

OIL ANALYSIS REPORT

Sample Rating Trend





583M Component **Diesel Engine** Fluid

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

DIAGNOSIS Recommendation

Resample at the next service interval to monitor.

Machine Id

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.

	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0086638	GFL0068646	GFL0055176
Sample Date		Client Info		13 Jul 2023	19 Jan 2023	18 Jul 2022
Machine Age	hrs	Client Info		9520	9246	9022
Oil Age	hrs	Client Info		9246	9022	7899
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				NORMAL	ATTENTION	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 METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>90	79	<u>∧</u> 72	36
Chromium	ppm	ASTM D5185m	>20	2	2	1
Nickel	ppm	ASTM D5185m	>2	<1	0	<1
Titanium	ppm	ASTM D5185m	>2	<1	0	0
Silver	ppm	ASTM D5185m	>2	0	0	<1
Aluminum	ppm	ASTM D5185m	>20	5	3	0
Lead	ppm	ASTM D5185m	>40	2	2	1
Copper	ppm	ASTM D5185m	>330	3	3	2
Tin	ppm	ASTM D5185m	>15	<1	0	<1
Antimony	ppm	ASTM D5185m				
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 0	history2 4
	ppm ppm					
Boron		ASTM D5185m	0	1	0	4
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	1 2	0	4
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	1 2 64	0 0 61	4 0 63
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	1 2 64 <1	0 0 61 <1	4 0 63 <1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150	1 2 64 <1 924 1141 1044	0 0 61 <1 932 1087 986	4 0 63 <1 984 1187 1031
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	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	1 2 64 <1 924 1141	0 0 61 <1 932 1087	4 0 63 <1 984 1187
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	1 2 64 <1 924 1141 1044	0 0 61 <1 932 1087 986	4 0 63 <1 984 1187 1031
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 2 64 <1 924 1141 1044 1292	0 0 61 <1 932 1087 986 1213	4 0 63 <1 984 1187 1031 1277
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	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 2 64 <1 924 1141 1044 1292 2888 current 12	0 0 61 <1 932 1087 986 1213 2946 history1 6	4 0 63 <1 984 1187 1031 1277 3357 history2 5
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	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	1 2 64 <1 924 1141 1044 1292 2888 current 12 9	0 0 61 <1 932 1087 986 1213 2946 history1	4 0 63 <1 984 1187 1031 1277 3357 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	0 0 60 1010 1070 1150 1270 2060	1 2 64 <1 924 1141 1044 1292 2888 current 12	0 0 61 <1 932 1087 986 1213 2946 history1 6	4 0 63 <1 984 1187 1031 1277 3357 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 0 1010 1070 1150 1270 2060 limit/base	1 2 64 <1 924 1141 1044 1292 2888 current 12 9 2 2 8 2 8 8	0 0 61 <1 932 1087 986 1213 2946 history1 6 8	4 0 63 <1 984 1187 1031 1277 3357 history2 5 10
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 imit/base >25 >20	1 2 64 <1 924 1141 1044 1292 2888 current 12 9 2 2 8 2 current 12 9 2 2 2 8 8	0 0 61 <1 932 1087 986 1213 2946 history1 6 8 0 0 history1 1.9	4 0 63 <1 984 1187 1031 1277 3357 history2 5 10 0 history2 1.1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25	1 2 64 <1 924 1141 1044 1292 2888 current 12 9 2 current 1.8 16.1	0 0 61 <1 932 1087 986 1213 2946 history1 6 8 0 0 history1 1.9 1.9	4 0 63 <1 984 1187 1031 1277 3357 history2 5 10 0 history2 1.1 12.7
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 limit/base >25 >20 limit/base	1 2 64 <1 924 1141 1044 1292 2888 current 12 9 2 2 8 2 current 12 9 2 2 2 8 8	0 0 61 <1 932 1087 986 1213 2946 history1 6 8 0 0 history1 1.9	4 0 63 <1 984 1187 1031 1277 3357 history2 5 10 0 history2 1.1
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 2060 225 220 220 1imit/base >20 20	1 2 64 <1 924 1141 1044 1292 2888 current 12 9 2 current 1.8 16.1	0 0 61 <1 932 1087 986 1213 2946 history1 6 8 0 0 history1 1.9 1.9	4 0 63 <1 984 1187 1031 1277 3357 history2 5 10 0 Vistory2 1.1 1.1 12.7
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 <u>imit/base</u> >6 >20 20	1 2 64 <1 924 1141 1044 1292 2888 <u>current</u> 12 9 2 <u>current</u> 1.8 16.1 29.2	0 0 61 <1 932 1087 986 1213 2946 history1 6 8 0 0 history1 1.9 16.4 29.7	4 0 63 <1 984 1187 1031 1277 3357 history2 5 10 0 history2 1.1 12.7 25.6

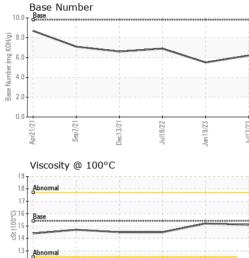


12 11

Apr21/21

Sep7/21

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
3/21	8/23 -	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Dec13/21 Jul18/22	Jan 19,23 - Jul 13,23 -	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
		Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
		Free Water	scalar	*Visual		NEG	NEG	NEG
		FLUID PROP		method	limit/base	current	history1	history2
		Visc @ 100°C	cSt	ASTM D445		15.1	15.2	14.5
		GRAPHS						
		Ferrous Alloys						
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Jul18/22	Jan 19/23	70 60						
5 T	Ja	50						
		Ē 40 -						
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		Apr21/21	Dec13/21 Jul18/22	Jan 19/23	Jul13/23			
		4		Jan	Jul			
		Non-ferrous Meta	als					
		copper						
		8 - enseense lead						
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			22+	23	23			
		Apr21/21 Sep7/21	Dec13/21 Jul18/22	Jan 19/23	Jul13/23			
		√ Viscosity @ 100°		ت ت	-	D 1		
		¹⁹		1	10.0	Base Number		
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		17			(₽ ^{8.0}			
		Difference Base			Q 6.0			
		Base 0015		_	-0.9 KO			
		0 15 ts 14			.0.6 KO Bun ber 4.0-			
		13 - Abnormal			iber (m			
		13 Abnormal			2.0-			
		13 - Abnormal 12 -	13/21+	9/23	0.0	2121	13/21-	9/23
		13 - Abnormal 12 -	Dac13/21+	Jan 19,23	2.0-	Api21/21	Dec13/21 Jult 8/22	Jan 19/23
	Laboratory	13 Abnormal 12 11 12 11 12 12 12 12 12 12			0.0-	4		
	Laboratory Sample No.	: WearCheck USA - : GFL0086638		on Ave., Ca : 14 c	ry, NC 27513 Jul 2023	4	tironmental - 415	- Michigan Eas
	Sample No. Lab Number	: WearCheck USA - : GFL0086638 : 05898344	501 Madis Received Diagnose	on Ave., Ca : 14 . ed : 17 .	ry, NC 27513 Jul 2023 Jul 2023	4	ironmental - 415	- Michigan Eas 6200 Elmridge ing Heights, M
	Sample No. Lab Number Unique Number	: WearCheck USA - : GFL0086638 : 05898344 : 10559700	501 Madis Received	on Ave., Ca : 14 . ed : 17 .	ry, NC 27513 Jul 2023	4	ironmental - 415 Sterl	- Michigan Eas 6200 Elmridge ing Heights, M US 48313
enticate 12367 a discuss this	Sample No. Lab Number Unique Number Test Package	: WearCheck USA - : GFL0086638 : 05898344 : 10559700	501 Madis Received Diagnose Diagnosti	on Ave., Ca : 14 c ed : 17 c ician : Dor	ry, NC 27513 Jul 2023 Jul 2023 Baldridge	4	ironmental - 415 Sterl Contac	- Michigan Eas 6200 Elmridge ing Heights, M