

OIL ANALYSIS REPORT

Sample Rating Trend





Machine Id 913021 Component

Fluid

Diesel Engine

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.

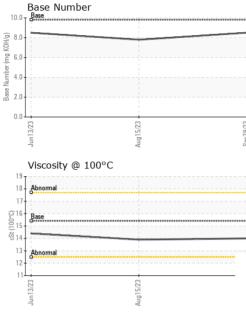
Fluid Condition

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		GFL0091813	GFL0086562	GFL0074367
Sample Date		Client Info		29 Sep 2023	15 Aug 2023	13 Jun 2023
Machine Age	hrs	Client Info		3385	3017	2555
Oil Age	hrs	Client Info		3385	3017	0
Oil Changed		Client Info		Not Changd	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 METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>120	10	15	4
Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Nickel	ppm	ASTM D5185m	>5	1	2	<1
Titanium	ppm	ASTM D5185m	>2	0	0	0
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>20	3	1	1
Lead	ppm	ASTM D5185m	>40	0	0	0
Copper	ppm	ASTM D5185m	>330	2	3	0
Tin	ppm	ASTM D5185m	>15	<1	<1	0
Vanadium	ppm	ASTM D5185m		0	<1	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	Method ASTM D5185m	limit/base	current 2	history1 <1	history2 5
	ppm ppm					
Boron		ASTM D5185m	0	2	<1	5
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	2 0	<1 0	5 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	2 0 73	<1 0 62	5 0 63
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	2 0 73 <1	<1 0 62 <1	5 0 63 <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	2 0 73 <1 1108	<1 0 62 <1 1014	5 0 63 <1 1024
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	2 0 73 <1 1108 1207	<1 0 62 <1 1014 1101	5 0 63 <1 1024 1139
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	2 0 73 <1 1108 1207 1174	<1 0 62 <1 1014 1101 1022	5 0 63 <1 1024 1139 1121
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	2 0 73 <1 1108 1207 1174 1471	<1 0 62 <1 1014 1101 1022 1255	5 0 63 <1 1024 1139 1121 1380
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	2 0 73 <1 1108 1207 1174 1471 4029	<1 0 62 <1 1014 1101 1022 1255 3209	5 0 63 <1 1024 1139 1121 1380 4054
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	2 0 73 <1 1108 1207 1174 1471 4029 current	<1 0 62 <1 1014 1101 1022 1255 3209 history1	5 0 63 <1 1024 1139 1121 1380 4054 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 ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	2 0 73 <1 1108 1207 1174 1471 4029 current 6	<1 0 62 <1 1014 1101 1022 1255 3209 history1 6	5 0 63 <1 1024 1139 1121 1380 4054 history2 5
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 kimit/base	2 0 73 <1 1108 1207 1174 1471 4029 current 6 2	<1 0 62 <1 1014 1101 1022 1255 3209 history1 6 5	5 0 63 <1 1024 1139 1121 1380 4054 history2 5 2
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 >20	2 0 73 <1 1108 1207 1174 1471 4029 current 6 2 3	<1 0 62 <1 1014 1101 1022 1255 3209 history1 6 5 0	5 0 63 <1 1024 1139 1121 1380 4054 history2 5 2 2 <1
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	2 0 73 <1 1108 1207 1174 1471 4029 current 6 2 3 3	<1 0 62 <1 1014 1101 1022 1255 3209 history1 6 5 0 0	5 0 63 <1 1024 1139 1121 1380 4054 history2 5 2 <1 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 2060 225 >25 >20 1imit/base >20	2 0 73 <1 1108 1207 1174 1471 4029 <u>current</u> 6 2 3 3 <u>current</u> 0.4	<1 0 62 <1 1014 1101 1022 1255 3209 history1 6 5 0 history1 0.6	5 0 63 <1 1024 1139 1121 1380 4054 history2 5 2 <1 history2 0.2
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> >4 >20	2 0 73 <1 1108 1207 1174 1471 4029 <i>current</i> 6 2 3 <i>current</i> 0.4 6.9	<1 0 62 <1 1014 1101 1022 1255 3209 history1 6 5 0 history1 0.6 8.7	5 0 63 <1 1024 1139 1121 1380 4054 history2 5 2 2 <1 history2 0.2 5.7
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 D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 20 225 20 220 20 1imit/base 24 20 20 230 20 20 20 20 20 20 20 20 20 20 20 20 20	2 0 73 <1 1108 1207 1174 1471 4029 <u>current</u> 6 2 3 <u>current</u> 0.4 6.9 19.1	<1 0 62 <1 1014 1101 1022 1255 3209 history1 6 5 0 0 history1 0.6 8.7 20.4	5 0 63 <1 1024 1139 1121 1380 4054 history2 5 2 <1 bistory2 0.2 5.7 18.8
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 D7844 *ASTM D7844	0 0 0 1010 1070 1150 1270 2060 2060 225 20 225 20 220 20 1imit/base 24 20 20 230 20 20 20 20 20 20 20 20 20 20 20 20 20	2 0 73 <1 1108 1207 1174 1471 4029 <i>current</i> 6 2 3 <i>current</i> 0.4 6.9 19.1	<1 0 62 <1 1014 1101 1022 1255 3209 history1 6 5 0 history1 0.6 8.7 20.4 history1	5 0 63 <1 1024 1139 1121 1380 4054 history2 5 2 2 <1 history2 0.2 5.7 18.8 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
5/23	9/23 -		scalar	*Visual	NORML	NORML	NORML	NORML
Aug 15/23	Sep 29/23	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
		Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
		Free Water	scalar	*Visual	20.L	NEG	NEG	NEG
		FLUID PROF		method	limit/base	current	history1	history2
		Visc @ 100°C	cSt	ASTM D445		14.0	13.9	14.4
-		GRAPHS						
		Ferrous Alloys						
		¹⁶ T						
/23		14 - iron	~	<				
Aug15/23		12 - nickel						
4		10						
		E 8						
		6						
		4						
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		in 13/	Aug 15/23		Sep29/23			
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		10 copper]						
		8 -						
		annon tin						
		6 -						
		dd						
		4						
		2						
		0						
		ın 13/23	5/23		sep29/23			
		Jun1	Aug 15/23		Sep 2			
		Viscosity @ 100	°C			Base Number		
		19 18 Abnormal			10.0			
		17+			🙃 8.0			
					3/HO)			
		Base			<u>و</u> 6.0			
		8 1r P			nber			
						+		
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		0 15 3 14 13 Abnomal			(0/HOX Bw) Jack Market 4.0			
		10			2.0			
		13 - Abnormal 12			0.0		m	
		13 - Abnormal 12	15/23		0.0	13/23	15,23	
		13 Abnormal	Aug15/23		2.0	Jun13/23	Aug15/23	
		13 - Abnormal 12			0.0 Sep29/23			
4	Laboratory	13 Abnomal 12 11 EXEC 11 EXEC 11 EXEC 13 EXEC 13 EXEC 13 EXEC 14 EXEC 14 EXEC 14 EXEC 14 EXEC 15 EXEC	- 501 Madi		ry, NC 27513		ronmental - 654 - F	Richmond Hauli
-	Sample No.	: WearCheck USA	- 501 Madi Received	d : 03 (ry, NC 27513 Dct 2023		ronmental - 654 - F	Richmond Hauli 00 Lewis Roa
	Sample No. Lab Number	2 Abnormal 12 11 2 2 2 2 2 2 2 2 2 2 2 2 2	- 501 Madi Received Diagnos	d : 03 (ed : 04 (ry, NC 27513 Dct 2023 Dct 2023		ronmental - 654 - F	00 Lewis Roa Chester, V
	Sample No. Lab Number Unique Number	2 2 2 2 2 3 4 4 4 4 4 4 5 5 5 5 5 5 5 5 5 5 5 5 5	- 501 Madi Received	d : 03 (ed : 04 (ry, NC 27513 Dct 2023		ronmental - 654 - F 118	Richmond Hauli 00 Lewis Roa Chester, V US 2383
ticate 12367	Sample No. Lab Number Unique Number Test Package	2 2 2 2 2 3 4 4 4 4 4 4 5 5 5 5 5 5 5 5 5 5 5 5 5	- 501 Madi Received Diagnos Diagnos	d : 03 (ed : 04 (tician : We	ry, NC 27513 Oct 2023 Oct 2023 S Davis		ronmental - 654 - F 118 Contact: Ma	Richmond Hauli 00 Lewis Roa Chester, V

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Submitted By: TECHNICIAN ACCOUNT