

OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id 226044

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.

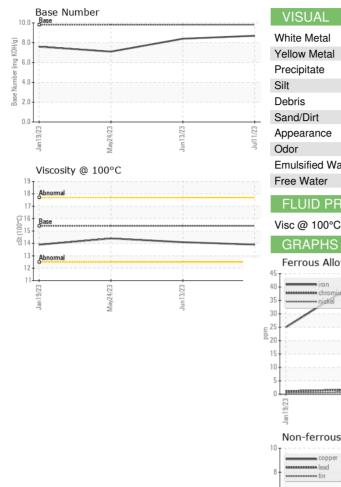
Fluid Condition

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

SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0072554	GFL0072519	GFL0068328
Sample Date		Client Info		11 Jul 2023	13 Jun 2023	24 May 2023
Machine Age	hrs	Client Info		14169	0	0
Oil Age	hrs	Client Info		0	0	0
Oil Changed		Client Info		Changed	N/A	N/A
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<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	>100	11	13	41
Chromium	ppm	ASTM D5185m	>20	<1	<1	2
Nickel	ppm		>4	0	0	<1
Titanium	ppm	ASTM D5185m	- T	<1	0	1
Silver		ASTM D5185m	2	0	0	<1
Aluminum	ppm ppm	ASTM D5185m	>20	0 <1	2	7
Lead			>20	<1 0	0	1
Copper	ppm ppm	ASTM D5185m	>40	0 <1	1	2
			>330	0	<1	<1
Tin Vanadium	ppm		>15	-		<1
	ppm	ASTM D5185m ASTM D5185m		<1	<1	
Cadmium	ppm	ASTM DS185m		0	0	<1
ADDITIVES						
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm		0	current 5	7	7
	ppm ppm			5 0	7 0	7 0
Boron		ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	5 0 63	7 0 59	7 0 62
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0 0 60	5 0	7 0 59 <1	7 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	5 0 63	7 0 59 <1 948	7 0 62 <1 978
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	5 0 63 <1	7 0 59 <1	7 0 62 <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	5 0 63 <1 1031	7 0 59 <1 948	7 0 62 <1 978
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	5 0 63 <1 1031 1183	7 0 59 <1 948 1124	7 0 62 <1 978 1150
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	5 0 63 <1 1031 1183 1082	7 0 59 <1 948 1124 991	7 0 62 <1 978 1150 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 ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	5 0 63 <1 1031 1183 1082 1294	7 0 59 <1 948 1124 991 1231	7 0 62 <1 978 1150 1028 1245
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	5 0 63 <1 1031 1183 1082 1294 3708	7 0 59 <1 948 1124 991 1231 3606	7 0 62 <1 978 1150 1028 1245 2986
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 0 1010 1070 1150 1270 2060	5 0 63 <1 1031 1183 1082 1294 3708 current	7 0 59 <1 948 1124 991 1231 3606 history1	7 0 62 <1 978 1150 1028 1245 2986 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 method ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	5 0 63 <1 1031 1183 1082 1294 3708 <u>current</u> 3	7 0 59 <1 948 1124 991 1231 3606 history1 2	7 0 62 <1 978 1150 1028 1245 2986 history2 14
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm 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 method ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 limit/base >25	5 0 63 <1 1031 1183 1082 1294 3708 <u>current</u> 3 4	7 0 59 <1 948 1124 991 1231 3606 history1 2 2 2	7 0 62 <1 978 1150 1028 1245 2986 history2 14 12
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25	5 0 63 <1 1031 1183 1082 1294 3708 current 3 4 0	7 0 59 <1 948 1124 991 1231 3606 history1 2 2 2 2	7 0 62 <1 978 1150 1028 1245 2986 history2 14 12 4
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25	5 0 63 <1 1031 1183 1082 1294 3708 current 3 4 0	7 0 59 <1 948 1124 991 1231 3606 history1 2 2 2 2 2 2	7 0 62 <1 978 1150 1028 1245 2986 history2 14 12 4 4 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 ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base >3	5 0 63 <1 1031 1183 1082 1294 3708 <u>current</u> 3 4 0 <u>current</u> 0.2	7 0 59 <1 948 1124 991 1231 3606 history1 2 2 2 2 2 <i>history1</i> 0.4	7 0 62 <1 978 1150 1028 1245 2986 history2 14 12 4 <i>history2</i> 0.5
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 >3 >20	5 0 63 <1 1031 1183 1082 1294 3708 <i>current</i> 3 4 0 <i>current</i> 0.2 7.6	7 0 59 <1 948 1124 991 1231 3606 history1 2 2 2 2 2 2 2 history1 0.4 7.3	7 0 62 <1 978 1150 1028 1245 2986 history2 14 12 4 history2 0.5 12.4
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 imit/base >3 >20	5 0 63 <1 1031 1183 1082 1294 3708 <u>current</u> 3 4 0 <u>current</u> 0.2 7.6 19.0	7 0 59 <1 948 1124 991 1231 3606 history1 2 2 2 2 2 2 history1 0.4 7.3 20.1	7 0 62 <1 978 1150 1028 1245 2986 history2 14 12 4 12 4 history2 0.5 12.4 24.7
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 D7624 *ASTM D7415	0 0 0 1010 1070 1150 1270 2060 2060 225 20 225 20 220 20 20 20 20 20 20 20 20 20 20 20	5 0 63 <1 1031 1183 1082 1294 3708 Current 3 4 0 Current 0.2 7.6 19.0 Current	7 0 59 <1 948 1124 991 1231 3606 history1 2 2 2 2 2 history1 0.4 7.3 20.1 history1	7 0 62 <1 978 1150 1028 1245 2986 history2 14 12 4 12 4 0.5 12.4 24.7 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
Jun13/23		Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
	Jul11/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
-un C	Jul	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	RTIES	method	limit/base	current	history1	history2
		Visc @ 100°C	cSt	ASTM D445	15.4	13.9	14.1	14.4
		GRAPHS						
1		Ferrous Alloys						
		40 - iron						
Jun 13/23		35 - nickel						
~		30						
		E ²⁵ -						
		15						
		10						
		5						
				<u>5</u>	<u> </u>			
		Jan 19/23 May24/23		Jun 13/23	Jul11/23			
		_		Ju	Γ			
		Non-ferrous Meta	ls					
		copper						
		8 - tin						
		6						
		udd						
		4-						
		2-						
		0	the state of the s	September				
		an 19/23 lay24,/23		13/23	ul11/23			
		∽ ≥	_	Jun	lul.			
		Viscosity @ 100°C	C			Base Number		
		18 - Abnormal				4		
		17			(B/H			
		⊖ ¹⁶ Base			9.0 g			
		C2-016 Base 15 53 14			0.0 Base Number (mg KOH/g)			
						+		
		13 Abnormal			2.0			
		12						
		/23 +		3/23 -	0.0	1/23	1/23+	
		Jan 19/23 May24/23		Jun 13/23	Jul11/23	Jan 19/23	May24/23	
TESTING LABORATORY	Laboratory Sample No. Lab Number Unique Number Test Package	: <mark>05904119</mark> : 10565475	501 Madia Received Diagnose Diagnost	l : 21 . ed : 25 .	Cary, NC 27513 I Jul 2023 5 Jul 2023 GFL Environmental - 419 - Metro Sagina 6950 N Michiga Saginaw, M Ves Davis US 4860 Contact: Jeremy Hine 69. jhines@gflenv.co ceditation. T: (800)684-127			