

# **OIL ANALYSIS REPORT**

#### Sample Rating Trend





# Component

Diesel Engine

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.

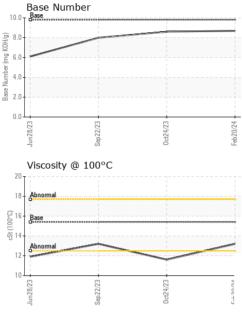
### Fluid Condition

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

SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0092886	GFL0097461	GFL0092896
Sample Date		Client Info		20 Feb 2024	24 Oct 2023	22 Sep 2023
Machine Age	hrs	Client Info		7404	7404	7404
Oil Age	hrs	Client Info		7404	7404	0
Oil Changed		Client Info		N/A	N/A	N/A
Sample Status				NORMAL	ABNORMAL	MARGINAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<1.0	<b>3</b> .5	<b>2</b> .5
Water		WC Method	>0.2	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
WEAR METAL	S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>100	6	9	12
Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Nickel	ppm	ASTM D5185m	>4	<1	0	<1
Titanium	ppm	ASTM D5185m		<1	0	0
Silver	ppm	ASTM D5185m	>3	0	0	0
Aluminum	ppm	ASTM D5185m	>20	2	2	1
Lead	ppm	ASTM D5185m	>40	0	0	<1
Copper	ppm	ASTM D5185m	>330	2	0	<1
Tin	ppm	ASTM D5185m	>15	<1	0	0
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	limit/base 0	current 20	history1 18	history2 7
	ppm ppm					
Boron		ASTM D5185m	0	20	18	7
Boron Barium	ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0	20 0	18 0	7 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	20 0 54	18 0 63	7 0 52
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	20 0 54 <1	18 0 63 0	7 0 52 <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	20 0 54 <1 794	18 0 63 0 939	7 0 52 <1 730
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	20 0 54 <1 794 1077	18 0 63 0 939 1083	7 0 52 <1 730 874
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	20 0 54 <1 794 1077 988	18 0 63 0 939 1083 1038	7 0 52 <1 730 874 818
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	20 0 54 <1 794 1077 988 1162	18 0 63 0 939 1083 1038 1256	7 0 52 <1 730 874 818 1001
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 <b>method</b> ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	20 0 54 <1 794 1077 988 1162 3195	18 0 63 0 939 1083 1083 1038 1256 3069	7 0 52 <1 730 874 818 1001 2600
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	20 0 54 <1 794 1077 988 1162 3195 current	18 0 63 0 939 1083 1083 1038 1256 3069 history1	7 0 52 <1 730 874 818 1001 2600 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> ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	20 0 54 <1 794 1077 988 1162 3195 current 5	18 0 63 0 939 1083 1038 1256 3069 history1 5	7 0 52 <1 730 874 818 1001 2600 history2 4
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 ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 Limit/base >25	20 0 54 <1 794 1077 988 1162 3195 Current 5 2	18 0 63 0 939 1083 1083 1038 1256 3069 history1 5 3	7 0 52 <1 730 874 818 1001 2600 history2 4 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	ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 <b>limit/base</b> >25 >20	20 0 54 <1 794 1077 988 1162 3195 Current 5 2 2 2	18 0 63 0 939 1083 1038 1256 3069 history1 5 3 0 history1 0.1	7 0 52 <1 730 874 818 1001 2600 history2 4 3 2 4 3 2 history2 0.2
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 ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25	20 0 54 <1 794 1077 988 1162 3195 current 5 2 2 2 2	18 0 63 0 939 1083 1038 1256 3069 history1 5 3 0 0	7 0 52 <1 730 874 818 1001 2600 history2 4 3 2 2 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 ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20	20 0 54 <1 794 1077 988 1162 3195 <u>current</u> 5 2 2 2 2 <u>current</u> 0.1	18 0 63 0 939 1083 1038 1256 3069 history1 5 3 0 history1 0.1	7 0 52 <1 730 874 818 1001 2600 history2 4 3 2 history2 0.2
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 TS ppm ppm ppm ppm	ASTM D5185m ASTM D51854 ASTM D7844 *ASTM D7624	0 0 0 1010 1070 1150 1270 2060 <i>limit/base</i> >25 >20 <i>limit/base</i> >3 >20	20 0 54 <1 794 1077 988 1162 3195 <b>current</b> 5 2 2 2 2 <b>current</b> 0.1 5.1	18 0 63 0 939 1083 1038 1256 3069 history1 5 3 0 history1 0.1 7.9	7 0 52 <1 730 874 818 1001 2600 history2 4 3 2 4 3 2 history2 0.2 7.0
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	ASTM D5185m ASTM D51854 ASTM D7844 *ASTM D7624	0 0 0 1010 1070 1150 1270 2060 <b>imit/base</b> >25 <b>imit/base</b> >3 >20 >3 >20	20 0 54 <1 794 1077 988 1162 3195 <b>current</b> 5 2 2 2 2 <b>current</b> 0.1 5.1 17.7	18 0 63 0 939 1083 1038 1256 3069 history1 5 3 0 history1 0.1 7.9 18.9	7 0 52 <1 730 874 818 1001 2600 history2 4 3 2 2 history2 0.2 7.0 18.3
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 TS ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7415	0 0 0 1010 1070 1150 1270 2060 2060 225 20 220 220 20 3 20 20 3 3 20 20 3 3 20 20 20 20 20 20 20 20 20 20 20 20 20	20 0 54 <1 794 1077 988 1162 3195 Current 5 2 2 2 Current 0.1 5.1 17.7 Current	18 0 63 0 939 1083 1083 1038 1256 3069 history1 5 3 0 history1 0.1 7.9 18.9 history1	7 0 52 <1 730 874 818 1001 2600 history2 4 3 2 0.2 7.0 18.3 history2



# **OIL ANALYSIS REPORT**



		VISUAL		method	limit/base	current	history1	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		
0ct24/23	Feb20/24	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML	
0ct2	Feb 2	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	RTIES	method	limit/base	current	history1	history2	
		Visc @ 100°C	cSt	ASTM D445		13.2	▲ 11.6	13.2	
		GRAPHS							
~	and the second se	Ferrous Alloys							
		40 T							
0ct24/23	100	35 - iron							
0ct2	מעניים	30 - new nickel							
		25							
		틆 20							
		15							
		10							
		5 - Photosomerane							
		53 53		23	24				
		Jun 28/23 Sep 22/23		0ct24/23	Feb20/24				
		→ Non-ferrous Metal	c	0	LL.				
		14 <sub>T</sub>							
		12- copper							
		10-							
		4							
		2							
		Jun 28/23 Sep 22/23		0ct24/23	Feb20/24				
				00	Fet				
		Viscosity @ 100°C	2			Base Numb	er		
		18 Abnormal			10.	0 Base			
		17+			- 8.	0			
		16 - Page			(B/HOX Base Number (MD KOHK)		and the second se		
		0 15		· · · · · · · · · · · · · · · · · · ·	Ē 6.1	0			
		0 15 15 14			-a 5 4.				
		13 Abnormal			Nu as				
		12			<u>2</u> .	0			
		11			0.	0			
		10 +		+/23 -			2/23 -	+/23 -	
		Jun28/23 Sep22/23		0ct24/23	Feb20/24	Jun28/23	Sep 22/23	0ct24/23	
		,							
d	Laboratory	: WearCheck USA - 50				GF	L Environmenta		
NAB	Sample No.	: GFL0092886		Received : 01 Mar 2024			1241 KING SETTLEMENT R		
REDITED	Lab Number			Tested : 01 Mar 2024 Diagnosed : 01 Mar 2024 - Wes Davis			ALPENA, I		
ING LABORATORY	Unique Number		Diagr	iosed :01	war 2024 - W	ves Davis	Contact	US 4970	
ING LABORATORY	Toet Dockore	· FI FF1		Contact: DYLAN TOLA dylan.tolan@gflenv.co					
tificate L2367	Test Package	: FLEEI , contact Customer Serv	ice at 1-8	00-237-136	9				

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Submitted By: GFL463 and GFL641 - DYLAN TOLAN