

OIL ANALYSIS REPORT

Sample Rating Trend





Component Diesel Engine Fluid

PETRO CANADA DURON SHP 15W40 (--- GAL)

Recommendation

Resample at the next service interval to monitor.

Machine Id 4506M

Wear

All component wear rates are normal.

Contamination

There is no indication of any contamination in the oil.

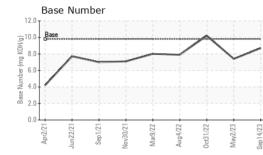
Fluid Condition

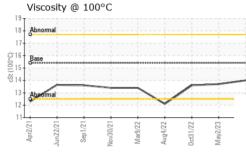
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORI		method	limit/base	ourroat	historyd	history 0
	WATION		- inni/base	current	history1	history2
Sample Number		Client Info		GFL0093179	GFL0081451	GFL0057316
Sample Date		Client Info		14 Sep 2023	02 May 2023	31 Oct 2022
Machine Age	hrs	Client Info		28052	27006	18278
Oil Age	hrs	Client Info		27006	25717	25717
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				NORMAL	NORMAL	MARGINAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	<1.0	4 .2
Glycol		WC Method		NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>80	26	83	25
Chromium	ppm	ASTM D5185m	>5	1	2	1
Nickel	ppm	ASTM D5185m	>2	<1	0	<1
Titanium	ppm	ASTM D5185m		<1	0	0
Silver	ppm	ASTM D5185m	>3	0	0	0
Aluminum	ppm	ASTM D5185m		3	3	2
Lead	ppm	ASTM D5185m	>30	0	<1	<1
Copper	ppm	ASTM D5185m		۰ <1	1	<1
Tin		ASTM D5185m	>5	<1	<1	<1
Vanadium	ppm ppm	ASTM D5185m	>0	<1	0	0
Cadmium		ASTM D5185m		0	0	0
	ppm	ASTIM D3103III		U	0	0
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	0	<1	1	3
Barium	ppm ppm	ASTM D5185m ASTM D5185m	0	0	0	0
Barium Molybdenum		ASTM D5185m ASTM D5185m	0 60	0 60	0 57	0 54
Barium	ppm	ASTM D5185m	0 60	0	0	0
Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m	0 60	0 60	0 57	0 54
Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 60 0	0 60 <1	0 57 <1	0 54 <1
Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 60 0 1010	0 60 <1 1063	0 57 <1 813	0 54 <1 842
Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 60 0 1010 1070 1150	0 60 <1 1063 1194	0 57 <1 813 979	0 54 <1 842 1013
Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 60 0 1010 1070 1150	0 60 <1 1063 1194 1092	0 57 <1 813 979 954	0 54 <1 842 1013 939
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 60 0 1010 1070 1150 1270	0 60 <1 1063 1194 1092 1364	0 57 <1 813 979 954 1144	0 54 <1 842 1013 939 1147
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 60 0 1010 1070 1150 1270 2060 limit/base	0 60 <1 1063 1194 1092 1364 3940	0 57 <1 813 979 954 1144 2669	0 54 <1 842 1013 939 1147 2998
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 60 0 1010 1070 1150 1270 2060 limit/base	0 60 <1 1063 1194 1092 1364 3940 current	0 57 <1 813 979 954 1144 2669 history1	0 54 <1 842 1013 939 1147 2998 history2
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 method ASTM D5185m	0 60 0 1010 1070 1150 1270 2060 limit/base >20	0 60 <1 1063 1194 1092 1364 3940 current 7	0 57 <1 813 979 954 1144 2669 history1 8	0 54 <1 842 1013 939 1147 2998 history2 4
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 method ASTM D5185m	0 60 0 1010 1070 1150 1270 2060 limit/base >20	0 60 <1 1063 1194 1092 1364 3940 current 7 4	0 57 <1 813 979 954 1144 2669 history1 8 3	0 54 <1 842 1013 939 1147 2998 history2 4 9
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 60 0 1010 1070 1150 1270 2060 <i>limit/base</i> >20 >20 <i>limit/base</i>	0 60 <1 1063 1194 1092 1364 3940 current 7 4 2 2	0 57 <1 813 979 954 1144 2669 history1 8 3 2 history1	0 54 <1 842 1013 939 1147 2998 history2 4 9 2 history2
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 60 0 1010 1070 1150 1270 2060 <i>limit/base</i> >20 <i>limit/base</i> >3	0 60 <1 1063 1194 1092 1364 3940 <u>current</u> 7 4 2 2 <u>current</u> 0.4	0 57 <1 813 979 954 1144 2669 history1 8 3 2 2 history1 0.7	0 54 <1 842 1013 939 1147 2998 history2 4 9 2 history2 1.4
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 60 0 1010 1070 1150 1270 2060 <i>limit/base</i> >20 <i>limit/base</i> >3 >20	0 60 <1 1063 1194 1092 1364 3940 <u>current</u> 7 4 2 2 <u>current</u> 0.4 7.8	0 57 <1 813 979 954 1144 2669 history1 8 3 2 history1 0.7 10.5	0 54 <1 842 1013 939 1147 2998 history2 4 9 2 history2 1.4 1.4 12.6
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 60 0 1010 1070 1150 1270 2060 <i>limit/base</i> >20 <i>limit/base</i> >20 <i>limit/base</i> >3 >20 <i>s</i> 3	0 60 <1 1063 1194 1092 1364 3940 <u>current</u> 7 4 2 <u>current</u> 0.4 7.8 18.5	0 57 <1 813 979 954 1144 2669 history1 8 3 2 history1 0.7 10.5 19.3	0 54 <1 842 1013 939 1147 2998 history2 4 9 2 history2 1.4 12.6 24.3
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAI	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844 *ASTM D7844	0 60 0 1010 1070 1150 1270 2060 <i>limit/base</i> >20 <i>limit/base</i> >3 >20 >30 <i>limit/base</i>	0 60 <1 1063 1194 1092 1364 3940 <u>current</u> 7 4 2 2 <u>current</u> 0.4 7.8 18.5 18.5	0 57 <1 813 979 954 1144 2669 history1 8 3 2 history1 0.7 10.5 19.3 history1	0 54 <1 842 1013 939 1147 2998 history2 4 9 2 history2 1.4 12.6 24.3 history2
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAI Oxidation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7414	0 60 0 1010 1070 1150 1270 2060 imit/base >20 imit/base >3 >20 imit/base >3 20 j	0 60 <1 1063 1194 1092 1364 3940 current 7 4 2 2 current 0.4 7.8 18.5 18.5	0 57 <1 813 979 954 1144 2669 history1 8 3 2 history1 0.7 10.5 19.3 history1 18.0	0 54 <1 842 1013 939 1147 2998 history2 4 9 2 history2 1.4 12.6 24.3 history2 2.
Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAI	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844 *ASTM D7844	0 60 0 1010 1070 1150 1270 2060 imit/base >20 imit/base >3 >20 imit/base >3 20 j	0 60 <1 1063 1194 1092 1364 3940 <u>current</u> 7 4 2 2 <u>current</u> 0.4 7.8 18.5 18.5	0 57 <1 813 979 954 1144 2669 history1 8 3 2 history1 0.7 10.5 19.3 history1	0 54 <1 842 1013 939 1147 2998 history2 4 9 2 history2 1.4 12.6 24.3 history2



OIL ANALYSIS REPORT





	VISUAL		method	limit/base	current	history1	history2				
A	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				
Mar9/22 Aug4/22 Oct31/22 May2/23 Sep14/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML				
Ma Aug Oct3 Sep1	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	14.0	13.7	13.6				
\neg	GRAPHS										
	Ferrous Alloys										
22 - 23 - 23 - 23 - 23 - 23 - 23 - 23 -	iron										
Mar9/22 Aug4/22 Oct31/22 May2/23	100 - chromium										
	80		Λ								
	60										
	40			$\mathbf{\lambda}$							
				N							
	20										
		2 5	3 10 V	C7							
	Apr2/21 Jun22/21 Sep1/21 Nov30/21	Mar9/22	Aug+/22 0ct31/22 May2/23	Sep14/23							
	Z		e ő N	S							
	Non-ferrous Metals										
	copper										
	8 - energy tin										
	6-										
	udd										
	4										
	2										
		$ \ge $									
		- 12	2 12 K	22							
	Apr2/21 Jun22/21 Sep1/21 Nov30/21	Mar9/22	Aug+/22 0ct31/22 May2/23	Sep 14/23							
	Viscosity @ 100°C		4 0 ≥	Se							
	¹⁹	-		12.0	Base Number						
	18 - Abnormal										
	17			10.0 우	Base		\wedge				
	Base			1.8 KQ							
	D 16 Base										
	3 14			.8.1 Base Number (mg KOH/g)							
	13 Abrormal		/								
	12			2.0	U -						
		22	3 2			21-	33				
	Apr2/21 Jun22/21 Sep1/21 Nov30/21	Mar9/22	Aug+/22 0ct31/22 May2/23	Sep 14/23	Apr2/21 Jun22/21 Sep1/21	Nov30/21 Mar9/22 Aug4/22	0ct31/22 May2/23				
	2	_ •	- 0 2	õ	7	2 2 4					
Laboratory	: WearCheck USA -				3 GFL Env	ironmental - 415					
Sample No. Lab Number		Received				6200 Elmridg					
Lab Number Unique Number		Diagnos	•			Ster	ing Heights, M US 4831:				
Certificate L2367 Test Package	: FLEET	Contac	ct: Frank Wola								
o discuss this sample report, o		vice at 1-8	00-237-1369	Э.			ak@gflenv.cor				
Denotes test methods that a						T:	(586)825-951 F				
atements of conformity to spec	itiantiane are bacad an t	no ormalo	accontance (nonan rula /	$(u \cdot (v \cdot n \cdot n \cdot n \cdot n - n - n - n - n - n - n$		Г				



Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

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