

OIL ANALYSIS REPORT

Sample Rating Trend





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

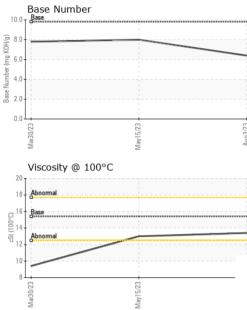
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0085505	GFL0075399	GFL0075311
Sample Date		Client Info		03 Aug 2023	15 May 2023	30 Mar 2023
Machine Age	mls	Client Info		22745	14103	9491
Oil Age	mls	Client Info		22745	14103	0
Oil Changed		Client Info		Changed	N/A	N/A
Sample Status				NORMAL	NORMAL	ABNORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>3.0	<1.0	<1.0	0.5
Glycol		WC Method		NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>120	7	5	28
Chromium	ppm	ASTM D5185m		<1	<1	1
Nickel	ppm	ASTM D5185m	>5	0	<1	1
Titanium	ppm	ASTM D5185m		<1	0	<1
Silver	ppm	ASTM D5185m	>2	<1	1	<1
Aluminum	ppm	ASTM D5185m		<1	2	9
Lead	ppm	ASTM D5185m	>40	2	<1	<1
Copper	ppm	ASTM D5185m		- 157	52	130
Tin	ppm	ASTM D5185m	>15	<1	1	2
Vanadium	ppm	ASTM D5185m	210	<1	<1	0
Cadmium	ppm	ASTM D5185m		0	0	0
	PP			•	0	Ũ
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	0	0	10	236
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	0 0	10 0	236 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	0 0 41	10 0 45	236 0 126
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	0 0 41 <1	10 0 45 <1	236 0 126 4
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	0 0 41 <1 11	10 0 45 <1 55	236 0 126 4 663
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	0 0 41 <1 11 2445	10 0 45 <1 55 2651	236 0 126 4 663 1553
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	0 0 41 <1 11 2445 1015	10 0 45 <1 55 2651 1110	236 0 126 4 663 1553 682
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	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	0 0 41 <1 11 2445 1015 1234	10 0 45 <1 55 2651 1110 1329	236 0 126 4 663 1553 682 850
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	0 0 41 <1 11 2445 1015	10 0 45 <1 55 2651 1110	236 0 126 4 663 1553 682
Boron 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 ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	0 0 41 <1 11 2445 1015 1234 3383	10 0 45 <1 55 2651 1110 1329 4008 history1	236 0 126 4 663 1553 682 850 2746 history2
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 ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	0 0 41 <1 11 2445 1015 1234 3383	10 0 45 <1 55 2651 1110 1329 4008	236 0 126 4 663 1553 682 850 2746 history2 ▶ 95
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 ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	0 0 41 <1 11 2445 1015 1234 3383	10 0 45 <1 55 2651 1110 1329 4008 history1	236 0 126 4 663 1553 682 850 2746 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 method	0 0 60 1010 1070 1150 1270 2060	0 0 41 <1 11 2445 1015 1234 3383 current 8	10 0 45 <1 55 2651 1110 1329 4008 history1 18	236 0 126 4 663 1553 682 850 2746 history2 ▶ 95
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 method ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25	0 0 41 <1 11 2445 1015 1234 3383 current 8 3	10 0 45 <1 55 2651 1110 1329 4008 history1 18 2	236 0 126 4 663 1553 682 850 2746 vistory2 > 95 3
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 60 0 1010 1070 1150 1270 2060 limit/base >25	0 0 41 <1 11 2445 1015 1234 3383 current 8 3 6	10 0 45 <1 55 2651 1110 1329 4008 history1 18 2 5	236 0 126 4 663 1553 682 850 2746 history2 ▲ 95 3 24
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	0 0 41 <1 11 2445 1015 1234 3383 current 8 3 6 current	10 0 45 <1 55 2651 1110 1329 4008 history1 18 2 5 5 history1	236 0 126 4 663 1553 682 850 2746 vistory2 95 3 24 vistory2
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 ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base	0 0 41 <1 11 2445 1015 1234 3383 current 8 3 6 current 0.2	10 0 45 <1 55 2651 1110 1329 4008 history1 18 2 5 5 history1 0.1	236 0 126 4 663 1553 682 850 2746 bistory2 95 3 24 24 bistory2 0.3
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 imit/base >25 20 imit/base >20	0 0 41 <1 11 2445 1015 1234 3383 current 8 3 6 current 0.2 7.3	10 0 45 <1 55 2651 1110 1329 4008 history1 18 2 5 5 history1 0.1 6.4	236 0 126 4 663 1553 682 850 2746
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 	0 0 41 <1 11 2445 1015 1234 3383 <u>current</u> 8 3 6 <u>current</u> 0.2 7.3 18.4	10 0 45 <1 55 2651 1110 1329 4008 history1 18 2 5 5 history1 0.1 6.4 17.2	236 0 126 4 663 1553 682 850 2746 history2
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 D7844	0 0 0 1010 1070 1150 1270 2060 imit/base >25 imit/base >4 >20 imit/base >30	0 0 41 <1 11 2445 1015 1234 3383 <i>current</i> 8 3 6 <i>current</i> 0.2 7.3 18.4	10 0 45 <1 55 2651 1110 1329 4008 history1 18 2 5 history1 0.1 6.4 17.2 history1	236 0 126 4 663 1553 682 850 2746 history2



OIL ANALYSIS REPORT

VISUAL



	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
lay15/23 - Aug3/23 -	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
May15/23 Aug3/23	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	RTIES	method	limit/base	current	history1	history2
	Visc @ 100°C	cSt	ASTM D445	15.4	13.4	13.0	9 .4
	GRAPHS						
	Ferrous Alloys						
23	iron						
May15/23	25 - management chromium						
<	20						
	<u>ة</u> 15						
	10						
	5						
		53		53			
	Mar30/22	May15/23		Aug3/23			
	≥ Non-ferrous Metal			4			
	¹⁶⁰ T	5					
	140 - copper			/			
	120 tin						
	100						
	₩ 80	/	/				
	60	\checkmark					
	40						
	20 -						
	3	23.		23			
	Mar30/23	May15/23		Aug3/23			
	≥ Viscosity @ 100°C						
	20 ₁			10.0	Base Number		
	18 - Abnormal			10.0		****	
		1		_@ 8.0			
	G 16 Base		******	KOH			
	2000 14 33 Abnormal			0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0			
	경 12						
				ase			
	10			° 2.0			
	84			0.0	L		
	Mar30/23	May15/23		Aug3/23	Mar30/23	May15/23	
	Ma	May		Aı	Ma	May	
Laboratory	: WearCheck USA - 5 : GFL0085505	3 - Sugar Land Haulir West Belfort Stree Sugar Land, T US 7749 ontact: Gino Grieg griego@gflenv.con T					

Submitted By: TECHNICIAN ACCOUNT