

# **OIL ANALYSIS REPORT**

Sample Rating Trend

NORMAL

# Machine Id 413001

#### 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.

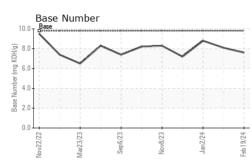
### Fluid Condition

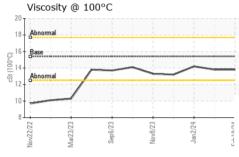
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0109327	GFL0093569	GFL0093561
Sample Date		Client Info		19 Feb 2024	29 Jan 2024	02 Jan 2024
Machine Age	hrs	Client Info		3388	3284	3130
Oil Age	hrs	Client Info		354	250	96
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	>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	>100	7	5	1
Chromium	ppm	ASTM D5185m	>20	<1	<1	0
Nickel	ppm	ASTM D5185m	>4	1	1	<1
Titanium	ppm	ASTM D5185m		19	20	18
Silver	ppm	ASTM D5185m	>3	0	0	<1
Aluminum	ppm	ASTM D5185m	>20	3	2	2
Lead	ppm	ASTM D5185m	>40	0	<1	0
Copper	ppm	ASTM D5185m		2	2	<1
Tin	ppm		>15	- <1	1	<1
Vanadium	ppm	ASTM D5185m		0	<1	<1
Cadmium	ppm	ASTM D5185m		0	0	0
Ouumum	ppin	ASTIVI DUTOJITI		U	0	0
ADDITIVES	ppin	method	limit/base	current	history1	history2
	ppm		limit/base			
ADDITIVES		method ASTM D5185m		current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	0	current 14	history1 21	history2 29
ADDITIVES Boron Barium Molybdenum	ppm ppm	method ASTM D5185m ASTM D5185m	0	current 14 3	history1 21 0	history2 29 0
ADDITIVES Boron Barium	ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	current 14 3 45	history1 21 0 47	history2 29 0 44
ADDITIVES Boron Barium Molybdenum Manganese	ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	current 14 3 45 0	history1 21 0 47 0	history2 29 0 44 <1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	current 14 3 45 0 761	history1 21 0 47 0 802	history2 29 0 44 <1 829
ADDITIVES Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	current           14           3           45           0           761           1113	history1 21 0 47 0 802 1178	history2 29 0 44 <1 829 1111
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070 1150	current           14           3           45           0           761           1113           996	history1 21 0 47 0 802 1178 893	history2           29           0           44           <1           829           1111           1066
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	0 0 60 0 1010 1070 1150 1270	current           14           3           45           0           761           1113           996           1116	history1 21 0 47 0 802 1178 893 1176	history2           29           0           44           <1           829           1111           1066           1249
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	0 0 60 1010 1070 1150 1270 2060 limit/base	current           14           3           45           0           761           1113           996           1116           3336	history1 21 0 47 0 802 1178 893 1176 3335	history2         29         0         44         <1         829         1111         1066         1249         3357
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method 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	current           14           3           45           0           761           1113           996           1116           3336           current           4	history1 21 0 47 0 802 1178 893 1176 3335 history1	history2         29         0         44         <1         829         1111         1066         1249         3357         history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25	current 14 3 45 0 761 1113 996 1116 3336 current	history1         21         0         47         0         802         1178         893         1176         3335         history1         4	history2         29         0         44         <1         829         1111         1066         1249         3357         history2         3
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 limit/base >25	current           14           3           45           0           761           1113           996           1116           3336           current           4           0	history1         21         0         47         0         802         1178         893         1176         3335         history1         4         0	history2         29         0         44         <1         829         1111         1066         1249         3357         history2         3         3         3
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25	current         14         3         45         0         761         1113         996         1116         3336         current         4         0         10         current	history1         21         0         47         0         802         1178         893         1176         3335         history1         4         0         8	history2         29         0         44         <1         829         1111         1066         1249         3357         history2         3         3         4
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25 	current         14         3         45         0         761         1113         996         1116         3336         current         4         0         10         current         0.2	history1         21         0         47         0         802         1178         893         1176         3335         history1         4         0         8         history1         0         2         0         0         0         0         0         4         0         8         history1         0.2	history2         29         0         44         <1         829         1111         1066         1249         3357         history2         3         4         +history2         0         0.1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Silicon Silicon Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base	current         14         3         45         0         761         1113         996         1116         3336         current         4         0         10         current	history1         21         0         47         0         802         1178         893         1176         3335         history1         4         0         8         history1	history2         29         0         44         <1         829         1111         1066         1249         3357         history2         3         4         4
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Silicon Sidium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm <b>TS</b> ppm ppm ppm	method           ASTM D5185m           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 imit/base >25 imit/base >20	current         14         3         45         0         761         1113         996         1116         3336         current         4         0         10         current         0.2         7.8	history1         21         0         47         0         802         1178         893         1176         3335         history1         4         0         8         history1         0         8         0.2         6.8	history2         29         0         44         <1         829         1111         1066         1249         3357         history2         3         4         -         0.1         5.5
ADDITIVES 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	method         ASTM D5185m         ASTM D7844         *ASTM D7844         *ASTM D7415         method	0 0 0 1010 1070 1150 1270 2060 imit/base >25 imit/base >20 imit/base >3 >20	current         14         3         45         0         761         1113         996         1116         3336         current         4         0         10         current         0.2         7.8         19.0         current	history1         21         0         47         0         802         1178         893         1176         3335         history1         4         0         8         history1         4         0         8         history1         0.2         6.8         18.4         history1	history2         29         0         44         <1         829         1111         1066         1249         3357         history2         3         4         • history2         0.1         5.5         18.1         history2
ADDITIVES 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 <b>TS</b> ppm ppm ppm	method           ASTM D5185m           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>imit/base</b> >25 <b>imit/base</b> >3 >20	current         14         3         45         0         761         1113         996         1116         3336         current         4         0         10         current         0.2         7.8         19.0	history1         21         0         47         0         802         1178         893         1176         3335         history1         4         0         8         history1         0.2         6.8         18.4	history2         29         0         44         <1         829         1111         1066         1249         3357         history2         3         4         history2         0.1         5.5         18.1



# **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
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
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	15.4	13.8	13.8	14.2
GRAPHS						

Ferrous Alloys 35 30 25 20 15 10 5 0. Sep6/23 lar23/23 1018/72 n2/24 Feb 19/24 Non-ferrous Metals 250 200 150 100 50 0 Feb19/24 an2/24 0v8/73 Viscosity @ 100°C Base Number 20 10.0 18 8 (mg KOH/g) 16 cSt (100°C) 6 ( umber 4 ( 12 Base 10 0.0 8 Sep6/23 -Nov8/23 -Jan2/24 -Feb19/24. Sep6/23 -Feb19/24. Nov22/22 Nov8/23 Jan2/24 Mar23/23 Mar23/23 Vov22/22 : WearCheck USA - 501 Madison Ave., Cary, NC 27513 GFL Environmental - 891 - Oklahoma City Hauling Laboratory Sample No. : GFL0109327 Received : 20 Feb 2024 1001 South Rockwell Lab Number : 06094053 Tested : 21 Feb 2024 Oklahoma City, OK Unique Number : 10886906 Diagnosed : 21 Feb 2024 - Wes Davis US 73128 Test Package : FLEET Contact: Andy Smith andrew.smith@gflenv.com

To discuss this sample report, contact Customer Service at 1-800-237-1369.

\* - Denotes test methods that are outside of the ISO 17025 scope of accreditation.

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

Certificate L2367

T: (405)306-1651

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