

OIL ANALYSIS REPORT

Sample Rating Trend

NORMAL

Machine Id 712027

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		GFL0090288	GFL0090266	GFL0090164
Sample Date		Client Info		05 Dec 2023	09 Oct 2023	04 Oct 2023
Machine Age	hrs	Client Info		4682	4328	8301
Oil Age	hrs	Client Info		600	150	150
Oil Changed		Client Info		Changed	Not Changd	N/A
Sample Status				NORMAL	NORMAL	SEVERE
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	0.4	• 11.4
Water		WC Method	>0.2	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>110	7	<1	27
Chromium	ppm	ASTM D5185m	>4	<1	<1	<1
Nickel	ppm	ASTM D5185m	>2	0	0	0
Titanium	ppm	ASTM D5185m		0	<1	0
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>25	15	<1	8
Lead	ppm	ASTM D5185m	>45	0	0	<1
Copper	ppm	ASTM D5185m	>85	<1	<1	3
Tin	ppm	ASTM D5185m	>4	<1	0	0
Vanadium	ppm	ASTM D5185m		<1	<1	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current <1	history1 4	history2 5
	ppm ppm	ASTM D5185m				
Boron		ASTM D5185m	0	<1	4	5
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	<1 0	4	5 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	<1 0 57	4 0 55	5 0 51
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	<1 0 57 <1	4 0 55 <1	5 0 51 <1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	<1 0 57 <1 988	4 0 55 <1 908	5 0 51 <1 769
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 57 <1 988 1068	4 0 55 <1 908 998	5 0 51 <1 769 844
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 57 <1 988 1068 1062	4 0 55 <1 908 998 983	5 0 51 <1 769 844 850
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	<1 0 57 <1 988 1068 1062 1284	4 0 55 <1 908 998 983 1197	5 0 51 <1 769 844 850 1040
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 0 1010 1070 1150 1270 2060	<1 0 57 <1 988 1068 1062 1284 3081	4 0 55 <1 908 998 983 1197 3010	5 0 51 <1 769 844 850 1040 2901
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	<1 0 57 <1 988 1068 1062 1284 3081 current	4 0 55 <1 908 998 983 1197 3010 history1	5 0 51 <1 769 844 850 1040 2901 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	<1 0 57 <1 988 1068 1062 1284 3081 <u>current</u> 3	4 0 55 <1 908 998 983 1197 3010 history1 5	5 0 51 <1 769 844 850 1040 2901 history2 8
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 1010 1070 1150 1270 2060 limit/base >30	<1 0 57 <1 988 1068 1062 1284 3081 <u>current</u> 3 4	4 0 55 <1 908 998 983 1197 3010 history1 5 <1	5 0 51 <1 769 844 850 1040 2901 history2 8 40
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 >30	<1 0 57 <1 988 1068 1062 1284 3081 current 3 4 31	4 0 55 <1 908 998 983 1197 3010 history1 5 < <1 2	5 0 51 <1 769 844 850 1040 2901 history2 8 40 6
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	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 >30	<1 0 57 <1 988 1068 1062 1284 3081 <u>current</u> 3 4 31 <u>current</u>	4 0 55 <1 908 998 983 1197 3010 history1 5 <1 2 history1	5 0 51 <1 769 844 850 1040 2901 history2 8 40 6 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 ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >30 limit/base >20	<1 0 57 <1 988 1068 1062 1284 3081 <u>current</u> 3 4 31 <u>current</u> 0.2	4 0 55 <1 908 998 983 1197 3010 history1 5 <1 2 history1 0	5 0 51 <1 769 844 850 1040 2901 history2 8 40 6 kistory2 0.9
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 >30 200 limit/base >30	<1 0 57 <1 988 1068 1062 1284 3081 <i>current</i> 3 4 31 <i>current</i> 0.2 6.5	4 0 55 <1 908 998 983 1197 3010 history1 5 <1 2 history1 0 3.9	5 0 51 <1 769 844 850 1040 2901 history2 8 40 6 kistory2 0.9 7.7
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 imit/base >30 imit/base >3 20	<1 0 57 <1 988 1068 1062 1284 3081 <u>current</u> 3 4 31 <u>current</u> 0.2 6.5 18.5	4 0 55 <1 908 998 983 1197 3010 history1 5 <1 2 history1 0 3.9 16.8	5 0 51 <1 769 844 850 1040 2901 history2 8 40 6 history2 0.9 7.7 20.1
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 TS ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7415	0 0 0 1010 1070 1150 1270 2060 Iimit/base >30 200 Iimit/base >3 >20 >30	<1 0 57 <1 988 1068 1062 1284 3081 Current 3 4 31 Current 0.2 6.5 18.5 Current	4 0 55 <1 908 998 983 1197 3010 history1 5 <1 2 history1 0 3.9 16.8 history1	5 0 51 <1 769 844 850 1040 2901 history2 8 40 6 history2 0.9 7.7 20.1 history2

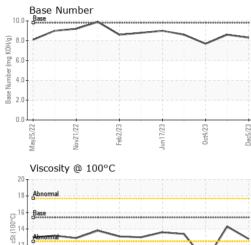


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Nov21/22

OIL ANALYSIS REPORT

VISUAL



	Laboratory Sample No. Lab Number Unique Number	: GFL0090288 : <mark>06027550</mark>	Received Diagnose	01 Madison Ave., Cary, NC 27513Acceived: 07 Dec 2023Aliagnosed: 08 Dec 2023Aliagnostician: Don BaldridgeAliagnostician: Don BaldridgeAliagnostician: Scope of accreditation.			GFL Environmental - 821 - Ozarks Haulin 33924 Olath Driv Lebanon, M US 6553 Contact: Landen Johnso landen.johnson@gflenv.cor T: (417)664-001			
		May25/22 6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	E2/TimL	Oct4/23	0.0 (0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(May25/22 Nov21/22	Feb2/23	0ct4/23		
		Viscosity @ 100°C	7		10.0	Base Number		\sim		
		May25/22 Nov21/22	Jun17/23 +	Dot4/23	Dec5/23					
		Copper 8 - Lead 6 - Lead								
		22/52/Jew Non-ferrous Metal	~	0ct4/23	Dec5/23					
٦r	_		\sim	\square	/					
Jun17/23	Octi/23	GRAPHS Ferrous Alloys		٨						
	~	FLUID PROPE Visc @ 100°C		method ASTM D445	limit/base 15.4	current 12.8	history1 14.3	history2 10.1		
		Free Water	scalar	*Visual	>0.2	NEG	NEG	NEG		
Jun17/23	0ct4/23 Dec5/23	Odor Emulsified Water	scalar	*Visual *Visual	NORML	NORML	NORML	NORML		
/23 /23 /23	Sand/Dirt Appearance		*Visual *Visual	NONE NORML	NONE NORML	NONE NORML	NONE NORML			
	Silt Debris		*Visual *Visual	NONE NONE	NONE NONE	NONE NONE	NONE NONE			
		Yellow Metal Precipitate		*Visual *Visual	NONE NONE	NONE NONE	NONE NONE	NONE		

limit/base

Submitted By: GFL821, GFL824 and GFL829 - Landen Johnson