

## **OIL ANALYSIS REPORT**

Sample Rating Trend





Machine Id **4521M** Component **Diesel Engine** Fluid

## PETRO CANADA DURON SHP 15W40 (--- GAL)

### 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.

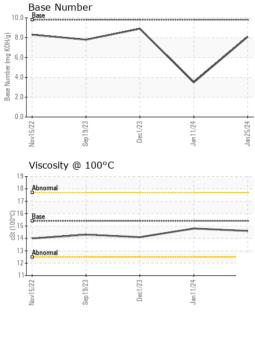
### Fluid Condition

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

SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0110041	GFL0110001	GFL0104386
Sample Date		Client Info		25 Jan 2024	11 Jan 2024	01 Dec 2023
Machine Age	hrs	Client Info		23503	23308	23057
Oil Age	hrs	Client Info		600	251	23057
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				NORMAL	ABNORMAL	NORMAL
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	52	25	10
Chromium	ppm	ASTM D5185m	>20	3	2	<1
Nickel	ppm	ASTM D5185m	>2	<1	<1	<1
Titanium	ppm	ASTM D5185m	>2	<1	0	0
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>20	4	<u> </u>	3
Lead	ppm	ASTM D5185m	>40	1	<1	<1
Copper	ppm	ASTM D5185m	>330	2	12	2
Tin	ppm	ASTM D5185m	>15	<1	<1	<1
Vanadium	ppm	ASTM D5185m		<1	0	0
Cadmium	ppm	ASTM D5185m		0	0	<1
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base 0	current 0	history1 2	history2 0
	ppm ppm					
Boron		ASTM D5185m	0	0	2 0 54	0
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0 0 60 0	0 0	2 0 54 <1	0
Boron Barium Molybdenum Manganese Magnesium	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	0 0 51 <1 848	2 0 54 <1 602	0 0 85 0 1374
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	0 0 51 <1	2 0 54 <1	0 0 85 0
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150	0 0 51 <1 848 952 897	2 0 54 <1 602 1504 717	0 0 85 0 1374 1431 1464
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	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	0 0 51 <1 848 952 897 1120	2 0 54 <1 602 1504 717 963	0 0 85 0 1374 1431 1464 1780
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	0 0 60 0 1010 1070 1150	0 0 51 <1 848 952 897	2 0 54 <1 602 1504 717	0 0 85 0 1374 1431 1464
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	0 0 60 0 1010 1070 1150 1270	0 0 51 <1 848 952 897 1120 2291 current	2 0 54 <1 602 1504 717 963 2419 history1	0 0 85 0 1374 1431 1464 1780 4669 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 ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	0 0 51 <1 848 952 897 1120 2291 2291 current 8	2 0 54 <1 602 1504 717 963 2419 history1 6	0 0 85 0 1374 1431 1464 1780 4669 history2 4
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	0 0 60 1010 1070 1150 1270 2060	0 0 51 <1 848 952 897 1120 2291 current 8 11	2 0 54 <1 602 1504 717 963 2419 history1 6 14	0 0 85 0 1374 1431 1464 1780 4669 history2 4 0
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	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	0 0 51 <1 848 952 897 1120 2291 2291 current 8	2 0 54 <1 602 1504 717 963 2419 history1 6	0 0 85 0 1374 1431 1464 1780 4669 history2 4
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 ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 limit/base >25	0 0 51 <1 848 952 897 1120 2291 current 8 11	2 0 54 <1 602 1504 717 963 2419 history1 6 14	0 0 85 0 1374 1431 1464 1780 4669 history2 4 0
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 <b>limit/base</b> >25	0 0 51 <1 848 952 897 1120 2291 current 8 11 3 <i>current</i> 2	2 0 54 <1 602 1504 717 963 2419 history1 6 14 14 14 14 0	0 0 85 0 1374 1431 1464 1780 4669 history2 4 0 7 history2 0.1
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 <b>TS</b>	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base	0 0 51 <1 848 952 897 1120 2291 <i>current</i> 8 11 3 <i>current</i> 2 15.4	2 0 54 <1 602 1504 717 963 2419 history1 6 14 14 14 14 0 0 11.1	0 0 85 0 1374 1431 1464 1780 4669 history2 4 0 7 history2 0.1 5.9
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 limit/base >25 >20 limit/base >6	0 0 51 <1 848 952 897 1120 2291 current 8 11 3 <i>current</i> 2	2 0 54 <1 602 1504 717 963 2419 history1 6 14 14 14 14 0	0 0 85 0 1374 1431 1464 1780 4669 history2 4 0 7 history2 0.1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	<pre>ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm</pre>	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 imit/base >25 imit/base >20	0 0 51 <1 848 952 897 1120 2291 <i>current</i> 8 11 3 <i>current</i> 2 15.4	2 0 54 <1 602 1504 717 963 2419 history1 6 14 14 14 14 0 0 11.1	0 0 85 0 1374 1431 1464 1780 4669 history2 4 0 7 history2 0.1 5.9
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	<pre>ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm</pre>	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>imit/base</b> >25 <b>imit/base</b> >20 <b>imit/base</b> >6 >20	0 0 51 <1 848 952 897 1120 2291 current 8 11 3 <i>current</i> 2 15.4 27.9	2 0 54 <1 602 1504 717 963 2419 history1 6 14 14 14 14 0 0 11.1 23.8	0 0 85 0 1374 1431 1464 1780 4669 history2 4 0 7 history2 0.1 5.9 17.9



# **OIL ANALYSIS REPORT**



		VISUAL		method	limit/base	current	history1	history2
		White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
		Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
		Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
	$\checkmark$	Silt	scalar	*Visual	NONE	NONE	NONE	NONE
		Debris	scalar	*Visual	NONE	NONE	NONE	NONE
		Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Dec1/23	Jan 11/24	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
	Jar	000	scalar	*Visual	NORML	NORML	NORML	NORML
		Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
		Free Water	scalar	*Visual		NEG	NEG	NEG
		FLUID PROPE			limit/base	current	history1	history2
1		Visc @ 100°C	cSt	ASTM D445	15.4	14.6	14.8	14.1
		GRAPHS						
		Ferrous Alloys						
/23	/24 -	50 - iron						
Dec1/23	Jan 1 1/24	nickel						
		40		/				
		<u>E</u> 30-		/				
		20		/				
		10	$\checkmark$					
		23	/23	/24	/24			
		Vov15/22 Sep19/23	Dec1/23	Jan11/24	Jan 25/24			
		2 07		,	,			
		Non-ferrous Meta	als					
		Non-ferrous Meta	als	^				
		12 copper	als	$\wedge$				
		12 10 copper 10 tin	als	$\wedge$				
		12 10 8	als	$\wedge$				
		12 10 copper 10 tin	als	$\bigwedge$				
		12 10 8	als	$\wedge$				
		12 10 8	als	$\wedge$				
		12 10 8	als	$\bigwedge$				
		12 10 10 10 10 10 10 10 10 10 10		57	29			
		12 10 10 10 10 10 10 10 10 10 10		an11/24	ar 25/24			
		12 10 10 10 10 10 10 10 10 10 10	Deci/23	Jan 11/24	Jan25/24			
		12 10 10 10 10 10 10 10 10 10 10	Deci/23	Jan11/24 -	7	Base Number		
		Viscosity @ 100°	Deci/23	Jan11/24	7	Base Number		
		Viscosity @ 100°	Deci/23	Jan 11/24	10.0	Base		
		Viscosity @ 100°	Deci/23	Jan11/24	10.0	Base		
		Viscosity @ 100°	Deci/23	Jan11/24	10.0	Base		
		12 10 10 10 10 10 10 10 10 10 10	Deci/23	Jan11/24	10.0	Base		
		12 10 10 10 10 10 10 10 10 10 10	Deci/23	Jan11/24	0.0 8.0 0.0 KOH(0) 0.0 Bun 10.0 Bun 10.	Base		
		12 10 10 10 10 10 10 10 10 10 10	Deci/23	Jani 1/24	10.0 (0)HOX Bull bull bull bull bull bull bull bull	Base		
		12 10 10 10 10 10 10 10 10 10 10	Decl/23		10.0 (0,0HOX Bu) Jaquiny 4.0 9888 2.0 0.0	Base		24
		12 10 10 10 10 10 10 10 10 10 10	Deci/23		10.0 (0,0HOX Bu) Jaquiny 4.0 9888 2.0 0.0	Base		lan 11/24
		12 10 10 10 10 10 10 10 10 10 10	Decl/23	Jan11/24 - Jan11/24 -	10.0 (0)HOX Bull bull bull bull bull bull bull bull	Base	Dec1/23	Jan11/24
	Laboratory	12 10 10 10 10 10 10 10 10 10 10	Decl/23	Jan 11/24 Jan	10.0 (0)HOX BUU Jaquing See BUU Jaquing See 2.0 +72/52 Lief	Nov15/22 Sep 19/23		
NAB	Laboratory Sample No.	Viscosity @ 100° beam in the second	C 501 Madia Recieved	son Ave., Ca	10.0 (0H0) Bull 50.0 (0H0) Seturn 4.0 (0H0) Seturn 4.0 (0	Nov15/22 Sep 19/23	EZU1990 vironmental - 410	<b>) - Michigan We</b> 00 Van Born F
	Laboratory Sample No. Lab Number	Viscosity @ 100°	C 501 Madia Recieved Diagnos	son Ave., Ca d : 01 red : 02	10.0 (0H0) Bull 50.0 (0H0) Second 4.0 (0H0) Second 4.0 (0	Nov15/22 Sep 19/23	EZU1990 vironmental - 410	<b>) - Michigan We</b> 00 Van Born F Wayne, N
	Laboratory Sample No. Lab Number Unique Numbe	Viscosity @ 100°	C 501 Madia Recieved	son Ave., Ca d : 01 red : 02	10.0 (0H0) Bull 50.0 (0H0) Seturn 4.0 (0H0) Seturn 4.0 (0	Nov15/22 Sep 19/23	vironmental - 410 3900	<b>) - Michigan We</b> 00 Van Born F Wayne, N US 4818
tificate 12367 discuss thi	Laboratory Sample No. Lab Number Unique Numbe Test Package	Viscosity @ 100°	C 501 Madii Recieved Diagnos	son Ave., Ca d : 01 tician : Dor	10.0 (0H0) Bull 50.0 (0H0) Set 10 (0H0) Set	Nov15/22 Sep 19/23	vironmental - 410 3900 Contac	<b>) - Michigan We</b> 00 Van Born F

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Submitted By: Belal Dgheish