

OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id 220104

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

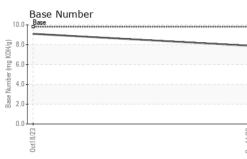
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

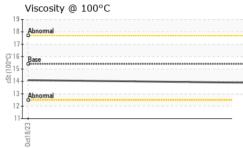
SAMPLE INFORM	ΛΑΤΙΟΝ	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0095257	GFL0095278	
Sample Date		Client Info		11 Dec 2023	18 Oct 2023	
Machine Age	hrs	Client Info		0	8937	
Oil Age	hrs	Client Info		600	600	
Oil Changed		Client Info		Changed	Changed	
Sample Status				NORMAL	NORMAL	
CONTAMINATI	ON	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	<1.0	
Water		WC Method	>0.2	NEG	NEG	
Glycol		WC Method		NEG	NEG	
-	~			-		
WEAR METALS	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	11	26	
Chromium	ppm		>20	1	2	
Nickel	ppm	ASTM D5185m	>4	0	0	
Titanium	ppm	ASTM D5185m		<1	<1	
Silver	ppm	ASTM D5185m	>3	0	0	
Aluminum	ppm		>20	9	7	
Lead	ppm	ASTM D5185m	>40	<1	0	
Copper	ppm		>330	27	5	
Tin	ppm		>15	2	<1	
Vanadium	ppm	ASTM D5185m		0	0	
Cadmium	ppm	ASTM D5185m		0	0	
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base 0	current 4	history1 4	history2
	ppm ppm					
Boron		ASTM D5185m	0	4	4	
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	4 0	4	
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	4 0 62	4 0 58	
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	4 0 62 <1	4 0 58 <1	
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	4 0 62 <1 895	4 0 58 <1 864	
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	4 0 62 <1 895 1440	4 0 58 <1 864 1228	
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	4 0 62 <1 895 1440 1129	4 0 58 <1 864 1228 1119	
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm 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	4 0 62 <1 895 1440 1129 1323	4 0 58 <1 864 1228 1119 1223	
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	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 0 1010 1070 1150 1270 2060	4 0 62 <1 895 1440 1129 1323 3168	4 0 58 <1 864 1228 1119 1223 3085	
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	4 0 62 <1 895 1440 1129 1323 3168 current	4 0 58 <1 864 1228 1119 1223 3085 history1	
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	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 limit/base	4 0 62 <1 895 1440 1129 1323 3168 current 7	4 0 58 <1 864 1228 1119 1223 3085 history1 15	 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm	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	4 0 62 <1 895 1440 1129 1323 3168 current 7 <1 9	4 0 58 <1 864 1228 1119 1223 3085 history1 15 3	 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm	ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20	4 0 62 <1 895 1440 1129 1323 3168 current 7 <1 9	4 0 58 <1 864 1228 1119 1223 3085 history1 15 3 4	 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25	4 0 62 <1 895 1440 1129 1323 3168 current 7 <1 9 current	4 0 58 <1 864 1228 1119 1223 3085 history1 15 3 4 history1	 history2 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base >3	4 0 62 <1 895 1440 1129 1323 3168 <u>current</u> 7 <1 9 <u>current</u> 0.3	4 0 58 <1 864 1228 1119 1223 3085 history1 15 3 4 history1 0.2	 history2 history2 history2
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 TS ppm ppm ppm ppm spm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 imit/base >25 >20 imit/base >3 >20	4 0 62 <1 895 1440 1129 1323 3168 <i>current</i> 7 <1 9 <i>current</i> 0.3 7.3	4 0 58 <1 864 1228 1119 1223 3085 history1 15 3 4 history1 0.2 5.8	 history2 history2
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 TS ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844	0 0 0 1010 1070 1150 1270 2060 2060 225 20 220 220 20 3 20 20 20 3 3 20 20 20 20 20 20 20 20 20 20 20 20 20	4 0 62 <1 895 1440 1129 1323 3168 <i>current</i> 7 <1 9 <i>current</i> 0.3 7.3 18.6	4 0 58 <1 864 1228 1119 1223 3085 history1 15 3 4 history1 0.2 5.8 18.4 history1	 history2 history2 history2
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 TS ppm ppm ppm ppm spm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 20 225 20 20 3 20 3 20 3 20 20 20 20 20 20 20 20 20 20 20 20 20	4 0 62 <1 895 1440 1129 1323 3168 <u>current</u> 7 <1 9 <u>current</u> 0.3 7.3 18.6	4 0 58 <1 864 1228 1119 1223 3085 history1 15 3 4 history1 0.2 5.8 18.4	 history2 history2 history2 history2



OIL ANALYSIS REPORT

VISUAL





	VISUAL		memou	mmubas	se cuire	fit filstory i	Thistory 2
	White Metal	scalar	*Visual	NONE	NONE	NONE	
	Yellow Metal	scalar	*Visual	NONE	NONE	NONE	
	Precipitate	scalar	*Visual	NONE	NONE		
	Silt	scalar	*Visual	NONE	NONE	NONE	
	Debris	scalar	*Visual	NONE	NONE		
	Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	
/23	Appearance	scalar	*Visual	NORML	NORM		
Dec11/23	Odor	scalar	*Visual	NORML	NORM		
	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	
	Free Water	scalar	*Visual		NEG	NEG	
	FLUID PROPE		method	limit/bas			history2
	Visc @ 100°C	cSt	ASTM D445	15.4	13.9	14.1	
	GRAPHS Ferrous Alloys						
	³⁰ T						
	25 - iron						
	25- nickel						
	20						
E	15						
	10			<u> </u>			
	5-						
				~			
	0ct18/23			Dec11/23			
	00			Dec			
	Non-ferrous Meta	S					
	30 copper						
	25		_				
	20-						
E	15						
8							
	10						
	5						
			100000-1000000-1000000-1000000-1000000-1000000				
	8/23			1/23 -			
	0ct18/23			Dec11/23			
	Viscosity @ 100°C	;			Dens M	mbor	
	19				Base Nu		
	18 - Abnormal						
	17-			(a)	8.0-		
C.	Base			Base Number (ma KOH/a)	6.0-		
	Base 15- 3 14			er (m			
č	3 14			Num	4.0-		
	13 Abnormal				2.0		
	12-				2.0		
	11				0.0		~
	0ct18/23			Dec11/23	0ct18/23		Dec11/23
	00			Dei	00		Dec
Laboratory Sample No. Lab Number Unique Number Test Package	: 06047609	501 Madi Recieved Diagnos Diagnos	d : 29 ed : 02 ,	ry, NC 27 Dec 2023 Jan 2024 s Davis	513 GI	F Contact: I	Intington Road Hauling er Huntington Rd ORT WAYNE, IN US 46809 MICHAEL MUGG



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