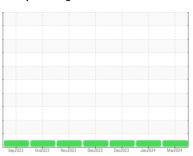


# **OIL ANALYSIS REPORT**

### Sample Rating Trend







Machine Id **821083** 

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

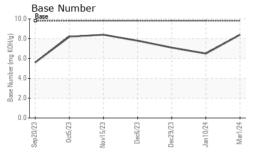
## **Fluid Condition**

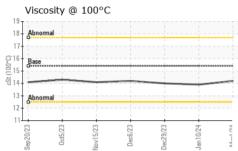
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

Client Info   Client Info   CR   CR   Client Info   CR   Client Info   Changed   NORMAL   N	AL)		Sep2023	Oct2023 Nov2023	Dec2023 Dec2023 Jan2024	Mar2024	
Client Info	SAMPLE INFOR	RMATION	method	limit/base	current	history1	history2
Machine Age   hrs   Client Info   1681   1421   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1429   1348   1348   1229   1348   1348   1229   1348   1348   1229   1348   1348   1229   1348   1348   1229   1348   1348   1229   1348   1348   1229   1348   1348   1229   1348   1348   1229   1348   1348   1229   1348   1348   1229   1348   1348   1229   1348   1348   1229   1348   1348   1229   1348   1348   1229   1348   1348   1229   1348   1348   1229   1348   1348   1229   1348   1348   1229   1348   1348   1229   1348   1348   1229   1348   1348   1229   1348   1348   1229   1348   1348   1229   1348   1348   1229   1348   1348   1229   1348   1348   1229   1348   1348   1229   1348   1348   1229   1348   1348   1229   1348   1348   1229   1348   1348   1229   1348   1348   1229   1348   1348   1	Sample Number		Client Info		GFL0111969	GFL0102577	GFL0107945
Oil Age	Sample Date		Client Info		01 Mar 2024	10 Jan 2024	29 Dec 2023
Oil Changed   Client Info   Not Changed   NoRMAL   NORM	Machine Age	hrs	Client Info		1681	1421	1348
NORMAL   NORMAL   NORMAL   NORMAL   CONTAMINATION   method   limit/base   current   history1   history2   history2   NEG   N	Oil Age	hrs	Client Info		0	600	0
CONTAMINATION	Oil Changed		Client Info		Not Changd	Changed	Not Changd
Water	Sample Status				NORMAL	NORMAL	NORMAL
Water         WC Method         >0.2         NEG         NEG         NEG           Glycol         WC Method         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         10         16         15           Chromium         ppm         ASTM D5185m         >20         <1	CONTAMINAT	ΓΙΟΝ	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>5	<1.0	<1.0	<1.0
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
	Glycol		WC Method		NEG	NEG	NEG
Chromium	WEAR METAL	_S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>100	10	16	15
Titanium	Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Silver	Nickel	ppm	ASTM D5185m	>4	0	<1	<1
Aluminum	Titanium	ppm	ASTM D5185m		0	<1	<1
Lead	Silver	ppm	ASTM D5185m	>3	0	<1	<1
Copper         ppm         ASTM D5185m         >330         <1         2         1           Tin         ppm         ASTM D5185m         >15         <1	Aluminum	ppm	ASTM D5185m	>20	2	4	4
Tin	Lead		ASTM D5185m	>40	0	<1	0
Tin	Copper	ppm	ASTM D5185m	>330	<1	2	1
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         <1	Tin		ASTM D5185m	>15	<1	<1	<1
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         <1         0         3           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         0         0         0           Manganese         ppm         ASTM D5185m         0         0         <1         <1           Magnesium         ppm         ASTM D5185m         1010         1056         1018         950           Calcium         ppm         ASTM D5185m         1070         1169         1087         1010           Phosphorus         ppm         ASTM D5185m         1270         1334         1378         1291           Sulfur         ppm         ASTM D5185m         2060         3089         3209         3018           CONTAMINANTS         method         limit/base         current         history1         history2           Solium         ppm         ASTM D5185m         >25         3	Vanadium	ppm	ASTM D5185m		0	<1	<1
Boron	Cadmium	ppm	ASTM D5185m		0	0	0
Barium	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         60         57         60         58           Manganese         ppm         ASTM D5185m         0         0         <1         <1           Magnesium         ppm         ASTM D5185m         1010         1056         1018         950           Calcium         ppm         ASTM D5185m         1070         1169         1087         1010           Phosphorus         ppm         ASTM D5185m         1150         1044         1082         1069           Zinc         ppm         ASTM D5185m         1270         1334         1378         1291           Sulfur         ppm         ASTM D5185m         2060         3089         3209         3018           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         4         3           Sodium         ppm         ASTM D5185m         >20         0         3         4           INFRA-RED         method         limit/base         current         history1         history2           Soot %         *ASTM D7844         >3	Boron	ppm	ASTM D5185m	0	<1	0	3
Manganese         ppm         ASTM D5185m         0         <1         <1           Magnesium         ppm         ASTM D5185m         1010         1056         1018         950           Calcium         ppm         ASTM D5185m         1070         1169         1087         1010           Phosphorus         ppm         ASTM D5185m         1150         1044         1082         1069           Zinc         ppm         ASTM D5185m         1270         1334         1378         1291           Sulfur         ppm         ASTM D5185m         2060         3089         3209         3018           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         4         3           Sodium         ppm         ASTM D5185m         >20         0         3         4           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         8.1         10.9         10.3           Sulfation         Abs/cm         *ASTM D7415	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium         ppm         ASTM D5185m         1010         1056         1018         950           Calcium         ppm         ASTM D5185m         1070         1169         1087         1010           Phosphorus         ppm         ASTM D5185m         1150         1044         1082         1069           Zinc         ppm         ASTM D5185m         1270         1334         1378         1291           Sulfur         ppm         ASTM D5185m         2060         3089         3209         3018           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         4         3           Sodium         ppm         ASTM D5185m         >20         0         3         4           Potassium         ppm         ASTM D5185m         >20         0         3         4           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.4         0.6         0.5           Nitration         Abs/cm         *ASTM D7415	Molybdenum	ppm	ASTM D5185m	60	57	60	58
Calcium         ppm         ASTM D5185m         1070         1169         1087         1010           Phosphorus         ppm         ASTM D5185m         1150         1044         1082         1069           Zinc         ppm         ASTM D5185m         1270         1334         1378         1291           Sulfur         ppm         ASTM D5185m         2060         3089         3209         3018           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         4         3           Sodium         ppm         ASTM D5185m         >20         0         3         4           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         8.1         10.9         10.3           Sulfation         Abs/.mm         *ASTM D7415         >30         19.1         21.6         21.3           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Ab	Manganese	ppm	ASTM D5185m	0	0	<1	<1
Phosphorus         ppm         ASTM D5185m         1150         1044         1082         1069           Zinc         ppm         ASTM D5185m         1270         1334         1378         1291           Sulfur         ppm         ASTM D5185m         2060         3089         3209         3018           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         4         3           Sodium         ppm         ASTM D5185m         >20         0         3         4           Potassium         ppm         ASTM D5185m         >20         0         3         4           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.4         0.6         0.5           Nitration         Abs/cm         *ASTM D7624         >20         8.1         10.9         10.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.1         21.6         21.3           FLUID DEGRADATION         me	Magnesium	ppm	ASTM D5185m	1010	1056	1018	950
Zinc         ppm         ASTM D5185m         1270         1334         1378         1291           Sulfur         ppm         ASTM D5185m         2060         3089         3209         3018           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         4         3           Sodium         ppm         ASTM D5185m         3         3         5           Potassium         ppm         ASTM D5185m         >20         0         3         4           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.4         0.6         0.5           Nitration         Abs/cm         *ASTM D7624         >20         8.1         10.9         10.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.1         21.6         21.3           FLUID DEGRADATION method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414	Calcium	ppm	ASTM D5185m	1070	1169	1087	1010
Sulfur         ppm         ASTM D5185m         2060         3089         3209         3018           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         4         3           Sodium         ppm         ASTM D5185m         >20         0         3         4           Potassium         ppm         ASTM D5185m         >20         0         3         4           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.4         0.6         0.5           Nitration         Abs/cm         *ASTM D7624         >20         8.1         10.9         10.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.1         21.6         21.3           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.8         19.5         18.6	Phosphorus	ppm	ASTM D5185m	1150	1044	1082	1069
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         4         3           Sodium         ppm         ASTM D5185m         3         3         5           Potassium         ppm         ASTM D5185m         >20         0         3         4           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.4         0.6         0.5           Nitration         Abs/cm         *ASTM D7624         >20         8.1         10.9         10.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.1         21.6         21.3           FLUID DEGRADATION method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.8         19.5         18.6	Zinc	ppm	ASTM D5185m	1270	1334	1378	1291
Silicon         ppm         ASTM D5185m         >25         3         4         3           Sodium         ppm         ASTM D5185m         3         3         5           Potassium         ppm         ASTM D5185m         >20         0         3         4           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.4         0.6         0.5           Nitration         Abs/cm         *ASTM D7624         >20         8.1         10.9         10.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.1         21.6         21.3           FLUID DEGRADATION method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.8         19.5         18.6	Sulfur	ppm	ASTM D5185m	2060	3089	3209	3018
Sodium         ppm         ASTM D5185m         3         3         5           Potassium         ppm         ASTM D5185m         >20         0         3         4           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.4         0.6         0.5           Nitration         Abs/cm         *ASTM D7624         >20         8.1         10.9         10.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.1         21.6         21.3           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.8         19.5         18.6	CONTAMINAN	NTS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         0         3         4           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.4         0.6         0.5           Nitration         Abs/cm         *ASTM D7624         >20         8.1         10.9         10.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.1         21.6         21.3           FLUID DEGRADATION method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.8         19.5         18.6	Silicon	ppm	ASTM D5185m	>25	3	4	3
INFRA-RED	Sodium	ppm	ASTM D5185m		3	3	5
Soot %         %         *ASTM D7844 >3         0.4         0.6         0.5           Nitration         Abs/cm         *ASTM D7624 >20         8.1         10.9         10.3           Sulfation         Abs/.1mm         *ASTM D7415 >30         19.1         21.6         21.3           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 >25         15.8         19.5         18.6	Potassium	ppm	ASTM D5185m	>20	0	3	4
Nitration         Abs/cm         *ASTM D7624         >20         8.1         10.9         10.3           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.1         21.6         21.3           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.8         19.5         18.6	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         19.1         21.6         21.3           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         15.8         19.5         18.6	Soot %	%	*ASTM D7844	>3	0.4	0.6	0.5
FLUID DEGRADATION method limit/base current history1 history2  Oxidation Abs/.1mm *ASTM D7414 >25 15.8 19.5 18.6	Nitration	Abs/cm	*ASTM D7624	>20	8.1	10.9	10.3
Oxidation Abs/.1mm *ASTM D7414 >25 <b>15.8</b> 19.5 18.6	Sulfation	Abs/.1mm	*ASTM D7415	>30	19.1	21.6	21.3
	FLUID DEGRA	NOITAG	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	15.8	19.5	18.6
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8			7.1



# **OIL ANALYSIS REPORT**

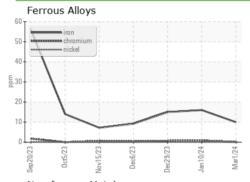


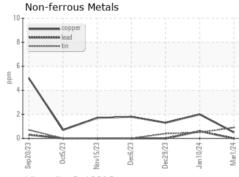


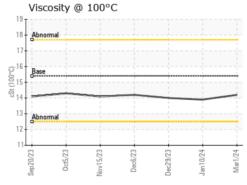
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
<b>Emulsified Water</b>	scalar	*Visual	>0.2	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG

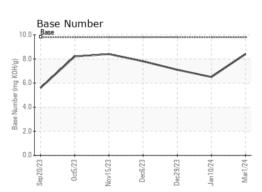
FLUID PROPI	ERTIES	method				history2
Visc @ 100°C	cSt	ASTM D445	15.4	14.2	13.9	14.0

## **GRAPHS**













Certificate L2367

Laboratory Sample No. Unique Number: 10914297

Test Package : FLEET

: GFL0111969 Lab Number : 06110800

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received **Tested** 

Diagnosed

: 06 Mar 2024 : 07 Mar 2024

: 07 Mar 2024 - Wes Davis

GFL Environmental - 892 - Pauls Valley Hauling

405 East Airport Industrial Road Pauls Valley, OK US 73075

Contact: Tony Graham tgraham2@wcamerica.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)

T:

F: