

OIL ANALYSIS REPORT

Sample Rating Trend

NORMAL

820015-101299

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

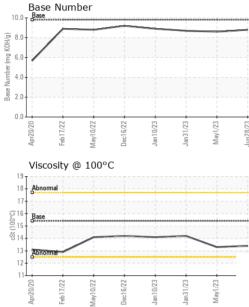
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0083703	GFL0075000	GFL0066009
Sample Date		Client Info		28 Jun 2023	01 May 2023	31 Jan 2023
Machine Age	hrs	Client Info		17310	8270	7700
Oil Age	hrs	Client Info		0	0	0
Oil Changed		Client Info		Not Changd	Changed	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	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	13	13	8
Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Nickel	ppm	ASTM D5185m	>4	0	<1	0
Titanium	ppm	ASTM D5185m		0	0	0
Silver	ppm	ASTM D5185m	>3	0	0	0
Aluminum	ppm	ASTM D5185m	>20	4	6	1
Lead	ppm	ASTM D5185m	>40	0	<1	0
Copper	ppm	ASTM D5185m	>330	0	<1	<1
Tin	ppm	ASTM D5185m	>15	0	0	0
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES						
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm		limit/base	current 2	history1 6	history2 0
	ppm ppm	ASTM D5185m				
Boron		ASTM D5185m	0	2	6	0
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0 0 60	2 0	6 0	0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	2 0 59	6 0 57	0 0 57
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	2 0 59 <1	6 0 57 <1	0 0 57 <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 <1 963	6 0 57 <1 871	0 0 57 <1 893
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 <1 963 1084	6 0 57 <1 871 1002	0 0 57 <1 893 1019
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	2 0 59 <1 963 1084 1034	6 0 57 <1 871 1002 1008	0 0 57 <1 893 1019 985
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	2 0 59 <1 963 1084 1034 1284	6 0 57 <1 871 1002 1008 1148	0 0 57 <1 893 1019 985 1160
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 1010 1070 1150 1270 2060	2 0 59 <1 963 1084 1034 1284 3809	6 0 57 <1 871 1002 1008 1148 3135	0 0 57 <1 893 1019 985 1160 2912
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 <1 963 1084 1034 1284 3809 current	6 0 57 <1 871 1002 1008 1148 3135 history1	0 0 57 <1 893 1019 985 1160 2912 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 <1 963 1084 1034 1284 3809 current 21	6 0 57 <1 871 1002 1008 1148 3135 history1 4	0 0 57 <1 893 1019 985 1160 2912 history2 6
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 <1 963 1084 1034 1284 3809 current 21 2	6 0 57 <1 871 1002 1008 1148 3135 history1 4 2	0 0 57 <1 893 1019 985 1160 2912 history2 6 <1
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	2 0 59 <1 963 1084 1034 1284 3809 current 21 2 2 5	6 0 57 <1 871 1002 1008 1148 3135 history1 4 2 8	0 0 57 <1 893 1019 985 1160 2912 history2 6 <1 2
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 2060 225 >25 >20 Imit/base >20	2 0 59 <1 963 1084 1034 1284 3809 current 21 2 5 5 current	6 0 57 <1 871 1002 1008 1148 3135 history1 4 2 8 8 history1	0 0 57 <1 893 1019 985 1160 2912 history2 6 <1 2 2 history2
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 2060 225 >25 >20 Imit/base >20	2 0 59 <1 963 1084 1034 1284 3809 <u>current</u> 21 2 5 5 <u>current</u> 0.4	6 0 57 <1 871 1002 1008 1148 3135 history1 4 2 8 8 history1 0.4	0 0 57 <1 893 1019 985 1160 2912 history2 6 <1 2 history2 0.2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm TS 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	2 0 59 <1 963 1084 1034 1284 3809 <i>current</i> 21 21 2 5 <i>current</i> 0.4 7.4	6 0 57 <1 871 1002 1008 1148 3135 history1 4 2 8 <u>history1</u> 0.4 7.1	0 0 57 <1 893 1019 985 1160 2912 history2 6 <1 2 history2 0.2 5.6
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	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 imit/base >25 imit/base >3 >20	2 0 59 <1 963 1084 1034 1284 3809 <u>current</u> 21 2 5 <u>current</u> 0.4 7.4 19.6	6 0 57 <1 871 1002 1008 1148 3135 history1 4 2 8 8 history1 0.4 7.1 23.6	0 0 57 <1 893 1019 985 1160 2912 history2 6 <1 2 2 history2 0.2 5.6 18.2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAE	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844	0 0 0 1010 1070 1150 1270 2060 imit/base >25 20 imit/base >3 >20 30 imit/base	2 0 59 <1 963 1084 1034 1284 3809 <i>current</i> 21 21 2 5 <i>current</i> 0.4 7.4 19.6 <i>current</i>	6 0 57 <1 871 1002 1008 1148 3135 history1 4 2 8 history1 0.4 7.1 23.6 history1	0 0 57 <1 893 1019 985 1160 2912 history2 6 <1 2 2 history2 0.2 5.6 18.2 history2



OIL ANALYSIS REPORT

VISUAL



ANAB	Laboratory Sample No. Lab Number	: GFL0083703	Received Diagnos	01 Madison Ave., Cary, NC 27513 Received : 20 Jul 2023 Diagnosed : 21 Jul 2023 Diagnostician : Wes Davis			GFL Environmental - 844 - Princeton Hauling 10129 Highway 62 Wes Princeton, KY US 42445 Contact: Kenneth Bigers kbigers@gflenv.com			
		19 18 Abnormal 17 16 16 15 14 13 12 11 12 14 13 12 14 14 15 14 15 14 15 15 15 15 15 15 15 15 15 15	Deci 6/22	Jan31/23-	10.0 (b)HOX Du) Jaquer 4.1 8385 Minute 4.1 2.1 8395 Minute 4.1 2.1 8395 Minute 4.1 0.0	0 - Base 0	Deci 6/22 Jani 10/23	Jan31/23		
		Viscosity @ 100°C	Dec16/22-	EZ/I/vew	Jun28/23	Base Number				
		Mon-ferrous Meta	Jan10/23	5212a	Jun26/23					
Dec16/22 + Jan10/23 +	Jan31/23	Visc @ 100°C GRAPHS Ferrous Alloys	cSt	ASTM D445	13.4	13.4	13.3	14.2		
				method	limit/base	current	history1	history2		
C		Emulsified Water Free Water	scalar scalar scalar	*Visual *Visual	>0.2	NORML NEG NEG	NEG	NEG		
Dec16/22	Appearance Odor	scalar	*Visual *Visual	NORML	NORML	NORML	NORML			
	Debris Sand/Dirt	scalar	*Visual *Visual	NONE	NONE	NONE	NONE			
	Precipitate Silt	scalar scalar	*Visual *Visual	NONE NONE	NONE NONE	NONE NONE	NONE NONE			
	Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE			

Contact/Location: Kenneth Bigers - GFL844