

# **OIL ANALYSIS REPORT**

### Sample Rating Trend

NORMAL



Diesel Engine

PETRO CANADA DURON SHP 15W40 (16 QTS)

## 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

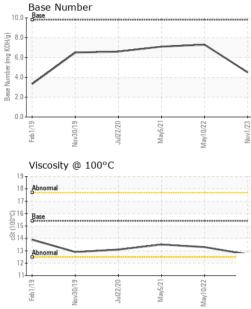
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

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SAMPLE INFOR	MATION	method	limit/base	current	history1	history2	
Sample Number		Client Info		GFL0094667	GFL0052448	PCA0039129	
Sample Date		Client Info		01 Nov 2023	10 May 2022	05 May 2021	
Machine Age	mls	Client Info		99577	73493	0	
Oil Age	mls	Client Info		26084	5538	10106	
Oil Changed		Client Info		Changed	Changed	N/A	
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	61	27	29	
Chromium	ppm		>20	1	<1	<1	
Nickel	ppm	ASTM D5185m	>4	0	0	0	
Titanium	ppm	ASTM D5185m	- T	0	0	0	
Silver		ASTM D5185m	>3	0	<1	<1	
Aluminum	ppm ppm	ASTM D5185m		4	4	3	
Lead		ASTM D5185m	>20	3	1	1	
	ppm	ASTM D5185m		2	2	1	
Copper	ppm				2	1	
Tin	ppm	ASTM D5185m ASTM D5185m	>15	<1		<1	
Antimony	ppm						
Vanadium	ppm	ASTM D5185m		0	<1	0	
Cadmium	ppm	ASTM D5185m		<1	<1	0	
ADDITIVES		method	limit/base	current	history1	history2	
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current 2	history1 15	history2 8	
	ppm ppm	ASTM D5185m					
Boron		ASTM D5185m	0	2	15	8	
Boron Barium	ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0	2 0	15 0	8 0	
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	2 0 61	15 0 60	8 0 57	
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	2 0 61 0	15 0 60 <1	8 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 61 0 457	15 0 60 <1 919	8 0 57 <1 810	
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 61 0 457 1491	15 0 60 <1 919 1168	8 0 57 <1 810 1060	
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 61 0 457 1491 954	15 0 60 <1 919 1168 1054	8 0 57 <1 810 1060 925	
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 61 0 457 1491 954 1162	15 0 60 <1 919 1168 1054 1268	8 0 57 <1 810 1060 925 1152	
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 1010 1070 1150 1270 2060	2 0 61 0 457 1491 954 1162 3115	15 0 60 <1 919 1168 1054 1268 2666	8 0 57 <1 810 1060 925 1152 2618	
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 ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	2 0 61 0 457 1491 954 1162 3115 current	15 0 60 <1 919 1168 1054 1268 2666 history1	8 0 57 <1 810 1060 925 1152 2618 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 <b>method</b>	0 0 60 1010 1070 1150 1270 2060 <b>limit/base</b>	2 0 61 0 457 1491 954 1162 3115 current 14	15 0 60 <1 919 1168 1054 1268 2666 history1 7	8 0 57 <1 810 1060 925 1152 2618 history2 8	
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 <b>limit/base</b>	2 0 61 0 457 1491 954 1162 3115 <u>current</u> 14 0	15 0 60 <1 919 1168 1054 1268 2666 history1 7 <1	8 0 57 <1 810 1060 925 1152 2618 history2 8 <	
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 <b>limit/base</b> >25 >20	2 0 61 0 457 1491 954 1162 3115 current 14 0 5	15 0 60 <1 919 1168 1054 1268 2666 history1 7 <1 3	8 0 57 <1 810 1060 925 1152 2618 history2 8 < <1 2	
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 ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 <b>limit/base</b> >20	2 0 61 0 457 1491 954 1162 3115 <u>current</u> 14 0 5 <u>current</u> 1.1	15 0 60 <1 919 1168 1054 1268 2666 history1 7 <1 3 history1 0.7	8 0 57 <1 810 1060 925 1152 2618 history2 8 <1 2 2 history2 0.7	
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 <i>limit/base</i> >25 >20 <i>limit/base</i> >3 >20	2 0 61 0 457 1491 954 1162 3115 <i>current</i> 14 0 5 <i>current</i> 1.1 1.1 13.2	15 0 60 <1 919 1168 1054 1268 2666 history1 7 <1 3 history1 0.7 11.2	8 0 57 <1 810 1060 925 1152 2618 history2 8 <1 2 8 <1 2 history2 0.7 11.1	
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 <b>imit/base</b> >25 <b>imit/base</b> >3 >20	2 0 61 0 457 1491 954 1162 3115 <u>current</u> 14 0 5 <u>current</u> 1.1 1.1 13.2 26.1	15 0 60 <1 919 1168 1054 1268 2666 history1 7 <1 3 <u>history1</u> 0.7 11.2 23.3	8 0 57 <1 810 1060 925 1152 2618 history2 8 <1 2 1 2 history2 0.7 11.1 23.6	
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 ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7415	0 0 0 1010 1070 1150 2260 225 220 220 imit/base >3 >20 >30 3 imit/base	2 0 61 0 457 1491 954 1162 3115 <i>current</i> 14 0 5 <i>current</i> 1.1 1.1 13.2 26.1 <i>current</i>	15 0 60 <1 919 1168 1054 1268 2666 history1 7 <1268 2666 0 history1 0.7 11.2 23.3 history1	8 0 57 <1 810 1060 925 1152 2618 history2 8 <1 2 8 <1 2 history2 0.7 11.1 23.6 history2	
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAI	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm ppm ppm ppm ppm ppm pp	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7415	0 0 0 1010 1070 1150 1270 2060 <b>imit/base</b> >25 <b>imit/base</b> >3 >20 30 <b>imit/base</b>	2 0 61 0 457 1491 954 1162 3115 <u>current</u> 14 0 5 <u>current</u> 1.1 13.2 26.1 <u>current</u>	15 0 60 <1 919 1168 1054 1268 2666 history1 7 <1 3 history1 0.7 11.2 23.3 history1 22.3	8 0 57 <1 810 1060 925 1152 2618 history2 8 <1 2 2 history2 0.7 11.1 23.6 history2 22.7	
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 2260 225 220 220 imit/base >3 >20 >30 3 imit/base	2 0 61 0 457 1491 954 1162 3115 <i>current</i> 14 0 5 <i>current</i> 1.1 1.1 13.2 26.1 <i>current</i>	15 0 60 <1 919 1168 1054 1268 2666 history1 7 <1268 2666 0 history1 0.7 11.2 23.3 history1	8 0 57 <1 810 1060 925 1152 2618 history2 8 <1 2 8 <1 2 history2 0.7 11.1 23.6 history2	



# **OIL ANALYSIS REPORT**

VISUAL



	Laboratory Sample No. Lab Number		Received : 02		ry, NC 2751: Nov 2023 Nov 2023	3 GFL Envi	GFL Environmental - 001 - Raleigh(CNG) 3741 Conquest Drive Garner, NC US 27529 Contact: Ronald Gregory rgregory@gflenv.com T: M 106:2012) F: (919)662-1730		
		17 16 16 16 16 16 16 16 16 16 16	Juizzizo Marfsizi	May10/22	(0)HOJ (0		Jui2220	May10/22 Nov1/23	
		Viscosity @ 100°C		May10/22	E2/1/10/1	Base Number			
		600 500 6 400 300 200 100 0 0 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7		2					
		Non-ferrous Meta	ls	2					
		Page 101 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	May5/21	May10/22	Nov1/23				
Jul2 Mar	May1	70 60 50 40 30			/				
Jui22/20 May5/21	May10/22 +	Ferrous Alloys							
		Visc @ 100℃ GRAPHS	cSt	ASTM D445	15.4	12.7	13.3	13.5	
		FLUID PROPE		method	limit/base	current	history1	history2	
°C		Emulsified Water Free Water	scalar scalar	*Visual *Visual	>0.2	NEG NEG	NEG NEG	NEG NEG	
Jul22/20 May5/21	May10/22 Nov1/23	Odor	scalar	*Visual	NORML	NORML	NORML	NORML	
/21	22	_ Sand/Dirt Appearance	scalar scalar	*Visual *Visual	NONE NORML	NONE NORML	NONE NORML	NONE NORML	
		Debris	scalar	*Visual	NONE	NONE	NONE	NONE	
		Silt	scalar	*Visual	NONE	NONE	NONE	NONE	
	_	Yellow Metal Precipitate	scalar scalar	*Visual *Visual	NONE NONE	NONE NONE	NONE NONE	NONE	
		White Metal	scalar	*Visual	NONE	NONE	NONE	NONE	



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