Environmental - 625 - Harrison Hauling 4102 Industrial Pkwy Harrison, MI US 48625 Contact: Glenda Standen gstanden@gflenv.com T:			
	Base 14 13 15 14 13 15 14 13 15 14 12 11 12 14 14 14 14 14 14 14 14 14 14 14 14 14	Dec9/22	Jun2023	2	.0	Dec9/22	Jun2023		
	udd 4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Dec9/22 -	Jun2/23	10					
	Mart 4/22 Jun 17/22 Sept 2/22	Dec2/22	52/02mL 52/02mL	Aug31/23					
	GRAPHS Ferrous Alloys			7					
	FLUID PROP Visc @ 100°C	CSt			current 13.8	history1 13.6	history2 13.6		
	Free Water	scalar	*Visual		NEG	NEG	NEG		
¥ ت ت							NORML		
Deci3/22	Appearance						NORML		
		scalar					NONE		
	Debris	scalar	*Visual	NONE		NONE	NONE		
	Silt	scalar	*Visual	NONE	NONE	NONE	NONE		
	Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE		
	Vollow Motal	coolar	*\/icual	NONE	NONE	NONE	NONE		
	Laboratory Sample No. Lab Number Unique Number	Silt Debris Sand/Dirt Appearance Odor Emulsified Water Free Water Fluid PROP Visc @ 100°C GRAPHS Ferrous Alloys Ferrous Alloys Non-ferrous Met Unique Number Unique Number Unique Number Sample No. Lab Number	Precipitate scalar Silt scalar Sand/Dirt scalar Appearance scalar Odor scalar Precipitate scalar Sand/Dirt scalar Appearance scalar Odor scalar Emulsified Water scalar Free Water scalar Mon-ferrous Metals Visc @ 100°C cSt GRAPHS Viscosity @ 100°C Viscosity @ 100°C 100 <sup>10</sup> Viscosity @ 100°C Viscosity @ 1	Precipitate scalar *Visual Silt scalar *Visual Sand/Dirt scalar *Visual Appearance scalar *Visual Appearance scalar *Visual Free Water scalar *Visual Visc @ 100°C cst ASTM D445 GRAPHS Ferrous Alloys Viscosity @ 100°C Viscosity @ 100°C Viscosity @ 100°C Uscosity @ 100°C Stab Number Unigue Number Unigue Number Unigue Number Unigue Number	Laboratory Sample No. Lab Number Unigue N	Precipitate scalar 'Visual NONE NONE Sitt scalar 'Visual NONE NONE Sanat/Dirt scalar 'Visual NONE NONE Appearance scalar 'Visual NONE NONE Appearance scalar 'Visual NORML NOR	<ul> <li>Precipitate scalar 'Visual NONE NONE NONE NONE</li> <li>Bitt scalar 'Visual NONE NONE NONE NONE</li> <li>Sand/Dirt scalar 'Visual NONE NONE NONE</li> <li>CHUID PROPERTIES method imitubase current history1</li> <li>Visc (P 100°C cSt ASTM D445 15.4 13.8 13.6</li> <li>CHUID PROPERTIES method imitubase current history1</li> <li>Visc (P 100°C reference of the scalar 'Visual 'Stala' 'S</li></ul>		

NONE

NONE

NONE

NONE

Submitted By: also GFL632 and GFL638 - Glenda Standen