

# **OIL ANALYSIS REPORT**

#### Sample Rating Trend



# Machine Id 710037

#### 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 INFORI	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0103501	GFL0094794	GFL0094786
Sample Date		Client Info		18 Dec 2023	27 Nov 2023	07 Nov 2023
Machine Age	hrs	Client Info		3957	3813	3650
Oil Age	hrs	Client Info		713	569	406
Oil Changed		Client Info		Changed	N/A	N/A
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINAT	ION	method	limit/base	current	history1	history2
Fuel		WC Method	>5	<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	>110	27	22	15
Chromium	ppm	ASTM D5185m	>4	<1	1	<1
Nickel	ppm	ASTM D5185m	>2	<1	<1	0
Titanium	ppm	ASTM D5185m		0	<1	<1
Silver	ppm	ASTM D5185m	>2	0	<1	0
Aluminum	ppm	ASTM D5185m	>25	10	10	8
Lead	ppm	ASTM D5185m	>45	0	1	<1
Copper	ppm	ASTM D5185m	>85	54	47	30
Tin	ppm	ASTM D5185m	>4	<1	<1	<1
Vanadium	ppm	ASTM D5185m		0	<1	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current 5	history1 5	history2 6
	ppm ppm					
Boron		ASTM D5185m	0	5	5	6
Boron Barium	ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0	5 0	5 0	6 0
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	5 0 7	5 0 8	6 0 9 <1 21
Boron Barium Molybdenum Manganese	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	5 0 7 <1	5 0 8 <1	6 0 9 <1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	5 0 7 <1 61	5 0 8 <1 58 2204 883	6 0 9 <1 21 2367 962
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	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	5 0 7 <1 61 2203	5 0 8 <1 58 2204 883 1131	6 0 9 <1 21 2367 962 1153
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	0 0 60 0 1010 1070 1150	5 0 7 <1 61 2203 803	5 0 8 <1 58 2204 883	6 0 9 <1 21 2367 962
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	5 0 7 <1 61 2203 803 1045	5 0 8 <1 58 2204 883 1131	6 0 9 <1 21 2367 962 1153
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	5 0 7 <1 61 2203 803 1045 3267	5 0 8 <1 58 2204 883 1131 3076	6 0 9 <1 21 2367 962 1153 3537
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	5 0 7 <1 61 2203 803 1045 3267 current	5 0 8 <1 58 2204 883 1131 3076 history1	6 0 9 <1 21 2367 962 1153 3537 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	0 0 60 0 1010 1070 1150 1270 2060 <b>limit/base</b>	5 0 7 <1 61 2203 803 1045 3267 current 7	5 0 8 <1 58 2204 883 1131 3076 history1 8	6 0 9 <1 21 2367 962 1153 3537 history2 6
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 <b>limit/base</b>	5 0 7 <1 61 2203 803 1045 3267 <u>current</u> 7 2	5 0 8 <1 58 2204 883 1131 3076 history1 8 4	6 0 9 <1 21 2367 962 1153 3537 history2 6 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 60 0 1010 1070 1150 1270 2060 <b>limit/base</b> >30	5 0 7 <1 61 2203 803 1045 3267 current 7 2 2 23	5 0 8 <1 58 2204 883 1131 3076 history1 8 4 20	6 0 9 <1 21 2367 962 1153 3537 history2 6 2 2 17
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>Imit/base</b> >30 >20	5 0 7 <1 61 2203 803 1045 3267 <b>current</b> 7 2 2 23 current	5 0 8 <1 58 2204 883 1131 3076 history1 8 4 20 history1	6 0 9 <1 21 2367 962 1153 3537 history2 6 2 17 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 TS ppm ppm	ASTM D5185m ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >30 limit/base >20	5 0 7 <1 61 2203 803 1045 3267 <i>current</i> 7 2 23 23 <i>current</i> 0.5	5 0 8 <1 58 2204 883 1131 3076 history1 8 4 20 history1 0.4	6 0 9 <1 21 2367 962 1153 3537 history2 6 2 17 history2 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 imit/base >30 220 imit/base >3 >20	5 0 7 <1 61 2203 803 1045 3267 <i>current</i> 7 2 23 23 <i>current</i> 0.5 8.1	5 0 8 <1 58 2204 883 1131 3076 history1 8 4 20 history1 0.4 7.7	6 0 9 <1 21 2367 962 1153 3537 history2 6 2 17 6 2 17 history2 0.3 7.3
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 <b>Imit/base</b> >30 20 <b>Imit/base</b> >3 >20	5 0 7 <1 61 2203 803 1045 3267 <b>current</b> 7 2 2 33 <b>current</b> 0.5 8.1 20.0	5 0 8 <1 58 2204 883 1131 3076 history1 8 4 20 history1 0.4 7.7 19.2	6 0 9 <1 21 2367 962 1153 3537 <b>history2</b> 6 2 17 <b>history2</b> 0.3 7.3 17.7
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 D7844 *ASTM D7844 *ASTM D7844	0 0 0 1010 1070 1150 1270 2060 2060 2060 2060 200 200 200 200 20	5 0 7 <1 61 2203 803 1045 3267 current 7 2 23 current 0.5 8.1 20.0 current	5 0 8 <1 58 2204 883 1131 3076 history1 8 4 20 history1 0.4 7.7 19.2 history1	6 0 9 <1 21 2367 962 1153 3537 history2 6 2 17 history2 0.3 7.3 17.7 history2



# **OIL ANALYSIS REPORT**

scalar

\*Visual

NONE

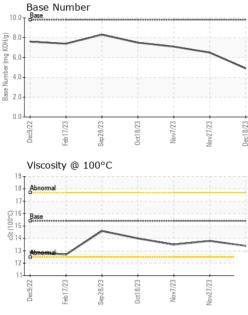
NONE

NONE

NONE

VISUAL

White Metal



Oct18/23 Nav7//23 Nov21/23	Yellow Metal Precipitate Silt Debris Sand/Dirt Appearance Odor Emulsified Water Free Water	scalar *Visua scalar *Visua scalar *Visua scalar *Visua scalar *Visua scalar *Visua scalar *Visua scalar *Visua scalar *Visua	NONE NONE NONE NONE NORML NORML >0.2	NONE NONE NONE NONE NORML NORML NEG NEG	NONENONENONENONENONENONENONENONENONENORMLNORMLNORMLNEGNEG
	FLUID PROPE			current	history1 history2
	Visc @ 100°C	cSt ASTM D	)445 15.4	13.4	13.8 13.5
	GRAPHS Ferrous Alloys Ferrous Alloys Competition	0ct18/23 0ct18/23 0ct18/23	10.0	Base Number	
	53 14 13 Abromal		(0, 8.0 + HOX KOL + 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,		
	Dec9/22	Oct18/23	0.0	Dec3/22 Feb 17/23	0ct18/23 Nov7/23 Nov27/23
Laboratory Sample No. Lab Number Unique Number Test Package To discuss this sample report, * - Denotes test methods that Statements of conformity to spe	jor	GFL environmental - 867 - Trafford (Blount Hauling) 1130 County Line Rd Trafford, AL US 35172 Contact: Jonathan Williams jonathan.williams@gflenv.com T: GM 106:2012) F:			

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