

# **OIL ANALYSIS REPORT**

#### Sample Rating Trend



# Machine Id 727022

#### 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

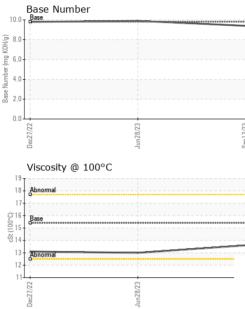
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORM	<b>MATION</b>	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0092934	GFL0015784	GFL0067634
Sample Date		Client Info		12 Sep 2023	28 Jun 2023	27 Dec 2022
Machine Age	hrs	Client Info		13172	12880	12192
Oil Age	hrs	Client Info		12880	12192	0
Oil Changed		Client Info		N/A	N/A	N/A
Sample Status				NORMAL	ABNORMAL	ABNORMAL
CONTAMINATI	ON	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	12	41	37
Chromium	ppm	ASTM D5185m	>20	1	3	<1
Nickel	ppm	ASTM D5185m		<1	1	0
Titanium	ppm	ASTM D5185m		<1	2	0
Silver	ppm	ASTM D5185m	>3	0	2	0
Aluminum	ppm	ASTM D5185m	>20	1	6	4
Lead	ppm	ASTM D5185m	>40	<1	4	0
Copper	ppm		>330	<1	3	2
Tin	ppm		>15	1	2	_ <1
Vanadium	ppm	ASTM D5185m	-	0	1	0
Cadmium	ppm	ASTM D5185m		<1	2	0
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	0	4	14	91
Barium	ppm	ASTM D5185m	0	44	0	0
				57		
Molybdenum	ppm	ASTM D5185m	60	57	69	71
Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m		1	69 2	71 <1
-				-		
Manganese	ppm	ASTM D5185m	0	1	2	<1
Manganese Magnesium	ppm ppm	ASTM D5185m ASTM D5185m	0 1010	1 857	2 926	<1 826
Manganese Magnesium Calcium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 1010 1070	1 857 938	2 926 1080	<1 826 1104
Manganese Magnesium Calcium Phosphorus	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 1010 1070 1150	1 857 938 908	2 926 1080 965	<1 826 1104 948
Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 1010 1070 1150 1270	1 857 938 908 1118 3193	2 926 1080 965 1222	<1 826 1104 948 1128
Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 1010 1070 1150 1270 2060 <b>limit/base</b>	1 857 938 908 1118 3193	2 926 1080 965 1222 3518	<1 826 1104 948 1128 3489
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 1010 1070 1150 1270 2060 <b>limit/base</b>	1 857 938 908 1118 3193 current	2 926 1080 965 1222 3518 history1	<1 826 1104 948 1128 3489 history2
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN <sup>T</sup> Silicon	ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b> ASTM D5185m	0 1010 1070 1150 1270 2060 <b>limit/base</b>	1 857 938 908 1118 3193 current 4	2 926 1080 965 1222 3518 history1 12	<1 826 1104 948 1128 3489 history2 5
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b> ASTM D5185m ASTM D5185m	0 1010 1070 1150 1270 2060 limit/base >25	1 857 938 908 1118 3193 current 4 28 5	2 926 1080 965 1222 3518 history1 12 ▲ 418	<1 826 1104 948 1128 3489 history2 5 5 ▲ 128
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 1010 1070 1150 1270 2060 <b>limit/base</b> >25 >20	1 857 938 908 1118 3193 current 4 28 5	2 926 1080 965 1222 3518 history1 12 12 ▲ 418 17	<1 826 1104 948 1128 3489 <b>history2</b> 5 5 128 9
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	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 ASTM D5185m	0 1010 1070 1150 1270 2060 <i>limit/base</i> >25 >20	1 857 938 908 1118 3193 current 4 28 5 5 current	2 926 1080 965 1222 3518 history1 12 ▲ 418 17 history1	<1 826 1104 948 1128 3489 bistory2 5 ▲ 128 9 bistory2
Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 1010 1070 1150 1270 2060 <i>limit/base</i> >25 >20 <i>limit/base</i> >3	1 857 938 908 1118 3193 current 4 28 5 5 current 0.4	2 926 1080 965 1222 3518 history1 12 ↓ 418 17 history1 1	<1 826 1104 948 1128 3489 bistory2 5 ▲ 128 9 bistory2 0.9
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 ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 1010 1070 1150 1270 2060 <b>limit/base</b> >20 <b>limit/base</b> >3 >20	1 857 938 908 1118 3193 current 4 28 5 current 0.4 6.0	2 926 1080 965 1222 3518 history1 12 ▲ 418 17 history1 1 1 10.8	<1 826 1104 948 1128 3489  history2  5 ▲ 128 9  history2  0.9 9.4
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 ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D7844 *ASTM D7844 *ASTM D7845	0 1010 1070 1150 1270 2060 imit/base >25 >20 imit/base >3 >20 >30	1 857 938 908 1118 3193 <u>current</u> 4 28 5 <u>current</u> 0.4 6.0 17.3	2 926 1080 965 1222 3518 history1 12 ▲ 418 17 history1 1 10.8 20.7	<1 826 1104 948 1128 3489  bistory2  5  128 9  bistory2 0.9 9.4 19.7

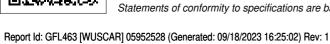


# **OIL ANALYSIS REPORT**

VISUAL



	White Metal	scalar	*Visual	NONE	NONE	NONE	NONE		
	Yellow Metal		*Visual	NONE	NONE	NONE	NONE		
	Precipitate		*Visual	NONE	NONE	NONE	NONE		
	Silt		*Visual	NONE	NONE	NONE	NONE		
	Debris		*Visual	NONE	NONE	NONE	NONE		
	Sand/Dirt		*Visual	NONE	NONE	NONE	NONE		
8/23 -	Appearance		*Visual	NORML	NORML	NORML	NORML		
Jun 28/23 Sep 1 2/23	Odor		*Visual	NORML	NORML	NORML	NORML		
°C	Emulsified Water		*Visual	>0.2	NEG	NEG	NEG		
	Free Water		*Visual		NEG	NEG	NEG		
	FLUID PROPE		method	limit/base	current	history1	history2		
	Visc @ 100°C		ASTM D445		13.6	13.0	13.1		
	GRAPHS	COL	A31101 D443	15.4	15.0	15.0	15.1		
	Ferrous Alloys								
	<sup>45</sup>								
8/23 -	40 - iron	1							
Jun 28/23	35								
	E <sup>25</sup> 20								
	15								
	10-								
		10000000000000000000000000000000000000	August 6						
	)ec21/22 -	un28/23 -		Sep12/23 -					
	Dec2	Jun2		Sep 1					
	Non-ferrous Metals	s							
	10 copper								
	8 - management lead								
	un								
	6								
	4								
	and the second se		No. of Concession, Name						
	2-	and the second sec							
	0								
	0ec27/22	Jun28/23		Sep 12/23					
		,		Sep					
	Viscosity @ 100°C Base Number								
	18 - Abnormal			10.0	Base				
	17+			- 8.0					
				KOH/g					
	() 16 Base 115 15 14			-0.0 6.0- 4.0- 4.0-					
ć	vi 14-			aq m 4.0-					
	13 - Abnormal			gase					
	12			° 2.0-					
	11			0.0	2	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			
	Dec27/22	Jun28/23		Sep12/23	Dec27/22	Jun28/23	Sep 12/23		
	De	ηr		S.	Ď	٦٢	S		
Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513 GFL Environmental - 463 - Cheboyg									
ANAR Sample No.	: GFL0092934 F	Received : 15 Sep 2023				501 N. Western Ave			
Lab Number		Diagnose		Sep 2023		Cł	neboygan, MI		
Certificate L2367 Unique Number	: 10648487 <b>[</b> : FLEET	Diagnosti	cian : wes	s Davis		Conta	US 49721 ct: Chris Gee		
To discuss this sample report, of		ice at 1-80	00-237-1369	).			@gflenv.com		
* - Denotes test methods that a	re outside of the ISO 12	7025 scop	be of accred	itation.			31)597-8553		
Statements of conformity to speci	ifications are based on th	he simple a	acceptance o	lecision rule (J	ICGM 106:2012)		F:		



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Submitted By: GFL463 and GFL641 - DYLAN TOLAN