

## **OIL ANALYSIS REPORT**

Sample Rating Trend



Component Diesel Engine

Machine Id

### 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.

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SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0091536	GFL0081311	GFL0071156
Sample Date		Client Info		12 Sep 2023	17 May 2023	03 Apr 2023
Machine Age	hrs	Client Info		15316	18035	17771
Oil Age	hrs	Client Info		600	600	600
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
Glycol		WC Method		NEG	NEG	0.0
WEAR METAL	S	method	limit/base	current	history1	history2
				66	29	41
Iron Chromium	ppm	ASTM D5185m ASTM D5185m	>90	3	29	2
Nickel	ppm	ASTM D5185m		3 1	<1	<1
Titanium	ppm ppm	ASTM D5185m		۱ <1	0	<1
Silver		ASTM D5185m	>2	<1 0	0	0
Aluminum	ppm ppm	ASTM D5185m	>20	11	5	4
Lead	ppm	ASTM D5185m	>20	3	0	4 <1
Copper	ppm	ASTM D5185m		2	<1	1
Tin		ASTM D5185m	>15	2 <1	0	0
Vanadium	ppm ppm	ASTM D5185m	>10	<1	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
	ppm				-	-
ADDITIVES			limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	0	1	2	6
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	1 0	2 0	6 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	1 0 65	2 0 58	6 0 68
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	1 0 65 1	2 0 58 <1	6 0 68 <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 0 65 1 1120	2 0 58 <1 880	6 0 68 <1 960
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 0 65 1 1120 1288	2 0 58 <1 880 1019	6 0 68 <1 960 1128
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 0 65 1 1120 1288 1121	2 0 58 <1 880 1019 964	6 0 68 <1 960 1128 1071
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	1 0 65 1 1120 1288 1121 1451	2 0 58 <1 880 1019 964 1187	6 0 68 <1 960 1128 1071 1300
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 0 65 1 1120 1288 1121 1451 3638	2 0 58 <1 880 1019 964 1187 2941	6 0 68 <1 960 1128 1071 1300 3105
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	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 0 1010 1070 1150 1270 2060	1 0 65 1 1120 1288 1121 1451 3638 current	2 0 58 <1 880 1019 964 1187 2941 history1	6 0 68 <1 960 1128 1071 1300 3105 history2
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 <b>method</b>	0 0 60 0 1010 1070 1150 1270 2060	1 0 65 1 1120 1288 1121 1451 3638	2 0 58 <1 880 1019 964 1187 2941 history1 9	6 0 68 <1 960 1128 1071 1300 3105
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b> ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 Limit/base	1 0 65 1 1120 1288 1121 1451 3638 <u>current</u> 13 16	2 0 58 <1 880 1019 964 1187 2941 history1 9 18	6 0 68 <1 960 1128 1071 1300 3105 history2 11 81
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm	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 Limit/base	1 0 65 1 1120 1288 1121 1451 3638 current 13	2 0 58 <1 880 1019 964 1187 2941 history1 9	6 0 68 <1 960 1128 1071 1300 3105 history2 11
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b> ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 Limit/base	1 0 65 1 1120 1288 1121 1451 3638 <u>current</u> 13 16	2 0 58 <1 880 1019 964 1187 2941 history1 9 18	6 0 68 <1 960 1128 1071 1300 3105 history2 11 81
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 <b>limit/base</b> >25	1 0 65 1 1120 1288 1121 1451 3638 <u>current</u> 13 16 4 <u>current</u>	2 0 58 <1 880 1019 964 1187 2941 history1 9 18 2	6 0 68 <1 960 1128 1071 1300 3105 history2 11 81 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	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 <b>limit/base</b> >20	1 0 65 1 1120 1288 1121 1451 3638 current 13 16 4 x	2 0 58 <1 880 1019 964 1187 2941 history1 9 18 2 2 history1	6 0 68 <1 960 1128 1071 1300 3105 history2 11 81 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 ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 <b>limit/base</b> >20	1 0 65 1 1120 1288 1121 1451 3638 <u>current</u> 13 16 4 <u>current</u>	2 0 58 <1 880 1019 964 1187 2941 history1 9 18 2 history1 0.5	6 0 68 <1 960 1128 1071 1300 3105 history2 11 81 2 history2 0.6
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 ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <i>limit/base</i> >25 >20 <i>limit/base</i> >20	1 0 65 1 1120 1288 1121 1451 3638 <i>current</i> 13 16 4 <i>current</i> 1.6 1.6 14.3	2 0 58 <1 880 1019 964 1187 2941 history1 9 18 2 history1 0.5 9.8	6 0 68 <1 960 1128 1071 1300 3105 history2 11 81 2 history2 0.6 11.3
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> >6 >20	1 0 65 1 1120 1288 1121 1451 3638 <i>current</i> 13 16 4 <i>current</i> 1.6 14.3 26.0	2 0 58 <1 880 1019 964 1187 2941 history1 9 18 2 9 18 2 history1 0.5 9.8 20.4 history1	6 0 68 <1 960 1128 1071 1300 3105 history2 11 81 2 <u>history2</u> 0.6 11.3 22.2
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 D7844 *ASTM D7844	0 0 0 1010 1070 1150 1270 2060 2060 225 20 220 20 20 20 20 20 30 20 20 20 20 20 20 20 20 20 20 20 20 20	1 0 65 1 1120 1288 1121 1451 3638 <u>current</u> 13 16 4 <u>current</u> 1.6 1.6 14.3 26.0	2 0 58 <1 880 1019 964 1187 2941 history1 9 18 2 history1 0.5 9.8 20.4	6 0 68 <1 960 1128 1071 1300 3105 history2 11 81 2 history2 0.6 11.3 22.2 history2



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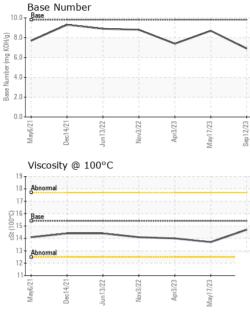
scalar

\*Visual

NONE

VISUAL

White Metal



						27513 GFL Environmental - 465 - Pontiac 23 888 Baldwir 23 Pontiac, M 0 US 48340 Contact: Ricky Matthews rickymathews@gflenv.com			
		13 + Abnormal 12 + 11 - 12/9/62 - 11 11 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9/62 - 12/9	Juni 3/22	Apr3/23 May17/23	Sep12/23		Jun 13/22 Nov3/22	Apr3/23	Sep 12/23 -
		17- (3-16- 16- 15- 3- 3- 15- 3- 3- 14- 3- 14- 3- 14- 14- 14- 15- 14- 15- 15- 15- 15- 15- 15- 15- 15			0.8 0.3 0.6 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4	)			\
		Viscosity @ 10	-	2		Base Number			
		May6/21	ZZ/Strun	Apri3/23	Sep12/23				
		8 copper 8 copper 6 copper 6 copper 8 c							
		Non-ferrous M	etals		Sep 12/23				
		E 40 30 20							
Nov3/22	Apr3/23 +	70 60 50			/				
		Visc @ 100°C GRAPHS Ferrous Alloys	cSt	ASTM D445	15.4	14.7	13.7	14.0	
		FLUID PRO		method	limit/base	current	history1	histor	ry2
		Free Water	scalar	*Visual		NEG	NEG	NEG	
С	2	Emulsified Water	scalar scalar	*Visual	>0.2	NORML NEG	NEG	NEG	L
Nov3/22	Apr3/23 May17/23	Appearance Odor	scalar	*Visual *Visual	NORML NORML	NORML	NORML NORML	NORM NORM	
5		Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE	
	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	NONE	

NONE

NONE

NONE