

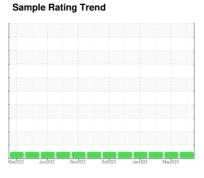
# **OIL ANALYSIS REPORT**

Area (P830962) 932001

**Diesel Engine** 

Fluid

## PETRO CANADA DURON GEO LD 15W40 (40 QTS)





## 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.

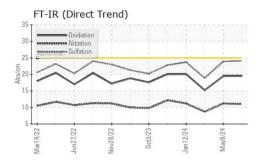
## **Fluid Condition**

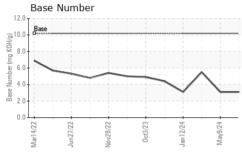
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

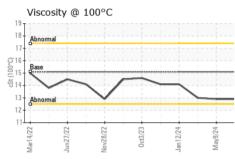
Cample Date   Client Info   09 May 2024   09 May 2024   14 Feb 2024   Machine Age   hrs   Client Info   6291   5693   5	40 Q1S)		Mar2022	Jun2022 Nov2022	0ct2023 Jan2024 M	ay2024	
Cample Date   Client Info   09 May 2024   09 May 2024   14 Feb 2024   Machine Age   hrs   Client Info   6291   5693   5	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Client Info	Sample Number		Client Info		GFL0117976	GFL0117972	GFL0101778
Machine Age			Client Info		09 May 2024	09 May 2024	14 Feb 2024
Oil Age	Machine Age	hrs			-	5693	5693
Contained   Client Info   Changed   Changed   Changed   NORMAL   NORMAL   NORMAL   NORMAL	Oil Age	hrs	Client Info		600	600	600
NORMAL   NORMAL   NORMAL   NORMAL   CONTAMINATION   method   limit/base   current   history1   history2   history2   NEG   N	Oil Changed		Client Info		Changed	Changed	Changed
Fuel	Sample Status					NORMAL	NORMAL
Water Glycol         WC Method WC Method         >0.2         NEG NEG NEG         NEG NEG         NEG NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >165         8         8         5           Chromium         ppm         ASTM D5185m         >5         1         1         <1           Nickel         ppm         ASTM D5185m         >4         <1         <1         0           Silver         ppm         ASTM D5185m         >2         <1         <1         <1         <1           Silver         ppm         ASTM D5185m         >2         0         0         0         0           Silver         ppm         ASTM D5185m         >20         3         2         2         2           Silver         ppm         ASTM D5185m         >20         3         3         1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1	CONTAMINAT	ION	method	limit/base	current	history1	history2
WEAR METALS	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >165         8         8         5           Chromium         ppm         ASTM D5185m         >5         1         1         <1	Water		WC Method	>0.2	NEG	NEG	NEG
Chromium	Glycol		WC Method		NEG	NEG	NEG
Chromium	WEAR METAL	.S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>165	8	8	5
Titanium	Chromium	ppm	ASTM D5185m	>5	1	1	<1
Silver	Nickel	ppm	ASTM D5185m	>4	<1	<1	0
Aluminum	Titanium	ppm	ASTM D5185m	>2	<1	<1	<1
Lead	Silver	ppm	ASTM D5185m	>2	0	0	0
Copper         ppm         ASTM D5185m         >90         3         3         1           Tin         ppm         ASTM D5185m         >5         <1	Aluminum	ppm	ASTM D5185m	>20	3	2	2
Tin	Lead	ppm	ASTM D5185m	>150	10	6	0
Vanadium         ppm         ASTM D5185m         <1         <1         0           Cadmium         ppm         ASTM D5185m         <1         <1         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         50         4         4         18           Barium         ppm         ASTM D5185m         50         56         56         56         48           Manganese         ppm         ASTM D5185m         50         56         56         48           Manganesium         ppm         ASTM D5185m         500         56         56         48           Manganesium         ppm         ASTM D5185m         560         527         519         515           Calcium         ppm         ASTM D5185m         780         743         711         668           Zinc         ppm         ASTM D5185m         870         902         887         874           Sulfur         ppm         ASTM D5185m         2040         2563         2463         2327           CONTAMINANTS         method         limit/base         current	Copper	ppm	ASTM D5185m	>90	3	3	1
Cadmium         ppm         ASTM D5185m         <1         <1         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         50         4         4         18           Barium         ppm         ASTM D5185m         5         2         2         0           Molybdenum         ppm         ASTM D5185m         50         56         56         48           Mangaese         ppm         ASTM D5185m         50         56         56         48           Mangaesium         ppm         ASTM D5185m         560         527         519         515           Calcium         ppm         ASTM D5185m         1510         1557         1528         1436           Phosphorus         ppm         ASTM D5185m         780         743         711         668           Zinc         ppm         ASTM D5185m         870         902         887         874           Sulfur         ppm         ASTM D5185m         2040         2563         2463         2327           CONTAMINANTS         method         limit/base         current         <	Tin	ppm	ASTM D5185m	>5	<1	<1	<1
ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         50         4         4         18           Barium         ppm         ASTM D5185m         5         2         2         0           Molybdenum         ppm         ASTM D5185m         50         56         56         48           Manganese         ppm         ASTM D5185m         0         <1	Vanadium	ppm	ASTM D5185m		<1	<1	0
Boron	Cadmium	ppm	ASTM D5185m		<1	<1	0
Barium	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         50         56         56         48           Manganese         ppm         ASTM D5185m         0         <1	Boron	ppm	ASTM D5185m	50	4	4	18
Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         560         527         519         515           Calcium         ppm         ASTM D5185m         1510         1557         1528         1436           Phosphorus         ppm         ASTM D5185m         780         743         711         668           Zinc         ppm         ASTM D5185m         870         902         887         874           Sulfur         ppm         ASTM D5185m         2040         2563         2463         2327           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >35         12         11         6           Sodium         ppm         ASTM D5185m         >5         5         6           Potassium         ppm         ASTM D5185m         >20         3         3         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >7.5         0 </td <td>Barium</td> <td>ppm</td> <td>ASTM D5185m</td> <td>5</td> <th>2</th> <td>2</td> <td>0</td>	Barium	ppm	ASTM D5185m	5	2	2	0
Magnesium         ppm         ASTM D5185m         560         527         519         515           Calcium         ppm         ASTM D5185m         1510         1557         1528         1436           Phosphorus         ppm         ASTM D5185m         780         743         711         668           Zinc         ppm         ASTM D5185m         870         902         887         874           Sulfur         ppm         ASTM D5185m         2040         2563         2463         2327           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >35         12         11         6           Sodium         ppm         ASTM D5185m         5         5         6           Potassium         ppm         ASTM D5185m         >20         3         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >7.5         0         0         0.1           Nitration         Abs/.1mm         *ASTM D7415         >30         24.1	Molybdenum	ppm			56	56	48
Calcium         ppm         ASTM D5185m         1510         1557         1528         1436           Phosphorus         ppm         ASTM D5185m         780         743         711         668           Zinc         ppm         ASTM D5185m         870         902         887         874           Sulfur         ppm         ASTM D5185m         2040         2563         2463         2327           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >35         12         11         6           Sodium         ppm         ASTM D5185m         5         5         6           Potassium         ppm         ASTM D5185m         >20         3         3         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >7.5         0         0         0.1           Nitration         Abs/:nm         *ASTM D7415         >30         24.1         23.9         18.9           FLUID DEGRADATION <td< td=""><td>Manganese</td><td>ppm</td><td>ASTM D5185m</td><td>0</td><th>&lt;1</th><td>&lt;1</td><td>&lt;1</td></td<>	Manganese	ppm	ASTM D5185m	0	<1	<1	<1
Phosphorus         ppm         ASTM D5185m         780         743         711         668           Zinc         ppm         ASTM D5185m         870         902         887         874           Sulfur         ppm         ASTM D5185m         2040         2563         2463         2327           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >35         12         11         6           Sodium         ppm         ASTM D5185m         5         5         6           Potassium         ppm         ASTM D5185m         >20         3         3         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >7.5         0         0         0.1           Nitration         Abs/cm         *ASTM D7624         >20         11.0         11.2         8.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         24.1         23.9         18.9           FLUID DEGRADATION         method         limit/b	Magnesium	ppm	ASTM D5185m	560	527	519	515
Zinc         ppm         ASTM D5185m         870         902         887         874           Sulfur         ppm         ASTM D5185m         2040         2563         2463         2327           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >35         12         11         6           Sodium         ppm         ASTM D5185m         5         5         6           Potassium         ppm         ASTM D5185m         >20         3         3         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >7.5         0         0         0.1           Nitration         Abs/cm         *ASTM D7624         >20         11.0         11.2         8.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         24.1         23.9         18.9           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25 <td>Calcium</td> <td>ppm</td> <td>ASTM D5185m</td> <td>1510</td> <th>1557</th> <td>1528</td> <td>1436</td>	Calcium	ppm	ASTM D5185m	1510	1557	1528	1436
Sulfur         ppm         ASTM D5185m         2040         2563         2463         2327           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >35         12         11         6           Sodium         ppm         ASTM D5185m         5         5         6           Potassium         ppm         ASTM D5185m         >20         3         3         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >7.5         0         0         0.1           Nitration         Abs/cm         *ASTM D7624         >20         11.0         11.2         8.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         24.1         23.9         18.9           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         19.5         19.5         15.2	Phosphorus	ppm	ASTM D5185m	780	743	711	668
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >35         12         11         6           Sodium         ppm         ASTM D5185m         5         5         6           Potassium         ppm         ASTM D5185m         >20         3         3         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >7.5         0         0         0.1           Nitration         Abs/cm         *ASTM D7624         >20         11.0         11.2         8.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         24.1         23.9         18.9           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         19.5         19.5         15.2	Zinc	ppm	ASTM D5185m	870	902	887	874
Silicon         ppm         ASTM D5185m         >35         12         11         6           Sodium         ppm         ASTM D5185m         5         5         6           Potassium         ppm         ASTM D5185m         >20         3         3         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >7.5         0         0         0.1           Nitration         Abs/cm         *ASTM D7624         >20         11.0         11.2         8.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         24.1         23.9         18.9           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         19.5         19.5         15.2	Sulfur		ASTM D5185m	2040	2563	2463	2327
Sodium         ppm         ASTM D5185m         5         6           Potassium         ppm         ASTM D5185m         >20         3         3         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >7.5         0         0         0.1           Nitration         Abs/cm         *ASTM D7624         >20         11.0         11.2         8.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         24.1         23.9         18.9           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         19.5         19.5         15.2	CONTAMINAN	ITS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         3         3         1           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >7.5         0         0         0.1           Nitration         Abs/cm         *ASTM D7624         >20         11.0         11.2         8.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         24.1         23.9         18.9           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         19.5         19.5         15.2	Silicon	ppm	ASTM D5185m	>35	12	11	6
INFRA-RED	Sodium	ppm	ASTM D5185m		5	5	6
Soot %         %         *ASTM D7844 > 7.5         0         0         0.1           Nitration         Abs/cm         *ASTM D7624 > 20         11.0         11.2         8.7           Sulfation         Abs/.1mm         *ASTM D7415 > 30         24.1         23.9         18.9           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 > 25         19.5         19.5         15.2	Potassium	ppm	ASTM D5185m	>20	3	3	1
Nitration         Abs/cm         *ASTM D7624         >20         11.0         11.2         8.7           Sulfation         Abs/.1mm         *ASTM D7415         >30         24.1         23.9         18.9           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         19.5         19.5         15.2	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         24.1         23.9         18.9           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         19.5         19.5         15.2	Soot %	%	*ASTM D7844	>7.5	0	0	0.1
FLUID DEGRADATION method limit/base current history1 history2  Oxidation Abs/.1mm 'ASTM D7414 >25 19.5 19.5 15.2	Nitration	Abs/cm	*ASTM D7624	>20	11.0	11.2	8.7
Oxidation Abs/.1mm *ASTM D7414 >25 <b>19.5</b> 19.5 15.2	Sulfation	Abs/.1mm	*ASTM D7415	>30	24.1	23.9	18.9
	FLUID DEGRA	OITAC	method	limit/base	current	history1	history2
Base Number (BN) mg KOH/g ASTM D2896   10.2 3.1 3.1 5.5	Oxidation	Abs/.1mm	*ASTM D7414	>25	19.5	19.5	15.2
	Base Number (BN)	mg KOH/g	ASTM D2896	10.2	3.1	3.1	5.5

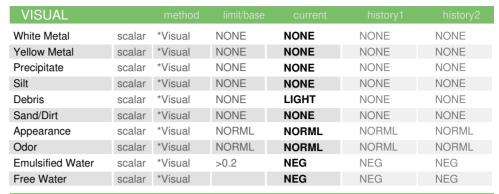


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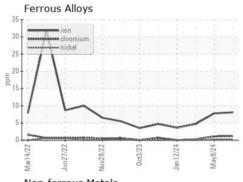


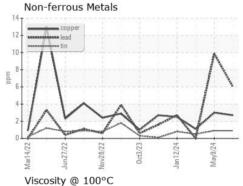


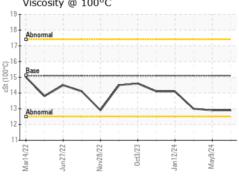


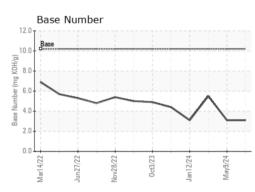
FLUID PROP	ERTIES	method				history2
Visc @ 100°C	cSt	ASTM D445	15.1	12.9	12.9	13.0

### **GRAPHS**













Certificate 12367

Laboratory Sample No.

: GFL0117976 Lab Number : 06176515 Unique Number : 11022568 Test Package : FLEET

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received : 10 May 2024

**Tested** : 13 May 2024 Diagnosed : 13 May 2024 - Wes Davis

GFL Environmental - 030 - Conway Myrtle Beach

3010 HWY 378 Conway, SC US 29527

Contact: ARCILIO RUEZ aruiz@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)

T:

F: