

# **OIL ANALYSIS REPORT**

Sample Rating Trend





### Machine Id 910092

Fluid

Component Diesel Engine

## PETRO CANADA DURON SHP 15W40 (36 QTS)

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 INFOR	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0085060	GFL0052111	GFL0018512
Sample Date		Client Info		05 Aug 2023	30 Sep 2022	30 Mar 2022
Machine Age	hrs	Client Info		8181	5623	5023
Oil Age	hrs	Client Info		8181	5623	0
Oil Changed		Client Info		Changed	N/A	N/A
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	20	8	12
Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Nickel	ppm	ASTM D5185m	>5	0	0	0
Titanium	ppm	ASTM D5185m		<1	0	0
Silver	ppm	ASTM D5185m	>2	0	0	<1
Aluminum	ppm	ASTM D5185m		1	<1	<1
Lead	ppm	ASTM D5185m	>40	2	<1	<1
Copper	ppm		>330	2	8	6
Tin	ppm	ASTM D5185m	>15	- <1	<1	<1
Vanadium	ppm	ASTM D5185m		<1	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
	ppm		11 11 11	-		-
ADDITIVES	ppm	method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	0	<1	2	5
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	<1 0	2 <1	5 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	<1 0 62	2 <1 59	5 0 61
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	<1 0 62 <1	2 <1 59 <1	5 0 61 <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 62 <1 999	2 <1 59 <1 859	5 0 61 <1 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	<1 0 62 <1 999 1135	2 <1 59 <1 859 1072	5 0 61 <1 1003 1156
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 62 <1 999 1135 945	2 <1 59 <1 859 1072 910	5 0 61 <1 1003 1156 1109
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	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 62 <1 999 1135 945 1301	2 <1 59 <1 859 1072 910 1186	5 0 61 <1 1003 1156 1109 1348
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 1010 1070 1150 1270 2060	<1 0 62 <1 999 1135 945	2 <1 59 <1 859 1072 910 1186 2481	5 0 61 <1 1003 1156 1109 1348 2573
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 1010 1070 1150 1270 2060	<1 0 62 <1 999 1135 945 1301 2767 current	2 <1 59 <1 859 1072 910 1186 2481 history1	5 0 61 <1 1003 1156 1109 1348 2573 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 60 0 1010 1070 1150 1270 2060	<1 0 62 <1 999 1135 945 1301 2767 current 4	2 <1 59 <1 859 1072 910 1186 2481 history1 2	5 0 61 <1 1003 1156 1109 1348 2573 history2 3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m <b>method</b> ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 limit/base >25	<1 0 62 <1 999 1135 945 1301 2767 current 4 5	2 <1 59 <1 859 1072 910 1186 2481 history1 2 6	5 0 61 <1 1003 1156 1109 1348 2573 history2 3 0
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 1010 1070 1150 1270 2060	<1 0 62 <1 999 1135 945 1301 2767 current 4	2 <1 59 <1 859 1072 910 1186 2481 history1 2	5 0 61 <1 1003 1156 1109 1348 2573 history2 3
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 <b>method</b> ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 limit/base >25	<1 0 62 <1 999 1135 945 1301 2767 current 4 5	2 <1 59 <1 859 1072 910 1186 2481 history1 2 6	5 0 61 <1 1003 1156 1109 1348 2573 history2 3 0
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 60 0 1010 1070 1150 1270 2060 <b>limit/base</b> >25	<1 0 62 <1 999 1135 945 1301 2767 current 4 5 0	2 <1 59 <1 859 1072 910 1186 2481 <b>history1</b> 2 6 2	5 0 61 <1 1003 1156 1109 1348 2573 history2 3 0 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 <b>limit/base</b> >25	<1 0 62 <1 999 1135 945 1301 2767 current 4 5 0 0	2 <1 59 <1 859 1072 910 1186 2481 <b>history1</b> 2 6 2 2 <b>history1</b>	5 0 61 <1 1003 1156 1109 1348 2573 history2 3 0 1 1 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 limit/base >25 >20 limit/base	<1 0 62 <1 999 1135 945 1301 2767 <u>current</u> 4 5 0 <u>current</u> 1.1	2 <1 59 <1 859 1072 910 1186 2481 <b>history1</b> 2 6 2 2 <b>history1</b> 1.1	5 0 61 <1 1003 1156 1109 1348 2573 history2 3 0 1 1 history2 0.5
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 <i>limit/base</i> >25 >20 <i>limit/base</i> >4 >20	<1 0 62 <1 999 1135 945 1301 2767 <i>current</i> 4 5 0 <i>current</i> 1.1 9.6	2 <1 59 <1 859 1072 910 1186 2481 history1 2 6 2 2 history1 1.1 9.8	5 0 61 <1 1003 1156 1109 1348 2573 history2 3 0 1 history2 0.5 8.4
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 D7844	0 0 0 1010 1070 1150 1270 2060 <b>imit/base</b> >25 <b>imit/base</b> >4 >20 >30	<1 0 62 <1 999 1135 945 1301 2767 <u>current</u> 4 5 0 <u>current</u> 1.1 9.6 22.2	2 <1 59 <1 859 1072 910 1186 2481 <b>history1</b> 2 6 2 2 <b>history1</b> 1.1 9.8 23.2	5 0 61 <1 1003 1156 1109 1348 2573 history2 3 0 1 1 history2 0.5 8.4 19.7
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 20 20 20 20 20 20 20 20 20 20 20	<1 0 62 <1 999 1135 945 1301 2767 Current 4 5 0 Current 1.1 9.6 22.2 Current	2 <1 59 <1 859 1072 910 1186 2481 <b>history1</b> 2 6 2 6 2 <b>history1</b> 1.1 9.8 23.2 <b>history1</b>	5 0 61 <1 1003 1156 1109 1348 2573 history2 3 0 1 history2 0.5 8.4 19.7 history2

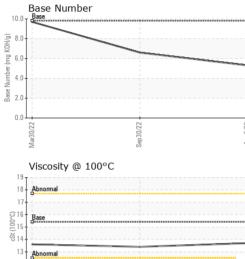


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Mar30/22

# **OIL ANALYSIS REPORT**



	VISUAL		method				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
Sep 30/22	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Sep	0001	scalar	*Visual	NORML	NORML	NORML	NORML
	Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
	Free Water	scalar	*Visual		NEG	NEG	NEG
	FLUID PROP	ERTIES	method	limit/base	current	history1	history2
	Visc @ 100°C	cSt	ASTM D445	15.4	13.7	13.4	13.6
	GRAPHS						
	Ferrous Alloys						
/22	iron chromium						
Sep 30/22	15-						
	튭 10	$\checkmark$					
	5-						
	52 52			23			
	Mar30/22	Sep30/22		Aug5/23			
				4			
	Non-ferrous Met	ais					
	copper						
	8 - management tin						
	and	$\sim$					
	6	$\frown$					
	6 G	$\frown$					
	6	$\frown$					
	6	$\frown$					
	6						
	6 4 2 0	2					
	6 4 2 0	p30/22		ug5/23			
	6 undd 4 2 0 Z2005zPM	Sep30/22		Augs/23			
	CODERNY Viscosity @ 100	05			Base Number		
	инд 4 2 0 2 0 2 0 2 0 0 2 0 0 2 0 0 2 0 0 2 0 0 2 0 0 2 0 0 2 0 0 2 0 0 2 0 0 2 0 0 2 0	05		10.0	Base		
	6 4 2 0 2 0 2 0 2 0 2 0 2 0 2 0 2 0 2 0 2	05		10.0	Base		
	6 4 2 0 727 727 727 727 727 727 727 727 727	05		10.0	Base		
	6 4 2 0 727 727 727 727 727 727 727 727 727	05		10.0	Base		
	Viscosity @ 1000	05		10.0	Base		
	Viscosity @ 1000	05		10.0	Base		
	Viscosity @ 100	05			Base		
	Viscosity @ 1000	05		10.0 (0)HOX Duu Jarquny 80 4.0 2.0	Base		
	Viscosity @ 1000	°C		10.0 (0) 8.0 HOX But 6.0 baguny 4.0 2.0 0.0	Base		
	Viscosity @ 100	05		10.0 (0)HOX Duu Jarquny 80 4.0 2.0	Base	Sep30/22	
	Uiscosity @ 1000	Sep 30/2/2		10.0 (0,110,0 (0,110,0 (0,110,0 (0,110,0) (0,10,0)) (0,10,0) (0,10,0) (0,10,0) (0,10,0) (0,10	Base 2000: Department 2000: Department 2	Sep30/22	
Laborator	viscosity @ 100 <sup>19</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup></sup>	•°C		10.0 (0)HOX Bull 4.0 Bull arguny see 2.0 COSPME ry, NC 27513	Base 2000: Department 2000: Department 2	ZZUGE dag rironmental - 410	- Michigan We
Sample No	y : WearCheck USA 0. : GFL0085060	•°C	d :10/	10.0 (PHOX But 4.0 ECUSPAN ry, NC 27513 Aug 2023	Base 2000: Department 2000: Department 2	ZZUGE dag rironmental - 410	- <b>Michigan We</b> 00 Van Born R
Sample No Lab Numb	y : WearCheck USA 0. : GFL0085060 . : 05920592	°C − 501 Madia Received Diagnose	d : 107 ed : 107	10.0 (PHOX But 4.0 (PHOX But 4.0 (PHOX But 4.0 (PHOX But 4.0 (PHOX But 4.0) (PHOX But 4.0 (PHOX But 4.0) (PHOX	Base 2000: Department 2000: Department 2	ZZUGE dag rironmental - 410	- Michigan We
Sample No	y : WearCheck USA 0. : GFL0085060 viso2506	•°C	d : 107 ed : 107	10.0 (PHOX But 4.0 ECUSPAN ry, NC 27513 Aug 2023	Base 2000: Department 2000: Department 2	vironmental - 410 3900	- <b>Michigan We</b> 00 Van Born F Wayne, N

Submitted By: Belal Dgheish