

## **OIL ANALYSIS REPORT**

Sample Rating Trend





Machine Id 813018

Fluid

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

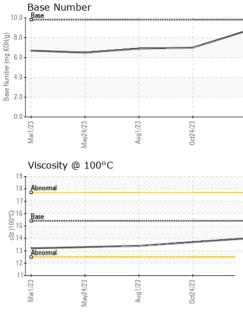
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0101563	GFL0093160	GFL0086704
Sample Date		Client Info		10 Nov 2023	24 Oct 2023	01 Aug 2023
Machine Age	hrs	Client Info		3163	3025	2424
Oil Age	hrs	Client Info		8113	8113	8113
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>3.0	<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	>120	4	13	12
Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Nickel	ppm	ASTM D5185m	>5	<1	<1	<1
Titanium	ppm	ASTM D5185m	>2	<1	<1	0
Silver	ppm	ASTM D5185m	>2	<1	0	0
Aluminum	ppm	ASTM D5185m	>20	2	2	1
Lead	ppm	ASTM D5185m	>40	<1	<1	0
Copper	ppm	ASTM D5185m	>330	2	2	4
Tin	ppm	ASTM D5185m	>15	<1	<1	<1
Vanadium	ppm	ASTM D5185m		<1	0	0
Cadmium	ppm	ASTM D5185m		<1	<1	0
		mathad	limit/base	ourroot	la ta ta mud	history2
ADDITIVES		method				nistoryz
Boron	ppm	ASTM D5185m	0	4	nistory i 1	2
	ppm ppm					
Boron		ASTM D5185m	0	4	1	2
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0 0 60	4 <1	1 3	2 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	4 <1 60	1 3 62	2 0 57
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	4 <1 60 <1	1 3 62 <1	2 0 57 <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	4 <1 60 <1 917	1 3 62 <1 927	2 0 57 <1 858
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	4 <1 60 <1 917 1145	1 3 62 <1 927 1105	2 0 57 <1 858 1014
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	4 <1 60 <1 917 1145 1050	1 3 62 <1 927 1105 988	2 0 57 <1 858 1014 968
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	4 <1 60 <1 917 1145 1050 1232	1 3 62 <1 927 1105 988 1249	2 0 57 <1 858 1014 968 1169
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 1010 1070 1150 1270 2060	4 <1 60 <1 917 1145 1050 1232 3067	1 3 62 <1 927 1105 988 1249 3298	2 0 57 <1 858 1014 968 1169 2844
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	4 <1 60 <1 917 1145 1050 1232 3067 current	1 3 62 <1 927 1105 988 1249 3298 history1	2 0 57 <1 858 1014 968 1169 2844 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	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 ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 imit/base >25	4 <1 60 <1 917 1145 1050 1232 3067 current 4	1 3 62 <1 927 1105 988 1249 3298 history1 4	2 0 57 <1 858 1014 968 1169 2844 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 <b>method</b> ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 imit/base >25	4 <1 60 <1 917 1145 1050 1232 3067 current 4 0	1 3 62 <1 927 1105 988 1249 3298 history1 4 <1	2 0 57 <1 858 1014 968 1169 2844 <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 ppm TS	ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 <b>limit/base</b> >25 >20	4 <1 60 <1 917 1145 1050 1232 3067 current 4 0 2	1 3 62 <1 927 1105 988 1249 3298 history1 4 <1 2	2 0 57 <1 858 1014 968 1169 2844 history2 4 2 2 4 2 2 <1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	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> >25	4 <1 60 <1 917 1145 1050 1232 3067 current 4 0 2 2	1 3 62 <1 927 1105 988 1249 3298 history1 4 <1 2 history1	2 0 57 <1 858 1014 968 1169 2844 <b>history2</b> 4 2 2 4 2 <1 <b>history2</b>
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 0 1010 1070 1150 1270 2060 2060 225 >25 >20 1imit/base >20	4 <1 60 <1 917 1145 1050 1232 3067 <i>current</i> 4 0 2 <i>current</i> 0.2	1 3 62 <1 927 1105 988 1249 3298 history1 4 <1 2 history1 0.6	2 0 57 <1 858 1014 968 1169 2844 <b>history2</b> 4 2 2 4 2 <1 <b>history2</b> 0.5
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> >4 >20	4 <1 60 <1 917 1145 1050 1232 3067 current 4 0 2 current 0.2 5.5	1 3 62 <1 927 1105 988 1249 3298 history1 4 <1 2 history1 0.6 8.4	2 0 57 <1 858 1014 968 1169 2844 history2 4 2 2 4 2 2 4 2 1 history2 0.5 7.6
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> >4 >20	4 <1 60 <1 917 1145 1050 1232 3067 <i>current</i> 4 0 2 <i>current</i> 0.2 5.5 18.3	1 3 62 <1 927 1105 988 1249 3298 history1 4 <1 2 history1 0.6 8.4 19.9	2 0 57 <1 858 1014 968 1169 2844 <b>history2</b> 4 2 2 4 2 <1 <b>history2</b> 0.5 7.6 19.8
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 D7844	0 0 0 1010 1070 1150 1270 2060 2060 225 20 220 220 20 1imit/base 22 20 20 20 20 20 20 20 20 20 20 20 20	4 <1 60 <1 917 1145 1050 1232 3067 current 4 0 2 current 0.2 5.5 18.3 current	1 3 62 <1 927 1105 988 1249 3298 history1 4 <1 2 history1 0.6 8.4 19.9 history1	2 0 57 <1 858 1014 968 1169 2844 history2 4 2 2 4 2 2 4 2 3 4 2 2 4 1 5 5 7.6 19.8 19.8



# **OIL ANALYSIS REPORT**

VISUAL



		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		*Visual	NONE	NONE	NONE	NONE
		Sand/Dirt		*Visual	NONE	NONE	NONE	NONE
Aug1/23	4/23 -			*Visual	NORML	NORML	NORML	NORML
Aug	0ct24/23 Nov10/23	Odor		*Visual	NORML	NORML	NORML	NORML
_		Emulsified Water		*Visual	>0.2	NEG	NEG	NEG
2		Free Water		*Visual		NEG	NEG	NEG
	<u></u>					nea		
		FLUID PROP	ERTIES	method	limit/base	current	history1	history2
		Visc @ 100°C	cSt	ASTM D445	15.4	14.0	13.7	13.4
		GRAPHS						
		Ferrous Alloys						
23	23	16- iron						
Aug1/23	0ct24/23	14 - nickel		I I I I I				
4	0	12-		$\neg$				
		E10						
		8						
		4						
		2		   				
			CTUTO IN COLUMN					
		Mar1/23 May24/23	Aug1/23	0ct24/23	Nov10/23			
		Maví	Aug	Oct	Novi			
		Non-ferrous Met	als					
		100 copper						
		80						
		tin						
		60						
		40						
		20						
			53	53	53			
		Mar1/23 May24/23	Aug1/23	0ct24/23	Nov10/23			
		2		0	Nc			
		Viscosity @ 100	<sup>2</sup> ر			Base Number		
		18 - Abnormal		<b>.</b>	10.0	Base		
		17-	1	1	- 8.0			/
					6.0 Base Number (mg KOHV6)			
		0015 314		*****	E 6.0			
		C S1			.a .g .g .4.0			
					Na se Nu			
		13 - Abnormal			<sup>66</sup> 2.0			
		12						
		11	- 23	- 723 -	0.0	23	23	723-
		Mar1/23 May24/23	Aug1/23	0ct24/23	Nov10/23	Mar1/23 May24/23	Aug 1/23	0ct24/23 Nov10/23
						_		
4	Laboratory	: WearCheck USA				GFL Envi	ronmental - 41	5 - Michigan East
ANAB	Sample No. Lab Number	: GFL0101563 : 06005225	Received Diagnose		Nov 2023 Nov 2023		Cto.	6200 Elmridge rling Heights, Ml
TESTING LABORATORY	Unique Number		Diagnose		s Davis		510	US 48313
	Test Package		Diagnosti		5 0 4 1 5		Conta	ict: Frank Wolak
		contact Customer Se	rvice at 1-80	0-237-1369	).			lak@gflenv.com
		are outside of the ISO						: (586)825-9514
		- March and a second second second			1	10011 100.0010		· ′ –

\* - Denotes test metho Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

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