

OIL ANALYSIS REPORT

Sample Rating Trend





Machine Id **4619M** Component **Diesel Engine** Fluid

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

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

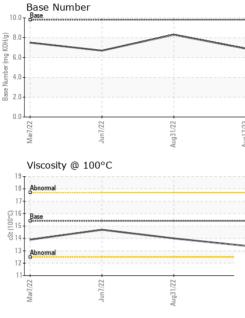
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0085052	GFL0052086	GFL0052144
Sample Date		Client Info		17 Aug 2023	31 Aug 2022	07 Jun 2022
Machine Age	hrs	Client Info		83461	18195	17581
Oil Age	hrs	Client Info		83461	17627	568
Oil Changed		Client Info		Changed	N/A	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	20.0	NEG	NEG	NEG
WEAR METAL	c	method	limit/base		history1	
				current		history2
Iron	ppm	ASTM D5185m	>90	28	22	22
Chromium	ppm	ASTM D5185m	>20	1	1	1
Nickel	ppm	ASTM D5185m	>2	<1	<1	0
Titanium	ppm	ASTM D5185m		<1	0	0
Silver	ppm	ASTM D5185m	>2	0	<1	<1
Aluminum	ppm	ASTM D5185m	>20	2	2	2
Lead	ppm	ASTM D5185m	>40	0	<1	<1
Copper	ppm	ASTM D5185m	>330	1	1	1
Tin	ppm	ASTM D5185m	>15	<1	<1	<1
Vanadium	ppm	ASTM D5185m		<1	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base 0	current 1	history1 5	history2 0
	ppm ppm	ASTM D5185m				
Boron		ASTM D5185m	0	1	5	0
Boron Barium	ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0	1 0	5 0	0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	1 0 62	5 0 60	0 0 66
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	1 0 62 <1	5 0 60 <1	0 0 66 <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	1 0 62 <1 1002	5 0 60 <1 917	0 0 66 <1 920
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	1 0 62 <1 1002 1161	5 0 60 <1 917 1044	0 0 66 <1 920 1095
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	1 0 62 <1 1002 1161 1061	5 0 60 <1 917 1044 1029	0 0 66 <1 920 1095 1002
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 62 <1 1002 1161 1061 1291	5 0 60 <1 917 1044 1029 1226	0 0 66 <1 920 1095 1002 1270
Boron 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 0 60 0 1010 1070 1150 1270 2060	1 0 62 <1 1002 1161 1061 1291 3361	5 0 60 <1 917 1044 1029 1226 2814	0 0 66 <1 920 1095 1002 1270 2847
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	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	1 0 62 <1 1002 1161 1061 1291 3361 current	5 0 60 <1 917 1044 1029 1226 2814 history1	0 0 66 <1 920 1095 1002 1270 2847 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 kimit/base >25	1 0 62 <1 1002 1161 1061 1291 3361 current 7	5 0 60 <1 917 1044 1029 1226 2814 history1 3	0 0 66 <1 920 1095 1002 1270 2847 history2 4
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm 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 >25	1 0 62 <1 1002 1161 1061 1291 3361 current 7 12	5 0 60 <1 917 1044 1029 1226 2814 history1 3 19	0 0 66 <1 920 1095 1002 1270 2847 history2 4 64
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	1 0 62 <1 1002 1161 1061 1291 3361 current 7 12 5	5 0 60 <1 917 1044 1029 1226 2814 history1 3 19 3 History1	0 0 66 <1 920 1095 1002 1270 2847 history2 4 64 0 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 Limit/base >20	1 0 62 <1 1002 1161 1061 1291 3361 <i>current</i> 7 12 5 <i>current</i> 0.8	5 0 60 <1 917 1044 1029 1226 2814 history1 3 19 3 history1 0.9	0 0 66 <1 920 1095 1002 1270 2847 history2 4 64 0 bistory2 0.7
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 TS 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 62 <1 1002 1161 1061 1291 3361 <i>current</i> 7 12 5 <i>current</i> 0.8 11.5	5 0 60 <1 917 1044 1029 1226 2814 history1 3 19 3 history1 0.9 12.1	0 0 66 <1 920 1095 1002 1270 2847 history2 4 64 0 history2 0.7 11.9
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 imit/base >6 >20	1 0 62 <1 1002 1161 1061 1291 3361 <u>current</u> 7 12 5 <u>current</u> 0.8 11.5 22.2	5 0 60 <1 917 1044 1029 1226 2814 history1 3 19 3 19 3 history1 0.9 12.1 24.3	0 0 66 <1 920 1095 1002 1270 2847 history2 4 64 0 0 history2 0.7 11.9 24.1
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 *ASTM D7844	0 0 0 1010 1070 1150 1270 2060 2060 225 220 220 imit/base >6 >20 >20 >30	1 0 62 <1 1002 1161 1061 1291 3361 <i>current</i> 7 12 5 <i>current</i> 0.8 11.5 22.2 <i>current</i>	5 0 60 <1 917 1044 1029 1226 2814 history1 3 19 3 history1 0.9 12.1 24.3 history1	0 0 66 <1 920 1095 1002 1270 2847 history2 4 64 0 0 history2 0.7 11.9 24.1 history2
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 20 220 20 20 20 20 20 20 20 20 20 20 20	1 0 62 <1 1002 1161 1061 1291 3361 <u>current</u> 7 12 5 <u>current</u> 0.8 11.5 22.2	5 0 60 <1 917 1044 1029 1226 2814 history1 3 19 3 19 3 history1 0.9 12.1 24.3	0 0 66 <1 920 1095 1002 1270 2847 history2 4 64 0 history2 0.7 11.9 24.1



OIL ANALYSIS REPORT

VISUAL



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		11-	Mar7/22		Aug31/22	Aug17/23 +	Mar7/22	Aug31/22	د 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
		12	Abnormal			2.0			
		⁶³ 14					+		
		() () () () () () () () () () () () () (
			Rase			KOH/g			
		18- 17-	Abnormal		1	≈ 8.0			
		19-				10.0	Base Number		
			Viscosity @ 100°	С	Au	Au			
		5	Mar7/22 - Jun7/22 -		Aug31/22 .	Aug17/23			
		0			all of the Destantion of the Destantion of the				
		2							
		udd 4							
		6							
		8	seesesseeses lead						
		10	copper						
			≅ ⊰ Non-ferrous Meta	als	Aug	Aug17/			
		0.	Mar7/22		Aug31/22	17/23			
		5							
		10							
		튭 15							
	Aug	20	nicke						
	Aug31/22	25	iron chromium			_			
		30-	Ferrous Alloys						
		1	GRAPHS						
		Ň	/isc @ 100°C	cSt	ASTM D445	15.4	13.4	14.0	14.7
			FLUID PROPE	ERTIES	method	limit/base	current	history1	history2
			Free Water	scalar	*Visual	>0.2	NEG	NEG	NEG
	Au		Ddor Emulsified Water	scalar scalar	*Visual *Visual	NORML >0.2	NORML NEG	NORML NEG	NORML NEG
	Aug31/22	-	ppearance	scalar	*Visual	NORML	NORML	NORML	NORML
		Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE	
			Debris	scalar	*Visual	NONE	NONE	NONE	NONE
			Silt	scalar	*Visual	NONE	NONE	NONE	NONE
			Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
			Vhite Metal Yellow Metal	scalar scalar	*Visual *Visual	NONE NONE	NONE	NONE NONE	NONE NONE

* - Denotes test m Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

Submitted By: Belal Dgheish

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