

## **OIL ANALYSIS REPORT**

Sample Rating Trend





Machine Id 4578M Component

Fluid

Diesel Engine

## PETRO CANADA DURON SHP 15W40 (36 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.

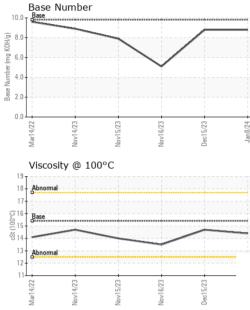
### Fluid Condition

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

	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0110013	GFL0104146	GFL0059316
Sample Date		Client Info		08 Jan 2024	15 Dec 2023	16 Nov 2023
Machine Age	hrs	Client Info		23530	23372	23244
Oil Age	hrs	Client Info		23530	23372	23244
Oil Changed		Client Info		N/A	N/A	N/A
Sample Status				NORMAL	NORMAL	ABNORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>3.0	<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	>90	22	10	61
Chromium	ppm	ASTM D5185m	>20	<1	<1	2
Nickel	ppm	ASTM D5185m	>2	0	0	<b>5</b>
Titanium	ppm	ASTM D5185m	>2	0	0	0
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>20	2	2	2
Lead	ppm	ASTM D5185m	>40	<1	0	<1
Copper	ppm	ASTM D5185m	>330	<1	<1	14
Tin	ppm	ASTM D5185m	>15	0	<1	2
Vanadium	ppm	ASTM D5185m		0	<1	0
Cadmium	ppm	ASTM D5185m		0	<1	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current <1	history1 <1	history2 0
	ppm ppm	ASTM D5185m				
Boron		ASTM D5185m	0	<1	<1	0
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	<1 0	<1 0	0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	<1 0 58	<1 0 60	0 0 61
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	<1 0 58 0	<1 0 60 0	0 0 61 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 58 0 1004	<1 0 60 0 1021	0 0 61 1 928
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 58 0 1004 1081	<1 0 60 0 1021 1161	0 0 61 1 928 1054
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 ASTM D5185m	0 0 60 0 1010 1070 1150	<1 0 58 0 1004 1081 996	<1 0 60 0 1021 1161 1127	0 0 61 1 928 1054 949
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 0 58 0 1004 1081 996 1344	<1 0 60 0 1021 1161 1127 1349	0 0 61 1 928 1054 949 1210
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 ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	<1 0 58 0 1004 1081 996 1344 3001	<1 0 60 0 1021 1161 1127 1349 3430	0 0 61 1 928 1054 949 1210 2104
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	<1 0 58 0 1004 1081 996 1344 3001 current	<1 0 60 0 1021 1161 1127 1349 3430 history1	0 0 61 1 928 1054 949 1210 2104 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 1010 1070 1150 1270 2060	<1 0 58 0 1004 1081 996 1344 3001 <i>current</i> 7	<1 0 60 0 1021 1161 1127 1349 3430 history1 6	0 0 61 1 928 1054 949 1210 2104 history2 6
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	<1 0 58 0 1004 1081 996 1344 3001 <u>current</u> 7 4	<1 0 60 0 1021 1161 1127 1349 3430 history1 6 3	0 0 61 1 928 1054 949 1210 2104 <b>history2</b> 6 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	<1 0 58 0 1004 1081 996 1344 3001 current 7 4 1	<1 0 60 0 1021 1161 1127 1349 3430 history1 6 3 2	0 0 61 1 928 1054 949 1210 2104 history2 6 6 6 3
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	<1 0 58 0 1004 1081 996 1344 3001 <i>current</i> 7 4 1 <i>current</i>	<1 0 60 0 1021 1161 1127 1349 3430 history1 6 3 2 2 history1	0 0 61 1 928 1054 949 1210 2104 <b>history2</b> 6 6 3 3 <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 <b>TS</b> ppm ppm	ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base >20	<1 0 58 0 1004 1081 996 1344 3001 <i>current</i> 7 4 1 <i>current</i> 0.3	<1 0 60 0 1021 1161 1127 1349 3430 history1 6 3 2 history1 0.2	0 0 61 1 928 1054 949 1210 2104 <b>history2</b> 6 6 6 3 <b>history2</b> 1.3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc 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 58 0 1004 1081 996 1344 3001 <i>current</i> 7 4 1 <i>current</i> 0.3 8.2	<1 0 60 0 1021 1161 1127 1349 3430 history1 6 3 2 history1 0.2 6.8	0 0 61 1 928 1054 949 1210 2104 history2 6 6 6 6 3 3 history2 1.3 11.0
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 20 220 <b>imit/base</b> >6 >20 20	<1 0 58 0 1004 1081 996 1344 3001 <i>current</i> 7 4 1 1 <i>current</i> 0.3 8.2 19.7	<1 0 60 0 1021 1161 1127 1349 3430 history1 6 3 2 <u>history1</u> 0.2 6.8 18.4	0 0 61 1 928 1054 949 1210 2104 <b>history2</b> 6 6 6 3 <b>history2</b> 1.3 11.0 23.6



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VISUAL		method	limit/base	current	history1	history
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
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG
FLUID PROPE		method	limit/base	current	history1	history
Visc @ 100°C	cSt	ASTM D445	15.4	14.4	14.7	13.5
GRAPHS						
Ferrous Alloys						
iron i		1				
- chromium	Λ					
) - nickel	/	<b>\</b>				
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	16/23	:15/23	an8/24			
	Nov16/23	Dec15/23	Jan8/24			
		Dec15/23	Jan8/24			
ZZ/blawW Non-ferrous Metal		Dec15/23	Jan8/24			
ZZ/F LIEW Non-ferrous Metal		Decl 5/23	Jan6/24			
ZZZ/ł LIEW Non-ferrous Metal		Dect 5/23	Jan8/24			
ZZ/F LIEW Non-ferrous Metal		Dect 5/23	Jan8/24			
ZZZ/ł LIEW Non-ferrous Metal		Dec15/23	Jan0/24			
Non-ferrous Metal		Dec15/23	Jan6)24			
ZZZ/ł LIEW Non-ferrous Metal		Dec15/23	Janô/24			
Non-ferrous Metal		Dec15/23	Jan0/24			
CZ2FF1FE RON-ferrous Metal		Dec15/23	Jan8/24			
CZ2/FLIEW Non-ferrous Metal		Dec15/23	Jan 8/24			
CZ2FH1000 Non-ferrous Metal						
CZ2FH1000 Non-ferrous Metal						
CZ2FH1000 Non-ferrous Metal		Dec15/23	Jan8/24 Jan8/24			
ZZi+Jusy Non-ferrous Metal	Is					
CZ2FH1000 Non-ferrous Metal	Is		Jan6/24	Base Number		
ZZ2+J1mW Non-ferrous Metal	Is					
Non-ferrous Metal	Is		428per	Base Number		
Non-ferrous Metal	Is		428per	Base Number		
Non-ferrous Metal	Is		428per	Base Number		
Non-ferrous Metal	Is		428per	Base Number		
Non-ferrous Metal	Is		428per	Base Number		
Non-ferrous Metal	Is		428per	Base Number		
Non-ferrous Metal	Is		10.0 4709uer (0)H0) K0 (0)H0) ase Mumpa 4.0	Base Number		
Non-ferrous Metal	Is		428per	Base Number		
Non-ferrous Metal	Is		10.0 (0,HQ) Multiple (0,HQ) Mu	Base Number		
Non-ferrous Metal	Ezggivon		10.0 4709uer (0)H0) K0 (0)H0) ase Mumpa 4.0	Base Number	Nov15/23	Dec15/23



Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)