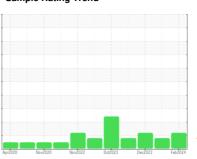


# **OIL ANALYSIS REPORT**

Sample Rating Trend



FUEL

# 920092-260371

Component

**Diesel Engine** 

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

## **DIAGNOSIS**

## Recommendation

The oil change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

#### Wear

All component wear rates are normal.

## Contamination

There is a moderate amount of fuel present in the oil. Tests confirm the presence of fuel in the oil.

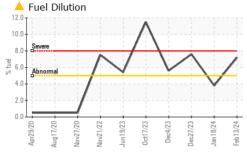
### Fluid Condition

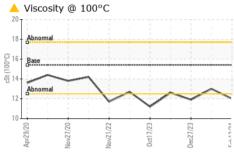
The BN result indicates that there is suitable alkalinity remaining in the oil. Fuel is present in the oil and is lowering the viscosity. The oil is no longer serviceable due to the presence of contaminants.

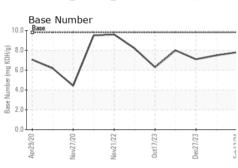
GAL)		Apr2020	Nov2020 Nov2022	Oct2023 Dec2023	Feb 2024	
SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0108081	GFL0108149	GFL0102497
Sample Date		Client Info		13 Feb 2024	18 Jan 2024	27 Dec 2023
Machine Age	hrs	Client Info		23641	23477	23322
Oil Age	hrs	Client Info		14809	0	0
Oil Changed		Client Info		Changed	Not Changd	N/A
Sample Status				ABNORMAL	MARGINAL	ABNORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
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	>100	3	2	6
Chromium	ppm	ASTM D5185m	>20	<1	0	<1
Nickel	ppm	ASTM D5185m	>4	0	0	0
Titanium	ppm	ASTM D5185m		0	0	0
Silver	ppm	ASTM D5185m	>3	0	0	0
Aluminum	ppm	ASTM D5185m	>20	1	<1	<1
Lead	ppm	ASTM D5185m	>40	0	0	0
Copper	ppm	ASTM D5185m	>330	0	<1	<1
Tin	ppm	ASTM D5185m	>15	<1	<1	<1
Vanadium	ppm	ASTM D5185m		0	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 <1	history2 2
	ppm ppm					
Boron	• • •	ASTM D5185m	0	<1	<1	2
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	<1 0	<1	2
Boron Barium Molybdenum	ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	<1 0 49	<1 0 51	2 0 52
Boron Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	<1 0 49 <1	<1 0 51	2 0 52 <1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	<1 0 49 <1 786	<1 0 51 0 883	2 0 52 <1 840
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	<1 0 49 <1 786 875	<1 0 51 0 883 971	2 0 52 <1 840 932
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	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	<1 0 49 <1 786 875 877	<1 0 51 0 883 971 923	2 0 52 <1 840 932 913
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 ASTM D5185m	0 0 60 0 1010 1070 1150	<1 0 49 <1 786 875 877 1085	<1 0 51 0 883 971 923 1085	2 0 52 <1 840 932 913 1115
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	<1 0 49 <1 786 875 877 1085 2556	<1 0 51 0 883 971 923 1085 2734	2 0 52 <1 840 932 913 1115 2663
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	<1 0 49 <1 786 875 877 1085 2556	<1 0 51 0 883 971 923 1085 2734 history1	2 0 52 <1 840 932 913 1115 2663 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	<1 0 49 <1 786 875 877 1085 2556 current	<1 0 51 0 883 971 923 1085 2734 history1	2 0 52 <1 840 932 913 1115 2663 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 Iimit/base >25	<1 0 49 <1 786 875 877 1085 2556 current 2	<1 0 51 0 883 971 923 1085 2734 history1 3 13	2 0 52 <1 840 932 913 1115 2663 history2 2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm	ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25	<1 0 49 <1 786 875 877 1085 2556 current 2 2	<1 0 51 0 883 971 923 1085 2734 history1 3 13	2 0 52 <1 840 932 913 1115 2663 history2 2 3 <1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel	ppm	ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20 >5	<1 0 49 <1 786 875 877 1085 2556 current 2 2 1 ▲ 7.2	<1 0 51 0 883 971 923 1085 2734 history1 3 13 1	2 0 52 <1 840 932 913 1115 2663 history2 2 3 <1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED	ppm	ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20 >5	<1 0 49 <1 786 875 877 1085 2556  current 2 2 1 ↑7.2  current	<1 0 51 0 883 971 923 1085 2734 history1 3 13 1 ▲ 3.8	2 0 52 <1 840 932 913 1115 2663 history2 2 3 <1 ▲ 7.6
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot %	ppm	ASTM D5185m	0 0 60 0 1010 1150 1270 2060 limit/base >25 >20 >5	<1 0 49 <1 786 875 877 1085 2556  current 2 2 1 ↑7.2  current 0.3	<1 0 51 0 883 971 923 1085 2734 history1 3 13 1  ▲ 3.8 history1 0.1	2 0 52 <1 840 932 913 1115 2663 history2 2 3 <1 ▲ 7.6 history2 0.4
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur  CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration	ppm	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7624	0 0 60 0 1010 1150 1270 2060 limit/base >25 >20 >5 limit/base	<1 0 49 <1 786 875 877 1085 2556  current 2 2 1  ▲ 7.2  current 0.3 6.2	<1 0 51 0 883 971 923 1085 2734 history1 3 13 1  ▲ 3.8 history1 0.1 4.9	2 0 52 <1 840 932 913 1115 2663 history2 2 3 <1 ▲ 7.6 history2 0.4 7.0
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation	ppm	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7624	0 0 0 0 1010 1150 1270 2060 limit/base >25 >20 >5 limit/base >3 >20 >30	<1 0 49 <1 786 875 877 1085 2556  current 2 2 1 ↑7.2  current 0.3 6.2 18.2	<1 0 51 0 883 971 923 1085 2734 history1 3 13 1 △ 3.8 history1 0.1 4.9 17.6	2 0 52 <1 840 932 913 1115 2663 history2 2 3 <1 ▲ 7.6 history2 0.4 7.0 19.7
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation FLUID DEGRAE	ppm	ASTM D5185m ASTM D78185m ASTM D78144 *ASTM D7844 *ASTM D7844 *ASTM D7844	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25 >20 >5 limit/base >3 >20 >30 limit/base	<1 0 49 <1 786 875 877 1085 2556  current 2 2 1 ▲ 7.2  current 0.3 6.2 18.2  current	<1 0 51 0 883 971 923 1085 2734 history1 3 13 1  ▲ 3.8 history1 0.1 4.9 17.6 history1	2 0 52 <1 840 932 913 1115 2663 history2 2 3 <1 ▲ 7.6 history2 0.4 7.0 19.7 history2



## **OIL ANALYSIS REPORT**



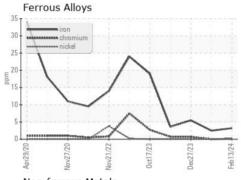


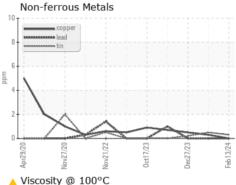


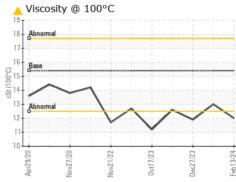
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
<b>Emulsified Water</b>	scalar	*Visual	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG

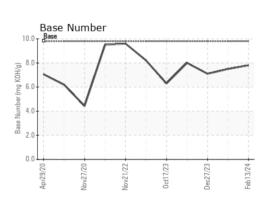
FLUID PROPI	ERITES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.4	<b>12.0</b>	13.0	<u> </u>

## **GRAPHS**













Laboratory Sample No. Lab Number : 06096127

: GFL0108081

: WearCheck USA - 501 Madison Ave., Cary, NC 27513

**Tested** Unique Number: 10888980 Diagnosed

Received : 21 Feb 2024 : 25 Feb 2024

: 25 Feb 2024 - Wes Davis Test Package: FLEET (Additional Tests: FuelDilution, PercentFuel)

22820 S State Route 291

Contact: JOHNNY PEREZ johnny.perez@gflenv.com

Harrisonville, MO

US 64701

T:

F:

To discuss this sample report, contact Customer Service at 1-800-237-1369. \* - Denotes test methods that are outside of the ISO 17025 scope of accreditation.

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

Report Id: GFL837 [WUSCAR] 06096127 (Generated: 02/25/2024 21:48:29) Rev: 1

Submitted By: JEREMY BROWN

GFL Environmental - 837 - Harrison TS