

## **OIL ANALYSIS REPORT**

#### Sample Rating Trend



## Machine Id 410017

#### 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.

GAL)									
SAMPLE INFOR	MATION	method	limit/base	current	history1	history2			
Sample Number		Client Info		GFL0098464	GFL0098486	GFL0083709			
Sample Date		Client Info		01 Nov 2023	10 Oct 2023	19 Sep 2023			
Machine Age	hrs	Client Info		0	0	0			
Oil Age	hrs	Client Info		0	600	0			
Oil Changed		Client Info		Not Changd	Changed	Not Changd			
Sample Status				NORMAL	NORMAL	NORMAL			
CONTAMINAT	ION	method	limit/base	current	history1	history2			
Fuel		WC Method	>5	<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	>110	3	14	13			
Chromium	ppm	ASTM D5185m	>4	<1	1	<1			
Nickel	ppm	ASTM D5185m	>2	0	0	0			
Titanium	ppm	ASTM D5185m		0	<1	<1			
Silver	ppm	ASTM D5185m	>2	0	0	0			
Aluminum	ppm	ASTM D5185m	>25	4	16	13			
Lead	ppm	ASTM D5185m	>45	0	1	1			
Copper	ppm	ASTM D5185m	>85	2	7	6			
Tin	ppm	ASTM D5185m	>4	0	1	<1			
Vanadium	ppm	ASTM D5185m		0	0	<1			
Cadmium	ppm	ASTM D5185m		0	<1	<1			
ADDITIVES		method	limit/base	current	history1	history2			
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current 4	history1 <1	history2 0			
	ppm ppm								
Boron		ASTM D5185m	0	4	<1	0			
Boron Barium Molybdenum	ppm	ASTM D5185m ASTM D5185m	0 0 60	4 0	<1 0	0			
Boron Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	4 0 57	<1 0 52	0 0 58			
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	4 0 57 0	<1 0 52 1	0 0 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	4 0 57 0 896	<1 0 52 1 871	0 0 58 <1 927			
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	4 0 57 0 896 1130	<1 0 52 1 871 1046	0 0 58 <1 927 1173			
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	4 0 57 0 896 1130 1025	<1 0 52 1 871 1046 862	0 0 58 <1 927 1173 963			
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	4 0 57 0 896 1130 1025 1212	<1 0 52 1 871 1046 862 1157	0 0 58 <1 927 1173 963 1210			
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	4 0 57 0 896 1130 1025 1212 3039	<1 0 52 1 871 1046 862 1157 2569	0 0 58 <1 927 1173 963 1210 3432			
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 1010 1070 1150 1270 2060	4 0 57 0 896 1130 1025 1212 3039 current	<1 0 52 1 871 1046 862 1157 2569 history1	0 0 58 <1 927 1173 963 1210 3432 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 <b>method</b>	0 0 60 1010 1070 1150 1270 2060	4 0 57 0 896 1130 1025 1212 3039 current 3	<1 0 52 1 871 1046 862 1157 2569 history1 5	0 0 58 <1 927 1173 963 1210 3432 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 Limit/base >30	4 0 57 0 896 1130 1025 1212 3039 <u>current</u> 3 3	<1 0 52 1 871 1046 862 1157 2569 history1 5 6	0 0 58 <1 927 1173 963 1210 3432 history2 5 5 5			
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> >30	4 0 57 0 896 1130 1025 1212 3039 current 3 3 8	<1 0 52 1 871 1046 862 1157 2569 history1 5 6 47	0 0 58 <1 927 1173 963 1210 3432 history2 5 5 5 40			
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 <b>limit/base</b> >30 20 <b>limit/base</b>	4 0 57 0 896 1130 1025 1212 3039 current 3 3 8 8	<1 0 52 1 871 1046 862 1157 2569 history1 5 6 47 history1	0 0 58 <1 927 1173 963 1210 3432 <b>history2</b> 5 5 5 40 <b>history2</b>			
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	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> >30 20 <b>limit/base</b>	4 0 57 0 896 1130 1025 1212 3039 <u>current</u> 3 3 8 <u>current</u> 0.1	<1 0 52 1 871 1046 862 1157 2569 history1 5 6 47 history1 0.4	0 0 58 <1 927 1173 963 1210 3432 <b>history2</b> 5 5 5 40 <b>history2</b> 0.3			
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> >30 <i>limit/base</i> >20	4 0 57 0 896 1130 1025 1212 3039 current 3 3 3 8 current 0.1 5.7	<1 0 52 1 871 1046 862 1157 2569 history1 5 6 47 47 history1 0.4 8.5	0 0 58 <1 927 1173 963 1210 3432 history2 5 5 5 40 history2 0.3 7.8			
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 <b>imit/base</b> >30 <b>imit/base</b> >3 20	4 0 57 0 896 1130 1025 1212 3039 current 3 3 3 8 current 0.1 5.7 18.7	<1 0 52 1 871 1046 862 1157 2569 history1 5 6 47 history1 0.4 8.5 21.2	0 0 58 <1 927 1173 963 1210 3432 <b>history2</b> 5 5 5 40 <b>history2</b> 0.3 7.8 20.8			



Base

Nov25/22 Dec30/22

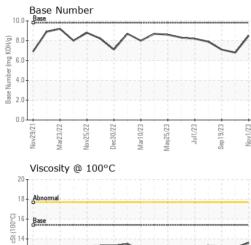
12 10

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Vov29/21 Mar23/22

# **OIL ANALYSIS REPORT**

VISUAL



		White Metal	coolor	*Visual	NONE	NONE	NONE	NONE
$\vee$		Yellow Metal	scalar 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
Dec30/22 - Mar10/23 - May25/23 -	Jul1/23 - Sep19/23 - Nov1/23 -	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Decô Mari Mayô	Ju Sep1 Nov	Odor	scalar	*Visual	NORML	NORML	NORML	NORML
°C		Emulsified Water	scalar	*Visual	>0.2	NEG	NEG	NEG
		Free Water	scalar	*Visual		NEG	NEG	NEG
		FLUID PROPE	RTIES	method	limit/base	current	history1	history2
		Visc @ 100°C	cSt	ASTM D445	15.4	13.6	13.1	13.2
	~	GRAPHS						
		Ferrous Alloys						
Dec30/22 Mar10/23 May25/23	Jul1/23 Sep19/23	100 100 100 100 100 100 100 100	Mart 0/23	Sep19/23	Nov1/23			
		200 200 200 200 200 200 200 200	Mari 10/23	Sapt 12/2		Base Number	~~~	
		Constant of the second	Mar10/23	Juli 123 Sep 19/23	0.0 6.0 400 fc0 8 asse Mumber (mg KOH(8) 0.0 0.0 0.0	Nov29/21 Mar23/22 Nov25/22	Dec30/22 Mar10/23 May25/23	Jult/23 Sep19/23 Nov1/23
* - Denotes tes	st methods that a	: 05998655	Received Diagnose Diagnost ice at 1-8 7025 sco	l : 06 f ed : 06 f ician : Wes 00-237-1369 pe of accred	GFL Environmental - 846 - Mayfield Hauling 3426 State Route 45 Mayfield, KY US 42066 Contact: Jack Lindsey jack.lindsey@gflenv.com T: (270)970-3690 CGM 106:2012) F:			

Contact/Location: Jack Lindsey - GFL846