

# **OIL ANALYSIS REPORT**

#### Sample Rating Trend



# Machine Id 601441

#### Component Diesel Engine

Fluid PETRO CANADA DURON SHP 15W40 (--- 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.

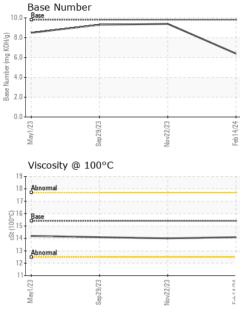
SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0112715	GFL0101356	GFL0091816
Sample Date		Client Info		14 Feb 2024	22 Nov 2023	29 Sep 2023
Machine Age	hrs	Client Info		5590	5590	5569
Oil Age	hrs	Client Info		0	0	5569
Oil Changed		Client Info		Not Changd	Not Changd	Not Changd
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>2.0	<1.0	<1.0	<1.0
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	2	3	4
Chromium	ppm	ASTM D5185m	>20	0	<1	0
Nickel	ppm	ASTM D5185m	>4	0	<1	0
Titanium	ppm	ASTM D5185m		<1	<1	2
Silver	ppm	ASTM D5185m	>3	0	0	0
Aluminum	ppm	ASTM D5185m	>20	<1	<1	3
Lead	ppm	ASTM D5185m	>40	1	<1	<1
Copper	ppm	ASTM D5185m	>330	<1	<1	<1
Tin	ppm	ASTM D5185m	>15	<1	<1	0
Vanadium	ppm	ASTM D5185m		<1	0	0
Cadmium	ppm	ASTM D5185m		0	<1	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base 0	current 8	history1 5	history2 9
	ppm ppm	ASTM D5185m				
Boron		ASTM D5185m	0	8	5	9
Boron Barium	ppm	ASTM D5185m ASTM D5185m	0 0 60	8 0	5	9 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	8 0 59	5 1 59	9 0 63
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	8 0 59 0	5 1 59 <1	9 0 63 0
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	8 0 59 0 929	5 1 59 <1 934	9 0 63 0 917
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	8 0 59 0 929 1024	5 1 59 <1 934 1047	9 0 63 0 917 1043
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	8 0 59 0 929 1024 990	5 1 59 <1 934 1047 987	9 0 63 0 917 1043 1064
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	8 0 59 0 929 1024 990 1192	5 1 59 <1 934 1047 987 1169	9 0 63 0 917 1043 1064 1262
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	8 0 59 0 929 1024 990 1192 3038	5 1 59 <1 934 1047 987 1169 3535	9 0 63 0 917 1043 1064 1262 3643
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	8 0 59 0 929 1024 990 1192 3038 current	5 1 59 <1 934 1047 987 1169 3535 history1	9 0 63 0 917 1043 1064 1262 3643 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 1010 1070 1150 1270 2060 kimit/base >25	8 0 59 0 929 1024 990 1192 3038 current 3	5 1 59 <1 934 1047 987 1169 3535 history1 4	9 0 63 0 917 1043 1064 1262 3643 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 ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 kimit/base >25	8 0 59 0 929 1024 990 1192 3038 <u>current</u> 3 17	5 1 59 <1 934 1047 987 1169 3535 history1 4 3	9 0 63 0 917 1043 1064 1262 3643 history2 3 2
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> >25 >20	8 0 59 0 929 1024 990 1192 3038 current 3 17 0	5 1 59 <1 934 1047 987 1169 3535 history1 4 3 2	9 0 63 0 917 1043 1064 1262 3643 history2 3 2 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 ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 <b>limit/base</b> >20	8 0 59 0 929 1024 990 1192 3038 current 3 17 0	5 1 59 <1 934 1047 987 1169 3535 history1 4 3 2 history1	9 0 63 0 917 1043 1064 1262 3643 history2 3 2 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 ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20 <b>limit/base</b> >20	8 0 59 0 929 1024 990 1192 3038 current 3 17 0 current	5 1 59 <1 934 1047 987 1169 3535 history1 4 3 2 history1 0.1	9 0 63 0 917 1043 1064 1262 3643 history2 3 2 1 history2 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 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	8 0 59 0 929 1024 990 1192 3038 <i>current</i> 3 17 0 <i>current</i> 0.2 4.3	5 1 59 <1 934 1047 987 1169 3535 history1 4 3 2 history1 0.1 4.4	9 0 63 0 917 1043 1064 1262 3643 history2 3 2 1 history2 0.1 5.1
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	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D7415	0 0 0 1010 1070 1150 2260 225 220 220 imit/base >3 >20 >30 20 30	8 0 59 0 929 1024 990 1192 3038 current 3 17 0 current 0.2 4.3 15.4 current	5 1 59 <1 934 1047 987 1169 3535 history1 4 3 2 history1 0.1 4.4 17.3	9 0 63 0 917 1043 1064 1262 3643 history2 3 2 1 1 history2 0.1 5.1 17.6 history2
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 imit/base >25 imit/base >3 >20 imit/base >3 >20	8 0 59 0 929 1024 990 1192 3038 <u>current</u> 3 17 0 <u>current</u> 0.2 4.3 15.4	5 1 59 <1 934 1047 987 1169 3535 history1 4 3 2 history1 0.1 4.4 17.3 history1	9 0 63 0 917 1043 1064 1262 3643 <b>history2</b> 3 2 1 <b>history2</b> 0.1 5.1 17.6

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# **OIL ANALYSIS REPORT**

VISUAL



	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
Nav22/23 Feb 14/24	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Nov2 Feb1	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		14.1	14.0	14.1
	GRAPHS						
	Ferrous Alloys						
	10iron						
Nov22/23	8 - newspace chromium						
Nov	III CKEI						
	6						
	udd 4						
	2 -						
	0						
	123		2/23	1/24			
	May1/23 Sep 29/23		Nov22/23	Feb14/24			
	Non-ferrous Meta	als	2	_			
	<sup>10</sup> T						
	copper						
	8 - tin						
	6						
	ш dd						
	4						
	2						
	2 -		and the second	destants.			
	2						
	2 0 E2/1/M		22/23	14/24			
	5ep29/23		Nov22/23 -	Feb14/24			
	Viscosity @ 100°	2	Nov22/23 +		Base Number		
		C	Nov22/23 -	Feb14/24			
	Viscosity @ 100°	C	Nov22/23 -	10.0	Base		
	Viscosity @ 100°	C	Nov22/23	10.0	Base		
	Viscosity @ 100°	C	Nov22/23	10.0	Base		
	Viscosity @ 100°	C	Nov2223 +	10.0	Base		
	Viscosity @ 100° bnomal bnomal Base Base 3 14	C	Nov22223	10.0 8.0 (0)(0) (0)(0) (0)(0)(0) (0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(0)(	Base		
	Viscosity @ 100°	C	Nov22223	10.0	Base		
	Viscosity @ 100° Abnormal Base Abnormal Abnormal Abnormal	C		10.0 (0,HO) Bull Jack 4.0 880 980 2.0 0.0	Base		
	Viscosity @ 100° Abnormal Base Abnormal Abnormal Abnormal	C		10.0 (0,HO) Bull Jack 4.0 880 980 2.0 0.0	Base	23/23	
	Viscosity @ 100° Abnomal Base Abnomal Abnomal Abnomal	C	Nov22/23 Nov22/23 -	10.0 (0)HOX DUL bull bull bull bull bull bull bull bull	Base	Sep 29/12	
	Viscosity @ 100°0 Abnormal Abnormal Abnormal Base Exercheck USA - 50 C GFL0112715 C 06097489 T 10890342		n Ave., Cary ved : 22 d : 23	0.0 0.3 0.0 0.0 14/54 0.0 East 14/54 East 14/54 East 14/574 East 14/574 East 14/574 East 14/574 East 14/574 East 14/574 East 14/574 East 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.	GFL Envir	ronmental - <b>654 - F</b> 118	Richmond Haul 00 Lewis Ro Chester, <sup>v</sup> US 238
Sample No. Lab Number	Viscosity @ 100°0	01 Madiso Recei Teste Diagr	n Ave., Cary ved : 22 d : 23 iosed : 23	NC 27513 Feb 2024 Feb 2024 - W	GFL Envir	ronmental - 654 - F 118 Contact	

Submitted By: TECHNICIAN ACCOUNT