

OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id 411028

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

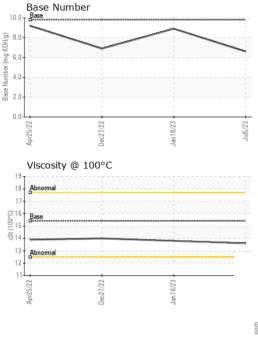
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0086425	GFL0048865	GFL0048912
Sample Date		Client Info		05 Jul 2023	18 Jan 2023	27 Dec 2022
Machine Age	hrs	Client Info		5201	0	3909
Oil Age	hrs	Client Info		525	238	595
Oil Changed		Client Info		Changed	Not Changd	Changed
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	<1.0	<1.0
Glycol		WC Method		NEG	NEG	NEG
WEAR METAL	method	limit/base	current	history1	history2	
Iron	ppm	ASTM D5185m	>100	28	6	32
Chromium	ppm	ASTM D5185m	>20	2	1	4
Nickel	ppm	ASTM D5185m	>4	0	0	<1
Titanium	ppm	ASTM D5185m		0	0	<1
Silver	ppm	ASTM D5185m	>3	0	0	0
Aluminum	ppm	ASTM D5185m	>20	17	6	29
Lead	ppm	ASTM D5185m	>40	0	0	<1
Copper	ppm	ASTM D5185m	>330	0	0	1
Tin	ppm	ASTM D5185m	>15	0	0	<1
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
			11 1. 0			Istation O
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	Method ASTM D5185m	limit/base	current 2	history1 6	nistory2 3
	ppm ppm		0			
Boron		ASTM D5185m	0	2	6	3
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0 0 60	2 0	6 0	3 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	2 0 59	6 0 57	3 0 62
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	2 0 59 0	6 0 57 <1	3 0 62 <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	2 0 59 0 950	6 0 57 <1 879	3 0 62 <1 961
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	2 0 59 0 950 1038	6 0 57 <1 879 1021	3 0 62 <1 961 1141
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 1010 1070 1150	2 0 59 0 950 1038 950	6 0 57 <1 879 1021 936	3 0 62 <1 961 1141 956
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	2 0 59 0 950 1038 950 1222	6 0 57 <1 879 1021 936 1120	3 0 62 <1 961 1141 956 1235
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	2 0 59 0 950 1038 950 1222 3363	6 0 57 <1 879 1021 936 1120 3484	3 0 62 <1 961 1141 956 1235 3173
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	2 0 59 0 950 1038 950 1222 3363 current	6 0 57 <1 879 1021 936 1120 3484 history1	3 0 62 <1 961 1141 956 1235 3173 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 imit/base >25	2 0 59 0 950 1038 950 1222 3363 current 3	6 0 57 <1 879 1021 936 1120 3484 history1 3	3 0 62 <1 961 1141 956 1235 3173 history2 4
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 1010 1070 1150 1270 2060 imit/base >25	2 0 59 0 950 1038 950 1222 3363 current 3 5	6 0 57 <1 879 1021 936 1120 3484 history1 3 0	3 0 62 <1 961 1141 956 1235 3173 history2 4 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 imit/base >25 >20	2 0 59 0 950 1038 950 1222 3363 current 3 5 32	6 0 57 <1 879 1021 936 1120 3484 history1 3 0 6	3 0 62 <1 961 1141 956 1235 3173 history2 4 6 6 65
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 imit/base >25 -20	2 0 59 0 950 1038 950 1222 3363 current 3 5 32 2 current	6 0 57 <1 879 1021 936 1120 3484 history1 3 0 6 history1	3 0 62 <1 961 1141 956 1235 3173 history2 4 6 65 bistory2
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	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 Imit/base >25 >20 Imit/base >3	2 0 59 0 950 1038 950 1222 3363 <u>current</u> 3 5 32 <u>current</u> 1.2	6 0 57 <1 879 1021 936 1120 3484 history1 3 0 6 history1 0.3	3 0 62 <1 961 1141 956 1235 3173 history2 4 6 6 65 history2 1.6
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 ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 imit/base >25 >20 imit/base >3 >20	2 0 59 0 950 1038 950 1222 3363 <i>current</i> 3 5 32 <i>current</i> 1.2 10.4	6 0 57 <1 879 1021 936 1120 3484 history1 3 0 6 history1 0.3 5.8	3 0 62 <1 961 1141 956 1235 3173 history2 4 6 6 65 history2 1.6 11.6
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 TS ppm ppm ppm ppm ppm ppm Abs/cm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 imit/base >25 imit/base >3 >20 >30	2 0 59 0 950 1038 950 1222 3363 <u>current</u> 3 5 32 <u>current</u> 1.2 10.4 23.5	6 0 57 <1 879 1021 936 1120 3484 history1 3 0 6 <u>history1</u> 0.3 5.8 18.0	3 0 62 <1 961 1141 956 1235 3173 history2 4 6 6 65 history2 1.6 11.6 25.5
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 TS ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844	0 0 0 1010 1070 1150 2260 225 220 220 imit/base >3 >20 >30 imit/base	2 0 59 0 950 1038 950 1222 3363 current 3 5 32 current 1.2 10.4 23.5	6 0 57 <1 879 1021 936 1120 3484 history1 3 0 6 history1 0.3 5.8 18.0 history1	3 0 62 <1 961 1141 956 1235 3173 history2 4 6 6 65 history2 1.6 11.6 25.5 history2



OIL ANALYSIS REPORT

VISUAL



Laboratory Sample No. Lab Number Unique Number	: GFL0 : <mark>05895</mark>	086425 5 <mark>961</mark>	Received Diagnos	Received : 12 Jul 2023			GFL Environmental - 005 - Wilson/Tri-East(CNG) 2810 Contentnea Road S Wilson, NC US 27893-8501 Contact: WALTER SKOKOWSKI walter.skokowski@gflenv.com			
	13 Abnon 12 11 72/52/dV	mal Dec21/23		Jan 18/23	2		Dec21/22	Jan 18/23	Jul5/23	
	17- ()-16 ()-15- #30 14-				8 Number (mg KOH/g) 4	.0 -				
	Visco	osity @ 100°	°C	Jan			ber			
	2 0 22/5	22/1		8/23	5/23					
	6									
		copper lead	als	7						
	0	ec27/22	N Balantan Antonio anto	an 18/23	Jul5/23					
	20 15 10									
	30	iron chromium nickel			1					
			JOI		10.1		10.0		1.0	
				method	limit/base				history2 4.0	
			scalar	*Visual	>0.2	NEG	NEG		IEG IEG	
, in C	Odor	:fied Meter	scalar	*Visual	NORML	NORML				
5/23			scalar scalar	*Visual *Visual	NONE	NONE			IONE IORML	
			scalar	*Visual	NONE	NONE	NONE		IONE	
	Silt	liale	scalar						IONE IONE	
			scalar	*Visual	NONE	NONE	NONE		IONE	
	Laboratory Sample No. Lab Number	Yellow Precip Silt Debris Sand/ Appea Odor Emuls Free V FLU Visc @ GR Ferro Sand/ Appea Odor Emuls Free V Visc @ GR Sand/ Visc @ GR Sand/ Visc @ GR Sand/ Visc @ GR Sand/ Sand/ Visc @ GR Sand/ Sand/ Visc @ GR Sand/ S	Debris Sand/Dirt Appearance Odor Emulsified Water Free Water FLUID PROP Visc @ 100°C GRAPHS Ferrous Alloys Job Job Job Job Job Job Job Job Job Job	Yellow Metal scalar Precipitate scalar Silt scalar Debris scalar Sand/Dirt scalar Appearance scalar Odor scalar Emulsified Water scalar Free Water scalar Free Water scalar Free Water scalar Ferous Alloys Visc @ 100°C cSt GRAPHS Ferrous Metals Usc @ 100°C Viscosity @ 100°C Viscosity @ 100°C	Yellow Metal scalar 'Visual Precipitate scalar 'Visual Debris scalar 'Visual Sand/Dirt scalar 'Visual Appearance scalar 'Visual Odor scalar 'Visual Free Water scalar 'Visual For cost ASTM D445 GRAPHS Ferrous Alloys Uscosity @ 100°C Uscosity @ 100°C Uscosity @ 100°C Viscosity @ 100°C Uscosity @ 100°C Us	Vellow Metal scalar Visual NONE Precipitate scalar Visual NONE Sitt scalar Visual NONE Debris scalar Visual NONE Sand/Dint scalar Visual NORML Odor scalar Visual NORML Odor scalar Visual NORML Odor scalar Visual NORML Emulsified Water scalar Visual NORML Visc @ 100°C cSt ASTM D445 15.4 CRAPHS Ferrous Alloys Visc @ 100°C cSt ASTM D445 15.4 CRAPHS Forrous Metals Viscosity @ 100°C Viscosity @ 100°C Viscos	Yellow Metal scalar 'Visual NONE NONE Precipitate scalar 'Visual NONE NONE Sit is scalar 'Visual NONE NONE Sand/Dirt scalar 'Visual NONE NONE Sand/Dirt scalar 'Visual NONE NONE Appearance scalar 'Visual NORML NORML Odro scalar 'Visual NORML NORML NORML Sit is calar 'Visual NORML NO	Vellow Metal scalar 'Visual NONE NONE NONE Precipitate scalar 'Visual NONE NONE NONE Sitt scalar 'Visual NONE NONE NONE Debris scalar 'Visual NONE NONE NONE Appearance scalar 'Visual NORML NORML NORML NORM Odor scalar 'Visual NORML NORML NORML NORM The Ultified Water scalar 'Visual NORML NORML NORM Brew Water scalar 'Visual Sol2 NEG NEG Free Water scalar 'Visual Sol2 NEG NEG Second Preve Water Scalar 'Visual Sol2 NEG NEG Non-ferrous Metals Visco 100°C cSt ASTM D445 15.4 13.6 13.8 CRAPHS Ferrous Alloys Uscosity @ 100°C Uscosity @ 100°C Uscos	Vellow Metal scalar Visual NONE NONE NONE NONE NONE NONE NONE NON	

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Submitted By: WALTER SKOKOWSKI

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