

## **OIL ANALYSIS REPORT**

Sample Rating Trend





## 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.

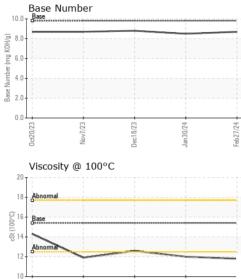
### Fluid Condition

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		GFL0101893	GFL0101992	GFL0101960
Sample Date		Client Info		27 Feb 2024	30 Jan 2024	18 Dec 2023
Machine Age	hrs	Client Info		8317	8236	8116
Oil Age	hrs	Client Info		312	231	0
Oil Changed		Client Info		Not Changd	Not Changd	Not Changd
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>2.0	<1.0	1.4	<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	>100	1	1	2
Chromium	ppm	ASTM D5185m	>20	0	0	<1
Nickel	ppm		>4	0	<1	0
Titanium	ppm	ASTM D5185m	- 1	<1	<1	<1
Silver	ppm	ASTM D5185m	>3	0	0	0
Aluminum	ppm	ASTM D5185m	>20	<1	2	<1
Lead	ppm	ASTM D5185m	>40	0	1	<1
Copper	ppm		>330	0	<1	<1
Tin	ppm	ASTM D5185m	>15	0	<1	0
Vanadium	ppm	ASTM D5185m		0	0	<1
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
	maa					
Boron	ppm ppm	ASTM D5185m	0	6	6	4
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	6 0	6 0	4
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0	6	6	4
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 60	6 0 57	6 0 58	4 0 57
Boron Barium Molybdenum	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	6 0 57 <1	6 0 58 <1	4 0 57 0
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	6 0 57 <1 916	6 0 58 <1 895	4 0 57 0 868
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	6 0 57 <1 916 1040	6 0 58 <1 895 1015	4 0 57 0 868 1001
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	6 0 57 <1 916 1040 1036	6 0 58 <1 895 1015 1076	4 0 57 0 868 1001 932
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	6 0 57 <1 916 1040 1036 1222	6 0 58 <1 895 1015 1076 1232	4 0 57 0 868 1001 932 1106
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	6 0 57 <1 916 1040 1036 1222 3045	6 0 58 <1 895 1015 1076 1232 3158	4 0 57 0 868 1001 932 1106 2908
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	6 0 57 <1 916 1040 1036 1222 3045 current	6 0 58 <1 895 1015 1076 1232 3158 history1	4 0 57 0 868 1001 932 1106 2908 history2
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 0 1010 1070 1150 1270 2060 kimit/base >25	6 0 57 <1 916 1040 1036 1222 3045 current 2	6 0 58 <1 895 1015 1076 1232 3158 history1 3	4 0 57 0 868 1001 932 1106 2908 history2 2
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 0 1010 1070 1150 1270 2060 kimit/base >25	6 0 57 <1 916 1040 1036 1222 3045 <u>current</u> 2 2	6 0 58 <1 895 1015 1076 1232 3158 history1 3 2	4 0 57 0 868 1001 932 1106 2908 history2 2 2 <1
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 ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 Limit/base >20	6 0 57 <1 916 1040 1036 1222 3045 current 2 2 2 0	6 0 58 <1 895 1015 1076 1232 3158 history1 3 2 2 2 history1 0	4 0 57 0 868 1001 932 1106 2908 history2 2 2 <1 0 0 history2 0.1
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 TS	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 Limit/base >20	6 0 57 <1 916 1040 1036 1222 3045 <u>current</u> 2 2 2 0 0	6 0 58 <1 895 1015 1076 1232 3158 history1 3 2 2 2 history1	4 0 57 0 868 1001 932 1106 2908 history2 2 <1 0 0
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 ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 Limit/base >20	6 0 57 <1 916 1040 1036 1222 3045 <u>current</u> 2 2 0 <u>current</u> 0	6 0 58 <1 895 1015 1076 1232 3158 history1 3 2 2 2 history1 0	4 0 57 0 868 1001 932 1106 2908 history2 2 2 <1 0 0 history2 0.1
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 225 220 220 220 20 20 20 20 20 20 20 20 20	6 0 57 <1 916 1040 1036 1222 3045 <i>current</i> 2 2 2 0 <i>current</i> 0 <i>current</i>	6 0 58 <1 895 1015 1076 1232 3158 history1 3 2 2 2 history1 0 4.9	4 0 57 0 868 1001 932 1106 2908 history2 2 2 <1 0 Vistory2 0.1 4.6
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 ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 20 225 20 20 3 20 20 20 20 20 20 20 20 20 20 20 20 20	6 0 57 <1 916 1040 1036 1222 3045 <u>current</u> 2 2 0 <u>current</u> 0 5.1 17.6	6 0 58 <1 895 1015 1076 1232 3158 history1 3 2 2 2 history1 0 4.9 17.5	4 0 57 0 868 1001 932 1106 2908 <b>history2</b> 2 <1 0 <b>history2</b> 0.1 4.6 17.4
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 D7844 *ASTM D7624 *ASTM D7415	0 0 0 1010 1070 1150 1270 2060 2060 225 20 220 220 20 3 20 20 20 20 20 20 20 20 20 20 20 20 20	6 0 57 <1 916 1040 1036 1222 3045 <i>current</i> 2 2 2 0 <i>current</i> 0 5.1 17.6	6 0 58 <1 895 1015 1076 1232 3158 history1 3 2 2 2 history1 0 4.9 17.5 history1	4 0 57 0 868 1001 932 1106 2908 history2 2 2 <1 0 V history2 0.1 4.6 17.4 history2



# **OIL ANALYSIS REPORT**



Nov7/23

		VISUAL		method			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	
8/23 -	0/24	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Dec18/23	Jan30/24 Feb27/24	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
c		Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
C		Free Water	scalar	*Visual		NEG	NEG	NEG
		FLUID PROPI	ERTIES	method	limit/base	current	history1	history2
		Visc @ 100°C	cSt	ASTM D445	15.4	11.8	12.0	12.6
		GRAPHS						
		Ferrous Alloys						
/23	- 124	12						
Dec18/23	Jan 30/24 ۱ م در ۲۰ می ۲	10-						
		8 E						
		Ē 6-						
		4						
		2						
			23	24	54			
		0ct20/23 Nov7/23	Dec18/23	Jan30/24	Feb27/24			
		Non-ferrous Meta		7	LL.			
		<sup>10</sup> T						
		8 - copper						
		tin tin						
		6- #						
		8. 4-						
		2-		ad and an a state of the other designment of the othes				
		3 53	23	24	24			
		0ct20/23 Nov7/23	Dec18/23	Jan 30/24	Feb27/24			
		Viscosity @ 100°	С			Base Number		
		19 18 <b>Abnormal</b>	1		10.	0 Base		
		-						
		17			(B) 8.	0 +		
		16 Base			g KOH/g)			
		16 Base			.8 .0 KOH/a) per (mg			
		16 Base () 15 15 14 14			(D) HOX BUILD	0-		
		16 Base 00 15 30 14			.e (mg KOH/c	0-		
		16-Base 15-15-15-14-15-15-15-15-15-15-15-15-15-15-15-15-15-			6. Jegun Jagun Jag	0		
		16 Base 0015 15 4 Abnoma 12 11 10	5/23 <del></del>	224		0	5/5	024
		16-Base 15-15-15-14-15-15-15-15-15-15-15-15-15-15-15-15-15-	Dec18/23	Jan30/24	6. Jegun Jagun Jag	0	Dec18/23	Jan30/24
d	Laboratory	16 Base 0015 15 4 Abnoma 12 11 10			Feb27//24 Base Number (mg KOH(	0ct20/23		
	Sample No.	: WearCheck USA - 56 : GFL0101893	01 Madiso <b>Rece</b> i	n Ave., Cary ived : 28	, NC 27513 Feb 2024	GFL Env	ironmental - 89	<b>4 - Ada Hauling</b> adway, Suite D
	Sample No. Lab Number	Base 16 Base 15 15 14 10 10 10 10 10 10 10 10 10 10	01 Madiso Recei Teste	n Ave., Cary ived : 28	, NC 27513 Feb 2024 Feb 2024	GFL Env	ironmental - 89	1 <b>4 - Ada Hauling</b> adway, Suite D Ada, OK
	Sample No. Lab Number Unique Number	: WearCheck USA - 50 : GFL0101893 : 06103616 : 10901846	01 Madiso Recei Teste	n Ave., Cary ived : 28	, NC 27513 Feb 2024	GFL Env	<b>ironmental - 89</b> 1904 North Brc	1 <b>4 - Ada Hauling</b> adway, Suite D Ada, OK US 74820
Certificate L2367 To discuss this	Sample No. Lab Number Unique Number Test Package	: WearCheck USA - 50 : GFL0101893 : 06103616 : 10901846	01 Madiso Recei Teste Diagr	in Ave., Cary ived : 28 id : 29 nosed : 29	, NC 27513 Feb 2024 Feb 2024 - V	GFL Env	<b>ironmental - 89</b> 1904 North Bro Contact: J	1 <b>4 - Ada Hauling</b> adway, Suite D Ada, OK

Submitted By: Johnny Spurlock

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