

OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id **427193 - SW4742** 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.

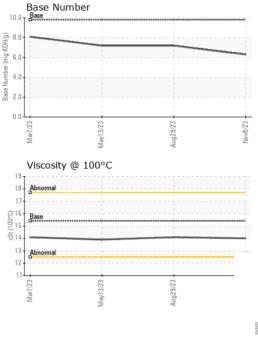
Fluid Condition

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

AAL)		Mar202				
SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0094130	GFL0089454	GFL0075402
Sample Date		Client Info		08 Nov 2023	29 Aug 2023	13 May 2023
Machine Age	mls	Client Info		321849	311407	296568
Oil Age	mls	Client Info		321849	311407	296568
Oil Changed		Client Info		N/A	Changed	N/A
Sample Status				NORMAL	NORMAL	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	6	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	13	12	15
Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Nickel	ppm	ASTM D5185m	>4	0	0	<1
Titanium	ppm	ASTM D5185m		0	0	<1
Silver	ppm	ASTM D5185m	>3	0	0	<1
Aluminum	ppm	ASTM D5185m	>20	1	<1	1
Lead	ppm	ASTM D5185m	>40	3	2	3
Copper	ppm	ASTM D5185m	>330	0	0	0
Tin	ppm	ASTM D5185m	>15	<1	0	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 0	current	history1 0	history2 1
	ppm ppm					
Boron		ASTM D5185m	0	<1	0	1
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	<1 0	0	1 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	<1 0 44	0 0 46	1 0 44
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	<1 0 44 <1	0 0 46 <1	1 0 44 <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	<1 0 44 <1 11	0 0 46 <1 9	1 0 44 <1 33
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	<1 0 44 <1 11 2507	0 0 46 <1 9 2492	1 0 44 <1 33 2750
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	<1 0 44 <1 11 2507 1074	0 0 46 <1 9 2492 1076	1 0 44 <1 33 2750 1156
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	<1 0 44 <1 11 2507 1074 1300	0 0 46 <1 9 2492 1076 1305	1 0 44 <1 33 2750 1156 1398
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	<1 0 44 <1 11 2507 1074 1300 3133	0 0 46 <1 9 2492 1076 1305 3765	1 0 44 <1 33 2750 1156 1398 4107
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	<1 0 44 <1 11 2507 1074 1300 3133 current	0 0 46 <1 9 2492 1076 1305 3765 history1	1 0 44 <1 33 2750 1156 1398 4107 history2
Boron Barium Molybdenum Magaese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon	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	<1 0 44 <1 11 2507 1074 1300 3133 current 6	0 0 46 <1 9 2492 1076 1305 3765 history1 6	1 0 44 <1 33 2750 1156 1398 4107 history2 9
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN 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 0 1010 1070 1150 1270 2060 kimit/base >25	<1 0 44 <1 11 2507 1074 1300 3133 current 6 <	0 0 46 <1 9 2492 1076 1305 3765 history1 6 0	1 0 44 <1 33 2750 1156 1398 4107 history2 9 3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN ^T Silicon Sodium Potassium	ppm	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 limit/base >25 >20	<1 0 44 <1 11 2507 1074 1300 3133 current 6 <1 1	0 0 46 <1 9 2492 1076 1305 3765 history1 6 0 1	1 0 44 <1 33 2750 1156 1398 4107 history2 9 3 1
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 limit/base >25	<1 0 44 <1 11 2507 1074 1300 3133 current 6 <1 1 1	0 0 46 <1 9 2492 1076 1305 3765 history1 6 0 1 1 history1	1 0 44 <1 33 2750 1156 1398 4107 history2 9 3 1 1 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANT Silicon Sodium Potassium INFRA-RED Soot %	ppm i ppm i	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base >3	<1 0 44 <1 11 2507 1074 1300 3133 <u>current</u> 6 <1 1 1 <u>current</u> 0.2	0 0 46 <1 9 2492 1076 1305 3765 history1 6 0 1 1 history1 0.1	1 0 44 <1 33 2750 1156 1398 4107 history2 9 3 1 1 history2 0.3
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 <i>limit/base</i> >25 >20 <i>limit/base</i> >3 >20	<1 0 44 <1 11 2507 1074 1300 3133 <i>current</i> 6 <1 1 <i>current</i> 0.2 8.5	0 0 46 <1 9 2492 1076 1305 3765 history1 6 0 1 history1 0.1 6.8	1 0 44 <1 33 2750 1156 1398 4107 history2 9 3 1 9 3 1 history2 0.3 8.4
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 2060 225 20 225 20 imit/base >3 20 20	<1 0 44 <1 11 2507 1074 1300 3133 current 6 <1 1 1 current 0.2 8.5 19.5	0 0 46 <1 9 2492 1076 1305 3765 history1 6 0 1 1 history1 0.1 6.8 16.6	1 0 44 <1 33 2750 1156 1398 4107 history2 9 3 1 1 history2 0.3 8.4 19.4
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 2260 225 220 220 imit/base >3 >20 >30 3 imit/base	<1 0 44 <1 11 2507 1074 1300 3133 Current 6 <1 1 0.2 8.5 19.5 Current	0 0 46 <1 9 2492 1076 1305 3765 history1 6 0 1 history1 0.1 6.8 16.6 history1	1 0 44 <1 33 2750 1156 1398 4107 history2 9 3 1 history2 0.3 8.4 19.4 history2



OIL ANALYSIS REPORT



		_	VISUAL		method	limit/base	current	history1	history2
		V	White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
		Y	Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
		F	Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
		S	Silt	scalar	*Visual	NONE	NONE	NONE	NONE
		- C	Debris	scalar	*Visual	NONE	NONE	NONE	NONE
			Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
29.02	Aug 29/23 Nov8/23	A	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
	Aug No	C	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
		E	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
		F	Free Water	scalar	*Visual		NEG	NEG	NEG
			FLUID PROPE	RTIES	method	limit/base	current	history1	history2
		V	/isc @ 100°C	cSt	ASTM D445	15.4	14.0	14.1	13.9
			GRAPHS						
		16.	Ferrous Alloys						
20,72	Aug <i>29/23</i>	14	chromium						
And	Aug	12.							
		10 · Ed 8 ·							
		6.	/						
		4.							
		2							
		0.	73		/23				
			Mar7/23 May13/23		Aug 29/23	Nav8/23			
			Non-ferrous Meta	ls					
		10.	copper						
		8.	second lead						
		0							
		mqq							
		4.							
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			Mar7/23 May13/23		Aug 29/23	Nov8/23			
		10	Viscosity @ 100°C	2			Base Number		
		19· 18·			1	10.0	Base		
		17-	1			(^B) ^{8.0}			
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		12.				0.0-			
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			Mar7/23 May13/23		Ач		-	2 4	
٩	Laboratory	: \	≥ ! WearCheck USA		son Ave., Ca	ry, NC 27513		onmental - 983 - S	ugar Land Hauli
NAB	Sample No.	: \ : (ے + WearCheck USA GFL0094130	Received	son Ave., Ca 1 : 14 I	ry, NC 27513 Nov 2023		onmental - 983 - Si 16011 Wes	u gar Land Hauli St Belfort Stre
		: \ : (: (ے WearCheck USA -		son Ave., Ca d : 14 l ed : 16 l	ry, NC 27513		onmental - 983 - Si 16011 Wes	ugar Land Haul in St Belfort Stre Sugar Land, T
	Sample No. Lab Number Unique Number Test Package	:\ :(:(r :1	ے WearCheck USA -	Received Diagnose Diagnost	son Ave., Ca d : 14 l ed : 16 l tician : Dor	ry, NC 27513 Nov 2023 Nov 2023 Nov 2023 Nov 2029		onmental - 983 - Si 16011 Wes S Conta	

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Submitted By: TECHNICIAN ACCOUNT