

# **OIL ANALYSIS REPORT**

Area (P830962) 932001

**Diesel Engine** 

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

# Sample Rating Trend



# DIAGNOSIS

# Recommendation

Resample at the next service interval to monitor.

All component wear rates are normal.

# Contamination

There is no indication of any contamination in the oil.

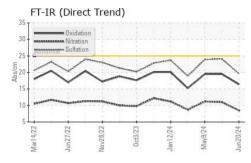
# **Fluid Condition**

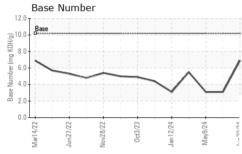
The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

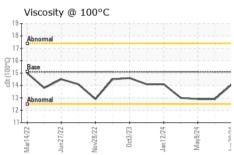
SAMPLE INFORMATION   method   imit/base   current   history1   history2	40 Q1S)		Mar2022	Jun2022 Nov2022	Oct2023 Jan2024 May2024	Jun2024	
Sample Date	SAMPLE INFOR	MATION	method	limit/base	current	history1	history2
Machine Age         hrs         Client Info         6559         6291         5693           Oil Age         hrs         Client Info         600         600         600           Oil Changed         Client Info         Not Changed	Sample Number		Client Info		GFL0125702	GFL0117976	GFL0117972
Oil Age         hrs         Client Info         600         600         600           Oil Changed         Client Info         Not Changed         NoRMAL	Sample Date		Client Info		20 Jun 2024	09 May 2024	09 May 2024
Oil Changed Sample Status         Client Info         Not Changed NORMAL         Change NoRMAL         Change NEG         Change NEG         Change NEG         Change NEG         Change NEG         Change NEG         NoE         Change NEG         Change NEG         Change NEG         Change NEG         Change NEG         Change NEG         Change NEG         Change NEG         Change NEG         Cha	Machine Age	hrs	Client Info		6559	6291	5693
Sample Status	Oil Age	hrs	Client Info		600	600	600
CONTAMINATION         method         limit/base         current         history1         history2           Fuel         WC Method         >3.0         <1.0	Oil Changed		Client Info		Not Changd	0	Changed
Fuel	Sample Status				NORMAL	NORMAL	NORMAL
Water Glycol         WC Method Glycol         >0.2         NEG NEG         NEG NEG         NEG           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >165         2         8         8           Chromium         ppm         ASTM D5185m         >5         0         1         1           Nickel         ppm         ASTM D5185m         >4         0         <1         <1           Sliver         ppm         ASTM D5185m         >2         0         <1         <1           Sliver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >20         2         3         2           Lead         ppm         ASTM D5185m         >90         <1         3         3           Tin         ppm         ASTM D5185m         >5         <1         <1         <1           Vanadium         ppm         ASTM D5185m         >5         <1         <1         <1           Vanadium         ppm         ASTM D5185m         50         23         <	CONTAMINAT	ION	method	limit/base	current	history1	history2
Second   WC Method   MEG   NEG   NEG	Fuel		WC Method	>3.0	<1.0	<1.0	<1.0
WEAR METALS	Water		WC Method	>0.2	NEG	NEG	NEG
Iron	Glycol		WC Method		NEG	NEG	NEG
Chromium         ppm         ASTM D5185m         >5         0         1         1           Nickel         ppm         ASTM D5185m         >4         0         <1	WEAR METAL	.S	method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>165	2	8	8
Titanium         ppm         ASTM D5185m         >2         0         <1         <1           Silver         ppm         ASTM D5185m         >2         0         0         0           Aluminum         ppm         ASTM D5185m         >20         2         3         2           Lead         ppm         ASTM D5185m         >150         <1	Chromium	ppm	ASTM D5185m	>5	0	1	1
Silver	Nickel	ppm	ASTM D5185m	>4	0	<1	<1
Aluminum	Titanium	ppm	ASTM D5185m	>2	0	<1	<1
Lead	Silver	ppm	ASTM D5185m	>2	0	0	0
Copper         ppm         ASTM D5185m         >90         <1         3         3           Tin         ppm         ASTM D5185m         >5         <1	Aluminum	ppm	ASTM D5185m	>20	2	3	2
Tin         ppm         ASTM D5185m         >5         <1         <1         <1           Vanadium         ppm         ASTM D5185m         0         <1         <1           Cadmium         ppm         ASTM D5185m         0         <1         <1           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         50         23         4         4           Barium         ppm         ASTM D5185m         50         2         2         2           Molybdenum         ppm         ASTM D5185m         50         47         56         56           Manganese         ppm         ASTM D5185m         50         47         56         56           Magnesium         ppm         ASTM D5185m         560         569         527         519           Calcium         ppm         ASTM D5185m         1510         1566         1557         1528           Phosphorus         ppm         ASTM D5185m         780         808         743         711           Zinc         ppm         ASTM D5185m         2040         2838	Lead	ppm	ASTM D5185m	>150	<1	10	6
Vanadium         ppm         ASTM D5185m         0         <1         <1           Cadmium         ppm         ASTM D5185m         0         <1         <1           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         50         23         4         4           Barium         ppm         ASTM D5185m         50         23         4         4           Barium         ppm         ASTM D5185m         50         23         4         4           Barium         ppm         ASTM D5185m         50         47         56         56           Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         560         569         527         519           Calcium         ppm         ASTM D5185m         1510         1566         1557         1528           Phosphorus         ppm         ASTM D5185m         780         808         743         711           Sulfur         ppm         ASTM D5185m         2040         2838         2563 <t< td=""><td>Copper</td><td>ppm</td><td>ASTM D5185m</td><td>&gt;90</td><th>&lt;1</th><td>3</td><td>3</td></t<>	Copper	ppm	ASTM D5185m	>90	<1	3	3
Cadmium         ppm         ASTM D5185m         0         <1         <1           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         50         23         4         4           Barium         ppm         ASTM D5185m         5         0         2         2           Molybdenum         ppm         ASTM D5185m         50         47         56         56           Manganese         ppm         ASTM D5185m         50         47         56         56           Magnesium         ppm         ASTM D5185m         560         569         527         519           Calcium         ppm         ASTM D5185m         780         808         743         711           Zinc         ppm         ASTM D5185m         780         808         743         711           Zinc         ppm         ASTM D5185m         870         953         902         887           Sulfur         ppm         ASTM D5185m         2040         2838         2563         2463           CONTAMINANTS         method         limit/base         current<	Tin	ppm		>5	<1	<1	<1
ADDITIVES	Vanadium	ppm	ASTM D5185m		0	<1	<1
Boron         ppm         ASTM D5185m         50         23         4         4           Barium         ppm         ASTM D5185m         5         0         2         2           Molybdenum         ppm         ASTM D5185m         50         47         56         56           Manganese         ppm         ASTM D5185m         50         47         56         56           Magnesium         ppm         ASTM D5185m         560         569         527         519           Calcium         ppm         ASTM D5185m         780         808         743         711           Zinc         ppm         ASTM D5185m         780         808         743         711           Zinc         ppm         ASTM D5185m         870         953         902         887           Sulfur         ppm         ASTM D5185m         2040         2838         2563         2463           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         3         3         3           Potassium         ppm         ASTM D5185m         >20	Cadmium	ppm	ASTM D5185m		0	<1	<1
Barium         ppm         ASTM D5185m         5         0         2         2           Molybdenum         ppm         ASTM D5185m         50         47         56         56           Manganese         ppm         ASTM D5185m         0         <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         50         47         56         56           Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         560         569         527         519           Calcium         ppm         ASTM D5185m         1510         1566         1557         1528           Phosphorus         ppm         ASTM D5185m         780         808         743         711           Zinc         ppm         ASTM D5185m         870         953         902         887           Sulfur         ppm         ASTM D5185m         2040         2838         2563         2463           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >35         5         12         11           Sodium         ppm         ASTM D5185m         >20         3         3         3           INFRA-RED         method         limit/base         current         history1         history2           Soot %         *ASTM D7844         >7.5	Boron	ppm	ASTM D5185m	50			4
Manganese         ppm         ASTM D5185m         0         <1         <1         <1           Magnesium         ppm         ASTM D5185m         560         569         527         519           Calcium         ppm         ASTM D5185m         1510         1566         1557         1528           Phosphorus         ppm         ASTM D5185m         780         808         743         711           Zinc         ppm         ASTM D5185m         870         953         902         887           Sulfur         ppm         ASTM D5185m         2040         2838         2563         2463           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >35         5         12         11           Sodium         ppm         ASTM D5185m         >35         5         12         11           Sodium         ppm         ASTM D5185m         >20         3         3         3           INFRA-RED         method         limit/base         current         history1         history2           Soot %         % *ASTM D7844         >7.5	Barium	ppm	ASTM D5185m	5	0	2	2
Magnesium         ppm         ASTM D5185m         560         569         527         519           Calcium         ppm         ASTM D5185m         1510         1566         1557         1528           Phosphorus         ppm         ASTM D5185m         780         808         743         711           Zinc         ppm         ASTM D5185m         870         953         902         887           Sulfur         ppm         ASTM D5185m         2040         2838         2563         2463           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >35         5         12         11           Sodium         ppm         ASTM D5185m         >20         3         3         3           Potassium         ppm         ASTM D5185m         >20         3         3         3           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         8.5         11.0         11.2           Sulfation         Abs/.1mm         *ASTM D7415	Molybdenum	ppm	ASTM D5185m	50	47		
Calcium         ppm         ASTM D5185m         1510         1566         1557         1528           Phosphorus         ppm         ASTM D5185m         780         808         743         711           Zinc         ppm         ASTM D5185m         870         953         902         887           Sulfur         ppm         ASTM D5185m         2040         2838         2563         2463           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >35         5         12         11           Sodium         ppm         ASTM D5185m         >66         5         5           Potassium         ppm         ASTM D5185m         >20         3         3         3           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         8.5         11.0         11.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.6         24.1         23.9           FLUID DEGRADATION         method         lim	Manganese	ppm	ASTM D5185m		<1		
Phosphorus         ppm         ASTM D5185m         780         808         743         711           Zinc         ppm         ASTM D5185m         870         953         902         887           Sulfur         ppm         ASTM D5185m         2040         2838         2563         2463           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >35         5         12         11           Sodium         ppm         ASTM D5185m         >35         5         12         11           Sodium         ppm         ASTM D5185m         >20         3         3         3           Potassium         ppm         ASTM D5185m         >20         3         3         3           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         8.5         11.0         11.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.6         24.1         23.9           FLUID DEGRADATION         "ASTM D7414	-	ppm	ASTM D5185m				
Zinc         ppm         ASTM D5185m         870         953         902         887           Sulfur         ppm         ASTM D5185m         2040         2838         2563         2463           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >35         5         12         11           Sodium         ppm         ASTM D5185m         >66         5         5           Potassium         ppm         ASTM D5185m         >20         3         3         3           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7624         >20         8.5         11.0         11.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.6         24.1         23.9           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         16.4         19.5         19.5		ppm	ASTM D5185m				
Sulfur         ppm         ASTM D5185m         2040         2838         2563         2463           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >35         5         12         11           Sodium         ppm         ASTM D5185m         >6         5         5           Potassium         ppm         ASTM D5185m         >20         3         3           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >7.5         0         0         0           Nitration         Abs/cm         *ASTM D7624         >20         8.5         11.0         11.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.6         24.1         23.9           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         16.4         19.5         19.5		ppm					
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >35         5         12         11           Sodium         ppm         ASTM D5185m         6         5         5           Potassium         ppm         ASTM D5185m         >20         3         3           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >7.5         0         0         0           Nitration         Abs/cm         *ASTM D7624         >20         8.5         11.0         11.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.6         24.1         23.9           FLUID DEGRADATION         method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         16.4         19.5         19.5							
Silicon         ppm         ASTM D5185m         >35         5         12         11           Sodium         ppm         ASTM D5185m         6         5         5           Potassium         ppm         ASTM D5185m         >20         3         3           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >7.5         0         0         0           Nitration         Abs/cm         *ASTM D7624         >20         8.5         11.0         11.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.6         24.1         23.9           FLUID DEGRADATION method         limit/base         current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         16.4         19.5         19.5			ASTM D5185m	2040	2838	2563	2463
Sodium         ppm         ASTM D5185m         6         5         5           Potassium         ppm         ASTM D5185m         >20         3         3         3           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >7.5         0         0         0           Nitration         Abs/cm         *ASTM D7624         >20         8.5         11.0         11.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.6         24.1         23.9           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         16.4         19.5         19.5		ITS	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         3         3         3           INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >7.5         0         0         0           Nitration         Abs/cm         *ASTM D7624         >20         8.5         11.0         11.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.6         24.1         23.9           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         16.4         19.5         19.5		ppm		>35	5		
INFRA-RED         method         limit/base         current         history1         history2           Soot %         %         *ASTM D7844         >7.5         0         0         0           Nitration         Abs/cm         *ASTM D7624         >20         8.5         11.0         11.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.6         24.1         23.9           FLUID DEGRADATION method limit/base current         history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         16.4         19.5         19.5		ppm	ASTM D5185m		6		5
Soot %         %         *ASTM D7844 > 7.5         0         0         0           Nitration         Abs/cm         *ASTM D7624 > 20         8.5         11.0         11.2           Sulfation         Abs/.1mm         *ASTM D7415 > 30         19.6         24.1         23.9           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414 > 25         16.4         19.5         19.5	Potassium	ppm	ASTM D5185m	>20	3	3	3
Nitration         Abs/cm         *ASTM D7624         >20         8.5         11.0         11.2           Sulfation         Abs/.1mm         *ASTM D7415         >30         19.6         24.1         23.9           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         16.4         19.5         19.5	INFRA-RED		method	limit/base	current	history1	history2
Sulfation         Abs/.1mm         *ASTM D7415         >30         19.6         24.1         23.9           FLUID DEGRADATION method limit/base current history1         history2           Oxidation         Abs/.1mm         *ASTM D7414         >25         16.4         19.5         19.5	Soot %	%	*ASTM D7844	>7.5	0	0	0
FLUID DEGRADATION method limit/base current history1     history2       Oxidation     Abs/.1mm *ASTM D7414     >25     16.4     19.5     19.5	Nitration	Abs/cm	*ASTM D7624	>20	8.5	11.0	11.2
Oxidation         Abs/.1mm         *ASTM D7414         >25         16.4         19.5         19.5	Sulfation	Abs/.1mm	*ASTM D7415	>30	19.6	24.1	23.9
	FLUID DEGRAI	DATION	method	limit/base	current	history1	history2
Base Number (BN)         mg KOH/g         ASTM D2896         10.2         6.9         3.1         3.1	Oxidation	Abs/.1mm	*ASTM D7414	>25	16.4	19.5	19.5
	Base Number (BN)	mg KOH/g	ASTM D2896	10.2	6.9	3.1	3.1



# **OIL ANALYSIS REPORT**



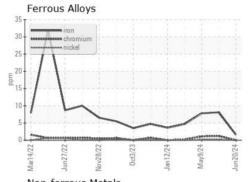




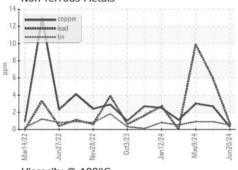
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	LIGHT	NONE
Sand/Dirt	scalar	*Visual	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

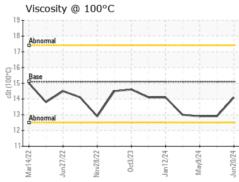
FLUID PROP	ERITES	method	ilmit/base		nistory i	nistoryz
Visc @ 100°C	cSt	ASTM D445	15.1	14.1	12.9	12.9

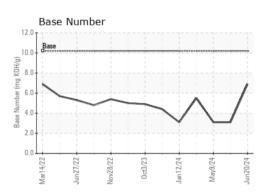
# **GRAPHS**















Certificate 12367

Laboratory Sample No. Unique Number : 11089573

: GFL0125702 Lab Number : 06216709

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

**Tested** : 24 Jun 2024 Diagnosed : 24 Jun 2024 - Wes Davis

: 21 Jun 2024

GFL Environmental - 030 - Conway Myrtle Beach

3010 HWY 378 Conway, SC US 29527

aruiz@gflenv.com

Contact: ARCILIO RUEZ

Test Package : FLEET 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: