

# **OIL ANALYSIS REPORT**

Sample Rating Trend





Machine Id 927042 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

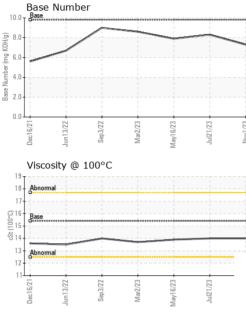
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFOR	MATION	method	limit/base	current	history1	history2		
Sample Number		Client Info		GFL0092613	GFL0082534	GFL0075200		
Sample Date		Client Info		01 Nov 2023	21 Jul 2023	16 May 2023		
Machine Age	hrs	Client Info	17119		16559	16080		
Oil Age	hrs	Client Info	560		607	606		
Oil Changed		Client Info	Not Changd		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	. 010	NEG	NEG	NEG		
-	0		11 11 11					
WEAR METAL	5	method	limit/base	current	history1	history2		
Iron	ppm	ASTM D5185m		23	10	15		
Chromium	ppm	ASTM D5185m		<1	<1	0		
Nickel	ppm	ASTM D5185m	>5	0	0	1		
Titanium	ppm	ASTM D5185m	>2	0	0	0		
Silver	ppm	ASTM D5185m	>2	0	0	0		
Aluminum	ppm	ASTM D5185m	>20	3	2	<1		
Lead	ppm	ASTM D5185m	>40	1	0	<1		
Copper	ppm	ASTM D5185m	>330	1	0	<1		
Tin	ppm	ASTM D5185m	>15	<1	<1	<1		
Vanadium	ppm	ASTM D5185m		0	0	0		
Cadmium	ppm	ASTM D5185m		0	0	0		
ADDITIVES		method	limit/base	current	history1	history2		
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current 7	history1 2	history2 0		
	ppm ppm							
Boron		ASTM D5185m	0	7	2	0		
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	7 0	2 0	0		
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	7 0 62	2 0 65	0 0 61		
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	7 0 62 0	2 0 65 <1	0 0 61 <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	7 0 62 0 952	2 0 65 <1 1059	0 0 61 <1 1006		
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	7 0 62 0 952 1073	2 0 65 <1 1059 1146	0 0 61 <1 1006 1140		
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	7 0 62 0 952 1073 958	2 0 65 <1 1059 1146 1096	0 0 61 <1 1006 1140 1022		
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	7 0 62 0 952 1073 958 1220	2 0 65 <1 1059 1146 1096 1353	0 0 61 <1 1006 1140 1022 1321		
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	7 0 62 0 952 1073 958 1220 3028	2 0 65 <1 1059 1146 1096 1353 3723	0 0 61 <1 1006 1140 1022 1321 3403		
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	7 0 62 0 952 1073 958 1220 3028 current	2 0 65 <1 1059 1146 1096 1353 3723 history1	0 0 61 <1 1006 1140 1022 1321 3403 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	0 0 60 1010 1070 1150 1270 2060	7 0 62 0 952 1073 958 1220 3028 current 5	2 0 65 <1 1059 1146 1096 1353 3723 history1 5	0 0 61 <1 1006 1140 1022 1321 3403 history2 5		
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 1010 1070 1150 1270 2060 kimit/base >25	7 0 62 0 952 1073 958 1220 3028 <u>current</u> 5 4	2 0 65 <1 1059 1146 1096 1353 3723 history1 5 4	0 0 61 <1 1006 1140 1022 1321 3403 history2 5 4		
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 0 1010 1070 1150 1270 2060 <b>limit/base</b> >25	7 0 62 0 952 1073 958 1220 3028 <u>current</u> 5 4 1	2 0 65 <1 1059 1146 1096 1353 3723 history1 5 4 0	0 0 61 <1 1006 1140 1022 1321 3403 history2 5 4 2		
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	7 0 62 0 952 1073 958 1220 3028 <i>current</i> 5 4 1 1 <i>current</i> 0.9	2 0 65 <1 1059 1146 1096 1353 3723 history1 5 4 0 bistory1 0.5	0 0 61 <1 1006 1140 1022 1321 3403 history2 5 4 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 TS	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base	7 0 62 0 952 1073 958 1220 3028 current 5 4 1 1	2 0 65 <1 1059 1146 1096 1353 3723 history1 5 4 0 0 history1	0 0 61 <1 1006 1140 1022 1321 3403 history2 5 4 2 5 4 2 history2 0.8		
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	7 0 62 0 952 1073 958 1220 3028 <u>current</u> 5 4 1 2 0.9 8.6	2 0 65 <1 1059 1146 1096 1353 3723 history1 5 4 0 history1 0.5 7.0	0 0 61 <1 1006 1140 1022 1321 3403 history2 5 4 2 5 4 2 history2 0.8 9.2		
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 ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7624	0 0 0 1010 1070 1150 2260 2060 225 220 220 1imit/base >20 >20 30 20 30 20 20 20 20 20 20 20 20 20 20 20 20 20	7 0 62 0 952 1073 958 1220 3028 <i>current</i> 5 4 1 <i>current</i> 0.9 8.6 21.1	2 0 65 <1 1059 1146 1096 1353 3723 history1 5 4 0 0 history1 0.5 7.0 19.8 history1	0 0 61 <1 1006 1140 1022 1321 3403 history2 5 4 2 5 4 2 0.8 9.2 20.7 history2		
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 <b>imit/base</b> >4 >20 >30	7 0 62 0 952 1073 958 1220 3028 <u>current</u> 5 4 1 1 <u>current</u> 0.9 8.6 21.1	2 0 65 <1 1059 1146 1096 1353 3723 history1 5 4 0 0 history1 0.5 7.0 19.8	0 0 61 <1 1006 1140 1022 1321 3403 history2 5 4 2 history2 0.8 9.2 20.7		



# **OIL ANALYSIS REPORT**

VISUAL



	Laboratory Sample No. Lab Number Unique Number Test Package	: GFL0092613 : 06000995 r : 10729355 e : FLEET			Receiv Diagno	501 Madison Ave., Cary, NC 2751 <b>Received</b> : 07 Nov 2023 <b>Diagnosed</b> : 08 Nov 2023 <b>Diagnostician</b> : Wes Davis vice at 1-800-237-1369.			513 <b>GFL Environmental - 947 - WB Horicon HC</b> N7296 County Rd V Horicon, W US 53032 Contact: Tim Kieffer tim.kieffer@gflenv.com						
		(3-16- (3-001)) (3-14- 13- 12- 11-	Apnormal 2325	Sep3/22 +	Mai223	May16/23	Jul21/23	(b)Hub B.0 Base Mumber (m) KON (0) Base Mumber (m) KON (0) COLONIC (0) COLONIC (0) COLO	Jun13/22	Sep3/22 -	Mar2/23	May16/23	Jul21/23	Nov1/23	
		19 - 18 - 17 -	Viscosity	′@ 100	)°C			10.0 Base	e Numb	oer				/	
		2-	Dec16/21	Sep3/22	Mar2/23 -	May16/23	Jui21/23								
		6 - Edd 4 -		n											
		<sup>10</sup>	Non-feri	opper	tals										
		5-	Dec16/21	Sep3/22	Mar2/23	May16/23	Jul21/23								
- :	8	20 - 6 15 - 10 -					/								
Mar2/23	May16/23 +	<sup>30</sup> 25		Alloys											
		_	isc @ 10 GRAPI		cSt	ASTM D4	445 15.4	14	1.0		14.0		13.9		
					scala PERTIE		d limit/		current		history	1	histor	ry2	
		Er	mulsified ree Wate		scala	r *Visual	>0.2	N	EG EG		NEG		NEG NEG		
Mar2/23	May16/23 Jul21/23 Nov1/23	Ap	opearan dor	ce	scala scala		NORN		ORML ORML		NORML NORML		NORM NORM		
	Sa	and/Dirt		scala		NONE		ONE		NONE		NONE			
		Si	ilt ebris		scala scala		NONE		ONE ONE		NONE NONE		NONE NONE		
		Pr	recipitate		scala		NONE	E NO	ONE	1	NONE		NONE		
		Ye	ellow Me	tal	scala	r *Visual	NONE	- N(	ONE		NONE		NONE		

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Submitted By: See also GFL935 - Tim Kieffer