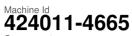


# **OIL ANALYSIS REPORT**

#### Sample Rating Trend





# Component

Diesel Engine

PETRO CANADA DURON SHP 15W40 (--- LTR)

## 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.

			-	121 Jan2022 Jul2022 May2023			
SAMPLE INFOR	MATION	method	limit/base	current	history1	history2	
Sample Number		Client Info		GFL0086528	GFL0074310	GFL0045503	
Sample Date		Client Info		27 Sep 2023	04 May 2023	09 Jul 2022	
Machine Age	mls	Client Info		634559	35119	0	
Oil Age	mls	Client Info		0	0	0	
Oil Changed		Client Info		N/A	Not Changd	N/A	
Sample Status				NORMAL	ABNORMAL	SEVERE	
CONTAMINAT	ION	method	limit/base	current	history1	history2	
Fuel		WC Method	>3.0	<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	>120	4	42	22	
Chromium	ppm	ASTM D5185m	>20	<1	2	1	
Nickel	ppm	ASTM D5185m	>5	0	<1	0	
Titanium	ppm	ASTM D5185m		0	1	0	
Silver	ppm	ASTM D5185m	>2	0	0	0	
Aluminum	ppm	ASTM D5185m	>20	2	<b>1</b> 1	1	
Lead	ppm	ASTM D5185m	>40	0	0	2	
Copper	ppm	ASTM D5185m	>330	<1	2	3	
Tin	ppm	ASTM D5185m	>15	<1	0	<1	
Antimony	ppm	ASTM D5185m					
Vanadium	ppm	ASTM D5185m		0	0	0	
Cadmium	ppm	ASTM D5185m		0	0	0	
				•	0		
ADDITIVES		method	limit/base	current	history1	history2	
ADDITIVES Boron	ppm		limit/base 0				
		method ASTM D5185m		current	history1	history2	
Boron	ppm	method ASTM D5185m	0	current 3	history1 9	history2 0	
Boron Barium	ppm ppm	method ASTM D5185m ASTM D5185m	0 0 60	current 3 0	history1 9 0	history2 0 4	
Boron Barium Molybdenum	ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	current 3 0 62	history1 9 0 58	history2 0 4 57	
Boron Barium Molybdenum Manganese	ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	current 3 0 62 0	history1 9 0 58 <1	history2 0 4 57 <1	
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	current 3 0 62 0 911	history1 9 0 58 <1 938	history2 0 4 57 <1 829	
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	Current 3 0 62 0 911 1063	history1 9 0 58 <1 938 1049	history2 0 4 57 <1 829 1022	
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150	Current 3 0 62 0 911 1063 1038	history1 9 0 58 <1 938 1049 1024	history2 0 4 57 <1 829 1022 896	
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270	Current 3 0 62 0 911 1063 1038 1252	history1 9 0 58 <1 938 1049 1024 1258	history2 0 4 57 <1 829 1022 896 1141	
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	Current 3 0 62 0 911 1063 1038 1252 3684	history1 9 0 58 <1 938 1049 1024 1258 3712	history2           0           4           57           <1           829           1022           896           1141           3149           history2           2	
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method 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	Current 3 0 62 0 911 1063 1038 1252 3684 Current	history1 9 0 58 <1 938 1049 1024 1258 3712 history1	history2 0 4 57 <1 829 1022 896 1141 3149 history2	
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm ppm <b>TS</b>	methodASTM D5185mASTM D5185m	0 0 60 1010 1070 1150 1270 2060 limit/base >25	Current           3           0           62           0           911           1063           1038           1252           3684           current           5	history1 9 0 58 <1 938 1049 1024 1024 1258 3712 history1 ▲ 29	history2           0           4           57           <1           829           1022           896           1141           3149           history2           2	
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 limit/base >25	Current           3           0           62           0           911           1063           1038           1252           3684           current           5           0           1	history1         9         0         58         <1         938         1049         1024         1258         3712         history1         29         <1	history2         0         4         57         <1         829         1022         896         1141         3149         history2         2         0	
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>limit/base</b> >25	Current           3           0           62           0           911           1063           1038           1252           3684           current           5           0           1	history1 9 0 58 <1 938 1049 1024 1258 3712 history1 ▲ 29 <1 2	history2           0           4           57           <1           829           1022           896           1141           3149           history2           2           0           0	
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>limit/base</b> >25	current           3           0           62           0           911           1063           1038           1252           3684           current           5           0           1           current	history1         9         0         58         <1         938         1049         1024         1258         3712         history1         ▲ 29         <1         2         history1	history2         0         4         57         <1         829         1022         896         1141         3149         history2         2         0         0         0         0         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	method           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20	current           3           0           62           0           911           1063           1038           1252           3684           current           5           0           1           current           0           1           current           0           1           current           0.1	history1         9         0         58         <1         938         1049         1024         1258         3712         history1         ▲ 29         <1         2         history1         0.8	history2         0         4         57         <1         829         1022         896         1141         3149         history2         2         0         0         history2         2         0         history2	
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	method           ASTM D5185m           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <i>limit/base</i> >25 >20 <i>limit/base</i> >4 >20	current           3           0           62           0           911           1063           1038           1252           3684           current           5           0           1           current           0           1           current           0.1           5.1	history1 9 0 58 <1 938 1049 1024 1258 3712 history1 ▲ 29 <1 2 history1 0.8 5.4	history2         0         4         57         <1         829         1022         896         1141         3149         history2         2         0         0         history2         2         0         history2         8.3         16.7	
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 <b>TS</b> ppm ppm ppm ppm ppm ppm <b>Abs/cm</b>	method           ASTM D5185m           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 20 225 20 220 20 20 20 20 20 20 20 20 20 20 20	current           3           0           62           0           911           1063           1038           1252           3684           current           5           0           1           current           0           1           current           0.1           5.1           17.6	history1         9         0         58         <1         938         1049         1024         1258         3712         history1         ▲ 29         <1         2         history1         0.8         5.4         17.2	history2         0         4         57         <1         829         1022         896         1141         3149         history2         2         0         0         history2         2         0         history2         8.3         16.7         35.6	
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 ppm ppm	method           ASTM D5185m           ASTM D7844           *ASTM D7624           *ASTM D7415           method	0 0 0 1010 1070 1150 1270 2060 /////////////////////////////////	Current           3           0           62           0           911           1063           1038           1252           3684           current           5           0           1           current           5.1           17.6           current	history1   9   0   58   <1   938   1049   1024   1258   3712   history1   29   <1   2   history1   0.8   5.4   17.2   history1	history2         0         4         57         <1         829         1022         896         1141         3149         history2         2         0         0         history2         2         0         history2         €         8.3         16.7         35.6         history2	

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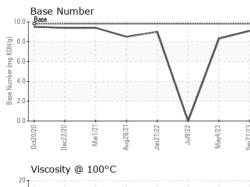
18

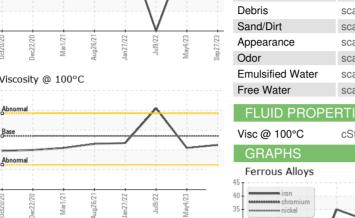
cSt (100°C) 15

12 10

# **OIL ANALYSIS REPORT**

VISUAL





Aug26/21 Jan27/22 Jul9/22	Pr Si De cz/j-hew Oc	ebris and/Dirt opearance dor	scalar scalar	*Visual *Visual *Visual *Visual *Visual *Visual *Visual	NONE  NONE  NONE  NONE  NONE  NONE  NONE  NORML  NORML	NONE NONE NONE NONE NONE NORML	NONE NONE NONE NONE NONE NORML NORML	NONE NONE NONE NONE NONE NORML NORML
°C		mulsified Water ree Water	scalar scalar	*Visual *Visual	>0.2	NEG NEG	NEG NEG	NEG NEG
~				method	limit/base	current	history1	history2
	Vi	isc @ 100°C	cSt	ASTM D445	15.4	14.5	14.2	18.2
		GRAPHS						
	45 T	Ferrous Alloys						
Aug26/21 Jan27/22 Jul9/22		chromium nickel	Jan21/2/2	Jul9/22	Sep21/23			
		20 21 21 20	22	23	23			
		0ct20/20 Dec22/20 Mar1/21	Jan 27/22	Jul9/22 May4/23	Sep27/23			
	20 T	Viscosity @ 100°C				Base Number		
	17- (2000) 16- 15- 14- 13- 12- 11-	Abnormal Base Abnormal 02/27200 02/27200	Jan27/22	Jul922	10.0 (0,HOX Bul) and HOX BEER (0,HOX BUL) and HOX	0c:20/20 Dec:22/20 Mart1/21	Aug26/21	Jub/222 Maj4/23
Sar Lab	nple No.       : G         Number       : O         que Number       : 10         the Package       : FI         ople report, contation       : C         thods that are out       : C	5965062       I         0671613       I         LEET       I         act Customer Servi       I         utside of the ISO 1       I	Received Diagnose Diagnosti Ce at 1-80 7025 scop	: 29 5 d : 02 0 cian : Ang 00-237-1369 be of accred	ep 2023 Oct 2023 ela Borella <i>tation.</i>		Contact:	chmond Hauling 0 Lewis Road Chester, VA US 23831 Jimmy Mayes s@gflenv.com T: F

\* - Denotes test methods that are outside of the ISO 17025 scope of accreditation. Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

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F: