

OIL ANALYSIS REPORT

Sample Rating Trend





Component Diesel Engine Fluid

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

Recommendation

Resample at the next service interval to monitor.

Machine Id 564M

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		GFL0093149	GFL0081444	GFL0064001
Sample Date		Client Info		06 Nov 2023	16 May 2023	13 Dec 2022
Machine Age	hrs	Client Info		11371	10529	9778
Oil Age	hrs	Client Info		10529	9778	9186
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>3.0	<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	>90	17	47	39
Chromium	ppm	ASTM D5185m		<1	2	2
Nickel	ppm	ASTM D5185m	>2	0	<1	<1
Titanium	ppm	ASTM D5185m		0	<1	0
Silver	ppm	ASTM D5185m	>2	0	<1	0
Aluminum	ppm	ASTM D5185m		1	5	2
Lead	ppm	ASTM D5185m	>40	0	0	<1
Copper	ppm	ASTM D5185m		0	1	1
Tin	ppm	ASTM D5185m	>15	0	<1	<1
Vanadium	ppm	ASTM D5185m		0	0	<1
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	Method ASTM D5185m	limit/base	current 5	history1 2	history2 3
	ppm ppm					
Boron		ASTM D5185m	0	5	2	3
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	5 0	2 0	3 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	5 0 58	2 0 60	3 0 60
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	5 0 58 0	2 0 60 <1	3 0 60 <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	5 0 58 0 916	2 0 60 <1 919	3 0 60 <1 933
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 58 0 916 1050	2 0 60 <1 919 1080	3 0 60 <1 933 1063
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	5 0 58 0 916 1050 973	2 0 60 <1 919 1080 979	3 0 60 <1 933 1063 990
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 58 0 916 1050 973 1260	2 0 60 <1 919 1080 979 1252	3 0 60 <1 933 1063 990 1250
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 1010 1070 1150 1270 2060	5 0 58 0 916 1050 973 1260 2896	2 0 60 <1 919 1080 979 1252 3002	3 0 60 <1 933 1063 990 1250 3017
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	5 0 58 0 916 1050 973 1260 2896 current	2 0 60 <1 919 1080 979 1252 3002 history1	3 0 60 <1 933 1063 990 1250 3017 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	0 0 60 1010 1070 1150 1270 2060	5 0 58 0 916 1050 973 1260 2896 2896 current 3	2 0 60 <1 919 1080 979 1252 3002 history1 6	3 0 60 <1 933 1063 990 1250 3017 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 method ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base	5 0 58 0 916 1050 973 1260 2896 current 3 2	2 0 60 <1 919 1080 979 1252 3002 history1 6 6	3 0 60 <1 933 1063 990 1250 3017 history2 7 7 7
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 limit/base >25 >20	5 0 58 0 916 1050 973 1260 2896 current 3 2 2 0	2 0 60 <1 919 1080 979 1252 3002 history1 6 6 6 2	3 0 60 <1 933 1063 990 1250 3017 history2 7 7 7 0
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 ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 Limit/base >20	5 0 58 0 916 1050 973 1260 2896 <u>current</u> 3 2 2 0 <u>current</u> 0.3	2 0 60 <1 919 1080 979 1252 3002 history1 6 6 6 2 2 history1 0.9	3 0 60 <1 933 1063 990 1250 3017 history2 7 7 7 0 0 history2 0.9
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 TS	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <i>limit/base</i> >25 >20 <i>limit/base</i> >20	5 0 58 0 916 1050 973 1260 2896 current 3 2 2 0 0	2 0 60 <1 919 1080 979 1252 3002 history1 6 6 6 2 2 history1	3 0 60 <1 933 1063 990 1250 3017 history2 7 7 7 0 bistory2
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 imit/base >25 imit/base >6 >20	5 0 58 0 916 1050 973 1260 2896 <u>current</u> 3 2 2 0 <u>current</u> 0.3 8.2 20.6	2 0 60 <1 919 1080 979 1252 3002 history1 6 6 6 2 2 history1 0.9 11.0 24.3	3 0 60 <1 933 1063 990 1250 3017 history2 7 7 7 7 0 0 history2 0.9 12.2 25.6
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 D7844 *ASTM D7844	0 0 0 1010 1070 1150 1270 2060 2060 225 20 220 220 20 20 20 20 20 20 20 20 20 2	5 0 58 0 916 1050 973 1260 2896 current 3 2 2 0 current 0.3 8.2 20.6 current	2 0 60 <1 919 1080 979 1252 3002 history1 6 6 6 2 <u>history1</u> 0.9 11.0 24.3 history1	3 0 60 <1 933 1063 990 1250 3017 history2 7 7 7 7 0 0 history2 0.9 12.2 25.6 history2
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 imit/base >25 imit/base >6 >20	5 0 58 0 916 1050 973 1260 2896 <u>current</u> 3 2 2 0 <u>current</u> 0.3 8.2 20.6	2 0 60 <1 919 1080 979 1252 3002 history1 6 6 6 2 2 history1 0.9 11.0 24.3	3 0 60 <1 933 1063 990 1250 3017 history2 7 7 7 7 0 bistory2 0.9 12.2 25.6



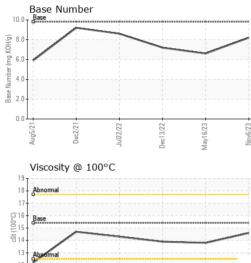
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Dec2/21

OIL ANALYSIS REPORT

VISUAL



		VISUAL							
		White Metal	scalar	*Visual	NONE	NONE	NONE	NONE	
Decl3/22 day16/23	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		
	1ay16/23 - Nov6/23 -	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML	
Dec13/22	May16/23 Nov6/23	Odor	scalar	*Visual	NORML	NORML	NORML	NORML	
		Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG	
· · · · · · · · · · · · · · · · · · ·		Free Water	scalar	*Visual		NEG	NEG	NEG	
		FLUID PROPE	RTIES	method	limit/base	current	history1	history2	
		Visc @ 100°C	cSt	ASTM D445	15.4	14.6	13.8	13.9	
		GRAPHS							
		Ferrous Alloys							
22	23	60 iron							
Dec13/22	May16/23	50 - nickel		1					
D	ž	40	/	$\langle \rangle$					
		<u>ة</u> 30	/						
		20			\backslash				
		10							
		Aug5/21 Dec2/21	Dec13/22	May16/23	Nov6/23				
		-		Mar	2				
		Non-ferrous Metal	S						
		copper							
		8 - Hennessee lead							
		6							
		mdd							
		4							
		2							
				-					
		22	22	23	/23				
		Aug5/21 Dec2/21 Jul22/22	Dec13/22	May16/23	Nov6/23				
		Viscosity @ 100°C		-		Base Number			
		19 18 Abnormal		1	10.0				
		18 Abnormal	1	1	8.0		~		
					B/HO)			/	
		Base 00015 314				0-			
		ti 14			un 4.0	o -			
				1	N ase				
		13 Abromal		1	⁶⁶ 2.0	D			
		11							
		Aug5/21	Dec13/22 -	6/23 -	Nov6/23	Aug5/21-	Jul22/22 - Jec13/22 -	6/23	
		Aug Dec	Dec1.	May16/23	Nov	Auc	Jul22/22 Dec13/22	May16/23 .	
				_					
4	Laboratory	: WearCheck USA - 5				3 GFL Envi	GFL Environmental - 415 - Michigan E		
	Sample No. Lab Number		Received Diagnos		Nov 2023 Nov 2023		6200 Elmric Sterling Heights,		
			Stern	US 483					
	Unique Number	: 10/29813	: 10729813 Diagnostician : Wes Davis : FLEET						
Cate L2367	Unique Number Test Package		Diagnosi		Davis		Contac	t: Frank Wo	

Submitted By: Frank Wolak