

OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id 813039

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.

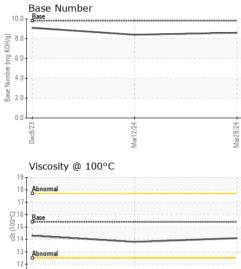
SAMPLE INFORI	MAT <u>IO</u> N	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0108998	GFL0108991	GFL0096889
Sample Date		Client Info		28 Mar 2024	12 Mar 2024	08 Dec 2023
Machine Age	hrs	Client Info		0	0	0
Oil Age	hrs	Client Info		600	600	600
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>3.0	<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	>75	18 1	11	4
Chromium	ppm	ASTM D5185m		-	<1	<1
Nickel	ppm	ASTM D5185m	>4	<1	0	<1
Titanium Silver	ppm	ASTM D5185m ASTM D5185m		<1 0	0	<1 0
	ppm	ASTM D5185m		4	4	2
Aluminum	ppm					<1
Lead	ppm	ASTM D5185m		0	0	
Copper	ppm	ASTM D5185m		2		<1
Tin	ppm		>4	<1	<1	<1
Vanadium	ppm	ASTM D5185m		0	0	
Cadmium	ppm	ASTM D5185m		0	0	<1
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base 0	current <1	history1 5	history2 2
	ppm ppm					
Boron		ASTM D5185m	0	<1	5	2
Boron Barium Molybdenum Manganese	ppm	ASTM D5185m ASTM D5185m	0	<1 0	5 0	2 12
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	<1 0 65	5 0 57	2 12 61
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	<1 0 65 <1	5 0 57 <1	2 12 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 1070 1150	<1 0 65 <1 1014	5 0 57 <1 935	2 12 61 <1 964 1059 1012
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	<1 0 65 <1 1014 1180	5 0 57 <1 935 1035	2 12 61 <1 964 1059 1012 1227
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	0 0 60 0 1010 1070 1150	<1 0 65 <1 1014 1180 969	5 0 57 <1 935 1035 997	2 12 61 <1 964 1059 1012
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	<1 0 65 <1 1014 1180 969 1286	5 0 57 <1 935 1035 997 1198 2997 history1	2 12 61 <1 964 1059 1012 1227 3294 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	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	<1 0 65 <1 1014 1180 969 1286 3254 <i>current</i> 5	5 0 57 <1 935 1035 997 1198 2997 history1 3	2 12 61 <1 964 1059 1012 1227 3294 history2 3
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 0 65 <1 1014 1180 969 1286 3254 current	5 0 57 <1 935 1035 997 1198 2997 history1	2 12 61 <1 964 1059 1012 1227 3294 history2
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	0 0 60 1010 1070 1150 1270 2060 limit/base	<1 0 65 <1 1014 1180 969 1286 3254 <i>current</i> 5	5 0 57 <1 935 1035 997 1198 2997 history1 3	2 12 61 <1 964 1059 1012 1227 3294 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 1010 1070 1150 1270 2060 limit/base	<1 0 65 <1 1014 1180 969 1286 3254 <u>current</u> 5 2	5 0 57 <1 935 1035 997 1198 2997 history1 3 1	2 12 61 <1 964 1059 1012 1227 3294 history2 3 0
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	0 0 0 1010 1070 1150 1270 2060 limit/base >25	<1 0 65 <1 1014 1180 969 1286 3254 current 5 2 8	5 0 57 <1 935 1035 997 1198 2997 history1 3 1 6	2 12 61 <1 964 1059 1012 1227 3294 history2 3 0 5
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 225 >25	<1 0 65 <1 1014 1180 969 1286 3254 <i>current</i> 5 2 8 <i>current</i>	5 0 57 <1 935 1035 997 1198 2997 history1 3 1 6 <i>h</i> istory1	2 12 61 <1 964 1059 1012 1227 3294 history2 3 0 5 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 limit/base >25 >20 limit/base	<1 0 65 <1 1014 1180 969 1286 3254 <i>current</i> 5 2 8 <i>current</i> 0.5	5 0 57 <1 935 1035 997 1198 2997 history1 3 1 6 history1 0.3	2 12 61 <1 964 1059 1012 1227 3294 history2 3 0 5 history2 0.1
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> >25 >20 <i>limit/base</i> >20	<1 0 65 <1 1014 1180 969 1286 3254 <i>current</i> 5 2 8 <i>current</i> 0.5 7.4	5 0 57 37 935 1035 997 1198 2997 history1 3 1 6 history1 0.3 8.2	2 12 61 <1 964 1059 1012 1227 3294 history2 3 0 5 history2 0.1 5.8
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 225 20 225 20 20 20 20 20 20 20 20 20 20 20 20 20	<1 0 65 <1 1014 1180 969 1286 3254 <i>current</i> 5 2 8 <i>current</i> 0.5 7.4 19.0	5 0 57 <1 935 1035 997 1198 2997 history1 3 1 6 <u>history1</u> 0.3 8.2 19.1	2 12 61 <1 964 1059 1012 1227 3294 history2 3 0 5 history2 0.1 5.8 18.0
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	0 0 0 1010 1070 1150 1270 2060 2060 225 20 220 20 20 20 20 20 20 20 20 20 20 20	<1 0 65 <1 1014 1180 969 1286 3254 Current 5 2 8 Current 0.5 7.4 19.0 Current	5 0 57 <1 935 1035 997 1198 2997 history1 3 1 6 history1 0.3 8.2 19.1 history1	2 12 61 <1 964 1059 1012 1227 3294 history2 3 0 5 history2 0.1 5.8 18.0 history2



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Dec8/23

OIL ANALYSIS REPORT



Mar12/24

	VISUAL		method				histor
	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
	Appearance	scalar	*Visual	NORML	NORML	NORML	NORM
	Odor	scalar	*Visual	NORML	NORML	NORML	NORM
	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
	Free Water	scalar	*Visual	>0.2	NEG	NEG	NEG
	FLUID PROPE		method	limit/base	current	history1	histo
	Visc @ 100°C	cSt	ASTM D445		14.1	13.8	14.3
	GRAPHS						
	Ferrous Alloys						
	18 16						
	14						
	12	/	/				
mdd	10						
id	8						
	6						
	4- *						
		Minana and American					
	Dec8/23	2/24 -		3/24 -			
	Deci	Mar12/24		Mar28/24			
	Non-ferrous Metal	s					
	¹⁰ T						
	8 - copper						
	essesses tin						
_	6 -						
bpm							
	4						
	2						
	23	24		24			
	Dec8/23	Mar12/24		Mar28/24			
	□ Viscosity @ 100°C			×			
					Base Number		
	¹⁹ T			10.0	T Deserve		
					Base		
	19 18 - Abnormal 17 -						
	19 18 - Abnormal 17 -						
	19 18 - Abnormal 17 -						
	19 18 - Abnormal 17 -						
cSt (100°C)	19 18 Abnormal 17 16 Base 15			6.0 bull KOH(0) bull kolor see			
cSt (100°C)	19 Abnormal 17 						
cSt (100°C)	Abnormal			(D/HO) Bull 19 19 19 19 19 10 10 10 10 10 10 10 10 10 10			
cSt (100°C)	Abnormal	12/24		(D/HO) Bull 19 19 19 19 19 10 10 10 10 10 10 10 10 10 10		1224	
cSt (100°C)	19 18 Abnormal 17 16 Base 15 14 Abnormal	Mari 224		(0,9)HOX Bull and Mumph 4.0 2.0	Dec8/23	Mar1224	
cSt (100°C)	Abnormal Abnormal Base Base Abnormal Abnormal		n Ave. 2-5	(0, 8, 0) (0, 0, 0) (0, 0	Dec8/23		art Warran 1
cSt (100°C)	Abnormal Base Abnormal	1 Madiso		(0,H0) Bul Jaquing 988 2.0 +72022FW 2, NC 27513	Dec8/23	ironmental - 401 - F	
• : • • • • • • • • • • • • • • • • • •	Abnormal Abnorm	1 Madiso Recei	ved : 01	(0,Hoy Bu) Jaquing 988 2.0 +72022#W 2, NC 27513 Apr 2024	Dec8/23	ironmental - 401 - F 4429 ALLE	N MARTI
cSt (100°C)	Abnormal Base Abnormal	1 Madiso Recei Teste	ved : 01 d : 02	(0,H0) Bul Jaquing 988 2.0 +72022FW 2, NC 27513	GFL Env	ironmental - 401 - F 4429 ALLE	N MARTII RT WAYN
()_001) tsp : V : C : 1 : F	Abnormal Base Base Abnormal Abno	1 Madiso Recei Teste Diagr	ved : 01 d : 02 iosed : 02	(0,40) (0,40)	GFL Env	ironmental - 401 - F 4429 ALLE FO Contact: 2	N MARTI RT WAYN US 4 Zachory Ro
: V : C : 11 : F ; <i>C</i>	Abnormal Base Abnormal	1 Madiso Recei Teste Diagr	ved : 01 d : 02 iosed : 02 200-237-1365	(0,H0) Bu bar (0,H0) Bu bar (0	GFL Env	ironmental - 401 - F 4429 ALLE FO Contact: 2	



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Submitted By: See also GFL401 - ZACHORY ROEHM