

## **OIL ANALYSIS REPORT**

Sample Rating Trend





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

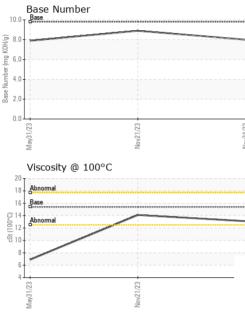
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0089106	GFL0089120	GFL0069846
Sample Date		Client Info		24 Nov 2023	21 Nov 2023	31 May 2023
Machine Age	mls	Client Info		249823	24804	23455
Oil Age	mls	Client Info		249823	0	600
Oil Changed		Client Info		Changed	N/A	Changed
Sample Status				NORMAL	NORMAL	SEVERE
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>3.0	<1.0	0.4	26.0
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	>90	13	6	9
Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Nickel	ppm	ASTM D5185m	>2	2	0	<b>1</b> 4
Titanium	ppm	ASTM D5185m	>2	0	<1	0
Silver	ppm	ASTM D5185m	>2	1	0	0
Aluminum	ppm	ASTM D5185m	>20	3	<1	<1
Lead	ppm	ASTM D5185m	>40	0	0	<1
Copper	ppm	ASTM D5185m	>330	45	<1	41
Tin	ppm		>15	1	0	0
Vanadium	ppm	ASTM D5185m		0	<1	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	0	16	0	<1
	ppm ppm			16 0	0	<1 0
Boron Barium Molybdenum		ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	16 0 58	0 0 58	<1 0 42
Boron Barium	ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	16 0 58 <1	0 0 58 <1	<1 0 42 <1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	16 0 58 <1 856	0 0 58 <1 1009	<1 0 42 <1 681
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	16 0 58 <1 856 1055	0 0 58 <1 1009 1095	<1 0 42 <1 681 807
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	16 0 58 <1 856 1055 1032	0 0 58 <1 1009 1095 977	<1 0 42 <1 681 807 749
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	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	16 0 58 <1 856 1055 1032 1170	0 0 58 <1 1009 1095 977 1359	<1 0 42 <1 681 807 749 878
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	16 0 58 <1 856 1055 1032 1170 2789	0 0 58 <1 1009 1095 977 1359 3276	<1 0 42 <1 681 807 749 878 2708
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	16 0 58 <1 856 1055 1032 1170 2789 current	0 0 58 <1 1009 1095 977 1359 3276 history1	<1 0 42 <1 681 807 749 878 2708 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> ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	16 0 58 <1 856 1055 1032 1170 2789 current 10	0 0 58 <1 1009 1095 977 1359 3276 history1 3	<1 0 42 <1 681 807 749 878 2708 kistory2 3
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 <b>method</b> ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 Limit/base >25	16 0 58 <1 856 1055 1032 1170 2789 <u>current</u> 10 3	0 0 58 <1 1009 1095 977 1359 3276 history1 3 5	<1 0 42 <1 681 807 749 878 2708 2708 history2 3 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 60 0 1010 1070 1150 1270 2060 <b>limit/base</b> >25 >20	16 0 58 <1 856 1055 1032 1170 2789 current 10 3 6	0 0 58 <1 1009 1095 977 1359 3276 history1 3 5 <1	<1 0 42 <1 681 807 749 878 2708 history2 3 6 5
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	16 0 58 <1 856 1055 1032 1170 2789 current 10 3 6	0 0 58 <1 1009 1095 977 1359 3276 history1 3 5 <1 history1	<1 0 42 <1 681 807 749 878 2708 <b>history2</b> 3 6 5 <b>history2</b>
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base >20	16 0 58 <1 856 1055 1032 1170 2789 current 10 3 6 current 0.3	0 0 58 <1 1009 1095 977 1359 3276 history1 3 5 <1 4 history1 0.1	<1 0 42 <1 681 807 749 878 2708 history2 3 6 5 5 history2 0.2
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	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 imit/base >20	16 0 58 <1 856 1055 1032 1170 2789 current 10 3 6 current 0.3 6.9	0 0 58 <1 1009 1095 977 1359 3276 history1 3 5 <1 5 <1 history1 0.1 5.6	<1 0 42 <1 681 807 749 878 2708 history2 3 6 5 history2 0.2 6.0
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 60 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base >20	16 0 58 <1 856 1055 1032 1170 2789 current 10 3 6 current 0.3	0 0 58 <1 1009 1095 977 1359 3276 history1 3 5 <1 4 history1 0.1	<1 0 42 <1 681 807 749 878 2708 history2 3 6 5 5 history2 0.2
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 D7844 *ASTM D7624	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 imit/base >20	16 0 58 <1 856 1055 1032 1170 2789 current 10 3 6 current 0.3 6.9	0 0 58 <1 1009 1095 977 1359 3276 history1 3 5 <1 5 <1 history1 0.1 5.6	<1 0 42 <1 681 807 749 878 2708 history2 3 6 5 history2 0.2 6.0
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 2060 225 20 225 20 <u>imit/base</u> >6 >20 20	16 0 58 <1 856 1055 1032 1170 2789 <u>current</u> 10 3 6 <u>current</u> 0.3 6.9 20.1	0 0 58 <1 1009 1095 977 1359 3276 history1 3 5 <1 history1 0.1 5.6 18.3	<1 0 42 <1 681 807 749 878 2708 history2 3 6 5 history2 0.2 6.0 17.0



# **OIL ANALYSIS REPORT**

VISUAL



						Current		
		White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
		Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
		Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
		Silt	scalar	*Visual	NONE	NONE	NONE	NONE
		Debris	scalar	*Visual	NONE	NONE	NONE	NONE
		Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
/23	/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Nov21/23	Nov24/23	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
-	6	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
				*Visual	>0.2			
1		Free Water	scalar			NEG	NEG	NEG
		FLUID PROPE		method	limit/base	current	history1	history2
		Visc @ 100°C	cSt	ASTM D445	15.4	13.1	14.1	6.9
		GRAPHS						
		Ferrous Alloys						
/23		12-			1			
Nov21/23		10						
~								
		uda l	/					
		6	$\sim$					
		4						
		2 -	$\backslash$	and an and a state of the state	and Williamson			
		0						
		31/23	21/23		Nov24/23			
		May31,	Nov21		Novi			
		Non-ferrous Meta	als					
		45 copper 1			1			
		40 - Beatenana lead		1				
		35 tin		/				
	,			/				
		E <sup>25</sup> <sub>20</sub>						
		15		/				
		10	/					
		5	$\setminus$ /					
		2	Nov21/23		Nov24/23			
		V31						
		May31/23			N			
		Viscosity @ 100°			N	Base Number		
		Viscosity @ 100°			2 10.0	D		
		Viscosity @ 100°			10.0	Base Number		
		Viscosity @ 100° Abnormal			10.0	Base Number		
	10	Viscosity @ 100° Abnormal			10.0	Base Number		
	1.100.00	Viscosity @ 100° Abnormal			10.0	Base Number		
	1,000,01,450	Viscosity @ 100°			10.0	Base		
	10-000 F 1400	Viscosity @ 100° Abnormal			10.0 8.0 (0)(HO) (0)(HO) 988 (Mumper 988	Base		
	10-000 17-800	Viscosity @ 100° Abnormal Base Abnormal Abnormal			10.0	Base		
	1000011787	Viscosity @ 100°	c		10.0 (0)HOX Bun January 888 2.0 0.0	Base		
	10-000 F1 45°	Viscosity @ 100°	c		10.0 (0)HOX Bun January 888 2.0 0.0	Base		
	10000 U 700	Viscosity @ 100° Abnormal Base Abnormal Abnormal			10.0 (0)HOX bul) bul) Jack B.0 (0)HOX bul) Jack B.0 (0)HOX B.0 (0)	Base	Nov21/23	
		Viscosity @ 100° Abnormal Base Abnormal Base Cite Cite Cite Cite Cite Cite Cite Cit	C		10.0 8.0 0.0(0) HO KON 9888 Namper 4.0 2.0 8888 0.0 0.0 0.0	Base EZ/12/12/12/12/12/12/12/12/12/12/12/12/12/	Nov21/23	
	pratory	Viscosity @ 100° bnormal bno	C EZI[2]		10.0 (0)HOX 6.0 10,0 10,0 10,0 10,0 10,0 10,0 10,0 10	Base EZ/12/12/12/12/12/12/12/12/12/12/12/12/12/	Nov21/23	15 - Michigan Ea:
Sam	oratory ple No.	Viscosity @ 100° bnormal Base bnormal bnormal base bnormal base control of the second base control of the second control of th	C EZUIZION 501 Madis Received	d : 27 M	10.0 (0)HO3 Bull Jagung 4.0 (0)HO3 Bull Jagung 4.0 (0)HO3 Bull Jagung 4.0 (0.0 (0)HO3 Bull Jagung 4.0 (0.0 (0)HO3 Bull Jagung 4.0 (0)HO3	Base EZ/12/12/12/12/12/12/12/12/12/12/12/12/12/	EZ/12/2001	15 - Michigan Ea 6200 Elmridg
Sam Lab	pratory ple No. Number	Viscosity @ 100° boomal Base boomal boomal base boomal base boomal base ba	C EZUIZION 501 Madia Received Diagnose	d : 27 M ed : 29 M	10.0 (0)HO3 Bull Jaquing 4.0 (0)HO3 Bull Jaquing 4.0 (0)HO3 Bull Jaquing 4.0 (0,0) (	Base E271E/New B GFL Env	EZ/12/2001	<b>15 - Michigan Ea</b> 6200 Elmridg erling Heights, N
Sam Lab I Uniqu	pratory ple No. Number Je Number	Viscosity @ 100° bnormal Base bnormal bnormal base bnormal base control of the second base control of the second control of th	C EZUIZION 501 Madis Received	d : 27 M ed : 29 M	10.0 (0)HO3 Bull Jagung 4.0 (0)HO3 Bull Jagung 4.0 (0)HO3 Bull Jagung 4.0 (0.0 (0)HO3 Bull Jagung 4.0 (0.0 (0)HO3 Bull Jagung 4.0 (0)HO3	Base E271E/New B GFL Env	rironmental - 4	15 - Michigan Ea 6200 Elmridg
Samı Lab I Uniqu untificate L2367 Test	pratory ple No. Number Je Number Package	Viscosity @ 100° Abnormal Base Abnormal Base Abnormal Base Control of the second Base B	C EZI Zong 501 Madis Received Diagnost	d : 27 M ed : 29 M tician : Jon	10.0 (0)HO3 Bull 35 (0.0 (0)HO3 Bull 35 (0.0 (0)HO3 Bull 35 (0.0 (0,HO3 Bull 35 (0.0) (0,HO3 Bull 35 (0.0	Base E271E/New B GFL Env	rironmental - 4 Ste	<b>15 - Michigan Ea</b> 6200 Elmridg erling Heights, N US 4831

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