

# **OIL ANALYSIS REPORT**

#### Sample Rating Trend



# 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.

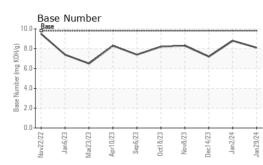
## Fluid Condition

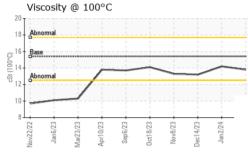
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		GFL0093569	GFL0093561	GFL0093595
Sample Date		Client Info		29 Jan 2024	02 Jan 2024	14 Dec 2023
Machine Age	hrs	Client Info		3284	3130	3034
Oil Age	hrs	Client Info		250	96	595
Oil Changed		Client Info		Not Changd	Not Changd	Changed
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		ASTM D5185m	>100	5	1	10
Chromium	ppm ppm	ASTM D5185m	>20	ວ <1	0	<1
Nickel	ppm	ASTM D5185m	>20	1	<1	2
Titanium	ppm	ASTM D5185m	~	20	18	<1
Silver		ASTM D5185m	>3	0	<1	<1
Aluminum	ppm ppm		>20	2	2	4
Lead		ASTM D5185m	>20	2 <1	0	4
	ppm		>40	2	<1	6
Copper Tin	ppm	ASTM D5185m	>330	1	<1	1
Vanadium	ppm	ASTM D5185m	>10	۱ <1	<1	0
Cadmium	ppm					0
				0	()	
	ppm	ASTM D5185m	limit/base	0	0	-
ADDITIVES	ppm	method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	0	current 21	history1 29	history2 2
ADDITIVES Boron Barium		method ASTM D5185m ASTM D5185m	0	current 21 0	history1 29 0	history2 2 0
ADDITIVES Boron Barium Molybdenum	ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60	current 21 0 47	history1 29 0 44	history2 2 0 55
ADDITIVES Boron Barium Molybdenum Manganese	ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0	current 21 0 47 0	history1 29 0 44 <1	history2 2 0 55 <1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010	current 21 0 47 0 802	history1 29 0 44 <1 829	history2 2 0 55 <1 919
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 60 0 1010 1070	Current 21 0 47 0 802 1178	history1 29 0 44 <1 829 1111	history2 2 0 55 <1 919 981
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	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 21 0 47 0 802 1178 893	history1 29 0 44 <1 829 1111 1066	history2 2 0 55 <1 919 981 958
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm	method           ASTM D5185m	0 0 60 0 1010 1070 1150 1270	Current 21 0 47 0 802 1178 893 1176	history1         29         0         44         <1         829         1111         1066         1249	history2 2 0 55 <1 919 981 958 1201
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060	Current 21 0 47 0 802 1178 893	history1         29         0         44         <1         829         1111         1066         1249         3357	history2 2 0 55 <1 919 981 958 1201 2743
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	Current 21 0 47 0 802 1178 893 1176 3335 Current	history1         29         0         44         <1         829         1111         1066         1249         3357         history1	history2 2 0 55 <1 919 981 958 1201 2743 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Chosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm ppm TS	method           ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	current           21           0           47           0           802           1178           893           1176           3335           current           4	history1         29         0         44         <1         829         1111         1066         1249         3357         history1         3	history2         2         0         55         <1         919         981         958         1201         2743         history2         6
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	0 0 60 1010 1070 1150 1270 2060	Current 21 0 47 0 802 1178 893 1176 3335 Current	history1         29         0         44         <1         829         1111         1066         1249         3357         history1	history2 2 0 55 <1 919 981 958 1201 2743 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Chosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm ppm ppm TS	method           ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 <b>limit/base</b>	current           21           0           47           0           802           1178           893           1176           3335           current           4	history1         29         0         44         <1         829         1111         1066         1249         3357         history1         3	history2         2         0         55         <1         919         981         958         1201         2743         history2         6
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm	method           ASTM D5185m	0 0 60 0 1010 1070 1150 1270 2060 <b>limit/base</b>	current           21           0           47           0           802           1178           893           1176           3335           current           4           0	history1         29         0         44         <1         829         1111         1066         1249         3357         history1         3         4         4	history2         2         0         55         <1         919         981         958         1201         2743         history2         6         4         10         history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sidium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm <b>TS</b>	method           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <b>limit/base</b> >25	current           21           0           47           0           802           1178           893           1176           3335           current           4           0           8	history1         29         0         44         <1         829         1111         1066         1249         3357         history1         3         4         history1         0.1	history2         2         0         55         <1         919         981         958         1201         2743         history2         6         4         10         history2         0.4
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm TS ppm ppm	method           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 >25 >20	21         0         47         0         802         1178         893         1176         3335         current         4         0         8         current         4         0         8         current	history1         29         0         44         <1         829         1111         1066         1249         3357         history1         3         4         4	history2         2         0         55         <1         919         981         958         1201         2743         history2         6         4         10         history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm <b>TS</b> ppm ppm	method           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 limit/base >25 >20 limit/base	current         21         0         47         0         802         1178         893         1176         3335         current         4         0         8         current         0         8         current         0.2	history1         29         0         44         <1         829         1111         1066         1249         3357         history1         3         4         history1         0.1	history2         2         0         55         <1         919         981         958         1201         2743         history2         6         4         10         history2         0.4
ADDITIVES 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	method           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 <i>imit/base</i> >25 >20 <i>imit/base</i> >3 >20	current           21           0           47           0           802           1178           893           1176           3335           current           4           0           8           current           0           8           current           0.2           6.8	history1         29         0         44         <1         829         1111         1066         1249         3357         history1         3         4         -         0.1         5.5	history2         2         0         55         <1         919         981         958         1201         2743         history2         6         4         10         history2         0.4         8.2
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 ppm	method           ASTM D5185m           ASTM D5185m	0 0 0 1010 1070 1150 1270 2060 2060 225 20 220 220 1imit/base >3 220 330	Current         21         0         47         0         802         1178         893         1176         3335         current         4         0         8         current         0.2         6.8         18.4	history1         29         0         44         <1         829         1111         1066         1249         3357         history1         3         4         0.1         5.5         18.1	history2         2         0         55         <1         919         981         958         1201         2743         history2         6         4         10         history2         0.4         8.2         19.5



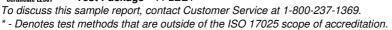
# **OIL ANALYSIS REPORT**





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	14.2	13.2
GRAPHS						

Ferrous Alloys 35 30 25 20 10 5 Π. Sep6/23 -18/73 lec14/23 Jan6/23 /lar23/23 Oct18/23 129/24 Anr10/75 Non-ferrous Metals 250 200 150 100 50 0 Jan6/23 an29/24 Oct18/23 CC/CC/VUI A=r72/72 nr10/73 v8/73 lec14/23 40/Cus 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 Jan 29/24 -Vov22/22 Jan6/23 Sep6/23 Nov8/23 Jan2/24 Jan6/23 Sep6/23 Nov8/23 an29/24 Dec14/23 Mar23/23 nr10/73 Oct18/23 Vov22/22 Mar23/23 Apr10/23 Oct18/23 Dec14/23 Jan2/24 GFL Environmental - 891 - Oklahoma City Hauling : WearCheck USA - 501 Madison Ave., Cary, NC 27513 Sample No. : GFL0093569 Recieved : 30 Jan 2024 1001 South Rockwell Lab Number Diagnosed : 31 Jan 2024 Oklahoma City, OK : 06073798 Unique Number : 10855889 Diagnostician : Wes Davis US 73128 Test Package : FLEET Contact: Andy Smith andrew.smith@gflenv.com



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

Laboratory

Submitted By: Andy Smith

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