

OIL ANALYSIS REPORT

Sample Rating Trend





Component

Diesel Engine

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

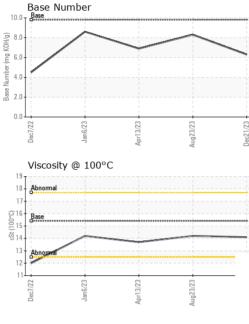
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFOR	MAT <u>IO</u> N	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0104579	GFL0092639	GFL0075196
Sample Date		Client Info		21 Dec 2023	23 Aug 2023	13 Apr 2023
Machine Age	hrs	Client Info		2464	1836	1485
Oil Age	hrs	Client Info		628	605	604
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
Water		WC Method	>0.2	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>110	27	26	22
Chromium	ppm	ASTM D5185m	>4	<1	<1	<1
Nickel	ppm	ASTM D5185m	>2	<1	0	0
Titanium	ppm	ASTM D5185m		<1	0	0
Silver	ppm	ASTM D5185m	>2	<1	<1	0
Aluminum	ppm	ASTM D5185m	>25	5	7	6
Lead	ppm	ASTM D5185m	>45	0	0	0
Copper	ppm	ASTM D5185m	>85	2	2	4
Tin	ppm	ASTM D5185m	>4	<1	<1	<1
Vanadium	ppm	ASTM D5185m		0	0	0
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 2	history2 23
	ppm ppm					
Boron Barium	ppm	ASTM D5185m	0	<1	2	23
Boron		ASTM D5185m ASTM D5185m	0	<1 9	2 0	23 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	<1 9 67	2 0 61	23 0 90
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	<1 9 67 <1	2 0 61 <1	23 0 90 <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 9 67 <1 1013	2 0 61 <1 978	23 0 90 <1 982
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 9 67 <1 1013 1129	2 0 61 <1 978 1061	23 0 90 <1 982 1165
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 9 67 <1 1013 1129 1058	2 0 61 <1 978 1061 1025	23 0 90 <1 982 1165 976
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	<1 9 67 <1 1013 1129 1058 1301	2 0 61 <1 978 1061 1025 1253	23 0 90 <1 982 1165 976 1168
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	<1 9 67 <1 1013 1129 1058 1301 3106	2 0 61 <1 978 1061 1025 1253 3551	23 0 90 <1 982 1165 976 1168 3026
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 method ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 Limit/base >30	<1 9 67 <1 1013 1129 1058 1301 3106 current	2 0 61 <1 978 1061 1025 1253 3551 history1	23 0 90 <1 982 1165 976 1168 3026 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	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 method	0 0 60 0 1010 1070 1150 1270 2060 Limit/base >30	<1 9 67 <1 1013 1129 1058 1301 3106 current 10	2 0 61 <1 978 1061 1025 1253 3551 history1 3	23 0 90 <1 982 1165 976 1168 3026 history2 23
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 method ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 Limit/base >30	<1 9 67 <1 1013 1129 1058 1301 3106 <u>current</u> 10 0	2 0 61 <1 978 1061 1025 1253 3551 history1 3 2 9 9	23 0 90 <1 982 1165 976 1168 3026 history2 23 3
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 >30 >20 Imit/base	<1 9 67 <1 1013 1129 1058 1301 3106 current 10 0 16 current 0.5	2 0 61 <1 978 1061 1025 1253 3551 history1 3 2 9 history1 0.3	23 0 90 <1 982 1165 976 1168 3026 history2 23 3 3 33 33 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 TS ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 Imit/base >30 >20	<1 9 67 <1 1013 1129 1058 1301 3106 current 10 0 16 current 0.5 10.0	2 0 61 <1 978 1061 1025 1253 3551 history1 3 2 9 history1 0.3 8.2	23 0 90 <1 982 1165 976 1168 3026 history2 23 3 3 33 33
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 >30 >20 Imit/base	<1 9 67 <1 1013 1129 1058 1301 3106 current 10 0 16 current 0.5	2 0 61 <1 978 1061 1025 1253 3551 history1 3 2 9 history1 0.3	23 0 90 <1 982 1165 976 1168 3026 history2 23 3 3 33 33 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 imit/base >30 220 imit/base >3 >20	<1 9 67 <1 1013 1129 1058 1301 3106 current 10 0 16 current 0.5 10.0	2 0 61 <1 978 1061 1025 1253 3551 history1 3 2 9 history1 0.3 8.2	23 0 90 <1 982 1165 976 1168 3026 history2 23 23 3 3 33 history2 0.3 8.2
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 >30 20 Imit/base >3 >20	<1 9 67 <1 1013 1129 1058 1301 3106 current 10 0 16 current 0.5 10.0 20.5	2 0 61 <1 978 1061 1025 1253 3551 history1 3 2 9 <u>history1</u> 0.3 8.2 18.5	23 0 90 <1 982 1165 976 1168 3026 history2 23 3 3 33 history2 0.3 8.2 18.4
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 D7624 *ASTM D7415	0 0 0 1010 1070 1150 1270 2060 imit/base >30 220 imit/base >3 >20 >30	<1 9 67 <1 1013 1129 1058 1301 3106 Current 10 0 16 Current 0.5 10.0 20.5 Current	2 0 61 <1 978 1061 1025 1253 3551 history1 3 2 9 history1 0.3 8.2 18.5 history1	23 0 90 <1 982 1165 976 1168 3026 history2 23 3 3 33 33 history2 0.3 8.2 18.4 history2



OIL ANALYSIS REPORT

VISUAL



	Laboratory Sample No. Lab Number Unique Number Test Package	: GFL0104579 : 06045468 · : 10806076	Recieve Diagnos	501 Madison Ave., Cary, NC 27513 Recieved : 26 Dec 2023 Diagnosed : 27 Dec 2023 Diagnostician : Wes Davis <i>ice at 1-800-237-1369</i> .			GFL Environmental - 947 - WB Horicon H N7296 County Rd Horicon, V US 5300 Contact: Tim Kieff tim.kieffer@gflenv.co		
		Dec7/22	Apri 3/23 +	Aug23/23	0.0 Dec21/23	Dec7/22	Apr13/23	Aug23/23	
		213 43 14 13 Abnormal			4.0 ese 2.0				
		17 16 Base 15 15 14			0.8 0.6 0.6 8 8 8 8 8 9 0.4 0 0.4 0 0.4 0 0.4 0 0.4 0 0.4 0 0.4 0 0.4 0 0.4 0 0.4 0 0.4 0 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0		\searrow	\frown	
		19 18 - Abnormal	1	1 1 1	10.0	~	1		
		Viscosity @ 10	Apr13/23	Aug23/23	Dec21/23	Page Number			
		Jan 6/23	3/23	3/23 (1/23				
		4							
		14 12 copper lead							
		Non-ferrous M		Aug2	Dec2				
		Dec7/22	Apr13/23	Aug23/23	Dec21/23				
		30 20 -							
A	Aı	50 E 40							
Apr13/23	Aug23/23 +	ron iron chromium 60							
		GRAPHS Ferrous Alloys							
		Visc @ 100°C	cSt	ASTM D445		14.1	14.2	13.7	
		Free Water FLUID PRO	scalar PERTIES	*Visual method	limit/base	NEG current	NEG history1	NEG history2	
	4	Emulsified Wate	r scalar	*Visual	>0.2	NEG	NEG	NEG	
Apr13/23	Aug23/23 Dec21/23	Appearance Odor	scalar scalar	*Visual *Visual	NORML NORML	NORML NORML	NORML NORML	NORML NORML	
		Debris Sand/Dirt	scalar scalar	*Visual *Visual	NONE NONE	NONE NONE	NONE	NONE	
		Silt	scalar	*Visual	NONE	NONE	NONE	NONE	
		Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE	

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Submitted By: See also GFL935 - Tim Kieffer