

OIL ANALYSIS REPORT

Sample Rating Trend





Component Diesel Engine Fluid

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.

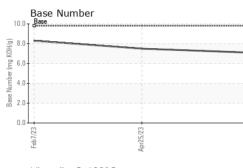
Fluid Condition

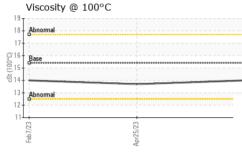
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0085413	GFL0075387	GFL0065813
Sample Date		Client Info		05 Jul 2023	25 Apr 2023	07 Feb 2023
Machine Age	mls	Client Info		232272	221741	212644
Oil Age	mls	Client Info		232272	212644	0
Oil Changed		Client Info		Changed	Changed	N/A
Sample Status				NORMAL	NORMAL	NORMAL
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	3	4	6
Chromium	ppm	ASTM D5185m	>20	0	<1	<1
Nickel	ppm	ASTM D5185m	>5	0	0	0
Titanium	ppm	ASTM D5185m	>2	0	0	0
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>20	<1	<1	0
Lead	ppm	ASTM D5185m	>40	<1	0	<1
Copper	ppm	ASTM D5185m	>330	2	1	<1
Tin	ppm	ASTM D5185m	>15	<1	0	<1
Vanadium	ppm	ASTM D5185m		<1	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method				history2
ADDITIVES Boron	ppm	ASTM D5185m	limit/base	current 0	history1 0	history2 0
	ppm ppm					
Boron		ASTM D5185m	0	0	0	0
Boron Barium Molybdenum	ppm	ASTM D5185m ASTM D5185m	0	0 0	0	0 0
Boron Barium	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	0 0 42	0 0 44	0 0 61
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	0 0 42 <1	0 0 44 <1	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	0 0 42 <1 14	0 0 44 <1 96	0 0 61 <1 949
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	0 0 42 <1 14 2568	0 0 44 <1 96 3116	0 0 61 <1 949 1063
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 1150	0 0 42 <1 14 2568 1073	0 0 44 <1 96 3116 1220	0 0 61 <1 949 1063 1028
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	0 0 42 <1 14 2568 1073 1280	0 0 44 <1 96 3116 1220 1473	0 0 61 <1 949 1063 1028 1237
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 1010 1070 1150 1270 2060 limit/base	0 0 42 <1 14 2568 1073 1280 3975	0 0 44 <1 96 3116 1220 1473 4347	0 0 61 <1 949 1063 1028 1237 2990
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 limit/base	0 0 42 <1 14 2568 1073 1280 3975 current	0 0 44 <1 96 3116 1220 1473 4347 history1	0 0 61 <1 949 1063 1028 1237 2990 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 1010 1070 1150 1270 2060 limit/base	0 0 42 <1 14 2568 1073 1280 3975 current 5	0 0 44 <1 96 3116 1220 1473 4347 history1 4	0 0 61 <1 949 1063 1028 1237 2990 history2 4
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 limit/base >25	0 0 42 <1 14 2568 1073 1280 3975 <u>current</u> 5 1	0 0 44 <1 96 3116 1220 1473 4347 history1 4 3	0 0 61 <1 949 1063 1028 1237 2990 history2 4 7
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 >25	0 0 42 <1 14 2568 1073 1280 3975 current 5 1 1 <1	0 0 44 <1 96 3116 1220 1473 4347 history1 4 3 0	0 0 61 <1 949 1063 1028 1237 2990 history2 4 7 2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base >4	0 0 42 <1 14 2568 1073 1280 3975 current 5 1 <1 <1	0 0 44 <1 96 3116 1220 1473 4347 history1 4 3 0 bistory1	0 0 61 <1 949 1063 1028 1237 2990 history2 4 7 2 2 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	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25 20 limit/base >4 >20	0 0 42 <1 14 2568 1073 1280 3975 <i>current</i> 5 1 <1 <1 <1 <i>current</i>	0 0 44 <1 96 3116 1220 1473 4347 history1 4 3 0 history1 0.2	0 0 61 <1 949 1063 1028 1237 2990 history2 4 7 2 2 history2 0.3
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 limit/base >25 .20 limit/base >4 >20	0 0 42 <1 14 2568 1073 1280 3975 <i>current</i> 5 1 <1 <1 <1 <i>current</i> 0.2 7.6	0 0 44 <1 96 3116 1220 1473 4347 history1 4 3 0 history1 0.2 7.0	0 0 61 <1 949 1063 1028 1237 2990 history2 4 7 2 2 history2 0.3 9.2
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 imit/base >25 	0 0 42 <1 14 2568 1073 1280 3975 <u>current</u> 5 1 <1 <1 <1 <u>current</u> 0.2 7.6 19.5	0 0 44 <1 96 3116 1220 1473 4347 history1 4 3 0 history1 0.2 7.0 17.5	0 0 61 <1 949 1063 1028 1237 2990 history2 4 7 2 2 history2 0.3 9.2 21.1
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 imit/base >25 imit/base >4 >20 imit/base >30	0 0 42 <1 14 2568 1073 1280 3975 <i>current</i> 5 1 <1 <1 <1 <i>current</i> 0.2 7.6 19.5 <i>current</i>	0 0 44 <1 96 3116 1220 1473 4347 history1 4 3 0 history1 0.2 7.0 17.5 history1	0 0 61 <1 949 1063 1028 1237 2990 history2 4 7 2 2 history2 0.3 9.2 21.1 history2



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
	Silt	scalar	*Visual	NONE	NONE	NONE	NONE
	Debris	scalar	*Visual	NONE	NONE	NONE	NONE
	Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Jul5/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
٦٢	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	14.0	13.7	14.0
	GRAPHS						
	Ferrous Alloys						
	iron						
	8 - nickel						
	6						
	u dd						
	4	1					
	2						
		/23 -		/23			
	Feb7/23	Apr25/23		Jul5/23			
	Non-ferrous Meta						
	10 _T						
	8 - copper						
	tin .						
	6						
	u dd 4						
	2						
	0		Incoloration descentes and				
	- Feb7/23	Apr25/23 .		Jul5/23			
	Feb	Apr2		ηſ			
	Viscosity @ 100°	С			Base Number		
	18 - Abnormal			10.0	Base		
	17-			(B) 8.0			
	© ¹⁶ Base			<u>P</u> 6.0			
	Base 0015-			.0 g mg (0.0			
	G ¹⁶ Base 000 15 ³⁷ 14			6.0 g mper 4.0			
	13 - Abnormal			(0)HOX (0) HOX (0) Jaquing 4.0			
	13 - Abnormal 12 -			2.0			
	13 Abnormal 12	23		0.0	23	23	
	13 - Abnormal 12 -	Apr25/23		2.0	Feb7/23	Apr25/23	
Laboratory Sample No. Lab Number Unique Number	¹³ Abnormal ¹² ¹² ¹¹ ¹² ¹² ¹² ¹² ¹² ¹² ¹² ¹³ ¹² ¹² ¹² ¹² ¹² ¹² ¹² ¹² ¹² ¹² ¹² ¹² ¹² ¹² ¹² ¹¹ ¹² ¹² ¹² ¹³ ¹² ¹² ¹³ ¹² ¹³ ¹² ¹² ¹³ ¹² ¹² ¹³ ¹² ¹³ ¹² ¹³ ¹² ¹³ ¹² ¹³ ¹² ¹³ ¹² ¹³ ¹² ¹³ ¹² ¹³ ¹² ¹³ ¹² ¹³ ¹² ¹³ ¹² ¹² ¹³ ¹² ¹² ¹³ ¹² ¹² ¹² ¹² ¹² ¹² ¹² ¹² ¹² ¹² ¹² ¹² ¹³ ¹² ¹² ¹² ¹³ ¹² ¹³ ¹³ ¹⁵		d : 12. ed : 13.	0.0	GFL Envi	ironmental - 983 - S 16011 Wes	st Belfort Stre Sugar Land, US 774
Laboratory Sample No. Lab Number Unique Number Test Package	¹³ Abnormal 12 12 11 12 12 11 12 12 12 12	501 Madis Received Diagnose Diagnost	d : 12 . ed : 13 . iician : Dor	ry, NC 27513 lul 2023 lul 2023 Baldridge	GFL Envi	ironmental - 983 - S 16011 Wei S htact: TECHNIC	st Belfort Stre Sugar Land, US 774

Submitted By: TECHNICIAN ACCOUNT