

OIL ANALYSIS REPORT

Sample Rating Trend



427062-402074 Component

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.

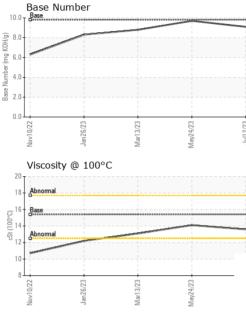
Fluid Condition

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		GFL0086306	GFL0081517	GFL0045422						
Sample Date		Client Info		12 Jul 2023	24 May 2023	13 Mar 2023						
Machine Age	hrs	Client Info		29620	29486	29453						
Oil Age	hrs	Client Info		0	0	0						
Oil Changed		Client Info		N/A	Not Changd	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	2	1	2						
Chromium	ppm	ASTM D5185m		- <1	0	<1						
Nickel	ppm	ASTM D5185m	>5	0	0	<1						
Titanium	ppm	ASTM D5185m		0	0	<1						
Silver	ppm	ASTM D5185m	>2	0	0	0						
Aluminum	ppm	ASTM D5185m		1	1	2						
Lead	ppm	ASTM D5185m	>40	0	0	<1						
Copper	ppm	ASTM D5185m		۰ <1	<1	0						
Tin	ppm	ASTM D5185m	>15	0	0	<1						
Vanadium	ppm	ASTM D5185m	>15	0	<1	<1						
Cadmium	ppm	ASTM D5185m		0	0	0						
	ррпп			-	-	-						
ADDITIVES		method	limit/base	current	history1	history2						
Boron	ppm	ASTM D5185m	0	32	43	165						
Boron Barium	ppm ppm	ASTM D5185m ASTM D5185m	0	32 <1	43 0	165 0						
Boron Barium Molybdenum		ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	32 <1 64	43 0 67	165 0 79						
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	32 <1 64 <1	43 0 67 <1	165 0 79 1						
Boron Barium Molybdenum Manganese Magnesium	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	32 <1 64 <1 943	43 0 67 <1 955	165 0 79 1 719						
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	32 <1 64 <1	43 0 67 <1	165 0 79 1 719 1217						
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	32 <1 64 <1 943	43 0 67 <1 955	165 0 79 1 719						
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	32 <1 64 <1 943 1152	43 0 67 <1 955 1196	165 0 79 1 719 1217						
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	32 <1 64 <1 943 1152 1072	43 0 67 <1 955 1196 1073	165 0 79 1 719 1217 850						
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	32 <1 64 <1 943 1152 1072 1283	43 0 67 <1 955 1196 1073 1258	165 0 79 1 719 1217 850 1093						
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 limit/base	32 <1 64 <1 943 1152 1072 1283 3836	43 0 67 <1 955 1196 1073 1258 3768	165 0 79 1 719 1217 850 1093 3124						
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 limit/base	32 <1 64 <1 943 1152 1072 1283 3836 current	43 0 67 <1 955 1196 1073 1258 3768 history1	165 0 79 1 719 1217 850 1093 3124 history2						
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m method	0 0 60 1010 1070 1150 1270 2060 limit/base	32 <1 64 <1 943 1152 1072 1283 3836 current 2	43 0 67 <1 955 1196 1073 1258 3768 history1 3	165 0 79 1 719 1217 850 1093 3124 history2 4						
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm 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 limit/base >25	32 <1 64 <1 943 1152 1072 1283 3836 current 2 5	43 0 67 <1 955 1196 1073 1258 3768 history1 3 6	165 0 79 1 719 1217 850 1093 3124 history2 4 22						
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25	32 <1 64 <1 943 1152 1072 1283 3836 current 2 5 4	43 0 67 <1 955 1196 1073 1258 3768 history1 3 6 2	165 0 79 1 719 1217 850 1093 3124 history2 4 22 25						
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 >20 limit/base >4	32 <1 64 <1 943 1152 1072 1283 3836 current 2 5 4 x	43 0 67 <1 955 1196 1073 1258 3768 history1 3 6 2 2 history1	165 0 79 1 719 1217 850 1093 3124 history2 4 22 25 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 ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base >4	32 <1 64 <1 943 1152 1072 1283 3836 current 2 5 4 current 0.2	43 0 67 <1 955 1196 1073 1258 3768 history1 3 6 2 2 history1 0.1	165 0 79 1 719 1217 850 1093 3124 history2 4 22 25 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 limit/base >25 .20 limit/base >4 >20	32 <1 64 <1 943 1152 1072 1283 3836 current 2 5 4 current 0.2 5.4	43 0 67 <1 955 1196 1073 1258 3768 history1 3 6 2 history1 0.1 4.8	165 0 79 1 719 1217 850 1093 3124 history2 4 22 25 history2 0.1 5.0						
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 D5185m	0 0 0 1010 1070 1150 1270 2060 imit/base >25 	32 <1 64 <1 943 1152 1072 1283 3836 <u>current</u> 2 5 4 <u>current</u> 0.2 5.4 17.5	43 0 67 <1 955 1196 1073 1258 3768 history1 3 6 2 <u>history1</u> 0.1 4.8 17.7	165 0 79 1 719 1217 850 1093 3124 history2 4 22 25 history2 0.1 5.0 18.6						
Boron 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 D7624	0 0 0 1010 1070 1150 1270 2060 imit/base >25 	32 <1 64 <1 943 1152 1072 1283 3836 current 2 5 4 current 0.2 5.4 17.5 current	43 0 67 <1 955 1196 1073 1258 3768 history1 3 6 2 history1 0.1 4.8 17.7 history1	165 0 79 1 719 1217 850 1093 3124 history2 4 22 25 history2 0.1 5.0 18.6 history2						



OIL ANALYSIS REPORT



		VISUAL		method				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		
3/23	/lay24/23 . Jul12/23 .	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML		
Mar13/23	May24,/23 Jul12/23	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	ERTIES	method	limit/base	current	history1	history2		
		Visc @ 100°C	cSt	ASTM D445	15.4	13.6	14.1	13.1		
		GRAPHS								
		Ferrous Alloys								
~		80		1						
Mar13/23	May24/23	70								
Ma	Ma	60-								
		Ē ⁵⁰ ₽								
		30								
		10								
		0		~						
		Nov10/22 Jan26/23	Mar13/23	May24/23	Jul12/23					
		2 ,		Ma	٦٢					
		Non-ferrous Meta	ls							
		copper								
		20 - tin								
		15								
		10								
		5								
		3 5	13	53	53					
		Nov10/22 Jan26/23	Mar13/23	May24/23	Jul12/23					
				Ma	-					
		Viscosity @ 100°C				Base Number				
		18 - Abnormal			10	0.0 Base				
		17-			(р ⁶	3.0				
		16 Base			KOH/					
		© 15 00 14 5 13 Abnormal			er (mg	6.0				
					quint 4	ŧ.0				
		12			Base Number (mg KOH/g)					
		10			- 2	2.0-				
		94	~	~		.0.0				
		Nov10/22 Jan26/23	Mar13/23	May24/23	Jul12/23	Nov10/22 Jan26/23	Mar13/23	May24/23		
	Laboratory Sample No. Lab Number Unique Number	: WearCheck USA - : GFL0086306 : 05904859 : 10566215	501 Madis Received Diagnose	01 Madison Ave., Cary, NC 27513			GFL Environmental - 868 - Childersburg Fines Hauling (Alpin 13737 Plant R Childersburg, A US 3504 Contact: JONATHAN WILLIAM jonathan.williams@gflenv.cor			
ertificate L2367	Test Package		vice at 1-8	00-237-136	9					