

## **OIL ANALYSIS REPORT**

#### Sample Rating Trend

-

Mar 2022 Mar 2022 Au





## 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		GFL0091371	GFL0088769	GFL0086113
Sample Date		Client Info		28 Aug 2023	15 Aug 2023	20 Jul 2023
Machine Age	hrs	Client Info		4586	4501	4749
Oil Age	hrs	Client Info		515	434	682
Oil Changed		Client Info		Changed	Not Changd	Changed
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<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	>110	11	14	8
Chromium	ppm	ASTM D5185m	>4	<1	<1	0
Nickel	ppm	ASTM D5185m	>2	0	0	0
Titanium	ppm	ASTM D5185m		0	<1	<1
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>25	5	5	3
Lead	ppm	ASTM D5185m	>45	0	<1	0
Copper	ppm	ASTM D5185m	>85	<1	2	1
Tin	ppm	ASTM D5185m	>4	<1	<1	0
Vanadium	ppm	ASTM D5185m		0	<1	<1
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	ASTM D5185m	0	current 8	history1 9	history2 11
	ppm ppm		0			
Boron		ASTM D5185m	0	8	9	11
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0 0 60	8 0	9 0	11 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	8 0 60	9 0 60	11 0 61
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	8 0 60 <1	9 0 60 1	11 0 61 <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	8 0 60 <1 805	9 0 60 1 776	11 0 61 <1 785
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	8 0 60 <1 805 1097	9 0 60 1 776 1137	11 0 61 <1 785 1143
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	8 0 60 <1 805 1097 937	9 0 60 1 776 1137 910	11 0 61 <1 785 1143 921
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	8 0 60 <1 805 1097 937 1177	9 0 60 1 776 1137 910 1119	11 0 61 <1 785 1143 921 1126
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 0 1010 1070 1150 1270 2060	8 0 60 <1 805 1097 937 1177 3330	9 0 60 1 776 1137 910 1119 3163	11 0 61 <1 785 1143 921 1126 3283
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 0 1010 1070 1150 1270 2060	8 0 60 <1 805 1097 937 1177 3330 current	9 0 60 1 776 1137 910 1119 3163 history1	11 0 61 <1 785 1143 921 1126 3283 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 <b>method</b>	0 0 60 0 1010 1070 1150 1270 2060	8 0 60 <1 805 1097 937 1177 3330 current 4	9 0 60 1 776 1137 910 1119 3163 history1 6	11 0 61 <1 785 1143 921 1126 3283 history2
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 <b>method</b> ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 limit/base >30	8 0 60 <1 805 1097 937 1177 3330 current 4 <	9 0 60 1 776 1137 910 1119 3163 history1 6 3	11 0 61 <1 785 1143 921 1126 3283 history2 3 1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc 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 <b>limit/base</b> >30	8 0 60 <1 805 1097 937 1177 3330 current 4 <1 4	9 0 60 1 776 1137 910 1119 3163 history1 6 3 9	11 0 61 <1 785 1143 921 1126 3283 history2 3 1 3
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 <b>limit/base</b> >30 20 <b>limit/base</b>	8 0 60 <1 805 1097 937 1177 3330 current 4 <1 4 <1 4	9 0 60 1 776 1137 910 1119 3163 history1 6 3 9 9	11 0 61 <1 785 1143 921 1126 3283 history2 3 1 3 3 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	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>limit/base</b> >30 20 <b>limit/base</b>	8 0 60 <1 805 1097 937 1177 3330 <u>current</u> 4 <1 4 <u>current</u>	9 0 60 1 776 1137 910 1119 3163 history1 6 3 9 9 history1 0.4	11 0 61 <1 785 1143 921 1126 3283 history2 3 1 3 1 3 history2 0.4
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 >3 >20	8 0 60 <1 805 1097 937 1177 3330 current 4 < 4 <1 4 current 0.5 7.4	9 0 60 1 776 1137 910 1119 3163 history1 6 3 9 history1 0.4 7.3	11 0 61 <1 785 1143 921 1126 3283 history2 3 1 3 1 3 history2 0.4 6.9
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 <b>imit/base</b> >30 <b>imit/base</b> >3 20	8 0 60 <1 805 1097 937 1177 3330 current 4 <1 4 <1 4 current 0.5 7.4 18.2	9 0 60 1 776 1137 910 1119 3163 history1 6 3 9 <u>history1</u> 0.4 7.3 18.0	11 0 61 <1 785 1143 921 1126 3283 history2 3 1 3 1 3 <i>history2</i> 0.4 6.9 17.6
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 ppm	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7415	0 0 0 1010 1070 1150 1270 2060 <b>Iimit/base</b> >30 >20 <b>Iimit/base</b> >30 >20 <b>Iimit/base</b>	8 0 60 <1 805 1097 937 1177 3330 current 4 < 4 <1 4 current 0.5 7.4 18.2 current	9 0 60 1 776 1137 910 1119 3163 <b>history1</b> 6 3 9 <b>history1</b> 0.4 7.3 18.0 <b>history1</b>	11 0 61 <1 785 1143 921 1126 3283 history2 3 1 3 1 3 history2 0.4 6.9 17.6 history2



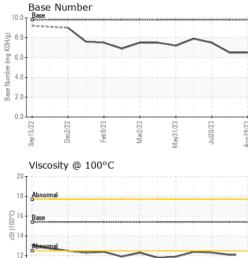
10 Sep15/22

Dec2/22

Feb 9/23

# **OIL ANALYSIS REPORT**

VISUAL



Certi	REDITED INGLASONATORY	Sa La Un	boratory mple No. b Number ique Numbe st Packag	: GFL0091371 : 05938604 er : 10629216	Receive Diagnos	501 Madison Ave., Cary, NC 27513 <b>Received</b> : 30 Aug 2023 <b>Diagnosed</b> : 31 Aug 2023 <b>Diagnostician</b> : Wes Davis vice at 1-800-237-1369. 17025 scope of accreditation.			GFL Environmental - 010 - Stockbridge 1280 Rum Creek Parkway Stockbridge, GA US 30281 Contact: JOSHUA TINKER joshuatinker@gflenv.com T:			
				Base (1001) 114 13 12 11 10 10 10 10 10 10 10 10 10 10 10 10	Mar2/23	May31/23		Sep 15/22	Feb9/23	Mar/31/23	Aug28/23	
				Viscosity @ 10	0°C			Base Number		$\sim$	_	
				Sep 15,222 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	_	May31/23	Aug28/23					
				70 60 50 <u>E</u> 40 30	$\wedge$							
				Non-ferrous Me		May3	Aug					
				Sep15/22	Mar2/23	May31/23	Aug28/23					
/enal	Mar2/23	May31/23	Jul20/23	20 15 10	/	$ \land $						
	/23	/23	/23	GRAPHS Ferrous Alloys	٨							
				FLUID PRO Visc @ 100°C	cSt	Method ASTM D445	limit/base 15.4	current 12.1	history1 12.1	histo 12.3	ory∠	
°C				Free Water	scalar	*Visual		NEG	NEG	NEG		
	Ma	Maya	Jul	Odor Emulsified Water	scalar scalar	*Visual *Visual	NORML >0.2	NORML NEG	NORML NEG	NORM NEG	ЛL	
c7/cna	Mar2/23	May31/23	Jul20/23	Sand/Dirt Appearance	scalar scalar	*Visual *Visual	NONE NORML	NONE NORML	NONE NORML	NONE		
			Debris	scalar	*Visual	NONE	NONE	NONE	NONE	=		
			Precipitate Silt	scalar scalar	*Visual *Visual	NONE NONE	NONE NONE	NONE	NONE			
	$\checkmark$		Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE	Ξ		
		-	White Metal	scalar	*Visual	NONE	NONE	NONE	NONE			

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Submitted By: JOSHUA TINKER

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