

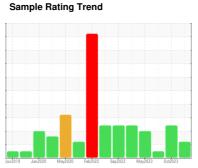
# **OIL ANALYSIS REPORT**



726044-310073

Component **Diesel Engine** 

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





## **DIAGNOSIS**

### Recommendation

Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

All component wear rates are normal.

## Contamination

Sodium and/or potassium levels are high. Test for glycol is negative.

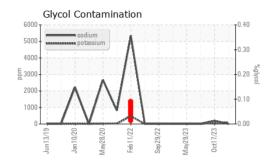
### **Fluid Condition**

The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is acceptable for the time in service.

(				2022 Sep2022 May2023		
SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0103929	GFL0093302	GFL0083450
Sample Date		Client Info		08 Jan 2024	17 Oct 2023	09 Aug 2023
Machine Age	hrs	Client Info		18874	187857	17736
Oil Age	hrs	Client Info		0	187857	17736
Oil Changed		Client Info		Changed	Changed	Not Changd
Sample Status				ABNORMAL	ABNORMAL	NORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	<1.0	0.9
Water		WC Method	>0.2	NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>80	22	24	5
Chromium	ppm	ASTM D5185m	>5	2	1	0
Nickel	ppm	ASTM D5185m	>2	<1	<1	0
Titanium	ppm	ASTM D5185m		0	<1	<1
Silver	ppm	ASTM D5185m	>3	0	<1	0
Aluminum	ppm	ASTM D5185m	>30	19	2	0
Lead	ppm	ASTM D5185m	>30	<1	<1	0
Copper	ppm	ASTM D5185m	>150	4	20	<1
Tin	ppm	ASTM D5185m	>5	1	1	0
Vanadium	ppm	ASTM D5185m		0	0	<1
Cadmium	ppm	ASTM D5185m		0	<1	0
ADDITIVES		ام مالم مما	limit/base	current	history1	history2
ADDITIVES		method	iiiiii/base	Current	HISTORY	HISTOLYZ
Boron	ppm	ASTM D5185m	0	8	4	20
	ppm		0			
Boron Barium	ppm	ASTM D5185m	0	8	4	20
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m	0 0 60	8 0	4	20
Boron Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	8 0 58	4 0 61	20 0 55
Boron Barium Molybdenum	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	8 0 58 2 627	4 0 61 3 709	20 0 55 <1
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	8 0 58 2 627 1574	4 0 61 3 709 1152	20 0 55 <1 796 1326
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	8 0 58 2 627 1574 757	4 0 61 3 709 1152 643	20 0 55 <1 796
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	8 0 58 2 627 1574	4 0 61 3 709 1152	20 0 55 <1 796 1326 897
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 1270	8 0 58 2 627 1574 757	4 0 61 3 709 1152 643 975	20 0 55 <1 796 1326 897 1070
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	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 58 2 627 1574 757 1012	4 0 61 3 709 1152 643 975 2206	20 0 55 <1 796 1326 897 1070 3247
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	8 0 58 2 627 1574 757 1012 2471 current	4 0 61 3 709 1152 643 975 2206 history1	20 0 55 <1 796 1326 897 1070 3247 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	8 0 58 2 627 1574 757 1012 2471 current	4 0 61 3 709 1152 643 975 2206 history1	20 0 55 <1 796 1326 897 1070 3247 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 limit/base >20	8 0 58 2 627 1574 757 1012 2471 current 8	4 0 61 3 709 1152 643 975 2206 history1 11	20 0 55 <1 796 1326 897 1070 3247 history2 3
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 >20	8 0 58 2 627 1574 757 1012 2471 current 8 2 ▲ 84	4 0 61 3 709 1152 643 975 2206 history1 11 ▲ 207 ▲ 84	20 0 55 <1 796 1326 897 1070 3247 history2 3 4
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED	ppm	ASTM D5185m *ASTM D2982  method	0 0 60 0 1010 1070 1150 1270 2060 limit/base >20	8 0 58 2 627 1574 757 1012 2471 current 8 2 ▲ 84 NEG current	4 0 61 3 709 1152 643 975 2206 history1 11 ▲ 207 ▲ 84 NEG history1	20 0 55 <1 796 1326 897 1070 3247 history2 3 4 0 NEG
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot %	ppm	ASTM D5185m *ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >20 >20	8 0 58 2 627 1574 757 1012 2471 current 8 2 ▲ 84 NEG current 0	4 0 61 3 709 1152 643 975 2206 history1 11 ▲ 207 ▲ 84 NEG history1 0.6	20 0 55 <1 796 1326 897 1070 3247 history2 3 4 0 NEG history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED	ppm	ASTM D5185m *ASTM D2982  method	0 0 60 0 1010 1070 1150 1270 2060 limit/base >20 >20	8 0 58 2 627 1574 757 1012 2471 current 8 2 ▲ 84 NEG current	4 0 61 3 709 1152 643 975 2206 history1 11 ▲ 207 ▲ 84 NEG history1	20 0 55 <1 796 1326 897 1070 3247 history2 3 4 0 NEG
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 D7624	0 0 60 0 1010 1070 1150 1270 2060 limit/base >20 >20	8 0 58 2 627 1574 757 1012 2471 current 8 2 ▲ 84 NEG current 0 11.3	4 0 61 3 709 1152 643 975 2206 history1 11 ▲ 207 ▲ 84 NEG history1 0.6 11.1	20 0 55 <1 796 1326 897 1070 3247 history2 3 4 0 NEG history2 0.2 6.1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration Sulfation FLUID DEGRAE	ppm	ASTM D5185m *ASTM D5185m *ASTM D5185m *ASTM D5185m *ASTM D5185m *ASTM D5185m *ASTM D2982 *ASTM D7844 *ASTM D7844 *ASTM D7844 *ASTM D7844 *ASTM D7844 *ASTM D7844	0 0 60 0 1010 1070 1150 1270 2060 limit/base >20 >20 limit/base >3 >20 >30 limit/base	8 0 58 2 627 1574 757 1012 2471 current 8 2 ▲ 84 NEG current 0 11.3 22.1 current	4 0 61 3 709 1152 643 975 2206 history1 11  ▲ 207 ▲ 84 NEG history1 0.6 11.1 21.6 history1	20 0 55 <1 796 1326 897 1070 3247 history2 3 4 0 NEG history2 0.2 6.1 18.1 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium Glycol INFRA-RED Soot % Nitration Sulfation	ppm	ASTM D5185m *ASTM D78185m *ASTM D78185m *ASTM D78185m *ASTM D78144 *ASTM D7844 *ASTM D7844 *ASTM D7844 *ASTM D7844 *ASTM D7844 *ASTM D7844	0 0 60 0 1010 1070 1150 1270 2060 limit/base >20 >20 limit/base >3 >20 >3	8 0 58 2 627 1574 757 1012 2471 current 8 2 ▲ 84 NEG current 0 11.3 22.1	4 0 61 3 709 1152 643 975 2206 history1 11 ▲ 207 ▲ 84 NEG history1 0.6 11.1 21.6	20 0 55 <1 796 1326 897 1070 3247 history2 3 4 0 NEG history2 0.2 6.1 18.1



# **OIL ANALYSIS REPORT**



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

limit/base

current

14.8

history1

14.1

method

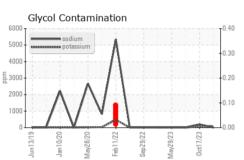
ASTM D445 15.4

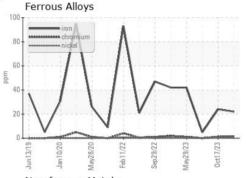
VISC 20 T	osity @	100°C				
18 - Abnor	mal		<u> </u>			
⊖ 16 - Base						
(100 Dase Abnor	ma	$\overline{}$				~
12			1		/	
10			· · · · · ·			
8/19	0/20	3/20 -	1/22	9/22 -	3/23 -	7/23
Jun13/19	Jan10	May28/2	문 -	Sep29/	May29/	0ct17/23



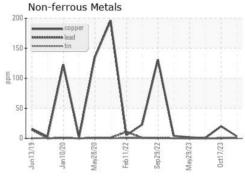
**FLUID PROPERTIES** 

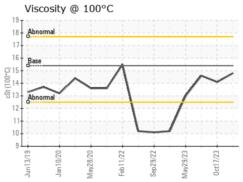
Visc @ 100°C

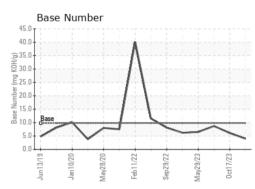




cSt











Laboratory Sample No. Lab Number **Unique Number** 

: GFL0103929 : 06060744 : 10832126

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

: 16 Jan 2024 : 17 Jan 2024 : Jonathan Hester Diagnostician

Test Package : FLEET ( Additional Tests: Glycol )

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)

GFL Environmental - 865 - East Mount Hauling

7213 East Mount Houston Road Houston, TX US 77050

Contact: Saul Castillo saul.castillo@gflenv.com

T:

F:

history2 NONE

NONE

NONE

NONE

NONE

NONE

NORML NORML NEG NEG

history2

14.6