

## **OIL ANALYSIS REPORT**

Sample Rating Trend



Machine Id 913070 Component

**Diesel Engine** Fluid

PETRO CANADA DURON SHP 15W40 (36 QTS)

DIAGNOSIS	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Recommendation	Sample Number		Client Info		GFL0108917	GFL0109971	GFL0104318
Oil and filter change at the time of sampling has	Sample Date		Client Info		27 Feb 2024	18 Jan 2024	27 Dec 2023
been noted. No corrective action is recommended	Machine Age	hrs	Client Info		4058	2345	2343
at this time. Resample at the next service interval to	Oil Age	hrs	Client Info		600	629	2343
monitor.	Oil Changed		Client Info		Changed	Changed	Changed
<ul> <li>Wear</li> <li>Exhaust valve wear is indicated.</li> </ul>	Sample Status				ABNORMAL	NORMAL	NORMAL
<b>Contamination</b> There is no indication of any contamination in the oil.	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
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.	Glycol		WC Method		NEG	NEG	NEG
	WEAR METAL	.S	method	limit/base	current	history1	history2
	Iron	ppm	ASTM D5185m	>120	34	6	20
	Chromium	ppm	ASTM D5185m	>20	2	<1	<1
	Nickel	ppm	ASTM D5185m		<u> </u>	0	0
	Titanium	ppm	ASTM D5185m	>2	<1	0	<1
	Silver	ppm	ASTM D5185m		0	0	0
	Aluminum	ppm	ASTM D5185m	>20	4	1	5
	Lead	ppm	ASTM D5185m		<1	0	0
	Copper	ppm	ASTM D5185m		7	<1	1
	Tin	ppm	ASTM D5185m		2	0	<1
	Vanadium	ppm	ASTM D5185m		- <1	<1	0
	Cadmium	ppm	ASTM D5185m		<1	0	0
	ADDITIVES		method	limit/base	current	history1	history2
	ADDITIVES Boron	ppm	method ASTM D5185m		current 3	history1 1	history2 5
		ppm ppm		0			
	Boron		ASTM D5185m	0	3	1	5
	Boron Barium	ppm	ASTM D5185m ASTM D5185m	0 0 60	3 0	1 0	5
	Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	3 0 94	1 0 57	5 0 59
	Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	3 0 94 2	1 0 57 <1	5 0 59 <1
	Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	3 0 94 2 1470	1 0 57 <1 973	5 0 59 <1 942
	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 1150	3 0 94 2 1470 1628	1 0 57 <1 973 961	5 0 59 <1 942 1089
	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 1270	3 0 94 2 1470 1628 1509	1 0 57 <1 973 961 1055	5 0 59 <1 942 1089 1053
	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	3 0 94 2 1470 1628 1509 1931	1 0 57 <1 973 961 1055 1255	5 0 59 <1 942 1089 1053 1258
	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	3 0 94 2 1470 1628 1509 1931 4239	1 0 57 <1 973 961 1055 1255 3120	5 0 59 <1 942 1089 1053 1258 3227
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	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	3 0 94 2 1470 1628 1509 1931 4239 current	1 0 57 <1 973 961 1055 1255 3120 history1	5 0 59 <1 942 1089 1053 1258 3227 history2
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	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 ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 Iimit/base >25	3 0 94 2 1470 1628 1509 1931 4239 current 7	1 0 57 <1 973 961 1055 1255 3120 history1 4	5 0 59 <1 942 1089 1053 1258 3227 history2 10
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm 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 ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 Iimit/base >25	3 0 94 2 1470 1628 1509 1931 4239 current 7 8	1 0 57 <1 973 961 1055 1255 3120 history1 4 3	5 0 59 <1 942 1089 1053 1258 3227 history2 10 5
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>limit/base</b> >25	3 0 94 2 1470 1628 1509 1931 4239 current 7 8 2	1 0 57 <1 973 961 1055 1255 3120 history1 4 3 2	5 0 59 <1 942 1089 1053 1258 3227 history2 10 5 1
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm <b>ITS</b>	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base >20	3 0 94 2 1470 1628 1509 1931 4239 current 7 8 2 2 current	1 0 57 <1 973 961 1055 1255 3120 history1 4 3 2 2 history1	5 0 59 <1 942 1089 1053 1258 3227 history2 10 5 1 1 history2
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	<pre>ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm</pre>	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 Imit/base >25 >20 Imit/base >4 >20	3 0 94 2 1470 1628 1509 1931 4239 current 7 8 2 2 current 0.9	1 0 57 <1 973 961 1055 1255 3120 history1 4 3 2 history1 0.2	5 0 59 <1 942 1089 1053 1258 3227 history2 10 5 1 1 history2 0.2
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration	<pre>ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm</pre>	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 Imit/base >25 >20 Imit/base >4 >20	3 0 94 2 1470 1628 1509 1931 4239 current 7 8 2 2 current 0.9 9.7	1 0 57 <1 973 961 1055 1255 3120 history1 4 3 2 history1 0.2 5.8	5 0 59 <1 942 1089 1053 1258 3227 history2 10 5 1 1 5 1 1 bistory2 0.2 5.2
	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 <b>JTS</b> ppm ppm ppm ppm ppm ppm ppm ppm ppm pp	ASTM D5185m ASTM D7844 *ASTM D7844 *ASTM D7844	0 0 0 1010 1070 1150 1270 2060 <b>imit/base</b> >25 >20 <b>imit/base</b> >4 >20 >30 <b>imit/base</b>	3 0 94 2 1470 1628 1509 1931 4239 current 7 8 2 2 current 0.9 9.7 21.8 current	1 0 57 <1 973 961 1055 1255 3120 history1 4 3 2 history1 0.2 5.8 18.2 history1	5 0 59 <1 942 1089 1053 1258 3227 history2 10 5 1 10 5 1 history2 0.2 5.2 17.5 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 ypm ppm p	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7415	0 0 0 1010 1070 1150 1270 2060 2060 2060 225 20 1000 225 20 20 20 20 20 20 20 20 20 20 20 20 20	3 0 94 2 1470 1628 1509 1931 4239 current 7 8 2 2 current 0.9 9.7 21.8	1 0 57 <1 973 961 1055 1255 3120 history1 4 3 2 history1 0.2 5.8 18.2	5 0 59 <1 942 1089 1053 1258 3227 history2 10 5 1 1 history2 0.2 5.2 17.5



## **OIL ANALYSIS REPORT**

▲ Ferrous Alloys	VISUAL		method	limit/base	current	history1	history2
80 iron	White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
www.inckel	Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
E 60	Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
40	Silt	scalar	*Visual	NONE	NONE	NONE	NONE
20	Debris	scalar	*Visual	NONE	NONE	NONE	NONE
0 pitessource	Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Sep19/23 Dec27/23 Jan18/24	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Set Jai	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Base Number	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
10.0 Base	Free Water	scalar	*Visual		NEG	NEG	NEG
(b) 8.0 bu) aquurvy 86 2.0	FLUID PROPE		method	limit/base	current	history1	history2
E 6.0	Visc @ 100°C	cSt	ASTM D445	15.4	13.5	13.9	13.9
E 4.0	GRAPHS						
Ž 2.0	Ferrous Alloys						
23 23 23 0.0	80 - iron chromium						
Sep 19/23 Jan 18/24	70 - nickel						
Viscosity @ 100°C	60 = 50						
<sup>19</sup> T	E <sup>50</sup> 40						
18 + Abnormal	30			/			
	20		/				
G 16 Base 15 3 14							
	Sep 19/23 Dec27/23		Jan 18/24	Feb27/24			
13 + Abnormal 12 -			Jai	E			
23 11	Non-ferrous Metals	5					
Sep 19/23 Jan 18/24	copper						
	20 - exercise tin						
	15						
	<u>ال</u>						
	5		/				
	0						
	Sep 19/23 Dec27/23		Jan 18/24	Feb27/24			
			Jan	Feb			
	Viscosity @ 100°C				Base Number	-	
	18 - Abnormal				Base		
	17		1				
	ତ୍ <sup>16</sup> - Base			6.0 6.0 4.0 8ase Number 4.0 2.0			
	G00015 65015 714			per (j			
				4.0			
	13 Abnormal			<sup>2</sup> 2.0			
	12-						
	11		8/24		9/23	7/23 -	7/24 -
	Sep 19/23 Dec27/23		Jan 18/24	Feb27/24	Sep19/23	Dec27/23	Feb27/24
		Marthe	- Aug. 0-	NO 07540			Michigan West
Laboratory Sample No.	: WearCheck USA - 501 : GFL0108917	Madiso Recei		v, NC 27513 1 Mar 2024	GFL EN	vironmental - 410 3900	- Michigan West 0 Van Born Rd
Lab Number		Teste		2 Mar 2024		0000	Wayne, MI
Vestica Lacontory Unique Number		Diagn	iosed : 04	Mar 2024 - Sea	an Felton	<b>A</b>	US 48184
Certificate 12367 Test Package To discuss this sample report,		ce at 1-8	00-237-1360	9			: Belal Dgheish sh@gflenv.com
* - Denotes test methods that							(734)714-2340
Statements of conformity to sp	pecifications are based of	n the sin	nple accepta	nce decision	rule (JCGM 10	6:2012)	F: