

## **OIL ANALYSIS REPORT**

Sample Rating Trend





Machine Id 926030

Fluid

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

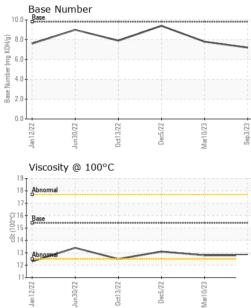
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0092637	GFL0064252	GFL0064272
Sample Date		Client Info		03 Sep 2023	10 Mar 2023	05 Dec 2022
Machine Age	hrs	Client Info		20215	19032	18943
Oil Age	hrs	Client Info		601	607	607
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
Glycol		WC Method		NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>120	10	11	9
Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Nickel	ppm	ASTM D5185m	>5	0	<1	<1
Titanium	ppm	ASTM D5185m	>2	0	0	<1
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>20	6	9	5
Lead	ppm	ASTM D5185m	>40	3	<1	<1
Copper	ppm	ASTM D5185m	>330	2	2	<1
Tin	ppm	ASTM D5185m	>15	1	<1	<1
Vanadium	ppm	ASTM D5185m		0	<1	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method				history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current 1	history1 1	history2 3
	ppm ppm		0		· · · · · · · · · · · · · · · · · · ·	
Boron		ASTM D5185m	0	1	1	3
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0 0 60	1 0	1 0	3 <1
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	1 0 58	1 0 58	3 <1 58
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	1 0 58 <1	1 0 58 <1	3 <1 58 <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	1 0 58 <1 920	1 0 58 <1 922	3 <1 58 <1 898
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	1 0 58 <1 920 1008	1 0 58 <1 922 1031	3 <1 58 <1 898 1014
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	1 0 58 <1 920 1008 943	1 0 58 <1 922 1031 976	3 <1 58 <1 898 1014 952
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	1 0 58 <1 920 1008 943 1166	1 0 58 <1 922 1031 976 1193	3 <1 58 <1 898 1014 952 1162
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	0 0 60 0 1010 1070 1150 1270 2060	1 0 58 <1 920 1008 943 1166 3084	1 0 58 <1 922 1031 976 1193 2774	3 <1 58 <1 898 1014 952 1162 3133
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	0 0 60 1010 1070 1150 1270 2060	1 0 58 <1 920 1008 943 1166 3084 current	1 0 58 <1 922 1031 976 1193 2774 history1	3 <1 58 <1 898 1014 952 1162 3133 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 ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 kimit/base >25	1 0 58 <1 920 1008 943 1166 3084 <i>current</i> 6	1 0 58 <1 922 1031 976 1193 2774 history1 4	3 <1 58 <1 898 1014 952 1162 3133 history2 5
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	0 0 60 1010 1070 1150 1270 2060 kimit/base >25	1 0 58 <1 920 1008 943 1166 3084 <u>current</u> 6 6	1 0 58 <1 922 1031 976 1193 2774 <b>history1</b> 4 3	3 <1 58 <1 898 1014 952 1162 3133 history2 5 4
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	1 0 58 <1 920 1008 943 1166 3084 <i>current</i> 6 6 7	1 0 58 <1 922 1031 976 1193 2774 history1 4 3 7	3 <1 58 <1 898 1014 952 1162 3133 history2 5 4 3
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 <b>Imit/base</b> >25 >20 <b>Imit/base</b> >20	1 0 58 <1 920 1008 943 1166 3084 <i>current</i> 6 6 6 7	1 0 58 <1 922 1031 976 1193 2774 history1 4 3 7 history1	3 <1 58 <1 898 1014 952 1162 3133 history2 5 4 3 3 history2
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 <b>Imit/base</b> >25 >20 <b>Imit/base</b> >20	1 0 58 <1 920 1008 943 1166 3084 <i>current</i> 6 6 6 7 <i>current</i> 0.4	1 0 58 <1 922 1031 976 1193 2774 history1 4 3 7 history1 0.3	3 <1 58 <1 898 1014 952 1162 3133 history2 5 4 3 3 history2 0.2
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 ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <i>limit/base</i> >25 >20 <i>limit/base</i> >20	1 0 58 <1 920 1008 943 1166 3084 <i>current</i> 6 6 6 7 <i>current</i> 0.4 8.0	1 0 58 <1 922 1031 976 1193 2774 history1 4 3 7 history1 0.3 8.4	3 <1 58 <1 898 1014 952 1162 3133 history2 5 4 3 3 history2 0.2 7.9
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 TS ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>imit/base</b> >25 <b>imit/base</b> >4 >20	1 0 58 <1 920 1008 943 1166 3084 <u>current</u> 6 6 6 7 7 <u>current</u> 0.4 8.0 19.8	1 0 58 <1 922 1031 976 1193 2774 history1 4 3 7 history1 0.3 8.4 19.0	3 <1 58 <1 898 1014 952 1162 3133 history2 5 4 3 3 history2 0.2 7.9 20.0
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 D7844	0 0 0 1010 1070 1150 1270 2060 /////////////////////////////////	1 0 58 <1 920 1008 943 1166 3084 <i>current</i> 6 6 6 7 <i>current</i> 0.4 8.0 19.8 <i>current</i>	1 0 58 <1 922 1031 976 1193 2774 history1 4 3 7 history1 0.3 8.4 19.0 history1	3 <1 58 <1 898 1014 952 1162 3133 history2 5 4 3 3 history2 0.2 7.9 20.0 history2



# **OIL ANALYSIS REPORT**

VISUAL



$\checkmark$		White Metal Yellow Metal	scalar scalar	*Visual *Visual	NONE NONE	NONE NONE	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
0ct13/22 Dec5/22	Mar10/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
De	Mar	Ouoi	scalar	*Visual	NORML	NORML	NORML	NORML
°C		Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
		Free Water	scalar	*Visual		NEG	NEG	NEG
		FLUID PROF			limit/base		history1	history2
		Visc @ 100°C	cSt	ASTM D445	15.4	12.8	12.8	13.1
		GRAPHS						
		Ferrous Alloys		· · · · · · · · · · · · · · · · · · ·				
0ct13/22 - Dec5/22 -	Mar10/23 -	20 - chromium	_					
D O	Ma							
		15 E						
		10						
		5						
		27 - 10 27 - 10	722	/23	/23			
		Jan 1 2/22 Jun 3 0/22	0ct13/22 Dec5/22	Mar10/23	Sep3/23			
		Non-ferrous Me	tals	-				
		10 copper						
		8 - Research lead						
		4						
		2			ALL DESCRIPTION OF THE OWNER OF T			
				and the second se	and the second second			
		152 152 0	22	/23	/23			
		Jan 1 2/2 2 Jun 3 0/2 2	0ct13/22 Dec5/22	Mar10/23	Sep3/23			
		Viscosity @ 100		-		Base Number		
		19			10			
		18 - Abnormal		1				
		17			(B/HO	8.0		
		016 Base 115 314			J Bw)	6.0 -		
		5 14			umber	4.0		
		13 Abnorma			ase N			
		- Contraction				2.0-		
		12-						
		12-	22	23	23		22	23
		12-	0ct13/22	Mar1 0/23	Sep 3/23 +	Jan 12/22 +	0ct13/22 Dec5/22	Mar1 0/23
	l ob sustaine	Jan 12/22 Jun 30/22	0	2	Sep3/23	Jan 12/22 Jun 30/22	-	2
	Laboratory Sample No.	: WearCheck USA	- 501 Madis	son Ave., Ca	rry, NC 275 <sup>-</sup>	Jan 12/22 Jun 30/22	ironmental - 947 -	- WB Horicon HC
	Sample No. Lab Number	: WearCheck USA GFL0092637 : 05947843	- 501 Madia Received Diagnose	≥ son Ave., Ca d : 12 5 ed : 13 5	ry, NC 275 <sup>-</sup> Sep 2023 Sep 2023	Jan 12/22 Jun 30/22	ironmental - 947 -	- WB Horicon HC 96 County Rd V Horicon, WI
	Sample No. Lab Number Unique Numbe	: WearCheck USA : GFL0092637 : 05947843 er : 10643802	- 501 Madia	≥ son Ave., Ca d : 12 5 ed : 13 5	rry, NC 275 <sup>-</sup> Sep 2023	Jan 12/22 Jun 30/22	ironmental - 947 - N729	• WB Horicon HC 96 County Rd V Horicon, WI US 53032
Certificate L2367	Sample No. Lab Number Unique Numbe Test Packag	: WearCheck USA : GFL0092637 : 05947843 er : 10643802 e : FLEET	- 501 Madia Received Diagnose Diagnost	son Ave., Ca d : 12 : ed : 13 : tician : We	rry, NC 275 <sup>.</sup> Sep 2023 Sep 2023 s Davis	Jan 12/22 Jun 30/22	ironmental - 947 - N729 Cont	- WB Horicon HC 96 County Rd V Horicon, WI US 53032 act: Tim Kieffer
To discuss th	Sample No. Lab Number Unique Numbe Test Packag nis sample report	: WearCheck USA : GFL0092637 : 05947843 er : 10643802	- 501 Madis Received Diagnos Diagnost	son Ave., Ca d : 12 ed : 13 tician : We	ry, NC 275 Sep 2023 Sep 2023 s Davis 9.	Jan 12/22 Jun 30/22	ironmental - 947 - N729 Cont tim.kieff	• WB Horicon HC 96 County Rd V Horicon, WI US 53032

Submitted By: See also GFL935 - Tim Kieffer