

## **OIL ANALYSIS REPORT**

Sample Rating Trend



Machine Id 4618M

Fluid

Component Diesel Engine

PETRO CANADA DURON SHP 15W40 (5 GAL)

	5 GAL)	Ap		Jul2023 Mar20		
SAMPLE INFOR		method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0115023	GFL0085023	GFL001851
Sample Date		Client Info		05 Mar 2024	19 Jul 2023	05 Apr 2022
Machine Age	hrs	Client Info		21705	129699	16769
Oil Age	hrs	Client Info		620	0	0
Oil Changed		Client Info		Changed	Changed	N/A
Sample Status				ABNORMAL	SEVERE	SEVERE
CONTAMINAT	TION	method	limit/base	current	history1	history2
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	>75	39	77	28
Chromium	ppm	ASTM D5185m	>5	<1	3	1
Nickel	ppm	ASTM D5185m	>4	0	<1	<1
Titanium	ppm	ASTM D5185m	>2	0	0	<1
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>15	2	2	2
Lead	ppm	ASTM D5185m	>25	0	0	0
Copper	ppm	ASTM D5185m	>100	<1	<1	<1
Tin	ppm	ASTM D5185m	>4	0	0	<1
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	0	0	3	4
Barium	ppm	ASTM D5185m	0	0	0	0
Molybdenum	ppm	ASTM D5185m	60	52	45	55
Manganese	ppm	ASTM D5185m	0	0	<1	<1
Magnesium	ppm	ASTM D5185m	1010	799	732	889
Calcium	ppm	ASTM D5185m	1070	884	797	1024
Phosphorus	ppm	ASTM D5185m	1150	771	758	1051
Zinc	ppm	ACTM DE105m	1270			
	pp	ASTM D5185m	1270	996	927	1150
Sulfur	ppm	ASTM D5185m ASTM D5185m	2060	996 2331	927 2411	1150 2411
	ppm					2411
Sulfur	ppm	ASTM D5185m	2060 limit/base	2331	2411	2411
Sulfur CONTAMINAN	ppm NTS	ASTM D5185m method	2060 limit/base	2331 current	2411 history1	2411 history
Sulfur CONTAMINAN Silicon	ppm VTS ppm	ASTM D5185m method ASTM D5185m	2060 limit/base	2331 current 9	2411 history1 8	2411 history 6 6 0
Sulfur CONTAMINAN Silicon Sodium	ppm NTS ppm ppm	ASTM D5185m method ASTM D5185m ASTM D5185m	2060 limit/base >25 >20	2331 current 9 3	2411 history1 8 4	2411 history2 6 6
Sulfur CONTAMINAN Silicon Sodium Potassium	ppm NTS ppm ppm ppm	ASTM D5185m method ASTM D5185m ASTM D5185m ASTM D5185m	2060 limit/base >25 >20	2331 current 9 3 0	2411 history1 8 4 0	2411 history2 6 6 0 ▲ 13.3
Sulfur CONTAMINAN Silicon Sodium Potassium Fuel	ppm NTS ppm ppm ppm	ASTM D5185m method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D3524	2060 limit/base >25 >20 >3.0	2331 <u>current</u> 9 3 0 ▲ 5.3	2411 history1 8 4 0 ▲ 26.4	2411 history2 6 6 0 ▲ 13.3
Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED	ppm VTS ppm ppm ppm %	ASTM D5185m method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D3524 method	2060 limit/base >25 >20 >3.0 limit/base >6	2331 current 9 3 0 ▲ 5.3 current	2411 history1 8 4 0 26.4 history1	2411 history: 6 6 6 0 ▲ 13.3 history:
Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot %	ppm VTS ppm ppm ppm %	ASTM D5185m method ASTM D5185m ASTM D5185m ASTM D3524 Method *ASTM D7844	2060 limit/base >25 >20 >3.0 limit/base >6	2331 current 9 3 0 ▲ 5.3 current 0.7	2411 history1 8 4 0 26.4 history1 1	2411 history2 6 6 6 0 ▲ 13.3 history2 1
Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration	ppm VTS ppm ppm ppm % Abs/cm Abs/.1mm	ASTM D5185m method ASTM D5185m ASTM D5185m ASTM D3524 *ASTM D7824 *ASTM D7824 *ASTM D7624	2060 limit/base >25 >20 >3.0 limit/base >6 >20	2331 current 9 3 0 ► 5.3 current 0.7 11.5	2411 history1 8 4 0 ▲ 26.4 history1 1 1 12.4	2411 history2 6 6 0 ▲ 13.3 history2 1 13.0 23.8
Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation	ppm VTS ppm ppm ppm % Abs/cm Abs/.1mm	ASTM D5185m method ASTM D5185m ASTM D5185m ASTM D3524 *ASTM D7824 *ASTM D7824 *ASTM D7624	2060 limit/base >25 >20 >3.0 limit/base >6 >20 >30	2331 current 9 3 0 ▲ 5.3 current 0.7 11.5 21.9	2411 history1 8 4 0 26.4 history1 1 12.4 21.9	2411 history2 6 6 6 0 13.3 history2 1 13.0



Recommendation

The oil change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

### Wear

All component wear rates are normal.

#### Contamination

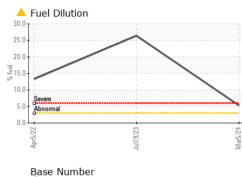
There is a moderate amount of fuel present in the oil. Tests confirm the presence of fuel in the oil.

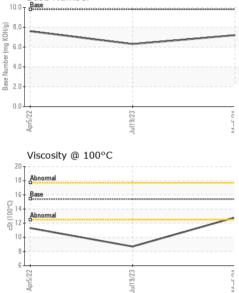
#### Fluid Condition

The BN result indicates that there is suitable alkalinity remaining in the oil. The oil is no longer serviceable due to the presence of contaminants. FUEL



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	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
	Silt	scalar	*Visual	NONE	NONE	NONE	NONE
	Debris	scalar	*Visual	NONE	NONE	NONE	NONE
1	Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Mar5/24	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	ERTIES	method	limit/base	current	history1	history2
	Visc @ 100°C	cSt	ASTM D445	15.4	12.8	▲ 8.7	11.3
	GRAPHS						
	Ferrous Alloys						
	80 70 iron	$\wedge$					
1-E 73	60						
	50						
	Ē 40						
	30						
	20 -						
	10-						
				ULULULUUU			
	Apr5/22	Jul19/23		Mar5/24			
	A	Ju		×			
	Non-ferrous Meta	als					
M-E /2	copper						
	8 - Head						
	6						
	6- E						
	6- Ed 4-						
	6- Wdd 4-						
	Б 4 2-						
	4						
	4	19723 119723		at5/24			
	4 0 27/gddy	Jult9/23		Mar5/24			
	4				Base Numbe	er	
	Viscosity @ 100°				Base Numb	er	
	Viscosity @ 100°			10.0		er	
	Viscosity @ 100°			10.0		er	
	Viscosity @ 100°			10.0		er	
	Viscosity @ 100° Abnomal Base Digital Abnomal			10.0		er	
	Viscosity @ 100°			10.0 (0,100 to 0,0 (0,100 to 0,0 (0,100 to 0,0 (0,100 to 0,0) (0,100 to 0,0) (0,1		er	
	Viscosity @ 100° Abnomal Base Digital Abnomal			10.0		er	
	Viscosity @ 100° Abnomal Base Colling Abnomal Base Abnomal Base	c		10.0 (0)HOX be be unagent 4.0 2.0 0.0	Base		
	Viscosity @ 100° Abnomal Base Colling Abnomal Base Abnomal Base	c		10.0 (0)HOX be be unagent 4.0 2.0 0.0	Base		
	Viscosity @ 100°			10.0 (BHO) BU apuny see 9 2.0		er	
Laboratory	Viscosity @ 100° Viscosity @ 100° Abnomal Base Control of the second	C EZőőjin D1 Madisc		10.0 (BHO) BU aumy accord and the second sec	Base		
Sample No.	Viscosity @ 100° Viscosity @ 100° Abnomal Base Control of the second	C EZGIIII D1 Madisc Recei	ived : 11	10.0 (BHO) BU Jack Hole (BHO) BU (BHO) BU JACH HOLE (BHO) BU (BHO) BU (B	Base	Environmental -	7400 Napier F
Sample No. Lab Number	Viscosity @ 100° Viscosity @ 100°	C EZGIIII D1 Madisc Recei Teste	ived : 11 ed : 13	10.0 (BHO) BU aumy accord and the second sec	GFL I	Environmental -	
Sample No. Lab Number Unique Number Test Package	Viscosity @ 100° Viscosity @ 100° Abnomal Base Control of the second	C D1 Madisc Rece Teste Diagr rests: Perc	ived : 11 ed : 13 nosed : 13 centFuel )	10.0 (a) HO (b) HO (b) HO (c) HO (c	GFL I	Environmental - N Contact: .	7400 Napier F NORTHVILLE, I

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

F: