

OIL ANALYSIS REPORT

Sample Rating Trend



427191 - SW4738

Component Diesel Engine

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

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor. (Customer Sample Comment: Engine) $% \label{eq:commutative}$

Wear

All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil.

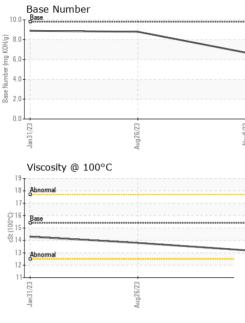
Fluid Condition

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

				Aug2023 Nov20		
SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0094134	GFL0089460	GFL0065827
Sample Date		Client Info		08 Nov 2023	26 Aug 2023	31 Jan 2023
Machine Age	mls	Client Info		351584	340693	330902
Oil Age	mls	Client Info		351584	340693	0
Oil Changed		Client Info		N/A	Changed	N/A
Sample Status				NORMAL	ABNORMAL	NORMAL
CONTAMINATI	ON	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	<1.0	<1.0
Glycol		WC Method		NEG	NEG	NEG
WEAR METALS	3	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	23	12	13
Chromium	ppm	ASTM D5185m	>20	2	1	<1
Nickel	ppm	ASTM D5185m	>4	<1	<1	0
Titanium	ppm	ASTM D5185m		0	0	0
Silver	ppm	ASTM D5185m	>3	<1	<1	0
Aluminum	ppm	ASTM D5185m	>20	2	1	1
Lead	ppm	ASTM D5185m	>40	2	0	<1
Copper	ppm	ASTM D5185m	>330	30	15	<1
Tin	ppm	ASTM D5185m	>15	2	0	<1
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm		limit/base	current 28	history1 456	history2 <1
	ppm ppm	ASTM D5185m				
Boron		ASTM D5185m	0	28	456	<1
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0 0 60	28 1	456 13	<1 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	28 1 47	456 13 74	<1 0 61
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	28 1 47 2	456 13 74 5	<1 0 61 <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	28 1 47 2 85	456 13 74 5 511	<1 0 61 <1 751
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	28 1 47 2 85 2329	456 13 74 5 511 1409	<1 0 61 <1 751 1862
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	28 1 47 2 85 2329 1036	456 13 74 5 511 1409 1083	<1 0 61 <1 751 1862 1145
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm 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	28 1 47 2 85 2329 1036 1279	456 13 74 5 511 1409 1083 1329	<1 0 61 <1 751 1862 1145 1408
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 2060	28 1 47 2 85 2329 1036 1279 3016	456 13 74 5 511 1409 1083 1329 4235	<1 0 61 <1 751 1862 1145 1408 4033
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	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	28 1 47 2 85 2329 1036 1279 3016 current	456 13 74 5 511 1409 1083 1329 4235 history1	<1 0 61 <1 751 1862 1145 1408 4033 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon	ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method	0 0 60 1010 1070 1150 1270 2060 imit/base >25	28 1 47 2 85 2329 1036 1279 3016 <i>current</i> 18	456 13 74 5 511 1409 1083 1329 4235 history1 ▲ 30	<1 0 61 <1 751 1862 1145 1408 4033 history2 7
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon Sodium	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 imit/base >25	28 1 47 2 85 2329 1036 1279 3016 current 18 3	456 13 74 5 511 1409 1083 1329 4235 history1 ▲ 30 4	<1 0 61 <1 751 1862 1145 1408 4033 history2 7 1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon Sodium Potassium	ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 imit/base >25 >20	28 1 47 2 85 2329 1036 1279 3016 Current 18 3 2	456 13 74 5 511 1409 1083 1329 4235 history1 ▲ 30 4 3	<1 0 61 <1 751 1862 1145 1408 4033 history2 7 1 3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon Sodium Potassium INFRA-RED	ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 imit/base >25 -20	28 1 47 2 85 2329 1036 1279 3016 Current 18 3 2 Current	456 13 74 5 511 1409 1083 1329 4235 history1 ▲ 30 4 3 History1	<1 0 61 <1 751 1862 1145 1408 4033 history2 7 1 3 3 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon Sodium Potassium INFRA-RED Soot %	ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 Imit/base >25 >20 Imit/base >3 >20	28 1 47 2 85 2329 1036 1279 3016 Current 18 3 2 Current 0.2	456 13 74 5 511 1409 1083 1329 4235 history1 ▲ 30 4 3 history1 0.1	<1 0 61 <1 751 1862 1145 1408 4033 history2 7 1 3 <u>history2</u> 0.4
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Solicon 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 >25 >20 Imit/base >3 >20	28 1 47 2 85 2329 1036 1279 3016 Current 18 3 2 Current 0.2 7.7 18.9	456 13 74 5 511 1409 1083 1329 4235 history1 ▲ 30 4 3 history1 0.1 5.1	<1 0 61 <1 751 1862 1145 1408 4033 history2 7 7 1 3 <i>history2</i> 0.4 10.4
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT 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 20 imit/base >3 >20	28 1 47 2 85 2329 1036 1279 3016 Current 18 3 2 Current 0.2 7.7 18.9	456 13 74 5 511 1409 1083 1329 4235 history1 30 4 3 0.1 0.1 5.1 19.6	<1 0 61 <1 751 1862 1145 1408 4033 history2 7 1 3 <u>history2</u> 0.4 10.4 21.8
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAD	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844 *ASTM D7844	0 0 0 1010 1070 1150 1270 2060 2060 225 20 220 220 1imit/base >3 >20 >30 30	28 1 47 2 85 2329 1036 1279 3016 Current 18 3 2 Current 0.2 7.7 18.9 Current	456 13 74 5 511 1409 1083 1329 4235 history1 ▲ 30 4 30 4 3 history1 0.1 5.1 19.6 history1	<1 0 61 <1 751 1862 1145 1408 4033 history2 7 1 3 history2 0.4 10.4 21.8 history2



OIL ANALYSIS REPORT



	White Metal Yellow Metal Precipitate Silt	scalar scalar scalar scalar	*Visual *Visual *Visual	NONE NONE	NONE NONE NONE	NONE NONE NONE	NONE NONE NONE	
	Precipitate Silt	scalar	*Visual					
	Silt			NONE	NONE	NONE	NONE	
		scalar				NONE	NONL	
		Scalai	*Visual	NONE	NONE	NONE	NONE	
	Debris	scalar	*Visual	NONE	NONE	NONE	NONE	
	Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE	
Nov8/23 -	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML	
Nov	Odor	scalar	*Visual	NORML	NORML	NORML	NORML	
	Emulsified Water				NEG		NEG	
	Free Water	scalar	*Visual		NEG	NEG	NEG	
	FLUID PROPE	ERTIES	method	limit/base	current	history1	history2	
	Visc @ 100°C	cSt	ASTM D445	15.4	13.2	13.8	14.3	
	GRAPHS							
	Ferrous Alloys							
	25 iron							
	20 - newspace chromium		/					
	1							
ter.								
	10							
	5							
	0			5				
	1/23	6/23		8/23				
	Jan 3	Aug2		Nov				
	Non-ferrous Meta	als						
	³⁰ T			/				
	25 - copper		/					
	20							
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10 1 1 1	톱 15	/						
	10							
				and				
		3		3				
	n31/2	g26/2		lov8/2				
	7			Z				
	¹⁹ T	C		10.0.	Base Number			
	18 - Abnormal							
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1. Co	D ¹⁶ Base			¥ 6.0-				
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5	³ 14			4.0				
	13 Abnormal			2.0·				
	12			2.0				
	114	22		-0.0	13			
	n31/2	g26/2		lov8/2	n31/2	g26/2		
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	: WearCheck USA -	501 Madie	son Ave. Ca	rv. NC 27513	GFI Envi	ronmental - 983 - S	ugar Land Hauli	
aboratory				Nov 2023				
Laboratory Sample No.		Received	d :14 i	NUV ZUZO				
Laboratory Sample No. Lab Number	: GFL0094134 : 06006798	Received Diagnos		Nov 2023				
Sample No.	: GFL0094134		ed :161				Sugar Land, 1	
Sample No. Lab Number Unique Number Test Package	: GFL0094134 : 06006798	Diagnos Diagnost	ed : 16 I tician : Dor	Nov 2023 n Baldridge		S Conta	Sugar Land, 1 US 774 ct: Gino Grieg go@gflenv.co	
		Emulsified Water Free Water FLUID PROPI Visc @ 100°C GRAPHS Ferrous Alloys	Emulsified Water scalar Free Water scalar Free Water scalar FLUID PROPERTIES Visc @ 100°C cSt GRAPHS Ferrous Alloys	Viscal Visual Emulsified Water scalar *Visual Free Water scalar *Visual FLUID PROPERTIES method Visc @ 100°C cSt ASTM D445 GRAPHS Ferrous Alloys Viscosity @ 100°C Viscosity @ 100°C	Viscal Visual >0.2 Free Water scalar *Visual >0.2 Free Water scalar *Visual FLUID PROPERTIES method limit/base Visc @ 100°C cSt ASTM D445 15.4 GRAPHS Ferrous Alloys Non-ferrous Metals Non-ferrous Metals Viscosity @ 100°C Viscosity @ 100°C	Emulsified Water scalar 'Visual >0.2 NEG Free Water scalar 'Visual NEG FLUID PROPERTIES method limit/base current Visc @ 100°C cSt ASTM D445 15.4 13.2 Ferrous Alloys Ferrous Metals Von-ferrous Metals Viscosity @ 100°C Viscosity @ 100°C	Perce Water scalar Visual >0.2 NEG NEG Free Water scalar Visual >0.2 NEG NEG Free Water scalar Visual NEG NEG Free Water scalar Visual NEG NEG Ferous Alloys Ferrous Alloys Ferrous Alloys 000-ferrous Metals 000-ferrous	

Submitted By: TECHNICIAN ACCOUNT