

# **OIL ANALYSIS REPORT**

## Sample Rating Trend





Machine Id 10719 Component

**Diesel Engine** 

PETRO CANADA DURON SHP 15W40 (29 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

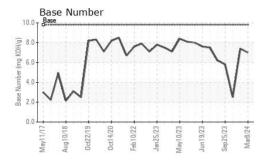
## **Fluid Condition**

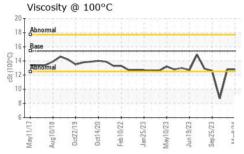
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORMATION   method   limit/base   current   history1   history2	#2017 Aug/2018 Oc2019 Oc2020 Feb/2022 Jan2023 May/2023 Sap/2023 May/202 Jan2023 Sap/2023 May/202						
Sample Date	SAMPLE INFOR	RMATION	method	limit/base	current	history1	history2
Machine Age         hrs         Client Info         11065         10942         10698           Oil Age         hrs         Client Info         369         243         695           Oil Changed         Client Info         Not Changd         Not Changd         Not Changd         ABNORMAL           Sample Status         Image: Control of	Sample Number		Client Info		GFL0112337	GFL0109909	GFL0097873
Oil Age         hrs         Client Info         369         243         695           Oil Changed Sample Status         Client Info         Not Changed         Not Changed         Changed Changed           Sample Status         NoRMAL         NoRMAL         ABNORMAL           CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >5         <1.0         <1.0         1.8           Water         WC Method         >0.2         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         17         11         34           Chromium         ppm         ASTM D5185m         >20         <1         <1         <1         <1           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         17         11         34           Chromium         ppm         ASTM D5185m         20         0         0         0           Silver	Sample Date		Client Info		08 Mar 2024	19 Jan 2024	02 Nov 2023
Oil Changed Sample Status         Client Info         Not Changd NORMAL         Not Changd NORMAL         Changed ABNORMAL           CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >5         <1.0	Machine Age	hrs	Client Info		11065	10942	10696
NORMAL   NORMAL   ABNORMAL	Oil Age	hrs	Client Info		369	243	695
CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >5         <1.0	Oil Changed		Client Info		Not Changd	Not Changd	Changed
Fuel   WC Method   S5	Sample Status				NORMAL	NORMAL	ABNORMAL
Water Glycol         WC Method         >0.2         NEG         NEG         NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         17         11         34           Chromium         ppm         ASTM D5185m         >20         <1	CONTAMINA	ΓΙΟΝ	method	limit/base	current	history1	history2
Second   WC Method   MEG   NEG   NEG   NEG   WEAR METALS   method   limit/base   current   history1   history2   history2   lron   ppm   ASTM D5185m   >20   <1   <1   <1   <1   <1   <1   <1   <	Fuel		WC Method	>5	<1.0	<1.0	1.8
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >100         17         11         34           Chromium         ppm         ASTM D5185m         >20         <1	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >20         <1         <1         <1           Nickel         ppm         ASTM D5185m         >4         0         0         0           Titanium         ppm         ASTM D5185m         >3         0         0         0           Silver         ppm         ASTM D5185m         >20         5         3         11           Lead         ppm         ASTM D5185m         >40         <1	WEAR METAI	LS	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>100	17	11	34
Titanium	Chromium	ppm	ASTM D5185m	>20	<1	<1	<1
Silver	Nickel	ppm	ASTM D5185m	>4	0	0	0
Aluminum         ppm         ASTM D5185m         >20         5         3         11           Lead         ppm         ASTM D5185m         >40         <1	Titanium	ppm	ASTM D5185m		0	0	<1
Lead         ppm         ASTM D5185m         >40         <1         0         <1           Copper         ppm         ASTM D5185m         >330         <1         <1         7           Tin         ppm         ASTM D5185m         >15         0         0         1           Vanadium         ppm         ASTM D5185m         0         0         0         <1           Cadmium         ppm         ASTM D5185m         0         0         0         <1           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         5         5         47           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         <1         <1         <1         <1           Magnesium         ppm         ASTM D5185m         0         <1         <1         <1         <1         <1           Calcium         ppm         ASTM D5185m         1070         981         1031         506           Phosphorus         ppm         ASTM D5185m <td>Silver</td> <td>ppm</td> <td>ASTM D5185m</td> <td>&gt;3</td> <th>0</th> <td>0</td> <td>0</td>	Silver	ppm	ASTM D5185m	>3	0	0	0
Copper         ppm         ASTM D5185m         >330         <1         <1         7           Tin         ppm         ASTM D5185m         >15         0         0         1           Vanadium         ppm         ASTM D5185m         0         0         0         -1           Cadmium         ppm         ASTM D5185m         0         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         5         5         47           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         -1         -1         -1         -1           Manganese         ppm         ASTM D5185m         0         -1         -1         -1         -1           Magnesium         ppm         ASTM D5185m         1010         829         799         352           Calcium         ppm         ASTM D5185m         1070         981         1031         506           Phosphorus         ppm         ASTM D5185m	Aluminum	ppm	ASTM D5185m	>20	5	3	11
Tin         ppm         ASTM D5185m         >15         0         0         1           Vanadium         ppm         ASTM D5185m         0         0         <1           Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method limit/base current         history1         history2           Boron         ppm         ASTM D5185m         0         5         5         47           Barium         ppm         ASTM D5185m         0         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         56         55         26           Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1070         981         1031         506           Phosphorus         ppm         ASTM D5185m         1270         1140         1049         497           Sulfur         ppm         ASTM D5185m         2060         3049         2595         2039           CONTAMINANTS         method         limit/base	Lead	ppm	ASTM D5185m	>40	<1	0	<1
Tin         ppm         ASTM D5185m         >15         0         0         1           Vanadium         ppm         ASTM D5185m         0         0         <1           Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method limit/base current         history1         history2           Boron         ppm         ASTM D5185m         0         5         5         47           Barium         ppm         ASTM D5185m         0         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         56         55         26           Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1070         981         1031         506           Phosphorus         ppm         ASTM D5185m         1150         954         837         519           Zinc         ppm         ASTM D5185m         1270         1140         1049         497           Sulfur         ppm         ASTM D5185m         >25	Copper	ppm	ASTM D5185m	>330	<1	<1	7
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         0         5         5         47           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         0         -1         -1         -1           Magnesium         ppm         ASTM D5185m         1010         829         799         352           Calcium         ppm         ASTM D5185m         1070         981         1031         506           Phosphorus         ppm         ASTM D5185m         1150         954         837         519           Zinc         ppm         ASTM D5185m         1270         1140         1049         497           Sulfur         ppm         ASTM D5185m         2060         3049         2595         2039           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3	Tin	ppm	ASTM D5185m	>15	0	0	1
Boron	Vanadium	ppm	ASTM D5185m		0	0	<1
Boron         ppm         ASTM D5185m         0         5         5         47           Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         56         55         26           Manganese         ppm         ASTM D5185m         0         <1         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         829         799         352           Calcium         ppm         ASTM D5185m         1070         981         1031         506           Phosphorus         ppm         ASTM D5185m         1150         954         837         519           Zinc         ppm         ASTM D5185m         1270         1140         1049         497           Sulfur         ppm         ASTM D5185m         2060         3049         2595         2039           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >225         3         3         8           Sodium         ppm         ASTM D5185m <td>Cadmium</td> <td>ppm</td> <td>ASTM D5185m</td> <td></td> <th>0</th> <td>0</td> <td>0</td>	Cadmium	ppm	ASTM D5185m		0	0	0
Barium         ppm         ASTM D5185m         0         0         0         0           Molybdenum         ppm         ASTM D5185m         60         56         55         26           Manganese         ppm         ASTM D5185m         0         <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         60         56         55         26           Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         829         799         352           Calcium         ppm         ASTM D5185m         1070         981         1031         506           Phosphorus         ppm         ASTM D5185m         1150         954         837         519           Zinc         ppm         ASTM D5185m         1270         1140         1049         497           Sulfur         ppm         ASTM D5185m         2060         3049         2595         2039           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         3         8           Sodium         ppm         ASTM D5185m         >20         1         0         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         "ASTM D7844         >3	Boron	ppm	ASTM D5185m	0	5	5	<b>4</b> 7
Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         1010         829         799         352           Calcium         ppm         ASTM D5185m         1070         981         1031         506           Phosphorus         ppm         ASTM D5185m         1150         954         837         519           Zinc         ppm         ASTM D5185m         1270         1140         1049         497           Sulfur         ppm         ASTM D5185m         2060         3049         2595         2039           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         3         8           Sodium         ppm         ASTM D5185m         >20         1         0         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.7         0.4         0.2           Nitration         Abs/cm         *ASTM D7815 </td <td>Barium</td> <td>ppm</td> <td>ASTM D5185m</td> <td>0</td> <th>0</th> <td>0</td> <td>0</td>	Barium	ppm	ASTM D5185m	0	0	0	0
Magnesium         ppm         ASTM D5185m         1010         829         799         352           Calcium         ppm         ASTM D5185m         1070         981         1031         506           Phosphorus         ppm         ASTM D5185m         1150         954         837         519           Zinc         ppm         ASTM D5185m         1270         1140         1049         497           Sulfur         ppm         ASTM D5185m         2060         3049         2595         2039           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         3         8           Sodium         ppm         ASTM D5185m         >25         5         8           Potassium         ppm         ASTM D5185m         >20         1         0         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         8.5         7.0         6.0           Sulfation         Abs/.1mm         *ASTM D7415         >	Molybdenum	ppm	ASTM D5185m	60	56	55	26
Calcium         ppm         ASTM D5185m         1070         981         1031         506           Phosphorus         ppm         ASTM D5185m         1150         954         837         519           Zinc         ppm         ASTM D5185m         1270         1140         1049         497           Sulfur         ppm         ASTM D5185m         2060         3049         2595         2039           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         3         8           Sodium         ppm         ASTM D5185m         5         5         8           Potassium         ppm         ASTM D5185m         >20         1         0         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         8.5         7.0         6.0           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.2         17.7         30.0           FLUID DEGRADATION         *ASTM D7414         >2	Manganese	ppm	ASTM D5185m	0	<1	<1	<1
Phosphorus         ppm         ASTM D5185m         1150         954         837         519           Zinc         ppm         ASTM D5185m         1270         1140         1049         497           Sulfur         ppm         ASTM D5185m         2060         3049         2595         2039           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         3         8           Sodium         ppm         ASTM D5185m         5         5         8           Potassium         ppm         ASTM D5185m         >20         1         0         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.7         0.4         0.2           Nitration         Abs/cm         *ASTM D7624         >20         8.5         7.0         6.0           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.2         17.7         30.0           FLUID DEGRADATION         *ASTM D7414         >25         14.	Magnesium	ppm	ASTM D5185m	1010	829	799	352
Zinc         ppm         ASTM D5185m         1270         1140         1049         497           Sulfur         ppm         ASTM D5185m         2060         3049         2595         2039           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         3         8           Sodium         ppm         ASTM D5185m         >5         5         8           Potassium         ppm         ASTM D5185m         >20         1         0         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.7         0.4         0.2           Nitration         Abs/cm         *ASTM D7624         >20         8.5         7.0         6.0           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.2         17.7         30.0           FLUID DEGRADATION         *ASTM D7414         >25         14.4         13.3         34.4	Calcium	ppm	ASTM D5185m	1070	981	1031	506
Sulfur         ppm         ASTM D5185m         2060         3049         2595         2039           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         3         8           Sodium         ppm         ASTM D5185m         >20         5         5         8           Potassium         ppm         ASTM D5185m         >20         1         0         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.7         0.4         0.2           Nitration         Abs/cm         *ASTM D7624         >20         8.5         7.0         6.0           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.2         17.7         30.0           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.4         13.3         34.4	Phosphorus	ppm	ASTM D5185m	1150	954	837	519
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >25         3         3         8           Sodium         ppm         ASTM D5185m         5         5         8           Potassium         ppm         ASTM D5185m         >20         1         0         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.7         0.4         0.2           Nitration         Abs/cm         *ASTM D7624         >20         8.5         7.0         6.0           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.2         17.7         30.0           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.4         13.3         34.4	Zinc	ppm	ASTM D5185m	1270	1140	1049	497
Silicon         ppm         ASTM D5185m         >25         3         3         8           Sodium         ppm         ASTM D5185m         5         5         8           Potassium         ppm         ASTM D5185m         >20         1         0         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.7         0.4         0.2           Nitration         Abs/cm         *ASTM D7624         >20         8.5         7.0         6.0           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.2         17.7         30.0           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.4         13.3         34.4	Sulfur	ppm	ASTM D5185m	2060	3049	2595	2039
Sodium         ppm         ASTM D5185m         5         8           Potassium         ppm         ASTM D5185m         >20         1         0         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.7         0.4         0.2           Nitration         Abs/cm         *ASTM D7624         >20         8.5         7.0         6.0           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.2         17.7         30.0           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.4         13.3         34.4	CONTAMINA	NTS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         1         0         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.7         0.4         0.2           Nitration         Abs/cm         *ASTM D7624         >20         8.5         7.0         6.0           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.2         17.7         30.0           FLUID DEGRADATION method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.4         13.3         34.4	Silicon	ppm	ASTM D5185m	>25	3	3	8
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >3         0.7         0.4         0.2           Nitration         Abs/cm         *ASTM D7624         >20         8.5         7.0         6.0           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.2         17.7         30.0           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.4         13.3         34.4	Sodium	ppm	ASTM D5185m		5	5	8
Soot %         %         *ASTM D7844 >3         0.7         0.4         0.2           Nitration         Abs/cm         *ASTM D7624 >20         8.5         7.0         6.0           Sulfation         Abs/.1mm         *ASTM D7415 >30         18.2         17.7         30.0           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 >25         14.4         13.3         34.4	Potassium	ppm	ASTM D5185m	>20	1	0	1
Nitration         Abs/cm         *ASTM D7624         >20         8.5         7.0         6.0           Sulfation         Abs/.1mm         *ASTM D7415         >30         18.2         17.7         30.0           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.4         13.3         34.4	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         18.2         17.7         30.0           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         14.4         13.3         34.4	Soot %	%	*ASTM D7844	>3	0.7	0.4	0.2
FLUID DEGRADATION method limit/base current history1 history2  Oxidation Abs/.1mm *ASTM D7414 >25 14.4 13.3 34.4	Nitration	Abs/cm	*ASTM D7624	>20	8.5	7.0	6.0
Oxidation         Abs/.1mm         *ASTM D7414         >25         14.4         13.3         34.4	Sulfation	Abs/.1mm	*ASTM D7415	>30	18.2	17.7	30.0
	FLUID DEGRA	DATION	method	limit/base	current	history1	history2
	Oxidation	Abs/.1mm	*ASTM D7414	>25	14.4	13.3	34.4
	Base Number (BN)	mg KOH/g	ASTM D2896	9.8	7.0	7.4	<u>^</u> 2.5



# **OIL ANALYSIS REPORT**

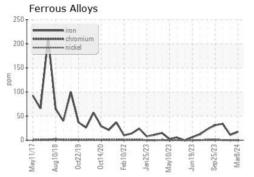


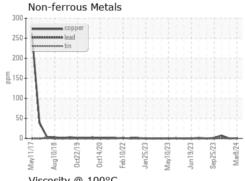


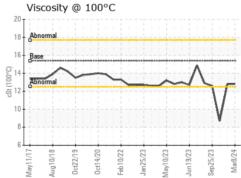
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual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

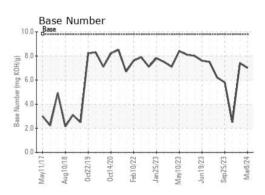
FLUID PROPE	RHES	method	ilmit/base	current	nistory i	nistory2
Visc @ 100°C	cSt	ASTM D445	15.4	12.8	12.8	8.7

## **GRAPHS**













Certificate L2367

Laboratory Sample No.

Lab Number : 06117726 Unique Number: 10926559 Test Package : FLEET

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : GFL0112337 Received : 13 Mar 2024

**Tested** Diagnosed

: 14 Mar 2024 : 14 Mar 2024 - Wes Davis

GFL Environmental - 010 - Stockbridge

1280 Rum Creek Parkway Stockbridge, GA

US 30281 Contact: JOSHUA TINKER

joshuatinker@gflenv.com T:

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)

F: