

## **OIL ANALYSIS REPORT**

Sample Rating Trend





Machine Id **423079** Component **Diesel Engine** Fluid

## 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 INFORM	MATION	method	limit/base	current	history 1	history 2
Sample Number		Client Info		GFL0084593	GFL0084759	GFL0068453
Sample Date		Client Info		22 Jun 2023	15 Jun 2023	15 Feb 2023
Machine Age	mls	Client Info		144593	18840	132570
Oil Age	mls	Client Info		0	0	0
Oil Changed		Client Info		Not Changd	Changed	Not Changd
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT	ION	method	limit/base	current	history 1	history 2
Fuel		WC Method	>5	<1.0	<1.0	<1.0
Glycol		WC Method		NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history 1	history 2
Iron	ppm	ASTM D5185m	>80	6	33	12
Chromium	ppm	ASTM D5185m		<1	2	<1
Nickel	ppm	ASTM D5185m	>2	0	<1	<1
Titanium		ASTM D5185m	~_	0	<1	<1
Silver	ppm	ASTM D5185m	>3	0	<1	0
	ppm			1	3	1
Aluminum	ppm	ASTM D5185m		0	3	2
Lead	ppm	ASTM D5185m	>30			
Copper	ppm	ASTM D5185m		4	32	22
Tin	ppm	ASTM D5185m	>5	<1	<1	<1
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
				-	0	
ADDITIVES		method	limit/base	current	history 1	history 2
ADDITIVES Boron	ppm	ASTM D5185m	0	current 37	history 1 5	33
	ppm ppm		0		history 1	
Boron		ASTM D5185m	0	37	history 1 5	33
Boron Barium Molybdenum	ppm	ASTM D5185m ASTM D5185m	0 0 60	37 0	history 1 5 7	33 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	37 0 48	history 1 5 7 61	33 0 53
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	37 0 48 <1	history 1 5 7 61 5	33 0 53 3
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	37 0 48 <1 590	history 1 5 7 61 5 612	33 0 53 3 568
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	37 0 48 <1 590 1572	history 1 5 7 61 5 612 1794	33 0 53 3 568 1642
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	37 0 48 <1 590 1572 764	history 1 5 7 61 5 612 1794 784	33 0 53 3 568 1642 732
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 1010 1070 1150 1270	37 0 48 <1 590 1572 764 946	history 1 5 7 61 5 612 1794 784 1043	33 0 53 3 568 1642 732 982
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 1010 1070 1150 1270 2060 limit/base	37 0 48 <1 590 1572 764 946 2904	history 1 5 7 61 5 612 1794 784 1043 2566	33 0 53 3 568 1642 732 982 2647
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 limit/base	37 0 48 <1 590 1572 764 946 2904 current	history 1 5 7 61 5 612 1794 784 1043 2566 history 1	33 0 53 3 568 1642 732 982 2647 history 2
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 0 1010 1070 1150 1270 2060 limit/base >20	37 0 48 <1 590 1572 764 946 2904 current 4	history 1     5     7     61     5     612     1794     784     1043     2566     history 1     13	33 0 53 3 568 1642 732 982 2647 history 2 10
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 <b>method</b> ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >20	37 0 48 <1 590 1572 764 946 2904 current 4 6	history 1     5     7     61     5     612     1794     784     1043     2566     history 1     13     33	33 0 53 3 568 1642 732 982 2647 <b>bistory 2</b> 10 24
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 limit/base >20	37 0 48 <1 590 1572 764 946 2904 current 4 6 <1	history 1     5     7     61     5     612     1794     784     1043     2566     history 1     13     33     8	33 0 53 3 568 1642 732 982 2647 history 2 10 24 7
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 imit/base >20 imit/base >3	37 0 48 <1 590 1572 764 946 2904 current 4 6 <1 current	history 1   5   7   61   5   612   1794   784   1043   2566   history 1   13   33   8   history 1	33 0 53 3 568 1642 732 982 2647 history 2 10 24 7 7 history 2
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 >20 limit/base >3 >20	37 0 48 <1 590 1572 764 946 2904 <u>current</u> 4 6 <1 <u>current</u> 0.1	history 1   5   7   61   5   612   1794   784   1043   2566   history 1   13   33   8   history 1   0.1	33 0 53 3 568 1642 732 982 2647 history 2 10 24 7 history 2 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 <b>TS</b> ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >20 limit/base >3 >20	37 0 48 <1 590 1572 764 946 2904 <i>current</i> 4 6 <1 <i>current</i> 0.1 7.1	history 1   5   7   61   5   612   1794   784   1043   2566   history 1   13   33   8   history 1   0.1   12.8	33 0 53 3 568 1642 732 982 2647 history 2 10 24 7 history 2 0.1 7.5
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 <b>TS</b> ppm ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>imit/base</b> >20 <b>imit/base</b> >3 >20 >3	37 0 48 <1 590 1572 764 946 2904 <b>current</b> 4 6 <1 <b>current</b> 0.1 7.1 19.8	history 1   5   7   61   5   612   1794   784   1043   2566   history 1   13   33   8   history 1   0.1   12.8   24.6	33 0 53 3 568 1642 732 982 2647 history 2 10 24 7 history 2 0.1 7.5 19.5
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRAD	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844	0 0 0 1010 1070 1150 1270 2060 imit/base >20 imit/base >3 >20 >30 imit/base	37 0 48 <1 590 1572 764 946 2904 <i>current</i> 4 6 <1 <i>current</i> 0.1 7.1 19.8 <i>current</i>	history 1   5   7   61   5   612   1794   784   1043   2566   history 1   13   33   8   history 1   0.1   12.8   24.6   history 1	33 0 53 3 568 1642 732 982 2647 history 2 10 24 7 history 2 0.1 7.5 19.5 19.5

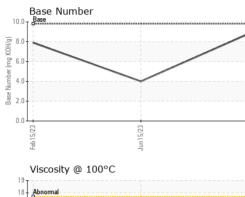


17 () 16 () 15 14 Base

> 13 Abnorma 12 11

Feb15/23

# **OIL ANALYSIS REPORT**



Jun15/23

	VISUAL		method	limit/base	current	history 1	history 2		
/	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		
Jun22/23	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML		
Junc	Odor	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	history 1	history 2		
	Visc @ 100°C		ASTM D445		14.8	14.8	15.0		
	GRAPHS								
	Ferrous Alloys								
	35 iron	$\wedge$							
	30 - chromium	$\langle \rangle$							
	25								
	20- E								
	<sup>•</sup> 15								
	10								
	5								
		~							
	Feb 15/23	Jun 15/23		Jun22/23					
	—	,		Jun					
	Non-ferrous Met	als							
	35 copper	-							
	30 - nessesses lead								
	25		<b>\</b>						
	E <sup>20</sup>								
	<sup>1</sup> 15								
	10								
	5-	AND IS IN THE R. O. LEWIS CO., NAMES IN CO., NAMES INTERVIDADO INC., NAMES INTERVIDADO	and the owner of the owner owner owner owner o						
	0			No. of Concession, name					
	Feb 15/23	Jun15/23		Jun22/23					
		,		Jun					
					Base Number				
				10	0.0 Base				
	18 - Abnormal	1		- 1	3.0		/		
				Base Number (mg KOH/g)					
	316 Base			, Be	5.0	< / /			
	E 15 tis 14			mber	1.0	$\sim$			
	12			Nu ase					
	13 Abnormal			<sup>60</sup> 2	2.0 -				
	11				0.0				
	5/23	5/23				5/23 -	2/23 -		
	Feb 15/23	Jun15/23		Jun22/23	Feb 15/23	Jun15/23	Jun22/23		
Laboratory	: WearCheck USA	- 501 Madis	on Ave Ca	ry, NC 2751	13 GFL Env	ironmental - 856	- Houston South		
Sample No.	: GFL0084593	Received		Jun 2023			ghway 6 South		
Lab Number							Houston, TX		
Unique Number	: 10535410	Diagnosti	cian : Dor	n Baldridge		<b>.</b>	US 77083		
Test Package									
	sample report, contact Customer Service at 1-800-237-1369. krowald@gflenv.com methods that are outside of the ISO 17025 scope of accreditation. T: (303)641-3906								
	ifications are based on				(JCGM 106:2012)		F:		
					. /				



Certificate L2367 To discuss this \* - Denotes test Statements of conformity based on the simple acceptance decision rule (JCGM 106:2012)

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Contact/Location: GFL856, 859, 864 - KEITH ROWALD - GFL856