

## **OIL ANALYSIS REPORT**

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## NORMAL

## Machine Id 2584

Component

Diesel Engine

## PETRO CANADA DURON SHP 15W40 (11 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.

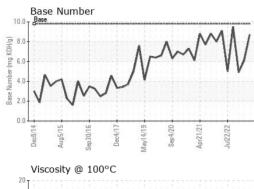
#### Fluid Condition

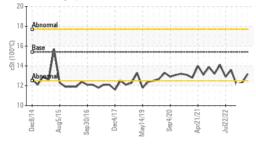
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0071574	GFL0071592	GFL0061685
Sample Date		Client Info		11 Jul 2023	16 May 2023	13 Jan 2023
Machine Age	mls	Client Info		362050	362050	362050
Oil Age	mls	Client Info		600	600	600
Oil Changed		Client Info		Changed	Changed	Changed
Sample Status				NORMAL	ABNORMAL	ABNORMAL
CONTAMINATI	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	<1.0	3.1
Glycol		WC Method		NEG	NEG	NEG
WEAR METALS	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	11	35	39
Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Nickel	ppm	ASTM D5185m	>4	<1	1	<1
Titanium	ppm	ASTM D5185m		<1	1	<1
Silver	ppm	ASTM D5185m	>3	0	0	0
Aluminum	ppm	ASTM D5185m	>20	9	<u> </u>	<b>1</b> 8
Lead	ppm	ASTM D5185m	>40	0	1	<1
Copper	ppm	ASTM D5185m	>330	1	5	4
Tin	ppm	ASTM D5185m	>15	<1	1	1
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		mathad	Parel Marca	ourropt	hintowed.	history 0
ADDITIVEO		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	0	2	nistory i 2	0
	ppm ppm					
Boron		ASTM D5185m	0	2	2	0
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0	2 <1	2 0	0 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	2 <1 65	2 0 60	0 0 59
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	2 <1 65 <1	2 0 60 <1	0 0 59 <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	2 <1 65 <1 1021	2 0 60 <1 858	0 0 59 <1 798
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	2 <1 65 <1 1021 1183	2 0 60 <1 858 1163	0 0 59 <1 798 1107
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	2 <1 65 <1 1021 1183 1148	2 0 60 <1 858 1163 892	0 0 59 <1 798 1107 895
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	2 <1 65 <1 1021 1183 1148 1376	2 0 60 <1 858 1163 892 1188	0 0 59 <1 798 1107 895 1132
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	2 <1 65 <1 1021 1183 1148 1376 4084	2 0 60 <1 858 1163 892 1188 3297	0 0 59 <1 798 1107 895 1132 2492
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 0 1010 1070 1150 1270 2060	2 <1 65 <1 1021 1183 1148 1376 4084 current	2 0 60 <1 858 1163 892 1188 3297 history1	0 0 59 <1 798 1107 895 1132 2492 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 Limit/base >25	2 <1 65 <1 1021 1183 1148 1376 4084 <i>current</i> 13	2 0 60 <1 858 1163 892 1188 3297 history1 ▲ 38	0 0 59 <1 798 1107 895 1132 2492 history2 ▲ 31
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 0 1010 1070 1150 1270 2060 Limit/base >25	2 <1 65 <1 1021 1183 1148 1376 4084 <b>current</b> 13 4	2 0 60 <1 858 1163 892 1188 3297 history1 ▲ 38 8	0 0 59 <1 798 1107 895 1132 2492 history2 ▲ 31 12
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 >20	2 <1 65 <1 1021 1183 1148 1376 4084 current 13 4 5	2 0 60 <1 858 1163 892 1188 3297 history1 ▲ 38 8 8 8	0 0 59 <1 798 1107 895 1132 2492 history2 ▲ 31 12 3
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm 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	2 <1 65 <1 1021 1183 1148 1376 4084 current 13 4 5 current	2 0 60 <1 858 1163 892 1188 3297 history1 38 8 8 8 8 8	0 0 59 <1 798 1107 895 1132 2492 history2 31 12 3 3
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 ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 Limit/base >20	2 <1 65 <1 1021 1183 1148 1376 4084 <i>current</i> 13 4 5 <i>current</i> 0.2	2 0 60 <1 858 1163 892 1188 3297 history1 ▲ 38 8 8 8 8 8 8 8 8 0.4	0 0 59 <1 798 1107 895 1132 2492 history2 ▲ 31 12 3 3 history2 0.4
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> >3 >20	2 <1 65 <1 1021 1183 1148 1376 4084 <i>current</i> 13 4 5 <i>current</i> 0.2 7.8	2 0 60 <1 858 1163 892 1188 3297 history1 ▲ 38 8 8 8 8 8 8 8 8 8 10.4	0 0 59 <1 798 1107 895 1132 2492 history2 ▲ 31 12 3 3 history2 0.4 10.3
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 3 20 20 20 20 20 20 20 20 20 20 20 20 20	2 <1 65 <1 1021 1183 1148 1376 4084 current 13 4 5 current 0.2 7.8 18.3	2 0 60 41 858 1163 892 1188 3297 history1 ▲ 38 8 8 8 8 8 8 8 8 8 10.4 10.9 22.0	0 0 59 <1 798 1107 895 1132 2492 ▲ 31 12 3 3 history2 0.4 10.3 22.5
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 ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7415	0 0 0 1010 1070 1150 2260 225 220 220 imit/base >3 >20 >30 Simit/base	2 <1 65 <1 1021 1183 1148 1376 4084 <i>current</i> 13 4 5 <i>current</i> 0.2 7.8 18.3 <i>current</i>	2 0 60 <1 858 1163 892 1188 3297 history1 ▲ 38 8 8 8 8 8 0.4 10.9 22.0 history1	0 0 59 <1 798 1107 895 1132 2492 history2 ▲ 31 12 3 3 history2 0.4 10.3 22.5 history2



# **OIL ANALYSIS REPORT**





White Metal Yellow Metal Precipitate Silt Debris Sand/Dirt Appearance	scalar scalar scalar scalar scalar	*Visual *Visual *Visual *Visual	NONE NONE NONE	NONE NONE NONE	NONE NONE NONE	NONE NONE NONE
Precipitate Silt Debris Sand/Dirt	scalar scalar	*Visual	NONE			
Silt Debris Sand/Dirt	scalar			NONE	NONE	NONE
Debris Sand/Dirt		*Visual				
Sand/Dirt	coolor		NONE	NONE	NONE	NONE
	Scalar	*Visual	NONE	NONE	NONE	NONE
Annearance	scalar	*Visual	NONE	NONE	NONE	NONE
	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		method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	15.4	13.2	12.3	<b>1</b> 2.1
GRAPHS						
Ferrous Alloys			12000			
35 - iron chromium			1			
30 - nickel		·····				
25						
20		N				
15		1	12212			
10-112	10	. /				
	VN	~~				
Dec8/14	Vlay14/19	Sep4/20 . Apr21/21 . Jul22/22 -				
Non-ferrous Metal						
25 copper		manna				
20 - tin						
15						
10 <b>1 1</b>		110111011				
5 14	A	4.4	A			
X Kony			in'			
Dec8/14 - Aug5/15 - Sep30/16 - Dec4/17	lay14/19	Sep4/20 Apr21/21 Jul22/22				
	2	Ar Ar				
Viscosity @ 100°C	č			Base Number	5	
18 - Abnormal			10.0-	Base		
17-			- 8.0·			MI
16 Base			KOH/{		IN	N M
15-		And a state of the	B 6.0		N.	· IV
		-M	(B/HOX Base Numper Allo	M.	N/Y	
10	A /	~		11 IAA	10	
13 Abroma	VV		10	V 1/*		
12	vv		2.0-	A A.		
Quanta	May14/19	Sep4/20	0.0-	Dec8/14 Aug5/15 Sep30/16	Dec4/17	Apr21/21

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 GFL Environmental - 035 - Greensboro Laboratory Sample No. : GFL0071574 Received : 24 Jul 2023 1236 Elon Place Lab Number : 05905270 Diagnosed : 24 Jul 2023 High Point, NC Unique Number : 10566626 Diagnostician : Wes Davis US 27263 Test Package : FLEET Contact: JORGE COSTA Certificate L2367 To discuss this sample report, contact Customer Service at 1-800-237-1369. jorge.costa@gflenv.com \* - Denotes test methods that are outside of the ISO 17025 scope of accreditation. T: (336)668-3712 F:

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

Submitted By: JORGE COSTA