

OIL ANALYSIS REPORT

Sample Rating Trend





Machine Id 819017 Component Diesel Engine

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.

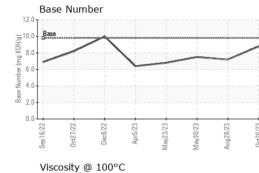
Fluid Condition

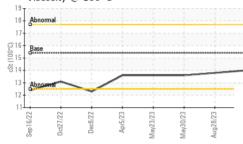
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORI	MATION	method				history2
Sample Number		Client Info		GFL0092774	GFL0080830	GFL0082781
Sample Date		Client Info		26 Oct 2023	28 Aug 2023	30 May 2023
Machine Age	hrs	Client Info		3719	3453	2682
Oil Age	hrs	Client Info		2682	0	600
Oil Changed		Client Info		N/A	Not Changd	Changed
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT		method	limit/base	current	history1	history2
					<1.0	
Fuel			>5	<1.0		<1.0
Glycol		WC Method		NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>80	33	65	15
Chromium	ppm	ASTM D5185m	>5	1	3	<1
Nickel	ppm	ASTM D5185m	>2	<1	<1	<1
Titanium	ppm	ASTM D5185m		0	0	0
Silver	ppm	ASTM D5185m	>3	<1	<1	0
Aluminum	ppm	ASTM D5185m	>30	5	17	<1
Lead	ppm	ASTM D5185m	>30	1	0	0
Copper	ppm	ASTM D5185m	>150	4	4	5
Tin	ppm	ASTM D5185m	>5	<1	<1	<1
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		<1	0	0
		mathad	limit/base		biotom	history2
ADDITIVES		method			nistory i	TIIStOLYZ
	maa				history1 4	
Boron	ppm mag	ASTM D5185m	0	1	4	<1
Boron Barium	ppm	ASTM D5185m ASTM D5185m			4 0	
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	1 4 57	4	<1 0 57
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m	0	1 4 57 <1	4 0 73	<1 0
Boron Barium Molybdenum	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	1 4 57 <1 830	4 0 73 1 1056	<1 0 57 <1
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	1 4 57 <1	4 0 73 1	<1 0 57 <1 937
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	1 4 57 <1 830 982 860	4 0 73 1 1056 1154 1087	<1 0 57 <1 937 1056 921
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 1150	1 4 57 <1 830 982	4 0 73 1 1056 1154	<1 0 57 <1 937 1056
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 4 57 <1 830 982 860 1125 2892	4 0 73 1 1056 1154 1087 1336 3431	<1 0 57 <1 937 1056 921 1213 3066
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	1 4 57 <1 830 982 860 1125 2892 current	4 0 73 1 1056 1154 1087 1336 3431 history1	<1 0 57 <1 937 1056 921 1213 3066 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 ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	1 4 57 <1 830 982 860 1125 2892 current 5	4 0 73 1 1056 1154 1087 1336 3431 history1 10	<1 0 57 <1 937 1056 921 1213 3066 history2 3
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 ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 kimit/base >20	1 4 57 <1 830 982 860 1125 2892 current 5 3	4 0 73 1 1056 1154 1087 1336 3431 history1 10 11	<1 0 57 <1 937 1056 921 1213 3066 history2 3 3 3
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 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 limit/base >20	1 4 57 <1 830 982 860 1125 2892 current 5 3 10	4 0 73 1 1056 1154 1087 1336 3431 history1 10 11 34	<1 0 57 <1 937 1056 921 1213 3066 history2 3 3 3 <1
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 ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 kimit/base >20	1 4 57 <1 830 982 860 1125 2892 current 5 3	4 0 73 1 1056 1154 1087 1336 3431 history1 10 11	<1 0 57 <1 937 1056 921 1213 3066 history2 3 3 3
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 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 limit/base >20	1 4 57 <1 830 982 860 1125 2892 current 5 3 10	4 0 73 1 1056 1154 1087 1336 3431 history1 10 11 34	<1 0 57 <1 937 1056 921 1213 3066 history2 3 3 3 <1
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 2060 220 20 20 20 20 20 20	1 4 57 <1 830 982 860 1125 2892 current 5 3 10 current	4 0 73 1 1056 1154 1087 1336 3431 history1 10 11 34 X4	<1 0 57 <1 937 1056 921 1213 3066 history2 3 3 <1 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 TS ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 2060 220 20 20 20 20 20 20	1 4 57 <1 830 982 860 1125 2892 <u>current</u> 5 3 10 <u>current</u> 1.7	4 0 73 1 1056 1154 1087 1336 3431 history1 10 11 34 history1 0.8	<1 0 57 <1 937 1056 921 1213 3066 history2 3 3 <1 history2 0.7
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> >20 <i>limit/base</i> >20	1 4 57 <1 830 982 860 1125 2892 <u>current</u> 5 3 10 <u>current</u> 1.7 10.1	4 0 73 1 1056 1154 1087 1336 3431 history1 10 11 34 history1 0.8 10.6	<1 0 57 <1 937 1056 921 1213 3066 history2 3 3 3 <1 history2 0.7 8.3
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 2060 200 200 200 320 320 33 200 230	1 4 57 <1 830 982 860 1125 2892 <u>current</u> 5 3 10 <u>current</u> 1.7 10.1 22.0	4 0 73 1 1056 1154 1087 1336 3431 history1 10 11 34 history1 0.8 10.6 21.3	<1 0 57 <1 937 1056 921 1213 3066 history2 3 3 <1 kistory2 0.7 8.3 20.3
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 D7844 *ASTM D7844	0 0 0 1010 1070 1150 1270 2060 2060 2060 200 200 200 200 200 200	1 4 57 <1 830 982 860 1125 2892 current 5 3 10 current 1.7 10.1 22.0 current	4 0 73 1 1056 1154 1087 1336 3431 history1 10 11 34 history1 0.8 10.6 21.3 history1	<1 0 57 <1 937 1056 921 1213 3066 history2 3 3 3 <1 history2 0.7 8.3 20.3 history2



OIL ANALYSIS REPORT





VISUAL		method	limit/base	current	history1	history2
	scalar	*Visual	NONE	NONE	NONE	NONE
	scalar	*Visual	NONE	NONE	NONE	NONE
	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 PROPER	TIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.4	14.0	13.8	13.6
GRAPHS						
Ferrous Alloys						
im		1				
iron		Δ.				
- chromium		\wedge				
		/: / : \	1.1			
nickel			1			
- Inckel						
		/	\sim			
		/	\mathbf{A}			
			$\mathbf{\lambda}$			
			\mathbf{X}			
			\mathbf{X}			
			$\mathbf{\lambda}$			
	<u> </u>					
	123		3/3			
	EZIEZ/4		et88/23			
	CZJEZ/NeW	May30/23 Aug28/23	0ct26/23			
	EZIEZ/veW		0ct26/23			
ZZY91 Legs Non-ferrous Metals	Ma/23/23		Oct26/23			
ZZUGPHQ Non-ferrous Metals	May23/23		0cf58/23			
ZZUBJee ZZUBJee Non-ferrous Metals	Way23/23		0ct56/23			
ZZU91 das ZZU12240 Non-ferrous Metals	May23/23		0et26/23			
ZZI I CPO ZZI I CPO ZZI I CPO Non-ferrous Metals	May23/23		0et56/23			
ZZ/g1/deg Non-ferrous Metals	May(23/23		0cf58/23			
ZZYgites Non-ferrous Metals	Mar(23/23		0428/33			
Copper Source State Non-ferrous Metals	CZ/EZ/eW		Oct26/23			
Non-ferrous Metals	May23/23		0ct28/23			
CZUGDAD	Ma/23/23		005586/23			
CZUGJudy CZUGJudy Non-ferrous Metals	CZ/CZ/MW		0428/33			
Non-ferrous Metals	CZ/EZ/eW		Oct26/23			
CZJgradu ZZJgradu Non-ferrous Metals		May30/23	0ct26/23			
CZJgradu ZZJgradu Non-ferrous Metals		May30/23	0ct26/23			
CZUGING CZUGING Non-ferrous Metals		May30/23	0ct58/23			
Copper States in Copper States in Copper			0ct26/23	Baco Number		
Viscosity @ 100°C		May30/23	0ct26/23	Base Number		
Viscosity @ 100°C		May30/23	0ct26/23	Base Number		
EZIGINA ZZI (ZDA) ZZI (ZDA		May30/23	62/98290 000700 000700000000	1 1 1	-	
ZZUJ91des Non-ferrous Metals		May30/23	229270 00 229270 2000 20070 2000 2	Base Number	-	
ZZUJGION ZZUZZUGO Kon-ferrous Metals ZZUGDO ZZUZDO ZZUZDO ZZUZDO ZZUGON ZZUZDO ZZUZDO ZZUZDO ZZUZDO ZZUZDO ZZUGON ZZUZDO		May30/23	229270 00 229270 2000 20070 2000 2	1 1 1		
Non-ferrous Metals		May30/23	229270 00 229270 2000 20070 2000 2	1 1 1		
Non-ferrous Metals		May30/23	229270 00 229270 2000 20070 2000 2	1 1 1		
ZZUJGION ZZUZZUGO Kon-ferrous Metals ZZUGDO ZZUZDO ZZUZDO ZZUZDO ZZUGON ZZUZDO ZZUZDO ZZUZDO ZZUZDO ZZUZDO ZZUGON ZZUZDO		May30/23	229270 00 229270 2000 20070 2000 2	1 1 1	_	
Non-ferrous Metals		May30/23	12.0- 000 000 000 000 000 000 000 000 000	1 1 1	_	

0.0

Sep16/22

0ct27/22

Aug28/23 .

Vlay30/23

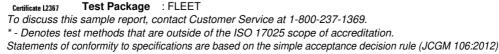
Diagnostician : Wes Davis

0ct26/23 .

: 03 Nov 2023

: 06 Nov 2023





12 11-

Laboratory

Sample No.

Lab Number

Unique Number : 10725991

Sep16/22.

0ct27/22

: GFL0092774

: 05997631

Dec8/22

Apr5/23

Mav23/23

: WearCheck USA - 501 Madison Ave., Cary, NC 27513

Received

Diagnosed

Dec8/22 -

Apr5/23

Vlav23/23

May30/23

Contact: MARK WOMBLE

mwomble@gflenv.com

GFL Environmental - 455 - Flint

Aug28/23

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Flint Township, MI

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US 48507

0ct26/23

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