

## **OIL ANALYSIS REPORT**

#### Sample Rating Trend

## NORMAL

## Machine Id 3712

Component

## Diesel Engine

## PETRO CANADA DURON SHP 15W40 (10 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.

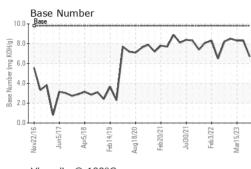
#### Fluid Condition

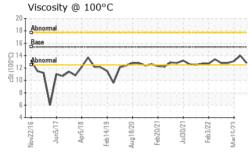
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is acceptable for the time in service.

-				g2020 Feb2021 Jul2021 Feb2022		
SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0093742	GFL0093733	GFL0049472
Sample Date		Client Info		26 Jan 2024	11 Sep 2023	15 Mar 2023
Machine Age	hrs	Client Info		22748	22170	251353
Oil Age	hrs	Client Info		22748	22170	0
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT	ION	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
Glycol		WC Method		NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>75	24	9	22
Chromium	ppm	ASTM D5185m	>5	2	1	1
Nickel	ppm	ASTM D5185m	>4	0	0	<1
Titanium	ppm	ASTM D5185m	>2	<1	<1	0
Silver	ppm	ASTM D5185m		0	<1	0
Aluminum	ppm	ASTM D5185m	>15	4	0	4
Lead	ppm	ASTM D5185m	>25	<1	0	1
Copper	ppm		>100	2	0	<1
Tin	ppm		>4	_ <1	0	<1
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	mag		limit/base		history1 81	
Boron	ppm mag	ASTM D5185m		current 31 0		history2 5 0
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	31 0	81 0	5 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	31 0 63	81 0 67	5 0 57
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	31 0 63 <1	81 0 67 <1	5 0 57 <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	31 0 63 <1 301	81 0 67 <1 334	5 0 57 <1 858
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	31 0 63 <1 301 1740	81 0 67 <1 334 1747	5 0 57 <1 858 1144
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	31 0 63 <1 301 1740 849	81 0 67 <1 334 1747 873	5 0 57 <1 858 1144 1003
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	31 0 63 <1 301 1740	81 0 67 <1 334 1747	5 0 57 <1 858 1144
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	31 0 63 <1 301 1740 849 1104	81 0 67 <1 334 1747 873 1119	5 0 57 <1 858 1144 1003 1207
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	31 0 63 <1 301 1740 849 1104 3170 current	81 0 67 <1 334 1747 873 1119 4223 history1	5 0 57 <1 858 1144 1003 1207 2766
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 <b>method</b>	0 0 60 0 1010 1070 1150 1270 2060	31 0 63 <1 301 1740 849 1104 3170 current 15	81 0 67 <1 334 1747 873 1119 4223 history1 9	5 0 57 <1 858 1144 1003 1207 2766 history2 7
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	31 0 63 <1 301 1740 849 1104 3170 current	81 0 67 <1 334 1747 873 1119 4223 history1	5 0 57 <1 858 1144 1003 1207 2766 history2
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 ASTM D5185m ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 <b>limit/base</b>	31 0 63 <1 301 1740 849 1104 3170 current 15 63	81 0 67 <1 334 1747 873 1119 4223 history1 9 69	5 0 57 <1 858 1144 1003 1207 2766 history2 7 2
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 0 1010 1070 1150 1270 2060 <b>limit/base</b> >25	31 0 63 <1 301 1740 849 1104 3170 current 15 63 0	81 0 67 <1 334 1747 873 1119 4223 history1 9 69 69 <1	5 0 57 <1 858 1144 1003 1207 2766 history2 7 2 2 1
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 limit/base >25 >20 limit/base	31 0 63 <1 301 1740 849 1104 3170 current 15 63 0 current 0.6	81 0 67 <1 334 1747 873 1119 4223 history1 9 69 <1 9 69 <1 0.1	5 0 57 <1 858 1144 1003 1207 2766 history2 7 2 7 2 1 history2 0.8
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 2060 225 >25	31 0 63 <1 301 1740 849 1104 3170 current 15 63 0 current	81 0 67 <1 334 1747 873 1119 4223 history1 9 69 <1 history1	5 0 57 <1 858 1144 1003 1207 2766 history2 7 2 2 1 1 history2
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 2060 2060 225 20 20 20 1imit/base >20	31 0 63 <1 301 1740 849 1104 3170 current 15 63 0 current 0.6 9.9	81 0 67 <1 334 1747 873 1119 4223 history1 9 69 <1 9 69 <1 history1 0.1 6.8	5 0 57 <1 858 1144 1003 1207 2766 history2 7 2 7 2 1 history2 0.8 10.3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAI	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7624	0 0 0 1010 1070 1150 1270 2060 2060 225 20 220 20 20 20 20 20 20 20 20 20 20 20	31 0 63 <1 301 1740 849 1104 3170 Current 15 63 0 Current 0.6 9.9 21.3 Current	81 0 67 <1 334 1747 873 1119 4223 history1 9 69 <1 69 <1 history1 0.1 6.8 17.7 history1	5 0 57 <1 858 1144 1003 1207 2766 history2 7 2 7 2 2 1 history2 0.8 10.3 21.7 history2
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 2060 225 20 225 20 <b>imit/base</b> >6 20 20	31 0 63 <1 301 1740 849 1104 3170 <u>current</u> 15 63 0 <u>current</u> 0.6 9.9 21.3	81 0 67 <1 334 1747 873 1119 4223 history1 9 69 <1 9 69 <1 0.1 6.8 17.7	5 0 57 <1 858 1144 1003 1207 2766 history2 7 2 7 2 1 history2 0.8 10.3 21.7



# **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
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG
FLUID PROPE	RTIES	method	limit/base	current	history1	history
Visc @ 100°C	cSt	ASTM D445	15.4	12.8	14.0	13.1
GRAPHS						
Ferrous Alloys						
iron						
80 - nickel						
60 -						
		A				
40	$ \Lambda $	- Λ	a ta a			
MAN	VY	$\Lambda \Lambda \Lambda$	4,			
20-	VY	W	V			
			V s			
	Mg18/20	Jul30/21	Mart5/23			
Nov22/16 Jun5/17 Apr5/18 Feb14/19	A	Jul30/21 Feb3/22	Mart5/23			
0 9U27U9 Vory102 Non-ferrous Meta		Jui30/21 Feb3/22	Mart5/23			
0 91/27/00 81/51/04 Non-ferrous Meta		Jul30/21	Marisza			
Non-ferrous Meta		Julg0/21 Feb3/22	Maris/23			
0 91/27/00 81/51/04 Non-ferrous Meta		Jul30/21 Feb3/22	Mart 5/23			
0 U U U U U U U U U U U U U		JuB021 Feb3/22	War15/23			
Non-ferrous Meta super tim tim tim		Julianzi Feb322	Wart5/23			
Non-ferrous Meta		Julgozi	Wari 5/23			
Non-ferrous Meta	ls					
Non-ferrous Meta	ls					
Nov-21/16 Pup2/11/13 P	Aug18/20	Jul30/21 Jul30/21 Feb322 Feb322	Mart5/23			
0 9U/27/04 Storage of the least of the leas	Aug18/20		Marts/23	Base Number		
0 9U/27/04 Storage of the least of the leas	Aug18/20		Marts/23	Base Number		
0 9 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2	Aug18/20		10.0	Base Number		~~~~~
Non-ferrous Meta Superior Super Superior Super Sup	Aug18/20		10.0	Base Number	~~~~	~~~
0 9 1/2 Non-ferrous Meta 50 0 50 0 50 0 0 1/2 1/3 10 0 0 0 1/2 1/3 10 0 0 0 1/2 1/3 10 0 0 1/2 1/3 10 10 10 10 10 10 10 10 10 10	Aug18/20		10.0	Base Number	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~
0     81/500       0     81/500       0     81/500       0     81/500       0     91/727/00       0     9	Aug18/20		10.0	Base Number		~~~
Non-ferrous Meta SUIZENN Non-ferrous Meta Sun Sun Sun Sun Sun Sun Sun Sun	Aug18/20		10.0 (0)HOX KOULAND (0) 10.0 (0)HOX KOULAND (0) 10.0 (0) (0) 10.0 (0) (0) (	Base Number		~~~
Non-ferrous Meta Non-ferrous Meta	Aug18/20		10.0	Base Number		$\sim$
0 81/500   0 81/500   0 81/500   0 81/500   0 91/57/00   0	Aug18/20		10.0 (0)HOX KOULAND (0) 10.0 (0)HOX KOULAND (0) 10.0 (0) (0) 10.0 (0) (0) (	Base Number	Feb 14/19 Aug 18/20 Feb 20/21 Feb 20/21	JutBO21

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 GFL Environmental - 029 - Wytheville Laboratory Sample No. : GFL0093742 Recieved : 30 Jan 2024 2390 North 4th Street Lab Number : 06074511 Diagnosed : 31 Jan 2024 Wytheville, VA Unique Number : 10856602 Diagnostician : Sean Felton US 24382 Test Package : FLEET Contact: CHARLES CORVIN Certificate L2367 To discuss this sample report, contact Customer Service at 1-800-237-1369. charles.corvin@gflenv.com;canastasio@wearcheckusa.com \* - Denotes test methods that are outside of the ISO 17025 scope of accreditation. T: (276)223-4476 F: (276)223-1283

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

Submitted By: CHARLES CORVIN

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