

### **OIL ANALYSIS REPORT**

Sample Rating Trend

NORMAL

# 429055-402460

#### 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 INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0093271	GFL0074172	GFL0065199
Sample Date		Client Info		22 Sep 2023	03 May 2023	09 Feb 2023
Machine Age	mls	Client Info		188306	10203	9635
Oil Age	mls	Client Info		188306	10203	9635
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
Glycol		WC Method		NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>110	16	16	14
Chromium	ppm	ASTM D5185m	>4	1	1	<1
Nickel	ppm	ASTM D5185m	>2	0	<1	0
Titanium	ppm	ASTM D5185m		0	0	0
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>25	2	0	0
Lead	ppm	ASTM D5185m	>45	2	2	2
Copper	ppm	ASTM D5185m	>85	2	2	5
Tin	ppm	ASTM D5185m	>4	<1	<1	<1
Vanadium	ppm	ASTM D5185m		0	<1	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method				history2
Boron	ppm		limit/base	current 0	history1 2	history2 0
	ppm ppm	ASTM D5185m				
Boron		ASTM D5185m	0	0	2	0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m	0 0 60	0 0	2 0	0 0
Boron Barium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	0 0 63	2 0 62	0 0 64
Boron Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	0 0 63 <1	2 0 62 <1	0 0 64 <1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	0 0 63 <1 920	2 0 62 <1 996	0 0 64 <1 918
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	0 0 63 <1 920 1065	2 0 62 <1 996 1041	0 0 64 <1 918 1111
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 1010 1070 1150	0 0 63 <1 920 1065 1010	2 0 62 <1 996 1041 1058	0 0 64 <1 918 1111 1043
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	0 0 63 <1 920 1065 1010 1247	2 0 62 <1 996 1041 1058 1299	0 0 64 <1 918 1111 1043 1236
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 1010 1070 1150 1270 2060	0 0 63 <1 920 1065 1010 1247 3208	2 0 62 <1 996 1041 1058 1299 3657	0 0 64 <1 918 1111 1043 1236 2760
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	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	0 0 60 1010 1070 1150 1270 2060	0 0 63 <1 920 1065 1010 1247 3208 current	2 0 62 <1 996 1041 1058 1299 3657 history1	0 0 64 <1 918 1111 1043 1236 2760 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	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 0 60 1010 1070 1150 1270 2060	0 0 63 <1 920 1065 1010 1247 3208 current 6	2 0 62 <1 996 1041 1058 1299 3657 history1 6	0 0 64 <1 918 1111 1043 1236 2760 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 ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 <b>limit/base</b> >30	0 0 63 <1 920 1065 1010 1247 3208 current 6 4	2 0 62 <1 996 1041 1058 1299 3657 history1 6 5	0 0 64 <1 918 1111 1043 1236 2760 history2 4 1
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>imit/base</b> >30	0 0 63 <1 920 1065 1010 1247 3208 <u>current</u> 6 4 3	2 0 62 <1 996 1041 1058 1299 3657 history1 6 5 3	0 0 64 <1 918 1111 1043 1236 2760 history2 4 1 4
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 <b>Imit/base</b> >3	0 0 63 <1 920 1065 1010 1247 3208 <i>current</i> 6 4 3 <i>current</i> 0.4	2 0 62 <1 996 1041 1058 1299 3657 history1 6 5 3 3 <i>history</i> 1	0 0 64 <1 918 1111 1043 1236 2760 history2 4 1 4 1 4 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 <b>TS</b> 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	0 0 63 <1 920 1065 1010 1247 3208 <u>current</u> 6 4 3 3	2 0 62 <1 996 1041 1058 1299 3657 history1 6 5 3 3 <u>history1</u> 0.6	0 0 64 <1 918 1111 1043 1236 2760 history2 4 1 4 1 4 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 >20 imit/base >3 >20	0 0 63 <1 920 1065 1010 1247 3208 <i>current</i> 6 4 3 <i>current</i> 0.4 9.0	2 0 62 <1 996 1041 1058 1299 3657 history1 6 5 3 3 history1 0.6 9.2	0 0 64 <1 918 1111 1043 1236 2760 history2 4 1 4 1 4 history2 0.5 9.6
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> >30 20 <b>imit/base</b> >3 >20 >30	0 0 63 <1 920 1065 1010 1247 3208 <i>current</i> 6 4 3 0.4 9.0 20.5 <i>current</i>	2 0 62 <1 996 1041 1058 1299 3657 history1 6 5 3 history1 0.6 9.2 20.7 history1	0 0 64 <1 918 1111 1043 1236 2760 history2 4 1 4 1 4 <b>history2</b> 0.5 9.6 20.8
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 *ASTM D7844	0 0 0 1010 1070 1150 2060 2060 2060 200 200 200 200 200 200	0 0 63 <1 920 1065 1010 1247 3208 <u>current</u> 6 4 3 3 <u>current</u> 0.4 9.0 20.5	2 0 62 <1 996 1041 1058 1299 3657 history1 6 5 3 3 history1 0.6 9.2 20.7	0 0 64 <1 918 1111 1043 1236 2760 history2 4 1 4 1 4 0.5 9.6 20.8 history2



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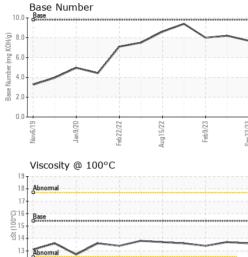
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Nov6/19

Jan9/20

## **OIL ANALYSIS REPORT**

VISUAL



Feb22/22

Aug15/22

	VISUAL		methoa			nistory i	riistoryz
$\sim$	White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
	Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
		scalar	*Visual	NONE	NONE	NONE	NONE
	Precipitate						
	Silt	scalar	*Visual	NONE	NONE	NONE	NONE
	Debris	scalar	*Visual	NONE	NONE	NONE	NONE
	Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Feb 9/23 Sep 2 2/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Sep.	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
	Free Water	scalar	*Visual		NEG	NEG	NEG
1							
	FLUID PROPE		method	limit/base	current	history1	history2
	Visc @ 100°C	cSt	ASTM D445	15.4	13.6	13.7	13.4
	GRAPHS						
	Ferrous Alloys						
~~~~~	20 iron						
Feb 9/23	chromium						
ű.	15 million nickel		<				
1			$\sim$				
	<u>الم</u> 10						
	5-						
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	20 110 10	22	23	23			
	Nov6/19	Aua15/22	Feb 9/23	Sep22/23			
				õ			
	Non-ferrous Meta	IS					
	copper						
	200 - tin						
udd	150						
id	100						
	50						
	0 V						
		. 22.	1/23 -	2/23 -			
	Nov6/19 Jan9/20	Aug 15/22	Feb9/23	Sep22/23			
	Viscosity @ 100°C						
	<sup>19</sup> T			10	Base Number	-	
	18 - Abnormal			10			
	17-				.0 -		
-	-16 - Bree			KOH/		F	
	Base 15			B G	.0 -	/	
	Base 15 3 14			aque 4			
				Base Number (mg KOH/g)			
	Abnormal			<u>ش</u> 2	.0-		
	11				.0		
		22	1/23		61/8	122	//23 -
	Nov6/19 Jan9/20	Aua 15/22	Feb9/23	Sep22/23	Nov6/19 Jan9/20	Feb22/22 Aug15/22	Feb 9/23 Sep 22/23
	LA	< <				- <	
Laboratory	: WearCheck USA -					ironmental - 865 - Ea	
Sample No.		Receive		Sep 2023	7	213 East Mount	
Lab Number		Diagnosed : 29 Sep 2023					Houston, TX
Unique Number		Diagnos	tician : We	s Davis		<b>•</b> •	US 77050
Test Package	: FLEET	ion at 1	000 007 100	n			t: Saul Castillo
sample report, o	contact Customer Serv	ice at 1-8	500-237-136	J.		saul.castil	lo@gflenv.com

To discuss this sample rep \* - Denotes test methods that are outside of the ISO 17025 scope of accreditation.

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

Certificate L2367

Submitted By: TECHNICIAN ACCOUNT

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