

## **OIL ANALYSIS REPORT**

Sample Rating Trend





4544M Component Diesel Engine Fluid PETRO CANADA DURON SHP 15W40 (--- GAL)

### Recommendation

Resample at the next service interval to monitor.

Machine Id

#### Wear

All component wear rates are normal.

#### Contamination

There is no indication of any contamination in the oil.

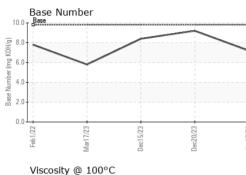
### Fluid Condition

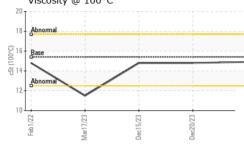
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0108697	GFL0105865	GFL0105691
Sample Date		Client Info		17 Jan 2024	20 Dec 2023	15 Dec 2023
Machine Age	hrs	Client Info		7936	7728	7718
Oil Age	hrs	Client Info		7728	7718	6069
Oil Changed	1110	Client Info		Changed	Changed	Changed
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT		un otto o d	limit/base			
		method		current	history1	history2
Fuel		WC Method	>3.0	<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	>90	48	0	39
Chromium	ppm	ASTM D5185m	>20	3	0	2
Nickel	ppm	ASTM D5185m	>2	0	<1	<1
Titanium	ppm	ASTM D5185m	>2	0	0	0
Silver	ppm	ASTM D5185m	>2	0	0	<1
Aluminum	ppm	ASTM D5185m	>20	4	<1	4
Lead	ppm	ASTM D5185m	>40	3	0	2
Copper	ppm	ASTM D5185m	>330	4	<1	2
Tin	ppm	ASTM D5185m	>15	<1	0	<1
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base 0	current 0	history1 4	history2 2
	ppm ppm					
Boron		ASTM D5185m	0	0	4	2
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	0 0	4 0	2 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	0 0 57	4 0 59	2 0 58
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	0 0 57 1	4 0 59 <1	2 0 58 <1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	0 0 57 1 865	4 0 59 <1 942	2 0 58 <1 919
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	0 0 57 1 865 994	4 0 59 <1 942 1031	2 0 58 <1 919 1045
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	0 0 57 1 865 994 987	4 0 59 <1 942 1031 1102	2 0 58 <1 919 1045 1048
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 57 1 865 994 987 1178	4 0 59 <1 942 1031 1102 1290	2 0 58 <1 919 1045 1048 1256
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	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	0 0 57 1 865 994 987 1178 2568	4 0 59 <1 942 1031 1102 1290 3220	2 0 58 <1 919 1045 1048 1256 2924
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	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 57 1 865 994 987 1178 2568 current	4 0 59 <1 942 1031 1102 1290 3220 history1	2 0 58 <1 919 1045 1048 1256 2924 history2
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 ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 <b>limit/base</b>	0 0 57 1 865 994 987 1178 2568 current 7	4 0 59 <1 942 1031 1102 1290 3220 history1 5	2 0 58 <1 919 1045 1048 1256 2924 history2 7
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 0 1010 1070 1150 1270 2060 <b>limit/base</b>	0 0 57 1 865 994 987 1178 2568 <u>current</u> 7 6	4 0 59 <1 942 1031 1102 1290 3220 history1 5 2	2 0 58 <1 919 1045 1048 1256 2924 history2 7 6
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>limit/base</b> >25 >20	0 0 57 1 865 994 987 1178 2568 current 7 6 0	4 0 59 <1 942 1031 1102 1290 3220 history1 5 2 2 <1	2 0 58 <1 919 1045 1048 1256 2924 history2 7 6 3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	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 >25 >20 limit/base	0 0 57 1 865 994 987 1178 2568 <u>current</u> 7 6 0 <u>current</u> 2.8	4 0 59 <1 942 1031 1102 1290 3220 history1 5 2 <1 5 2 <1 history1 0	2 0 58 <1 919 1045 1048 1256 2924 history2 7 6 3 3 history2 2
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	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25	0 0 57 1 865 994 987 1178 2568 <u>current</u> 7 6 0	4 0 59 <1 942 1031 1102 1290 3220 history1 5 2 <1 +istory1	2 0 58 <1 919 1045 1048 1256 2924 history2 7 6 3 3 history2
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 2060 225 >20 imit/base >20 imit/base >20	0 0 57 1 865 994 987 1178 2568 <i>current</i> 7 6 0 <i>current</i> 2.8 14.2	4 0 59 <1 942 1031 1102 1290 3220 history1 5 2 <1 5 2 <1 history1 0 4.2	2 0 58 <1 919 1045 1048 1256 2924 history2 7 6 3 3 history2 2 2 12.1
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 225 20 220 220 20 20 20 20 20 20 20 20 20 2	0 0 57 1 865 994 987 1178 2568 <i>current</i> 7 6 0 <i>current</i> 2.8 14.2 27.3	4 0 59 <1 942 1031 1102 1290 3220 history1 5 2 <1 5 2 <1 history1 0 4.2 17.2 history1	2 0 58 <1 919 1045 1048 1256 2924 history2 7 6 3 3 history2 2 12.1 24.1 24.1
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 2060 225 20 225 20 <u>imit/base</u> >6 >20 20	0 0 57 1 865 994 987 1178 2568 <u>current</u> 7 6 0 0 <u>current</u> 2.8 14.2 27.3	4 0 59 <1 942 1031 1102 1290 3220 history1 5 2 <1 5 2 <1 history1 0 4.2 17.2	2 0 58 <1 919 1045 1048 1256 2924 <b>history2</b> 7 6 3 <b>history2</b> 2 12.1 24.1



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VISUAL		method	limit/base	current	history1	histo
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
Appearance	scalar	*Visual	NORML	NORML	NORML	NORM
Odor	scalar	*Visual	NORML	NORML	NORML	NORM
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG
FLUID PROPE	RTIES	method	limit/base	current	history1	histo
Visc @ 100°C	cSt	ASTM D445	15.4	14.9	14.8	14.8
GRAPHS						
Ferrous Alloys						
<sup>0</sup> T		!				
0 - chromium						
nickel						
0						
0						
0 +						
•	_		1			
•	_		/			
		/	/			
0						
	3		4			
	15/23	EZIOZ				
0	Dec15/23	Dec20/23	Jan 17/24			
Feb1/22		Dec20/23				
Non-ferrous Metals		Dec20723				
Non-ferrous Metals		Dec20733				
Non-ferrous Metals		Dec20/23				
Non-ferrous Metals		Dec20/23				
Non-ferrous Metals		Dec20/23				
Non-ferrous Metals		De:20/23				
Non-ferrous Metals		Dec20/23				
Non-ferrous Metals		Dec20/23				
Non-ferrous Metals		Dec20/23				
Non-ferrous Metals		Dec20/23				
Non-ferrous Metals		Dec20123				
Non-ferrous Metals		Dec20/23				
Non-ferrous Metals	S		Jan 1724.			
Non-ferrous Metals	S		Jan 1724.			
Non-ferrous Metals		De:20/23				
Non-ferrous Metals	S []		Jan 1724.			
Non-ferrous Metals	S []		Jan17/24 Jan17/24	Base Numbe	24	
Non-ferrous Metals	S []		Jan17/24 Jan17/24	Base Numbe	21	
Non-ferrous Metals	S []		Jan17/24 Jan17/24	Base Numbe	2r	
Non-ferrous Metals	S []		10.0	Base Numbe	27	
Non-ferrous Metals	S []		10.0	Base Numbe	21	
Non-ferrous Metals	S []		10.0	Base Numbe	21	
Non-ferrous Metals	S []		10.0	Base Numbe	21	
Non-ferrous Metals	S []		10.0	Base Numbe	2r	
Non-ferrous Metals	S []		10.0	Base Numbe	er	
Non-ferrous Metals	S []		10.0 ase Mumber (mg K0H(g) 6.0 7 7 7 10 10 10 10 10 10 10 10 10 10 10 10 10	Base Numbe	27	
Non-ferrous Metals	S []		Jan17/24 ber (mg KOH(g) 0'9	Base Numbe	21	
Non-ferrous Metals	S []		+72/L[Luer] +72/L[Luer] 10.0 (0)HOX Bul Jaquiny 8.0 (0)HOX Bul Jaqui	Base Numbe	51.	
Non-ferrous Metals	S Deci 523	Dec20/23	+72/L1meL 10.0 (0)HOX bull see 2.0 0.0	Base		
Non-ferrous Metals	S Deci 523	Dec20/23	+72/L1meL 10.0 (0)HOX bull see 2.0 0.0	Base		10/23
Non-ferrous Metals	S []		+72/L[Luer] +72/L[Luer] 10.0 (0)HOX Bul Jaquiny 8.0 (0)HOX Bul Jaqui	Base Number	15 0601 5/23	Dec20/23



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