

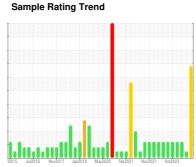




(BD49538) 1963 Component

**Diesel Engine** 

PETRO CANADA DURON SHP 15W40 (9 GAL)





## **DIAGNOSIS**

### Recommendation

We advise that you check for the source of the coolant leak. Check for low coolant level. We advise that you check the air filter, air induction system, and any areas where dirt may enter the component. Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

### Wear

The iron level is abnormal. All other component wear rates are normal.

### Contamination

Sodium and/or potassium levels are high. Elemental levels of silicon (Si) and aluminum (Al) indicate alumina-silicate (coarse dirt) ingress.

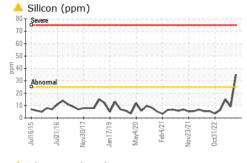
### Fluid Condition

The BN level is low.

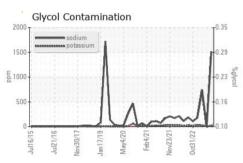
<u> </u>						
SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0108850	GFL0105731	GFL0086666
Sample Date		Client Info		29 Jan 2024	18 Dec 2023	07 Aug 2023
Machine Age	hrs	Client Info		28134	26975	26501
Oil Age	hrs	Client Info		10351	708	0
Oil Changed		Client Info		Changed	Not Changd	Changed
Sample Status				ABNORMAL	NORMAL	ABNORMAL
CONTAMINATI	ON	method	limit/base	current	history1	history2
Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
Water		WC Method	>0.2	NEG	NEG	NEG
WEAR METALS	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>90	<u>^</u> 86	4	49
Chromium	ppm	ASTM D5185m	>20	4	<1	3
Nickel	ppm	ASTM D5185m	>2	1	<1	<1
Titanium	ppm	ASTM D5185m	>2	<1	0	0
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>20	<b>▲</b> 10	2	6
Lead	ppm	ASTM D5185m	>40	1	0	0
Copper	ppm	ASTM D5185m	>330	2	12	1
Tin	ppm	ASTM D5185m	>15	<1	0	<1
Vanadium	ppm	ASTM D5185m	>10	<1	0	0
Cadmium		ASTM D5185m		0	0	0
	ppm	AOTIVI DOTOSIII		Ū		
V D D I T I V / E C		ام ممالات مص	limit/hooo	a	hiotomid	history2
ADDITIVES		method	limit/base	current	history1	Historyz
Boron	ppm	ASTM D5185m	0	29	18	20
	ppm ppm	ASTM D5185m				
Boron		ASTM D5185m	0	29	18	20
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	29 <1	18	20
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	29 <1 114	18 0 59	20 0 88
Boron Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	29 <1 114	18 0 59	20 0 88 <1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	29 <1 114 1 921	18 0 59 0 861	20 0 88 <1 900
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	29 <1 114 1 921 1056	18 0 59 0 861 974	20 0 88 <1 900 1051
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	29 <1 114 1 921 1056 941	18 0 59 0 861 974 818	20 0 88 <1 900 1051 969
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	29 <1 114 1 921 1056 941 1205	18 0 59 0 861 974 818 1090	20 0 88 <1 900 1051 969 1206
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	29 <1 114 1 921 1056 941 1205 2812	18 0 59 0 861 974 818 1090 2848	20 0 88 <1 900 1051 969 1206 3448
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	29 <1 114 1 921 1056 941 1205 2812 current	18 0 59 0 861 974 818 1090 2848 history1	20 0 88 <1 900 1051 969 1206 3448 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	29 <1 114 1 921 1056 941 1205 2812 current  35	18 0 59 0 861 974 818 1090 2848 history1	20 0 88 <1 900 1051 969 1206 3448 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 Iimit/base >25	29 <1 114 1 921 1056 941 1205 2812 current  35 1508	18 0 59 0 861 974 818 1090 2848 history1 9	20 0 88 <1 900 1051 969 1206 3448 history2 15
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 Iimit/base >25	29 <1 114 1 921 1056 941 1205 2812 current  35 1508 23	18 0 59 0 861 974 818 1090 2848 history1 9 0	20 0 88 <1 900 1051 969 1206 3448 history2 15  742 26
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	0 0 60 0 1010 1150 1270 2060 limit/base >25 >20	29 <1 114 1 921 1056 941 1205 2812 current  35 1508 23 NEG	18 0 59 0 861 974 818 1090 2848 history1 9 0 1 NEG	20 0 88 <1 900 1051 969 1206 3448 history2 15 742 26 NEG
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m *ASTM D2982 *Method	0 0 60 0 1010 1070 1150 1270 2060 Iimit/base >25	29 <1 114 1 921 1056 941 1205 2812  current  35 1508 23 NEG current	18 0 59 0 861 974 818 1090 2848 history1 9 0 1 NEG	20 0 88 <1 900 1051 969 1206 3448 history2 15  742 26 NEG history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m *ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *ASTM D5185m *ASTM D5185m *ASTM D2982  method  *ASTM D7844	0 0 60 0 1010 1150 1270 2060 limit/base >25 >20	29 <1 114 1 921 1056 941 1205 2812  current  35 1508 23 NEG  current  4.8	18 0 59 0 861 974 818 1090 2848 history1 9 0 1 NEG history1 0.1	20 0 88 <1 900 1051 969 1206 3448 history2 15 742 26 NEG history2 3.4
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration	ppm	ASTM D5185m *ASTM D7844 *ASTM D7624 *ASTM D76145	0 0 60 0 1010 1150 1270 2060 limit/base >25 >20	29 <1 114 1 921 1056 941 1205 2812 current  35 1508 23 NEG current 4.8 15.7	18 0 59 0 861 974 818 1090 2848 history1 9 0 1 NEG history1 0.1 4.5	20 0 88 <1 900 1051 969 1206 3448 history2 15  742 26 NEG history2 3.4 13.6
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration Sulfation FLUID DEGRAD	ppm	ASTM D5185m *ASTM D7844 *ASTM D7844 *ASTM D7624 *ASTM D7415 method	0 0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20	29 <1 114 1 921 1056 941 1205 2812 current  ▲ 35 ▲ 1508 ▲ 23 NEG current  4.8 15.7 31.3 current	18 0 59 0 861 974 818 1090 2848 history1 9 0 1 NEG history1 0.1 4.5 17.8 history1	20 0 88 <1 900 1051 969 1206 3448 history2 15 742 26 NEG history2 3.4 13.6 25.7 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration Sulfation	ppm	ASTM D5185m *ASTM D7844 *ASTM D7624 *ASTM D76145	0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base >30 limit/base	29  <1 114 1 921 1056 941 1205 2812  current  ▲ 35 ▲ 1508 ▲ 23 NEG  current  4.8 15.7 31.3	18 0 59 0 861 974 818 1090 2848 history1 9 0 1 NEG history1 0.1 4.5 17.8	20 0 88 <1 900 1051 969 1206 3448 history2 15  742 26 NEG history2 3.4 13.6 25.7

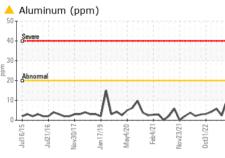


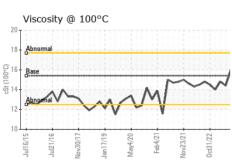
# **OIL ANALYSIS REPORT**



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Jul16/15	Jul21/16	Nov30/17	13	May4/20	eb4/2	Nov23/2	Dct31/22



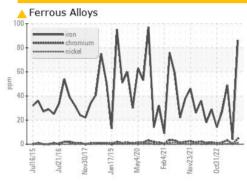


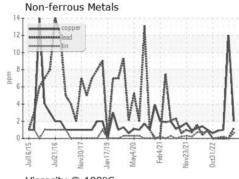


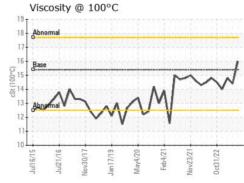
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	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

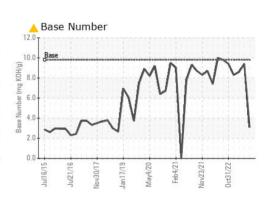
FLUID PROPI	ERITES	method	limit/base	current	history1	history
Visc @ 100°C	cSt	ASTM D445	15.4	16.0	14.4	14.8

# **GRAPHS**













Certificate L2367

Laboratory Sample No.

Lab Number : 06076585 Unique Number: 10858676

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : GFL0108850 Received **Tested** 

Diagnosed Test Package: FLEET (Additional Tests: Glycol)

: 05 Feb 2024 : 05 Feb 2024 - Jonathan Hester

: 01 Feb 2024

GFL Environmental - 415 - Michigan East 6200 Elmridge Sterling Heights, MI US 48313

Contact: Frank Wolak fwolak@gflenv.com T: (586)825-9514

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: GFL415 [WUSCAR] 06076585 (Generated: 02/12/2024 01:32:32) Rev: 1

Submitted By: Frank Wolak