

### **OIL ANALYSIS REPORT**

Sample Rating Trend



MACK 812100

Diesel Engine

PETRO CANADA DURON SHP 15W40 (--- GAL)

	GAL)	Feb2023	Apr2023 Jun2023 /	Aug2023 Sep2023 Jan2024		
SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0109064	GFL0109060	GFL008619
Sample Date		Client Info		05 Jan 2024	05 Jan 2024	27 Sep 2023
Machine Age	hrs	Client Info		6168	6168	5362
Oil Age	hrs	Client Info		0	6168	5477
Oil Changed		Client Info		N/A	N/A	N/A
Sample Status				ATTENTION	ATTENTION	NORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
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	>120	7	19	2
Chromium	ppm	ASTM D5185m	>20	<1	1	0
Nickel	ppm	ASTM D5185m	>5	0	2	0
Titanium	ppm	ASTM D5185m	>2	0	<1	0
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>20	2	2	0
Lead	ppm	ASTM D5185m	>40	0	<1	<1
Copper	ppm	ASTM D5185m	>330	<1	3	<1
Tin	ppm	ASTM D5185m		0	1	<1
Vanadium	ppm	ASTM D5185m		0	0	<1
Cadmium	ppm	ASTM D5185m		0	<1	0
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	0	20	10	29
Barium	ppm	ASTM D5185m	0	0	0	0
Molybdenum	ppm	ASTM D5185m	60	60	76	62
					10	01
Manganese	ppm	ASTM D5185m	0	0	<1	<1
Manganese Magnesium		ASTM D5185m ASTM D5185m	0 1010	0 722		
0	ppm			-	<1	<1
Magnesium	ppm ppm	ASTM D5185m	1010	722	<1 912	<1 788
Magnesium Calcium Phosphorus	ppm ppm ppm	ASTM D5185m ASTM D5185m	1010 1070	722 1106	<1 912 1445	<1 788 1071
Magnesium Calcium Phosphorus	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	1010 1070 1150	722 1106 934	<1 912 1445 994	<1 788 1071 912
Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	1010 1070 1150 1270	722 1106 934 1096	<1 912 1445 994 1376	<1 788 1071 912 1132 2961
Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	1010 1070 1150 1270 2060	722 1106 934 1096 2986	<1 912 1445 994 1376 3527	<1 788 1071 912 1132 2961
Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method	1010 1070 1150 1270 2060 limit/base	722 1106 934 1096 2986 current	<1 912 1445 994 1376 3527 history1	<1 788 1071 912 1132 2961 history2
Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b> ASTM D5185m	1010 1070 1150 1270 2060 limit/base	722 1106 934 1096 2986 current 3	<1 912 1445 994 1376 3527 history1 7	<1 788 1071 912 1132 2961 history2 2
Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b> ASTM D5185m ASTM D5185m	1010 1070 1150 1270 2060 limit/base >25	722 1106 934 1096 2986 current 3 3 3	<1 912 1445 994 1376 3527 history1 7 0	<1 788 1071 912 1132 2961 history2 2 1
Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	1010 1070 1150 1270 2060 limit/base >25 >20	722 1106 934 1096 2986 <u>current</u> 3 3 3 3	<1 912 1445 994 1376 3527 history1 7 0 3	<1 788 1071 912 1132 2961 history2 2 2 1 1 <1 <1.0
Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel	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 D3524	1010 1070 1150 1270 2060 limit/base >25 >20 >3.0	722 1106 934 1096 2986 current 3 3 3 3 <	<1 912 1445 994 1376 3527 history1 7 0 3 0.2	<1 788 1071 912 1132 2961 history2 2 2 1 1 <1 <1.0
Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel 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 ASTM D3524	1010 1070 1150 1270 2060 <i>limit/base</i> >25 >20 >20 >3.0 <i>limit/base</i>	722 1106 934 1096 2986 current 3 3 3 3 <1.0 current	<1 912 1445 994 1376 3527 history1 7 0 3 0.2 history1	<1 788 1071 912 1132 2961 history2 2 1 1 <1 <1 0 history2
Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration	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 D3524 <b>method</b> *ASTM D7844	1010 1070 1150 1270 2060 <i>limit/base</i> >25 >20 >3.0 <i>limit/base</i> >4	722 1106 934 1096 2986 current 3 3 3 <1.0 current 0.4	<1 912 1445 994 1376 3527 history1 7 0 3 0.2 history1 0.6	<1 788 1071 912 1132 2961 history2 2 2 1 <1 <1 <10 history2 0.1
Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot %	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 D3524 ASTM D3524 *ASTM D7844 *ASTM D7624	1010 1070 1150 1270 2060 <b>limit/base</b> >25 >20 >3.0 <b>limit/base</b> >4 >20	722 1106 934 1096 2986 <u>current</u> 3 3 3 3 <1.0 <u>current</u> 0.4 7.5	<1 912 1445 994 1376 3527 history1 7 0 3 0.2 history1 0.6 8.3	<1 788 1071 912 1132 2961 history2 2 1 <1 <1 <1 <10 history2 0.1 4.6 16.3
Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel 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 D3524 ASTM D3524 *ASTM D7844 *ASTM D7624	1010 1070 1150 1270 2060 <b>limit/base</b> >25 >20 >20 >3.0 <b>limit/base</b> >4 >20 >30	722 1106 934 1096 2986 <b>current</b> 3 3 3 3 <1.0 <b>current</b> 0.4 7.5 17.7	<1 912 1445 994 1376 3527 history1 7 0 3 0.2 history1 0.6 8.3 19.9	<1 788 1071 912 1132 2961 history2 2 1 <1 <1 <10 history2 0.1 4.6

# DIAGNOSIS

Recommendation

No corrective action is recommended at this time. 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.

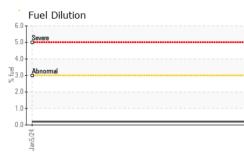
#### Fluid Condition

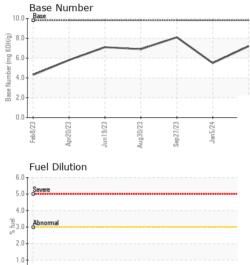
The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil. Confirm oil type.



0.0 Jan5/24

## **OIL ANALYSIS REPORT**





		VISUAL		method	limit/base	current	history1	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
	lan 5,0 d	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
	<u>.</u>	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
		Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
		Free Water	scalar	*Visual		NEG	NEG	NEG
	$\backslash$	FLUID PROP	ERTIES	method	limit/base	current	history1	history2
	$\checkmark$	Visc @ 100°C	cSt	ASTM D445	15.4	<b>12.1</b>	<b>12.0</b>	12.7
		GRAPHS						
		Ferrous Alloys						
53		45 40						
Aug30/23	Sep 2 //23 Jan 5/24	35 - nickel						
₹ °	77	30						
		E 25 20						
		15			1			
		10	-	/				
		5						
			51 51	en 4	t t			
		Feb 8/23 Apr20/23 Jun 19/23	Aug30/23	Sep27/23 Jan5/24	Jan5/24			
		4 1		es l	7			
		Non-ferrous Met	als					
		14- copper						
		12-						
		10						
		<u>ة</u> 8						
		6						
		4						
		2						
		0		t 13	and a state of the			
		Feb 8/23 Apr20/23 Jun 19/23	Aug30/23	Sep 27/23 Jan 5/24	Jan5/24			
		_		ö ,	,			
		<sup>19</sup>	-		10	Base Numb	er	
		18 - Abnormal						
		17-			(B/HC	.0		
		ି <mark>Base</mark>			J Br 6	.0		
		O 15			nber (			
		St (1			<u>5</u> 4	.0-		
		C-00015 15 14	1		0			
		13 Abnormal			0 0 0 0 (0H) 9 gase Mumber (mg KOH/0) 2	.0-		
		13 12	23	24		.0	23	24
		13 12	ług30/23 +	Sep27/23			Jun 19/23 Jug 30/23	Jan5/24
		Herboliza	Aug30/23 +	03	Jan5/24	Feb8/23	Juni 19/23 Aug30/23 Sep27/23	
4	Laboratory	13 12 11 EZ (2002) LE (2002)	501 Madi	son Ave., Ca	+ <sub>2/5</sub> uer	Feb8/23	Environmental -	009 - Fairbu
NAB	Sample No.	: WearCheck USA - : GFL0109064	501 Madi Recieve	son Ave., Ca d : 09 v	ry, NC 2751 lan 2024	Feb8/23	Environmental -	<b>009 - Fairbu</b> Roosevelt Hv
	Sample No. Lab Number	: WearCheck USA - : GFL0109064 : 06055760	501 Madi Recieve Diagnos	son Ave., Ca d : 09 c ed : 11 c	ry, NC 2751 lan 2024 Jan 2024	.0. E2002JdW 3 GFL	Environmental -	<b>009 - Fairbu</b> Roosevelt Hv Fairburn, G
tificate 12367	Sample No.	: WearCheck USA - : GFL0109064 : 06055760 r : 10821709	501 Madi Recieve Diagnos Diagnos	son Ave., Ca d : 09 c ed : 11 c tician : Jon	ry, NC 2751 lan 2024 lan 2024 athan Heste	3 <b>GFL</b>	Environmental - 6905	<b>009 - Fairbu</b> Roosevelt Hv

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

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