

## **OIL ANALYSIS REPORT**

Sample Rating Trend

NORMAL



Machine Id 825054-101235

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	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0087698	GFL0078555	GFLI-538129
Sample Date		Client Info		24 Aug 2023	01 Jun 2023	09 Sep 2020
Machine Age	hrs	Client Info		12599	12599	10711
Oil Age	hrs	Client Info	0		0	447
Oil Changed		Client Info	N/A		Changed	Changed
Sample Status			NORMAL		NORMAL	SEVERE
CONTAMINATI	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	<1.0	<u> </u>
Glycol		WC Method		NEG	NEG	NEG
WEAR METALS	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>80	7	5	72
Chromium	ppm	ASTM D5185m	>5	0	<1	2
Nickel	ppm	ASTM D5185m	>2	0	0	1
Titanium	ppm	ASTM D5185m		0	0	0
Silver	ppm	ASTM D5185m	>3	0	0	0
Aluminum	ppm	ASTM D5185m		4	1	7
Lead	ppm	ASTM D5185m	>30	- <1	0	1
Copper	ppm		>150	<1	4	146
Tin	ppm	ASTM D5185m	>5	0	0	3
Antimony	ppm	ASTM D5185m	>5			0
Vanadium	ppm	ASTM D5185m		0	<1	0
Cadmium		ASTM D5185m		0	0	0
	ppm	ASTIVI DJ TOJITI		U	0	
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	ASTM D5185m	0	4	2	15
Boron Barium	ppm ppm		0	4 0	2 0	15 10
Boron Barium Molybdenum		ASTM D5185m ASTM D5185m ASTM D5185m	0	4 0 59	2 0 62	15 10 69
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	4 0	2 0 62 <1	15 10 69 10
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	4 0 59	2 0 62	15 10 69
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	4 0 59 <1	2 0 62 <1	15 10 69 10
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	4 0 59 <1 992	2 0 62 <1 975	15 10 69 10 683
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	4 0 59 <1 992 1151	2 0 62 <1 975 1103	15 10 69 10 683 1376
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	4 0 59 <1 992 1151 1009	2 0 62 <1 975 1103 1051	15 10 69 10 683 1376 1048
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	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	4 0 59 <1 992 1151 1009 1262	2 0 62 <1 975 1103 1051 1209	15 10 69 10 683 1376 1048 1267
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	4 0 59 <1 992 1151 1009 1262 3767	2 0 62 <1 975 1103 1051 1209 3621	15 10 69 10 683 1376 1048 1267
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium	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 0 60 0 1010 1070 1150 1270 2060	4 0 59 <1 992 1151 1009 1262 3767 	2 0 62 <1 975 1103 1051 1209 3621 	15 10 69 10 683 1376 1048 1267  3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN	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 0 60 1010 1070 1150 1270 2060	4 0 59 <1 992 1151 1009 1262 3767  Current	2 0 62 <1 975 1103 1051 1209 3621  history1	15 10 69 10 683 1376 1048 1267  3 3 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon	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 0 60 1010 1070 1150 1270 2060	4 0 59 <1 992 1151 1009 1262 3767  <b>current</b> 13	2 0 62 <1 975 1103 1051 1209 3621  history1 5	15 10 69 10 683 1376 1048 1267  3 3 history2 ● 37
Boron Barium Molybdenum Manganese Magnesium Calcium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium	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 0 0 1010 1070 1150 1270 2060 <b>limit/base</b>	4 0 59 <1 992 1151 1009 1262 3767  current 13 2	2 0 62 <1 975 1103 1051 1209 3621  history1 5 3	15 10 69 10 683 1376 1048 1267  3 3 history2 ∮ 37 13
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 imit/base >20	4 0 59 <1 992 1151 1009 1262 3767  <b>current</b> 13 2 2	2 0 62 <1 975 1103 1051 1209 3621  <u>history1</u> 5 3 0	15 10 69 10 683 1376 1048 1267  3 ► history2 ● 37 13 1 1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm 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> >20 <b>imit/base</b>	4 0 59 <1 992 1151 1009 1262 3767  current 13 2 2 2 current	2 0 62 <1 975 1103 1051 1209 3621  history1 5 3 0 bistory1	15 10 69 10 683 1376 1048 1267  3 3 <b>history2</b> ↓ 37 13 1 1 <i>history2</i>
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 2060 220 220 220 220 220	4 0 59 <1 992 1151 1009 1262 3767  current 13 2 2 2 2 current 0.1	2 0 62 <1 975 1103 1051 1209 3621  history1 5 3 0 history1 0.1	15 10 69 10 683 1376 1048 1267  3 3 <b>history2</b> ● 37 13 1 1 1 <b>history2</b> 0.6
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium 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 >20 imit/base >20 imit/base >3 >20	4 0 59 <1 992 1151 1009 1262 3767  <i>current</i> 13 2 2 2 <i>current</i> 0.1 6.3	2 0 62 <1 975 1103 1051 1209 3621  history1 5 3 0 history1 0.1 5.2	15 10 69 10 683 1376 1048 1267  3      
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium 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> >20 <b>imit/base</b> >3 >20 >3 >20	4 0 59 <1 992 1151 1009 1262 3767  current 13 2 2 2 <u>current</u> 0.1 6.3 18.5	2 0 62 <1 975 1103 1051 1209 3621  history1 5 3 0 <u>history1</u> 0.1 5.2 17.6	15 10 69 10 683 1376 1048 1267  3 <b>bistory2</b> ● 37 13 1 1 <b>bistory2</b> 0.6 10 
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Lithium CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7415	0 0 0 1010 1070 1150 1270 2060 2060 2060 200 200 200 200 200 200	4 0 59 <1 992 1151 1009 1262 3767  13 2 2 2 0.1 6.3 18.5 0.1	2 0 62 <1 975 1103 1051 1209 3621  history1 5 3 0 history1 0.1 5.2 17.6 history1	15 10 69 10 683 1376 1048 1267  3 history2 ↓ 37 13 1 history2 0.6 10  history2

Contact/Location: BRYAN SWANSON - GFL837



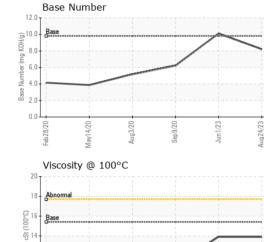
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Feb28/20

May14/20

# **OIL ANALYSIS REPORT**

VISUAL



		White Metal		*Visual	NONE	NONE	NONE	
		Yellow Metal	scalar	*Visual	NONE	NONE	NONE	
		Precipitate Silt	scalar	*Visual *Visual	NONE	NONE NONE	NONE NONE	
		Debris	scalar scalar	*Visual	NONE	NONE	NONE	
		Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	
/20	/23 +	Appearance	scalar	*Visual	NORML	NORML	NORML	
Aug3/20 Sep9/20	Jun1/23 Aug24/23	Odor	scalar	*Visual	NORML	NORML	NORML	
)°C		Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	
		Free Water	scalar	*Visual		NEG	NEG	
		FLUID PROPE	ERTIES	method	limit/base	current	history1	history2
		Visc @ 100°C	cSt	ASTM D445	15.4	13.9	13.9	▲ 11.1
		GRAPHS						
$\sim$ /		Ferrous Alloys						
Aug3/20	Jun1/23	80 70 60 70 60 70 10 10 10 10 10 10 10 10 10 1	$\bigwedge$	123 123	23 Aug24;23 Aug24;23			
		_ 2	Sep9/20	Jun1/23	Aug24/23			
		Viscosity @ 100°(	L ;		12.0	Base Number		
		18 - Abnormal				Base		
		17-			10.0 - ( <sup>D</sup> /H)	Base		
					0.8 8.0 - E		/	
		(2001) 15- 14-		_	-0.0			
		13 - Abnormal		/	6.0- Base Number (mg KOH/g) 4.0-		-	
		12	$\searrow$		2.0-			
		10			0.0			
		Feb28/20 May14/20	Sep9/20	Jun1/23	Aug24/23	Feb28/20 May14/20	Aug3/20 Sep9/20	Jun 1/23 Aug 24/23
		Fel Mai	5 S	٦٢	Aug	M a	A N	Jı
Certificate L2367								
* - Denotes test	methods that a	are outside of the ISO i	17025 sco <sub>l</sub>	be of accred	itation.		21 J an 6 War 18	on@gflenv.com T:
		ifications are based on				ICGM 106:2012)		F:

limit/base

Contact/Location: BRYAN SWANSON - GFL837