

OIL ANALYSIS REPORT



Machine Id 529013

Component Diesel Engine

Fluid PETRO CANADA DURON SHP 15W40 (--- LTR)

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.

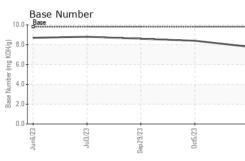
Fluid Condition

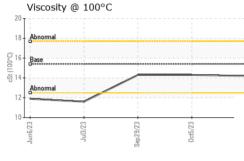
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORI	MAT <u>IO</u> N	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0091742	GFL0091798	GFL0091767
Sample Date		Client Info		20 Nov 2023	05 Oct 2023	29 Sep 2023
Machine Age	hrs	Client Info		10688	10405	10375
Oil Age	hrs	Client Info		10688	10405	10375
Oil Changed		Client Info		Changed	Not Changd	Not Changd
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	<1.0	<1.0
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	>110	10	8	8
Chromium	ppm	ASTM D5185m	>4	0	0	<1
Nickel	ppm	ASTM D5185m	>2	0	0	0
Titanium	ppm	ASTM D5185m		0	0	0
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>25	<1	7	4
Lead	ppm	ASTM D5185m	>45	0	<1	0
Copper	ppm	ASTM D5185m	>85	2	2	1
Tin	ppm	ASTM D5185m	>4	<1	0	<1
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
Cadmium ADDITIVES	ppm	ASTM D5185m method	limit/base	0 current	0 history1	0 history2
			limit/base	-	-	-
ADDITIVES	ppm ppm ppm	method		current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	0	current 0	history1 <1	history2 2
ADDITIVES Boron Barium	ppm ppm	method ASTM D5185m ASTM D5185m	0	current 0 0	history1 <1 0	history2 2 0
ADDITIVES Boron Barium Molybdenum	ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	current 0 0 59	history1 <1 0 63	history2 2 0 64
ADDITIVES Boron Barium Molybdenum Manganese	ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	current 0 0 59 <1	history1 <1 0 63 0	history2 2 0 64 0
ADDITIVES Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	Current 0 0 59 <1 984	history1 <1 0 63 0 1060	history2 2 0 64 0 947
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	Current 0 0 59 <1 984 1050	history1 <1 0 63 0 1060 1104	history2 2 0 64 0 947 1037
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150	Current 0 59 <1 984 1050 1020	history1 <1 0 63 0 1060 1104 1083	history2 2 0 64 0 947 1037 1056
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method 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	current 0 59 <1 984 1050 1020 1269	history1 <1 0 63 0 1060 1104 1083 1413	history2 2 0 64 0 947 1037 1056 1271 3487 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method 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	Current 0 59 <1 984 1050 1020 1269 2918	history1 <1 0 63 0 1060 1104 1083 1413 3367	history2 2 0 64 0 947 1037 1056 1271 3487
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method 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	current 0 0 59 <1 984 1050 1020 1269 2918 current 6 1	history1 <1 0 63 0 1060 1104 1083 1413 3367 history1 6 1	history2 2 0 64 0 947 1037 1056 1271 3487 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method 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	current 0 0 59 <1 984 1050 1020 1269 2918 current 6	history1 <1 0 63 0 1060 1104 1083 1413 3367 history1 6	history2 2 0 64 0 947 1037 1056 1271 3487 history2 6
ADDITIVES 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	method ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 Imit/base >30 >20	current 0 59 <1 984 1050 1020 1269 2918 current 6 1 2 current	history1 <1 0 63 0 1060 1104 1083 1413 3367 history1 6 1 <1 <1 history1	history2 2 0 64 0 947 1037 1056 1271 3487 history2 6 <1 4 history2
ADDITIVES 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	method ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 30 30 >30 >20 limit/base >30	current 0 0 59 <1 984 1050 1020 1269 2918 current 6 1 2 current 0.5	history1 <1 0 63 0 1060 1104 1083 1413 3367 history1 6 1 <1 history1 0 0.3	history2 2 0 64 0 947 1037 1056 1271 3487 history2 6 <1 4 history2 0.2
ADDITIVES 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	method ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 imit/base >30 >20 imit/base >3 >20	current 0 0 59 <1 984 1050 1020 1269 2918 current 6 1 2 current 0 0.5 8.8	history1 <1 0 63 0 1060 1104 1083 1413 3367 history1 6 1 <1 history1 0 .3 .1 .3	history2 2 0 64 0 947 1037 1056 1271 3487 history2 6 <1 4 history2 0.2 7.0
ADDITIVES 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	method ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 30 30 >30 >20 limit/base >30	current 0 0 59 <1 984 1050 1020 1269 2918 current 6 1 2 current 0.5	history1 <1 0 63 0 1060 1104 1083 1413 3367 history1 6 1 <1 history1 0 0.3	history2 2 0 64 0 947 1037 1056 1271 3487 history2 6 <1 4 history2 0.2
ADDITIVES 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 t t t t	method ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 imit/base >30 >20 imit/base >3 >20	current 0 0 59 <1 984 1050 1020 1269 2918 current 6 1 2 current 0 0.5 8.8	history1 <1 0 63 0 1060 1104 1083 1413 3367 history1 6 1 <1 history1 0 .3 .1 .3	history2 2 0 64 0 947 1037 1056 1271 3487 history2 6 <1 4 history2 0.2 7.0
ADDITIVES 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 t t t t	method ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 Imit/base >30 >20 Imit/base >3 >20	current 0 0 59 <1 984 1050 1020 1269 2918 current 6 1 2 current 0.5 8.8 20.7	history1 <1 0 63 0 1060 1104 1083 1413 3367 history1 6 1 <1 history1 0 0.3 8.1 19.7	history2 2 0 64 0 947 1037 1056 1271 3487 history2 6 <11 4 history2 0.2 7.0 18.8



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		
23	23 -		scalar	*Visual	NORML	NORML	NORML	NORML		
Sep29/23	0ct5/23 Nov20/23	Odor	scalar	*Visual	NORML	NORML	NORML	NORML		
03	2	Emulsified Water		*Visual		NEG	NEG			
			scalar		>0.2			NEG		
		Free Water	scalar	*Visual		NEG	NEG	NEG		
		FLUID PROPI Visc @ 100°C	cSt	method ASTM D445	limit/base	current	history1 14.3	history2 14.3		
		GRAPHS	CSI	ASTM D445	15.4	14.2	14.3	14.3		
		Ferrous Alloys								
		12 iron		I I						
Sep29/23	0ct5/23	10 - chramium			/					
Sel	0	8-		/						
		E 6-								
		d								
		4-								
		2-								
		C. C								
		Jun6/23 Jul3/23	Sep29/23	0ct5/23	Nov20/23					
		un luc	Sep 2	Oct	Nov2					
		Non-ferrous Meta	als							
		copper 8 -								
		6								
		E d d								
				I I						
		2								
			3	E C	53					
		Jun6/23 Jul3/23	sep29/23	0ct5/23	Nov20/23					
		Viscosity @ 100°	0,		N					
		¹⁹ T			10.0	Base Number				
		18 - Abnormal			⇒ 8.0					
		Base			B/HO)					
		0 15 -			E 6.0					
		() 15			10 H					
		13 Abnormal			(0)HOX Bayese Name 4.0-					
		12			²⁰ 2.0					
		11			0.0					
			9/23 -	5/23 -		Jun6/23	1/23 -	5/23 -		
		Jun6/23 Jul3/23	Sep29/23	0ct5/23	Nov20/23	Jun6/23 Jul3/23	Sep29/23	0ct5/23		
	Laboratory	: WearCheck USA - 501 Madison Ave., Cary, NC 27513 GFL Environmental - 654 - Richmond Ha								
4	Sample No.	: GFL0091742	Received		11800 Lewis Roa					
NAP	Lab Number	: 06014806	Diagnos	ed : 23 l	Nov 2023					
				US 2383						
	Unique Number		Diagnosi	tician : we	s Davis					
NG LABORATORY	Unique Number Test Package		Ţ					t: Jimmy Maye es@gflenv.co		