

# **OIL ANALYSIS REPORT**

Sample Rating Trend



Machine Id 821047

#### 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.

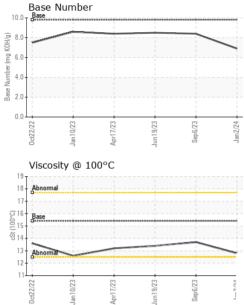
## Fluid Condition

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

SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0108618	GFL0066218	GFL0066202
Sample Date		Client Info		02 Jan 2024	06 Sep 2023	19 Jun 2023
Machine Age	hrs	Client Info		6591	5892	4393
Oil Age	hrs	Client Info		500	500	500
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	41	29	20
Chromium	ppm		>4	2	2	2
Nickel	ppm	ASTM D5185m	>2	2 <1	<1	0
Titanium	ppm	ASTM D5185m		0	0	0
Silver	ppm	ASTM D5185m	>2	۰ <1	0	0
Aluminum	ppm	ASTM D5185m	>25	10	6	7
Lead	ppm		>45	0	0	0
Copper	ppm	ASTM D5185m	>85	2	1	0
Tin	ppm	ASTM D5185m	>4	- <1	<1	0
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES	ppm	method	limit/base		history1	history2
Boron	ppm	ASTM D5185m	0	5	4	10
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	5 0	4 0	10 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	5 0 61	4 0 65	10 0 64
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	5 0 61 1	4 0 65 <1	10 0 64 0
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	5 0 61 1 932	4 0 65 <1 988	10 0 64 0 980
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	5 0 61 1 932 1126	4 0 65 <1 988 1111	10 0 64 0 980 1120
Boron Barium Molybdenum Manganese Magnesium	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	5 0 61 1 932 1126 1041	4 0 65 <1 988 1111 1048	10 0 64 0 980 1120 1041
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	5 0 61 1 932 1126	4 0 65 <1 988 1111	10 0 64 0 980 1120
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	5 0 61 1 932 1126 1041 1245	4 0 65 <1 988 1111 1048 1273	10 0 64 0 980 1120 1041 1288
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	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 0 1010 1070 1150 1270 2060	5 0 61 1 932 1126 1041 1245 2848	4 0 65 <1 988 1111 1048 1273 3134	10 0 64 0 980 1120 1041 1288 3648 history2
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 1010 1070 1150 1270 2060	5 0 61 1 932 1126 1041 1245 2848 current	4 0 65 <1 988 1111 1048 1273 3134 history1	10 0 64 0 980 1120 1041 1288 3648
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>	0 0 60 0 1010 1070 1150 1270 2060 Limit/base >30	5 0 61 1 932 1126 1041 1245 2848 current 4	4 0 65 <1 988 1111 1048 1273 3134 history1 3	10 0 64 0 980 1120 1041 1288 3648 history2 2
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 ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 Limit/base >30	5 0 61 1 932 1126 1041 1245 2848 current 4 8	4 0 65 <1 988 1111 1048 1273 3134 history1 3 6	10 0 64 0 980 1120 1041 1288 3648 <b>history2</b> 2 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 60 0 1010 1070 1150 1270 2060 <b>limit/base</b> >30	5 0 61 1 932 1126 1041 1245 2848 current 4 8 7	4 0 65 <1 988 1111 1048 1273 3134 history1 3 6 7	10 0 64 0 980 1120 1041 1288 3648 history2 2 4 6
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>Imit/base</b> >30 >20	5 0 61 1 932 1126 1041 1245 2848 <i>current</i> 4 8 7	4 0 65 <1 988 1111 1048 1273 3134 history1 3 6 7 7 history1	10 0 64 0 980 1120 1041 1288 3648 history2 2 4 6 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 ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >30 limit/base >20	5 0 61 1 932 1126 1041 1245 2848 <i>current</i> 4 8 7 <i>current</i> 1	4 0 65 <1 988 1111 1048 1273 3134 history1 3 6 7 <i>history1</i> 0.7	10 0 64 0 980 1120 1041 1288 3648 history2 2 4 6 history2 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 imit/base >30 220 imit/base >3 >20	5 0 61 1 932 1126 1041 1245 2848 <i>current</i> 4 8 7 <i>current</i> 1 1 10.0	4 0 65 <1 988 1111 1048 1273 3134 history1 3 6 7 history1 0.7 7.7	10 0 64 0 980 1120 1041 1288 3648 history2 2 2 4 6 history2 0.5 7.2
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 D5185m	0 0 0 1010 1070 1150 1270 2060 <b>Imit/base</b> >30 20 <b>Imit/base</b> >3 >20	5 0 61 1 932 1126 1041 1245 2848 <u>current</u> 4 8 7 <u>current</u> 1 1 10.0 20.7	4 0 65 <1 988 1111 1048 1273 3134 history1 3 6 7 history1 0.7 7.7 19.6	10 0 64 0 980 1120 1041 1288 3648 history2 2 4 6 6 history2 0.5 7.2 19.9
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 *ASTM D7415	0 0 0 1010 1070 1150 1270 2060 2060 2060 2060 200 200 200 200 20	5 0 61 1 932 1126 1041 1245 2848 <i>current</i> 4 8 7 <i>current</i> 1 10.0 20.7	4 0 65 <1 988 1111 1048 1273 3134 history1 3 6 7 history1 0.7 7.7 19.6 history1	10 0 64 0 980 1120 1041 1288 3648 history2 2 4 6 history2 0.5 7.2 19.9 history2



# **OIL ANALYSIS REPORT**



		VISUAL		method				history2	
		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	
Apr1 //23 Jun 19/23	Sep6/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML	
Jun	Se	Odor	scalar	*Visual	NORML	NORML	NORML	NORML	
2		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	12.8	13.7	13.4	
		GRAPHS							
		Ferrous Alloys							
		<sup>90</sup> T							
Apr1 //23 Jun 19/23	Sep6/23	chromium							
unr	S	70 nickel							
		₫ <sup>50</sup>							
		<sup>≅</sup> 40							
		30							
		20	$\sim$						
		10			*****				
		0ct22/22	Apri 7/23 - Jun 19/23 -	Sep6/23 -	Jan2/24 -				
		0ct2 Jan1	April 7/23 Jun 19/23	Sep	Jan				
		Non-ferrous Meta	als						
		10 copper							
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		6-							
		2							
		VALUE AND DESCRIPTION OF THE OWNER			and and a second se				
			Apr17/23 - Jun 19/23 -	Sep 6/23 -	Jan 2/24				
		0ct2 Jan1	Apr17/23 Jun19/23	Sep	Jan				
		Viscosity @ 100°	С			Base Number			
		19		1	10.0				
		18 <b>- Abnormal</b> 17	1 1		8.0			-	
					0.8 0.0 0.0 8 8 8 9.0 8 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0				
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		Abnormal		1	<sup>20</sup> 2.0	1			
		11			0.0	,			
			Apr17/23 - Jun19/23 -	Sep6/23 -	Jan2/24	0ct22/22	Apr17/23 - Jun19/23 -	Sep 6/23 - Jan 2/24 -	
		0ct2 Jan1	Apr17/23 Jun19/23	Sep	Jan	Oct2 Jan1	Apr1 Jun1	Sep	
			01 14- "	- A	NO 07540			D Marras 1	
			UT Madiso	Madison Ave., Cary, NC 27513 GFL E Received : 23 Feb 2024			nvironmental - 904B - Menomonie 1706 MIDWAY BC		
4	Laborato Sample N				Eah 2024		170		
	Sample N	<b>b.</b> : GFL0108618	Recei	ved : 23			-	6 MIDWAY RD	
	Sample N Lab Num			ved : 23 d : 25	8 Feb 2024 5 Feb 2024 6 Feb 2024 - W	les Davis	-	6 MIDWAY RD NOMONIE, WI US 54751	
Certificate L2367	Sample N Lab Num Unique Nun Test Pack	D. :GFL0108618 er :06098135 per :10896365 ge :FLEET	Recei Teste Diagn	ved : 23 d : 25 osed : 25	5 Feb 2024 Feb 2024 - W	les Davis	ME	NOMONIE, WI	
To discuss	Sample N Lab Num Unique Nun Test Pack this sample re	b. : GFL0108618 er : 06098135 ber : 10896365	Recei Teste Diagn vice at 1-8	ved : 23 d : 25 osed : 25 00-237-1369	5 Feb 2024 Feb 2024 - W 9.	les Davis	ME	NOMONIE, WI US 54751	

Submitted By: See also GFL904,A,B,C, 927, 938 - Andy Kane